



PALO VERDE COLLEGE

WHERE KNOWLEDGE TAKES ROOT AND OPPORTUNITY GROWS

2023-01

NEW CHILD DEVELOPMENT CENTER

BIDS ARE DUE NO LATER THAN FEBRUARY 3, 2023 AT 3:00 P.M. (PST)

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2023-01 New Child Development Center

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NOTICE TO BIDDERS

Notice is hereby given that the governing board ("Board") of the Palo Verde Community College District ("District" or "Owner") will receive sealed bids for the following project:

2023-01 NEW CHILD DEVELOPMENT CENTER

Submittal of Bids. Sealed Bids must be received by **3:00 p.m., February 3, 2023**, at the Administrative Services Office, located at 1 College Drive, Blythe, California, at or after which time the bids will be opened and publicly read aloud. The precise time will be established by the clock located in the Administrative Services Office. Any claim by a Bidder of error in its bid must be made in compliance with section 5100 et seq. of the Public Contract Code. It is the Bidder's responsibility to ensure timely delivery to the specified location. Any bid that is submitted after this time shall be non-responsive and returned to the Bidder.

Project Details. The Project consists of, **but is not limited to**, the following: Demolition and New Construction. Demo of existing CMU building that will include asbestos abatement and site grading. Construction prep for (1) one story building totaling 8,912 S.F. Fire alarm and approved automatic sprinkler system will be installed throughout. Project consists of permanent 24'x40' modular buildings uses of space for building include four classrooms, office space, kitchen, multipurpose room. Exterior improvements include a lunch shelter, playground and green space for play and gardening and parking.

Site Visit. A mandatory pre-bid conference and site visit will be held on **January 12, 2023 at 1:00 p.m.** (PST) meeting at the future site of the New Child Development Center located at 141 S. 2nd St, Blythe, California 92225 The site visit is expected to take approximately 2 hour(s). Failure to attend will render a Bidder ineligible.

Contractor's License Classification. The Bidder is required to possess the following State of California Contractor License: "B". The Bidder's license(s) must remain active and in good standing throughout the term of the Contract.

CUPCCAA. Palo Verde Community College (PVCCD) has adopted the CUPCCAA (Public Code Section 22000 Et Seq.). The act is commonly referred to as the "Informal Bidding Act". In accordance with the Act, Palo Verde Community College will maintain a list of qualified contractors who will be asked to bid on any public works project less than \$200,000 pertaining to a specific area of expertise. **All bidders must submit a CUPCCAA Pre-Qualification Application prior to bid submittal. Failure to comply will render the bidder as non-responsive.**

Bid Form. All bids shall be on the form provided by the District. Each bid must conform and be responsive to all pertinent Contract Documents, including, but not limited to, the Instructions to Bidders.

Bid Bond. A bid bond by an admitted surety insurer on the form provided by the District, cash, or a cashier's check or a certified check, drawn to the order of the Palo Verde Community College District, in the amount of ten percent (10%) of the total bid price, shall accompany the Bid Form and Proposal, as a guarantee that the Bidder will, within six (6) calendar days after the date of the Notice of Award, enter into a contract with the District for the performance of the services as stipulated in the bid.

Bonds. The successful Bidder shall be required to furnish a 100 % Performance Bond and a 100% Payment Bond if it is awarded the contract for the Work. The costs associated with providing these Bonds must be included in the total amount of the bid as submitted by the Bidder.

Prevailing Wage Rates. The Contractor and all Subcontractors under the Contractor shall pay all workers on all work performed pursuant to this Contract not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work as determined by the Director of the Department of Industrial Relations, State of California, for the type of work performed and the locality in which the work is to be performed within the boundaries of the District, pursuant to sections 1770 et seq. of the California Labor Code. Prevailing wage rates are also available on the Internet at: <<http://www.dir.ca.gov>>.

Labor Compliance Monitoring. This Project is subject to labor compliance monitoring and enforcement by the Compliance Monitoring Unit of the Department of Industrial Relations pursuant to Labor Code sections 1771.55 and 1771.75 and subject to the requirements of section 16450 et seq. of Title 8 of the California Code of Regulations. Contractors and subcontractors must register as Public Works Contractors with the Department of Industrial Relations. The Contractor and all Subcontractors under the Contractor shall furnish certified payroll records directly to the Labor Commissioner weekly and within ten (10) days of any request by the District or the Labor Commissioner in accordance with section 16461 of the California Code of Regulations. The successful Bidder shall comply with all requirements of Division 2, Part 7, Chapter 1, of the Labor Code commencing with section 1771.5.

Bid Documents. One Drawing, Specification and Contract Document set will be furnished online or via electronic means. Should the contractor require a full set of printed drawings, Bidder shall pay \$100.00 per set needed.

Award of Contract. The District shall award the Contract, if it awards it at all, to the lowest responsive responsible bidder based on the base bid amount only.

Waiver of Irregularities. The Board reserves the right to reject any and all bids and/or waive any irregularity in any bid received. If the District awards the Contract, the security of unsuccessful Bidder(s) shall be returned within sixty (60) days from the time the award is made. Unless otherwise required by law, no Bidder may withdraw its bid for ninety (90) days after the date of the bid opening.

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INSTRUCTIONS TO BIDDERS

Contractors shall follow the instructions in this document, and shall submit all documents, forms, and information required for consideration of a Bid.

Palo Verde Community College District ("District" or "Owner") will evaluate information submitted by the apparent low Bidder and, if incomplete or unsatisfactory to District, Bidder's bid may be rejected at the sole discretion of District.

1. Bids are requested for a general construction contract, or work described in general, for the following project.
2023-01 NEW CHILD DEVELOPMENT CENTER
2. District will receive sealed Bids from Bidders as stipulated in the Notice to Bidders.
3. Bidders must submit Bids on the Bid Form and Proposal and all other required District forms. Bids not submitted on the District's required forms shall be deemed non-responsive and shall not be considered. Additional sheets required to fully respond to requested information are permissible.
4. Bidders must supply all information required by each Bid Document. Bids must be full and complete. District reserves the right in its sole discretion to reject any Bid as non-responsive as a result of any error or omission in the Bid.

Bidders must complete and submit all of the following documents with the Bid Form and Proposal:

- **The Bid Bond (on the District's form) or other security**
 - **The Designated Subcontractors List**
 - **The Site-Visit Certification**
 - **The Non-collusion Declaration**
 - **Workers Compensation Certification**
 - **Prevailing Wage and Related Labor Requirement Certification**
 - **Drug-Free Workplace Certification**
 - **Tobacco-Free Environment Certification**
 - **Hazardous Materials Certification**
5. Bidders must submit with their Bids cash, a cashier's check or a certified check payable to District, or a bid bond by an admitted surety insurer of not less than ten percent (10%) of amount of base Bid, plus all additive alternates. If Bidder chooses to provide a Bid Bond as security, Bidder must use the required form of corporate surety provided by District (Document 00 43 13 Bid Bond). The Surety on Bidder's Bid Bond must be an insurer admitted in the State of California and authorized to issue surety bonds in the State of California. **Bids submitted without necessary bid security will be deemed non-responsive and will not be considered.**
 6. If Bidder to whom Contract is awarded shall for **Six (6) calendar days** after the date of the Notice of Award, fail or neglect to enter into Contract and submit required bonds, insurance certificates, and all other required documents, District may deposit Bid Bond, cash, cashier's check, or certified check for collection, and proceeds thereof may be retained by District as liquidated damages for failure of Bidder to enter into Contract, in the sole discretion of District. It is agreed that calculation of damages District may suffer as a result of Bidder's failure to enter into the Contract would be extremely difficult and impractical to determine and that the amount of the Bidder's required bid security shall be the agreed and conclusively presumed amount of damages.
 7. Bidders must submit with the Bid the Designated Subcontractors List for those subcontractors who will perform any portion of Work, including labor, rendering of service, or specially fabricating and installing a portion of the Work or improvement according to detailed drawings contained in the plans and specifications, in excess of one

half of one percent (0.5%) of total Bid. **Failure to submit this list when required by law shall result in Bid being deemed non-responsive and the Bid will not be considered.**

8. **If a mandatory pre-bid conference and site visit (“Site Visit”) is requested as referenced in the Notice to Bidders, then Bidders must submit the Site-Visit Certification with their Bid.** District will transmit to all prospective Bidders of record such Addenda as District in its discretion considers necessary in response to questions arising at the Site Visit. Oral statements shall not be relied upon and will not be binding or legally effective. Addenda issued by the District as a result of the Site Visit, if any, shall constitute the sole and exclusive record and statement of the results of the Site Visit.
9. Bidders shall submit the Non-collusion Declaration with their Bids. **Bids submitted without the Non-collusion Declaration shall be deemed non-responsive and will not be considered.**
10. Bids shall be clearly written without erasure or deletions. **District reserves the right to reject any Bid containing erasures or deletions.**
11. Bidders shall not modify the Bid Form and Proposal or qualify their Bids. Bidders shall not submit to the District a scanned, re-typed, word-processed, or otherwise recreated version of the Bid Form and Proposal or other District-provided document.
12. The Bidder and all Subcontractors under the Contractor shall pay all workers on all work performed pursuant to this Contract not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work as determined by the Director of the Department of Industrial Relations, State of California, for the type of work performed and the locality in which the work is to be performed within the boundaries of the District, pursuant to sections 1770 et seq. of the California Labor Code. Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are available upon request at the District’s principal office. Prevailing wage rates are also available on the internet at <http://www.dir.ca.gov>.
13. **Submission of Bid signifies careful examination of Contract Documents and complete understanding of the nature, extent, and location of Work to be performed.** Bidders must complete the tasks listed below as a condition to bidding, and submission of a Bid shall constitute the Bidder’s express representation to District that Bidder has fully completed the following:
 - a. Bidder has visited the Site, if required, and has examined thoroughly and understood the nature and extent of the Contract Documents, Work, Site, locality, actual conditions, as-built conditions, and all local conditions and federal, state and local laws, and regulations that in any manner may affect cost, progress, performance, or furnishing of Work or that relate to any aspect of the means, methods, techniques, sequences, or procedures of construction to be employed by Bidder and safety precautions and programs incident thereto;
 - b. Bidder has conducted or obtained and has understood all examinations, investigations, explorations, tests, reports, and studies that pertain to the subsurface conditions, as-built conditions, underground facilities, and all other physical conditions at or contiguous to the Site or otherwise that may affect the cost, progress, performance, or furnishing of Work, as Bidder considers necessary for the performance or furnishing of Work at the Contract Sum, within the Contract Time, and in accordance with the other terms and conditions of Contract Documents, including specifically the provisions of the General Conditions; and no additional examinations, investigations, explorations, tests, reports, studies, or similar information or data are or will be required by Bidder for such purposes;
 - c. Bidder has correlated its knowledge and the results of all such observations, examinations, investigations, explorations, tests, reports, and studies with the terms and conditions of the Contract Documents;

- d. Bidder has given the District prompt written notice of all conflicts, errors, ambiguities, or discrepancies that it has discovered in or among the Contract Documents and the actual conditions, and the written resolution thereof by the District is acceptable to Bidder;
- e. Bidder has made a complete disclosure in writing to the District of all facts bearing upon any possible interest, direct or indirect, that Bidder believes any representative of the District or other officer or employee of the District presently has or will have in this Contract or in the performance thereof or in any portion of the profits thereof;
- f. Bidder must, prior to bidding, perform the work, investigations, research, and analysis required by this document and that Bidder represented in its Bid Form and Proposal and the Agreement that it performed prior to bidding. Contractor under this Contract is charged with all information and knowledge that a reasonable bidder would ascertain from having performed this required work, investigation, research, and analysis. Bid prices must include entire cost of all work "incidental" to completion of the Work.
- g. Conditions Shown on the Contract Documents: Information as to underground conditions, as-built conditions, or other conditions or obstructions, indicated in the Contract Documents, e.g., on Drawings or in Specifications, has been obtained with reasonable care, and has been recorded in good faith. However, District only warrants, and Contractor may only rely, on the accuracy of limited types of information.
 - (1) As to above-ground conditions or as-built conditions shown or indicated in the Contract Documents, there is no warranty, express or implied, or any representation express or implied, that such information is correctly shown or indicated. This information is verifiable by independent investigation and Contractor is required to make such verification as a condition to bidding. In submitting its Bid, Contractor shall rely on the results of its own independent investigation. In submitting its Bid, Contractor shall not rely on District-supplied information regarding above-ground conditions or as-built conditions.
 - (2) As to any subsurface condition shown or indicated in the Contract Documents, Contractor may rely only upon the general accuracy of actual reported depths, actual reported character of materials, actual reported soil types, actual reported water conditions, or actual obstructions shown or indicated. District is not responsible for the completeness of such information for bidding or construction; nor is District responsible in any way for any conclusions or opinions of Contractor drawn from such information; nor is the District responsible for subsurface conditions that are not specifically shown (for example, District is not responsible for soil conditions in areas contiguous to areas where a subsurface condition is shown).
- h. Conditions Shown in Reports and Drawings Supplied for Informational Purposes: Reference is made to the document entitled Geotechnical Data, and the document entitled Existing Conditions, for identification of:
 - (1) Subsurface Conditions: Those reports of explorations and tests of subsurface conditions at or contiguous to the Site that have been utilized by Architect in preparing the Contract Documents; and
 - (2) Physical Conditions: Those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that has been utilized by Architect in preparing the Contract Documents.
 - (3) These reports and drawings are **not** Contract Documents and, except for any "technical" data regarding subsurface conditions specifically identified in Geotechnical Data and Existing Conditions, and underground facilities data, Contractor may not in any manner rely on the information in these reports and drawings. Subject to the foregoing, Contractor must make its own independent investigation of all conditions affecting the Work and must not rely on information provided by District.

14. Bidders may examine any available “as-built” drawings of previous work by giving District reasonable advance notice. District will not be responsible for accuracy of “as-built” drawings. The document entitled Existing Conditions applies to all supplied “as-built” drawings.
15. All questions about the meaning or intent of the Contract Documents are to be directed in writing to **Crystal Tautala, Fiscal Services Specialist** via email at crystal.tautala@paloverde.edu or via fax at 760.922.0230. Interpretations or clarifications considered necessary by the District in response to such questions will be issued in writing by Addenda faxed, mailed, or delivered to all parties recorded by the District as having received the Contract Documents. Questions received less than **SIX (6) calendar days** prior to the date for opening Bids may not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
16. Addenda may also be issued to modify other parts of the Contract Documents as deemed advisable by the District.
17. **Each Bidder must acknowledge each Addendum in its Bid Form and Proposal by number or its Bid shall be considered non-responsive.** Each Addenda shall be part of the Contract Documents. A complete listing of Addenda may be secured from the District.
18. Bids shall be based on products and systems specified in Contract Documents or listed by name in Addenda. Whenever in the Specifications any materials, process, or article is indicated or specified by grade, patent, or proprietary name, or by name of manufacturer, that Specification shall be deemed to be followed by the words “or equal.” Bidder may, unless otherwise stated, offer any material, process, or article that shall be substantially equal or better in every respect to that so indicated or specified. The District is not responsible and/or liable in any way for a Contractor’s damages and/or claims related, in any way, to that Contractor’s basing its bid on any requested substitution that the District has not approved. Contractors and materials suppliers who submit requests for substitutions prior to the award of the Contract must do so in writing and in compliance with Public Contract Code section 3400. All requests must comply with the following:
 - a. District must receive any request for substitution a minimum of **TEN (10) calendar days** prior to bid opening.
 - b. Within 35 days after the date of the Notice of Award, the Successful Bidder shall submit data substantiating a request for substitution containing sufficient information to assess acceptability of product or system and impact on Project, including, without limitation, the requirements specified in the Special Conditions and the Specifications. Insufficient information shall be grounds for rejection of substitution.
 - c. Approved substitutions shall be listed in Addenda. **District reserves the right not to act upon submittals of substitutions until after bid opening.**
 - d. Substitutions may be requested after Contract has been awarded only if indicated in and in accordance with requirements specified in the Special Conditions and the Specifications.
19. **All Bids must be sealed, and marked with name and address of the Bidder in the upper left corner.**

Bids will be received as indicated in the Notice to Bidders.

 - a. Mark envelopes with the name of the Project.
 - b. Bids must be submitted to the attention of **Crystal Tautala, Fiscal Services Specialist** located in the **Administrative Services Office, 1 College Drive, Blythe, CA 92225** by the date and time shown in the Notice to Bidders.
 - c. Bids must contain all documents as required herein.

- d. **It is the sole responsibility of the bidder to see that his bid is received at the proper time and place.** Any bid received after the scheduled closing time for receipt of bids will be returned to the bidder unopened.
20. Bids will be opened at or after the time indicated for receipt of bids.
21. This Contract may include alternates. Alternates are defined as alternate products, materials, equipment, systems, methods, or major elements of the construction, that may, at the District's option and under terms established in the Contract and pursuant to section 20103.8 of the Public Contract Code, be selected for the Work.
22. The District shall award the Contract, if it awards it at all, to the lowest responsive responsible bidder, if any, based on the criteria as indicated in the Notice to Bidders. In the event two or more responsible bidders submit identical bids, the District shall select the Bidder to whom to award the Contract by lot.
23. Time for Completion: District may issue a Notice to Proceed within **THREE (3)** months from the date of the Notice of Award. Once Contractor has received the Notice to Proceed, Contractor shall complete the Work within the period of time indicated in the Contract Documents.
- a. In the event that the District desires to postpone issuing the Notice to Proceed beyond this 3-month period, it is expressly understood that with reasonable notice to the Contractor, the District may postpone issuing the Notice to Proceed.
- b. It is further expressly understood by Contractor that Contractor shall not be entitled to any claim of additional compensation as a result of the postponement of the issuance of the Notice to Proceed beyond a 3-month period. If the Contractor believes that a postponement of issuance of the Notice to Proceed will cause a hardship to the Contractor, the Contractor may terminate the Contract. Contractor's termination due to a postponement beyond this 3-month period shall be by written notice to District within **TEN (10)** calendar days after receipt by Contractor of District's notice of postponement.
- c. It is further understood by the Contractor that in the event that Contractor terminates the Contract as a result of postponement by the District, the District shall only be obligated to pay Contractor for the Work that Contractor had performed at the time of notification of postponement and which the District had in writing authorized Contractor to perform prior to issuing a Notice to Proceed.
- d. Should the Contractor terminate the Contract as a result of a notice of postponement, District shall have the authority to award the Contract to the next lowest responsive responsible bidder.
24. **The Bidder to whom Contract is awarded shall execute and submit the following documents by 3:00 p.m. of the SIXTH (6TH) calendar day following the date of the Notice of Award. Failure to properly and timely submit these documents entitles District to reject the bid as non-responsive.**
- a. Agreement: To be executed by successful Bidder. Submit four (4) copies, each bearing an original signature.
- b. Escrow of Bid Documentation: This must include all required documentation. See the document Escrow of Bid Documentation for more information.
- c. Performance Bond (100%): On the form provided in the Contract Documents and fully executed as indicated on the form.
- d. Payment Bond (100%) (Contractor's Labor and Material Bond): On the form provided in the Contract Documents and fully executed as indicated on the form.
- e. **Insurance Certificates and Endorsements as required (reference Section 13 of General Conditions).**

- (1) **Commercial General Liability**
- (2) **Automobile Liability – Any Auto**
- (3) **Workers Compensation**
- (4) **Employers’ Liability**
- (5) **Builder’s Risk (Course of Construction)**

25. **Any bid protest by any Bidder regarding any other bid must be submitted in writing to the District, before 5:00 p.m. of the THIRD (3rd) business day following bid opening.**
- a. Only a Bidder who has actually submitted a bid, and who could be awarded the Contract if the bid protest is upheld, is eligible to submit a bid protest. Subcontractors are not eligible to submit bid protests. A Bidder may not rely on the bid protest submitted by another Bidder.
 - b. A bid protest must contain a complete statement of any and all bases for the protest and all supporting documentation. Materials submitted after the bid protest deadline will not be considered.
 - c. The protest must refer to the specific portions of all documents that form the bases for the protest.
 - d. The protest must include the name, address and telephone number of the person representing the protesting party.
 - e. The party filing the protest must concurrently transmit a copy of the protest and any attached documentation to all other parties with a direct financial interest that may be adversely affected by the outcome of the protest. Such parties shall include all other bidders or proposers who appear to have a reasonable prospect of receiving an award depending upon the outcome of the protest.
 - f. The procedure and time limits set forth in this paragraph are mandatory and are each bidder's sole and exclusive remedy in the event of bid protest. Failure to comply with these procedures shall constitute a waiver of any right to further pursue the bid protest, including filing a Government Code Claim or legal proceedings.
26. District reserves the right to reject any or all bids, including without limitation the right to reject any or all nonconforming, non-responsive, unbalanced, or conditional bids, to re-bid, and to reject the bid of any bidder if District believes that it would not be in the best interest of the District to make an award to that bidder, whether because the bid is not responsive or the bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by District. District also reserves the right to waive inconsequential deviations not involving price, time, or changes in the Work. For purposes of this paragraph, an “unbalanced bid” is one having nominal prices for some work items and/or enhanced prices for other work items.
27. Discrepancies between written words and figures, or words and numerals, **will be resolved in favor of numerals or figures.**
28. Prior to the award of Contract, District reserves the right to consider the responsibility of the Bidder. District may conduct investigations as District deems necessary to assist in the evaluation of any bid and to establish the responsibility, including, without limitation, qualifications and financial ability of Bidders, proposed subcontractors, suppliers, and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to District's satisfaction within the prescribed time.
29. **The bid must be signed in the name of the Bidder and must bear the signature in longhand of the person or persons duly authorized to sign the bid.**
30. The period of performance for this contract shall be as noted below. The District plans to proceed on the basis of the following schedule set forth.

1. **Bid Advertisement:** December 21 & December 28, 2022- Ongoing (Website)
2. **Pre-Bid Conference:** January 12, 2023 at 1:00 p.m.
3. **Last Day for RFI's** January 23, 2023 at 3:00 p.m.
4. **Bid Opening:** February 3, 2023 at 1:00 p.m. in the Admin. Services Office

5. **Anticipated Board Approval:** February 14, 2023
6. **Anticipated Notice of Award:** February 15, 2023
7. **Required Bonds:** February 23, 2023
8. **Pre-Construction Meeting:** February 27, 2023
9. **PO/ Notice to Proceed:** February 28, 2023
10. **Commence Work:** March 6, 2023
11. **Complete Work:** August 6, 2023
12. **10% Retention:** A minimum of 35 Days after Notice of Completion is recorded at the Riverside County Recorder.

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HAZARDOUS MATERIALS PROCEDURES & REQUIREMENTS

1. Summary

This document includes information applicable to hazardous materials and hazard waste abatement.

2. Notice of Hazardous Waste or Materials Conditions

- a. Contractor shall give notice in writing to the District, the Construction Manager, and the Architect promptly, before any of the following conditions are disturbed, and in no event later than twenty-four (24) hours after first observance, of any:
 - (1) Material that Contractor believes may be material that is hazardous waste or hazardous material, as defined in section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law;
 - (2) Other material that may present a substantial danger to persons or property exposed thereto in connection with Work at the site.
- b. Contractor's written notice shall indicate whether the hazardous waste or material was shown or indicated in the Contract Documents to be within the scope of Work, and whether the materials were brought to the site by Contractor, its Subcontractors, suppliers, or anyone else for whom Contractor is responsible. As used in this section the term "hazardous materials" shall include, without limitation, asbestos, lead, Polychlorinated biphenyl (PCB), petroleum and related hydrocarbons, and radioactive material.
- c. In response to Contractor's written notice, the District shall investigate the identified conditions.
- d. If the District determines that conditions do not involve hazardous materials or that no change in terms of Contract is justified, the District shall so notify Contractor in writing, stating reasons. If the District and Contractor cannot agree on whether conditions justify an adjustment in Contract Price or Contract Time, or on the extent of any adjustment, Contractor shall proceed with the Work as directed by the District.
- e. If after receipt of notice from the District, Contractor does not agree to resume Work based on a reasonable belief it is unsafe, or does not agree to resume Work under special conditions, then District may order such portion of Work that is in connection with such hazardous condition or such affected area to be deleted from the Work, or performed by others, or District may invoke its rights to terminate the Contract in whole or in part. District will determine entitlement to or the amount or extent of an adjustment, if any, in Contract Price or Contract Time as a result of deleting such portion of Work, or performing the Work by others.
- f. If Contractor stops Work in connection with any hazardous condition and in any area affected thereby, Contractor shall immediately redeploy its workers, equipment, and materials, as necessary, to other portions of the Work to minimize delay and disruption.

3. Additional Warranties and Representations

- a. Contractor represents and warrants that it, its employees, and its subcontractors and their employees, shall at all times have the required levels of familiarity with the Site and the Work, training, and ability to

comply fully with all applicable law and contract requirements for safe and expeditious performance of the Work, including whatever training is or may be required regarding the activities to be performed (including, but not limited to, all training required to address adequately the actual or potential dangers of Contract performance).

- b. Contractor represents and warrants that it, its employees, and its subcontractors and their employees, shall at all times have and maintain in good standing any and all certifications and licenses required by applicable federal, state, and other governmental and quasi-governmental requirements applicable to the Work.
- c. Contractor represents and warrants that it has studied carefully all requirements of the Specifications regarding procedures for demolition, hazardous waste abatement, or safety practices, specified in the Contract, and prior to submitting its bid, has either (a) verified to its satisfaction that the specified procedures are adequate and sufficient to achieve the results intended by the Contract Documents, or (b) by way of approved "or equal" request or request for clarification and written Addenda, secured changes to the specified procedures sufficient to achieve the results intended by the Contract Documents. Contractor accepts the risk that any specified procedure will result in a completed Project in full compliance with the Contract Documents.

4. Monitoring and Testing

- a. District reserves the right, in its sole discretion, to conduct air monitoring, earth monitoring, Work monitoring, and any other tests (in addition to testing required under the agreement or applicable law), to monitor Contract requirements of safe and statutorily compliant work methods and (where applicable) safe re-entry level air standards under state and federal law upon completion of the job, and compliance of the work with periodic and final inspection by public and quasi-public entities having jurisdiction.
- b. Contractor acknowledges that District has the right to perform, or cause to be performed, various activities and tests including, but not limited to, pre-abatement, during abatement, and post-abatement air monitoring, that District shall have no obligation to perform said activities and tests, and that a portion of said activities and tests may take place prior to the completion of the Work by Contractor. In the event District elects to perform these activities and tests, Contractor shall afford District ample access to the Site and all areas of the Work as may be necessary for the performance of these activities and tests. Contractor will include the potential impact of these activities or tests by District in the Contract Price and the Scheduled Completion Date.
- c. Notwithstanding District's rights granted by this paragraph, Contractor may retain its own industrial hygiene consultant at Contractor's own expense and may collect samples and may perform tests including, but not limited to, pre-abatement, during abatement, and post-abatement personal air monitoring, and District reserves the right to request documentation of all such activities and tests performed by Contractor relating to the Work and Contractor shall immediately provide that documentation upon request.

5. Compliance with Laws

- a. Contractor shall perform safe, expeditious, and orderly work in accordance with the best practices and the highest standards in the hazardous waste abatement, removal, and disposal industry, the applicable law, and the Contract Documents, including, but not limited to, all responsibilities relating to the preparation and return of waste shipment records, all requirements of the law, delivering of all requisite notices, and obtaining all necessary governmental and quasi-governmental approvals.
- b. Contractor represents that it is familiar with and shall comply with all laws applicable to the Work or completed Work including, but not limited to, all federal, state, and local laws, statutes, standards, rules, regulations, and ordinances applicable to the Work relating to:

- (1) The protection of the public health, welfare and environment;

- (2) Storage, handling, or use of asbestos, PCB, lead, petroleum based products or other hazardous materials;
- (3) The generation, processing, treatment, storage, transport, disposal, destruction, or other management of asbestos, PCB, lead, petroleum, or hazardous waste materials or other waste materials of any kind; and
- (4) The protection of environmentally sensitive areas such as wetlands and coastal areas.

6. Disposal

- a. Contractor has the sole responsibility for determining current waste storage, handling, transportation, and disposal regulations for the job Site and for each waste disposal facility. Contractor must comply fully at its sole cost and expense with these regulations and any applicable law. District may, but is not obligated to, require submittals with this information for it to review consistent with the Contract Documents.
- b. Contractor shall develop and implement a system acceptable to District to track hazardous waste from the Site to disposal, including appropriate "Hazardous Waste Manifests" on the EPA form, so that District may track the volume of waste it put in each landfill and receive from each landfill a certificate of receipt.
- c. Contractor shall provide District with the name and address of each waste disposal facility prior to any disposal, and District shall have the express right to reject any proposed disposal facility. Contractor shall not use any disposal facility to which District has objected. Contractor shall document actual disposal or destruction of waste at a designated facility by completing a disposal certificate or certificate of destruction forwarding the original to the District.

7. Permits

- a. Before performing any of the Work, and at such other times as may be required by applicable law, Contractor shall deliver all requisite notices and obtain the approval of all governmental and quasi-governmental authorities having jurisdiction over the Work. Contractor shall submit evidence satisfactory to District that it and any disposal facility
 - (1) have obtained all required permits, approvals, and the like in a timely manner both prior to commencement of the Work and thereafter as and when required by applicable law, and
 - (2) are in compliance with all such permits, approvals and the regulations.

For example, before commencing any work in connection with the Work involving asbestos-containing materials, or PCBs, or other hazardous materials subject to regulation, Contractor agrees to provide the required notice of intent to renovate or demolish to the appropriate state or federal agency having jurisdiction, by certified mail, return receipt requested, or by some other method of transmittal for which a return receipt is obtained, and to send a copy of that notice to District. Contractor shall not conduct any Work involving asbestos-containing materials or PCBs unless Contractor has first confirmed that the appropriate agency having jurisdiction is in receipt of the required notification. All permits, licenses, and bonds that are required by governmental or quasi-governmental authorities, and all fees, deposits, tap fees, offsite easements, and asbestos and PCB disposal facilities expenses necessary for the prosecution of the Work, shall be procured and paid for by Contractor. Contractor shall give all notices and comply with the all applicable laws bearing on the conduct of the Work as drawn and specified. If Contractor observes or reasonably should have observed that Plans and Specifications and other Contract Documents are at variance therewith, it shall be responsible for promptly notifying District in

writing of such fact. If Contractor performs any Work contrary to applicable laws, it shall bear all costs arising therefrom.

- b. In the case of any permits or notices held in District's name or of necessity to be made in District's name, District shall cooperate with Contractor in securing the permit or giving the notice, but the Contractor shall prepare for District review and execution upon approval, all necessary applications, notices, and other materials.

8. Indemnification

To the extent permitted by law, the indemnities and limitations of liability expressed throughout the Contract Documents apply with equal force and effect to any claims or liabilities imposed or existing by virtue of the removal, abatement, and disposal of hazardous waste. This includes, but is not limited to, liabilities connected to the selection and use of a waste disposal facility, a waste transporter, personal injury, property damage, loss of use of property, damage to the environment or natural resources, or "disposal" and "release" of materials associated with the Work (as defined in 42 U.S.C. § 9601 et seq.).

9. Termination

District shall have an absolute right to terminate for default immediately without notice and without an opportunity to cure should Contractor knowingly or recklessly commit a material breach of the terms of the Contract Documents, or any applicable law, on any matter involving the exposure of persons or property to hazardous waste. However, if the breach of contract exposing persons or property to hazardous waste is due solely to an ordinary, unintentional, and non-reckless failure to exercise reasonable care, then the procedures for termination for cause shall apply without modification.

END OF DOCUMENT

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2023-01

NEW CHILD DEVELOPMENT CENTER BID

SUBMITTAL DOCUMENTS

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2023-01 BID FORM AND PROPOSAL (page 1 of 4)

To: Governing Board of Palo Verde Community College District ("District" or "Owner")

From: _____
(Proper Name of Bidder)

The undersigned declares that the Contract Documents including, without limitation, the Notice to Bidders and the Instructions to Bidders have been read and agrees and proposes to furnish all necessary labor, materials, and equipment to perform and furnish all work in accordance with the terms and conditions of the Contract Documents, including, without limitation, the Drawings and Specifications of:

BID 2023-01 NEW CHILD DEVELOPMENT CENTER ("Project" or "Contract")

and will accept in full payment for that Work the following total Base Bid amount, all taxes and costs associated with Bonds included:

_____ dollars	\$ _____
Total Cost of Project	

Breakdowns

_____ dollars	\$ _____
Cost of Materials	

_____ dollars	\$ _____
Labor	

_____ dollars	\$ _____
Other: Please specify	

Descriptions of alternates are primarily scope definitions and do not necessarily detail the full range of materials and processes needed to complete the construction.

1. Unit Prices. The Bidder's Base Bid includes the following unit prices, which the Bidder must provide and the District may, at its discretion, utilize in valuing additive and/or deductive change orders:

2. **Allowance.** The allowance/s listed on this Bid Form shall only be allocated for unforeseen items relating to the Work. Contractor shall not bill for or be due any portion of this allowance unless the District has identified specific work, Contractor has submitted a price for that work or the District has proposed a price for that work, the District has accepted the cost for that work, and the District has prepared a change order incorporating that work. Contractor hereby authorizes the District to execute a unilateral deductive change order at or near the end of the Project for all or any portion of the allowance not allocated.
3. The undersigned has reviewed the Work outlined in the Contract Documents and fully understands the scope of Work required in this Proposal, understands the construction and project management function(s) is described in the Contract Documents, and that each Bidder who is awarded a contract shall be in fact a prime contractor, not a subcontractor, to the District, and agrees that its Proposal, if accepted by the District, will be the basis for the Bidder to enter into a contract with the District in accordance with the intent of the Contract Documents.
4. The undersigned has notified the District in writing of any discrepancies or omissions or of any doubt, questions, or ambiguities about the meaning of any of the Contract Documents, and has contacted the Construction Manager before bid date to verify the issuance of any clarifying Addenda.
5. The undersigned agrees to commence work under this Contract on the date established in the Contract Documents and to complete all work within the time specified in the Contract Documents.
6. The liquidated damages clause, of **\$1,000.00 per day**, of the General Conditions and Agreement is hereby acknowledged.
7. The undersigned acknowledges that **ten percent (10%) retention** is required for this Project and agrees thereto.
8. It is understood that the District reserves the right to reject this bid and that the bid shall remain open to acceptance and is irrevocable for a period of ninety (90) days.
9. The following documents are attached hereto:
 - **The Bid Bond (on the District's form) or other security**
 - **The Designated Subcontractors List**
 - **The Site-Visit Certification**
 - **The Non-collusion Declaration**
 - **Workers Compensation Certification**
 - **Prevailing Wage and Related Labor Requirement Certification**
 - **Disabled Veteran Business Enterprise Participation Certification**
 - **Drug-Free Workplace Certification**
 - **Tobacco-Free Environment Certification**
 - **Hazardous Materials Certification**
10. Receipt and acceptance of the following addenda is hereby acknowledged:

No.____, Dated _____	No.____, Dated _____
No.____, Dated _____	No.____, Dated _____
No.____, Dated _____	No.____, Dated _____
No.____, Dated _____	No.____, Dated _____

11. Bidder acknowledges that the license required for performance of the Work is a "B" license.
12. The undersigned hereby certifies that Bidder is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the Work.
13. Bidder specifically acknowledges and understands that if it is awarded the Contract, that it shall perform the Work of the Project while complying with all requirements of the applicable labor compliance program and directives of the Compliance Monitoring Unit of the Department of Industrial Relations. Contractors and subcontractors must register as Public Works Contractors with the Department of Industrial Relations.
14. The Bidder represents that it is competent, knowledgeable, and has special skills with respect to the nature, extent, and inherent conditions of the Work to be performed. Bidder further acknowledges that there are certain peculiar and inherent conditions existent in the construction of the Work that may create, during the Work, unusual or peculiar unsafe conditions hazardous to persons and property.
15. Bidder expressly acknowledges that it is aware of such peculiar risks and that it has the skill and experience to foresee and to adopt protective measures to adequately and safely perform the Work with respect to such hazards.
16. Bidder expressly acknowledges that it is aware that if a false claim is knowingly submitted (as the terms "claim" and "knowingly" are defined in the California False Claims Act, Cal. Gov. Code, §12650 et seq.), the District will be entitled to civil remedies set forth in the California False Claim Act. It may also be considered fraud and the Contractor may be subject to criminal prosecution.
17. The undersigned Bidder certifies that it is, at the time of bidding, and shall be throughout the period of the contract, licensed by the State of California to do the type of work required under the terms of the Contract Documents. Bidder further certifies that it is regularly engaged in the general class and type of work called for in the Contract Documents.

Furthermore, Bidder hereby certifies to the District that all representations, certifications, and statements made by Bidder, as set forth in this bid form, are true and correct and are made under penalty of perjury.

Dated this _____ day of _____ 20 _____

Proper Business Name of Bidder _____

Business Address of Bidder _____

Signature _____

Typed written name and title of Signer _____

Taxpayer's Identification No. of Bidder _____

Telephone Number _____

Fax Number _____

E-mail _____ Web page _____

Contractor's License No(s): No.: _____ Class: _____ Expiration Date: _____

No.: _____ Class: _____ Expiration Date: _____

Name of Corporation: _____

President: _____

2023-01 New Child Development Center

Secretary: _____

Treasurer: _____

Manager: _____

(If Bidder is a corporation, affix corporate seal)

END OF DOCUMENT

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00 43 13
BID BOND

(Note: If Bidder is providing a bid bond as its bid security, Bidder must use this form, NOT a surety company form.)

KNOW ALL PERSONS BY THESE PRESENTS:

That the undersigned, as _____ as Principal ("Principal"),
and _____ as Surety ("Surety"),
a corporation organized and existing under and by virtue of the laws of the State of _____ and authorized to do business as a
surety in the State of California, are held and firmly bound unto the **Palo Verde Community College District ("District") of Riverside County,
State of California** as Obligee, in the sum of

_____ (\$ _____)
lawful money of the United States of America, for the payment of which sum well and truly to be made, we, and each of us, bind ourselves, our heirs,
executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted a bid to the District for all Work specifically described in
the accompanying bid as:

2023-01 NEW CHILD DEVELOPMENT CENTER

NOW, THEREFORE, if the Principal is awarded the Contract and, within the time and manner required under the Contract Documents, after the
prescribed forms are presented to Principal for signature, enters into a written contract, in the prescribed form in accordance with the bid, and files two
bonds, one guaranteeing faithful performance and the other guaranteeing payment for labor and materials as required by law, and meets all other
conditions to the contract between the Principal and the Obligee becoming effective, or if the Principal shall fully reimburse and save harmless the
Obligee from any damage sustained by the Obligee through failure of the Principal to enter into the written contract and to file the required
performance and labor and material bonds, and to meet all other conditions to the Contract between the Principal and the Obligee becoming effective,
then this obligation shall be null and void; otherwise, it shall be and remain in full force and effect. The full payment of the sum stated above shall be
due immediately if Principal fails to execute the Contract within six (6) days of the date of the District's Notice of Award to Principal.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or the call
for bids, or to the work to be performed thereunder, or the specifications accompanying the same, shall in any way affect its obligation under this
bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or the call for bids, or
to the work, or to the specifications.

In the event suit is brought upon this bond by the Obligee and judgment is recovered, the Surety shall pay all costs incurred by the Obligee in such
suit, including a reasonable attorneys' fee to be fixed by the Court.

If the District awards the bid, the security of unsuccessful bidder(s) shall be returned within sixty (60) days from the time the award is made. Unless
otherwise required by law, no bidder may withdraw its bid for ninety (90) days after the date of the bid opening.

IN WITNESS WHEREOF, this instrument has been duly executed by the Principal and Surety above named, on the __
_____ day of _____, 20_____.

(Affix Corporate Seal)

Principal

By

(Affix Corporate Seal)

Surety

By

Name of California Agent of Surety

Address of California Agent of Surety

Telephone Number of California Agent of Surety

**Bidder must attach Power of Attorney and Certificate of Authority for Surety and a Notarial Acknowledgment for all Surety's signatures.
The California Department of Insurance must authorize the Surety to be an admitted Surety Insurer.**

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DESIGNATED SUBCONTRACTORS LIST

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID:

2023-01 NEW CHILD DEVELOPMENT CENTER

Bidder acknowledges and agrees that under Public Contract Code section 4100, et seq., it must clearly set forth below the name and location of each subcontractor who will perform work or labor or render service to the Bidder in or about the construction of the Work in an amount in excess of one-half of one percent (0.5%) of Bidder's total Bid and the kind of Work that each will perform. Furthermore, Bidder acknowledges and agrees that under Public Contract Code section 4100, et seq., if Bidder fails to list as to any portion of Work, or if Bidder lists more than one subcontractor to perform the same portion of Work, Bidder must perform that portion itself or be subjected to penalty under applicable law.

If alternate bids are called for and Bidder intends to use subcontractors different from or in addition to those subcontractors listed for work under the base Bid, Bidder must list subcontractors that will perform Work in an amount in excess of one half of one percent (0.5%) of Bidder's total Bid, including alternates.

In case more than one subcontractor is named for the same kind of Work, state the portion of Work that each subcontractor will perform.

Vendors or suppliers of materials only do not need to be listed.

If further space is required for the list of proposed subcontractors, additional sheets showing the required information, as indicated below, shall be attached hereto and made a part of this document.

Subcontractor Name: _____ **Location:** _____

Portion of Work: _____ **License #** _____

DIR Number: _____

Cost: _____

Subcontractor Name: _____ **Location:** _____

Portion of Work: _____ **License #** _____

DIR Number: _____

Cost: _____

Subcontractor Name: _____ **Location:** _____
Portion of Work: _____ **License #** _____
DIR Number: _____
Cost: _____

Subcontractor Name: _____ **Location:** _____
Portion of Work: _____ **License #** _____
DIR Number: _____
Cost: _____

Subcontractor Name: _____ **Location:** _____
Portion of Work: _____ **License #** _____
DIR Number: _____
Cost: _____

Subcontractor Name: _____ **Location:** _____
Portion of Work: _____ **License #** _____
DIR Number: _____
Cost: _____

Subcontractor Name: _____ **Location:** _____
Portion of Work: _____ **License #** _____
DIR Number: _____
Cost: _____

Subcontractor Name: _____ **Location:** _____
Portion of Work: _____ **License #** _____
DIR Number: _____

Cost: _____

Subcontractor Name: _____ **Location:** _____

Portion of Work: _____ License # _____

DIR Number: _____

Cost: _____

Subcontractor Name: _____ **Location:** _____

Portion of Work: _____ License # _____

DIR Number: _____

Cost: _____

Date: _____

Proper Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

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DOCUMENT 00 45 01
SITE-VISIT CERTIFICATION
TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

2023-01 NEW CHILD DEVELOPMENT CENTER

Check whichever option applies:

_____ I certify that I visited the Site of the proposed Work and became fully acquainted with the conditions relating to construction and labor. I fully understand the facilities, difficulties, and restrictions attending the execution of the Work under contract.

_____ I certify that _____ (Bidder's representative) visited the Site of the proposed Work and became fully acquainted with the conditions relating to construction and labor. The Bidder's representative fully understood the facilities, difficulties, and restrictions attending the execution of the Work under contract.

Bidder fully indemnifies the **Palo Verde Community College District**, its Architect, its Engineer, its Construction Manager, and all of their respective officers, agents, employees, and consultants from any damage, or omissions, related to conditions that could have been identified during my visit and/or the Bidder's representative's visit to the Site.

I certify under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Date: _____

Proper Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

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NON-COLLUSION DECLARATION

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID
Public Contract Code Section 7106

2023-01 NEW CHILD DEVELOPMENT CENTER

The undersigned declares:

I am the _____ of _____, the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____ [date],
at _____ [city], _____ [state]."

Date: _____

Proper Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

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WORKERS' COMPENSATION CERTIFICATION

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

PROJECT/CONTRACT NO.: **2023-01 NEW CHILD DEVELOPMENT CENTER**

("Project" or "Contract") between Palo Verde Community College District ("District" or "Owner") and _____ ("Contractor" or "Bidder"). Labor Code

section 3700 in relevant part provides:

Every employer except the state shall secure the payment of compensation in one or more of the following ways:

- a. By being insured against liability to pay compensation by one or more insurers duly authorized to write compensation insurance in this state.
- b. By securing from the Director of Industrial Relations a certificate of consent to self-insure, which may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to self-insure and to pay any compensation that may become due to his or her employees.

I am aware of the provisions of section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the Work of this Contract.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

(In accordance with Labor Code sections 1860 and 1861, the above certificate must be signed and filed with the awarding body prior to performing any Work under this Contract.)

END OF DOCUMENT

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**PREVAILING WAGE AND
RELATED LABOR REQUIREMENTS CERTIFICATION**

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

PROJECT/CONTRACT NO.: **2023-01 NEW CHILD DEVELOPMENT CENTER** between
Palo Verde Community College District (“District” or “Owner”) and _____
_____ (“Contractor” or “Bidder”).

I hereby certify that I will conform to the State of California Public Works Contract requirements regarding prevailing wages, benefits, on-site audits with 48-hours notice, payroll records, and apprentice and trainee employment requirements, for all Work on the above Project including, without limitation, the labor compliance program. I certify that I and my listed subcontractors have registered with the Department of Industrial Relations as Public Works Contractors.

Date: _____

Proper Name of Contractor: _____

DIR Number: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

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DRUG-FREE WORKPLACE CERTIFICATION

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

PROJECT/CONTRACT NO.: **2023-01 NEW CHILD DEVELOPMENT CENTER** between
Palo Verde Community College District ("District") and _____ ("Contractor" or "Bidder").

This Drug-Free Workplace Certification form is required from the successful Bidder pursuant to Government Code section 8350 et seq., the Drug-Free Workplace Act of 1990. The Drug-Free Workplace Act of 1990 requires that every person or organization awarded a contract or grant for the procurement of any property or service from any state agency must certify that it will provide a drug-free workplace by doing certain specified acts. In addition, the Act provides that each contract or grant awarded by a state agency may be subject to suspension of payments or termination of the contract or grant, and the contractor or grantee may be subject to debarment from future contracting, if the contracting agency determines that specified acts have occurred.

The District is not a "state agency" as defined in the applicable section(s) of the Government Code, but the District is a local agency and public school district under California law and requires all contractors on District projects to comply with the provisions and requirements of Government Code section 8350 et seq., the Drug-Free Workplace Act of 1990.

Contractor shall certify that it will provide a drug-free workplace by doing all of the following:

- a. Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited in the person's or organization's workplace and specifying actions which will be taken against employees for violations of the prohibition.
- b. Establishing a drug-free awareness program to inform employees about all of the following:
 - (1) The dangers of drug abuse in the workplace.
 - (2) The person's or organization's policy of maintaining a drug-free workplace.
 - (3) The availability of drug counseling, rehabilitation, and employee-assistance programs.
 - (4) The penalties that may be imposed upon employees for drug abuse violations.
- c. Requiring that each employee engaged in the performance of the contract or grant be given a copy of the statement required above, and that, as a condition of employment on the contract or grant, the employee agrees to abide by the terms of the statement.

I, the undersigned, agree to fulfill the terms and requirements of Government Code section 8355 listed above and will publish a statement notifying employees concerning (a) the prohibition of controlled substance at the workplace, (b) establishing a drug-free awareness program, and (c) requiring that each employee engaged in the performance of the Contract be given a copy of the statement required by section 8355(a), and requiring that the employee agree to abide by the terms of that statement.

I also understand that if the District determines that I have either (a) made a false certification herein, or (b) violated this certification by failing to carry out the requirements of section 8355, that the Contract awarded herein is subject to termination, suspension of payments, or both. I further understand that, should I violate the terms of the Drug-Free Workplace Act of 1990, I may be subject to debarment in accordance with the requirements of the aforementioned Act.

I acknowledge that I am aware of the provisions of Government Code section 8350 et seq. and hereby certify that I will adhere to the requirements of the Drug-Free Workplace Act of 1990.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

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TOBACCO-FREE ENVIRONMENT CERTIFICATION

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

PROJECT/CONTRACT NO.: **2023-01 NEW CHILD DEVELOPMENT CENTER** between Palo Verde Community College District (“District” or “Owner”) and _____ (“Contractor” or “Bidder”).

This Tobacco-Free Environment Certification form is required from the Bidder.

Pursuant to, without limitation, 20 U.S.C section 6083, Labor Code section 6400 et seq., Health & Safety Code section 104350 et seq. and District Board Policies, all District sites, including the Project site, are tobacco-free environments. Smoking and the use of tobacco products by all persons is prohibited on or in District property. District property includes school buildings, school grounds, school owned vehicles and vehicles owned by others while on District property.

I acknowledge that I am aware of the District’s policy regarding tobacco-free environments at District sites, including the Project site and hereby certify that I will adhere to the requirements of that policy and not permit any of my firm’s employees, agents, subcontractors, or my firm’s subcontractors’ employees or agents to use tobacco and/or smoke on the Project site.

Date: _____

Proper Name of Contractor: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

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HAZARDOUS MATERIALS CERTIFICATION

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

2023-01 NEW CHILD DEVELOPMENT CENTER

between **Palo Verde Community College District** (“District” or “Owner”) and _____
_____ (“Contractor” or “Bidder”).

1. Contractor hereby certifies that no Asbestos, or Asbestos-Containing Materials, polychlorinated biphenyl (PCB), or any material listed by the federal or state Environmental Protection Agency or federal or state health agencies as a hazardous material, or any other material defined as being hazardous under federal or state laws, rules, or regulations (“New Hazardous Material”), shall be furnished, installed, or incorporated in any way into the Project or in any tools, devices, clothing, or equipment used to affect any portion of Contractor's work on the Project for District.
2. Contractor further certifies that it has instructed its employees with respect to the above-mentioned standards, hazards, risks, and liabilities.
3. Asbestos and/or asbestos-containing material shall be defined as all items containing but not limited to chrysotile, crocidolite, amosite, anthophyllite, tremolite, and actinolite. Any or all material containing greater than one-tenth of one percent (0.1%) asbestos shall be defined as asbestos-containing material.
4. Any disputes involving the question of whether or not material is New Hazardous Material shall be settled by electron microscopy or other appropriate and recognized testing procedure, at the District’s determination. The costs of any such tests shall be paid by Contractor if the material is found to be New Hazardous Material.
5. All Work or materials found to be New Hazardous Material or Work or material installed with equipment containing “New Hazardous Material” will be immediately rejected and this Work will be removed at Contractor's expense at no additional cost to the District.
6. Contractor has read and understood the document Hazardous Materials Procedures & Requirements, and shall comply with all the provisions outlined therein.

Date: _____
 Proper Name of Contractor: _____
 Signature: _____
 Print Name: _____
 Title: _____

END OF DOCUMENT

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2023-01

NEW CHILD DEVELOPMENT CENTER

EXECUTION OF CONTRACT DOCUMENTS

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DOCUMENT 00 51 00
NOTICE OF AWARD
(SAMPLE ONLY)

Dated: _____ 20____

To: _____

The Bidder to whom Contract is awarded shall execute and submit the following documents by 3:00 p.m. of the **Sixth (6TH)** calendar day following the date of the Notice of Award.

a. **Agreement:** To be executed by successful Bidder.
(Contractor)

To: _____
(Address)

From: Governing Board ("Board") of **Palo Verde Community College District** ("District" or "Owner")

2023-01 NEW CHILD DEVELOPMENT CENTER

("Project" or "Contract"). Contractor has been awarded the referenced Contract on _____, 20____, by action of the District's Board. The Contract Price is _____ Dollars (\$ _____), and includes alternates _____.

I have attached two (2) original copies of the Agreement. One copy is for your records and **the other is to be signed and returned with the aforementioned contract documentation no later than** February 23, 2023

You must comply with the following conditions precedent within **SIX (6)** calendar days of the date of this Notice of Award.

- b. **Escrow of Bid Documentation:** This must include all required documentation. See the document Escrow of Bid Documentation for more information.
- c. **Performance Bond (100%):** On the form provided in the Contract Documents and fully executed as indicated on the form.
- d. **Payment Bond (100%) (Contractor's Labor and Material Bond):** On the form provided in the Contract Documents and fully executed as indicated on the form.
- e. **Insurance Certificates and Endorsements as required (reference Section 13 of General Conditions).**
 - (1) **Commercial General Liability**
 - (2) **Automobile Liability – Any Auto**
 - (3) **Workers Compensation**
 - (4) **Employers' Liability**
 - (5) **Builder's Risk (Course of Construction)**
- f. **Contractor's Safety Plan** specifically adapted for the Project

Failure to comply with these conditions within the time specified will entitle District to consider your bid abandoned, to annul this Notice of Award, and to declare your Bid Security forfeited, as well as any other rights the District may have against the Contractor.

After you comply with those conditions, District will return to you one fully signed counterpart of the Agreement.

PALO VERDE COMMUNITY COLLEGE DISTRICT

BY: _____

NAME: _____

TITLE: _____

END OF DOCUMENT

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AGREEMENT FORM – STIPULATED SUM (SINGLE-PRIME CONTRACT)
(sample only)

THIS AGREEMENT IS MADE AND ENTERED INTO THIS _____ DAY OF _____, 20____, by and between the Palo Verde Community College District (“District”) and _____ (“Contractor”) (“Agreement”). **WITNESSETH:** That the parties hereto have mutually covenanted and agreed, and by these presents do covenant and agree with each other, as follows:

- 1. The Work:** Contractor agrees to furnish all tools, equipment, apparatus, facilities, labor, and material necessary to perform and complete in a good and workmanlike manner, the work of the following project:
PROJECT: 2023-01 New Child Development Center
 (“Project” or “Contract” or “Work”)
It is understood and agreed that the Work shall be performed and completed as required in the Contract Documents including, without limitation, the Drawings and Specifications and submission of all documents required to secure funding or by the Division of the State Architect for close-out of the Project, under the direction and supervision of, and subject to the approval of, the District or its authorized representative.
- 2. The Contract Documents:** The complete Contract consists of all Contract Documents as defined in the General Conditions and incorporated herein by this reference. Any and all obligations of the District and Contractor are fully set forth and described in the Contract Documents. All Contract Documents are intended to cooperate so that any Work called for in one and not mentioned in the other or vice versa is to be executed the same as if mentioned in all Contract Documents.
- 3. Interpretation of Contract Documents:** Should any question arise concerning the intent or meaning of Contract Documents, including the Drawings or Specifications, the question shall be submitted to the District for interpretation. If a conflict exists in the Contract Documents, modifications, beginning with the most recent, shall control over this Agreement (if any), which shall control over the Special Conditions, which shall control over any Supplemental Conditions, which shall control over the General Conditions, which shall control over the remaining Division 0 documents, which shall control over Division 1 Documents which shall control over Division 2 through Division 18 documents, which shall control over figured dimensions, which shall control over large-scale drawings, which shall control over small-scale drawings. In no case shall a document calling for lower quality and/or quantity material or workmanship control. The decision of the District in the matter shall be final.
- 4. Time for Completion:** It is hereby understood and agreed that the work under this contract shall be completed no later than **August 6, 2023**. Contractor and District expressly agree that this stated time for completion of the Work is reasonable for this Project.
- 5. Completion-Extension of Time:** Should the Contractor fail to complete this Contract, and the Work provided herein, within the time fixed for completion, due allowance being made for the contingencies provided for herein, the Contractor shall become liable to the District for all loss and damage that the District may suffer on account thereof. The Contractor shall coordinate its work with the Work of all other contractors. The District shall not be liable for delays resulting from Contractor's failure to coordinate its Work with other contractors in a manner that will allow timely completion of Contractor's Work. Contractor shall be liable for delays to other contractors caused by Contractor's failure to coordinate its Work with the work of other contractors.
- 6. Liquidated Damages:** Time is of the essence for all work under this Agreement. It is hereby understood and agreed that it is and will be difficult and/or impossible to ascertain and determine the actual damage that the District will sustain in the event of and by reason of Contractor's delay; therefore, Contractor agrees that it shall pay to the District the sum of **One Thousand Dollars (\$1,000.00)** per day as liquidated damages for each and every day's delay beyond the time herein prescribed in finishing the Work.
It is hereby understood and agreed that this amount is not a penalty.
In the event any portion of the liquidated damages are not paid to the District, the District may deduct that amount from any money due or that may become due the Contractor under this Agreement. The District's right to assess liquidated damages is as indicated herein and in the General Conditions.
The time during which the Contract is delayed for cause as hereinafter specified may extend the time of completion for a reasonable time as the District may grant. This provision does not exclude the recovery of damages for delay by either party under other provisions in the Contract Documents.
- 7. Loss Or Damage:** The District and its authorized representatives shall not in any way or manner be answerable or suffer loss, damage, expense, or liability for any loss or damage that may happen to the Work, or any part thereof, or in or about the same during its construction and before acceptance, and the Contractor shall assume all liabilities of every kind or nature arising from the Work, either by accident, negligence, theft, vandalism, or any cause whatever; and shall hold the District and its authorized representatives harmless from all liability of every kind and nature arising from accident, negligence, or any cause whatever.
- 8. Insurance and Bonds:** Before commencing the Work, Contractor shall provide all required certificates of insurance, and payment and performance bonds as evidence thereof.

9. **Prosecution of Work:** If the Contractor should neglect to prosecute the Work properly or fail to perform any provisions of this contract, the District, may, pursuant to the General Conditions and without prejudice to any other remedy it may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor.
10. **Authority of Architect, Project Inspector, and DSA:** Contractor hereby acknowledges that the Architect(s), the Project Inspector(s), and the Division of the State Architect have authority to approve and/or stop Work if the Contractor's Work does not comply with the requirements of the Contract Documents, Title 24 of the California Code of Regulations, and all applicable laws. The Contractor shall be liable for any delay caused by its non-compliant Work.
11. **Assignment of Contract:** Neither the Contract, nor any part thereof, nor any moneys due or to become due thereunder, may be assigned by the Contractor without the written approval of the District, nor without the written consent of the Surety on the Contractor's Performance Bond (the "Surety"), unless the Surety has waived in writing its right to notice of assignment.
12. **Classification of Contractor's License:** Contractor hereby acknowledges that it currently holds valid Type "B" Contractor's license(s) issued by the State of California, Contractor's State Licensing Board, in accordance with division 3, chapter 9, of the Business and Professions Code and in the classification called for in the Contract Documents.
13. **Payment of Prevailing Wages:** The Contractor and all Subcontractors under the Contractor shall pay all workers on all Work performed pursuant to this Contract not less than the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work as determined by the Director of the Department of Industrial Relations, State of California, for the type of work performed and the locality in which the work is to be performed within the boundaries of the District, pursuant to sections 1770 et seq. of the California Labor Code.
14. **Labor Compliance:** Labor compliance is monitored and enforced by the Compliance Monitoring Unit of the Department of Industrial Relations, Contractor specifically acknowledges and understands that it shall perform the Work of this Agreement while complying with all the applicable provisions of the District's labor compliance program or State labor compliance, if applicable, including, without limitation, the requirement that the Contractor and all of its Subcontractors shall timely submit complete and accurate certified payroll records as required by the Contract Documents, or the District cannot issue payment. Contractor and its subcontractors must register as Public Works Contractors with the Department of Industrial Relations.
15. **Contract Price:** In consideration of the foregoing covenants, promises, and agreements on the part of the Contractor, and the strict and literal fulfillment of each and every covenant, promise, and agreement, and as compensation agreed upon for the Work and construction, erection, and completion as aforesaid, the District covenants, promises, and agrees that it will well and truly pay and cause to be paid to the Contractor in full, and as the full Contract Price and compensation for construction, erection, and completion of the Work hereinabove agreed to be performed by the Contractor, the following price:

Dollars

(\$ _____),

in lawful money of the United States, which sum is to be paid according to the schedule provided by the Contractor and accepted by the District and subject to additions and deductions as provided in the Contract. This amount supersedes any previously stated and/or agreed to amount(s).

16. **Severability:** If any term, covenant, condition, or provision in any of the Contract Documents is held by a court of competent jurisdiction to be invalid, void or unenforceable, the remainder of the provisions in the Contract Documents shall remain in full force and effect and shall in no way be affected, impaired, or invalidated thereby.

IN WITNESS WHEREOF, accepted and agreed on the date indicated above:

CONTRACTOR

DISTRICT

PALO VERDE COMMUNITY COLLEGE DISTRICT

By: _____

By: _____

Name: _____

Name: _____

Title: _____

Title: _____

NOTE: If the party executing this Contract is a corporation, a certified copy of the by-laws, or of the resolution of the Board of Directors, authorizing the officers of said corporation to execute the Contract and the bonds required thereby must be attached hereto.

END OF DOCUMENT

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DOCUMENT 00 55 00

NOTICE TO PROCEED

(sample only)

Dated: _____, 20__

TO: (Contractor) _____

ADDRESS: _____

REGARDING 2023-01 NEW CHILD DEVELOPMENT CENTER

PROJECT/CONTRACT NO.: 2023-01 between the **Palo Verde Community College District** ("District") and Contractor ("Contract").

You are notified that the Contract Time under the above Contract will commence to run on

March 6, 2023. By that date, you are to start performing your obligations under the Contract Documents. In accordance with the Agreement executed by

Contractor, the date of completion is **August 6, 2023**

You must submit the following documents to the District by **3:00 p.m.** of the **SECOND (2nd)** calendar day following the date of this Notice to Proceed:

- a. Contractor's preliminary schedule of construction.
- b. Contractor's preliminary schedule of values for all of the Work.
- c. Contractor's preliminary schedule of submittals, including Shop Drawings, Product Data, and Samples submittals
- d. A complete subcontractors list, including the name, address, telephone number, facsimile number, California State Contractors License number, classification, and monetary value of all Subcontracts.

Thank you. We look forward to a very successful Project.

PALO VERDE COMMUNITY COLLEGE DISTRICT

BY: _____

NAME: _____

TITLE: _____

END OF DOCUMENT

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ESCROW BID DOCUMENTATION

2023-01 NEW CHILD DEVELOPMENT CENTER

1. Requirement to Escrow Bid Documentation

- a. **Contractor shall submit, within SIX (6) calendar days after the date of the Notice of Award, one copy of all documentary information received or generated by Contractor in preparation of bid prices for this Contract, as specified herein.** This material is referred to herein as "Escrow Bid Documentation." The Escrow Bid Documentation of the Contractor will be held in escrow for the duration of the Contract.
- b. Contractor agrees, as a condition of award of the Contract, that the Escrow Bid Documentation constitutes all written information used in the preparation of its bid, and that no other written bid preparation information shall be considered in resolving disputes or claims. Contractor also agrees that nothing in the Escrow Bid Documentation shall change or modify the terms or conditions of the Contract Documents.
- c. The Escrow Bid Documentation will not be opened by District except as indicated herein. The Escrow Bid Documentation will be used only for the resolution of change orders and claims disputes.
- d. Contractor's submission of the Escrow Bid Documentation, as with the bonds and insurance documents required, is considered an essential part of the Contract award. Should the Contractor fail to make the submission within the allowed time specified above, District may deem the Contractor to have failed to enter into the Contract, and the Contractor shall forfeit the amount of its bid security, accompanying the Contractor's bid, and District may award the Contract to the next lowest responsive responsible bidder.
- e. **NO PAYMENTS WILL BE MADE, NOR WILL DISTRICT ACCEPT PROPOSED CHANGE ORDERS UNTIL THE ABOVE REQUIRED INFORMATION IS SUBMITTED AND APPROVED.**
- f. The Escrow Bid Documentation shall be submitted in person by an authorized representative of the Contractor to the District.

2. Ownership of Escrow Bid Documentation

- a. The Escrow Bid Documentation is, and shall always remain, the property of Contractor, subject to review by District, as provided herein.
- b. Escrow Bid Documentation constitute trade secrets, not known outside Contractor's business, known only to a limited extent and only by a limited number of employees of Contractor, safeguarded while in Contractor's possession, extremely valuable to Contractor, and could be extremely valuable to Contractor's competitors by virtue of it reflecting Contractor's contemplated techniques of construction. Subject to the provisions herein, District agrees to safeguard the Escrow Bid Documentation, and all information contained therein, against disclosure to the fullest extent permitted by law.

3. Format and Contents of Escrow Bid Documentation

- a. Contractor may submit Escrow Bid Documentation in its usual cost-estimating format; a standard format is not required. The Escrow Bid Documentation shall be submitted in the language (e.g., English) of the specification.
- b. Escrow Bid Documentation must clearly itemize the estimated costs of performing the work of each bid item contained in the bid schedule, separating bid items into sub-items as required to present a detailed cost estimate and allow a detailed cost review. The Escrow Bid Documentation shall include all subcontractor bids or quotes, supplier bids or quotes, quantity takeoffs, crews, equipment, calculations of rates of production and progress, copies of quotes from subcontractors and suppliers, and memoranda, narratives, add/deduct sheets, and all other information used by the Contractor to arrive at the prices contained in the bid proposal. Estimated costs should be broken down into Contractor's usual estimate categories such as direct labor, repair labor, equipment ownership and operation, expendable materials, permanent materials, and subcontract costs as appropriate. Plant and equipment and indirect costs should be detailed in the Contractor's usual format. The Contractor's allocation of indirect costs, contingencies, markup, and other items to each bid item shall be identified.
- c. All costs shall be identified. For bid items amounting to less than \$10,000, estimated unit costs are acceptable without a detailed cost estimate, provided that labor, equipment, materials, and subcontracts, as applicable, are included and provided that indirect costs, contingencies, and markup, as applicable, are allocated.
- d. Bid Documentation provided by District should not be included in the Escrow Bid Documentation unless needed to comply with the following requirements.

4. Submittal of Escrow Bid Documentation

- a. The Escrow Bid Documentation shall be submitted by the Contractor in a sealed container within **SIX (6)** calendar days after the date of the Notice of Award. The container shall be clearly marked on the outside with the Contractor's name, date of submittal, project name and the words "Escrow Bid Documentation – Intended to be opened in the presence of Authorized Representatives of Both District and Contractor".
- b. By submitting Escrow Bid Documentation, Contractor represents that the material in the Escrow Bid Documentation constitutes all the documentary information used in preparation of the bid and that the Contractor has personally examined the contents of the Escrow Bid Documentation container and has found that the documents in the container are complete.
- c. If Contractor's proposal is based upon subcontracting any part of the work, each subcontractor whose total subcontract price exceeds 5 percent (5%) of the total contract price proposed by Contractor, shall provide separate Escrow Documents to be included with those of Contractor. Those documents shall be opened and examined in the same manner and at the same time as the examination described above for Contractor.
- d. If Contractor wishes to subcontract any portion of the Work after award, District retains the right to require Contractor to submit Escrow Documents for the Subcontractor before the subcontract is approved.

5. Storage, Examination and Final Disposition of Escrow Bid Documentation

- a. The Escrow Bid Documentation will be placed in escrow, for the life of the Contract, in a mutually agreeable institution. The cost of storage will be paid by Contractor for the duration of the project until final Contract payment. The storage facilities shall be the appropriate size for all the Escrow Bid Documentation and located conveniently to both District's and Contractor's offices.
- b. The Escrow Bid Documentation shall be examined by both District and Contractor, at any time deemed necessary by either District or Contractor, to assist in the negotiation of price adjustments and change orders or the settlement of disputes and claims. In the case of legal proceedings, Escrow Bid Documentation shall be used subject to the terms of an appropriate protective order if requested by Contractor and ordered by a court of competent jurisdiction. Examination of the Escrow Bid Documentation is subject to the following conditions:
 - (1) As trade secrets, the Escrow Bid Documentation is proprietary and confidential to the extent allowed by law.
 - (2) District and Contractor shall each designate, in writing to the other party **SEVEN (7)** calendar days prior to any examination, the names of representatives who are authorized to examine the Escrow Bid Documentation. No other person shall have access to the Escrow Bid Documentation.
 - (3) Access to the documents may take place only in the presence of duly designated representatives of the District and Contractor. If Contractor fails to designate a representative or appear for joint examination on **SEVEN (7)** calendar days notice, then the District representative may examine the Escrow Bid Documents alone upon an additional **THREE (3)** calendar days notice if a representative of the Contractor does not appear at the time set.
 - (4) If a subcontractor has submitted sealed information to be included in the Escrow Bid Documents, access to those documents may take place only in the presence of a duly designated representative of the District, Contractor and that subcontractor. If that subcontractor fails to designate a representative or appear for joint examination on **SEVEN (7)** calendar days notice, then the District representative and/or the Contractor may examine the Escrow Bid Documentation without that subcontractor present upon an additional **THREE (3)** calendar days notice if a representative of that subcontractor does not appear at the time set.
- c. The Escrow Bid Documentation will be returned to Contractor at such time as the Contract has been completed and final settlement has been achieved.

END OF DOCUMENT

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PERFORMANCE BOND

(100% of Contract Price)

(Note: Principal must use this form, NOT a surety company form.)

KNOW ALL PERSONS BY THESE PRESENTS:

That WHEREAS, the governing board ("Board") of the Palo Verde Community College District, ("District") and _____ ("Principal") have entered into a contract for the furnishing of all materials and labor, services and transportation, necessary, convenient, and proper to perform the following project:

2023-01 NEW CHILD DEVELOPMENT CENTER

("Project" or "Contract") which Contract dated _____, 20____, and all of the Contract Documents attached to or forming a part of the Contract, are hereby referred to and made a part hereof, and

WHEREAS, said Principal is required under the terms of the Contract to furnish a bond for the faithful performance of the Contract;

NOW, THEREFORE, the Principal and _____ ("Surety") are held and firmly

bound unto the Board of the District in the penal sum of _____ DOLLARS

(\$ _____), lawful money of the United States, for the payment of which sum well and truly to be made we bind ourselves, our heirs, executors, administrators, successors, and assigns jointly and severally, firmly by these presents, to:

- Perform all the work required to complete the Project; and
- Pay to the District all damages the District incurs as a result of the Principal's failure to perform all the Work required to complete the Project.

The condition of the obligation is such that, if the above bounden Principal, his or its heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions, and agreements in the Contract and any alteration thereof made as therein provided, on his or its part to be kept and performed at the time and in the intent and meaning, including all contractual guarantees and warranties of materials and workmanship, and shall indemnify and save harmless the District, its trustees, officers and agents, as therein stipulated, then this obligation shall become null and void, otherwise it shall be and remain in full force and virtue.

Surety expressly agrees that the District may reject any contractor or subcontractor proposed by Surety to fulfill its obligations in the event of default by the Principal. Surety shall not utilize Principal in completing the Work nor shall Surety accept a Bid from Principal for completion of the Work if the District declares the Principal to be in default and notifies Surety of the District's objection to Principal's further participation in the completion of the Work.

As a condition precedent to the satisfactory completion of the Contract, the above obligation shall hold good for a period equal to the warranty and/or guarantee period of the Contract, during which time Surety's obligation shall continue if Contractor shall fail to make full, complete, and satisfactory repair and replacements and totally protect the District from loss or damage resulting from or caused by defective materials or faulty workmanship. The obligations of Surety hereunder shall continue so long as any obligation of Contractor remains. Nothing herein shall limit the District's rights or the Contractor or Surety's obligations under the Contract, law or equity, including, but not limited to, California Code of Civil Procedure section 337.15.

The Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of the Contract or to the work or to the specifications.

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by the Principal and Surety above named, on the _____ day of _____, 20____.

(Affix Corporate Seal)

Principal

By

Surety

By

Name of California Agent of Surety

Address of California Agent of Surety

Telephone Number of California Agent of Surety

Principal must attach a Notarial Acknowledgment for all Surety's signatures and a Power of Attorney and Certificate of Authority for Surety. The California Department of Insurance must authorize the Surety to be an admitted surety insurer. END OF DOCUMENT

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PAYMENTBOND
Contractor's Labor & Material Bond
(100% of Contract Price)

(Note: Principal must use this form, NOT a surety company form.)

KNOW ALL PERSONS BY THESE PRESENTS:

That WHEREAS, the governing board ("Board") of the Palo Verde Community College District, (or "District") and _____, ("Principal") have entered into a contract for the furnishing of all materials and labor, services and transportation, necessary, convenient, and proper to perform the following project:

2023-01 NEW CHILD DEVELOPMENT CENTER ("Project" or "Contract") which Contract dated _____, 20____, and all of the Contract Documents attached to or forming a part of the Contract, are hereby referred to and made a part hereof, and WHEREAS, pursuant to law and the Contract, the Principal is required, before entering upon the performance of the work, to file a good and sufficient bond with the body by which the Contract is awarded in an amount equal to 100 percent (100%) of the Contract price, to secure the claims to which reference is made in sections 8000 through 8138 and 9000 through 9510 of the Civil Code of California, and division 2, part 7, of the Labor Code of California.

NOW, THEREFORE, WE, the Principal and _____, ("Surety") are held and firmly

bound unto all laborers, material men, and other persons referred to in said statutes in the sum of _____

_____ Dollars (\$ _____), lawful money of the United States, being a sum not less than the total amount payable by the terms of Contract, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, or assigns, jointly and severally, by these presents.

The condition of this obligation is that if the Principal or any of his or its subcontractors, of the heirs, executors, administrators, successors, or assigns of any, all, or either of them shall fail to pay for any labor, materials, provisions, provender, or other supplies, used in, upon, for or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of the Principal or any of his or its subcontractors of any tier under Section 13020 of the Unemployment Insurance Code with respect to such work or labor, that the Surety will pay the same in an amount not exceeding the amount herein above set forth, and also in case suit is brought upon this bond, will pay a reasonable attorney's fee to be awarded and fixed by the Court, and to be taxed as costs and to be included in the judgment therein rendered.

It is hereby expressly stipulated and agreed that this bond shall inure to the benefit of any and all persons, companies, and corporations entitled to file claims under sections 8000 through 8138 and 9000 through 9510, including section 9100, of the Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this bond.

Should the condition of this bond be fully performed, then this obligation shall become null and void; otherwise it shall be and remain in full force and affect.

And the Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of Contract or the specifications accompanying the same shall in any manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension, alteration, or addition.

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed an original thereof, have been duly executed by the Principal and Surety above named, on the _____ day of _____, 20____.

(Affix Corporate Seal)

Principal

By

Surety

By

Name of California Agent of Surety

Address of California Agent of Surety

Telephone Number of California Agent of Surety

Principal must attach a Notarial Acknowledgment for all Surety's signatures and a Power of Attorney and Certificate of Authority for Surety. The California Department of Insurance must authorize the Surety to be an admitted surety insurer.

END OF DOCUMENT

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BID 2023-01 NEW CHILD DEVELOPMENT CENTER

ATTACHMENTS

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GENERAL CONDITIONS

Table of Articles

1. General Provisions
2. Owner
3. Contractor
4. Architect
5. Subcontractors
6. Construction by Owner By Separate Contractors
7. Changes in Work
8. Time
9. Payments and Completion
10. Protections of Persons and Property
11. Insurance and Bonds
12. Uncovering and Correction of Work
13. Miscellaneous Provisions
14. Termination or Suspension of Contract
15. Claims and Disputes

Article 1 General Provisions

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

2023-01 New Child Development Center

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™-2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the

Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to

rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents, (1) allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts; (2) Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and (3) whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2. 1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (I) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained

within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the

Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to

make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications,

or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section

3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques,

sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities,

or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities,

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including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identity to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided That (1) assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and (2) assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following: (1) The change in the Work; (2) The amount of the adjustment, if any, in the Contract Sum; and (3) The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods: (1) Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation; (2) Unit prices stated in the Contract Documents or subsequently agreed upon; (3) Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or (4) As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following: (1) Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect; (2) Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed; (3) Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others; (4) Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and (5) Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to

implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the

Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by

(1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment

that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract

Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of (1) defective Work not remedied; (2) third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor; (3) failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment; (4) reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum; (5) damage to the Owner or a Separate Contractor; (6) reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or (7) repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next

Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents,

the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented

to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment,

and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, formal completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from (1) liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled; (2) failure of the Work to comply with the requirements of the Contract Documents; (3) terms of special warranties required by the Contract Documents; or (4) audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to (1) employees on the Work and other persons who may be affected thereby; (2) the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and (3) other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the

other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in

the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section I 0.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance.

Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual

obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required b of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors,

subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§ 11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the

Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies

available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate

prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons: (1) Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped; (2) An act of government, such as a declaration of national emergency, that requires all Work to be stopped; (3) Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or (4) The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor (1) repeatedly refuses or fails to supply enough properly skilled workers or proper materials; (2) fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or Suppliers; (3) repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or (4) otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's

surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety: (1) Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor; (1) Accept assignment of subcontracts pursuant to Section 5.4; and (3) Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

1. That performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
2. That an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

1. Cease operations as directed by the Owner in the notice;
2. Take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
3. Except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the

Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes:

2. Damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
3. Damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of

limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

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TECHNICAL SPECIFICATIONS

END OF BID PACKET



American Modular Systems Inc.
 787 Spreckels Ave.
 Manteca, California 95336
 P: (209) 825-1921
 F: (209) 825-7018

Project: 1674-21 Palo Verde College- Child Development Center
 141 S 1st Street
 Blythe, California 92225

Submittal #08 71 00-1.0 - Door Hardware Submittal 08 71 00 - Door Hardware

Revision	0	Submittal Manager	Shelby Ward (American Modular Systems Inc.)
Status	Open	Date Created	Feb 4, 2022
Issue Date	Feb 4, 2022	Spec Section	08 71 00 - Door Hardware
Responsible Contractor	American Modular Systems Inc.	Received From	
Received Date		Submit By	
Final Due Date	Feb 18, 2022	Lead Time	
		Cost Code	
Location		Type	Product Information
Approvers	Jose Amador (Sillman Architecture), Connor Smith (Sillman Architecture)		
Ball in Court	Jose Amador (Sillman Architecture), Connor Smith (Sillman Architecture)		
Distribution	Suzanne Willis (American Modular Systems Inc.), Shelby Ward (American Modular Systems Inc.), Scott Wade (American Modular Systems Inc.), Amber Smith (American Modular Systems Inc.), David Sarich (American Modular Systems Inc.), Daniel Sarich (American Modular Systems Inc.), Matt Reichmuth (American Modular Systems Inc.)		
Description	<p>Hi Connor, Jose-</p> <p>Please see the attached Door Hardware submittal for your review and approval. Should you have any questions, please feel free to contact Amber at 209-825-1921.</p> <p>Thanks,</p> <p>SHELBY WARD ASSISTANT PROJECT MANAGER American Modular Systems O: 209.825.1921 F: 209.825.7018 AMERICANMODULAR.COM</p>		

Submittal Workflow

Name	Sent Date	Due Date	Returned Date	Response	Attachments
General Information Attachments					
Jose Amador		Feb 18, 2022		Pending	
Connor Smith		Feb 18, 2022		Pending	



Project Number: 1674-21
School District: Palo Verde College
 Child Development
Project Name: Center

DOOR HARDWARE SCHEDULE

EXTERIOR DOORS

GROUP 1 - ROUND DOOR (DOUBLE DOORS)	
DOOR SIZE	3'-0" x 7'-9"
ACTIVE DOOR	Right
DOOR MATERIAL	18 ga Hollow Metal
DOOR FINISH	Painted
DOOR VIEW LIGHT	Custom- Refer to N3.0A
GLAZING	Tempered Dual Glazed Gray Over Clear
FRAME	Storefront Custom - Refer to N3.0A
TRANSOM	Yes
SIDE LIGHT	Yes
GLAZING	Tempered Dual Glazed Gray Over Clear
HARDWARE	Entry
LOCKSET CORE TYPE	Non-Removable
LOCKSET CORE SIZE	Large Format
LOCKSET KEYWAY	C-Keyway
LOCKSET	Schlage ND95PD
HINGE	Hager BB1279 NRP-626
WEATHERSTRIP	Pemko 303DV
CLOSER	Norton 8501
THRESHOLD	Pemko 271AV
BOTTOM	Pemko 216AV
DOOR STOP	Trimco 1233
ADDITIONAL ACCESSORIES	
MULLION	Mullion
GROUP 2	
DOOR SIZE	3'-0" x 7'-0"
DOOR MATERIAL	18 ga Hollow Metal
DOOR FINISH	Painted
DOOR VIEW LIGHT	Full-Lite
GLAZING	Tempered Dual Glazed Gray Over Clear
FRAME	Storefront Frame
TRANSOM	Yes - <i>Top of Transom 9'-10"</i>
GLAZING	Tempered Dual Glazed Gray Over Clear
HARDWARE	Entry - Panic/Lockdown
LOCKSET CORE TYPE	Non-Removable
LOCKSET CORE SIZE	Large Format
LOCKSET KEYWAY	C-Keyway
LOCKSET	Von Duprin AX99NL-SP28
HINGE	Hager BB1279 NRP-626
WEATHERSTRIP	Pemko 303DV

CLOSER	Norton 8501
THRESHOLD	Pemko 271AV
BOTTOM	Pemko 216AV
DOOR STOP	Trimco 1233
GROUP 2A	
DOOR SIZE	3'-0" x 7'-0"
DOOR MATERIAL	18 ga Hollow Metal
DOOR FINISH	Painted
DOOR VIEW LIGHT	Full-Lite
GLAZING	Tempered Dual Glazed Gray Over Clear
FRAME	Storefront Frame
TRANSOM	Yes - <i>Top of Transom 8'-10"</i>
GLAZING	Tempered Dual Glazed Gray Over Clear
HARDWARE	Entry - Panic/Lockdown
LOCKSET CORE TYPE	Non-Removable
LOCKSET CORE SIZE	Large Format
LOCKSET KEYWAY	C-Keyway
LOCKSET	Von Duprin AX99NL-SP28
HINGE	Hager BB1279 NRP-626
WEATHERSTRIP	Pemko 303DV
CLOSER	Norton 8501
THRESHOLD	Pemko 271AV
BOTTOM	Pemko 216AV
DOOR STOP	Trimco 1233
GROUP 3	
DOOR SIZE	3'-0" x 7'-0"
DOOR MATERIAL	18 ga Hollow Metal
DOOR FINISH	Painted
DOOR VIEW LIGHT	Full-Lite
GLAZING	Tempered Dual Glazed Gray Over Clear
FRAME	Hollow Metal Welded
HARDWARE	Entry - Panic/Lockdown
LOCKSET CORE TYPE	Non-Removable
LOCKSET CORE SIZE	Large Format
LOCKSET KEYWAY	C-Keyway
LOCKSET	Von Duprin AX99NL-SP28
HINGE	Hager BB1279 NRP-626
WEATHERSTRIP	Pemko 303DV
CLOSER	Norton 8501
THRESHOLD	Pemko 271AV
BOTTOM	Pemko 216AV
DOOR STOP	Trimco 1233
GROUP 4 - DOUBLE DOOR	
DOOR SIZE	3'-0" x 7'-0"
ACTIVE DOOR	Right
DOOR MATERIAL	18 ga Hollow Metal
DOOR FINISH	Painted
DOOR VIEW LIGHT	Full-Lite
GLAZING	Tempered Dual Glazed Gray Over Clear
FRAME	Hollow Metal Welded
HARDWARE	Entry - Panic/Lockdown

LOCKSET CORE TYPE	Non-Removable
LOCKSET CORE SIZE	Large Format
LOCKSET KEYWAY	C-Keyway
LOCKSET	Von Duprin AX99NL-SP28
HINGE	Hager BB1279 NRP-626
WEATHERSTRIP	Pemko 303DV
CLOSER	Norton 8501
THRESHOLD	Pemko 271AV
BOTTOM	Pemko 216AV
DOOR STOP	Trimco 1233
ADDITIONAL ACCESSORIES	
MULLION	Mullion
GROUP 5	
DOOR SIZE	3'-0" x 7'-0"
DOOR MATERIAL	18 ga Hollow Metal
DOOR FINISH	Painted
FRAME	Hollow Metal Welded
HARDWARE	Staff Restroom
LOCKSET CORE TYPE	Non-Removable
LOCKSET CORE SIZE	Large Format
LOCKSET KEYWAY	C-Keyway
LOCKSET	Schlage ND85PD
HINGE	Hager BB1279 NRP-626
WEATHERSTRIP	Pemko 303DV
CLOSER	Norton 8501
THRESHOLD	Pemko 271AV
BOTTOM	Pemko 216AV
DOOR STOP	Trimco 1233
DOOR LOUVER	Yes
GROUP 6	
DOOR SIZE	3'-0" x 7'-0"
DOOR MATERIAL	18 ga Hollow Metal
DOOR FINISH	Painted
FRAME	Hollow Metal Welded
HARDWARE	Storage
LOCKSET CORE TYPE	Non-Removable
LOCKSET CORE SIZE	Large Format
LOCKSET KEYWAY	C-Keyway
LOCKSET	Schlage ND80PD
HINGE	Hager BB1279 NRP-626
WEATHERSTRIP	Pemko 303DV
CLOSER	Norton 8501
THRESHOLD	Pemko 271AV
BOTTOM	Pemko 216AV
DOOR STOP	Trimco 1233
GROUP 7	
DOOR SIZE	3'-0" x 7'-0"
DOOR MATERIAL	18 ga Hollow Metal
DOOR FINISH	Painted
FRAME	Hollow Metal Welded
HARDWARE	Custodial

LOCKSET CORE TYPE	Non-Removable
LOCKSET CORE SIZE	Large Format
LOCKSET KEYWAY	C-Keyway
LOCKSET	Schlage ND80PD
HINGE	Hager BB1279 NRP-626
WEATHERSTRIP	Pemko 303DV
CLOSER	Norton 8501
THRESHOLD	Pemko 271AV
BOTTOM	Pemko 216AV
DOOR STOP	Trimco 1233

INTERIOR DOORS

GROUP 8	
DOOR SIZE	3'-0" x 7'-0"
FIRE RATING	60-Minute Fired Rated Door
DOOR MATERIAL	Solid Core Birch
DOOR FINISH	Clear Birch Finish
DOOR VIEW LIGHT	1/4 Viewlight: 8" x 30" -Max 43" Bottom of Glass
FRAME	18 ga Hollow Metal Welded
HARDWARE	Classroom Entry - Panic/Lockdown
LOCKSET	Von Duprin AX99NL-SP28
HINGE	Hager 1279
DOORSTOP	Trimco 1270CV
CLOSER	Norton 8501
SMOKE SEAL	Pemko S88d
GROUP 8A	
DOOR SIZE	3'-6" x 7'-0"
FIRE RATING	60-Minute Fired Rated Door
DOOR MATERIAL	Solid Core Birch
DOOR FINISH	Clear Birch Finish
DOOR VIEW LIGHT	1/4 Viewlight: 8" x 30" -Max 43" Bottom of Glass
FRAME	18 ga Hollow Metal Welded
HARDWARE	Staff Workroom
LOCKSET	Copper Creek CRAL6241SS
HINGE	Hager 1279
DOORSTOP	Trimco 1270CV
CLOSER	Norton 8501
SMOKE SEAL	Pemko S88d
GROUP 9	
DOOR SIZE	3'-0" x 7'-0"
FIRE RATING	60-Minute Fired Rated Door
DOOR MATERIAL	Solid Core Birch
DOOR FINISH	Clear Birch Finish
FRAME	18 ga Hollow Metal Welded
HARDWARE	Staff Workroom
LOCKSET	Copper Creek CRAL6241SS
HINGE	Hager 1279
DOORSTOP	Trimco 1270CV
CLOSER	Norton 8501
SMOKE SEAL	Pemko S88d

GROUP 10	
DOOR SIZE	3'-0" x 7'-0"
FIRE RATING	60-Minute Fired Rated Door
DOOR MATERIAL	Solid Core Birch
DOOR FINISH	Clear Birch Finish
FRAME	18 ga Hollow Metal Welded
HARDWARE	Storage
LOCKSET	Copper Creek CRAL6250SS
HINGE	Hager 1279
DOORSTOP	Trimco 1270CV
SMOKE SEAL	Pemko S88d
GROUP 11	
DOOR SIZE	3'-0" x 7'-0"
FIRE RATING	60-Minute Fired Rated Door
DOOR MATERIAL	Solid Core Birch
DOOR FINISH	Clear Birch Finish
FRAME	18 ga Hollow Metal Welded
HARDWARE	Entry - Panic/Lockdown
LOCKSET	Von Duprin AX99NL-SP28
HINGE	Hager 1279
DOORSTOP	Trimco 1270CV
CLOSER	Norton 8501
SMOKE SEAL	Pemko S88d
GROUP 12	
DOOR SIZE	3'-0" x 7'-0"
DOOR MATERIAL	Solid Core Birch
DOOR FINISH	Clear Birch Finish
FRAME	18 ga Hollow Metal Welded
HARDWARE	Custodial
LOCKSET	Copper Creek CRAL6250SS
HINGE	Hager 1279
DOORSTOP	Trimco 1270CV
GROUP 13	
DOOR SIZE	3'-0" x 7'-0"
DOOR MATERIAL	Solid Core Birch
DOOR FINISH	Clear Birch Finish
FRAME	18 ga Hollow Metal Welded
HARDWARE	Staff Workroom
LOCKSET	Copper Creek CRAL6241SS
HINGE	Hager 1279
DOORSTOP	Trimco 1270CV
CLOSER	Norton 8501
GROUP 14	
DOOR SIZE	3'-0" x 7'-0"
DOOR MATERIAL	Solid Core Birch
DOOR FINISH	Clear Birch Finish
DOOR SIDE LIGHT	YES - 12" GLASS
FRAME	18 ga Hollow Metal Welded
HARDWARE	Staff Workroom
LOCKSET	Copper Creek CRAL6241SS
HINGE	Hager 1279

DOORSTOP	Trimco 1270CV
CLOSER	Norton 8501
GROUP 15	
DOOR SIZE	3'-0" x 7'-0"
DOOR MATERIAL	Solid Core Birch
DOOR FINISH	Clear Birch Finish
DOOR VIEW LIGHT	YES - 12" GLASS
FRAME	18 ga Hollow Metal Welded
HARDWARE	Entry - Panic/Lockdown
LOCKSET	Von Duprin AX99NL-SP28
HINGE	Hager 1279
DOORSTOP	Trimco 1270CV
CLOSER	Norton 8501
GROUP 16 - DOUBLE DOOR	
DOOR SIZE	3'-0" x 7'-0"
ACTIVE DOOR	Right
DOOR MATERIAL	Solid Core Birch
DOOR FINISH	Clear Birch Finish
FRAME	18 ga Hollow Metal Welded
MULLION	Yes
HARDWARE	Storage
LOCKSET	Copper Creek CRAL6250SS
HINGE	Hager 1279
DOORSTOP	Trimco 1270CV
GROUP 17	
DOOR SIZE	3'-0" x 7'-0"
DOOR MATERIAL	Solid Core Birch
DOOR FINISH	Clear Birch Finish
FRAME	18 ga Hollow Metal Welded
HARDWARE	Single-Use Restroom - Lockable
LOCKSET	Copper Creek CRAL6231SS
HINGE	Hager 1279
DOORSTOP	Trimco 1270CV
CLOSER	Norton 8501
GROUP 17A	
DOOR SIZE	3'-0" x 7'-0"
DOOR MATERIAL	Solid Core Birch
DOOR FINISH	Clear Birch Finish
FRAME	18 ga Hollow Metal Welded
HARDWARE	Multi-Use Restroom
LOCKSET	Copper Creek CRAL6260SS
HINGE	Hager 1279
DOORSTOP	Trimco 1270CV
CLOSER	Norton 8501
GROUP 18	
DOOR SIZE	3'-0" x 7'-0"
DOOR MATERIAL	Solid Core Birch
DOOR FINISH	Clear Birch Finish
DOOR VIEW LIGHT	1/4 Viewlight: 8" x 30" -Max 43" Bottom of Glass
FRAME	18 ga Hollow Metal Welded
HARDWARE	Staff Workroom

LOCKSET	Copper Creek CRAL6241SS
HINGE	Hager 1279
DOORSTOP	Trimco 1270CV
CLOSER	Norton 8501

DIAGRAMS

DOORS						FRAMES		REMARKS
DOOR NO.	DOOR TYPE	DOOR SIZE	QUANTITY	MATERIAL	FINISH	FRAME TYPE	MATERIAL	
1	D3	3'-0" x 7'-9" (DBL)	1	HM	PT	A	(F1)	STF CLR
2	D4	3'-0" x 7'-0"	10	HM	PT	B	(F3)	STF CLR
2A	D4	3'-0" x 7'-0"	3	HM	PT	B	(F2)	STF CLR
3	D4	3'-0" x 7'-0"	1	HM	PT	B	(F5)	STL PT
4	D5	3'-0" x 7'-0" (DBL)	1	HM	PT	B	(F4)	STL PT
5	D1	3'-0" x 7'-0"	1	HM	PT	C	(F5)	STL PT
6	D1	3'-0" x 7'-0"	1	HM	PT	H	(F5)	STL PT
7	D1	3'-0" x 7'-0"	1	HM	PT	H	(F5)	STL PT
8	D6	3'-0" x 7'-0"	4	SC	CLR	B	(F5)	STL PT
8A	D7	3'-6" x 7'-0"	1	SC	CLR	E	(F7)	STL PT
9	D1	3'-0" x 7'-0"	1	SC	CLR	E	(F5)	STL PT
10	D1	3'-0" x 7'-0"	1	SC	CLR	F	(F5)	STL PT
11	D1	3'-0" x 7'-0"	1	SC	CLR	B	(F5)	STL PT
12	D1	3'-0" x 7'-0"	3	SC	CLR	F	(F5)	STL PT
13	D1	3'-0" x 7'-0"	5	SC	CLR	E	(F5)	STL PT
14	D1	3'-0" x 7'-0"	2	SC	CLR	E	(F6)	STL PT
15	D1	3'-0" x 7'-0"	1	SC	CLR	B	(F6)	STL PT
16	D2	3'-0" x 7'-0" (DBL)	1	SC	CLR	F	(F4)	STL PT
17	D1	3'-0" x 7'-0"	4	SC	CLR	D	(F5)	STL PT
17A	D1	3'-0" x 7'-0"	4	SC	CLR	G	(F5)	STL PT
18	D6	3'-0" x 7'-0"	1	SC	CLR	E	(F5)	STL PT

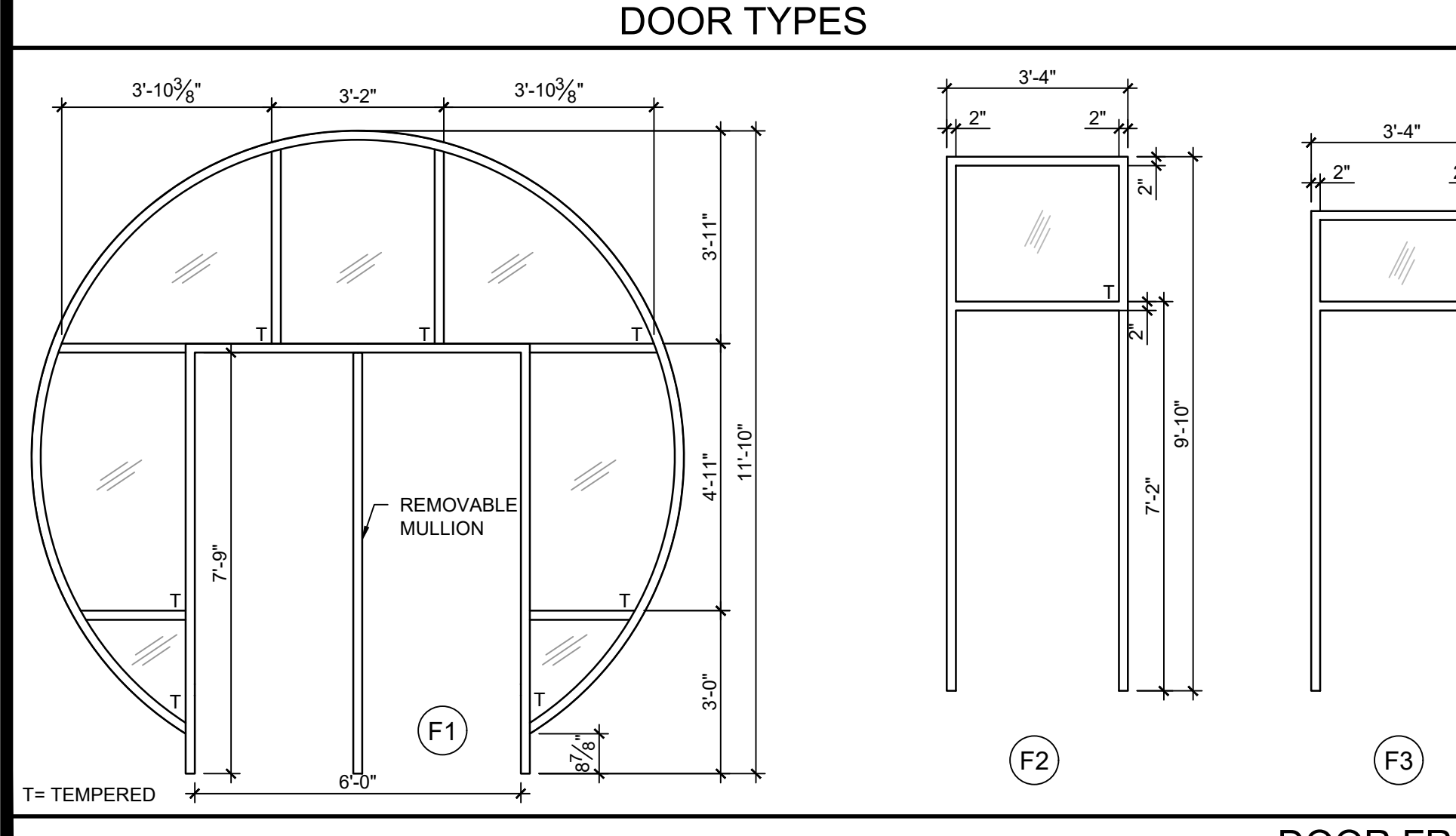
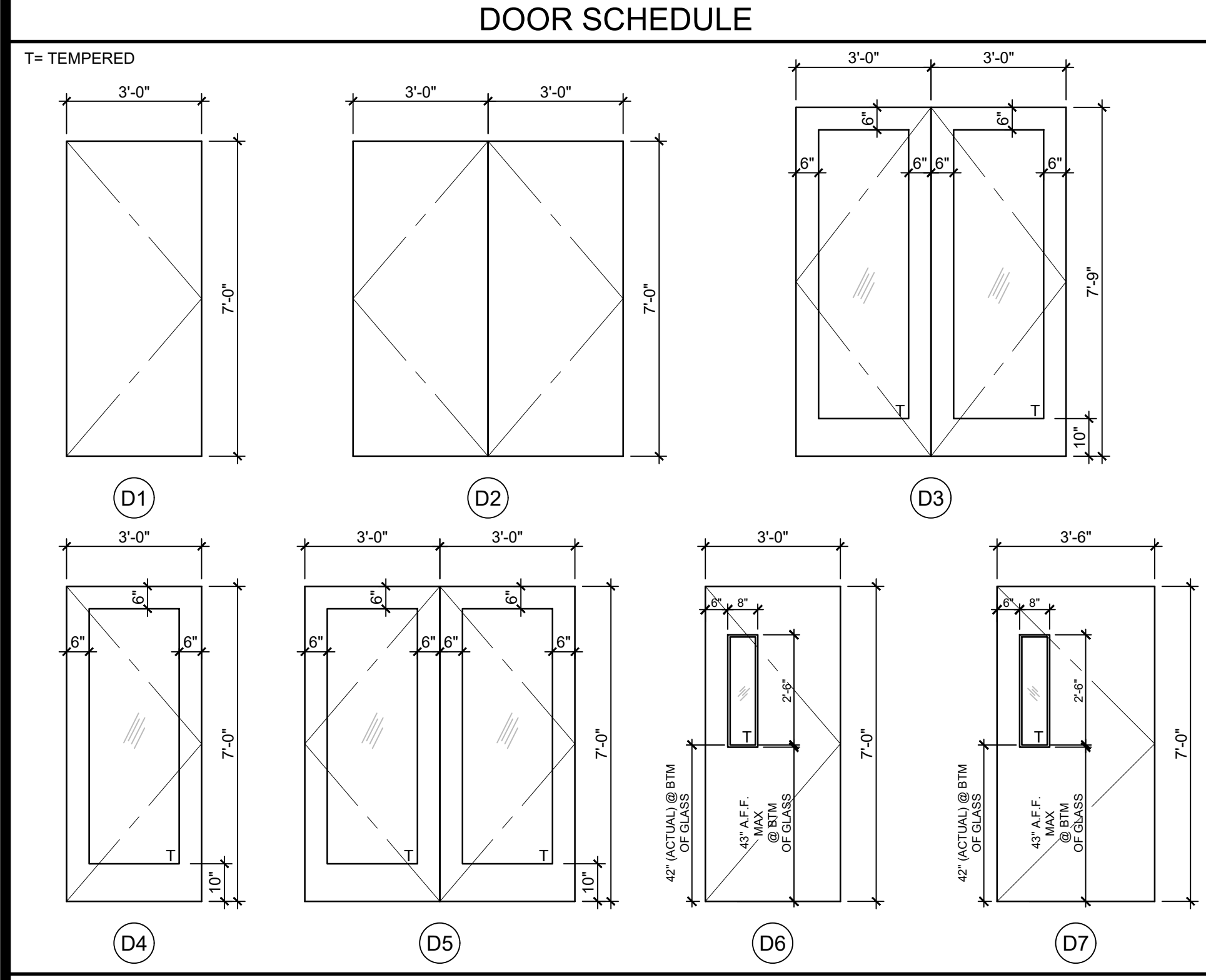
DOOR NOTES

- DOORS SHALL COMPLY WITH C.B.C. SECTION 1010.10.
- CLASSROOMS ≥ 981 S.F. WILL REQUIRE PANIC HARDWARE THAT COMPLIES WITH C.B.C. SECTION 1010.1.10.
- PER C.B.C. 1010.1.11; PROVIDE LOCKS THAT ALLOW DOORS TO CLASSROOMS AND ANY ROOM WITH AN OCCUPANCY OF FIVE OR MORE PERSONS TO BE LOCKED FROM THE INSIDE. LOCKS SHALL COMPLY WITH C.B.C. SECTION 1010.1.9.

DOOR ABBREVIATIONS

HM - HOLLOW METAL
STL - STEEL FRAME, 16ga. FULLY WELDED
SC - SOLID CORE WOOD

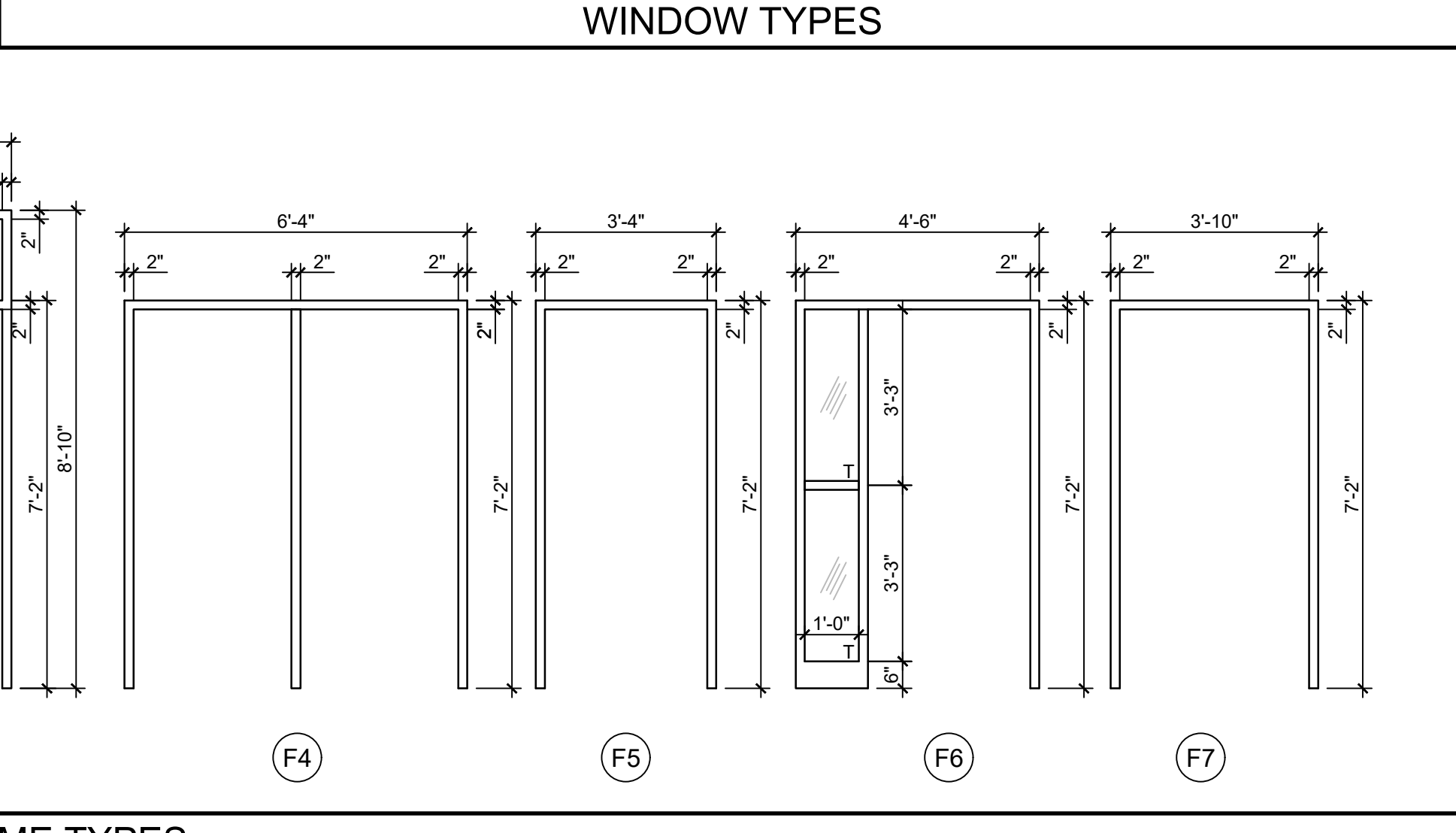
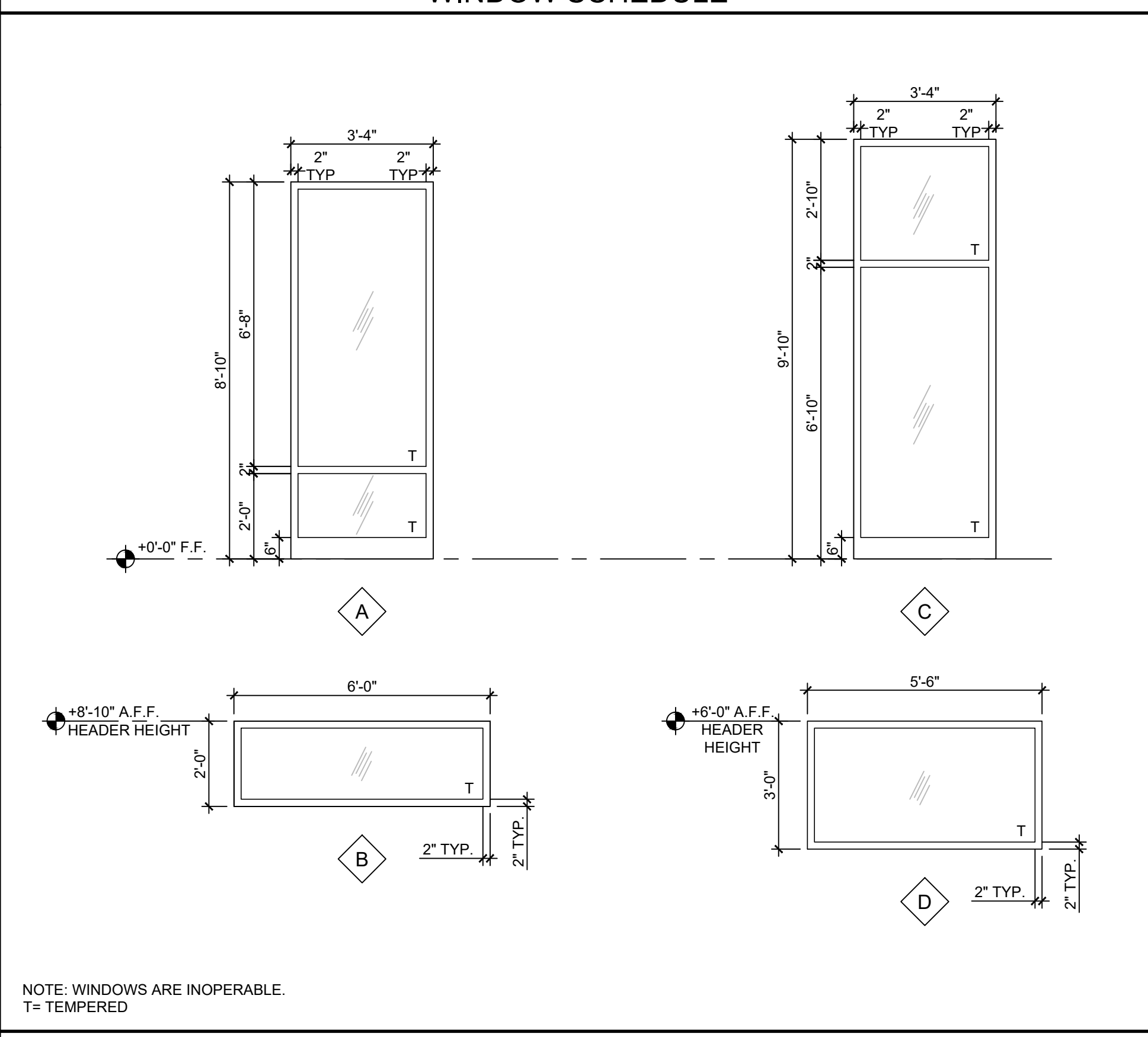
PT - PAINTED
STF - STOREFRONT
CLR - CLEAR FINISH



DOOR FRAME TYPES

WINDOW TYPE	QTY.	FUNCTION	W WIDTH	H HEIGHT	FINISH	GLASS TYPE	U FACTOR	SHGC	VT MIN	MIN STC RATING	REMARKS
A	39	FIXED	3'-4"	8'-10"	STOREFRONT	SOLAR GREY ²	0.780	0.430	0.37	27	INOPERABLE
B	11	FIXED	6'-0"	2'-0"	CLEAR ANODIZED	SOLAR GREY ²	0.780	0.430	0.37	27	INOPERABLE
C	3	FIXED	3'-4"	9'-10"	STOREFRONT	SOLAR GREY ²	0.780	0.430	0.37	27	INOPERABLE
D	1	FIXED	5'-6"	3'-0"	CLEAR ANODIZED	SOLAR GREY ²	0.780	0.430	0.37	27	INOPERABLE

WINDOW SCHEDULE



DOOR FRAME TYPES

ROOM NUMBER	ROOM NAME	FLOOR	BASE	FINISHES						REMARKS
				FRONT	REAR	RIGHT	LEFT	CEILING	CEILING HEIGHT	
01, 102, 103, 104	CLASSROOM	A/C	D	F	F	L	L	K	9'-0"	FRP BETWEEN LOWER AND UPPER CABINETS
132, 136	PREP ROOM	C	D	F	F	L	L	K	9'-0"	
139, 140, 115	CLOSET	C	D	G	G	G	G	K	9'-0"	
126, 127, 119	CORRIDOR	C	D	H	H	H	H	H	9'-0"	
116	CUSTODIAL	O	D	J	J	J	J	K	9'-0"	
121	PANTRY	C	D	J	J	J	J	K	9'-0"	
112	FIRE RISER	O	D	J	J	J	J	K	9'-0"	
120	KITCHEN	N	N	J	J	J	J	K	10'-0"	EPOXY TO SELF-COVE 6" BASE
117	DATA	O	D	G	G	G	G	K	9'-0"	
114	NURSE	C	D	F	F	F	F	K	9'-0"	
113	OFFICE	P	D	F	F	F	F	K	9'-0"	
100	RECEPTION	P	D	F	F	F	F	K	9'-0"/12'-0"	WALK OFF MAT @ EXTERIOR DOORS
124	MULTIPURPOSE ROOM	C	D	F	F	F	F	K	10'-0"	WALK OFF MAT @ EXTERIOR DOORS
118, 119, 138, 130, 129, 131, 133, 135, 134	RESTROOM	B	E	J	J	J	J	M	9'-0"	

FINISH INDICATOR OPTIONS

A - CARPET; PER STATE OF CALIF SPEC COMPLYING WITH GROUP 1, TYPE A OR TYPE B, CLASS 2, DENSITY 4600.
B - VINYL SHEET FLOORING; 0.6 MIN. C.D.F. PER ASTM D 2047
C - VCT; ARMSTRONG, STANDARD, OR EXCELON.
D - TOP SET BASE; 4"
E - TOP SET BASE; 6"
F - WALL FINISH; 1/2" VINYL TACKBOARD CLASS 1 OVER 1/2" GYP BOARD BACKING
G - FIRE RATED PLYWOOD (NON-PAINTED)
H - 1/2" GYP BOARD; TAPE, PAINTED FINISH
J - 3/32" F.R.P.; OVER 1/2" W.R. GYP BOARD
K - ACOUSTICAL LAY-IN GRID CEILING PANELS; 2'x4'
L - 1/2" VINYL TACKBOARD; CLASS 1, OVER 5/8" TYPE 'X' GYP BOARD BACKING
M - 5/8" TYPE 'X' GYP BOARD; TAPE, TEXTURE, PAINTED FINISH
N - EPOXY
O - EXPOSED CONCRETE WITH CONCRETE SEALER
P - LVT

ROOM FINISHES SCHEDULE

A	EXTERIOR DOOR LOCKSET w/LEVER RHODES SCHLAGE ND95PD
B	EXTERIOR/INTERIOR DOOR PANIC BAR w/PULL ON EXTERIOR VON DUPRIN AX99NL (REQUIRED WHEN OCCUPANT LOAD IS 50 OR MORE)
C	EXTERIOR SINGLE USE RESTROOM LOCKSET w/LEVER RHODES SCHLAGE ND85PD
D	INTERIOR SINGLE USE RESTROOM COPPER CREEK 6231-RESTROOM w/ADA LEVER
E	INTERIOR ENTRY/OFFICE COPPER CREEK 6241-ENTRY/OFFICE w/ADA LEVER
F	INTERIOR STOREROOM COPPER CREEK 6250-STOREROOM w/ADA LEVER
G	INTERIOR MULTI USE RESTROOM COPPER CREEK 6260-RESTROOM w/ADA LEVER
H	EXTERIOR STOREROOM LOCKSET w/LEVER RHODES SCHLAGE ND80PD

EXTERIOR DOOR HARDWARE

- HINGES: HAGER 4-1/2x4-1/2 BUTTS, BB1279 US26D, 1-1/2 PAIR PER DOOR, WITH SET SCREW IN BARREL AND BALL BEARING DESIGN.
- CLOSER: NORTON 8500DA OR 8500BF SERIES, LCN 1460 DEL SERIES OR EQUAL. (5 LBS. MAX. PRESSURE)
- WEATHERSTRIPPING: ALL EXTERIOR DOORS SHALL BE WEATHERSTRIPPED WITH PEMKO 299D, ULTRA WS007 OR EQUAL, AT DOOR JAMBS AND HEAD.
- THRESHOLD: THRESHOLD SHALL BE PEMKO 271 AV 5" ALUMINUM WITH PEMKO 216 AV ULTRA TH042 DOOR BOTTOM.
- LOCKDOWN: INTERIOR TEACHERS' MANUAL LOCK FOR CAMPUS LOCK DOWN CRITERIA - REQUIRED FOR STATE-FUNDED SCHOOLS, PER EDUCATION CODE SECTION 17075.50 (AND ALSO CBC 1010.1.11); PROVIDE LOCKS THAT ALLOW DOORS TO CLASSROOMS AND ANY ROOM WITH AN OCCUPANCY OF FIVE OR MORE PERSONS TO BE LOCKED FROM THE INSIDE. LOCKS SHALL COMPLY WITH C.B.C. SECTION 1010.1.9.

DOOR HARDWARE NOTES

- OPERABLE PARTS OF DOOR HARDWARE SHALL BE 34" MINIMUM AND 44" MAXIMUM ABOVE THE FINISH FLOOR OR GROUND.
- HANDLES, PULLS, LATCHES, LOCKS AND OTHERS OPERABLE PARTS ON DOORS SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING OR TWISTING OF THE WRIST. THE FORCE REQUIRED TO ACTIVATE OPERABLE PARTS SHALL BE 5 lbs. MAX. (11B-404.2.7, 11B-309.4)
- ADDITIONAL DOORS MAY BE REQUIRED BASED ON BUILDING LAYOUT.

DOOR HARDWARE SCHEDULE

AMS
American Modular Systems
787 Spreckels Ave., Manteca, CA 95336
Phone (209) 825-1921 Fax (209) 825-7018
www.americanmodular.com

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PRE-CHECKED SET NAME

MODULAR BUILDING
CONSISTING OF
40' & 24' MODULES

SITE SPECIFIC PROJECT NAME

PALO VERDE COLLEGE
CHILD DEVELOPMENT CENTER
(1)48' x 40', (2)24'x40' & (1)144'x40' MODULES

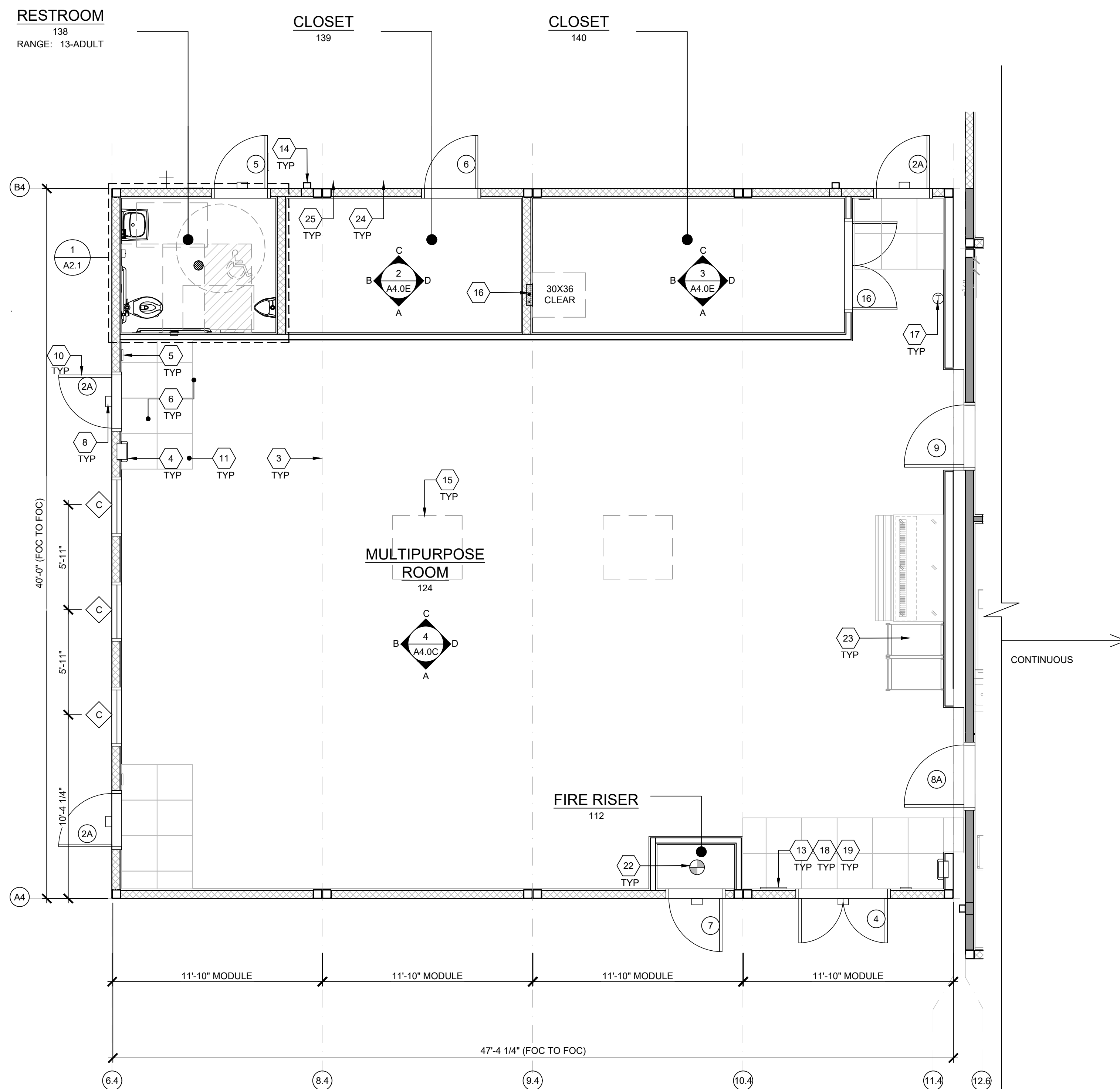
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REVISIONS

DRAWN BY: JMA/JKA
SCALE: AS NOTED
DATE: 2/02/22
PROJECT NO: 1674-21
SHEET TITLE:
TYPICAL SCHEDULES:
DOORS, WINDOWS
& FINISHES
SHEET NUMBER:
N3.0



- 1 (2) 8x4" MARKER BOARDS - SEE SHEET A4.0
- 2 NOT USED
- 3 TYP. MOD LINE
- 4 FIRE EXTINGUISHER - TOP OF HANDLE @ +48" A.F.F. 4" MAX PROTRUSION FROM WALL IF BOTTOM OF FIRE EXTINGUISHER IS ABOVE 27" A.F.F.
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- 17 THERMOSTAT
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- 19 ASSISTIVE LISTENING (AL) SIGN POSTED IN PROMINENT PLACE AT OR NEAR THE ENTRANCE PER 17/N4.0.
- 20 CASEWORK - BLOCKING AS NEEDED PER 8/A7.1
- 21 CASEWORK W/ SINK - BLOCKING AS NEEDED PER 8/A7.1/ REFER TO 17/A1.0



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PRE-CHECKED SET NAME
MODULAR BUILDING
 CONSISTING OF
 40' & 24' MODULES

 SITE SPECIFIC PROJECT NAME
PALO VERDE COLLEGE
CHILD DEVELOPMENT CENTER
 (1)48' x 40', (2)24'x40' & (1)144'x40' MODULES

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REVISIONS	
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△	
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△	

DRAWN BY:	JMA/KA
SCALE:	AS NOTED
DATE:	2/02/22
PROJECT NO:	1674-21
SHEET TITLE:	

FLOOR PLAN - BLDG A

SHEET NUMBER:

A1.0A

FLOOR PLAN - BLDG A

SCALE: 1/8" = 1'-0"

1

NOT USED

- X # = MECHANICAL OR PLUMBING FIXTURE - SEE MECHANICAL OR PLUMBING DRAWINGS
- X = KEY NOTE - SEE KEY NOTES ABOVE
- X = DOOR TYPE - SEE SCHEDULE, SHEET N3.0
- X = WINDOW TYPE - SEE SCHEDULE, SHEET N3.0

- WALL TYPES/LEGEND**
- 2X4 WALL = NO HATCHING
 - 2X6 WALL = ANSI37 (252)
 - 2X8 WALL = ANSI31 (252)
 - FIRE-RATED WALL = SOLID (252)

NOTES:
 FOR ALL ENERGY NOTES REFER TO A1.0
 FOR ALL ACOUSTIC NOTES REFER TO A1.0
 FOR ALL SHEET NOTES REFER TO A1.0

NOT USED

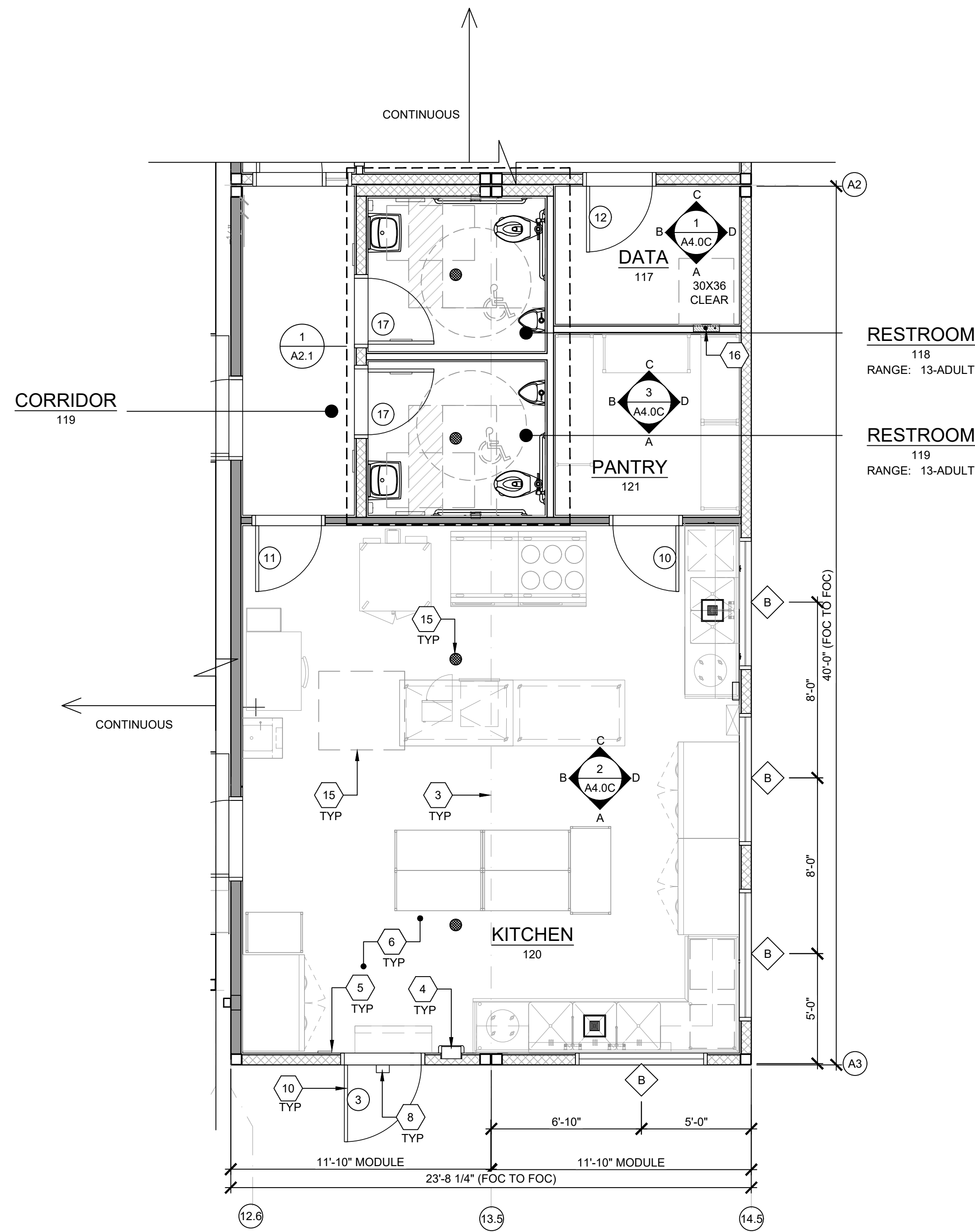
2

SYMBOLS LEGEND

WALL LEGEND

NOTES

NOT USED



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PRE-CHECKED SET NAME
MODULAR BUILDING
 CONSISTING OF
 40' & 24' MODULES
EVOLVE
 SITE SPECIFIC PROJECT NAME
PALO VERDE COLLEGE
CHILD DEVELOPMENT CENTER
 (1)48' x 40', (2)24'x40' & (1)144'x40' MODULES

KEY NOTES

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REVISIONS

DRAWN BY: JMA/KA
 SCALE: AS NOTED
 DATE: 2/02/22
 PROJECT NO: 1874-21

SHEET TITLE:
FLOOR PLAN - BLDG B

SHEET NUMBER:
A1.0B

FLOOR PLAN - BLDG B

SCALE: 1/8" = 1'-0" 1

NOT USED

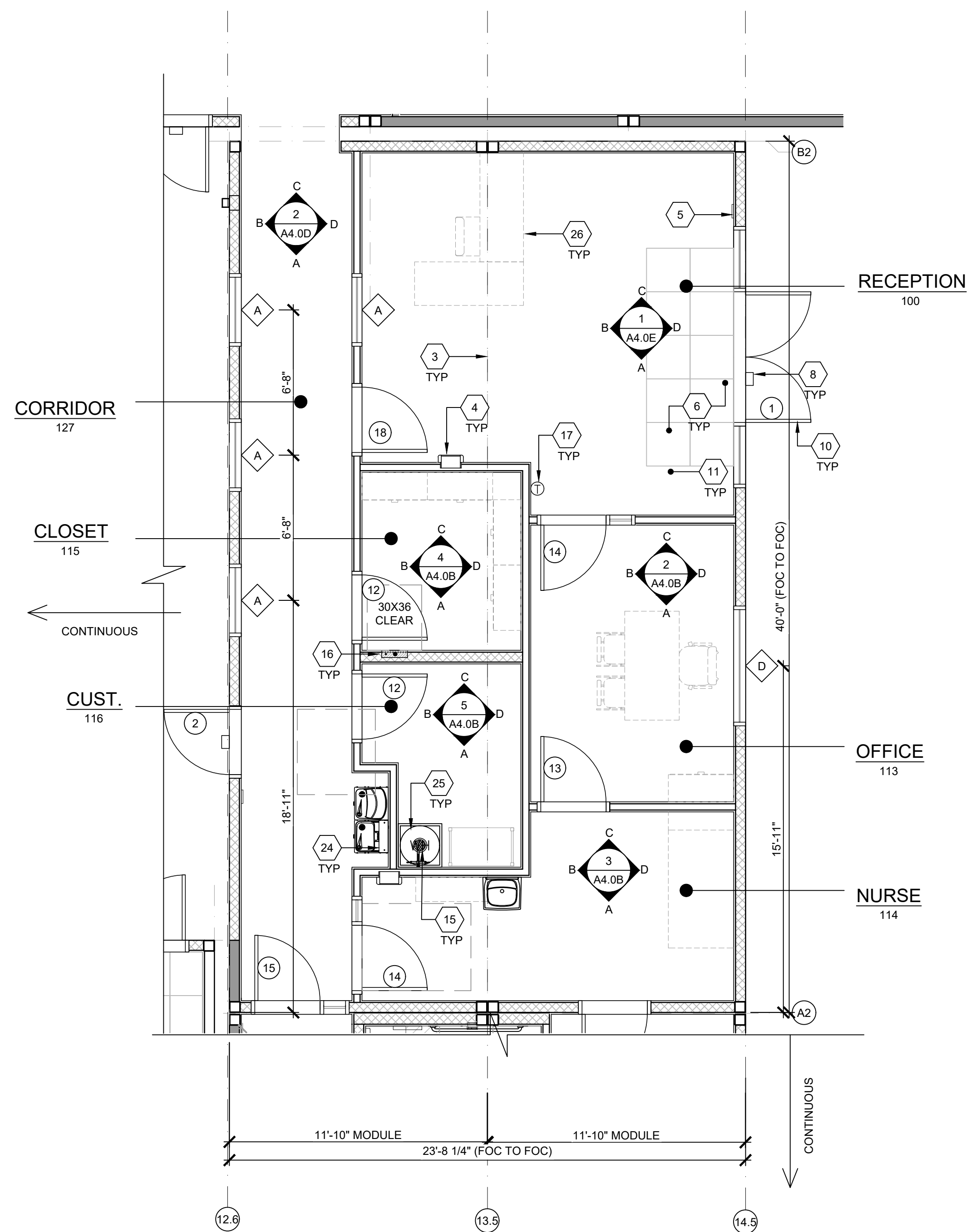
NOT USED

2 SYMBOLS LEGEND

WALL LEGEND

NOTES

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PRE-CHECKED SET NAME
MODULAR BUILDING
 CONSISTING OF
 40' & 24' MODULES
EVOLVE
 SITE SPECIFIC PROJECT NAME
PALO VERDE COLLEGE
CHILD DEVELOPMENT CENTER
 (1)48' x 40', (2)24'x40' & (1)144'x40' MODULES

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REVISIONS
<div style="display: flex; justify-content: space-between;"> △ △ </div>

DRAWN BY: JMA/KA
 SCALE: AS NOTED
 DATE: 2/02/22
 PROJECT NO: 1874-21

SHEET TITLE:
FLOOR PLAN - BLDG C

SHEET NUMBER:
A1.0C

FLOOR PLAN - BLDG C

SCALE: 1/8" = 1'-0" 1

NOT USED

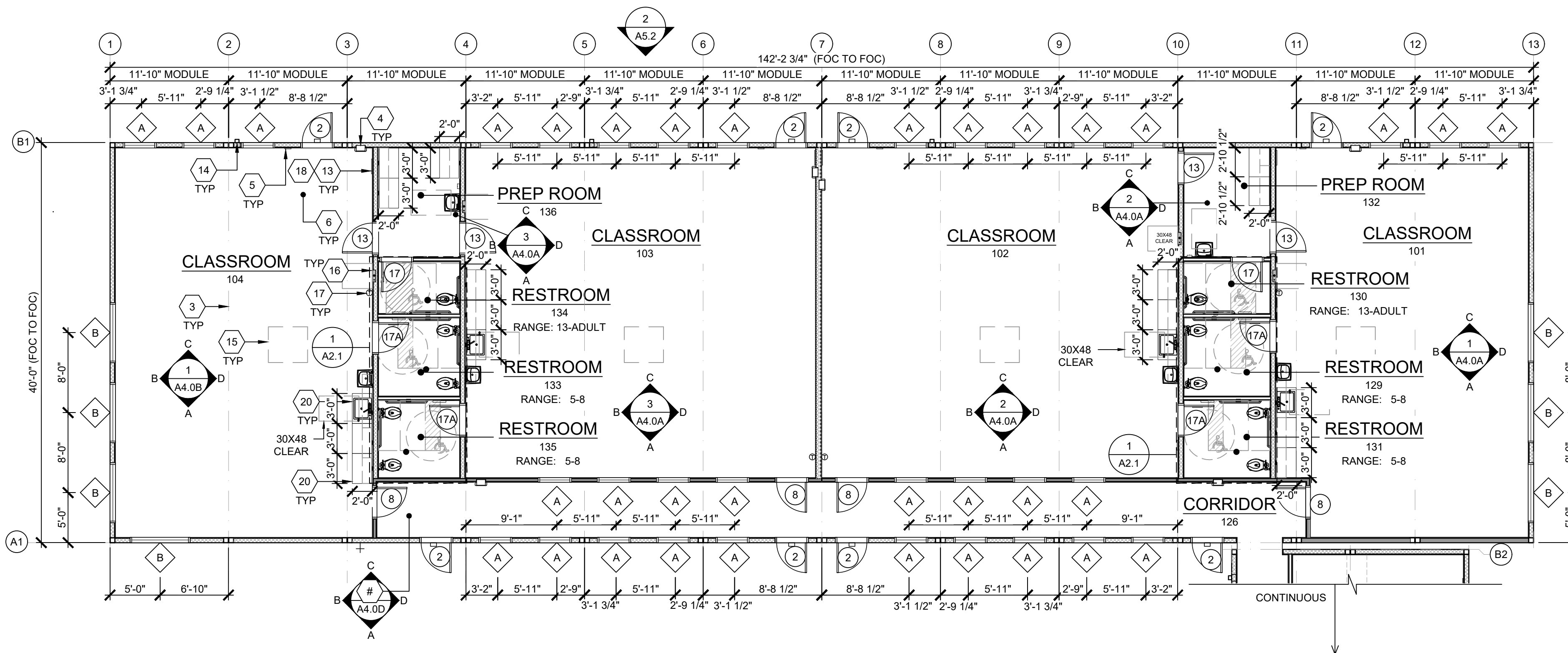
NOT USED 2

SYMBOLS LEGEND

WALL LEGEND

NOTES

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PRE-CHECKED SET NAME
MODULAR BUILDING
CONSISTING OF
40' & 24' MODULES
EVOLVE

SITE SPECIFIC PROJECT NAME
PALO VERDE COLLEGE
CHILD DEVELOPMENT CENTER
(1)48' x 40', (2)24'x40' & (1)144'x40' MODULES

MANUFACTURER PROFESSIONAL OF RECORD ON PC

PRELIMINARY
NOT FOR
CONSTRUCTION

THESE DRAWINGS ARE PRELIMINARY AND NOT FOR CONSTRUCTION UNLESS STAMPED & SIGNED BY THE ENGINEER OF RECORD.

REVISIONS	

DRAWN BY:	JMA/KA
SCALE:	AS NOTED
DATE:	2/02/22
PROJECT NO.:	1874-21

SHEET TITLE:
FLOOR PLAN - BLDG D

SHEET NUMBER:
A1.0D

FLOOR PLAN - BLDG D

SCALE: 1/8" = 1'-0"

1

NOT USED

- X# = MECHANICAL OR PLUMBING FIXTURE - SEE MECHANICAL OR PLUMBING DRAWINGS
- X = KEY NOTE - SEE KEY NOTES ABOVE
- X = DOOR TYPE - SEE SCHEDULE, SHEET N3.0
- X = WINDOW TYPE - SEE SCHEDULE, SHEET N3.0

- WALL TYPES/LEGEND**
- 2X4 WALL = NO HATCHING
 - 2X6 WALL = ANSI137 (252)
 - 2X8 WALL = ANSI131 (252)
 - FIRE-RATED WALL = SOLID (252)

NOTES:
FOR ALL ENERGY NOTES REFER TO A1.0
FOR ALL ACOUSTIC NOTES REFER TO A1.0
FOR ALL SHEET NOTES REFER TO A1.0

NOT USED

2

SYMBOLS LEGEND

WALL LEGEND

NOTES

NOT USED



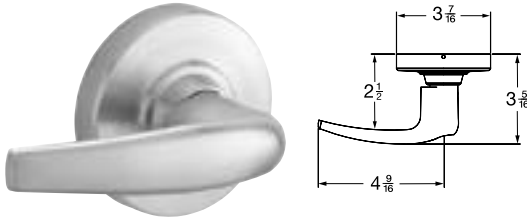
787 Spreckels Avenue
Manteca CA, 95336
P 209.825.1921

LOCKSET: SCHLAGE ND95PD

Designs and finishes

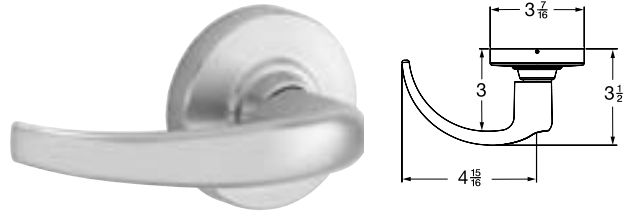
Lever designs and finishes

Athens (ATH)²



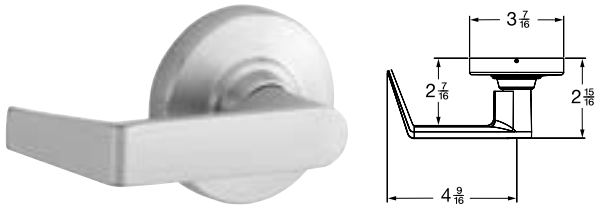
- Mechanical
- Wired electrified
- Wireless electronic

Sparta (SPA)^{1,2}



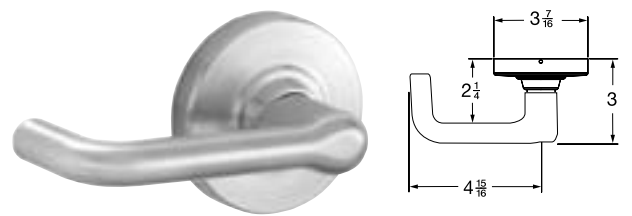
- Mechanical
- Wired electrified
- Wireless electronic

Rhodes (RHO)^{1,2}



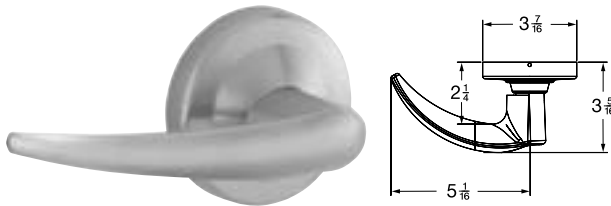
- Mechanical
- Wired electrified
- NDE wireless electronic

Tubular (TLR)^{1,2}



- Mechanical
- Wired electrified

Omega (OME)¹



- Mechanical
- Wired electrified

All levers comply with the Americans with Disabilities Act (ADA).

- Rhodes, Sparta, Tubular and Omega levers comply with California State code for return within 1/2" of door face.
- All levers except Omega can support cylinders from other manufacturers, see cylinder section page 24 for details.

Finish options

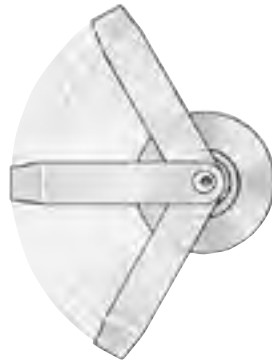


Color	Bright brass	Satin brass	Satin bronze	Oil rubbed bronze	Satin nickel	Matte black	Bright chrome	Satin chrome	Aged bronze
ANSI/BHMA number	605	606	612	613	619	622	625	626/626AM	643e
US number	US3	US4	US10	US10B	US15	US19	US26	US26D	US11
Mechanical	■	■	■	■	■	■	■	■	■
Wired electrified	■	■	■	■	■	■	■	■	■
Wireless electronic	■	■	■	—	■	■	■	■	■

Product information and specifications contained in this catalog are subject to change without notice. Please consult the factory.

ND Series mechanical lock
Vandlgard™ function list

Vandlgard™ trim is specifically designed for highly abusive environments. The outside lever rotates freely up and down when locked, limiting the ability of vandals to apply excessive force to the chassis



Schlage ANSI

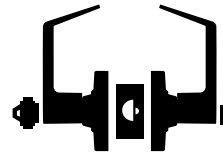
ND91PD F82

Entrance/office lock

- Push-button locking.
- Push-button disengages outside lever until unlocked with key or by turning inside lever.
- Vandlgard allows outside spindle to disengage from latch when locked.
- Inside lever always free for immediate egress.

Outside

Inside



Schlage ANSI

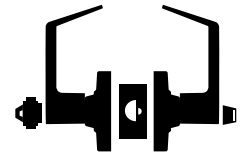
ND92PD F109

Entrance lock

- Turn/push-button locking: Pushing and turning button disengages outside lever, requiring using of key until button is manually unlocked.
- Push-button locking: Pushing button disengages outside lever until unlocked by key or by turning inside lever.
- Vandlgard allows outside spindle to disengage from latch when locked.
- Inside lever always free for immediate egress.

Outside

Inside



Schlage ANSI

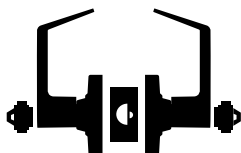
ND93PD F88

Vestibule lock

- Latch retracted by key from outside when outside lever is disengaged by key in inside lever.
- Vandlgard allows outside spindle to disengage from latch when locked.
- Inside lever always free for immediate egress.

Outside

Inside



Schlage ANSI

ND94PD F84

Classroom lock

- Outside lever disengaged and unlocked by key.
- Vandlgard allows outside spindle to disengage from latch when locked.
- Inside lever always free for immediate egress.

Outside

Inside



Schlage ANSI

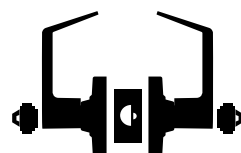
ND95PD -

Classroom security lock

- Key in either lever locks or unlocks outside lever.
- Vandlgard allows outside spindle to disengage from latch when locked.
- Inside lever always free for immediate egress.

Outside

Inside



Schlage ANSI

ND96PD F86

Storeroom lock

- Outside lever always disengaged.
- Entrance by key only.
- Vandlgard allows outside spindle to disengage from latch when locked.
- Inside lever always free for immediate egress.

Outside

Inside

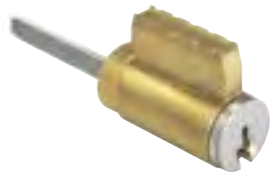


Available with RX

Cylinders and key systems

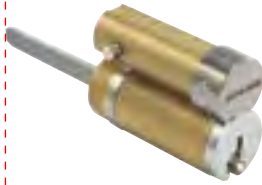
A strong lock is only part of the security solution—proper key control is equally important. Schlage offers extensive options to meet the security needs of the specific project.

Cylinders



Standard cylinders - options¹

- 6-pin conventional (standard)
- Primus[®] XP high security
- Primus XP UL437 Listed high security
- Hotel cylinder (for use in faculty restroom function)



Full size interchangeable cores - options¹

- Conventional core
- Primus XP high security core



Small format interchangeable cores - options²

- 7-pin combined or uncombined Everest 29[™] R family restricted keyways³
- 6 or 7-pin uncombined Falcon[®]/Best[®] keyways⁴
- Disposable plastic construction core

¹ Available in 606 and 626 finish only; Everest 29 S123 keyway standard.

² Available 606, 613 (simulated), and 626 finish only.

³ Restricted keyway cores require authorization from the end user.

⁴ Best Cores are available in A, D, E, F, G, H, J, K, L, and M keyways. To avoid confusion with existing Schlage keyways, specify SFIC open keyways with a 'B' suffix, e.g. "AB." Must be ordered separately from lock; not available factory keyed.

Key systems

Classic keyway

- Popular design found in many existing products
- Non-restricted keyway—keys are duplicated and available without any ordering formalities

Everest 29

- Patented through 2029
- Key duplication is restricted providing a higher level of security for the cylinder
- Can be integrated to an existing Everest B, C, or D system
- Ability to add Primus XP or UL437 for additional security

Primus XP

- High security, dual locking cylinder
- Unique side bit milling on key makes unauthorized duplication highly enforceable
- Allows creation of geographically exclusive keys in a thousand available combinations
- Can be used to upgrade an Everest 29 or Classic system to a high-security cylinder

Everest 29 SL

- A high security conventional (KIL) cylinder pinned on an A2 system compatible with the Schlage Everest B and Everest 29 R keyways
- Users can expand existing Everest B and Everest 29 R key systems
- Allows for Primus XP in the SFIC keyways



Ordering instructions

Example

Function + cylinder	Outside		Inside		Door				
	Lever	Finish	Lever	Finish	Latch	Strike	Thickness	Extension	Dimension
Mechanical ND95PD	RHO	626	RHO	626					
Wired electrified ND80EUL	RHO	605	SPA	619	14-048	10-013	214	EE	118
Wireless electronic NDE80BD	SPA	619							

Detail

Function	Mechanical: See pages 12-17 Wired electrified: See pages 18-19 Wireless electronic: NDE80; see pages 20-21		
Cylinder	Standard: P (Patented Everest 29) L (less cylinder) C (less double cylinder) Z (Everest SL)	Full size Interchangeable (FSIC): R (FSIC, Patented Everest29) J (FSIC, less core) T (FSIC, Construction Core)	Small format Interchangeable: GD (SFIC, Patented Everest 29) BD (SFIC, less core) BDC (SFIC, disposable core) HD (SFIC, construction core)
	For non-Schlage cylinders please see page 24		
Outside lever	Mechanical: ATH (Athens), RHO (Rhodes) , SPA (Sparta), TLR (Tubular), OME (Omega) Wired electrified: ATH (Athens), RHO (Rhodes), SPA (Sparta), TLR (Tubular), OME (Omega) Wireless electronic: ATH (Athens), RHO (Rhodes), SPA (Sparta)		
	Note: Specify tactile as: 8AT (Athens), 8RO (Rhodes), 8SP (Sparta), 8TR (Tubular)		
Outside finish	605 Bright brass (US3) 606 Satin brass (US4) 612 Satin bronze (US10) 613 Oil rubbed bronze (US10B) ¹ 619 Satin nickel (US15) 622 Matte black (US19) 626 Satin chrome (US26D) 626AM Satin chrome anti-microbial 625 Bright chrome (US26) 643e Aged bronze (US11)		
	¹ Not available NDE wireless electronic		
Inside lever	Specify only if different from outside lever. Same options as outside lever.		
Inside finish	Specify only if different from outside finish. Same options as outside finish.		
Latch	Specify only if different from standard latch; see page 24 for options.		
Strike	Specify only if different from standard strike; see page 24 for options.		
Door thickness	Specify only if outside standard door range (1 5/8"-2 1/8"). Extended door thickness not available NDE wireless electronic.		
Extension	Specify only for doors 2 1/8" or greater. Example: EE = Extended Equally, EI = Extended Inside, EO = Extended Outside, ED = Extended Differently		
Dimension	Specify only for non-standard strike lip length.		
Options	Specify any additional requirements or options. Example: KA = Keyed Alike, KD = Keyed Different, Obit, etc.		



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HINGE: HAGER BB1279 NRP-626

BB1279

Five Knuckle - Ball Bearing - Standard Weight

Description:

- ANSI A8112
- Two ball bearings
- Non-rising removable pin with button tip and plug
- 3-1/2" x 3-1/2" (89 mm x 89mm) available with reversible hole pattern
- For use on medium weight doors or doors requiring medium frequency service

Note:

- Complies with NFPA80 requirements for use on fire rated door assemblies

Electric Modifications:

- [EMN](#) (Electric Monitor Only)
- [ETW](#) (Electric Through-Wire Only)
- [ETM](#) (Electric Through-Wire with Monitoring)
- [Quick Connect](#)



PRODUCT SPECIFICATIONS

MATERIAL:

- Steel with Steel pin

FINISHES:

- LS, H2H, USP, US3, US4, US10, US10A, US10B, US15, US26, **US26D**

OPTIONS:

- **NRP - Non-removable pin**

PRODUCT SIZE OPTIONS

HINGE SIZE (INCHES)	HINGE SIZE (MM)	GAUGE OF METAL	HOLE COUNT	SCREW SIZE (MACHINE)	SCREW SIZE (WOOD)
3 1/2 x 3 1/2	89 x 89	0.119	6	1/2 x 10-24	1 x 9
4 x 4	102 x 102	0.129	8	1/2 x 12-24	1 1/4 x 12
4 1/2 x 4	114 x 102	0.134	8	1/2 x 12-24	1 1/4 x 12
4 1/2 x 4 1/2	114 x 114	0.134	8	1/2 x 12-24	1 1/4 x 12
5 x 4	127 x 102	0.145	8	1/2 x 12-24	1 1/4 x 12
5 x 4 1/2	127 x 114	0.145	8	1/2 x 12-24	1 1/4 x 12
5 x 5	127 x 127	0.145	8	1/2 x 12-24	1 1/4 x 12
6 x 4-1/2	152 x 114	0.160	10	1/2 x 1/4-20	1 1/2 x 14
6 x 5	152 x 127	0.160	10	1/2 x 1/4-20	1 1/2 x 14
6 x 6	152 x 152	0.160	10	1/2 x 1/4-20	1 1/2 x 14

WEATHERSTRIP: PEMKO 303DV



ASSA ABLOY

**PERIMETER GASKETING:
STANDARD PERIMETER GASKETING**

303DV

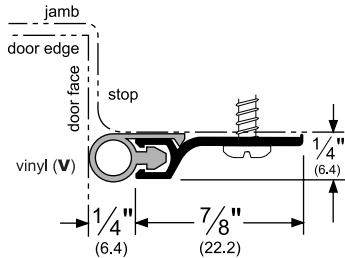


AVAILABLE FINISHES: A, BDG, **D**, G, PW, SN

WIDTH: 1/4" (6.4 mm)

PROFILE HEIGHT: 7/8" (22.2 mm)

TOTAL HEIGHT WITH INSERT: 1-1/8" (28.6 mm)



A (Mill Finish Aluminum)

BDG (Bright Dip Gold Anodized Aluminum)

D (Dark Bronze Anodized Aluminum)

G (Gold Anodized Aluminum)

PW (Painted White Aluminum)

SN (Satin Nickel Anodized Aluminum)

TITLE:

PREPARED FOR:

PREPARED BY:

DATE:

COMMENTS:

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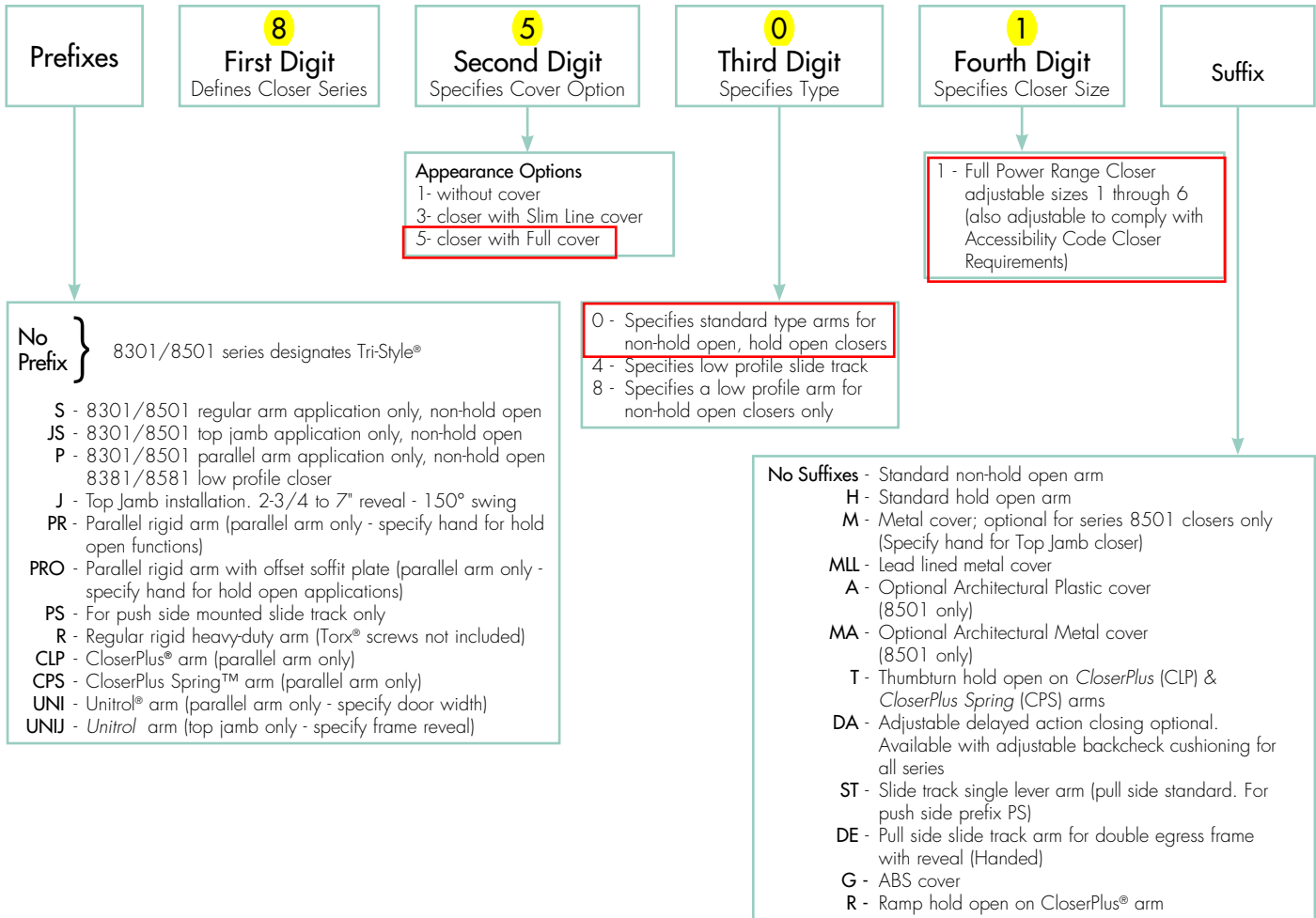


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CLOSER: NORTON 8501

HOW TO ORDER

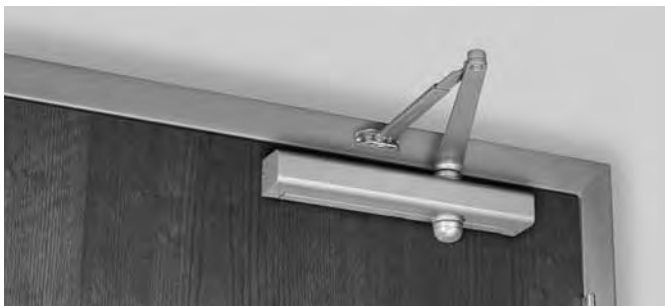
For optimum protection of door and frame assemblies, always use auxiliary wall, floor, or overhead door stop.



Notes:

- Warranty becomes void if door closer is installed on the exterior side of a door in the exterior wall of a building.
- It is strongly recommended, and required on fire door assemblies, that doors having a door closer be hung on ball bearing or anti-friction hinges or pivots; unless an alternate method is identified in the door manufacturer's listing.
- Failure to use the correct type and size fasteners may void factory warranty.
- Fasteners for fire/smoke door assemblies must conform to NFPA 80. In some applications additional fasteners may be mandated by NFPA 80 that are not shipped with standard Norton product, such as sleeve-nuts/sex nuts or through-bolts and grommet nuts.
- Sizing charts provided on pages 13-25 are based on 1-3/4" (44mm) x 7" (2.13m) standard weight doors swinging to 110°. Other conditions (such as door height or weight; or wind/draft conditions) may require a larger size closer.

APPLICATIONS



Regular Arm

8301 - slim cover

This is the only pull-side application where a double lever arm is used. It is the most power-efficient application for a door closer. Sufficient frame, door and/or ceiling clearance must be considered.



8501 - full cover

Since the arm assembly projects directly out from the frame, this application may present an aesthetics issue or be prone to vandalism.



Top Jamb

For efficiency reasons this application provides the best alternative to the regular arm application. There must be sufficient frame face and/or ceiling clearance for this application. It requires a top rail on the door of just 2-1/4" (57mm). This application provides the best door control for doors in exterior walls that swing out of a building.



The entire door closer and arm assembly project from the frame, similar to the regular arm application, where matters of appearance and malicious abuse can be of concern. Consideration must be given to depth of frame reveal.



Parallel Arm

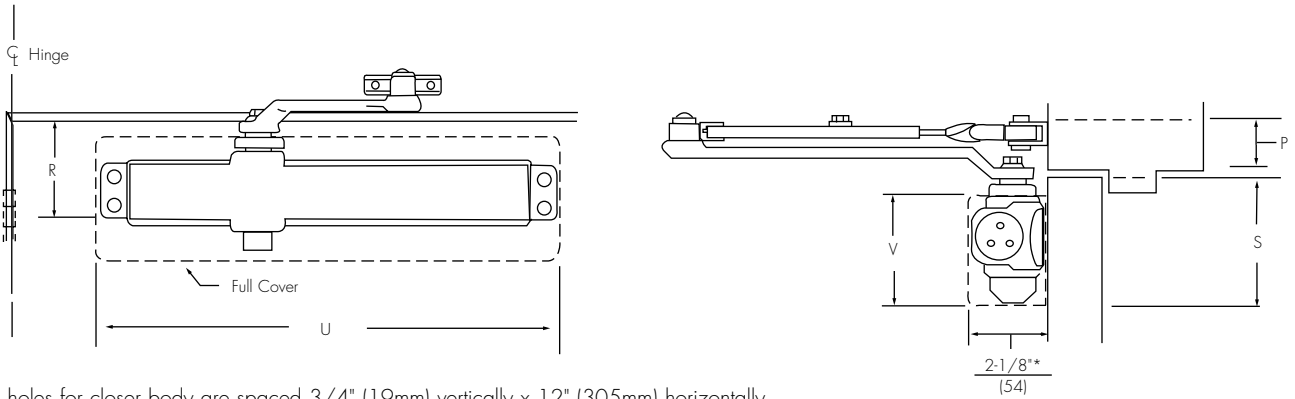
This application provides the most appealing design appearance for a surface-mounted door closer having a double lever arm. This also makes it beneficial in vandalism-prone areas. It is on the push side of the door and the arm assembly extends almost parallel to the door. In the closed position, there is very little or no hardware projecting beyond the frame face in most situations.



Due to the geometry of the arm it is approximately 25% less power efficient than a regular arm application. The entire closer and arm assembly are mounted below the frame stop. Top rail clearance dimensions will vary based on the type of cover used. (See pg. 15)

8000 SERIES ARCHITECTURAL DOOR CLOSER

REGULAR ARM



Mounting holes for closer body are spaced 3/4" (19mm) vertically x 12" (305mm) horizontally.

Note: All measurements are inches/mm.

Maximum 180° door swing, conditions permitting.

Closer Series	Covers	P Minimum Ceiling Clearance			R Minimum Top Rail				S Minimum Top Rail Clearance		U Closer Length	V Closer Height	
					W/O Drop Plate		W/8146 Drop Plate						
		NHO	Low Profile	HO	NHO	Low Profile	NHO	Low Profile	NHO	Low Profile			
8101	No Cover										12-3/4" (324)		
8301	Slim Line Plastic									3-1/2" (89)	3-3/8" (86)	13" (330)	2-7/8" (73)
8501	Full Plastic	1-1/2" (38)	1" (25)	1-5/8" (41)	2-1/2" (64)	2-3/8" (60)	1-5/8" (41)	1-1/2" (38)					
8501M	Metal								4-1/4" (108)	4-1/8" (105)	13-5/8" (346)	3-3/4" (95)	
8501A	Arch. Plastic								3-5/8" (92)	3-1/2" (89)	14" (356)	3-1/8" (79)	
8501MA	Arch. Metal								3-1/2" (89)	3-3/8" (86)		3" (76)	

Door Width Inches (cm)		Model Number	
Interior	Exterior	Non-Hold Open	Hold Open
30" (76)	—	8301 8501	8301H 8501H
36" (91)	30" (76)		
48" (122)	36" (91)		
—	48" (122)		
Unusual			

Note: 8301/8501 door closers are set at midpower range from the factory and can be adjusted for door sizes noted above.

* Projection is for Slim Line or Full Covers. Projection for Metal Covers = 2-3/16" (56mm). Projection for Architectural Plastic & Architectural Metal Covers = 2-1/4" (57mm).

Note: Please contact factory if door weight exceeds 250 lbs.



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THRESHOLD: PEMKO 271AV



ASSA ABLOY

**COMMERCIAL THRESHOLDS:
SADDLE THRESHOLDS**

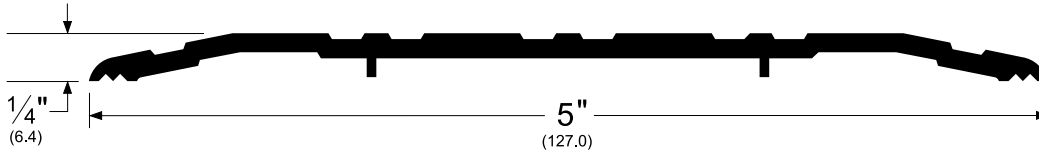


AVAILABLE FINISHES: **A**, B, D, G, SN

WIDTH: 5" (127.0 mm)

HEIGHT: 1/4" (6.4 mm)

TITLE:
PREPARED FOR:
PREPARED BY:
DATE:
COMMENTS:



A (Mill Finish Aluminum)

B (Mill Finish Extruded Bronze [Brass])

D (Dark Bronze Anodized)

G (Gold Anodized)

SN (Satin Nickel Anodized)

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BOTTOM: PEMKO 216AV



ASSA ABLOY

DOOR BOTTOMS: DOOR SHOES

216AV

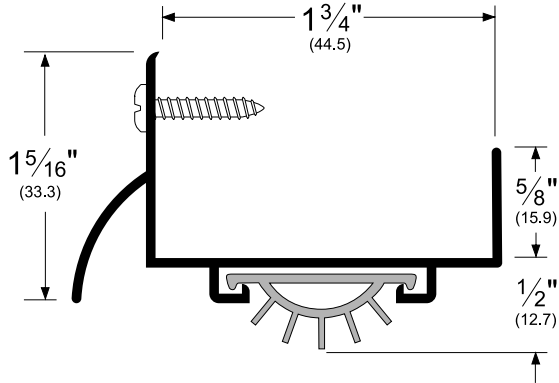


AVAILABLE FINISHES: A, B, BDG, D, G, PW, SN

WIDTH: 1-3/4" (44.5 mm)

PROFILE HEIGHT 1: 1-5/16" (33.3 mm) PROFILE HEIGHT 2: 5/8" (15.9 mm)

TOTAL HEIGHT WITH INSERT: Approx. 1-9/16" (39.7 mm)



A (Mill Finish Aluminum)

B (Mill Finish Extruded Bronze [Brass])

BDG (Bright Dip Gold Anodized Aluminum)

D (Dark Bronze Anodized Aluminum)

G (Gold Anodized Aluminum)

PW (Painted White Aluminum)

SN (Satin Nickel Anodized Aluminum)

TITLE:

PREPARED FOR:

PREPARED BY:

DATE:

COMMENTS:

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216_V_CUT Rev 1 - 05.14.08

DOOR STOP: TRIMCO 1233

ANIXTER



TRIMCO | 1233 626

Floor Stop

Height 2-7/8"

Cast Brass/Bronze,
Satin Chrome Plated

MFR PART # 1233 626

PART # CS113199

Specifications:

Base Material BRASS
Finish US26D SATIN CHROME
Product Type STOP
Mounting FLOOR MOUNT
Sales Category STOP
UNSPSC Code 46171500

MULLION

Accessories

Mullions

Removable steel mullions provide single door performance in double door openings with rim devices. Mullions are easily removed by loosening bottom set screw and removing top fitting cover. The top mullion fitting is attached to the frame and is concealed by the fitting cover.

- Steel mullions are 2" (51mm) wide and 3" (76mm) deep, with a wall thickness of $\frac{1}{8}$ " (3mm)
- Mullions are shipped with mounting screws and prepared for strikes (strikes are not included except where indicated)
- Steel mullions are available in SP28 and SP313 finishes (Consult factory for other powder coat finish options)

Keyed removable steel mullions (KR)

KR mullions make removal faster and easier by a single operation of the mortise cylinder. Once mullion is removed, large equipment or furniture can freely pass through the opening. The unit will self lock when re-installed, without the use of the cylinder key. Uses a $1\frac{1}{4}$ " mortise cylinder with a straight cam (Schlage cam reference L583-477). Cylinders are sold separately. Prefix mullion model with "KR".

Removable aluminum mullions are $1\frac{1}{16}$ " (27mm) wide on face closest to the door and $2\frac{3}{8}$ " (60mm) at the widest point. The depth is $3\frac{1}{8}$ " (79mm) with a wall thickness of $\frac{1}{8}$ " (3mm).

Aluminum mullions are available in 606, 612, 628, 710 and 622/711 finishes. Consult factory for other powder coat finish options. Aluminum mullions are not available keyed removable.

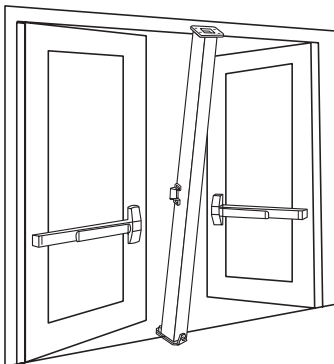
Stock hollow metal applications for devices mounted to cover ANSI 161 cutouts are higher than the standard mullion strike location. Consult the factory for special strike preparation or order a blank mullion. See below.

Blank mullions

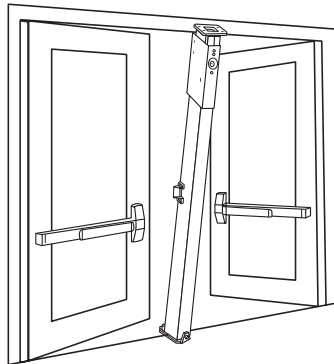
are furnished without strike preparation. They are used to mount devices at a strike height different from the standard mullion preparation.

To order, specify:

1. For keyed removable option on steel mullions, prefix model number with "KR"
2. Model number
3. Height of opening
4. Finish
5. Handing if required
6. Centerline deviation (refer to device template for standard centerline)
7. Strikes, when required, should be ordered with device



Removable mullions



Keyed removable steel mullions

LOCKSET: VON DUPRIN AX99NL-SP28

Accessibility options

Accessible device (AX)

The AX device is a UL certified exit device designed to meet the progressive requirements of the California Building Code for accessible openings. This device meets the 5 lbs of operating force requirement called for in chapter 11B-309.4. The AX device also exceeds ANSI/BHMA requirements. Available devices include: AX98/99, AX98/99-F, AX98/9927LBR, AX98/9927-F LBR, AX98/9949LBL, AX98/9949-FLBL, AX98/9949-F LBLAFL, AX98/9950LBL, AX98/9950-FLBL. Additionally, all AX devices will be shipped with a new UL label clearly stating "Meets California building Code (2013) Sec. 11B-309.4" and an "AX" identifier label on device center case. See images below for reference.



Latches

Less bottom rod, panic and fire rated (LBR)

LBR option is available, using a spring loaded auxiliary latch bolt installed in the lower door edge. When exposed to heat the auxiliary latch bolt releases, keeping the doors in alignment and closed during a fire. UL listed 3 hours on hollow metal doors double egress, 90 minute swinging same direction, and 20 minutes wood doors (consult wood door manufacturer). Fits door stiles as narrow as 3⁵/₈".

LBR devices must be ordered in pairs or must be used in conjunction with an approved automatic or constant latching flush bolt.

Pullman latch (PL)

When PL is specified the standard latches are replaced with pullman style latches. Pullman latches are always extended and are most commonly used in conjunction with electric strikes and LBR-less bottom rod application. Not available with Fire rated devices.

Not recommended where security is of the utmost importance since latches do not deadlock.

Nomenclature – how to order

Prefix	Device series/type		Trim/rating		Suffix/finish		Door width	Handing	Less bottom rod/cable	Trim options/finish	Lever style	Accessories	Other information
1	2	3	4	5	6	7	8	9	10	11	12	13	14
QEL	- 98	- 27	- L	- F	-	- 626	- 3'	- RHR	- LBR	- 996/626	- 299F/06	- SNB	- HM

Detail

1 Prefixes

None	Standard
AX	Accessible device
CD	Cylinder dogging - panic only
CDSI	Cylinder dogging with security indicator
CI	Cylinder dogging indicator
CD-CX	Chexit cylinder dogging
CX	Chexit
DI	Dogging indicator
E	Electric locking mortise/lever
EL	Electric latch retraction
HDSI	Hex dogging with security indicator
HH	Hurrican device
LD	Less dogging
LX	Latch bolt monitoring
LX-LC	Latch bolt monitoring, low current
LX-RX	Latch bolt monitoring, request to exit
LX-RX-LC	Latch bolt monitoring, request to exit low current
PL	Pullman latch
PN	Pneumatic latch retraction
QEL	Quiet electric latch retraction
QM	Quiet mechanical
RX	Request to exit
RX2	Double request to exit
RX-AUX	Request to exit, auxiliary
RX-LC	Request to exit, low current
SD	Special dogging -panic only
SS	Signal switch
WP-RX	Waterproof request to exit
WS	Windstorm (FEMA rated) surface vertical rod device
XP	Heavy protection - rim

2 Device series

98	Series 98-smooth
99	Series 99-grooved

3 Device type

None	Rim device
27	Surface mounted vertical rod device
47	Concealed vertical rod device
47WDC	Concealed vertical rod wood door device
48	Concealed vertical rod device
49	Concealed vertical cable device
50WDC	Concealed vertical cable wood door device
52	Rim device with remote trim input (pool exit hardware)
57	Three-point latch device
75	Mortise lock device

4 Trim functions

EO	For AD or CO locks, order the panic as Exit Only (EO)
DT	Dummy trim
EO	Exit only
HL	Hospital pull trim
K	Knob
K-BE	Knob - blank escutcheon
K-DT	Knob, rigid - dummy trim
K-NL	Knob, rigid - night latch
L	Lever (classroom)
L-BE	Lever - blank escutcheon
L-DT	Lever, rigid - dummy trim
L-NL	Lever, rigid - night latch
NL	Night latch
NL-OP	Night latch cylinder assembly, optional pull
TL	Turn lever
TL-BE	Turn lever - blank escutcheon
TP	Thumbpiece
TP-BE	Thumbpiece - blank escutcheon

5 Rating

F	Fire exit hardware
Blank	Panic exit hardware

6 Suffix

-2	Double cylinder (rim and mortise only)
-2SI	Double cylinder with security indicator (rim only)
CON	Connectors
WH	Weep holes

7 Finish

605	Bright Brass
606	Satin Brass
612	Satin Bronze
619	Satin Nickel
622/711	Matte Black/Matte Black, Anodized
625	Bright Chrome
626	Satin Chrome
626AM	Satin Chrome, Antimicrobial
628	Aluminum, Anodized
630	Satin Stainless
630AM	Satin Stainless, Antimicrobial
643e	Aged Bronze
693	Black Paint
710	Dark Brown, Anodized

8 Door width

3'	Standard default	1 3/4"	Standard
4'		2 1/4"	Optional
2'	Vertical only		

Door thickness

9 Handing

LHR	Left hand reverse
RHR	Right hand reverse

10 Less bottom rod/cable

LBR	Less bottom rod
LBL	Less bottom latch
LBR-AFL	LBR with fire pin
LBL-AFL	LBL with fire pin

11 Trim options/finish

See trim options/finish for each device type

12 Lever style

06	Standard default (optional levers available)
-----------	--

13 Accessories

CYL	Cylinder
GBK	Glass bead kit
SEC	Security screws
SLM	SLM blocking
SNB	Sex bolts

14 Other information

Touchbar options	
BRILLE	Vision impaired touchpad, raised letter, and braille
PUSH	Touchbar trim embossed 'PUSH'
RSS	Red silk-screened lettered touchbar trim
KN	Knurled touchbar
SG	Safety glow

Miscellaneous

CE	CE labeled
LCP	Less cover plate
IOWDA	#IOWDA cover plate
RAT REL	Ratchet release assy

Door material

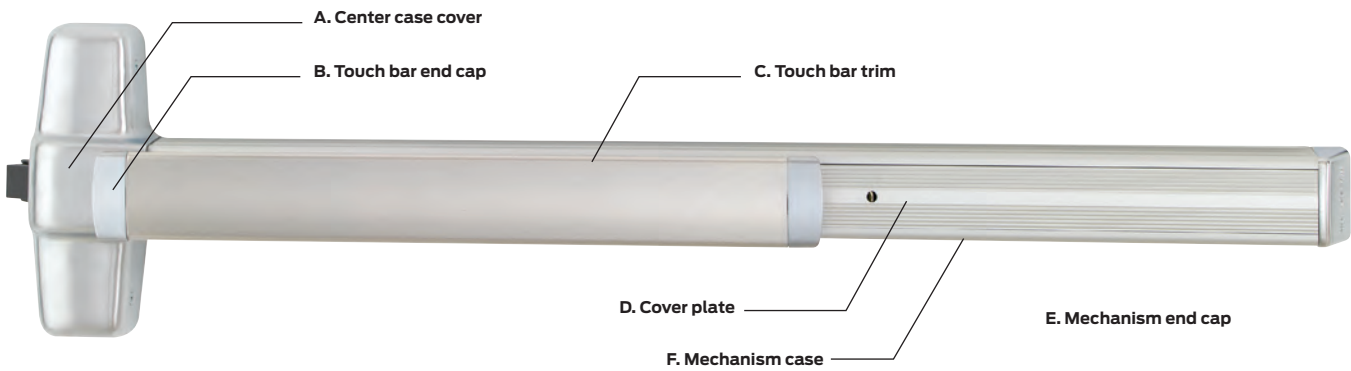
AL	Aluminum door
HM	Hollow metal
WD	Wood door
CP	Composite door
INS2	Insulclad - 1/2"
INS4	Insulclad - 1/4"
SC	Steelcraft, HH device only

Door application

D	Double egress
P	Pair of doors
S	Single door

Note: Not all options are listed. See the specific device type pages for complete options available.

Device finish options



Finishes

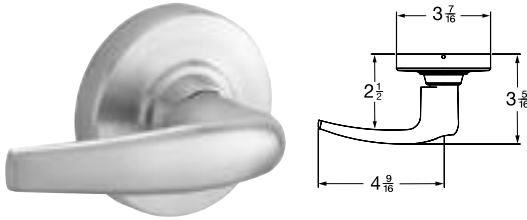
Color	BHMA number	A, B, E	C	D and F
Bright brass	605	Bright brass	Bright brass, 605	Buffed anodized
Satin brass	606	Satin brass	Satin brass, 606	Anodized
Satin bronze	612	Plated	Satin bronze, 612	Anodized
Satin bronze, oil-rubbed	613	Oil rubbed bronze	Oil rubbed bronze, 613	Powder coat
Bright chrome	625	Plated	Bright stainless steel, 629	Buffed anodized
Satin chrome	626	Plated	Satin stainless steel, 630	Anodized
Satin stainless steel*	630	Stainless steel	Satin stainless steel, 630	Anodized
Aluminum, anodized	628	Powder coat	Satin stainless steel, 630	Anodized
Duranodic dark bronze	710	Powder coat	Powder coat	Powder coat
Black	622	Powder coat	Powder coat	Powder coat
Aged bronze	643e	Relieved aged bronze	Relieved aged bronze	Aged bronze, no relief

LOCKSET: SCHLAGE ND85PD

Designs and finishes

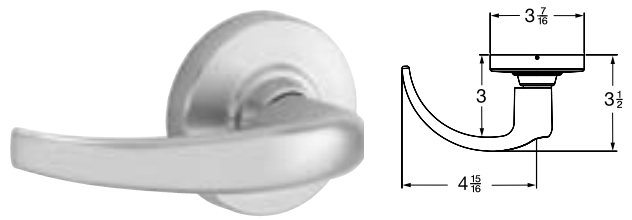
Lever designs and finishes

Athens (ATH)²



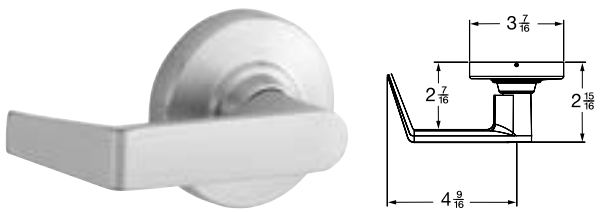
Mechanical | Wired electrified | Wireless electronic

Sparta (SPA)^{1,2}



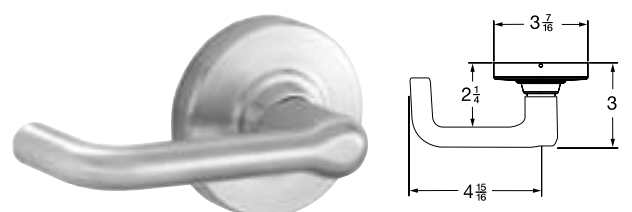
Mechanical | Wired electrified | Wireless electronic

Rhodes (RHO)^{1,2}



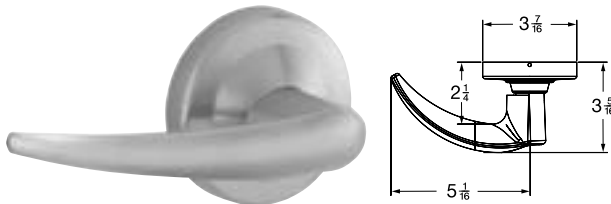
Mechanical | Wired electrified | NDE wireless electronic

Tubular (TLR)^{1,2}



Mechanical | Wired electrified

Omega (OME)¹



Mechanical | Wired electrified

All levers comply with the Americans with Disabilities Act (ADA).

- 1 Rhodes, Sparta, Tubular and Omega levers comply with California State code for return within 1/2" of door face.
- 2 All levers except Omega can support cylinders from other manufacturers, see cylinder section page 24 for details.

Finish options



Color	Bright brass	Satin brass	Satin bronze	Oil rubbed bronze	Satin nickel	Matte black	Bright chrome	Satin chrome	Aged bronze
ANSI/BHMA number	605	606	612	613	619	622	625	626/626AM	643e
US number	US3	US4	US10	US10B	US15	US19	US26	US26D	US11
Mechanical	■	■	■	■	■	■	■	■	■
Wired electrified	■	■	■	■	■	■	■	■	■
Wireless electronic	■	■	■	—	■	■	■	■	■

Product information and specifications contained in this catalog are subject to change without notice. Please consult the factory.

ND Series mechanical lock
Keyed function list

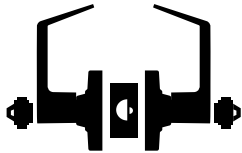
Schlage ANSI

ND82PD **F87**

Institution lock†

- Both levers always fixed.
- Entrance by key in either lever.

Outside **Inside**



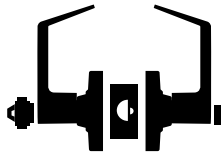
Schlage ANSI

ND85PD **-**

Faculty restroom lock

- Outside lever is fixed.
- Entrance by key only.
- Visual occupancy indicator, allowing only emergency key to operate.
- Turn inside lever or close door to unlock.
- Rotation of inside spinner-button enables lock-out feature.
- Inside lever always free for immediate egress.
- Not available with interchangeable core cylinders.

Outside **Inside**



Electrified locks can be found in the electrified section of the catalog (page 19).

Ordering instructions

Example

	Function + cylinder	Outside		Inside		Door				
		Lever	Finish	Lever	Finish	Latch	Strike	Thickness	Extension	Dimension
Mechanical	ND85PD	RHO	626	RHO	626					
Wired electrified	ND80EUL	RHO	605	SPA	619	14-048	10-013	214	EE	118
Wireless electronic	NDE80BD	SPA	619							

Detail

Function	Mechanical: See pages 12-17 Wired electrified: See pages 18-19 Wireless electronic: NDE80; see pages 20-21		
Cylinder	Standard: P (Patented Everest 29) L (less cylinder) C (less double cylinder) Z (Everest SL)	Full size Interchangeable (FSIC): R (FSIC, Patented Everest29) J (FSIC, less core) T (FSIC, Construction Core)	Small format Interchangeable: GD (SFIC, Patented Everest 29) BD (SFIC, less core) BDC (SFIC, disposable core) HD (SFIC, construction core)
	For non-Schlage cylinders please see page 24		
Outside lever	Mechanical: ATH (Athens), RHO (Rhodes) , SPA (Sparta), TLR (Tubular), OME (Omega) Wired electrified: ATH (Athens), RHO (Rhodes), SPA (Sparta), TLR (Tubular), OME (Omega) Wireless electronic: ATH (Athens), RHO (Rhodes), SPA (Sparta)		
	Note: Specify tactile as: 8AT (Athens), 8RO (Rhodes), 8SP (Sparta), 8TR (Tubular)		
Outside finish	605 Bright brass (US3) 606 Satin brass (US4) 612 Satin bronze (US10) 613 Oil rubbed bronze (US10B) ¹ 619 Satin nickel (US15) 622 Matte black (US19) 626 Satin chrome (US26D) 626AM Satin chrome anti-microbial 625 Bright chrome (US26) 643e Aged bronze (US11)		
	¹ Not available NDE wireless electronic		
Inside lever	Specify only if different from outside lever. Same options as outside lever.		
Inside finish	Specify only if different from outside finish. Same options as outside finish.		
Latch	Specify only if different from standard latch; see page 24 for options.		
Strike	Specify only if different from standard strike; see page 24 for options.		
Door thickness	Specify only if outside standard door range (1 5/8"-2 1/8"). Extended door thickness not available NDE wireless electronic.		
Extension	Specify only for doors 2 1/8" or greater. Example: EE = Extended Equally, EI = Extended Inside, EO = Extended Outside, ED = Extended Differently		
Dimension	Specify only for non-standard strike lip length.		
Options	Specify any additional requirements or options. Example: KA = Keyed Alike, KD = Keyed Different, Obit, etc.		



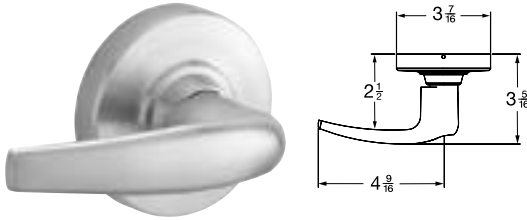
787 Spreckels Avenue
Manteca CA, 95336
P 209.825.1921

LOCKSET: SCHLAGE ND80PD

Designs and finishes

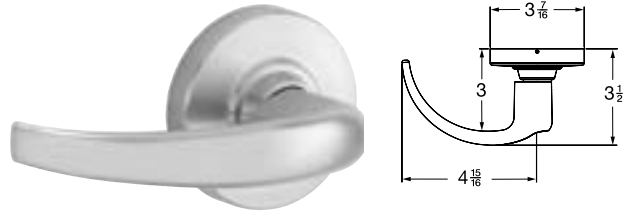
Lever designs and finishes

Athens (ATH)²



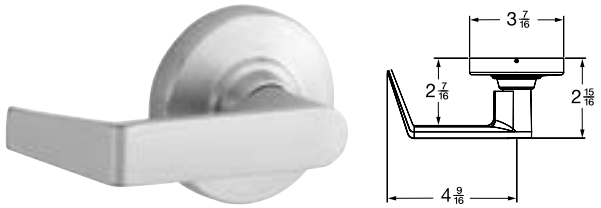
Mechanical | Wired electrified | Wireless electronic

Sparta (SPA)^{1,2}



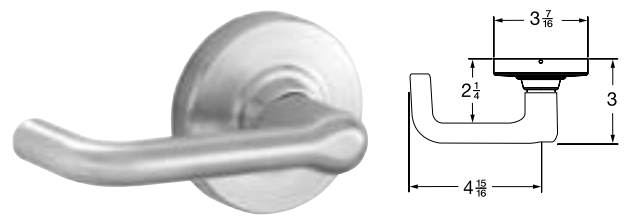
Mechanical | Wired electrified | Wireless electronic

Rhodes (RHO)^{1,2}



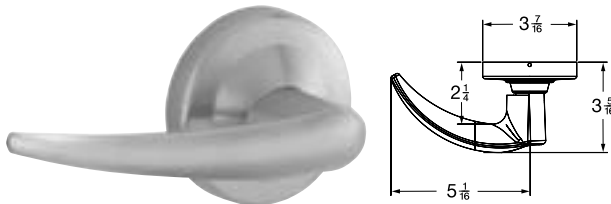
Mechanical | Wired electrified | NDE wireless electronic

Tubular (TLR)^{1,2}



Mechanical | Wired electrified

Omega (OME)¹



Mechanical | Wired electrified

All levers comply with the Americans with Disabilities Act (ADA).

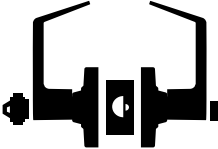
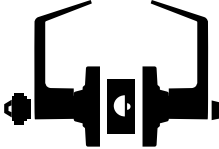
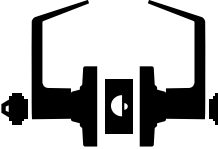
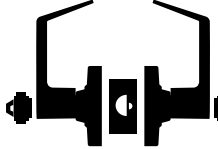
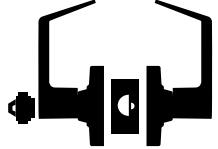
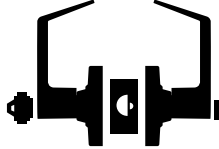
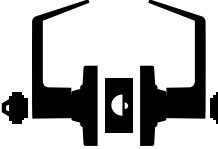
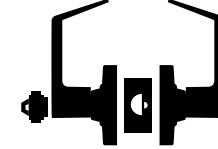
- 1 Rhodes, Sparta, Tubular and Omega levers comply with California State code for return within 1/2" of door face.
- 2 All levers except Omega can support cylinders from other manufacturers, see cylinder section page 24 for details.

Finish options

Color	Bright brass	Satin brass	Satin bronze	Oil rubbed bronze	Satin nickel	Matte black	Bright chrome	Satin chrome	Aged bronze
ANSI/BHMA number	605	606	612	613	619	622	625	626/626AM	643e
US number	US3	US4	US10	US10B	US15	US19	US26	US26D	US11
Mechanical	■	■	■	■	■	■	■	■	■
Wired electrified	■	■	■	■	■	■	■	■	■
Wireless electronic	■	■	■	—	■	■	■	■	■

Product information and specifications contained in this catalog are subject to change without notice. Please consult the factory.

ND Series mechanical lock
Keyed function list

<p>Schlage ANSI</p> <p>ND50PD F82</p> <p>Entrance/office lock</p> <ul style="list-style-type: none"> • Push-button locking. • Push-button locks outside lever until it is unlocked with key or by turning inside lever. • Inside lever always free for immediate egress. <p>Outside Inside</p> 	<p>Schlage ANSI</p> <p>ND53PD F109</p> <p>Entrance lock</p> <ul style="list-style-type: none"> • Turn/push-button locking: Pushing and turning the button locks the outside lever, requiring use of a key until the button is manually unlocked. • Push-button locking: Pushing button locks outside lever until unlocked by key or by turning the inside lever. • Inside lever always free for immediate egress. <p>Outside Inside</p> 	<p>Schlage ANSI</p> <p>ND60PD F88</p> <p>Vestibule lock</p> <ul style="list-style-type: none"> • Latch retracted by key from outside when outside lever is locked by key in inside lever. • Inside lever always free for immediate egress. <p>Outside Inside</p> 	<p>Schlage ANSI</p> <p>ND66PD F91</p> <p>Store lock†</p> <ul style="list-style-type: none"> • Key in either lever locks or unlocks both levers. <p>Outside Inside</p> 
<p>Schlage ANSI</p> <p>ND70PD F84</p> <p>Classroom lock</p> <ul style="list-style-type: none"> • Outside lever locked and unlocked by key. • Inside lever always free for immediate egress. <p>Outside Inside</p> 	<p>Schlage ANSI</p> <p>ND73PD F90</p> <p>Corridor lock</p> <ul style="list-style-type: none"> • Locked or unlocked by key from outside. • Push-button locking from inside. • Turn inside lever or close door to release button. • When outside lever is locked by key it can only be unlocked by key. • Inside lever always free for immediate egress. <p>Outside Inside</p> 	<p>Schlage ANSI</p> <p>ND75PD -</p> <p>Classroom security lock</p> <ul style="list-style-type: none"> • Key in either lever locks or unlocks outside lever. • Inside lever always free for immediate egress. <p>Outside Inside</p> 	<p>Schlage ANSI</p> <p>ND80PD F86</p> <p>Storeroom lock</p> <ul style="list-style-type: none"> • Outside lever is fixed. • Entrance by key only. • Inside lever always free for immediate egress. <p>Outside Inside</p>  <p>Available with RX</p>

Ordering instructions

Example

Function + cylinder	Outside		Inside		Door				
	Lever	Finish	Lever	Finish	Latch	Strike	Thickness	Extension	Dimension
Mechanical ND80PD	RHO	626	RHO	626					
Wired electrified ND80EUL	RHO	605	SPA	619	14-048	10-013	214	EE	118
Wireless electronic NDE80BD	SPA	619							

Detail

Function	Mechanical: See pages 12-17 Wired electrified: See pages 18-19 Wireless electronic: NDE80; see pages 20-21
Cylinder	Standard: P (Patented Everest 29) L (less cylinder) C (less double cylinder) Z (Everest SL) Full size Interchangeable (FSIC): R (FSIC, Patented Everest29) J (FSIC, less core) T (FSIC, Construction Core) Small format Interchangeable: GD (SFIC, Patented Everest 29) BD (SFIC, less core) BDC (SFIC, disposable core) HD (SFIC, construction core) For non-Schlage cylinders please see page 24
Outside lever	Mechanical: ATH (Athens), RHO (Rhodes) , SPA (Sparta), TLR (Tubular), OME (Omega) Wired electrified: ATH (Athens), RHO (Rhodes), SPA (Sparta), TLR (Tubular), OME (Omega) Wireless electronic: ATH (Athens), RHO (Rhodes), SPA (Sparta) Note: Specify tactile as: 8AT (Athens), 8RO (Rhodes), 8SP (Sparta), 8TR (Tubular)
Outside finish	605 Bright brass (US3) 606 Satin brass (US4) 612 Satin bronze (US10) 613 Oil rubbed bronze (US10B) ¹ 619 Satin nickel (US15) 622 Matte black (US19) 626 Satin chrome (US26D) 626AM Satin chrome anti-microbial 625 Bright chrome (US26) 643e Aged bronze (US11) ¹ Not available NDE wireless electronic
Inside lever	Specify only if different from outside lever. Same options as outside lever.
Inside finish	Specify only if different from outside finish. Same options as outside finish.
Latch	Specify only if different from standard latch; see page 24 for options.
Strike	Specify only if different from standard strike; see page 24 for options.
Door thickness	Specify only if outside standard door range (1 5/8"-2 1/8"). Extended door thickness not available NDE wireless electronic.
Extension	Specify only for doors 2 1/8" or greater. Example: EE = Extended Equally, EI = Extended Inside, EO = Extended Outside, ED = Extended Differently
Dimension	Specify only for non-standard strike lip length.
Options	Specify any additional requirements or options. Example: KA = Keyed Alike, KD = Keyed Different, Obit, etc.

HINGE: HAGER 1279

1279

Five Knuckle
Plain Bearing
Standard Weight

Application:

- ANSI A8133
- Non-rising removable pin with button tip and plug
- With door closer use ball bearing hinge
- For use with medium frequency doors or doors requiring low frequency service



PRODUCT SPECIFICATIONS

MATERIAL:

- Steel with Steel pin

FINISHES:

- LS, H2H, USP, US3, US4, US10, US10A, US10B, US15, US26, US26D

OPTIONS:

- NRP - Non-removable pin

PRODUCT SIZE OPTIONS

HINGE SIZE (INCHES)	HINGE SIZE (MM)	GAUGE OF METAL	HOLE COUNT	SCREW SIZE (MACHINE)	SCREW SIZE (WOOD)
2 x 2	51 x 51	0.083	4	-	3/4 x 8
2 1/2 x 2 1/2	64 x 64	0.089	6	-	3/4 x 8
3 x 3	76 x 76	0.097	6	-	1 x 9
3 1/2 x 3 1/2	89 x 89	0.119	6	1/2 x 10-24	1 x 9
4 x 4	102 x 102	0.129	8	1/2 x 12-24	1 1/4 x 12
4 1/2 x 4	114 x 102	0.134	8	1/2 x 12-24	1 1/4 x 12
4 1/2 x 4 1/2	114 x 114	0.134	8	1/2 x 12-24	1 1/4 x 12
5 x 4	127 x 102	0.145	8	1/2 x 12-24	1 1/4 x 12
5 x 4 1/2	127 x 114	0.145	8	1/2 x 12-24	1 1/4 x 12
5 x 5	127 x 127	0.145	8	1/2 x 12-24	1 1/4 x 12
6 x 4 1/2	152 x 114	0.160	10	1/2 x 1/4-20	1 1/2 x 14
6 x 5	152 x 127	0.160	10	1/2 x 1/4-20	1 1/2 x 14
6 x 6	152 x 152	0.160	10	1/2 x 1/4-20	1 1/2 x 14



787 Spreckels Avenue
Manteca CA, 95336
P 209.825.1921

DOORSTOP: TRIMCO 1270CV

1270 Series

Wall Bumpers



1270CV.626
(CONCAVE SHOWN)



1270CX.626
(CONVEX SHOWN)

Trimco's **1270 Series** Wall Bumpers are an attractive, metal-encased, rubber stop for use with all styles of locksets and handles. With an anti-vandal design that casts a heavy duty washer into the rubber, this wall bumper is designed for maximum versatility and durability. They are supplied with our convenient combo fastener pack ensuring the right hardware for your application. The Prison Version (PV) adds Torx screws, an expansion shield, and an anti-rotation pin that prevents forceful unscrewing of the bumper from the wall. The School Version (SV) has exposed peripheral mounting screws.

APPLICATIONS

- Schools
- Offices
- Prisons
- Commercial & Industrial Buildings
- Hospitality

HEAVY DUTY STOPS & HOLDERS

PRODUCT FEATURES

- Anti-vandal heavy duty washer cast into rubber
- Our most versatile wall bumper
- Prison and school versions for highly abusive applications

SPECIFICATIONS

STANDARDS

BHMA L02101/L02251

MATERIAL OPTIONS

BR – Brass
BZ – Bronze
SS – Stainless Steel

FASTENERS

Combo Pack supplied includes Wood Screw with Rawl Plug & Plastic Toggler, Machine Screw and Metal Toggle Bolt, Machine Screw & Anchor.

WARRANTY

Lifetime Warranty

NOTES

Patent #6,295,697

FUNCTIONS

- 1270CV** Cast concave wall bumper
1270WV Wrought concave wall bumper
1270CX Cast convex wall bumper
1270WX Wrought convex wall bumper
1270CVPV Cast concave prison wall bumper (torx screw, expansion shield & anti-rotation pin)
1270CVSV Cast concave school wall bumper (surface mounted)
1270CXPV Cast convex prison wall bumper (torx screw, expansion shield & anti-rotation pin)
1270CXSV Cast convex school wall bumper (surface mounted)

FINISHES

605	Polished Brass
606	Satin Brass
613	Oil Rubbed Bronze
625	Polished Chrome
626	Satin Chrome
629	Polished Stainless Steel (wrought only)
630	Satin Stainless Steel (wrought only)

1270 Series

Wall Bumpers

HOW TO SPECIFY & ORDER

CHOOSE THE FOLLOWING

SERIES	FINISHES
<ul style="list-style-type: none"> • 1270CV Cast concave wall bumper • 1270WV Wrought concave wall bumper • 1270CX Cast convex wall bumper • 1270WX Wrought convex wall bumper • 1270CVPV Cast concave prison wall bumper (torx screw, expansion shield & anti-rotation pin) • 1270CVSV Cast concave school wall bumper (surface mounted) • 1270CXPV Cast convex prison wall bumper (torx screw, expansion shield & anti-rotation pin) • 1270CXSV Cast convex school wall bumper (surface mounted) 	<ul style="list-style-type: none"> • 605 Polished Brass (cast only) • 625 Polished Chrome (cast only) • 629 Polished Stainless Steel (wrought only) • 630 Satin Stainless Steel (wrought only) <p>See finish list for all options.</p>

EXAMPLE

For a satin chrome cast concave prison wall bumper, specify or order: **1270CVPV.626**

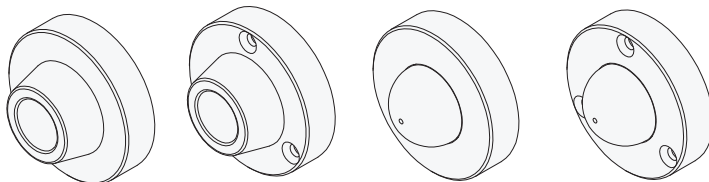
FRONT VIEW

1270CV
1270WV

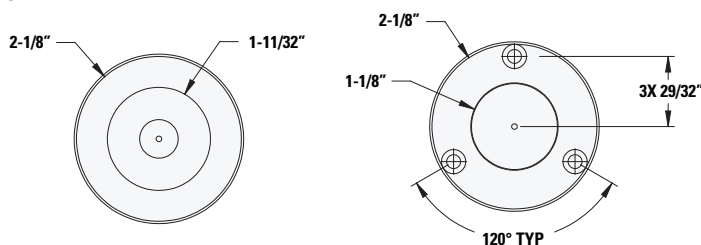
1270CVSV

1270CX
1270WX
1270CXPV

1270CXSV



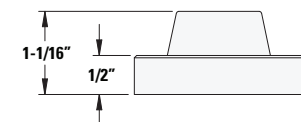
BOTTOM VIEW



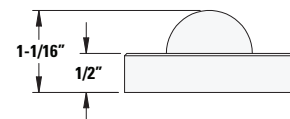
HOLE PATTERN ON 1270CVSV AND 1270CXSV ONLY

SIDE VIEW

1270CV
1270WV
1270CVSV



1270CX
1270WX
1270CXPV
1270CXSV



* Dimensions are informational only. Templates are available at www.trimcobbw.com

LOCKSET: COPPER CREEK CRAL6241SS



Bulldog Commercial Hardware 6200 Series ANSI/BHMA Grade-2 Heavy Duty Commercial Lever Specifications



AL6200 Series
Avery Style



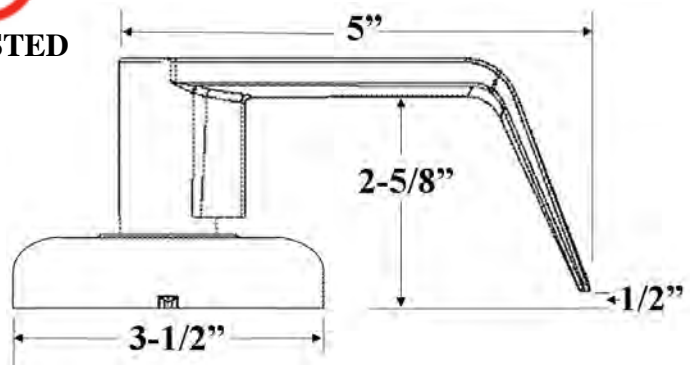
Meets ADA
Regulations



EL6200 Series
Erin Style



UL LISTED



Stocking Finish	Special Order Finishes	Case Qty	Case Wt	Case Size
SS	10B AB PB PS	Units	LBS	LxWxH
x	x x x x	6	12	15x9x12

Lever Specifications & Options		Function	Operation
ANSI / BHMA	ANSI 156.2 Grade-2.	6220 - Passage	Both levers always free turning. No locking operation.
Rose Diameter	3-3/8".	6231-Restroom	Inside push-button locks both levers. Lever can be opened from outside by turning outside privacy mechanism. (emergency egress & kickoff equipped)
Cylinder	6 pin C std.- 6 pin KW1 optional.	6241-Entry	Key or inside push button locks both levers. Turning inside lever or key unlocks both levers.
Keying	As specified: Available Master keyed, Builder keyed, KD, KA.	6250-Storeroom	Inside lever is free turning. Outside lever is always locked and can only be unlocked with key inserted and turned.
Thru-Bolt (auxiliary)	2 standard, removable.	6260-Classroom	Outside lever locked or unlocked with key. Inside is always free.
Latch	2-3/4" backset, 1" square corner narrow faceplate std. 2-3/8" optional. 1-1/8" black filler plate included to adapt to 1-1/8 hollow metal latch face cutout.	6290-Dummy	1/2 Dummy. Pull handle only. No locking or operation functions.
Strike	PT-LS12: 2-3/4" T-Strike std. PT-LS22: 4-7/8" ASA opt.		
Door Prep	1" edge bore, 1" or 1-1/8" x 2-1/4" latch mortise, 2-1/8" cross bore, 2-3/4" backset standard, 2-3/8" optional.		
Clutch	Standard.		
Door Thickness	Min. 1-3/8", Max 1-3/4".		
Handing	All, 6200 levers are non-handed.		
U.L.	3 hour, U.L. Labeled Fire Rated.		
Warranty	Lifetime mechanical, 2 year finish.		

LOCKSET: COPPER CREEK CRAL6250SS



Bulldog Commercial Hardware 6200 Series ANSI/BHMA Grade-2 Heavy Duty Commercial Lever Specifications



AL6200 Series
Avery Style



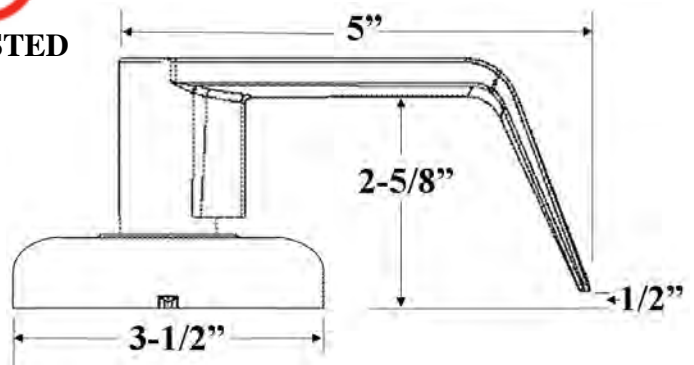
Meets ADA
Regulations



EL6200 Series
Erin Style



UL LISTED



Stocking Finish	Special Order Finishes	Case Qty	Case Wt	Case Size
SS	10B AB PB PS	Units	LBS	LxWxH
x	x x x x	6	12	15x9x12

Lever Specifications & Options		Function	Operation
ANSI / BHMA	ANSI 156.2 Grade-2.	6220 - Passage	Both levers always free turning. No locking operation.
Rose Diameter	3-3/8".	6231-Restroom	Inside push-button locks both levers. Lever can be opened from outside by turning outside privacy mechanism. (emergency egress & kickoff equipped)
Cylinder	6 pin C std.- 6 pin KW1 optional.	6241-Entry	Key or inside push button locks both levers. Turning inside lever or key unlocks both levers.
Keying	As specified: Available Master keyed, Builder keyed, KD, KA.	6250-Storeroom	Inside lever is free turning. Outside lever is always locked and can only be unlocked with key inserted and turned.
Thru-Bolt (auxiliary)	2 standard, removable.	6260-Classroom	Outside lever locked or unlocked with key. Inside is always free.
Latch	2-3/4" backset, 1" square corner narrow faceplate std. 2-3/8" optional. 1-1/8" black filler plate included to adapt to 1-1/8 hollow metal latch face cutout.	6290-Dummy	1/2 Dummy. Pull handle only. No locking or operation functions.
Strike	PT-LS12: 2-3/4" T-Strike std. PT-LS22: 4-7/8" ASA opt.		
Door Prep	1" edge bore, 1" or 1-1/8" x 2-1/4" latch mortise, 2-1/8" cross bore, 2-3/4" backset standard, 2-3/8" optional.		
Clutch	Standard.		
Door Thickness	Min. 1-3/8", Max 1-3/4".		
Handing	All, 6200 levers are non-handed.		
U.L.	3 hour, U.L. Labeled Fire Rated.		
Warranty	Lifetime mechanical, 2 year finish.		

LOCKSET: COPPER CREEK CRAL6231SS



Bulldog Commercial Hardware 6200 Series ANSI/BHMA Grade-2 Heavy Duty Commercial Lever Specifications



*AL6200 Series
Avery Style*



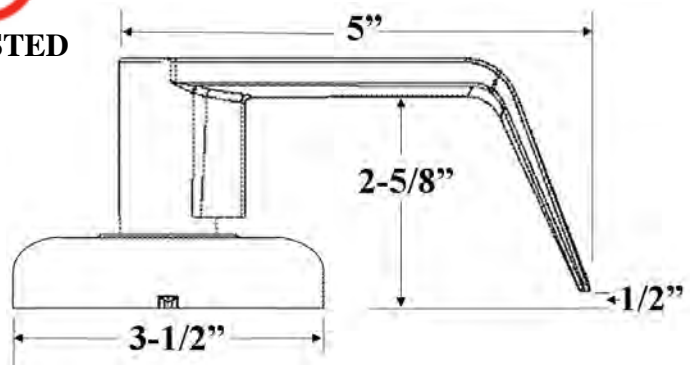
Meets ADA
Regulations



*EL6200 Series
Erin Style*



UL LISTED



Stocking Finish	Special Order Finishes	Case Qty	Case Wt	Case Size
SS	10B AB PB PS	Units	LBS	LxWxH
x	x x x x	6	12	15x9x12

Lever Specifications & Options		Function	Operation
ANSI / BHMA	ANSI 156.2 Grade-2.	6220 - Passage	Both levers always free turning. No locking operation.
Rose Diameter	3-3/8".	6231-Restroom	Inside push-button locks both levers. Lever can be opened from outside by turning outside privacy mechanism. (emergency egress & kickoff equipped)
Cylinder	6 pin C std.- 6 pin KW1 optional.	6241-Entry	Key or inside push button locks both levers. Turning inside lever or key unlocks both levers.
Keying	As specified: Available Master keyed, Builder keyed, KD, KA.	6250-Storeroom	Inside lever is free turning. Outside lever is always locked and can only be unlocked with key inserted and turned.
Thru-Bolt (auxiliary)	2 standard, removable.	6260-Classroom	Outside lever locked or unlocked with key. Inside is always free.
Latch	2-3/4" backset, 1" square corner narrow faceplate std. 2-3/8" optional. 1-1/8" black filler plate included to adapt to 1-1/8 hollow metal latch face cutout.	6290-Dummy	1/2 Dummy. Pull handle only. No locking or operation functions.
Strike	PT-LS12: 2-3/4" T-Strike std. PT-LS22: 4-7/8" ASA opt.		
Door Prep	1" edge bore, 1" or 1-1/8" x 2-1/4" latch mortise, 2-1/8" cross bore, 2-3/4" backset standard, 2-3/8" optional.		
Clutch	Standard.		
Door Thick-ness	Min. 1-3/8", Max 1-3/4".		
Handing	All, 6200 levers are non-handed.		
U.L.	3 hour, U.L. Labeled Fire Rated.		
Warranty	Lifetime mechanical, 2 year finish.		

LOCKSET: COPPER CREEK CRAL6260SS



Bulldog Commercial Hardware 6200 Series ANSI/BHMA Grade-2 Heavy Duty Commercial Lever Specifications



*AL6200 Series
Avery Style*



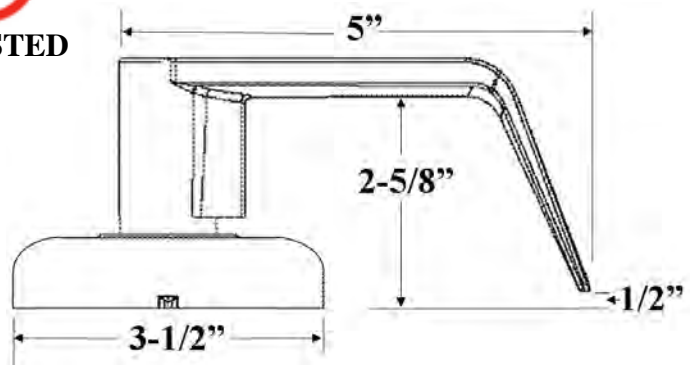
Meets ADA
Regulations



*EL6200 Series
Erin Style*



UL LISTED



Stocking Finish	Special Order Finishes	Case Qty	Case Wt	Case Size
SS	10B AB PB PS	Units	LBS	LxWxH
x	x x x x	6	12	15x9x12

Lever Specifications & Options		Function	Operation
ANSI / BHMA	ANSI 156.2 Grade-2.	6220 - Passage	Both levers always free turning. No locking operation.
Rose Diameter	3-3/8".	6231-Restroom	Inside push-button locks both levers. Lever can be opened from outside by turning outside privacy mechanism. (emergency egress & kickoff equipped)
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Strike	PT-LS12: 2-3/4" T-Strike std. PT-LS22: 4-7/8" ASA opt.		
Door Prep	1" edge bore, 1" or 1-1/8" x 2-1/4" latch mortise, 2-1/8" cross bore, 2-3/4" backset standard, 2-3/8" optional.		
Clutch	Standard.		
Door Thickness	Min. 1-3/8", Max 1-3/4".		
Handing	All, 6200 levers are non-handed.		
U.L.	3 hour, U.L. Labeled Fire Rated.		
Warranty	Lifetime mechanical, 2 year finish.		

PRODUCT SPECIFICATIONS

Elkay Outdoor Fountain Bi-Level Pedestal Non-Filtered, Non-Refrigerated. Features shall include 316 Stainless, Heavy Duty Vandal Resistant, Laminar Flow. Furnished with Vandal Resistant bubbler. Mechanical Front Bubbler Button activation. Product shall be Floor Mount/Freestanding, for Outdoor applications, serving 2 station(s). Unit shall be lead-free design which is certified to NSF/ANSI 61 & 372 (lead free) and meets Federal and State low-lead requirements.

Special Features:	316 Stainless, Heavy Duty Vandal Resistant, Laminar Flow
Finish:	Beige (BGE), Black (BK), Blue (BLU), Brown (BRN), Evergreen (EVG), Gray (GRY), Orange (ORN), Powder Coat (12 Color Options), Purple (PUR), Red (RED), Terracotta (TER), White (WHT), Yellow (YLW)
Power:	No Electrical Required
Bubbler Style:	Vandal Resistant
Activation by:	Mechanical Front Bubbler Button
Mounting Type:	Floor Mount/Freestanding
Chilling Capacity:	Non-refrigerated
Dimensions (L x W x H):	14" x 31" x 40-5/16"
Approx. Shipping Weight:	107 lbs.
Installation Location:	Outdoor
No. of Stations Served:	2
**When used in non-temperature controlled environments, unit(s) must be adequately winterized and/or protected from extreme heat to prevent damage where climates dictate.	

- Mechanically-Activated bubbler continues to supply water in event of service disruptions.
- Laminar flow provides clean fill with minimal splash.
- Base material constructed from marine-grade 316 stainless steel provides the ultimate corrosion protection from even the most corrosive elements.



Included with Product: Outdoor Fountain
Ships in one box.

AMERICAN PRIDE. A LIFETIME TRADITION. Like your family, the Elkay family has values and traditions that endure. For almost a century, Elkay has been a family-owned and operated company, providing thousands of jobs that support our families and communities.



PRODUCT COMPLIANCE

- ADA & ICC A117.1
- ASME A112.19.3/CSA B45.4
- Buy American Act
- NSF/ANSI 61 & 372 (lead free)



Complies with ADA & ICC A117.1 accessibility requirements when installed according to the requirements outlined in these standards. Installation may require additional components and/or construction features to be fully compliant. Consult the local Authority Having Jurisdiction if necessary.



[Installation Instructions \(PDF\) - 100003683](#)

Warranty pertains to drinking water applications only. Non-drinking water applications are not covered under warranty.

[Warranty \(PDF\)](#)

PART: _____ QTY: _____
 PROJECT: _____
 CONTACT: _____
 DATE: _____
 NOTES: _____
 APPROVAL: _____

In keeping with our policy of continuing product improvement, Elkay reserves the right to change product specifications without notice. Please visit elkay.com for the most current version of Elkay product specification sheets. This specification describes an Elkay product with design, quality, and functional benefits to the user. When making a comparison of other producers' offerings, be certain these features are not overlooked.

Optional Accessories		
LK4471LHB	Locking Hose Bib Spec Sheet (PDF)	
97890C	Accessory - Direct Bury Adaptor Spec Sheet (PDF)	

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**MOUNTING INSTRUCTIONS and
PLUMBING CONNECTIONS**

Provide solid, well-drained surface to mount pedestal fountain (concrete pad recommended) with adequate support (300lb. load minimum). (6) 3/8 minimum fasteners (not included) should be attached firmly to mounting surfaces in order to secure unit. (Refer to rough-in diagram)

Locate and install plumbing through ground as required.

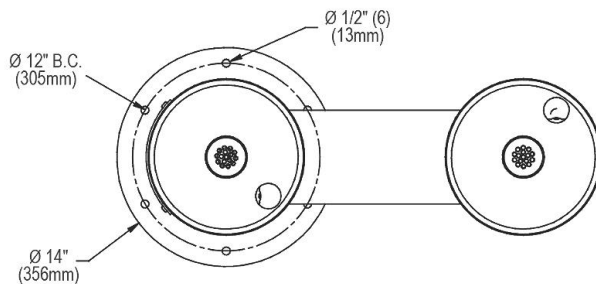
NOTE: Unit is not furnished with service valve.

Position pedestal over plumbing and secure base to fasteners. Remove access panels and connect supply and water lines. Turn on water supply and check for leaks. Reassemble access panels to pedestal.

Trap and service not included.

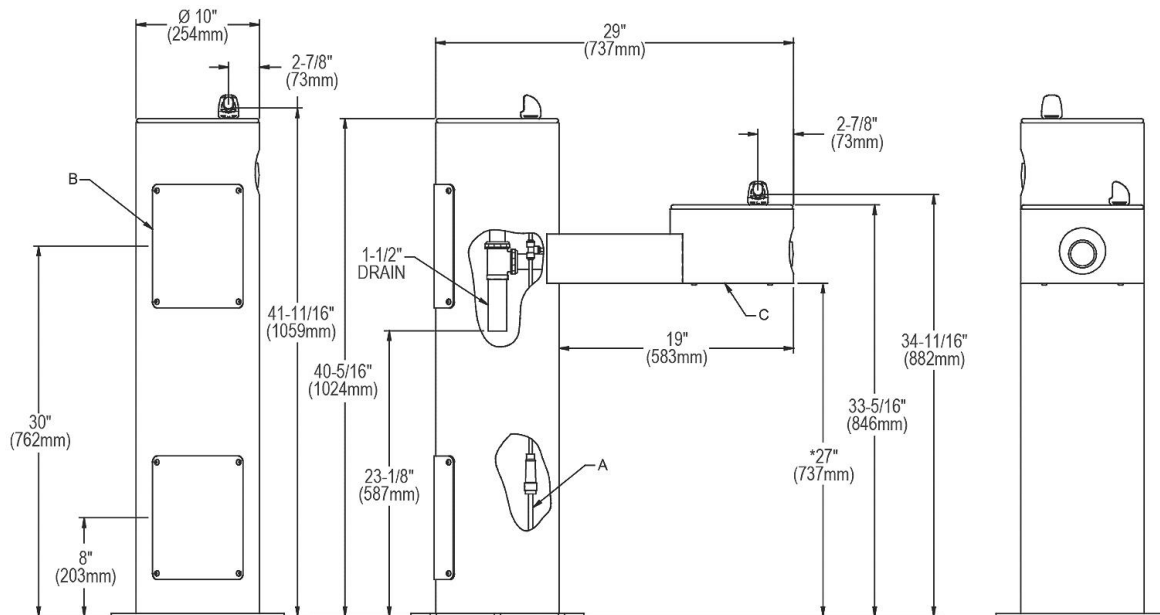
OPERATING PRESSURES:
Supply water 20 – 105 psi maximum

TOP VIEW



BACK VIEW

SIDE & FRONT VIEWS



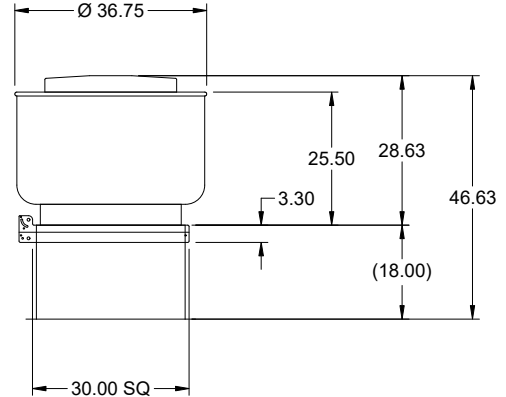
* ADA Requirement

- A = 3/8" O.D. Unplated copper tube connect shut off valve by others
- B = Access Panel (8" X 10")
- C = Removable bottom cover

In keeping with our policy of continuing product improvement, Elkay reserves the right to change product specifications without notice. Please visit elkay.com for the most current version of Elkay product specification sheets. This specification describes an Elkay product with design, quality, and functional benefits to the user. When making a comparison of other producers' offerings, be certain these features are not overlooked.

Model: CUBE-180-15

Belt Drive Upblast Centrifugal Roof Exhaust Fan



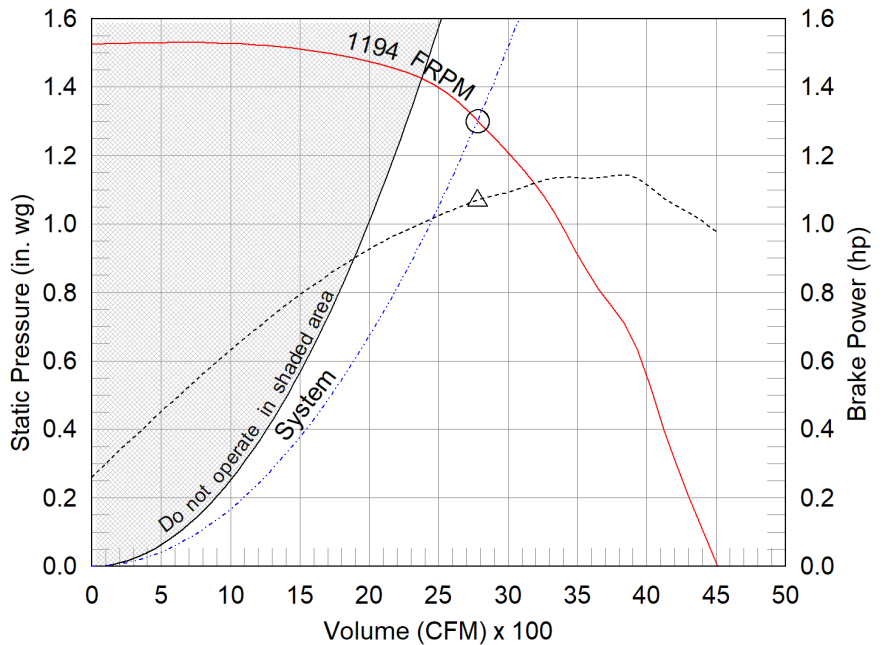
Dimensional	
Quantity	1
Weight w/o Acc's (lb)	112
Weight w/ Acc's (lb)	134
Weight w/ Acc's and Curb (lb)	184
Max T Motor Frame Size	184
Standard Curb Cap Size (in.)	30 x 30
Roof Opening (in.)	20.5 x 20.5

Performance	
Requested Volume (CFM)	2,780
Actual Volume (CFM)	2,780
Total External SP (in. wg)	1.3
Fan RPM	1194
Operating Power (hp)	1.07
Elevation (ft)	33
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.075
Drive Loss (%)	6.0
Tip Speed (ft/min)	5,782
Static Eff. (%)	57

Misc Fan Data	
Fan Eff. Index (FEI)	1.33
Outlet Velocity (ft/min)	952
FEI based on default motor calculation showing lowest efficiency option, for motor specific calculations please contact factory.	

Motor	
Motor Mounted	Yes
Size (hp)	1 1/2
Voltage/Cycle/Phase	208/60/3
Enclosure	ODP
Motor RPM	1725
Efficiency Rating	Standard
Windings	1
NEC FLA* (Amps)	6.6
Min. Circuit Ampacity (MCA)	8.25
Max. Overcurrent Protection (MOP)	15
Short Circuit Current Rtg (SCCR)	5 kA

OVERALL HEIGHT MAY BE GREATER DEPENDING ON MOTOR, ADAPTER, AND/OR HINGE BASE.



- △ Operating Bhp point
- Operating point at Total External SP
- Fan curve
- - - System curve
- - - Brake horsepower curve

Notes:

All dimensions shown are in units of in.
 *NEC FLA, MCA and MOP are for reference only – based on tables 430.248 or 430.25 of National Electric Code 2020. Actual motor FLA may vary, for sizing thermal overload, consult factory. MCA and MOP values shown only account for the motor, not accessories (damper actuator, field supplied VFD, etc).
 LwA - A weighted sound power level, based on ANSI S1.4
 dBA - A weighted sound pressure level, based on 11.5 dB attenuation per Octave band at 5 ft - dBA levels are not licensed by AMCA International
 Sones - calculated using ANSI/AMCA 301 at 5 ft

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	78	81	82	72	68	66	63	59	77	65	14.8



Model: CUBE-180-15

Belt Drive Upblast Centrifugal Roof Exhaust Fan

Standard Construction Features:

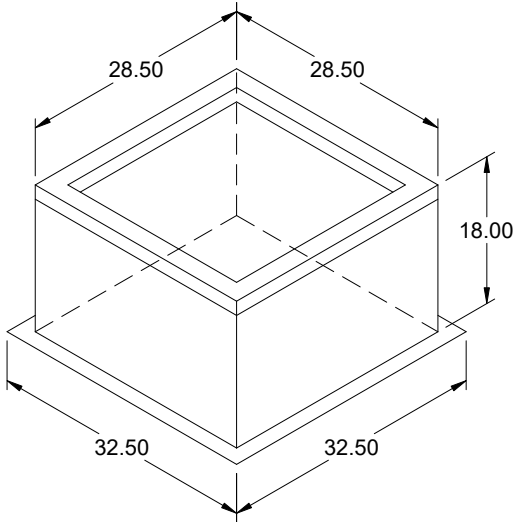
- Aluminum housing - Backward inclined aluminum wheel - Curb cap with prepunched mounting holes - Motor and drives isolated on shock mounts - Drain trough - Ball bearing motors - Adjustable motor pulley - Adjustable motor plate - Fan shaft mounted in ball bearing pillow blocks - Bearings meet or exceed temperature rating of fan - Static resistant belts - Corrosion resistant fasteners - Internal lifting lugs

Selected Options & Accessories:

Standard Curb Cap Size - 30 Square
UL/cUL 705 Listed - "Power Ventilators"
Switch, NEMA-1, Toggle, Shipped with Unit
Junction Box Mounted & Wired
Hinge, Factory Installed
Foam Curb Seal (Factory Applied)
Grease Trap (PN 475538)
Bearings with Grease Fittings, L10 life of 100,000 hrs (L50 avg. life 500,000 hrs)
Unit Warranty: 1 Yr (Standard)

Selected Sub Marks

See individual submittals for full details
GPI-30-G18



Model: GPI

Roof Curb

Standard Construction Features:

- Roof Curb fits between the building roof and the fan mounted directly to the roof support structure - Constructed of either 18 ga galvanized steel or 0.064 in. aluminum - Straight Sided without a cant - 2 in. mounting flange - 3 lb density insulation - Height - Available from 12 in. to 42 in. as specified in 0.5 in. increments. Notes: - The maximum roof opening dimension should not be greater than the "Actual" top outside dimension minus 2 in.. - The minimum roof opening dimension should be at least 2.5 in. more than the damper dimension or recommended duct size. - The Roof Opening Dimension may or may not be the same as the Structural Opening Dimension. - Damper Tray is optional and must be specified. Tray size is same as damper size. - Security bars are optional and must be specified. Frames and gridwork are all 12 ga steel. Gridwork is welded to the frame and the frame is welded to the curb.

General

Tag	Qty	Model	Sizing Method	Undersizing (in.)	Weight (lb)	Shipped Assembled	Union Label
	1	GPI-30	Nominal	1.5	49	Yes	No Preference

Dimensions

Curb Height (in.)	Nominal Outside Width (in.)	Nominal Outside Length (in.)	Actual Outside Width (in.)	Actual Outside Length (in.)	Actual Inside Width (in.)	Actual Inside Length (in.)	Flange Width (in.)	Flange Length (in.)	Hinge Base Width* (in.)	Hinge Base Length* (in.)
18	30	30	28.5	28.5	25	25	32.5	32.5	29	29

*May not be applicable

Accessories

Material	Security Bars	Liner	Insulation (in.)	Insulation R Value
Galvanized	No	No	1	R4.3

Installation, Operation and Maintenance Manuals

Job Title: Palo Verde CDC

Elevation: (ft) 33

Date: 7/15/2022

Submitted By:

GREENHECK ENGINEER ACCOUNT USA
100 GREENHECK DR
SCHOFIELD, WI 54476
US

Phone: (715)355-6463

Fax: (715)355-2399

Email Address:



P.O. Box 410 Schofield, WI 54476 (715) 359-6171 FAX (715) 355-2399 www.greenheck.com

Job Name: Palo Verde CDC

Product IOMs

Mark Name	Model Name
KEF-1	CUBE
KEF-1	GPI (No IOMs)

Installation, Operation and Maintenance Manual

Please read and save these instructions for future reference. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with these instructions will result in voiding of the product warranty and may result in personal injury and/or property damage.

Direct Drive Upblast Centrifugal Exhaust Fan

These fans are specifically designed for roof and wall mounted applications. The maximum continuous operating temperature for fan sizes 099-300 is 400°F (204°C) and for fan sizes 060-095 is 130°F (54°C). Direct drive fans are available with nominal wheel diameters ranging from 9 to 30 inches (229 to 762 mm) (060-300 unit sizes). Each fan shall bear a permanently affixed manufacturer's embossed metal nameplate containing the model number and individual serial number.



Belt Drive Upblast Centrifugal Exhaust Fan

These fans are specifically designed for roof and wall mounted applications. The maximum continuous operating temperature is 400°F (204°C). Belt drive fans are available with nominal wheel diameters ranging from 10 to 48 inches (254 to 1219 mm) (099-480 unit sizes). Each fan shall bear a permanently affixed manufacturer's embossed metal nameplate containing the model number and individual serial number.

NOTE: Both direct and belt drive units are capable for roof or wall mounting without selecting it up to size 130. Sizes 140-300 will need to be selected for sidewall mount. *Your accessories will change when you select sidewall mount.*

General Safety Information

Only qualified personnel should install this fan. Personnel should have a clear understanding of these instructions and should be aware of general safety precautions. Improper installation can result in electric shock, possible injury due to coming in contact with moving parts, as well as other potential hazards. Other considerations may be required if high winds or seismic activity is present. If more information is needed, contact a licensed professional engineer before moving forward.

1. Follow all local electrical and safety codes, as well as the National Electrical Code (NEC) and the National Fire Protection Agency (NFPA), where applicable. Follow the Canadian Electrical Code (CEC) in Canada.
2. The rotation of the wheel is critical. It must be free to rotate without striking or rubbing any stationary objects.
3. Motor must be securely and adequately grounded.
4. Do not spin fan wheel faster than max cataloged fan RPM. Adjustments to fan speed significantly affects motor load. If the fan RPM is changed, the motor current should be checked to make sure it is not exceeding the motor nameplate amps.
5. Do not allow the power cable to kink or come in contact with oil, grease, hot surfaces or chemicals. Replace cord immediately if damaged.
6. Verify that the power source is compatible with the equipment.

7. Never open access doors to a duct while the fan is running.

DANGER

Always disconnect, lock and tag power source before installing or servicing. Failure to disconnect power source can result in fire, shock or serious injury.

CAUTION

When servicing the fan, motor may be hot enough to cause pain or injury. Allow motor to cool before servicing.

CAUTION

Precaution should be taken in explosive atmospheres.

DANGER

Pour écarter les risques d'incendie, de choc électrique ou de blessure grave, veiller à toujours débrancher, verrouiller et étiqueter la source de courant avant l'installation ou l'entretien.

ATTENTION

Lors de toute intervention sur la soufflante, le moteur peut être suffisamment chaud pour provoquer une douleur voire une blessure. Laisser le moteur refroidir avant toute maintenance.

ATTENTION

Faire preuve de précaution dans les atmosphères explosives.

Receiving

Upon receiving the product, check to ensure all items are accounted for by referencing the delivery receipt or packing list. Inspect each crate or carton for shipping damage before accepting delivery. Alert the carrier of any damage detected. The customer will make notation of damage (or shortage of items) on the delivery receipt and all copies of the bill of lading which is countersigned by the delivering carrier. If damaged, immediately contact your representative. Any physical damage to the unit after acceptance is not the responsibility of the manufacturer.

Unpacking

Verify that all required parts and the correct quantity of each item have been received. If any items are missing, report shortages to your local representative to arrange for obtaining missing parts. Sometimes it is not possible that all items for the unit be shipped together due to availability of transportation and truck space. Confirmation of shipment(s) must be limited to only items on the bill of lading.

IMPORTANT

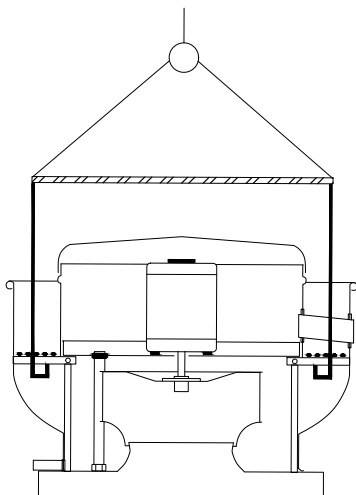
Do not lift by the fan hood. Avoid lifting fans in a way that will bend or distort fan parts. Never pass slings or timbers through the venturi of fan. Fans with special coatings or paints must be protected in handling to prevent damage.

Handling

Direct and Belt Drive Units

Lift Direct Drive unit on to the roof utilizing hooks under the horizontal supports. Evenly space the hooks using a minimum of four lifting straps. Use a spreader bar to ensure the straps do not come in contact with the unit, see Figure 1.

Figure 1



When lifting a Belt Drive unit onto the roof, use either the four lifting points on the drive frame or the two lifting points on the bearing plate if present, see Figure 2 for lifting points. Access to the drive frame is accomplished by removing the screws pointed out in Figure 3. The cover can then be removed and placed on a flat surface in an area protected from strong winds.

Figure 2

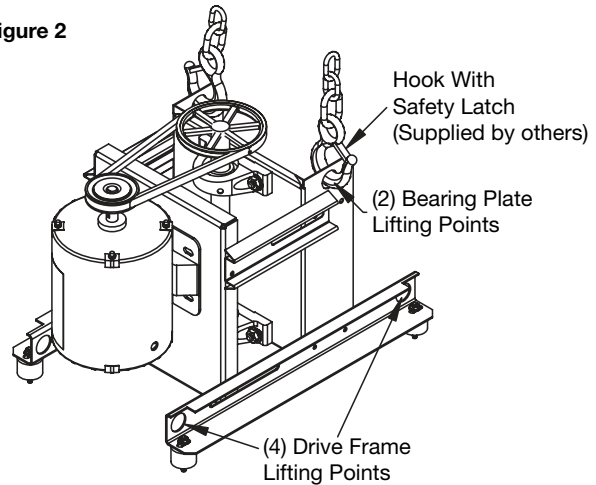
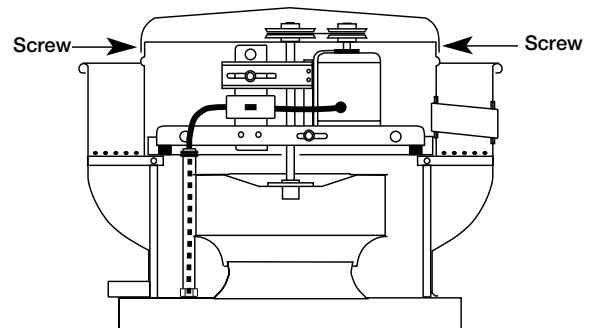


Figure 3



When the Direct and/or Belt Drive unit is on the roof, move fan to desired location using lifting points and fasten securely through mounting holes in base. Shims may be necessary depending upon roofing material thickness.

The motor amperage and voltage ratings must be checked for compatibility to supply voltage prior to final electrical connection. For Direct and/or Belt Drive installations, the electrical supply should be routed through the conduit chase located between the curb cap and the bottom of the motor compartment or through the breather tube. Wiring must conform to local and national codes.

Storage

Fans are protected against damage during shipment. If the unit cannot be installed and operated immediately, precautions need to be taken to prevent deterioration of the unit during storage. The user assumes responsibility of the fan and accessories while in storage. The manufacturer will not be responsible for damage during storage. These suggestions are provided solely as a convenience to the user.

Indoor

The ideal environment for the storage of fans and accessories is indoors, above grade, in a low humidity atmosphere which is sealed to prevent the entry of blowing dust, rain or snow. Temperatures should be evenly maintained between 30° to 110°F (-1° to 43°C) (wide temperature swings may cause condensation and “sweating” of metal parts). All accessories must be stored indoors in a clean, dry atmosphere. Remove any accumulations of dirt, water, ice or snow and wipe dry before moving to indoor storage. To avoid “sweating” of metal parts, allow cold parts to reach room temperature. To dry parts and packages, use a portable electric heater to get rid of any moisture buildup. Leave coverings loose to permit air circulation and to allow for periodic inspection.

The unit should be stored at least 3-1/2 inches (89 mm) off the floor on wooden blocks covered with moisture proof paper or polyethylene sheathing. Aisles between parts and along all walls should be provided to permit air circulation and space for inspection.

Outdoor

Fans designed for outdoor applications may be stored outdoors, if absolutely necessary. Roads or aisles for portable cranes and hauling equipment are needed.

The fan should be placed on a level surface to prevent water from leaking into the fan. The fan should be elevated on an adequate number of wooden blocks so that it is above water and snow levels and has enough blocking to prevent it from settling into soft ground. Locate parts far enough apart to permit air circulation, sunlight and space for periodic inspection. To minimize water accumulation, place all fan parts on blocking supports so that rain water will run off.

Do not cover parts with plastic film or tarps as these cause condensation of moisture from the air passing through heating and cooling cycles.

Fan wheels should be blocked to prevent spinning caused by strong winds.

Inspection and Maintenance During Storage

While in storage, inspect fans once per month. Keep a record of inspection and maintenance performed.

If moisture or dirt accumulations are found on parts, the source should be located and eliminated. At each inspection, rotate the wheel by hand ten to fifteen revolutions to distribute lubricant in motor. If paint deterioration begins, consideration should be given to touch-up or repainting. Fans with special coatings may require special techniques for touch-up or repair.

Machined parts coated with rust preventive should be restored to good condition promptly if signs of rust occur. Immediately remove the original rust preventive coating with petroleum solvent and clean with lint-free cloths. Polish any remaining rust from surface with crocus cloth or fine emery paper and oil. Do not destroy

the continuity of the surfaces. Thoroughly wipe clean with Tectyl® 506 (Ashland Inc.) or the equivalent. For hard to reach internal surfaces or for occasional use, consider using Tectyl® 511M Rust Preventive, WD-40® or the equivalent.

Removing From Storage

As fans are removed from storage to be installed in their final location, they should be protected and maintained in a similar fashion until the fan equipment goes into operation.

IMPORTANT

Installation, troubleshooting and parts replacement are to be performed only by qualified personnel. Consult and follow all applicable national, state and local codes. They will supercede this document.

Dimensional Data

Direct Drive

Model Size	Curb Cap	Damper	Roof/Wall Opening	Wall Opening with a curb through wall	**Approx. Weight
060, 070	17 (432)	8 (203)	10½ (267)	17 (432)	29 (13)
080, 090, 095	19 (483)	10 (254)	12½ (318)	19 (483)	40 (18)
099, 100, 101*, 120, 121*, 130, 131*	19 (483)	12 (305)	14½ (368)	19 (483)	67 (30)
140, 141*, 160, 161*	22 (559)	16 (406)	18½ (470)	22 (559)	90 (41)
180, 200, 200HP	30 (762)	18 (457)	20½ (521)	30 (762)	142 (64)
240, 240HP	34 (864)	24 (610)	26½ (673)	N/A	175 (79)
300, 300HP	40 (1016)	30 (762)	32½ (826)	N/A	313 (142)

Belt Drive

Model Size	Curb Cap	Shaft Bearings	Damper	Roof/Wall Opening	Wall Opening with a curb through wall	**Approx. Weight
099, 100, 101*, 100HP, 101HP*, 120, 121*, 130, 131*	19 (483)	¾ (19)	12 (305)	14½ (368)	19 (483)	66 (30)
140, 141*, 140HP, 141HP*, 160, 161*, 160HP, 161HP*	22 (559)	¾ (19)	16 (406)	18½ (470)	22 (559)	87 (39)
160XP, 161XP*	22 (559)	1 (25)	16 (406)	18½ (470)	22 (559)	87 (39)
180	30 (762)	¾ (19)	18 (457)	20½ (521)	30 (762)	126 (57)
180HP	30 (762)	1 (25)	18 (457)	20½ (521)	30 (762)	126 (57)
200	30 (762)	¾ (19)	18 (457)	20½ (521)	30 (762)	142 (64)
200HP	30 (762)	1 (25)	18 (457)	20½ (521)	30 (762)	142 (64)
220, 220HP, 240, 240HP, 240XP	34 (864)	1 (25)	24 (610)	26½ (673)	34 (864)	175 (79)
300, 300HP, 300XP	40 (1016)	1 (25)	30 (762)	32½ (826)	40 (1016)	313 (142)
360, 360HP, 360XP	46 (1168)	1¼ (32)	36 (914)	38½ (978)	N/A	440 (200)
420	52 (1321)	1¼ (32)	42 (1067)	44½ (1130)	N/A	578 (262)
480	58 (1473)	1½ (38)	48 (1219)	50½ (1283)	N/A	675 (306)

• All dimensions are in inches (millimeters).

* Previous size, no physical product change with new size

** Approximate weight shown in lbs. (kg.) is the largest cataloged open drip proof motor.

• “Curb Cap” is the inside dimension of the curb cap

• The roof curb should be 1½ in. (38 mm) less than the curb cap to allow for roofing and flashing.

• Roof/wall opening is a square dimension.



Installation

General Ventilation Installation

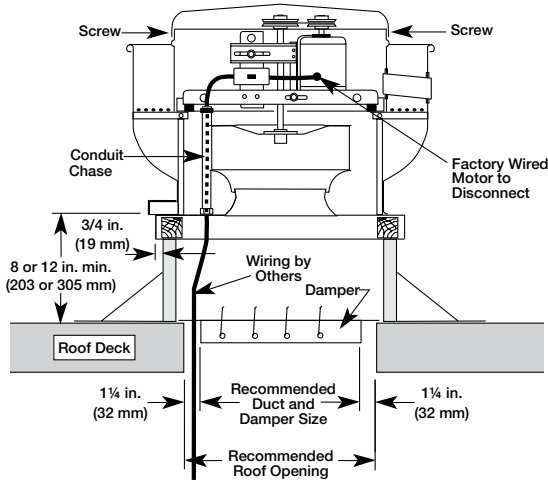


Figure 4 - Typical Roof Mounting Installation

1. On the roof surface, cut an appropriate sized hole and follow manufacturer's instructions on curb installation. Caulk and flash the curb to ensure a water tight seal.

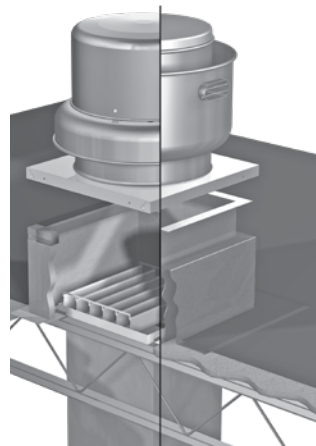


Figure 5 - Roof Curb Installation

2. If unit is equipped with a backdraft damper, it should be installed now.

3. Remove motor cover. Access to the motor compartment is accomplished by removing the screws as shown in Figure 3, page 2.

- 4a. On **belt drive** fans, use the lifting lugs on the drive frame or bearing plate to lift and place the unit on top of roof curb. Refer to Figure 2, page 2.

- 4b. On **direct drive** fans, lift and place the unit on top of roof curb using hooks under the horizontal supports. Refer to Figure 1, page 2.

5. Secure fan to curb using a minimum of eight lag screws, metal screws or other suitable fasteners. Shims may be required depending upon curb installation and roofing material.

6. Verify power line wiring is de-energized before connecting fan motor to power source.

7. For commercial kitchen and UL Listed emergency smoke control applications, the electrical supply must enter the motor compartment through the breather tube. For other non-flammable applications, the electrical supply can be routed through the conduit chase between the curb cap and the bottom of the motor compartment.

8. Connect power supply wiring to the motor as indicated on the motor nameplate or terminal box cover. Check the power source for compatibility with the requirements of your equipment.
9. Check fan wheel for free rotation, recenter if necessary. Check setscrew(s) for tightness.
10. Check all fasteners for tightness.
11. Mount and wire safety disconnect switch under motor cover. Wire control switches at ground level, refer to Figure 6.
12. Replace motor cover.

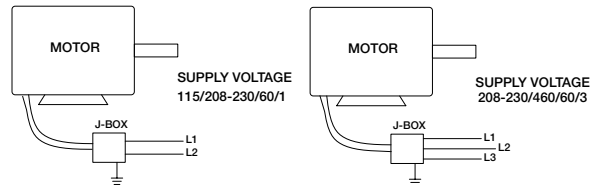
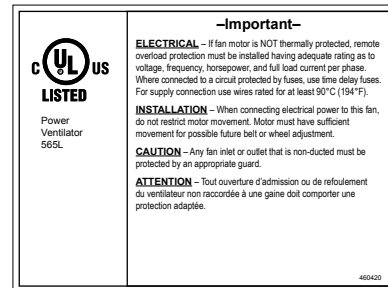


Figure 6 - Typical Wiring Diagram

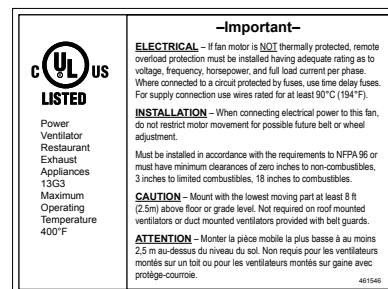
Vari-Green® Wiring

For Vari-Green wiring refer to the Vari-Green Motor and Controls Installation, Operation and Maintenance Manual for complete wiring and operation instructions.

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Power Ventilator
Restaurant
Exhaust
Appliances
label



Sidewall Mounting Installation

- 1a. **Curb:** Cut an appropriate sized hole in the wall for either through wall (recommended) or exterior face mount and follow the manufacturer's instructions on curb installation.
- 1b. **Wall bracket:** Cut an appropriate sized hole in the wall for exterior face mounting. If unit is equipped with a backdraft damper, it should be installed in the ductwork/wall opening now.
2. Mount the curb or wall bracket to the wall with a minimum of eight 3/8 inch fasteners around the flange. Caulk and flash the curb or wall bracket to ensure a watertight seal.
3. **Curb only:** If unit is equipped with a backdraft damper, it should be installed now.
4. Lift the fan into place. Do NOT support the unit by the hoodband during installation.
- 5a. **Curb:** Orient fan so the grease trough is downward and secure fan to curb using a minimum of eight lag screws, metal screws or other suitable fasteners.
- 5b. **Wall bracket:** Orient fan so the grease trough is downward and secure fan to bracket using the fasteners provided.
6. Follow steps 6 through 12 of General Ventilation Installation instructions on page 4.

NOTE: If using any type of hinging, your fan must be a minimum of 8 inches away from the wall.

NOTE: Do not install your fan more than 12 inches away from the wall.

NOTE: Both direct and belt drive units can be compatible for roof or wall mounting without selecting it up to size 130. *Your accessories will change when you select it is as sidewall mount.*

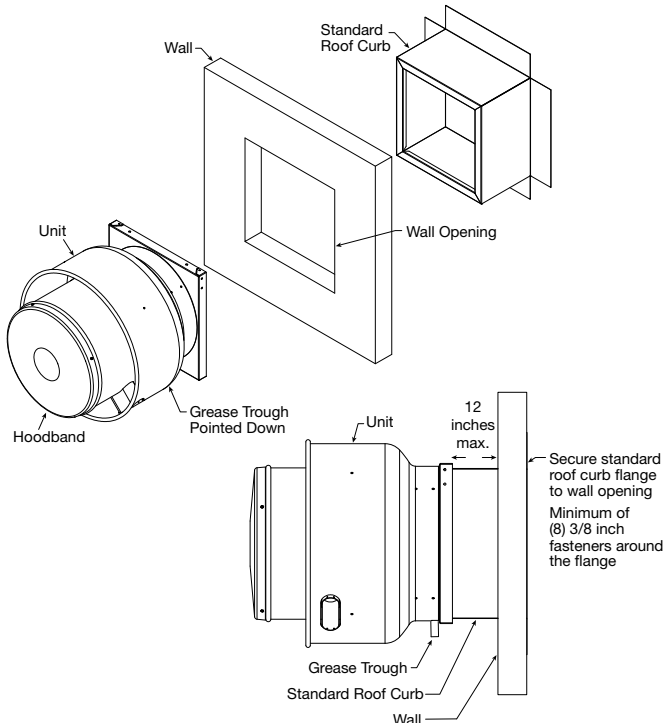


Figure 7 - Typical Sidewall Mounting Installation (Through Wall)

Commercial Kitchen Installation

Commercial kitchen installations must comply with NFPA 96. Check local and national codes for these installations and consult local code authorities for other specific requirements.

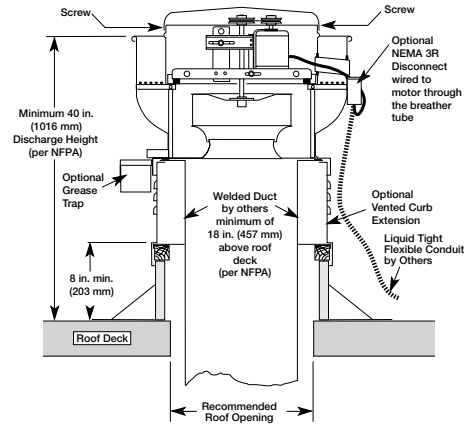


Figure 8
Typical Roof Mounting Installation

1. On the roof surface, cut an appropriate sized hole and follow manufacturer's instructions on curb installation. Caulk and flash the curb to ensure a watertight seal.
2. If unit is equipped with a backdraft damper. DO NOT install it.

Perform steps 3 - 12 of General Ventilation Installation.

IMPORTANT

The size of the duct must be equal to or larger than the inlet opening of the fan.

To comply with NFPA 96, the fan discharge must be a minimum of 40 in. (1016 mm) above the roof surface and a minimum of 10 ft. (3048 mm) from any building air intake.

Per NFPA 96, ductwork to an upblast discharge exhaust fan must be constructed of and supported by carbon steel not less than No. 6 MSG (1.52 mm) or stainless steel not less than No. 18 MSG (1.21 mm) in thickness. Duct must also extend a minimum of 18 in. (457 mm) above the roof surface.

Ensure that a minimum of 500 ft/min of air velocity through the duct is maintained per NFPA 96, clause 8.2.1.1, 2014 edition and UL 762, Issue #7, clause 6.2, October 14, 2013.

The following accessories may be required by NFPA 96 depending upon installation: Grease Trap, Hinge Kit or Hinged Base, Clean-Out Port, and Vented Curb.

Minimum duct velocities must be maintained in kitchen exhaust applications. If a speed controller is used, ensure compliance with all applicable codes.

Grease Trap Installation

The polypropylene grease trap is designed to collect grease residue and avoid drainage onto roof surface. Follow all local codes, as well as the National Fire Protection Agency (NFPA) where applicable.

NFPA 96: Upblast fans shall have a drain directed to a readily accessible and visible grease receptacle not to exceed 1 gal. (3.8L)

Refer to Document 476370 - Grease Trap Installation, Operation and Maintenance Manual for parts list and specific installation instructions.

Grease Trap Maintenance

Regular inspection of grease trap is recommended. Depending on the amount of grease discharged through the fan, the grease trap should be cleaned regularly to ensure proper operation.

- Check grease absorber (if included) every month. Replace grease absorber after every cleaning and/or as needed between cleanings.
- Replacement grease absorbers (P/N 476084) can be ordered from your local representative.

Hinge Installation

NFPA 96: Upblast exhaust fans shall be supplied with a hinge.

Refer to listed Installation, Operation and Maintenance Manuals for parts list and specific installation instructions:

- Document 481937 - Sidewall Mount Hinge Kit**
- Document 481366 - Bracket Hinge Kit**
- Document 462865/462866 - Hinge Kit**

UL Listed Emergency Smoke Control Installation

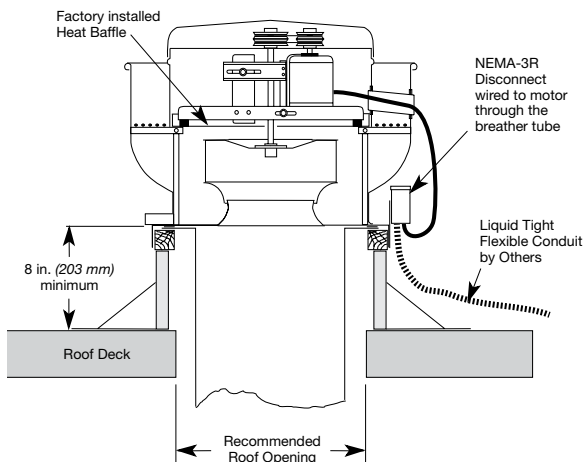


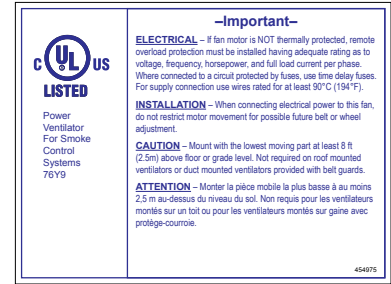
Figure 9 - Typical Roof Mounting Installation

Electrical Connection

For **belt drive** units in emergency smoke removal installations, the motor's amperage and voltage rating must be checked for compatibility to the supply voltage prior to final electrical connection. Also, the motor itself cannot have thermal overload protection.

The electrical supply must enter the motor compartment through the breather tube and the disconnect must be mounted outside the fan's motor compartment. Emergency smoke removal fans may also require an isolated power supply so that if power is cut to the building in the event of a fire, the fan will continue to operate.

Check the local and national electrical codes for emergency smoke removal fans. Consult local code authorities for your specific requirements.



Representation of UL Listed Power Ventilator for Smoke Control Systems label

Mounting for Severe Duty Installation

IMPORTANT

Only qualified installers should perform this work. Manufacturer assumes no liability for damages resulting from installation.

Installation instructions for seismic ratings are only recommendations. Final design must be determined by Structural Engineer of Record (SEOR) including requirements for curb construction, mounting of unit to curb and mounting of curb to structure.

Fan to Curb Mounting: 5/16 inch (7.9 mm) self-drilling fasteners are to be installed on each side of fan with one fastener 4 inches (102 mm) from each edge and one fastener in the center, Figure 10. Fasteners are to be equally spaced.

- Roof Curb Models GPF, GPFHL, GPFHD or Equivalent 18 ga. min.
- High Wind Ratings 42 in. Tall Max
- Seismic Ratings 24 in. Tall Max
- Welded Steel Construction

Fan Size	Fasteners per Side
≤ 161	3
180 to 240	5
≥ 300	9

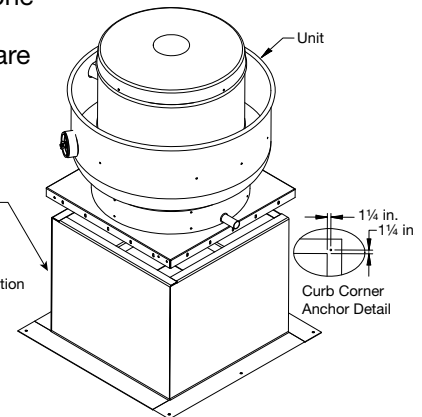


Figure 10 - Fan to Curb Mounting

Optional Hinged Base Mounting: For installations that include the optional hinged base accessory, the fan must be secured to the hinged base and curb using the correct number of fasteners as shown in the "Fan to Curb Mounting" section.

All fasteners must be installed through the curb cap of the fan, the hinged base, and the curb. All fasteners must be reinstalled after each time the fan is hinged open, see Figure 11.

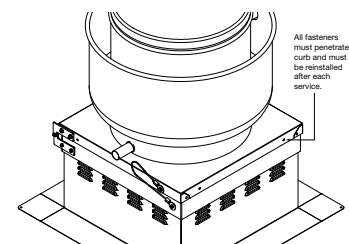


Figure 11 - Fasteners

Curb to Deck Mounting: Fasteners need to be located on all four sides of the curb, Figures 12a and 12b.

Figure 12a

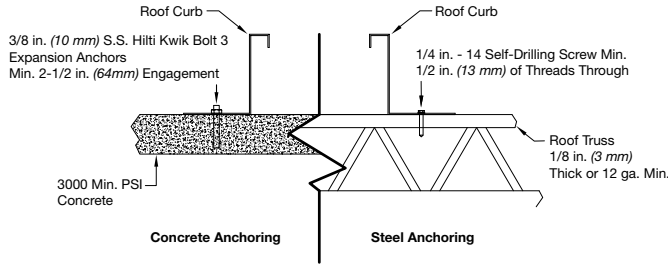
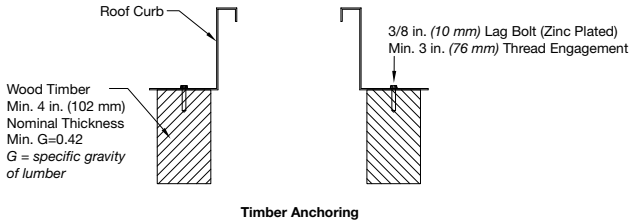


Figure 12b



High Wind Ratings				Seismic Ratings			
Fan Size	Curb Cap Size inches (millimeters)	Fasteners		Fan Size	Fasteners		
		Per Side	Total		Per Side	Total	
Steel	≤ 161	17x17 to 22x22 (432x432 to 559x559 mm)	3	12	060-240	2	8
	> 161	26x26 to 40x40 (660x660 to 1016x1016 mm)	4	16	300-360	3	12
				420-480	5	20	
Concrete	≤ 161	17x17 to 22x22 (432x432 to 559x559 mm)	3	12	060-240	2	8
	> 161	26x26 to 40x40 (660x660 to 1016x1016 mm)	3	12	300-360	3	12
				420-480	5	20	
Wood	≤ 161	17x17 to 22x22 (432x432 to 559x559 mm)	3	12	060-240	2	8
	> 161	26x26 to 40x40 (660x660 to 1016x1016 mm)	4	16	300-360	3	12
				420-480	5	20	

All dimensions are in inches (millimeters).

Pre-Starting Checks

1. Check all fasteners and setscrews for tightness. The wheel should rotate freely and be aligned as shown in Figure 13.

Model Type	Model Size	G - Overlap inch (mm)	H - Gap inch (mm)
X	-	060-095	-
X	X	099-161	1/4 (6)
X	X	180-300	1/2 (13)
-	X	360-480	3/4 (19)

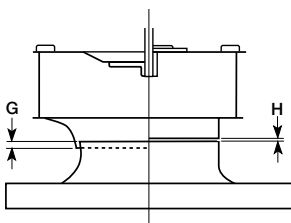


Figure 13
Wheel Overlap and Gap Dimension

2. Wheel position is preset and the unit is test run at the factory. Movement may occur during shipment and realignment may be necessary.

Centering the wheel can be accomplished by loosening the bolts on the support pan and moving support pan until wheel is properly aligned. For units with drive frame mounting, loosen the bolts holding the drive frame to the vibration isolators and reposition the drive frame if additional movement is needed for wheel alignment.

Wheel and inlet cone overlap can be adjusted by loosening the setscrews in the wheel hub and moving the wheel to the desired position. For direct and belt drive models with wheel hubs and shaft pulleys utilizing tapered bushing interface, reference page 9 for tapered bushing removal and move the wheel to the desired position.

3. Check wheel rotation (viewing from the shaft side) by momentarily energizing the unit. Rotation should be clockwise as shown in Figure 14 and correspond to the rotation decal on the unit. If wheel rotation is incorrect, reverse two of the wiring leads or check motor wiring for single phase. Fan RPM should be checked and verified with a tachometer.

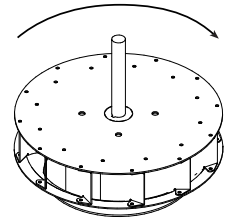


Figure 14

WARNING

Correct direction of wheel rotation is critical. Reversed rotation will result in poor air performance, motor overloading and possible motor burnout.

AVERTISSEMENT

La turbine doit impérativement tourner dans le bon sens. Une rotation en sens inverse entraînerait de mauvaises performances de soufflage, une surcharge du moteur voire un grillage du moteur.

Belt Drive Pre-Starting Belt Tension Checks

4. Always loosen tension enough to install belts without stretching. Do not force belt(s) see Figure 15. Forcing belts will break the cords and cause belt failure.
5. For units with two groove pulleys, adjust so the tension is equal in both belts.
6. If adjustments are made, it is very important to check the pulleys for proper alignment. Misaligned pulleys lead to excessive belt wear, vibration, noise and power loss, see Figure 16.

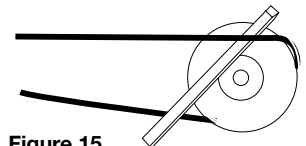


Figure 15

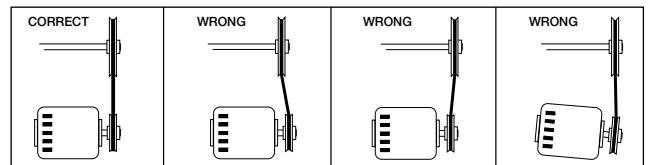


Figure 16

- Belt tension can be adjusted by loosening four fasteners on the drive frame, see Figure 17.

The motor plate slides on the slotted adjusting arms and drive frame angles in the same manner.

Four (4) fasteners in total.

Identical fasteners on opposing side must also be loosened.

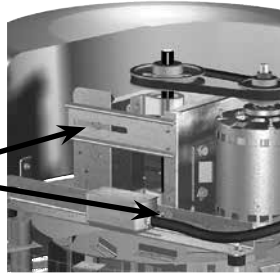
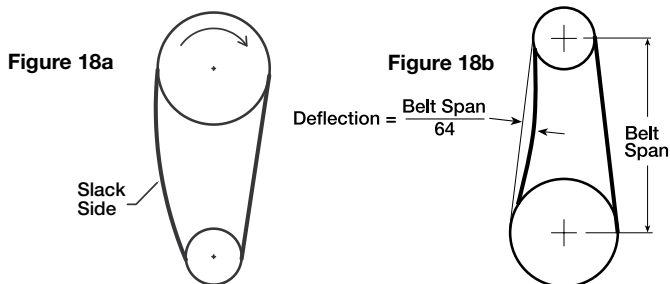


Figure 17

- Sizes 099-160:** Belts should be tensioned just enough to prevent slippage at full load. Belts should have a slight bow on the slack side while running at full load; see Figure 18a.
- Sizes 180-480:** Belt tension should be adjusted to allow 1/64 in. (0.397 mm) of deflection per inch of belt span. For example, a 15 in. (381 mm) belt span should have 15/64 in. (5.95 mm) (or about 1/4 in. (6 mm)) of deflection with moderate thumb pressure at mid-point between pulleys, see Figure 18b.



- The adjustable motor pulley is factory set for the RPM specified. Speed can be increased by closing or decreased by opening the adjustable motor pulley.
- Any increase in speed represents a substantial increase in the horsepower required by the unit.
- Motor amperage should always be checked to avoid serious damage to the motor when speed is varied.

IMPORTANT

The fan has been checked for mechanical noises at the factory prior to shipment. If mechanical noise should develop, suggested corrective actions are offered in the Troubleshooting section.

IMPORTANT

Over tightening belts will cause excessive bearing wear and noise. Too little tension will cause slippage at startup and uneven wear.

Operation

- Before starting up or operating fan, check all fasteners for tightness. In particular, check the setscrews in the wheel hub (or the tapered bushing and pulleys if applicable).
- While in the OFF position or before connecting the fan to power, turn the fan wheel by hand to be sure it is not striking the venturi or any obstacle.
- Start the fan and shut it off immediately to check rotation of the wheel with directional arrow in the motor compartment, reference Figure 14.
- When the fan is started, observe the operation and check for any unusual noises.
- With the system in full operation and all ductwork attached, measure current input to the motor and compare with the nameplate rating to determine if the motor is operating under safe load conditions.
- Keep inlets and approaches to fan clean and free from obstruction.

IMPORTANT

Adjust (tighten) belt tension after the first 24-48 hours of operation.

Inspection

Inspection of the fan should be conducted at the first 30 minute and 24 hour intervals of satisfactory operation.

30 Minute Interval: Inspect bolts, setscrews and motor mounting bolts. Adjust and tighten as necessary.

24 Hour Interval: Check all internal components. On belt drive unit only, inspect belt alignment and tension. Adjust and tighten as necessary.

Maintenance

DANGER

Disconnect and secure to the "off" position all electrical power to the fan prior to inspection or servicing. Failure to comply with this safety precaution could result in serious injury or death.

WARNING

This unit should be made non-functional when cleaning the wheel or housing (fuses removed, disconnect locked off).

DANGER

Pour écarter les risques de blessure grave ou de mort, débrancher et verrouiller l'alimentation électrique en position « Arrêt » avant tout contrôle ou entretien.

AVERTISSEMENT

L'appareil doit être rendu non opérationnel lors du nettoyage de la turbine ou du caisson (fusibles retirés, sectionneur verrouillé).

IMPORTANT

Uneven cleaning of the wheel will produce an out of balance condition that will cause vibration in the fan.

Installation and maintenance are to be performed only by qualified personnel who are familiar with local codes and regulations and who are experienced with this type of equipment.

Motor maintenance is generally limited to cleaning and lubrication (where applicable). Cleaning should be limited to exterior surfaces only. Removing dust buildup on motor housing ensures proper motor cooling.

Greasing of motors is only intended when fittings are provided. Many fractional horsepower motors are permanently lubricated and should not be lubricated after installation. Motors supplied with grease fittings should be greased in accordance with manufacturer's recommendations. Where motor temperatures do not exceed 104°F (40°C), the grease should be replaced after 2,000 hours of running time as a general rule.

Wheels require very little attention when moving clean air. Occasionally, oil and dust may accumulate causing imbalance. When this occurs, the wheel and housing should be cleaned to ensure smooth and safe operation.

All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.

- When installing fans for restaurant exhaust applications follow NFPA 96 for cleaning fans.
- Grease containers must be emptied at regular intervals to prevent overflow.

A proper maintenance program will help these units deliver years of dependable service.

Tapered Bushing Hub Installation and Removal

For wheel hubs and shaft pulleys utilizing a tapered bushing interface, follow this procedure for installation and removal. There are two possible set ups for the tapered bushing, both have the same procedure, but orientation of the hub varies.

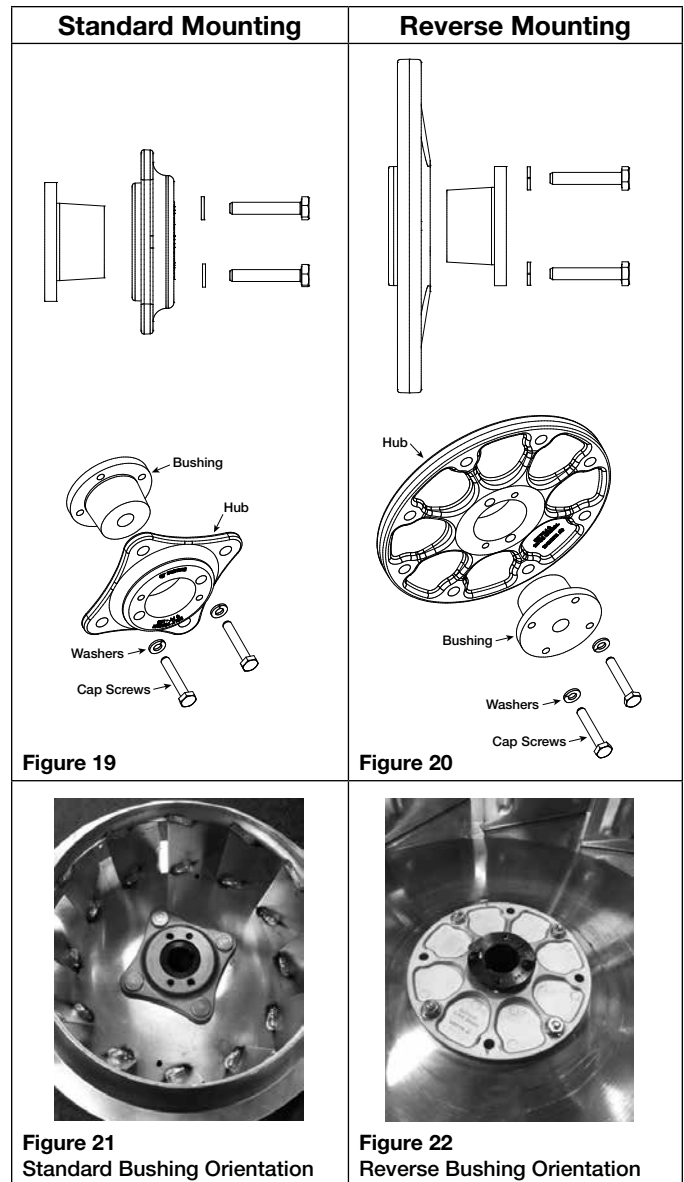
Tapered Bushing Removal:

1. If present, loosen the setscrew holding the bushing and shaft key in place.
2. Loosen and remove the socket head cap screws which fasten the bushing to the hub as shown in the section views and examples of Figures 19-22.

3. **Standard Mounting:** Take the two socket head cap screws that were removed and install them into the visibly threaded holes on the wheel hub.

Reverse Mounting: Install the two socket head cap screws into the visibly threaded holes of the bushing flange.

4. Once both socket head cap screws are installed, tighten them an eighth of a turn at a time, alternating between the two until the hub comes loose from the bushing.



Bushing Installation

1. Clean all surfaces of hub and bushing to remove any oil or residue present and do not use any lubricant to install bushing into the hub. For both standard and reverse mounting styles, the socket head cap screws are adjustable from the inlet of the fan.
2. **Standard Mounting:** Slide the bushing and shaft key onto the fan shaft followed by the wheel and hub assembly. If present, use the keyway setscrew to hold the shaft key and bushing in place but **DO NOT** overtighten as this can damage the bushing. Align the unthreaded holes of the hub with the threaded holes of the tapered bushing.
Reverse Mounting: Slide the wheel and hub assembly onto the fan shaft followed by the bushing and shaft key. If present, use the keyway setscrew to hold the shaft key and bushing in place but **DO NOT** overtighten as this can damage the bushing. Align the unthreaded holes of the tapered bushing with the threaded holes of the hub.

3. Install the two bushing socket head cap screws into the aligned holes by hand (or without excessive torque) until the heads of the socket head cap screws are seated against the mating surface.
4. Adjust the height of the wheel in the fan relative to the inlet venturi then tighten the two socket head cap screws an eighth turn at a time in an alternating fashion and to a torque of 10 ft-lbs.

Belt and Bearing Maintenance

1. Belts tend to stretch after a period of time. They should be checked periodically for wear and tightness. When replacing belts, use the same type as supplied with the unit.
2. Matched belts should always be used on units with multi-groove pulleys.
3. For belt replacement, loosen tensioning device enough to allow removal of the belt by hand.
4. Once installed, adjust belts as shown in "Pre-Starting Checks."
5. To ensure tightness, check pulley setscrews. Proper keys must be in keyways.
6. Fan RPM should not be readjusted. Only use pulleys of identical size and type when replacing pulleys.
7. Shaft bearings can be classified in two groups: relubricating and non-relubricating. All non-relubricating bearings on belt drive fans are factory lubricated and require no further lubrication under normal use (between -20° to 180°F (-29° to 82°C) in a relatively clean environment).
8. On belt drive fans, the standard cast pillow block bearings are factory lubricated and are provided with external grease fittings. Annual lubrication is recommended, or more frequently if needed, see Table 1. Do not over-grease. Use only one or two shots of lubricant with a hand gun. Maximum hand gun rating is 40 psi. Rotate bearings during lubrication where good safety practice permits. Caution should be employed to prevent over packing or contamination.
9. Units installed in hot, humid or dirty locations should be equipped with special bearings. These bearings will require frequent lubrication. Caution should be employed to prevent over packing or contamination.
10. Grease fittings should be wiped clean. The unit should be in operation while lubricating bearings. Extreme care should be used around moving parts.
11. Grease should be pumped in very slowly until a slight bead forms around the seal. A high grade lithium base grease should be used (see Table 2).
12. During the first few months of operation, check bearing set screws periodically to ensure tightness.
13. If unit is to be left idle for an extended period, remove belts and store in a cool, dry place to avoid premature belt failure.

Recommended Bearing Lubrication Frequency in Months

NOTE

If unusual environment conditions exist (extreme temperature, moisture or contaminants) more frequent lubrication is required.

A good quality lithium base grease, conforming to NLGI Grade 2 consistency, such as those listed in Table 2 may be used.

Table 1: Suggested Fan Bearing Lubrication Intervals

Interval (months)	Type of Service
1 to 3	Heavy duty in dirty, dusty locations; high ambient temperatures; moisture laden atmosphere; vibration.
3 to 6	12 to 24 hours per day, heavy duty, or if moisture is present
6 to 12	8 to 16 hours per day in clean, relatively dry atmosphere
12 to 18	Infrequent operation or light duty in clean atmosphere

Table 2: Grease Manufacturers

Manufacturer	Grease (NLGI #2)
U.S. Electric Motors	Grease No. 83343
Chevron U.S.A. Inc	Chevron SRI Grease #2
Mobil Oil Corporation	Mobilith
	Mobil 532
Texaco, Inc.	Premium BRB #2
	Texaco Multifak #2
Amoco Oil Co.	Rykon Premium #2
Exxon	Unirex N2
Shell	B Shell Alvania #2

Parts List

Each fan bears a manufacturer's nameplate with model number and serial number embossed. This information will assist the local representative and the factory in providing service and replacement parts. Before taking any corrective action, make certain unit is not capable of operation during repairs.

NOTE

For replacement, the windband, vertical supports, drain trough and curb cap/venturi come as one complete assembly.

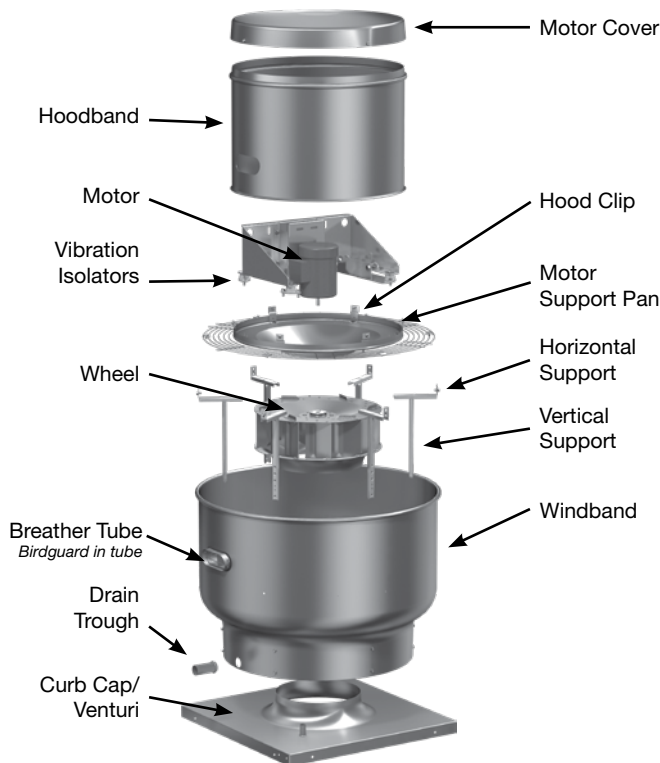
CAUTION

A fan manufactured with an explosion resistant motor does not certify the entire unit to be explosion proof. Refer to UL Listing mark for the fans approved usage.

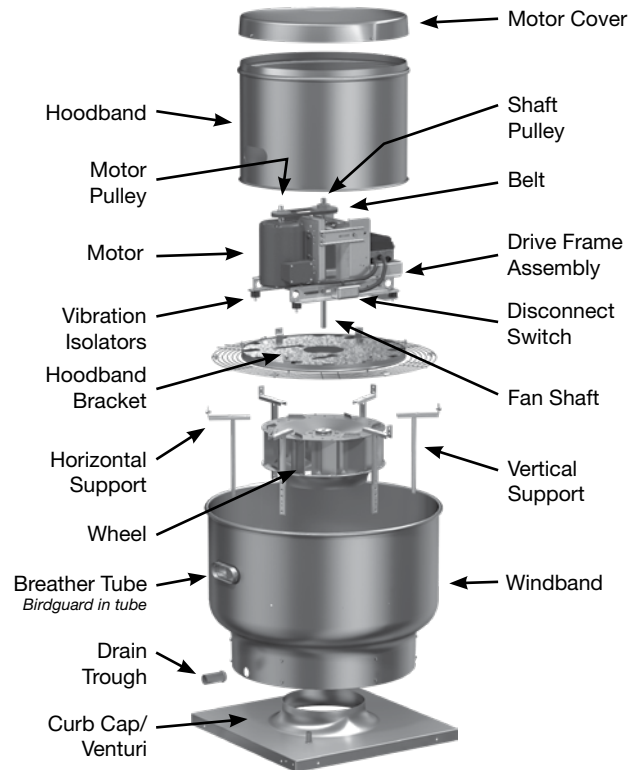
CAUTION

La présence d'un moteur antidéflagrant sur un ventilateur ne garantit pas que tout l'appareil est antidéflagrant. Pour connaître les emplois autorisés de l'appareil, voir son marquage de conformité UL.

Direct Drive

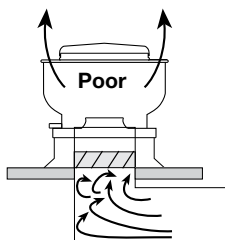


Belt Drive

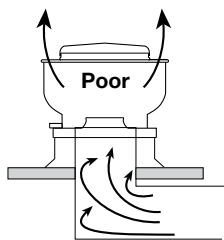


Fan Inlet Connections

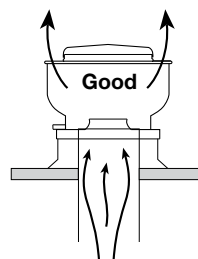
In order to ensure proper fan performance, caution must be exercised in fan placement and connection to the ventilation system. Obstructions, transitions, poorly designed elbows, improperly selected dampers, etc. can cause reduced performance, excessive noise and increased mechanical stress. For performance to be as published, the system must provide uniform and stable airflow into the fan.



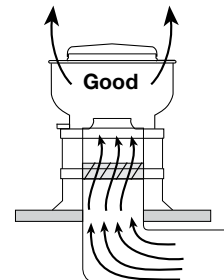
Dampers must open fully. Use motorized dampers in low airflow applications to reduce losses.



Avoid sharp turns or entrance conditions which cause uneven flow. Use turning vanes in elbows to reduce adverse effects.



Provide uniform airflow at fan inlet to ensure optimum performance.



Provide uniform airflow at fan inlet and through the damper to ensure optimum performance. Curb cap should be three wheel diameters from the radius. Use turning vanes in duct when possible.

Troubleshooting

WARNING

Before taking any corrective action, make certain unit is not capable of operation during repairs.

AVERTISSEMENT

Avant d'entreprendre toute action corrective, s'assurer que l'appareil ne pourra pas fonctionner durant les réparations.

PROBLEM	CAUSE	CORRECTIVE ACTION
Excessive noise or vibration	Wheel rubbing inlet	Adjust wheel and/or inlet cone. Tighten wheel hub or bearing collars on shaft.
	V-belt drive	Tighten pulleys on motor/fan shaft. Adjust belt tension. Align pulleys properly, see page 7, Figures 15 and 16. Replace worn belts or pulleys.
	Bearings	Replace defective bearing(s). Lubricate bearings. Tighten collars and fasteners.
	Wheel unbalance	Clean all dirt off wheel. Check wheel balance, rebalance in place if necessary.
	Belts too tight or too loose	Adjust tension, see page 8, Figures 18a and 18b.
	Wheel improperly aligned and rubbing	Center wheel on inlet, see page 7, Figure 13.
	Loose drive or motor pulleys	Align and tighten. See "Pre-Starting Checks", pages 7 and 8.
	Foreign objects in wheel or housing	Remove objects, check for damage or unbalance.
	Fan base not securely anchored	Secure properly.
	Motor hood loose and rattling	Tighten fasteners to secure the motor hood.
Defective or loose motor bearings	Replace motor with same frame size, RPM-HP	
High horsepower	Fan	Check rotation of wheel, see page 7, Figure 14. Reduce fan speed.
	Duct system	Resize ductwork. Check proper operation of face and bypass dampers. Check filters and access doors.
Fan does not operate	Electrical supply	Check fuses/circuit breakers. Check for switches off. Check for correct supply voltage.
	Drive	Check for broken belts. Tighten loose pulleys or belts.
	Motor	Ensure motor is correct horsepower and not tripping overload protector.
Motor overloads or overheats	Lubrication	Check for excessive or insufficient grease in the bearing.
	Mechanical	Replace damaged bearing. Relieve excessive belt tension. Align bearings. Check for bent shaft.
	Belt slippage	Adjust tension or replace bad belts, see pages 7 and 8.
	Over/Under line voltage	Contact power company.
	Incorrect wheel rotation	Check motor wiring, see page 4, Figure 6. Confirm wheel rotation, see page 7, Figure 14.
	Wheel RPM too high	Check drives or slow down fan by opening variable pitch pulley on motor shaft.
	Undersized motor	Check motor ratings with catalog speed and air capacity chart.
Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor.	
Reduced airflow	System resistance too high	Check system: Proper operation of backdraft or control dampers, obstruction in ductwork, clean dirty filters.
	Unit running backwards	Correct as shown see page 7, Figure 14.
	Excessive dirt buildup on wheels	Clean wheel, see page 9.
	Improper wheel alignment	Center wheel on inlet, see "Pre-Starting Checks".
	Dampers closed	Inspect and repair.
	Blocked duct/clogged filter	Clean or replace.
	Belt slippage	Replace and adjust tension.
Speed too slow	Check for correct drives.	

Our Commitment

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.

Product warranties can be found online at Greenheck.com, either on the specific product page or in the literature section of the website at Greenheck.com/Resources/Library/Literature.

Greenheck's Centrifugal Upblast and Sidewall Exhaust catalog provides additional information describing the equipment, fan performance, available accessories, and specification data.

AMCA Publication 410-96, Safety Practices for Users and Installers of Industrial and Commercial Fans, provides additional safety information. This publication can be obtained from AMCA International, Inc. at www.amca.org.



MSF-P117-H30-VFD

Unit Performance

Design Conditions					
Elevation (ft)	Summer		Winter (°F)	Supply (CFM)	Outdoor Air (CFM)
	DB (°F)	WB (°F)			
33	105.0	70.0	30.0	2,220	2,220

Unit Specifications					
Qty	Weight (lb)	Cooling Type	Heating Type	Unit Installation	Unit ETL Listing
1	321 (+/- 5%)	None	None	Outdoor	UL 705

Configuration				
Unit Orientation	Unit Configuration	Outdoor Air Intake	Return Air Intake	Supply Air Discharge
Horizontal	Constant Volume 100% OA	End	-	Bottom

Air Performance									
Type	Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	RPM	Operating Power (hp)	Fan			
						Qty	Type	Size (in.)	Drive-Type
Supply	2,220	0.5	0.726	1139	0.55	1	Plenum	16.8	Direct-Drive

Motor Specifications					
Motor	Qty	Size (HP)	Enclosure	Efficiency	RPM
Supply Fan Motor	1	2	ODP	NEMA Premium	1725

Electrical Specifications			
Power Supply	Rating (V/C/P)	MCA (A)	MOP (A)
Unit	208/60/3	9.8	15



CONSTRUCTION FEATURES AND ACCESSORIES

Unit	
Unit Installation - Outdoor	Std
Unit Construction - Single Wall	X
Corrosion Resistant Fasteners	Std
Access and Connections - Right side when facing intake	X
Service Access - Removable lift off panels	X
Unit Finish - G90 Galvanized	X
Finish Color	
Supply Fan - Direct-drive, backward-curved plenum	X
Supply Fan and Motor Vibration isolation - Neoprene	X
High Wind Rated	
Controls	
Unit Controls - Terminal strip	X
Remote Panel	
Supply Fan VFD - VFD by factory	
Supply Fan Control - Constant Volume	X
Melink/Vari-Flow wiring package	

Accessories	
Factory Installed, Lockable, NEMA 3R Disconnect	Std
Weatherhood - Aluminum Mesh filtered	X
Supply Air Filters - 2" MERV 13, 24x24x2 - (2)	X
Outdoor Air Inlet Damper - Gravity	X
Roof Curb - GPI	X
Combination Curb	
Wall Mount Bracket	
Spare Filters	
Warranty Options	
Unit Warranty - 1 Year	X

Standard Option	Std
Not Included	
Included	X

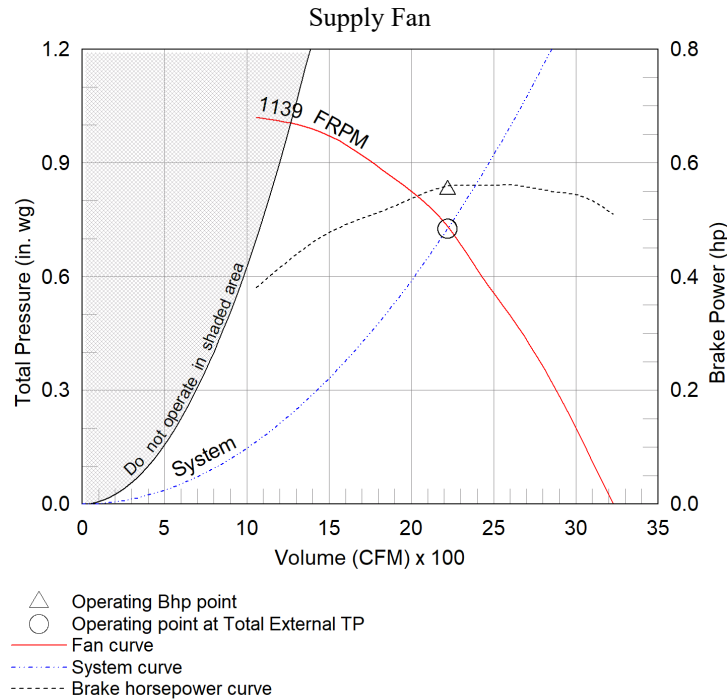
Notes
The Inlet damper is a gravity general purpose damper, model WD-300.

Fan Charts And Performance

Supply Fan Performance									
Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	RPM	Operating Power (hp)	Motor		Fan		
					Qty	Size (HP)	Qty	Type	Drive-Type
2,220	0.5	0.726	1139	0.55	1	2	1	Plenum	Direct

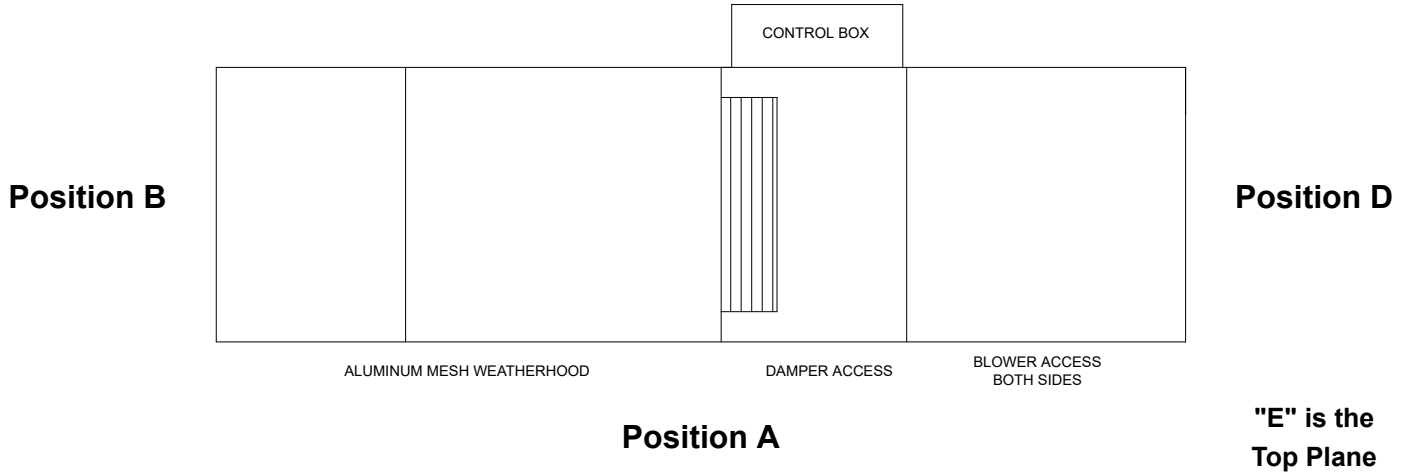
Pressure Drop (in. wg)							
Diffuser	Weatherhood	Filter	Damper	Cooling	Heating	External	Total
-	0.02	0.136	0.069	-	-	0.5	0.726

Sound Performance in Accordance with AMCA										
Sound Power by Octave Band								Lwa	dBA	Sones
62.5	125	250	500	1000	2000	4000	8000			
77	76	79	70	63	64	66	62	75	64	11.9

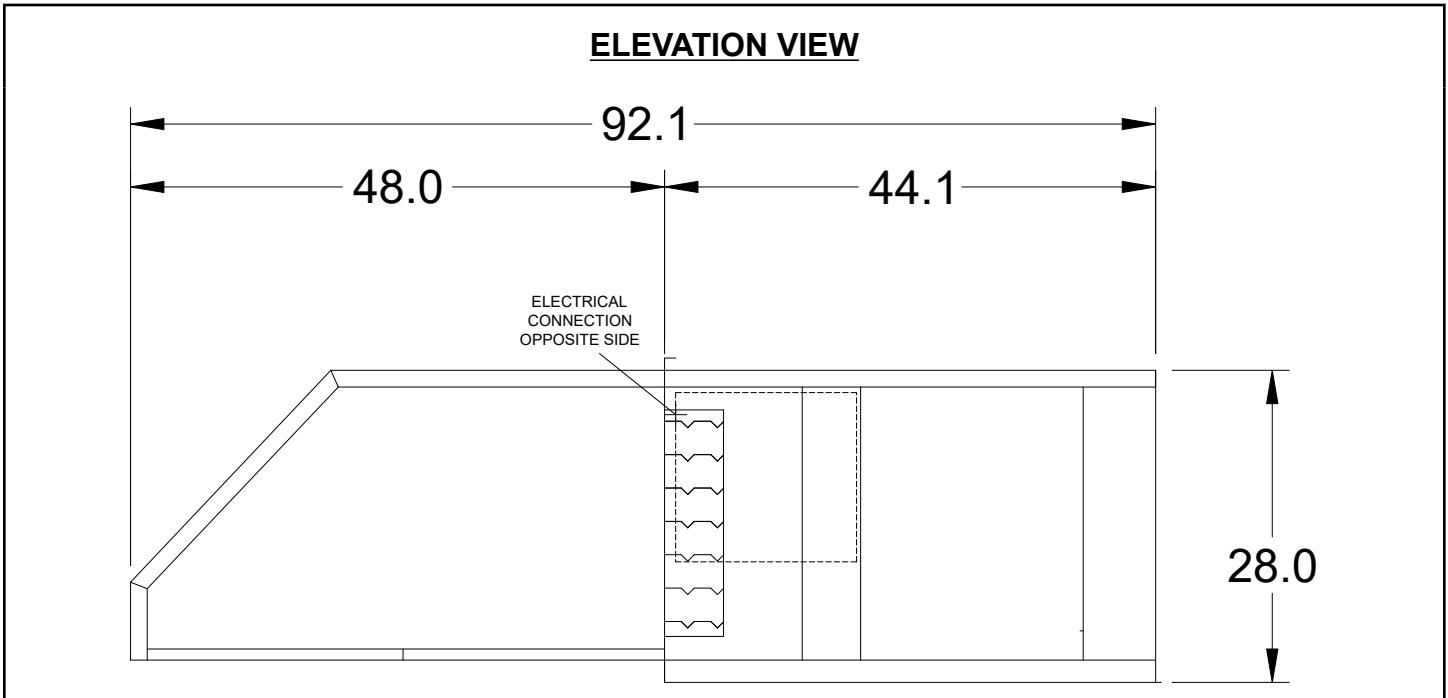


Radiated Sound

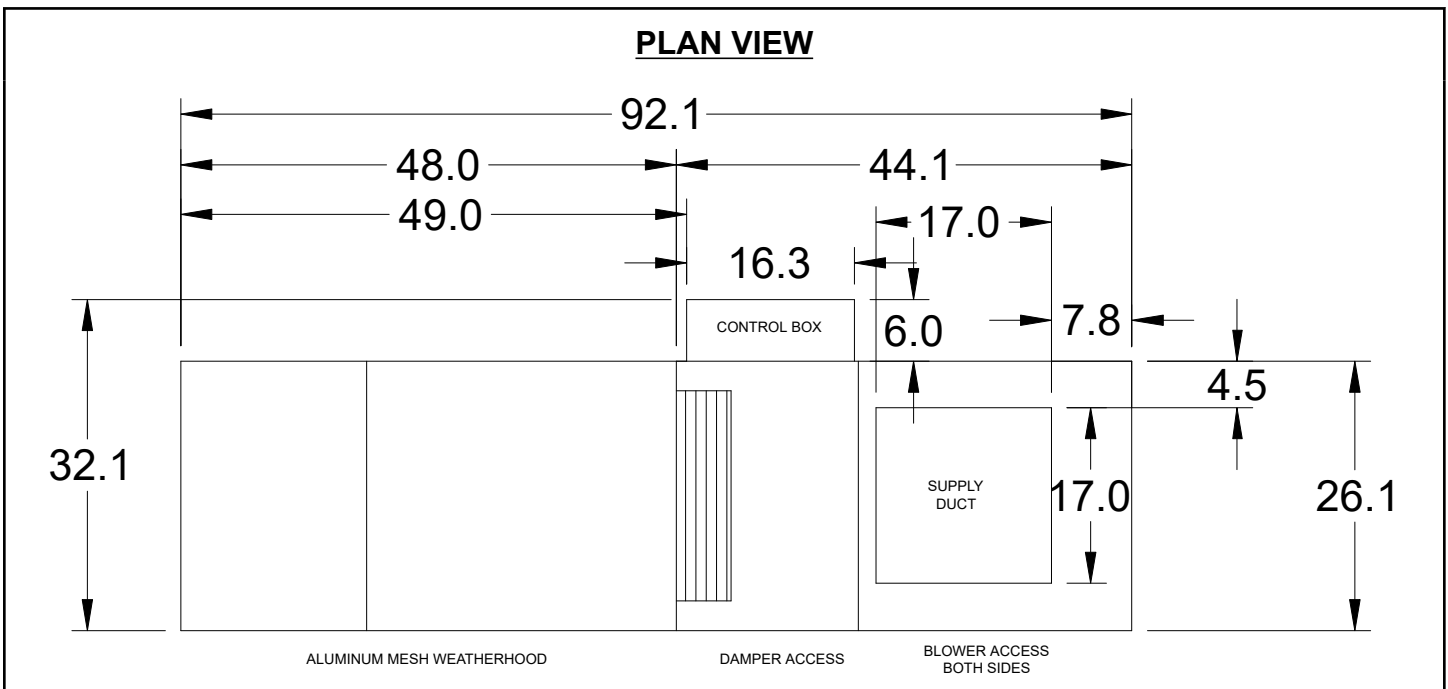
Position C



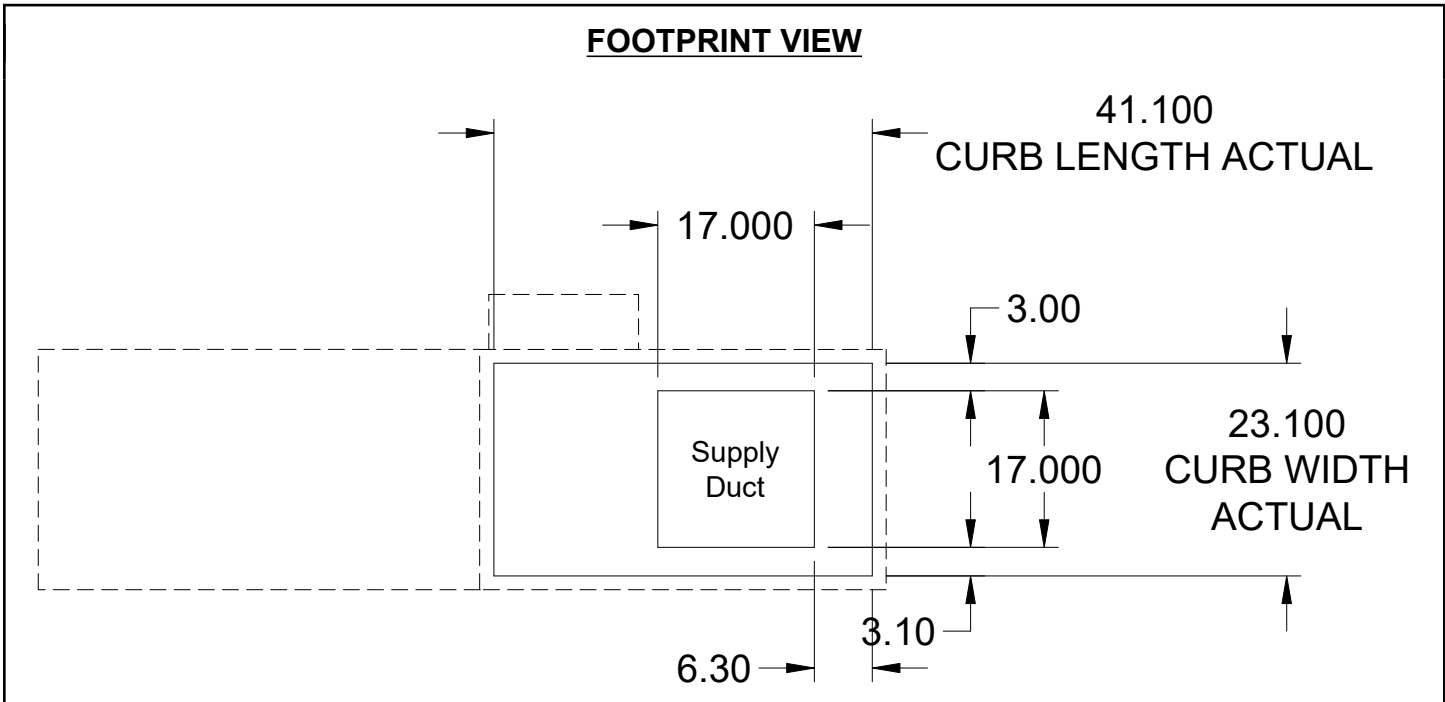
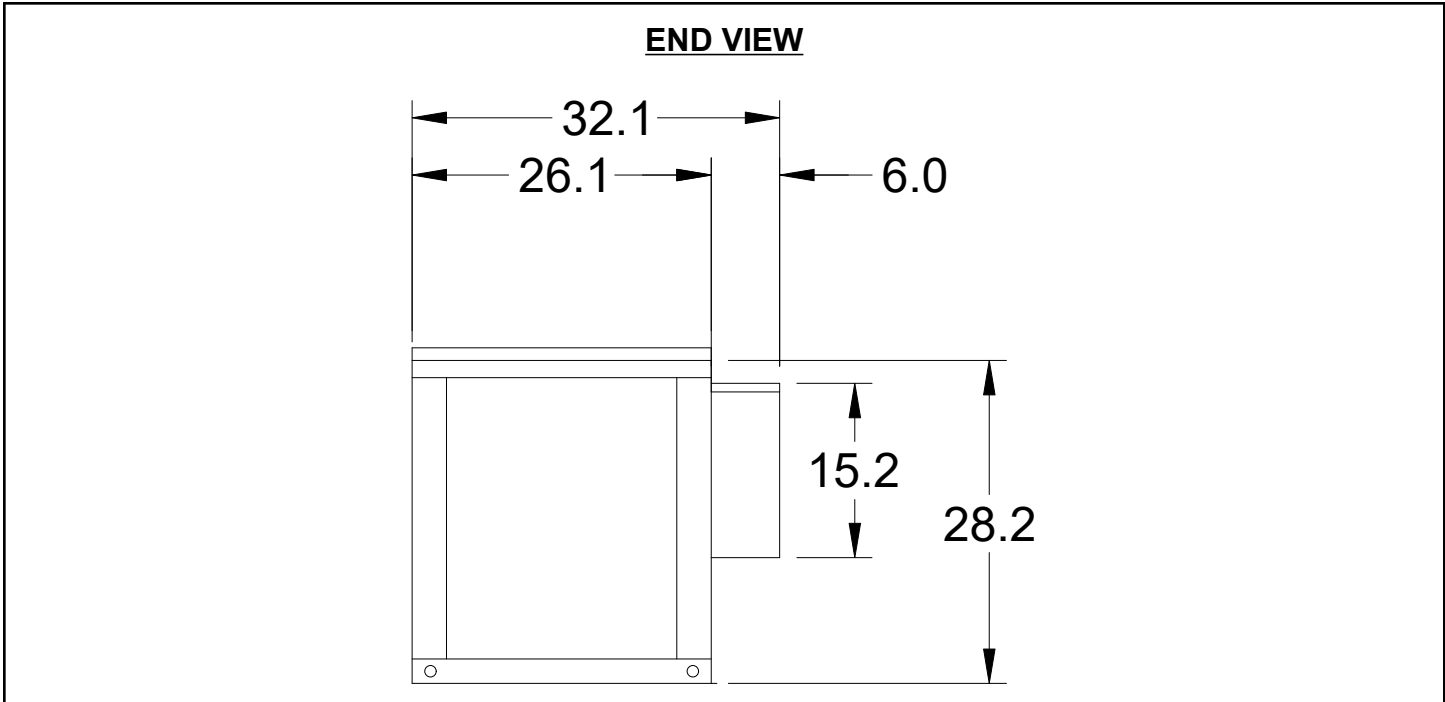
Radiated Sound Levels										
Plane	Octave Bands (Lw)								Plane Lw	Plane LwA
	1	2	3	4	5	6	7	8		
A	72	74	76	67	63	63	61	56	79	72
B	71	73	78	66	63	62	62	57	80	73
C	72	74	75	67	62	62	60	55	79	72
D	66	64	68	57	52	51	50	46	71	62
E	69	69	67	64	58	58	56	51	74	67
Total	77	79	81	73	68	68	66	62	85	77



Notes - Elevation View
Standard configuration for unit access is on the right-hand side, when looking into the unit intake in the direction of airflow.
Order of unit sections is from intake of unit to discharge of unit.
Sections included on this unit: Weatherhood Section, Filter Section, Blower Section



Notes - Plan View
Standard configuration for unit access is on the right-hand side, when looking into the unit intake in the direction of airflow.



Notes - Footprint View

Minimum Roof Opening: The minimum roof opening size is the illustrated duct diameter plus 0.25 in. on all sides. For example: If the duct size is 14 x 14 in. square, the minimum roof opening size is 14.5 x 14.5 in. square.

Maximum Roof Opening: There must be a minimum perimeter of 1.75 in. between the roof opening and the roof curb. For example: If the roof curb is 75 x 30 in. square, the maximum roof opening is 71.5 x 26.5 in. inches square.

The weatherhood and filter sections of the make-up air unit extend beyond the curb. This is by design, to prevent water infiltration.

Clearance Specifications

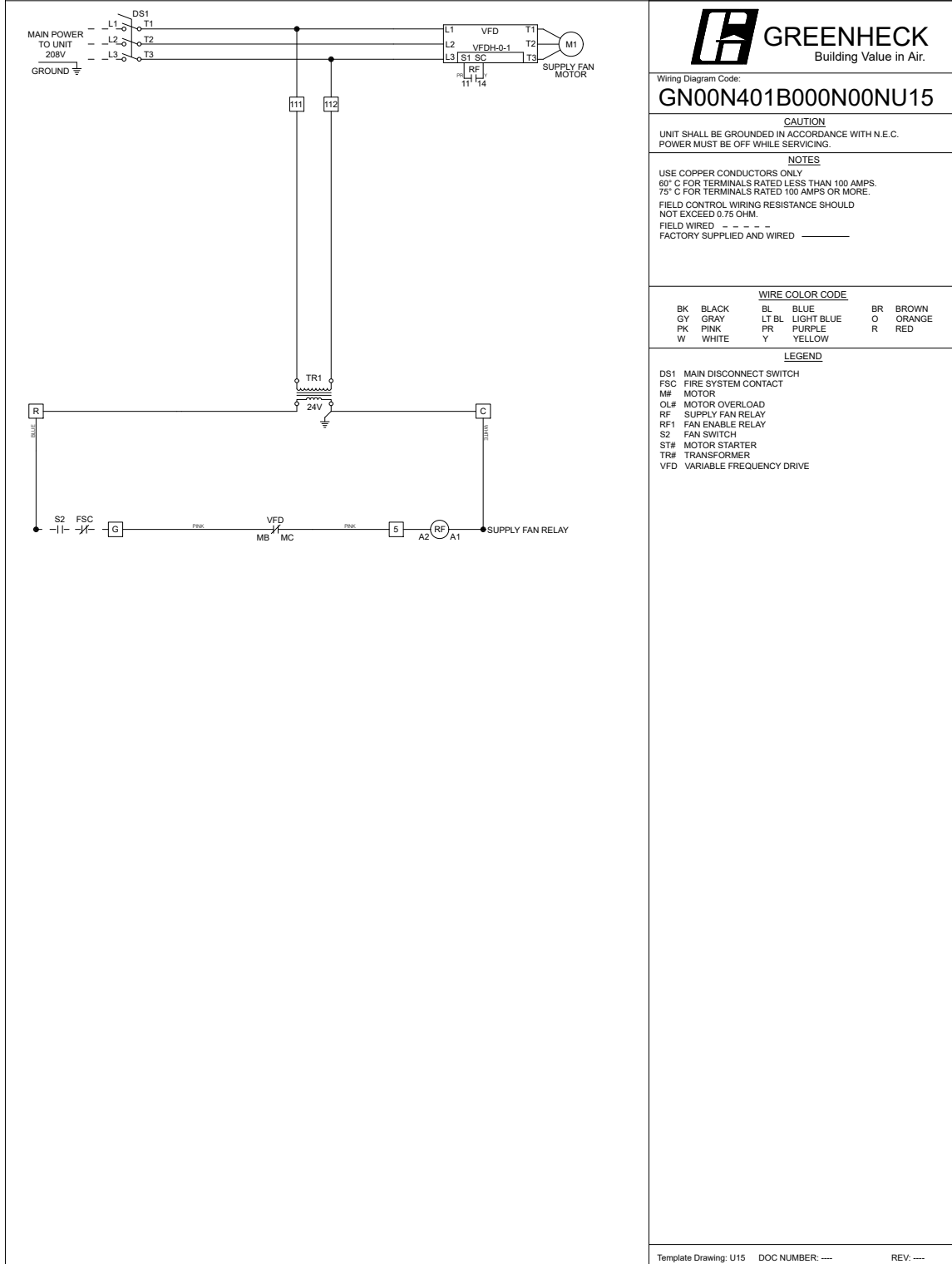
Recommended Minimum Combustible Clearances				
	Floor (in.)	Top (in.)	Sides (in.)	Ends (in.)
Insulated Units	0	0	0	0
Non-Insulated Units	0	6	6	6

Notes - Combustible Clearances
 Clearance to combustibles is defined as the minimum distance required between the heating source and the adjacent combustible surfaces to ensure the adjacent surface's temperature does not exceed 90 F above the ambient temperature.

Recommended Minimum Service Clearances	
Housing 32 and less (in.)	Housing 35 and higher (in.)
42 on the controls side of the unit	48 on the controls side of the unit

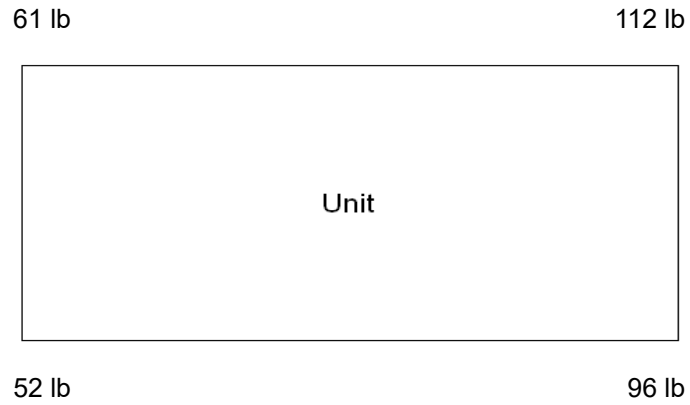
Notes - Service Clearances
 To ensure ample space for component removal (evaporative cooling media, coils, filters, etc.), service clearances should be 6 in. wider than the width of the module itself.

Wiring Diagram



Manufacturer reserves the right to change, modify, or improve this product at anytime

Corner Weights



Warranty Statement for Make-Up Air

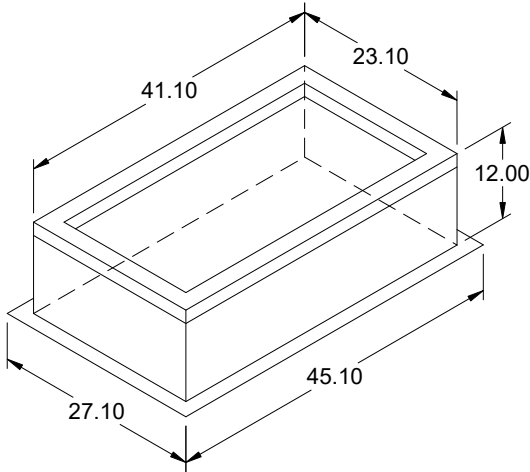
Unit Warranty

Greenheck warrants the equipment to be free from defects in material and workmanship for a period of 1 year (standard) from the shipment date.

Warranty Notes

Any component which proves defective during the warranty period will be repaired or replaced at Greenheck's sole option when returned to our factory, transportation prepaid. All warranties do not include labor costs associated with troubleshooting, removal, or installation. Greenheck will not be liable for any consequential, punitive, or incidental damages resulting from use, repair, or operation of any Greenheck product. These warranties are exclusive and are in lieu of all other warranties, whether written, oral, or implied, including the warranty of merchantability and the warranty of fitness for a particular purpose. No person (including any agent or salesperson) has authority to expand Seller's obligation beyond the terms of this warranty, or to state that the performance of the product is other than that published by Seller.

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.



Model: GPI

Roof Curb

Standard Construction Features:

- Roof Curb fits between the building roof and the fan mounted directly to the roof support structure - Constructed of either 18 ga galvanized steel or 0.064 in. aluminum - Straight Sided without a cant - 2 in. mounting flange - 3 lb density insulation - Height - Available from 12 in. to 42 in. as specified in 0.5 in. increments. Notes: - The maximum roof opening dimension should not be greater than the "Actual" top outside dimension minus 2 in.. - The minimum roof opening dimension should be at least 2.5 in. more than the damper dimension or recommended duct size. - The Roof Opening Dimension may or may not be the same as the Structural Opening Dimension. - Damper Tray is optional and must be specified. Tray size is same as damper size. - Security bars are optional and must be specified. Frames and gridwork are all 12 ga steel. Gridwork is welded to the frame and the frame is welded to the curb.

General

Tag	Qty	Model	Sizing Method	Undersizing (in.)	Weight (lb)	Shipped Assembled	Union Label
	1	GPI-24.6 x 42.6	Nominal	1.5	32	Yes	No Preference

Dimensions

Curb Height (in.)	Nominal Outside Width (in.)	Nominal Outside Length (in.)	Actual Outside Width (in.)	Actual Outside Length (in.)	Flange Width (in.)	Flange Length (in.)
12	24.6	42.6	23.1	41.1	27.1	45.1

Accessories

Material	Security Bars	Liner	Insulation (in.)	Insulation R Value
Galvanized	No	No	1	R4.3

Installation, Operation and Maintenance Manuals

Job Title: Palo Verde CDC

Elevation: (ft) 33

Date: 7/15/2022

Submitted By:

GREENHECK ENGINEER ACCOUNT USA
100 GREENHECK DR
SCHOFIELD, WI 54476
US

Phone: (715)355-6463

Fax: (715)355-2399

Email Address:



P.O. Box 410 Schofield, WI 54476 (715) 359-6171 FAX (715) 355-2399 www.greenheck.com

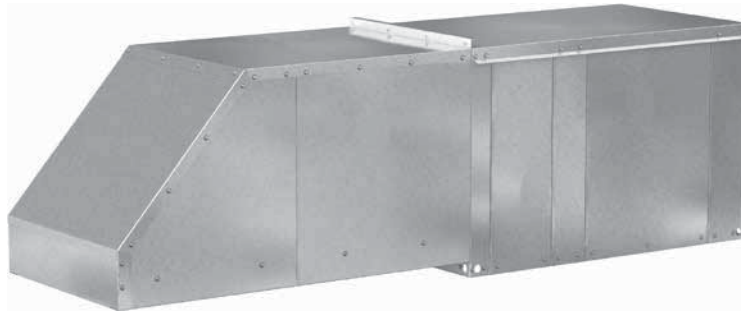
Job Name: Palo Verde CDC

Product IOMs

Mark Name	Model Name
MUA-1	MSF
MUA-1	GPI (No IOMs)

Installation, Operation and Maintenance Manual

Please read and save these instructions for future reference. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with these instructions will result in voiding of the product warranty and may result in personal injury and/or property damage.



General Safety Information

Only qualified personnel should install this unit. Personnel should have a clear understanding of these instructions and should be aware of general safety precautions. Improper installation can result in electric shock, possible injury due to coming in contact with moving parts, as well as other potential hazards. Other considerations may be required if high winds or seismic activity are present. If more information is needed, contact a licensed professional engineer before moving forward.

1. Follow all local electrical and safety codes, as well as the National Electrical Code (NEC), the National Fire Protection Agency (NFPA), where applicable. Follow the Canadian Electrical Code (CEC) in Canada.
2. The rotation of the wheel is critical. It must be free to rotate without striking or rubbing any stationary objects.
3. Motor must be securely and adequately grounded.
4. Do not spin fan wheel faster than the maximum cataloged fan rpm. Adjustments to fan speed significantly affects motor load. If the fan RPM is changed, the motor current should be checked to make sure it is not exceeding the motor nameplate amps.
5. Do not allow the power cable to kink or come in contact with oil, grease, hot surfaces, or chemicals. Replace cord immediately if damaged.
6. Verify that the power source is compatible with the equipment.
7. Never open blower access doors while the fan is running.

DANGER

Always disconnect power before working on or near a unit. Use appropriate lockout tagout procedures to prevent accidental power up.

CAUTION

When servicing the unit, motor may be hot enough to cause pain or injury. Allow motor to cool before servicing.

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

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Our Commitment Backcover



General

Receiving

This product may have been subject to road salt during transit. If so, immediately wash off all visible white residue from all exterior surfaces. Upon receiving the product, check to ensure all line items are accounted for by referencing the delivery receipt or packing list. Inspect each crate or carton for shipping damage before accepting delivery. Alert the carrier if any damage is detected, **do not refuse shipment**. The customer shall make notation of damage (or shortage of items) on the delivery receipt and all copies of the bill of lading should be countersigned by the delivering carrier. If damaged, immediately contact your manufacturer's representative. Any physical damage to the unit after acceptance is not the responsibility of the manufacturer.

Handling

Units are to be rigged and moved by the lifting brackets provided or by the skid when a forklift is used. Location of brackets varies by model and size. Handle in such a manner as to keep from scratching or chipping the coating. Damaged finish may reduce ability of unit to resist corrosion.

Unpacking

Verify that all required parts and the correct quantity of each item have been received. If any items are missing, report shortages to your local representative to arrange for obtaining missing parts. Sometimes it is not possible that all items for the unit be shipped together due to availability of transportation and truck space. Confirmation of shipment(s) must be limited to only items on the bill of lading.

Storage

Units are protected against damage during shipment. If the unit cannot be installed and operated immediately, precautions need to be taken to prevent deterioration of the unit during storage. The user assumes responsibility of the unit and accessories while in storage. The manufacturer will not be responsible for damage during storage. These suggestions are provided solely as a convenience to the user.

The ideal environment for the storage of units and accessories is indoors, above grade, in a low humidity atmosphere which is sealed to prevent the entry of blowing dust, rain, or snow. Units designed for outdoor applications may be stored outdoors. All accessories must be stored indoors in a clean, dry atmosphere.

Indoor

Maintain temperatures evenly to prevent condensation. Remove any accumulations of dirt, water, ice, or snow and wipe dry before moving to indoor storage. To avoid condensation, allow cold parts to reach room

temperature. Leave coverings loose to permit air circulation and to allow for periodic inspection.

The unit should be stored at least 3½ in. (89 mm) off the floor. Clearance should be provided to permit air circulation and space for inspection.

Outdoor

The fan should be placed on a level surface to prevent water from leaking into the unit. The unit should be elevated so that it is above water and snow levels. Ensure sufficient support to prevent unit from settling into soft ground. Locate parts far enough apart to permit air circulation, sunlight, and space for periodic inspection. To minimize water accumulation, place all unit parts on blocking supports so that rain water will run off.

Do not cover parts with plastic film or tarps as these cause condensation of moisture from the air passing through heating and cooling cycles.

Inspection and Maintenance

While in storage, inspect fans once per month. Keep a record of inspection and maintenance performed.

If moisture or dirt accumulations are found on parts, the source should be located and eliminated. At each inspection, rotate the fan wheel by hand ten to fifteen revolutions to distribute lubricant on motor. If paint deterioration begins, consideration should be given to touch-up or repainting. Fans with special coatings may require special techniques for touch-up or repair.

Machined parts coated with rust preventive should be restored to good condition promptly if signs of rust occur. Immediately remove the original rust preventive coating with petroleum solvent and clean with lint-free cloths. Polish any remaining rust from surface with crocus cloth or fine emery paper and oil. Do not destroy the continuity of the surfaces. Wipe thoroughly clean with Tectyl® 506 (Ashland Inc.) or the equivalent. For hard to reach internal surfaces or for occasional use, consider using Tectyl® 511M Rust Preventive, WD-40® or the equivalent.

Removing from Storage

As units are removed from storage to be installed in their final location, they should be protected and maintained in a similar fashion, until the equipment goes into operation.

Prior to installing the unit and system components, inspect the unit assembly to make sure it is in working order.

1. Check all fasteners, set screws on the fan, wheel, bearings, drive, motor base, and accessories for tightness.
2. Rotate the fan wheel(s) by hand and assure no parts are rubbing.

Installation

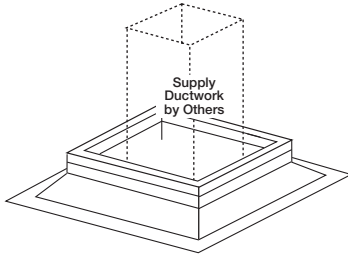
Outdoor Unit Mounting

Standard Curb

1. Install Curb

Position curb on the roof (reference the CAPS submittal for placement in relation to the unit). Verify that unit is level, shim if necessary. Attach curb to roof and flash into place using appropriate methods.

2. Install Ductwork



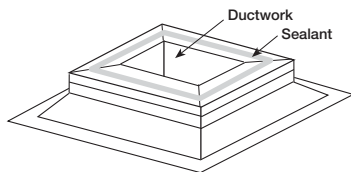
Good duct practices should be followed for all ductwork. All ductwork should be installed in accordance with SMACNA and AMCA guidelines, NFPA 96 and all local codes. Reference the CAPS submittal for ductwork sizes.

The use of a duct adapter is recommended on a downblast (DB) arrangement to align the ductwork with the supply unit. The duct adapter is only a guide and is not to be used as a support for the ductwork.

Model	Duct Size
MSF-P113-H10	13x13
MSF-P115-H20	15x15
MSF-P117-H30	17x17

3. Apply Sealant

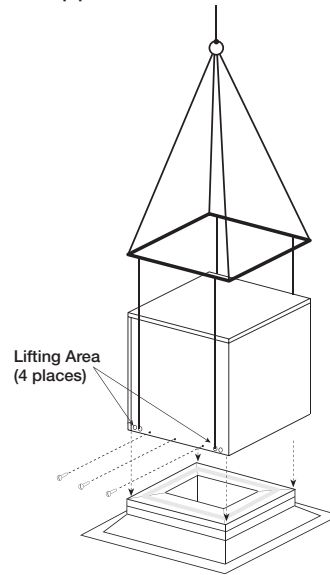
Apply an appropriate sealant around the perimeter of the curb and duct adapter(s) to isolate fan vibration and prevent water penetration.



4. Install Unit

Use a crane and a set of spreader bars hooked to the factory lifting lugs to lift and center the unit on the curb. The use of all lifting lugs and a set of spreader bars is mandatory when lifting the unit.

Fasten the unit to the curb using appropriate methods. The installer is responsible for determining appropriate support and fastening methods to ensure compliance with all applicable codes.

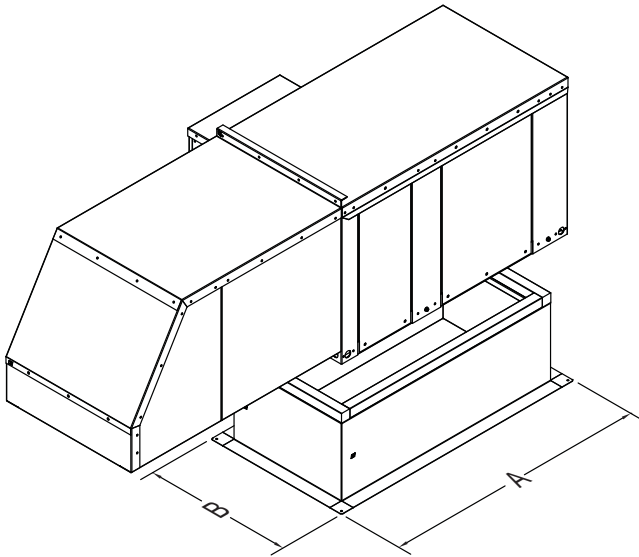


Installation

High Wind Applications

Curb to Deck Mounting

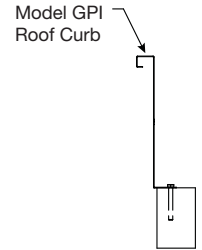
Fasteners need to be located on all four sides of the curb.



Timber Anchoring

3/8 inch Galvanized Lag Bolts
Min. 2-5/16 inch thread penetration
See table for quantity

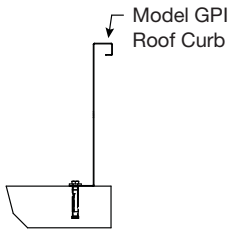
Wood Timber
Min. 4 inch Nom. Thickness
Min. G = 0.42



Min. Edge Distance: 1-1/2 inch

Model	No. of fasteners per side		Total
	A	B	
MSF-10	8	4	24
MSF-20	7	4	22
MSF-30	8	5	26

Concrete Deck Anchoring



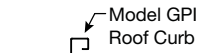
2500 Min. PSI
Concrete

3/8 inch SS Hilti Kwik Bolt TZ
Expansion Anchors
Min. 2-5/16 inch engagement
See table for quantity

Min. Edge Distance: 3 inches

Model	No. of fasteners per side		Total
	A	B	
MSF-10	5	2	14
MSF-20	5	3	16
MSF-30	6	3	18

Steel Deck Anchoring



1/4 inch-14 Self-Drilling Screw
Min. 3 inch thread engagement
See table for quantity
Min. Edge Distance: 3/4 inch

Roof Truss
1/8 inch thick or 12 ga. minimum

Model	No. of fasteners per side		Total
	A	B	
MSF-10	5	2	14
MSF-20	5	3	16
MSF-30	6	3	18

Installation

High Wind Applications

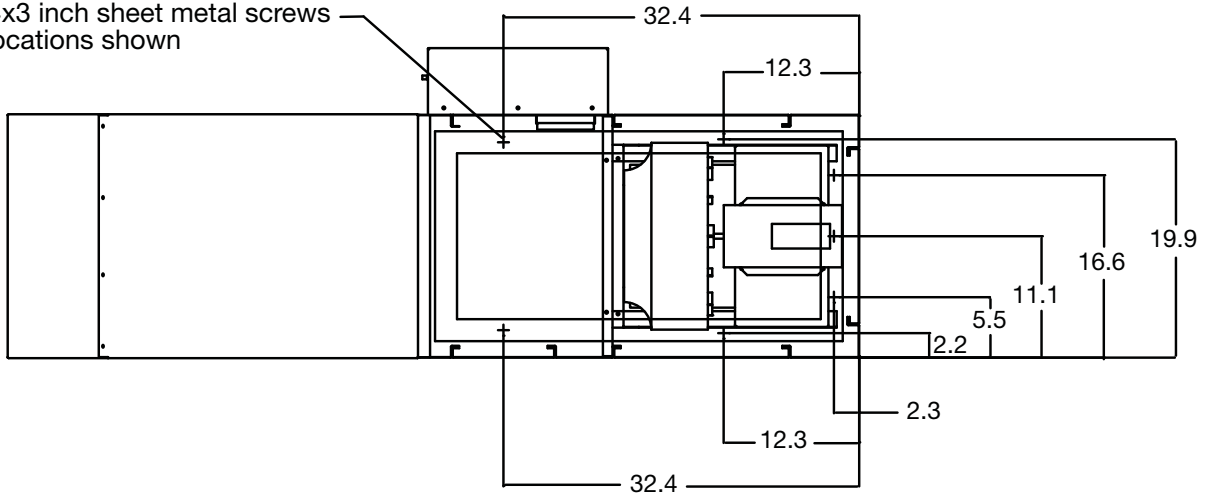
Unit to Curb Mounting for MSF-10

#14x3 inch sheet metal screws are to be installed as indicated.

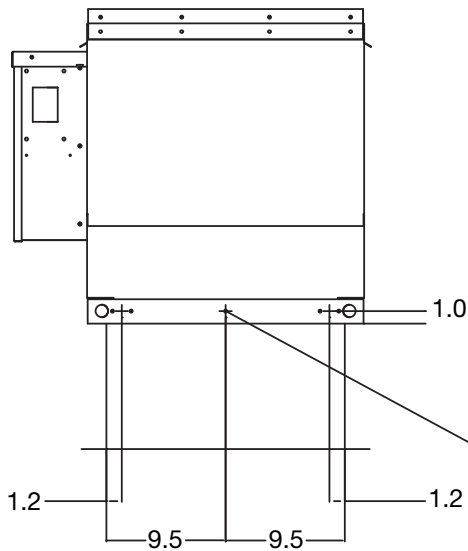
Unit to Curb Fastner Quantities				
Model	A	B	D	Bottom
MSF-10	3	2	2	7

TOP VIEW

(7) #14x3 inch sheet metal screws at locations shown



SIDE A VIEW



Remove sheet metal screw and replace with #14x3 inch sheet metal screws. Dimensions only for intake side.

All dimensions are shown in inches

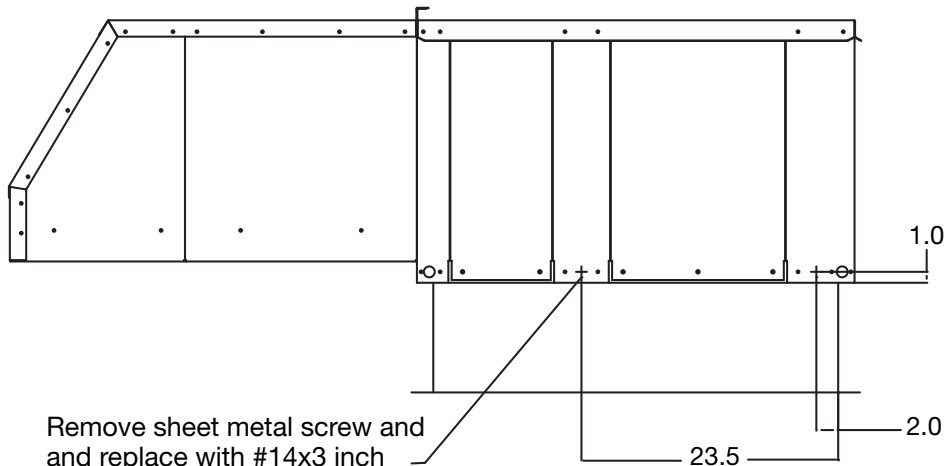


Installation

High Wind Applications

Curb to Deck Mounting for MSF-10

SIDE B VIEW

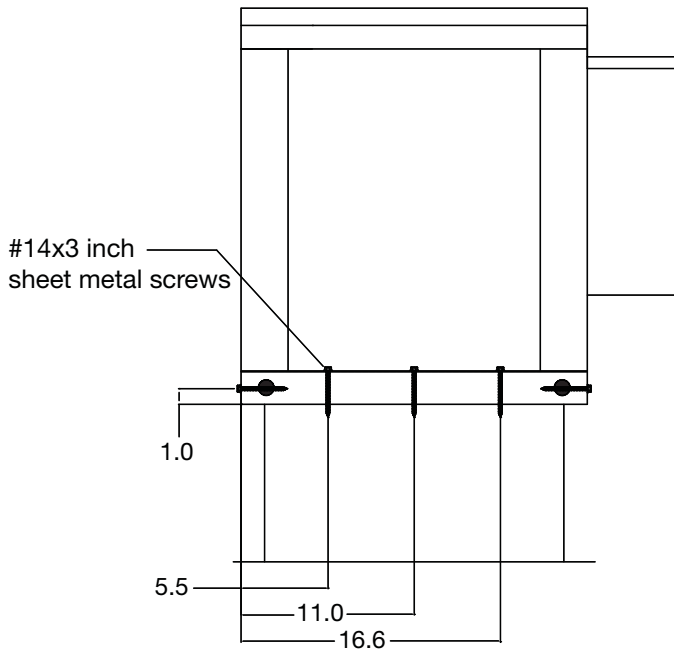


Remove sheet metal screw and replace with #14x3 inch sheet metal screws.

Dimensions typical on both sides for long side only

SIDE C VIEW

Fastener Attachment Detail



All dimensions are shown in inches



Installation

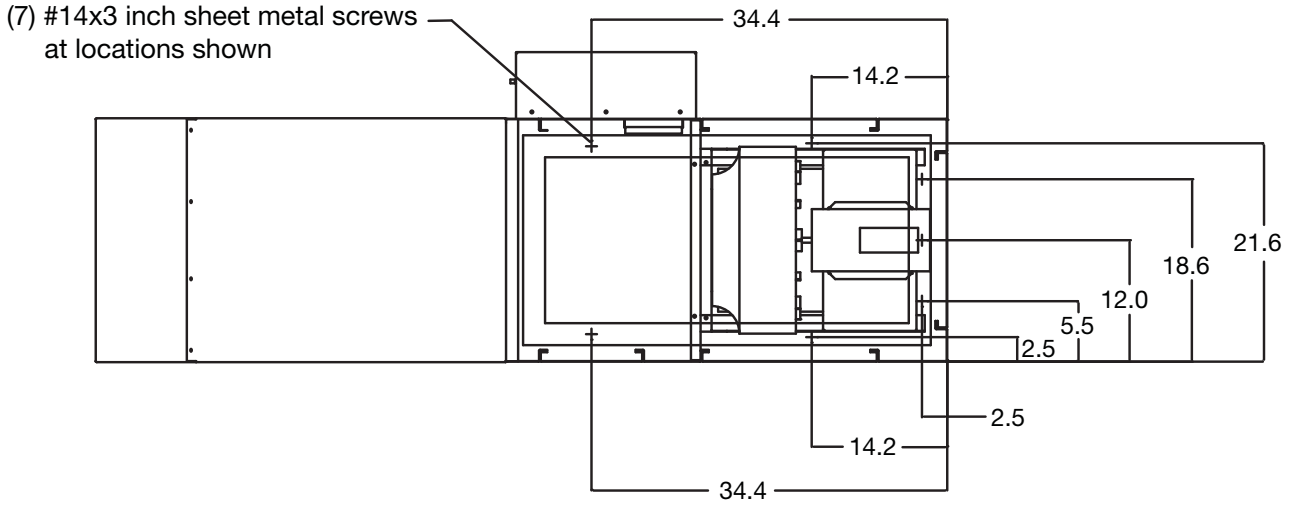
High Wind Applications

Unit to Curb Mounting for MSF-20

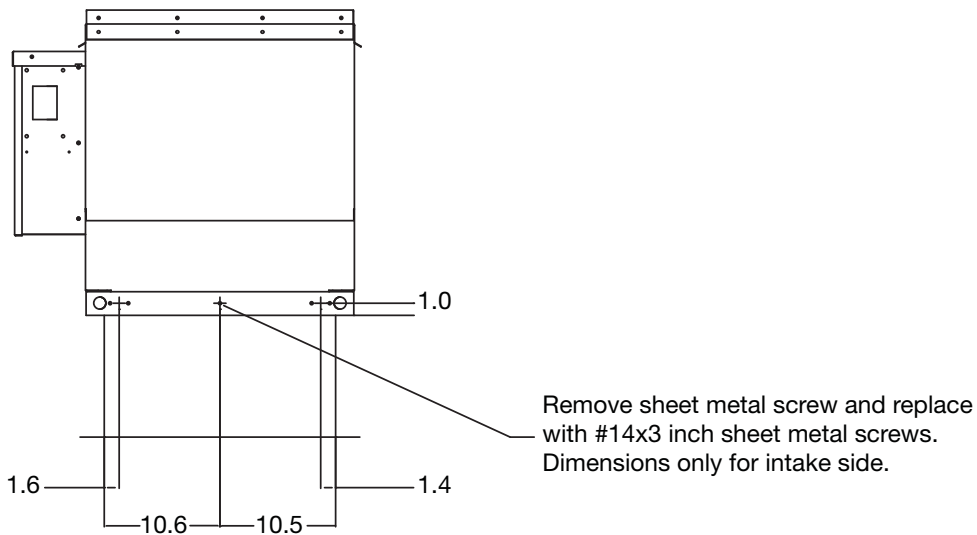
#14x3 inch sheet metal screws are to be installed as indicated.

Unit to Curb Fastner Quantities				
Model	A	B	D	Bottom
MSF-20	3	2	2	7

TOP VIEW



SIDE A VIEW



All dimensions are shown in inches

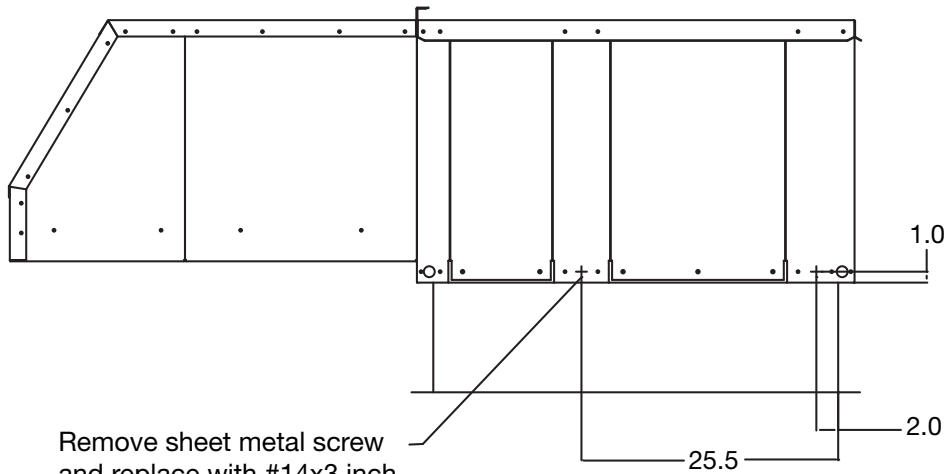


Installation

High Wind Applications

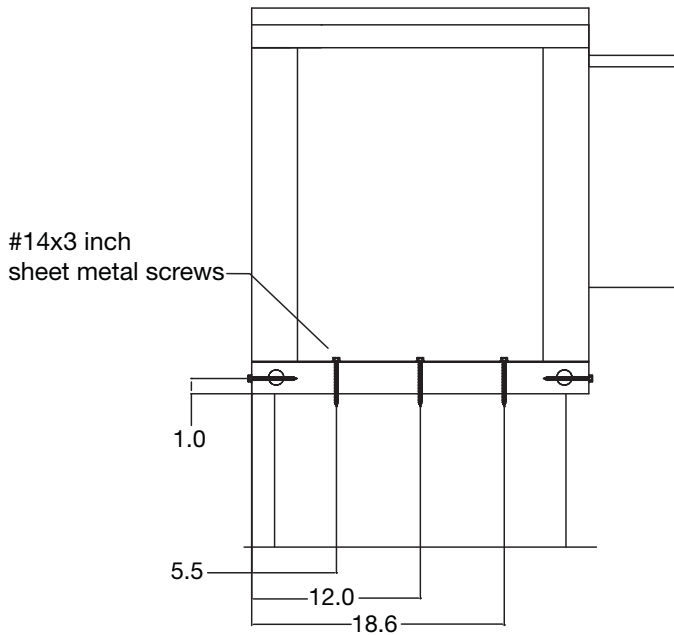
Curb to Deck Mounting for MSF-20

SIDE B VIEW



Dimensions typical on both sides for long side only

SIDE C VIEW
Fastener Attachment Detail



All dimensions are shown in inches



Installation

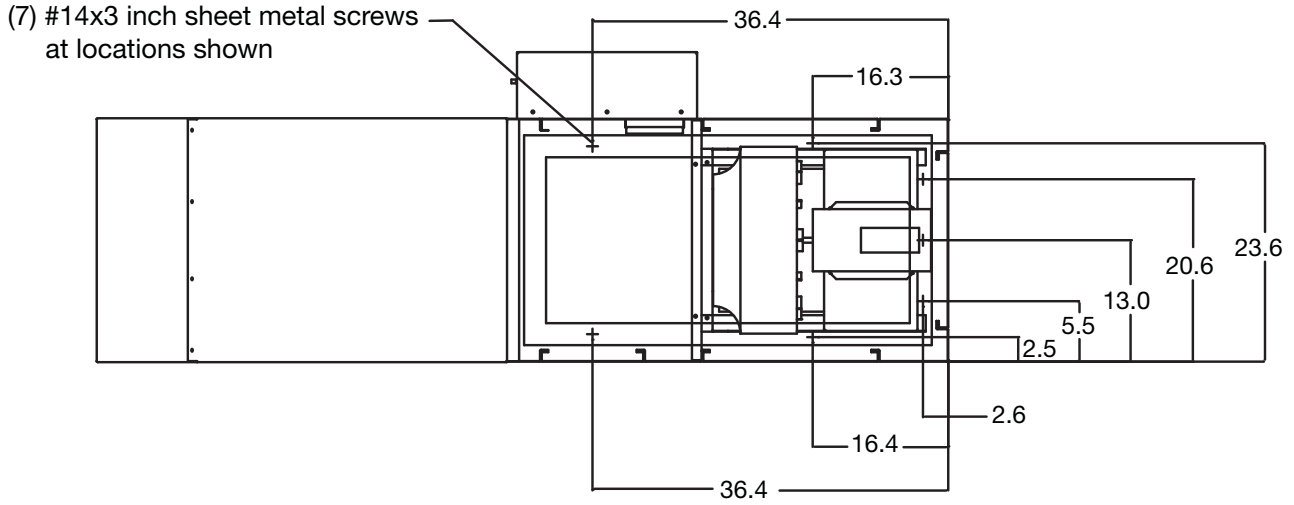
High Wind Applications

Unit to Curb Mounting for MSF-30

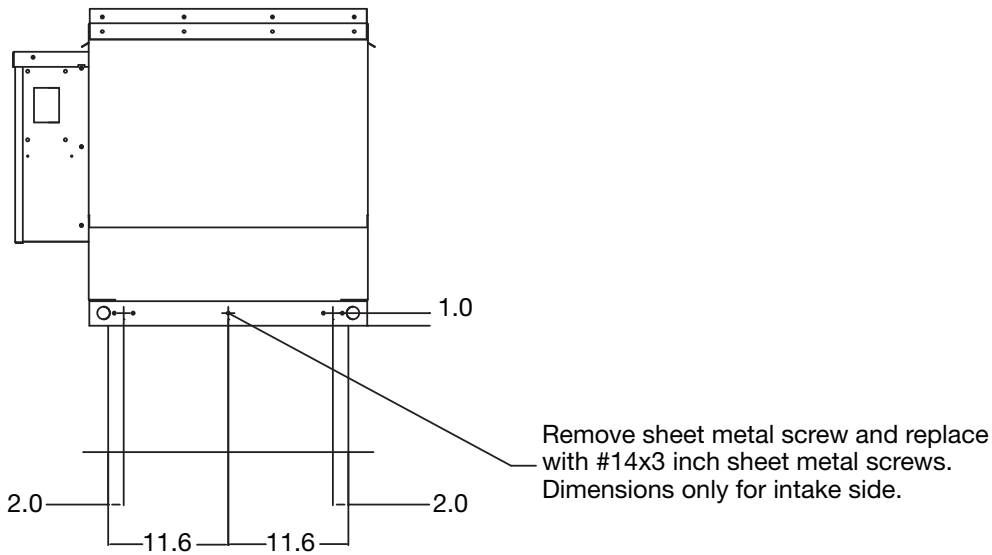
#14x3 inch sheet metal screws are to be installed as indicated.

Unit to Curb Fastner Quantities				
Model	A	B	D	Bottom
MSF-30	3	2	2	7

TOP VIEW



SIDE A VIEW



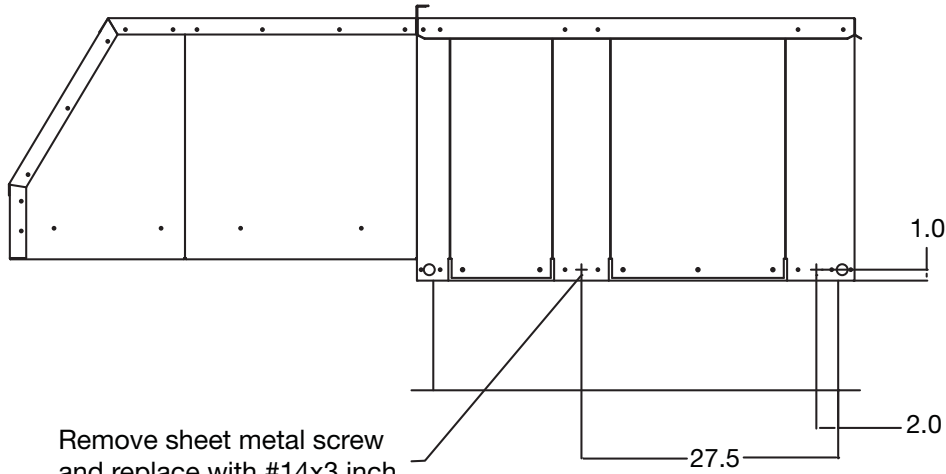
All dimensions are shown in inches

Installation

High Wind Applications

Curb to Deck Mounting for MSF-30

SIDE B VIEW

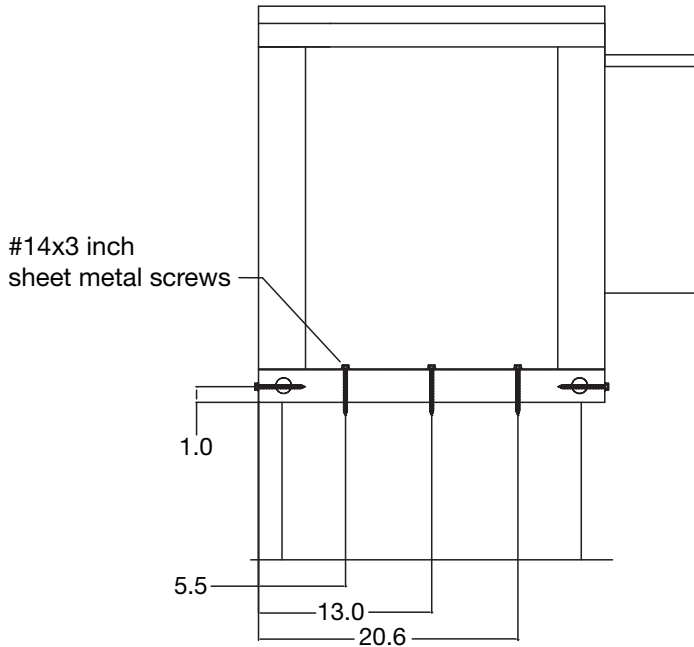


Remove sheet metal screw and replace with #14x3 inch sheet metal screws.

Dimensions typical on both sides for long side only

SIDE C VIEW

Fastener Attachment Detail



All dimensions are shown in inches



Installation

Electrical Wiring

Before connecting power to the unit, read and understand the following instructions and wiring diagrams. Complete wiring diagrams are attached on the inside of the control center door(s).

All wiring should be done in accordance with the latest edition of the National Electric Code ANSI/NFPA 70 and any local codes that may apply. In Canada, wiring should be done in accordance with the Canadian Electrical Code.

The equipment must be properly grounded. Any wiring running through the unit in the airstream must be protected by metal conduit, metal clad cable or raceways.

If replacement wire is required, it must have a temperature rating of at least 105°C.

High voltage electrical input is needed for this equipment. This work should be performed by a qualified electrician.

Any wiring deviations may result in personal injury or property damage. Manufacturer is not responsible for any damage to, or failure of the unit caused by incorrect final wiring.

Manufacturer's standard control voltage is 24 VAC. Control wire resistance should not exceed 0.75 ohms (approximately 285 feet total length for 14 gauge wire; 455 feet total length for 12 gauge wire). If the resistance exceeds 0.75 ohms, an industrial-style plug-in relay should be wired in place of the remote switch. The relay must be rated for at least 5 amps and have a 24 VAC coil. Failure to comply with these guidelines may cause motor starters to chatter or not pull in, resulting in contactor failures and/or motor failures.

Optional Exhaust Fan Starter

1. Verify Exhaust Fan Compatibility

Compare the voltage, frequency, and phase on the unit label with the exhaust fan label. Additionally, compare the exhaust HP on the unit label with the exhaust fan label. The unit has been sized to provide power for the exhaust fan and all values must match.

2. Determine the Size of the Exhaust Fan Power Lines

Size the exhaust fan power lines appropriately per the exhaust fan voltage, and amps.

3. Connect power to the Exhaust Fan

Connect the power lines to the exhaust fan disconnect switch. The electrical supply line must conform to local and national electrical codes. Electrical wires must be located so as not to rub on moving components.

Line Voltage

1. Determine the Size of the Main Power Lines

The unit's nameplate states the voltage and the unit's MCA. The main power lines to the unit should be sized accordingly.

58310

CONFORMS TO UL STD 705
POWER VENTILATORS

VOLTS PHASE HZ

MCA MOP

SUPPLY MOTOR HP AMPS

SUPPLY MOTOR LOCKED ROTOR CODE

EXHAUST MOTOR#1 HP AMPS

EXHAUST MOTOR#2 HP AMPS

SUITABLE FOR OUTDOOR USE

FOR GENERAL VENTILATION USE ONLY

DO NOT USE TO EXHAUST DIRT, DUST, GREASE
OR LINT-LADEN AIR

695066

2. Install Solid State Speed Controller

If the unit was supplied with a ship loose solid state speed controller, it must be installed to control the fan RPM.

NOTE: Units with VG or VFD in the model name or a unit with a control center do not require a field installed solid state speed controller.

3. Connect the Main Power

Connect the main power lines to the disconnect switch. The electrical supply must be compatible with the fan motor in regards to voltage, phase, and amperage capacity. Moreover, the electrical supply line must be properly fused and conform to local and national electrical codes. Electrical wires must be located so as not to rub on moving components.

NOTE: If fan motor is not thermally protected, remote overload protection must be installed having the adequate rating as to voltage, frequency horsepower, and full load current per phase.

Pre-Start-Up

Checklist

Tool List

- Voltage Meter (with wire probes)
- Amperage Meter
- Tachometer

WARNING

Disconnect and lock-out all power and gas before performing any maintenance or service to the unit. Failure to do so could result in serious injury or death and damage to equipment.

WARNING

Check the housing, blower, and ductwork for any foreign objects before running the blower.

Motor Identification

Check the metal nameplate located near the disconnect for the model number.

Suffix of the model number will identify the motor type that is referenced in the *Start-Up, Checklist, Start-Up Checklist* sections:

- MSF-P1##-H## (no suffix) - refer to PSC motor with solid state speed control
- MSF-P1##-H##-VG - refer to Vari-Green® motor
- MSF-P1##-H##-VFD - refers to Variable Frequency Drive (VFD) controlled motor

Pre-Start-Up Checklist

1. Check Fasteners for Tightness

Check fasteners, set screws and locking collars on the fan, motor base and accessories for tightness.

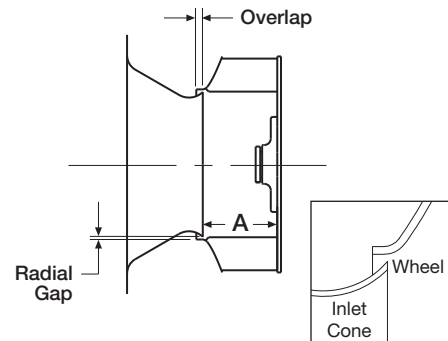
2. Check the Voltage

Before starting the unit, compare the supplied voltage, hertz and phase with the unit and motor nameplate information.

3. Check Wheel Overlap

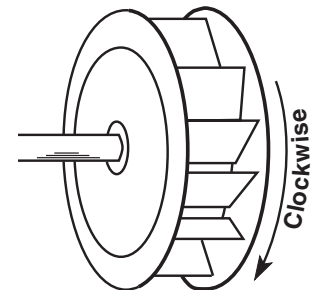
Wheel position is preset and the unit is tested at the factory. Movement may occur during shipment and realignment may be necessary. Wheel and inlet cone overlap can be adjusted by loosening the setscrews in the wheel and moving the wheel to the desired position.

Model	Overlap
MSF-P113-H10	1/4 in.
MSF-P115-H20	
MSF-P117-H30	



4. Wheel Rotation

Rotate the wheel by hand and make sure the wheel does not rub on any parts. Verify wheel rotation by momentarily energizing the unit. Rotation should be clockwise as shown below and correspond to the rotation decal on the unit.



- Motor Type _____
- Check fastener tightness
- Check Supply Voltage L1 - L2 _____ Amps
L2 - L3 _____ Amps
L1 - L3 _____ Amps
- Check Wheel Overlap
- Wheel Rotation

Start-Up

Checklist

Start-Up Checklist

1. Set Fan and Motor RPM

Motors with either solid state speed control or Vari-Green motor must be field balanced to the design fan RPM.

PSC Motor with Solid State Speed Control (MSF-P1XX-HXX)

To adjust the speed of a motor with solid state speed control, adjust the speed controller dial until the fan is at its design fan RPM. The speed controller is shipped loose on units without a control center and is factory mounted and wired on units with a control center.

Vari-Green® Motor (MSF-P1XX-HXX-VG)

To adjust the speed of a Vari-Green motor, adjust the built-in potentiometer on the motor. To increase the speed, rotate the dial clockwise. To decrease the speed, rotate the dial counterclockwise.

VFD Controlled Motor (MSF-P1XX-HXX-VFD)

The VFD will be factory programmed for the design fan RPM. If VFD adjustments are required, please see the Variable Frequency Drive section for additional information.

2. Check for Vibration

Check for unusual noise or vibration. Excessive vibration may be experienced during initial start-up. Left unchecked, it can cause a multitude of problems, including structural and/or component failure.

Generally, fan vibration and noise is transmitted to other parts of the building by the ductwork. To minimize this undesirable effect, the use of heavy canvas connectors is recommended.

3. Motor Check

Measure the motor's voltage and amps. Compare to the specifications. Motor amps can be reduced by lowering the fan and motor RPM

4. Air Volume Measurement and Check

Measure the unit's air volume (cfm) and compare it with its rated air volume. If air volume does not match the rated air volume, adjust the fan and motor RPM as necessary. The most accurate method for measuring the air volume is a pitot traverse method downstream of the blower. Other methods can be used, but should be proven and accurate.

Unit Model Number _____
(e.g. MSF-P113-H10)

Unit Serial Number _____
(e.g. 10111000)

Start-Up Date _____

Start-Up Personnel Name _____

Start-Up Company _____

Phone Number _____

Start-Up Blower Checklist

- Check line voltage L1-L2 _____
L2-L3 _____
L1-L3 _____
- Check blower rotation
- Check for vibration
- Supply fan RPM _____ RPM
- Motor nameplate amps _____ Amps
- Actual motor L1 _____ Amps
L2 _____ Amps
L3 _____ Amps
- Actual CFM delivered _____ CFM



Maintenance

General

Filters

Filter maintenance is generally limited to cleaning and replacement.

If aluminum mesh filters are installed, they can be washed in warm soapy water.

An adhesive spray can be added to aluminum mesh filters to increase their efficiency.

If disposable filters are installed, they can be checked by holding up to a light source. If light cannot pass through the filter, it should be replaced.

When reinstalling filters, be sure to install them with the airflow in the correct direction. An airflow direction arrow is located on the side of the filters.

Replacement filters should be from the same manufacturer and the same size as the original filters provided with the unit.

Model	Filter Size	Filter Qty
MSF-H10	19x19x1	2
MSF-H20	21x21x1	2
MSF-H30	24x24x1	2

Fan Wheels

Wheels require little attention when moving clean air. Occasionally, oil and dust may accumulate on the wheel causing imbalance. When this occurs, the wheel and housing should be cleaned to assure proper operation.

Motors

Motor maintenance is generally limited to cleaning and lubrication (where applicable).

Cleaning should be limited to exterior surfaces only. Removing dust and grease build-up on the motor assures proper motor cooling.

Motors supplied with grease fittings should be greased in accordance with the manufacturer's recommendations.

Do not allow water or solvents to enter the motor or bearings. Motors and bearings should never be sprayed with steam, water or solvents.

Greasing motors is only intended when fittings are provided. Many motors are permanently lubricated, requiring no additional lubrication.

Vari-Green® Motor Features

The Vari-Green motor is an electronically commutated (EC) motor that uses AC input power and internally converts it to a DC power supply which provides built-in control of motor speed down to 20% of design RPM.

Soft Start

All motors feature soft start technology which eliminates inrush current at start-up. The motors will reliably start at any speed setting

Overload Protection

If the motor becomes overloaded, it will automatically reduce its speed until it is no longer overloaded. This means that the motor will never operate in the “service factor” which is possible with many AC motors. The motor and control are electrically protected with lightning surge protection.

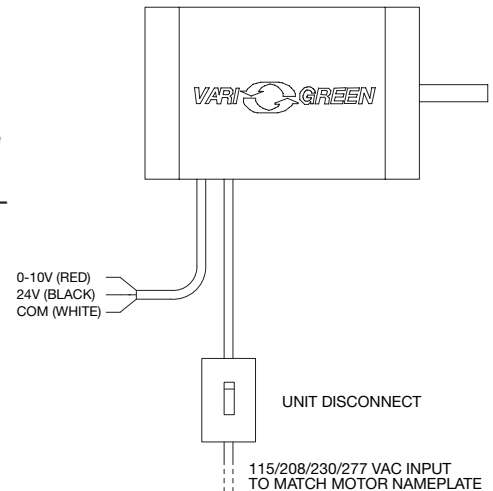
1/2 HP and 1 HP Motors

These motors have both a potentiometer dial on the motor for speed adjustment and the ability to accept a 0-10 VDC signal for remote speed control.

Electrical Wiring

The motor is prewired at the factory and cannot be changed inside the motor.

Connect single-phase power at the voltage listed on the nameplate. If remote control is desired, connect the 0-10 VDC and 24V signal for remote speed control.



Operation

There is a 4 second delay between the application of power and the motor starting. Motor speed is controlled as follows:

Dial on Motor

A small screwdriver can be used to make speed adjustments. To increase speed, rotate the dial clockwise. To decrease speed, rotate the dial counterclockwise. There is no need to connect the control wires.



0-10 VDC Signal

The dial on the motor will act as a maximum speed limiter. During start-up this should be adjusted for rated air volume.

24 VAC/DC power is required to control the motor with a 0-10 VDC signal. Without the 24 VAC/DC power the motor will be controlled by the dial on the motor. The motor will consume 0.7VA at 24 VAC or 25mA at 24 VDC.

From 0-1.9V the motor will be off. From 2-10V the motor will operate.

A low voltage wiring harness is needed to supply the 0-10V signal to the motor. This harness is available from the factory if conversion is necessary.

2 HP Motors

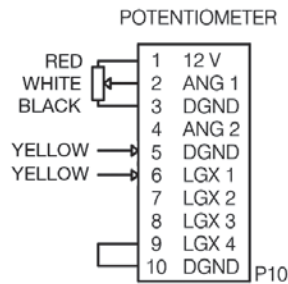
These motors have both a potentiometer dial on the motor for speed adjustment and the ability to accept a 0-10 VDC signal for remote speed control.

Electrical Wiring

All high and low voltage wiring connections are made inside the motor control box at the factory. Normally, there is no reason to enter the control box of the motor. If there is a need to enter the control box, disconnect power and wait at least five minutes to allow the capacitors to discharge.

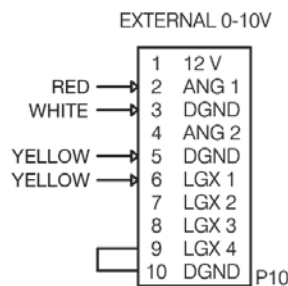
The motor is prewired at the factory and cannot be changed inside the motor. Connect single-phase power at the voltage listed on the nameplate. If remote control is desired, connect the 0-10 VDC signal for remote speed control. Inside the control motor control box wiring will be dependent on the selected operation:

Dial on Motor - the dial is factory-wired into the low voltage terminal block inside the control box. The wires are connected as shown.



Dial on motor connection inside control box

0-10 VDC Signal - a two-wire pigtail is factory-wired into the low voltage terminal block. The wires are connected as shown.



0-10 VDC signal connection inside control box

If the motor needs to be tested before the 0-10 VDC signal is available, a jumper can be placed between terminals 1 and 2. This will force the motor to run at full speed.

Operation

There will be up to a 30 second delay between the application of power and the motor starting. The motor will “rock” back and forth upon startup as part of its normal operation.

Dial on Motor

Turn the dial with your fingers to adjust. To increase the speed, rotate the dial clockwise. To decrease the speed, rotate the dial counterclockwise. Turning the dial fully counterclockwise will turn the motor off.



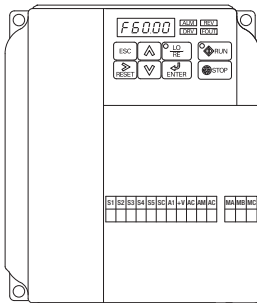
0-10 VDC signal

From 0-1.9V the motor will be off. From 2-10V the motor will operate. 10V will correspond to the nameplate motor RPM, regardless of the position of the dial on the motor.

Variable Frequency Drives (VFD)

VFD Features

The factory installed wired and programmed VFD is used to control the speed of the fan as either a constant speed, multi-speed or modulating speed control. A Yaskawa model J1000 VFD will be located in the unit control center. This section contains basic information on operation and changing VFD speed settings. For more detailed information including fault codes, see the Yaskawa VFD manual. For additional information on wiring please refer to the unit specific wiring diagram located inside the unit control center.



J1000

Changing the VFD Access Level

With factory default settings, the VFD will be configured to restrict access to the majority of the VFD parameters. To view or change any of these parameters, change the access level (A1-01) to 2. This will allow access to the all VFD parameters.

Operation

VFDs will be configured from the factory to operate in one of three modes:

Constant Speed

The VFD will control the motor to operate at constant speed. The VFD will run at Frequency Reference 1 (D1-01). The factory default setting is unit specific for design fan RPM.

Multi-Speed

Digital contact closures (by others) command the VFD to run at multiple speed settings:

- **Open** – VFD runs at frequency reference 1 (D1-01).
Factory default is unit specific for design fan RPM.
- **SC to S5** – VFD runs at frequency reference 3 (D1-03).
Factory default is unit specific for one-half design fan RPM.

Modulating

A 0-10 VDC signal wired in the field by others varies the speed of the fan. 10V results in design fan RPM and 0V results in one-half design fan RPM, per the factory default settings.

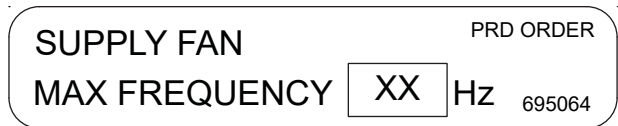
Changing VFD Speed Settings

Before making any changes, ensure the drive is stopped and the access level (A1-01) is set to 2.

Maximum and Minimum Frequency Limits

Maximum frequency will be indicated by a label on the unit.

Minimum recommended frequency is 18 Hz.



Constant Speed and Multi-Speed

Maximum speed – Change frequency reference 1 (D1-01) to the desired frequency. If the desired frequency is greater than 60Hz, adjust the max output frequency (E1-04) to the desired frequency first.

Minimum speed (multi-speed only) – Change frequency reference 3 (D1-03) to the desired frequency.

Modulating

Maximum Speed (Desired frequency ≥ 60 Hz) – Change the upper reference (D2-01) and the terminal A1 gain (H3-03) to 100%. Adjust the max output frequency (E1-04) to the desired frequency.

Maximum Speed (Desired frequency < 60 Hz) - Change the upper reference (D2-01) and the terminal A1 gain (H3-03) to desired % of 60 Hz (i.e. for 48 Hz set to 80%).

Minimum Speed – Change the lower reference (D2-02) and the terminal A1 bias (H3-04) to the desired % of 60 Hz (i.e. for 24 Hz set to 40%)

Reference

Maintenance Log

Date _____ Time _____ AM/PM

Notes: _____

Date _____ Time _____ AM/PM

Notes: _____

Date _____ Time _____ AM/PM

Notes: _____

Date _____ Time _____ AM/PM

Notes: _____

Date _____ Time _____ AM/PM

Notes: _____

Date _____ Time _____ AM/PM

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Date _____ Time _____ AM/PM

Notes: _____

Date _____ Time _____ AM/PM

Notes: _____

Date _____ Time _____ AM/PM

Notes: _____

Date _____ Time _____ AM/PM

Notes: _____

Our Commitment

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.

Product warranties can be found online at Greenheck.com, either on the specific product page or in the literature section of the website at Greenheck.com/Resources/Library/Literature.



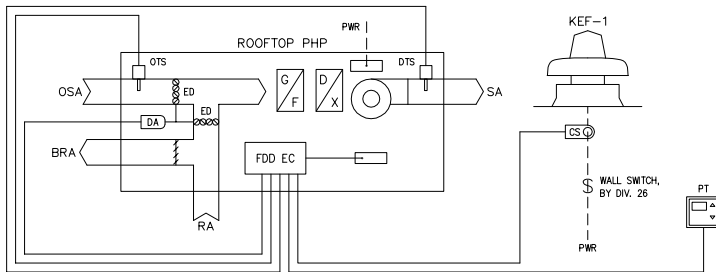
CONTROLS LEGEND	
SYMBOL	DESCRIPTION
PT	"WHITE RODGERS" #1F85-277 PROGRAMMABLE THERMOSTAT WITH OVERRIDE BUTTON
FDD EC	"BELIMO" ZIP FAULT DETECTION & DIAGNOSTICS ECONOMIZER CONTROLLER
ADR	AUTOMATED DEMAND RESPONSE
DTS	DISCHARGE TEMPERATURE SENSOR
OTS	OUTSIDE AIR TEMPERATURE SENSOR
DA	DAMPER ACTUATOR
ED	ECONOMIZER DAMPER
RIB	RELAY IN BOX
J-BOX	JUNCTION BOX
PWR	POWER WIRING BY DIV. 16
RA	RETURN AIR
OSA	OUTSIDE AIR
BRA	BAROMETRIC RELIEF AIR
SA	SUPPLY AIR
TCC	TEMPERATURE CONTROLS CONTRACTOR
EC	ELECTRICAL CONTRACTOR

WIRING BY TEMPERATURE CONTROL CONTRACTOR (TCC)

WIRING BY ELECTRICAL CONTRACTOR (EC)

THESE CONTROL DIAGRAMS ARE DIAGRAMMATIC AND DO NOT DEPICT ALL CONTROL WIRES, RELAYS OR COMPONENTS OF A COMPLETE SYSTEM. IT IS THE RESPONSIBILITY OF THE TEMPERATURE CONTROLS CONTRACTOR TO PROVIDE A COMPLETE AND FUNCTIONAL CONTROL SYSTEM AT NO ADDITIONAL COST TO THE OWNER.

NOTE: ALL CONTROL WIRING SHALL BE RUN IN CONDUIT.



SEQUENCE OF OPERATION

GENERAL:

THE THERMOSTAT SHALL BE PROGRAMMED AS DIRECTED BY THE DISTRICT FOR OCCUPIED PERIODS, AND UNOCCUPIED PERIODS. DURING PERIODS OF OCCUPANCY, OR IF THE THERMOSTAT'S MANUAL OVERRIDE BUTTON IS PUSHED, THE SUPPLY FAN SHALL BE ENABLED AND HEATING OR COOLING SHALL BE PROVIDED TO MAINTAIN ROOM TEMPERATURE SETPOINT. THE PHP UNIT SHALL PROVIDE MINIMUM OUTSIDE AIR VENTILATION FOR 1 HOUR PRIOR TO SCHEDULED OCCUPANCY. THE OUTSIDE AIR DAMPER SHALL MODULATE FULLY CLOSED WHENEVER THE PHP UNIT IS DISABLED.

AUTOMATED DEMAND RESPONSE (ADR):

THE HVAC CONTROLS SHALL BE CAPABLE OF RECEIVING A UTILITY COMPANY ADR SIGNAL. THE CAPABILITY OF FUTURE ADR PROGRAMMING (FOR NON-CRITICAL ZONES) IS ALL THAT IS REQUIRED FOR THIS PROJECT. ADR PROGRAMMING SHALL BE IMPLEMENTED IN THE FUTURE, BY OTHERS.

ECONOMIZER FAULT DETECTION AND DIAGNOSTICS (FDD):

TCC SHALL INSTALL IN EACH PHP UNIT AN FDD ECONOMIZER CONTROLLER AND ASSOCIATED OUTSIDE AIR & SUPPLY AIR TEMPERATURE SENSORS. THE FOLLOWING ITEMS SHALL BE MONITORED AND ALARMS SHALL BE GENERATED WHEN FAULTS OCCUR: TEMPERATURE SENSOR FAILURE (SUPPLY AIR, OUTSIDE AIR, ROOM AIR), ECONOMIZER NOT ECONOMIZING WHEN ENABLED, ECONOMIZER ECONOMIZING WHEN DISABLED, ECONOMIZER DAMPERS MODULATION FAILURE, EXCESS OUTSIDE AIR.

COOLING:

ON A CALL FOR COOLING, IF THE OUTSIDE AIR TEMPERATURE IS BELOW THE ECONOMIZER LOCKOUT TEMPERATURE SET AT 75 DEG F, THE ECONOMIZER DAMPERS SHALL MODULATE AS NEEDED TO OPERATE AS THE FIRST STAGE OF COOLING. ON AN ADDITIONAL CALL FOR COOLING, MECHANICAL (DX) COOLING SHALL BE ENABLED IN CONJUNCTION WITH THE ECONOMIZER TO MAINTAIN ROOM COOLING SETPOINT. IF SETPOINT STILL CANNOT BE MAINTAINED, OR IF THE OUTSIDE AIR TEMPERATURE RISES ABOVE THE ECONOMIZER LOCKOUT TEMPERATURE, THE ECONOMIZER DAMPERS SHALL MODULATE TO MINIMUM POSITION, AND MECHANICAL (DX) COOLING SHALL BE ENABLED TO MAINTAIN ROOM COOLING SETPOINT.

HEATING:

ON A CALL FOR HEATING, THE ECONOMIZER DAMPERS SHALL MODULATE TO MINIMUM POSITION, AND MECHANICAL (HEAT PUMP) HEATING SHALL BE ENABLED TO MAINTAIN ROOM HEATING SETPOINT. ON AN ADDITIONAL CALL FOR HEATING, THE AUX. STRIP HEAT SHALL BE ENABLED TO MAINTAIN ROOM HEATING SETPOINT.

KITCHEN EXHAUST AIR MAKE-UP:

FDD EC SHALL RESET THE ECONOMIZER OSA DAMPER POSITION TO PROVIDE REQUIRED MAKE-UP AIR WHEN THE KITCHEN HOOD EXHAUST FAN IS SWITCHED "ON", AS SEEN BY A CURRENT SWITCH CONTACT CLOSURE. SEE OSA DAMPER RESET SCHEDULE BELOW. WHENEVER THE KITCHEN HOOD EXHAUST FAN IS SWITCHED "ON", THE PHP UNIT SHALL BE AUTOMATICALLY ENABLED, IF NOT ALREADY RUNNING, AND ITS ECONOMIZER OSA DAMPER OPENED UP TO PROVIDE MAKE-UP AIR.

OSA DAMPER RESET SCHEDULE	
KEF-1 "ON"	KEF-1 "OFF"
560 cfm	120 cfm

SZCAV PHP UNIT CONTROL DIAGRAM

SCALE : NONE

(SINGLE ZONE CONSTANT AIR VOLUME w/
KITCHEN EXHAUST AIR MAKE-UP MODE)

Unit Report For HP-1

Project: !Test
Prepared By: Brayden Duncan

01/28/2022
10:02AM

Unit Parameters

Unit Model:..... **50VT-C36---5**
Unit Size:..... **36 (3 Tons)**
Volts-Phase-Hertz:..... **208-3-60**
Heating Type:..... **Heat Pump**
Duct Cfg:..... **Vertical Supply / Vertical Return**

Dimensions (ft. in.) & Weight (lb.) ***

Unit Length:..... **4' 0.25"**
Unit Width:..... **3' 8.1875"**
Unit Height:..... **4' 0.75"**

*** Weights and Dimensions are approximate. Weight does not include roof curbs, unit packaging, field installed accessories or factory installed options. Approximate dimensions are provided primarily for shipping purposes. For exact dimensions and weights, refer to appropriate product data catalog.

Total Operating Weight:..... **387 lb**

Warranty Information

1 year warranty on parts
5 year warranty on compressor

No optional warranties were selected.

NOTE: Please see Warranty Catalog 500-089 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
50VT-C36---5	Rooftop Unit	1

Performance Summary For HP-1

Project: !Test
Prepared By: Brayden Duncan

01/28/2022
10:02AM

Part Number:50VT-C36---5

ARI SEER:.....14.00

Base Unit Dimensions

Unit Length:.....48.3 in
Unit Width:.....44.2 in
Unit Height:.....48.8 in
Total Operating Weight:.....387 lb

Unit

Unit Voltage-Phase-Hertz:.....208-3-60
Air Discharge:.....Vertical
Fan Drive Type:.....Direct
Actual Airflow:.....1312 CFM
Site Altitude:.....0 ft

Cooling Performance

Condenser Entering Air DB:.....95.0 F
Evaporator Entering Air DB:.....80.0 F
Evaporator Entering Air WB:.....67.0 F
Entering Air Enthalpy:.....31.44 BTU/lb
Evaporator Leaving Air DB:.....60.9 F
Evaporator Leaving Air WB:.....58.8 F
Evaporator Leaving Air Enthalpy:.....25.58 BTU/lb
Unit Discharge Air DB:.....60.9 F
Unit Discharge Air WB:.....58.8 F
Unit Discharge Air Enthalpy:.....25.58 BTU/lb
Net Cooling Capacity:.....34.59 MBH
Net Sensible Capacity:.....27.13 MBH
Total Unit Power Input:.....3.00 kW
Coil Bypass Factor:.....0.057

Heating Performance

Outdoor Ambient Temperature:.....47.0 F
Entering Air Indoor Coil DB:.....70.0 F
Leaving Air Indoor Coil DB:.....94.5 F
Total Heating Capacity:.....34.68 MBH
Integrated Heating Capacity:.....34.68 MBH
Heating Power Input:.....2.73 kW

Supply Fan

External Static Pressure:.....0.33 in wg
Options / Accessories Static Pressure
Wet Coil:.....0.10 in wg
Total Application Static (ESP + Unit Opts/Acc.):.....0.43 in wg
Fan Power:.....0.48 BHP
Fan Motor Size, hp:.....1/2
NOTE:.....High Motor Speed, Vert

Selection includes construction throwaway filter into the base fan curve. This filter is not MERV Rated.

Electrical Data

Minimum Voltage:.....197
Maximum Voltage:.....253
Compressor RLA:.....10.4
Compressor LRA:.....73
Outdoor Fan FLA (ea):.....1
Indoor Fan Motor FLA:.....4.1

Performance Summary For HP-1

Project: ITest
Prepared By: Brayden Duncan

01/28/2022
10:02AM

Power Supply MCA:.....**18.2**
Power Supply MOCP (Fuse or HACR):.....**25**

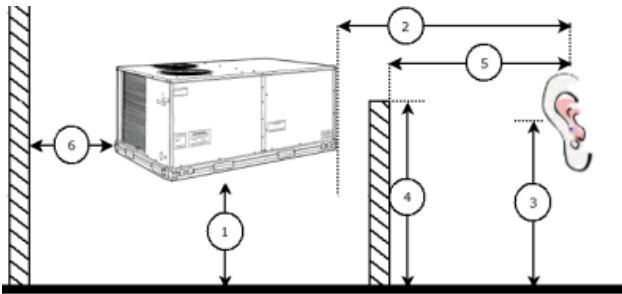
Control Panel SCCR: 5kA RMS at Rated Symmetrical Voltage

Acoustics

Sound Rating:.....**74.0 db**
Sound Power Levels, db re 10E-12 Watts

	Discharge	Inlet	Outdoor
63 Hz	NA	NA	NA
125 Hz	NA	NA	61.9
250 Hz	NA	NA	63.3
500 Hz	NA	NA	58.9
1000 Hz	NA	NA	59.9
2000 Hz	NA	NA	58.7
4000 Hz	NA	NA	56.2
8000 Hz	NA	NA	52.4

Advanced Acoustics



Advanced Acoustics Parameters

- 1. Unit height above ground:.....**30.0** ft
- 2. Horizontal distance from unit to receiver:.....**50.0** ft
- 3. Receiver height above ground:.....**5.7** ft
- 4. Height of obstruction:.....**0.0** ft
- 5. Horizontal distance from obstruction to receiver:.....**0.0** ft
- 6. Horizontal distance from unit to obstruction:.....**0.0** ft

Detailed Acoustics Information

Octave Band Center Freq. Hz	63	125	250	500	1k	2k	4k	8k	Overall
A	0.0	61.9	63.3	58.9	59.9	58.7	56.2	52.4	68.3 Lw
B	- 26.2	45.8	54.7	55.7	59.9	59.9	57.2	51.3	65.2 LwA
C	0.0	29.5	30.9	26.5	27.5	26.3	23.8	20.0	35.9 Lp
D	- 26.2	13.4	22.3	23.3	27.5	27.5	24.8	18.9	32.8 LpA

Legend

- A Sound Power Levels at Unit's Acoustic Center, Lw
- B A-Weighted Sound Power Levels at Unit's Acoustic Center, LwA
- C Sound Pressure Levels at Specific Distance from Unit, Lp
- D A-Weighted Sound Pressure Levels at Specific Distance from Unit, LpA

Performance Summary For HP-1

Project: !Test
Prepared By: Brayden Duncan

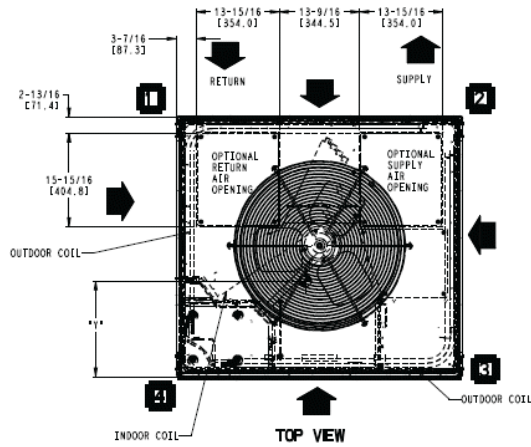
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Calculation methods used in this program are patterned after the ASHRAE Guide; other ASHRAE Publications and the AHRI Acoustical Standards. While a very significant effort has been made to insure the technical accuracy of this program, it is assumed that the user is knowledgeable in the art of system sound estimation and is aware of the tolerances involved in real world acoustical estimation. This program makes certain assumptions as to the dominant sound sources and sound paths which may not always be appropriate to the real system being estimated. Because of this, no assurances can be offered that this software will always generate an accurate sound prediction from user supplied input data. If in doubt about the estimation of expected sound levels in a space, an Acoustical Engineer or a person with sound prediction expertise should be consulted.

Certified Drawing for HP-1

Project: ITest
Prepared By: Brayden Duncan

01/28/2022
10:02AM



UNIT	ELECTRICAL CHARACTERISTICS	UNIT WT.		UNIT HEIGHT IN/MM			CENTER OF GRAVITY IN/MM				
		LB	KG	**	1	2	1	2			
50VT-C36---(3/5/6/0)	208/230-1-60, 208/230-3-60, 460-3-60	387	176.0	48-3/4	1238	20-1/2	521	17-1/2	445	17-3/8	441
50VT-C42---(3/5/6/0)	208/230-1-60, 208/230-3-60, 460-3-60	435	197.0	54-3/4	1391	20-1/2	521	17-1/2	445	17-3/8	448
50VT-C48---(3/5/6/0)	208/230-1-60, 208/230-3-60, 460-3-60	456	207.0	54-3/4	1391	20-1/2	521	17-1/2	445	17-3/8	448
50VT-C60---(3/5/6/0)	208/230-1-60, 208/230-3-60, 460-3-60	487	221.0	48-3/4	1238	20-1/2	521	17-1/2	445	18	457

UNIT	VOLTAGE	CONNER WEIGHTS LBS/KG							
		**	**	**	**	**	**		
36	208/230/460	58.1	26.3	77.4	35.1	116.1	52.7	135.3	61.4
42	208/230/460	65.3	29.6	87.0	39.5	130.3	59.2	152.3	69.1
48	208/230/460	68.4	31.0	91.2	41.4	136.8	62.1	159.6	72.4
60	208/230/460	73.1	33.1	97.4	44.2	146.1	66.3	170.3	77.3

REQUIRED CLEARANCES TO COMBUSTIBLE MAIL:

	INCHES (MM)
TOP OF UNIT	14 (355.6)
DUCT SIDE OF UNIT	2 (50.8)
SIDE OPPOSITE DUCTS	14 (355.6)
BOTTOM OF UNIT	0 (0.0)
ELECTRICAL PANEL	36 (914.4)

NEC REQUIRED CLEARANCES:

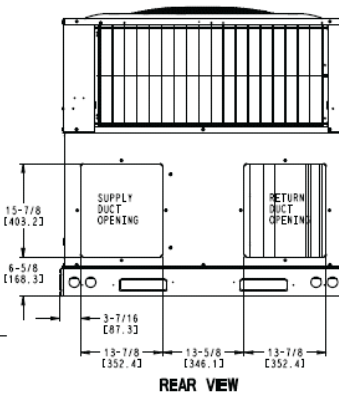
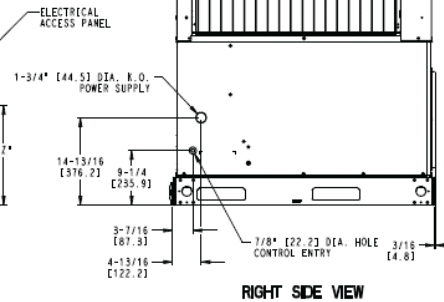
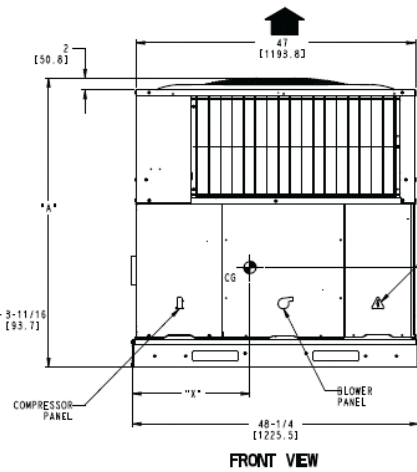
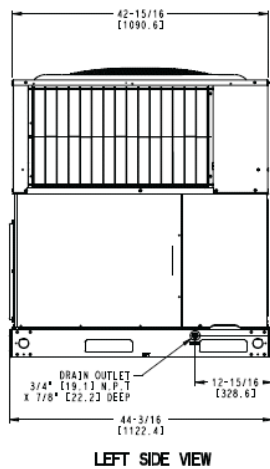
	INCHES (MM)
BETWEEN UNITS, POWER ENTRY SIDE	42 (1066.8)
UNIT AND UNGROUNDED SURFACES, POWER ENTRY SIDE	36 (914.0)
UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, POWER ENTRY SIDE	42 (1066.8)

REQUIRED CLEARANCE FOR OPERATION AND SERVICE:

	INCHES (MM)
EVAP. COIL ACCESS SIDE	36 (914.0)
POWER ENTRY SIDE	42 (1066.8)
(EXCEPT FOR NEC REQUIREMENTS)	
UNIT TOP	48 (1219.2)
SIDE OPPOSITE DUCTS	36 (914.0)
DUCT PANEL	12 (304.8)

*MINIMUM DISTANCES IF UNIT IS PLACED LESS THAN 12 (304.8) FROM WALL SYSTEM, THEN SYSTEM PERFORMANCE MAYBE COMPROMISED.

DIMENSIONS IN [] ARE IN MM



50VT500411



The new degree of comfort.™



Professional Classic™ Point-of-Use electric water heaters feature a space-saving design for installation in limited spaces

Efficiency

- .93 EF for 30-gallon model
- Single resistored stainless steel heating element to prolong anode rod and tank life

Features

- High efficiency heating element
- Over-temperature protector cuts off power in excess temperature situations
- Automatic thermostat keeps water at desired temperature
- Wall bracket for easy wall mount installations and corrosion resistant 1/4 turn drain valve included with 2.5 gallon model

Plus...

- Temperature and pressure relief valve
- Exclusive Rheemglas® tank lining resists corrosion and prolongs tank life
- Meets or exceeds National Appliance Energy Conservation Act (NAECA) requirements
- These units are U.L. listed and comply with Underwriter's Laboratories Specifications 174
- Enhanced-flow brass drain valve on 2.5-gallon model
- Low lead compliant

Warranty

- 6-Year limited tank and parts warranty.*

*See Residential Warranty Certificate for complete information

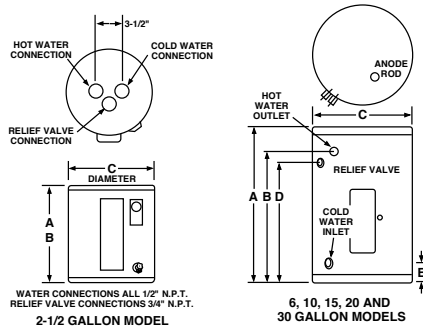
Units meet or exceed ANSI requirements and have been tested according to D.O.E. procedures. Units meet or exceed the energy efficiency requirements of NAECA, ASHRAE standard 90, ICC Code and all state energy efficiency performance criteria.



2.5-Gallon



6, 10, 15, 19.9 and 30-Gallon



Professional Classic Point-of-Use
2.5, 6, 10, 15, 19.9 and 30-Gallon Capacities
120 Volt AC
2-Wire Single Phase Electric



DESCRIPTION		FEATURES		ROUGHING IN DIMENSIONS (SHOWN IN INCHES)			ENERGY INFO.	
GAL. CAP.	MODEL NUMBER	HEIGHT A	HT. TO HOT WATER OUTLET B	DIAMETER C	HT. TO SIDE T&P VALVE D	HT. TO COLD WATER INLET E	APPROX. SHIP WT. (LBS.)	ENERGY FACTOR
2.5	PROE2 1 RH POU	14	14	9-3/4	-	-	22	N/A
6	PROE6 1 RH POU	15-1/4	12-1/2	15-3/4	11-1/2	4-1/4	36	N/A
10	PROE10 1 RH POU	23	20-1/2	15-3/4	19-1/2	4-1/4	46	N/A
15	PROE15 1 RH POU	24-1/4	22	17-3/4	21	4-1/2	54	N/A
19.9	PROE20 1 RH POU	25-1/4	22-3/4	19-3/4	21-3/4	5	69	N/A
30	PROE30 1 RH93 POU*	30	23	21-3/4	23	2-3/4	91	0.93

Energy Factor based on D.O.E. (Department of Energy) test procedures.
 *For double element, substitute "2" suffix for "1". Not available in 120 volt. Available with 2-wire (single phase) outlet only. (6000 watt max.).
 • **2.5 gallon model:** 1/2" N.P.T. inlet and outlet. Relief valve connection 3/4". Available with 120 or 240 volt AC single phase only, 120v (1440w) 240v (1500w) Power cord supplied with 120 volt models only.
 • **6 through 30 gallon models:** 3/4" N.P.T. outlet, inlet, anode rod. T & P valve connections. Not available with 3 phase wiring. Water heaters furnished standard with 120 volt AC, 2000 watt single element. Special wiring options – a limited number of wiring options are available. Consult factory for price and availability.

CONSTRUCTION DETAILS: The cold water enters the tank a few inches from the bottom. Both hot and cold water lines may be connected directly to the water heater without special nipples or tees. The relief valve simply screws into the opening provided.

In keeping with its policy of continuous progress and product improvement, Rheem reserves the right to make changes without notice.

Rheem Water Heating • 101 Bell Road
Montgomery, Alabama 36117-4305 • www.rheem.com



INTEGRATED HOME COMFORT



American Modular Systems Inc.
 787 Spreckels Ave.
 Manteca, California 95336
 P: (209) 825-1921
 F: (209) 825-7018

Project: 1674-21 Palo Verde College- Child Development Center
 141 S 1st Street
 Blythe, California 92225

Submittal #22 40 00-1.0 - Plumbing Submittal 22 40 00 - Plumbing Fixtures

Revision	0	Submittal Manager	Shelby Ward (American Modular Systems Inc.)
Status	Open	Date Created	Feb 15, 2022
Issue Date	Feb 15, 2022	Spec Section	22 40 00 - Plumbing Fixtures
Responsible Contractor	American Modular Systems Inc.	Received From	
Received Date		Submit By	
Final Due Date	Mar 1, 2022	Lead Time	
		Cost Code	

Location		Type	Product Information
Approvers	Jose Amador (Sillman Architecture), Stephanie Slagan (Palo Verde College), Connor Smith (Sillman Architecture)		
Ball in Court	Jose Amador (Sillman Architecture), Stephanie Slagan (Palo Verde College), Connor Smith (Sillman Architecture)		
Distribution	Suzanne Willis (American Modular Systems Inc.), Shelby Ward (American Modular Systems Inc.), Scott Wade (American Modular Systems Inc.), David Sarich (American Modular Systems Inc.), Daniel Sarich (American Modular Systems Inc.), Matt Reichmuth (American Modular Systems Inc.)		

Description Hi Connor, Jose, Stephanie-

Please see the attached Plumbing Fixtures submittal for your review and approval. Should you have any questions, please feel free to contact Amber at 209-825-1921.

Thanks,

SHELBY WARD
 ASSISTANT PROJECT MANAGER
 American Modular Systems
 O: 209.825.1921
 F: 209.825.7018
AMERICANMODULAR.COM

Submittal Workflow

Name	Sent Date	Due Date	Returned Date	Response	Attachments
General Information Attachments					
Jose Amador		Mar 1, 2022		Pending	
Stephanie Slagan		Mar 1, 2022		Pending	
Connor Smith		Mar 1, 2022		Pending	



Project Number: 1674-21
School District: Palo Verde College
Project Name: Child Development Center

PLUMBING FIXTURE SCHEDULE

PLUMBING FIXTURE GROUP 1

DESCRIPTION	MODEL NUMBER	MANUFACTURER
WATER LINE	Copper Type L Water Supply	
WASTE LINE	Cast Iron Waste	
WATER HEATER W-1	PR0E20 1 RH POU	Rheem
WATER HEATER W-2 (DED. KITCHEN)	ES50-12-G	Rheem
WATER HEATER W-3	Instahot E-80S/240 FLLP	Chronomite
BUBBLER	2507A	Halsey Taylor
DRINKING FOUNTAIN	VRCTL8WSK	Elkay
HOSE BIBB	Recessed B75CH	Woodford
URINAL	K-5452-ET-0	Kohler
TOILET T-1: Floor Mount Flush Valve -17"	Highcliff Ultra K-96057	Kohler
FIXTURE HEIGHT	<i>Ages 13-Adult</i>	
FLUSH VALVE	Yes	
TOILET T-2: Floor Mount Flush Valve -15"	Juvenile Ultra K-96059	Kohler
FIXTURE HEIGHT	<i>Ages 5-8</i>	
FLUSH VALVE	Yes	
SINK S-1: Wall Mount RR Sink w/ 4" Holes O.C.	Kingston K-2005-0	Kohler
METERED FAUCET	Z86500-XL-3M	Zurn
FIXTURE HEIGHT	<i>Ages 13-Adult</i>	
SINK S-2: Stainless Steel Class Sink	Dayton D12521	Elkay
FAUCET	Z871-B4-XL	Zurn
FIXTURE HEIGHT	<i>Ages 13-Adult</i>	
SINK S-3: Custodian Sink	MSR-2424	Floestone
FAUCET	Z843-M1-RC	Zurn
FIXTURE HEIGHT	<i>Ages 13-Adult</i>	
SINK S-4: Hand Sink		ROUGH-IN ONLY
FIXTURE HEIGHT	<i>Ages 13-Adult</i>	
SINK S-5: 2-Bin Sink		ROUGH-IN ONLY
FIXTURE HEIGHT	<i>Ages 13-Adult</i>	
SINK S-6: 3-Bin Sink		ROUGH-IN ONLY
FIXTURE HEIGHT	<i>Ages 13-Adult</i>	
STANDARD ACCESSORIES		
TP DISPENSER	575-CH	Creative Specialties
WALL MIRROR	B165 1830	Bobrick
GRAB BARS	8736 / 8748	Moen
ADDITIONAL ACCESSORIES		
FLOOR DRAIN	P415-CC	Zurn
DISHWASHER		ROUGH-IN ONLY

WATER HEATERS



The new degree of comfort.™



Professional Classic™ Point-of-Use electric water heaters feature a space-saving design for installation in limited spaces

Efficiency

- .93 EF for 30-gallon model
- Single resistored stainless steel heating element to prolong anode rod and tank life

Features

- High efficiency heating element
- Over-temperature protector cuts off power in excess temperature situations
- Automatic thermostat keeps water at desired temperature
- Wall bracket for easy wall mount installations and corrosion resistant 1/4 turn drain valve included with 2.5 gallon model

Plus...

- Temperature and pressure relief valve
- Exclusive Rheemglas® tank lining resists corrosion and prolongs tank life
- Meets or exceeds National Appliance Energy Conservation Act (NAECA) requirements
- These units are U.L. listed and comply with Underwriter's Laboratories Specifications 174
- Enhanced-flow brass drain valve on 2.5-gallon model
- Low lead compliant

Warranty

- 6-Year limited tank and parts warranty.*

*See Residential Warranty Certificate for complete information

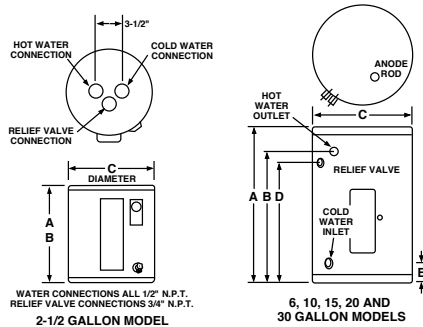
Units meet or exceed ANSI requirements and have been tested according to D.O.E. procedures. Units meet or exceed the energy efficiency requirements of NAECA, ASHRAE standard 90, ICC Code and all state energy efficiency performance criteria.



2.5-Gallon



6, 10, 15, 19.9 and 30-Gallon



Professional Classic Point-of-Use
2.5, 6, 10, 15, 19.9 and 30-Gallon Capacities
120 Volt AC
2-Wire Single Phase Electric



DESCRIPTION		FEATURES		ROUGHING IN DIMENSIONS (SHOWN IN INCHES)			ENERGY INFO.	
GAL. CAP.	MODEL NUMBER	HEIGHT A	HT. TO HOT WATER OUTLET B	DIAMETER C	HT. TO SIDE T&P VALVE D	HT. TO COLD WATER INLET E	APPROX. SHIP WT. (LBS.)	ENERGY FACTOR
2.5	PROE2 1 RH POU	14	14	9-3/4	-	-	22	N/A
6	PROE6 1 RH POU	15-1/4	12-1/2	15-3/4	11-1/2	4-1/4	36	N/A
10	PROE10 1 RH POU	23	20-1/2	15-3/4	19-1/2	4-1/4	46	N/A
15	PROE15 1 RH POU	24-1/4	22	17-3/4	21	4-1/2	54	N/A
19.9	PROE20 1 RH POU	25-1/4	22-3/4	19-3/4	21-3/4	5	69	N/A
30	PROE30 1 RH93 POU*	30	23	21-3/4	23	2-3/4	91	0.93

Energy Factor based on D.O.E. (Department of Energy) test procedures.
 *For double element, substitute "2" suffix for "1". Not available in 120 volt. Available with 2-wire (single phase) outlet only. (6000 watt max.).
 • **2.5 gallon model:** 1/2" N.P.T. inlet and outlet. Relief valve connection 3/4". Available with 120 or 240 volt AC single phase only, 120v (1440w) 240v (1500w) Power cord supplied with 120 volt models only.
 • **6 through 30 gallon models:** 3/4" N.P.T. outlet, inlet, anode rod. T & P valve connections. Not available with 3 phase wiring. Water heaters furnished standard with 120 volt AC, 2000 watt single element. Special wiring options – a limited number of wiring options are available. Consult factory for price and availability.
CONSTRUCTION DETAILS: The cold water enters the tank a few inches from the bottom. Both hot and cold water lines may be connected directly to the water heater without special nipples or tees. The relief valve simply screws into the opening provided.

In keeping with its policy of continuous progress and product improvement, Rheem reserves the right to make changes without notice.

Rheem Water Heating • 101 Bell Road
Montgomery, Alabama 36117-4305 • www.rheem.com



INTEGRATED HOME COMFORT



The new degree of comfort.™



Heavy Duty Electric commercial water heaters are available in 50 through 175 gallon capacities. All models 'quick ship' from Rheem warehouses – no deposit required

Features & Benefits

- 50, 85, 120 and new 175 gallon model can be shipped to your location in just a few days, no deposit required and Rheem pays shipping charges
- Ideal for general commercial use and point-of-use applications like eyewash stations, or used as a booster
- Inputs: 3 through 108 kW
- Voltages: 208, 240, or 480 VAC in either single phase or 3-phase; 277 VAC single phase
- Element wattages: 2000, 3000, 4000, 4500, 5000 and 6000 in the four voltages; 9000 watt element at 480 VAC
- Available in 1, 3, 6, 9 or 12 element configurations for your specific kW application
- Elements are Lifeguard™ stainless steel, screw-in type that resist burn out and corrosion
- ASME construction is available on E50, E85 and E120 models and comes standard on E175 model
- Long life tank design: proprietary steel formulation with high temperature porcelain enamel to maximize corrosion resistance resulting in a superior tank design
- Two anode rods are installed to ensure long life and corrosion resistance

Efficiency

- 98% thermal efficiency
- Thick foam insulation for minimal standby heat loss

Performance

- Recovery rate: Up to 438 gallons GPH at a 100 degree rise
- Up to 190° F maximum delivered temperature for E series; 160° F for ES50; 180° F for ES85 and ES120

Capacity & Shipping Weight

- 50 Gal/270 lbs./320 lbs. ASME
- 85 Gal/350 lbs./380 lbs. ASME
- 120 Gal/430 lbs./460 lbs. ASME
- 175 Gal/700 lbs. ASME only

Easy Installation & Service

- Control box is located at the front of unit for easy wiring during installation – Multiple knockout holes accommodate a variety of conduit sizes
- **Exclusive!** System Sentinel™ provides a diagnostic panel with LEDs that correspond to the number, location and status of each element
- **Exclusive!** Full-port, full-flow, brass drain valve for faster draining
- Minimum distance to combustibles is zero inches from jacket and 18 inches from access door
- All models approved for installation on combustible flooring

Plus

- Temperature and pressure relief valve at top of 175 gallon model and side on all other models
- Water connections: hot and cold water inlets are 2-1/2" NPT dielectric nipples on the 175 gallon model and 1-1/2" on all other models

Warranty

3-Year limited tank warranty, 1-year limited parts warranty

See Commercial Warranty Certificate for complete information.

Efficiency | These models have been tested according to DOE test procedures, and exceed the minimum energy factor requirements of current ASHRAE Standards (Part of the federally mandated Energy Policy Act (EPAct)). Also exceeds energy efficiency codes of all states including California Energy Commission (CEC).

Safety and Construction | Safety and Construction: These products are design certified by Underwriters Laboratories (UL) to meet UL standard 1453 and UL/NSF 005 as electric storage tank water heaters. All models are North Carolina and Massachusetts Code compliant. **Certified for a 150 PSI Maximum Working Pressure. (160 PSI maximum for ASME models)**



Rheem Heavy Duty
50, 85, 120 & 175-Gallon
Capacities
ASME Construction Option
3-Year Limited Warranty
Electric



(With
Optional
Seal Kit)



ELECTRICAL CHARACTERISTICS																
INPUT KW	NO. OF ELEMENTS	ELEM-ENT WAT-TAGE	FULL LOAD CURRENT IN AMPERES						SURFACE MOUNTED			IMMERSION THERMOSTATS				
			208V		240V		277V		480V		NO. OF T'STATS	NUMBER OF FUSES	NUMBER OF CONTACTORS	NUMBER OF FUSES	STAGED T'STATS	
			PHASE		PHASE		PHASE		PHASE						NO. OF T'STATS	KW STEP SIZE
			1	3	1	3	1	3	1	3						
3	1	3000	15	-	13	-	11	6	-	-	-	2	N/A	3		
6	3	2000	29	17	25	14	22	13	7	1	6	2	6	6		
9	3	3000	43	25	38	22	33	19	11	1	6	2	6	9		
12	3	4000	58	33	50	29	43	25	15	1	6	2	6	12		
15	3	5000	72	42	63	36	54	31	18	1	6	2	6	15		
18	3	6000	-	-	75	43	65	38	22	1	6	2	6	18		
18	6	3000	87	50	-	-	-	-	-	1	12	4	12	9		
24	6	4000	116	67	100	58	87	50	29	1	12	4	12	12		
27	6	4500	130	75	113	65	98	56	33	1	12	4	12	13.5		
30	6	5000	144	84	125	73	108	63	36	1	12	4	12	15		
36	6	6000	-	-	150	87	130	75	43	1	12	4	12	18		
36	9	4000	173	100	-	-	-	-	-	1	18	6	18	12		
45	9	5000	217	125	188	109	163	94	54	1	18	6	18	15		
54	9	6000	260	150	225	130	195	113	65	1	18	6	18	18		
60	12	5000	288	166	250q	144	217	125	72	-	-	-	24	15		
72	12	6000	-	200	-	172	260	150	87	-	-	-	24	18		
81	9	9000	-	-	-	-	-	169	98	-	-	-	18	27		
108*	12	9000	-	-	-	-	-	-	130	-	-	-	24	27		

Thermostat Staging – On all immersion thermostat models, 24 kW and above (18 kW for 208V), additional thermostats can be provided so that the maximum element input will not exceed 18 kW - 27 kW per step. Temperature differential between steps can be set as desired.

Note: Thermostat staging recommended on 81 and 108 kW models.

RECOVERY CAPACITIES Recovery in U.S. Gallons/Hr. (GPH) and Liters/Hr. (LPH) at Various Temperature Rises														
INPUT KW	EQUIVALENT BTU/HR.	UNITS	40°F (22°C)	50°F (28°C)	60°F (33°C)	70°F (39°C)	80°F (45°C)	90°F (50°C)	100°F (56°C)	110°F (61°C)	120°F (67°C)	130°F (72°C)	140°F (78°C)	
3	10,236	GPH	31	25	20	17	15	14	12	11	10	9	9	
		LPH	117	95	76	64	57	53	45	42	38	34	34	
6	20,473	GPH	62	50	41	35	31	28	25	23	21	19	18	
		LPH	235	188	157	134	117	104	94	85	78	72	67	
9	30,709	GPH	93	74	62	53	47	41	37	34	31	29	27	
		LPH	352	282	235	201	176	157	141	128	117	108	101	
12	40,946	GPH	124	99	83	71	62	55	50	45	41	38	35	
		LPH	470	376	313	268	235	209	188	171	157	145	134	
15	51,183	GPH	155	124	103	89	78	69	62	56	52	48	44	
		LPH	587	470	391	335	294	261	235	213	196	181	168	
18	61,420	GPH	186	149	124	106	93	83	74	68	62	57	53	
		LPH	705	564	470	403	352	313	282	256	235	217	201	
24	81,893	GPH	248	199	165	142	124	110	99	90	83	76	71	
		LPH	939	751	626	537	470	417	376	342	313	289	268	
27	92,129	GPH	279	223	186	160	140	124	112	102	93	86	80	
		LPH	1057	845	705	604	528	470	423	384	352	325	302	
30	102,366	GPH	310	248	207	177	155	138	124	113	103	95	89	
		LPH	1174	939	783	671	587	522	470	427	391	361	335	
36	122,839	GPH	372	298	248	213	186	165	149	135	124	115	106	
		LPH	1409	1127	939	805	705	626	564	512	470	434	403	
45	153,549	GPH	465	372	310	266	233	207	186	169	155	143	133	
		LPH	1761	1409	1174	1006	881	783	705	640	587	542	503	
54	184,259	GPH	558	447	372	319	279	248	223	203	186	172	160	
		LPH	2114	1691	1409	1208	1057	939	845	769	705	650	604	
60	204,723	GPH	620	496	414	354	310	276	248	226	206	190	178	
		LPH	2347	1878	1567	1340	1173	1045	939	856	780	719	674	
72	245,678	GPH	744	596	296	426	372	330	298	270	248	230	212	
		LPH	2816	2256	1120	1615	1408	1249	1128	1022	939	871	803	
81	276,388	GPH	838	670	558	479	419	372	335	305	279	258	239	
		LPH	3174	2540	2116	1814	1587	1410	1270	1154	1058	977	907	
108*	368,518	GPH	1094	875	730	625	547	486	438	398	365	337	313	
		LPH	4141	3312	2763	2366	2071	1840	1658	1507	1382	1276	1185	

WATER TEMPERATURE RATINGS						
MODEL NUMBER	TANK CAPACITY		THERMOSTAT TYPE	MINIMUM DELIVERED TEMPERATURE	MAXIMUM DELIVERED TEMPERATURE	HIGH TEMPERATURE LIMIT
	GALLONS	LITERS				
ES50	50	189	Surface	90°F	160°F	180°F
				32.2°C	71.1°C	82.2°C
ES85	85	322	Surface	120°F	180°F	190°F
				48.8°C	82.2°C	87.8°C
ES120	119.9	454	Surface	120°F	180°F	190°F
				48.8°C	82.2°C	87.8°C
E50(A)	50	189	Immersion	90°F	190°F	200°F
				32.2°C	87.8°C	93.3°C
E85(A)	85	322	Immersion	90°F	190°F	200°F
				32.2°C	87.8°C	93.3°C
E120(A)	119.9	454	Immersion	90°F	190°F	200°F
				32.2°C	87.8°C	93.3°C
E175A	175	662	Immersion	90°F	190°F	200°F
				32.2°C	87.8°C	93.3°C

MODEL NUMBERS Fast delivery from Rheem warehouses – no deposit – no shipping charges							
INPUT KW	SURFACE MOUNTED THERMOSTATS			IMMERSION THERMOSTATS			
	TANK CAPACITY IN GALLONS			TANK CAPACITY IN GALLONS			
	50	85	120	50	85	120	175
3	N/A	N/A	N/A	N/A	N/A	N/A	E175A-3-G
6	ES50-6-G	ES85-6-G	ES120-6-G	E50-6-G	E85-6-G	E120-6-G	E175A-6-G
9	ES50-9-G	ES85-9-G	ES120-9-G	E50-9-G	E85-9-G	E120-9-G	E175A-9-G
12	ES50-12-G	ES85-12-G	ES120-12-G	E50-12-G	E85-12-G	E120-12-G	E175A-12-G
15	ES50-15-G	ES85-15-G	ES120-15-G	E50-15-G	E85-15-G	E120-15-G	E175A-15-G
18	ES50-18-G	ES85-18-G	ES120-18-G	E50-18-G	E85-18-G	E120-18-G	E175A-18-G
24	ES50-24-G	ES85-24-G	ES120-24-G	E50-24-G	E85-24-G	E120-24-G	E175A-24-G
27	ES50-27-G	ES85-27-G	ES120-27-G	E50-27-G	E85-27-G	E120-27-G	E175A-27-G
30	ES50-30-G	ES85-30-G	ES120-30-G	E50-30-G	E85-30-G	E120-30-G	E175A-30-G
36	ES50-36-G	ES85-36-G	ES120-36-G	E50-36-G	E85-36-G	E120-36-G	E175A-36-G
45	ES50-45-G	ES85-45-G	ES120-45-G	E50-45-G	E85-45-G	E120-45-G	E175A-45-G
54	ES50-54-G	ES85-54-G	ES120-54-G	E50-54-G	E85-54-G	E120-54-G	E175A-54-G
60	N/A	N/A	N/A	N/A	N/A	N/A	E175A-60-G
72	N/A	N/A	N/A	N/A	N/A	N/A	E175A-72-G
81	N/A	N/A	N/A	N/A	E85A-81-GS	E120A-81-GS	E175A-81-G
108	N/A	N/A	N/A	N/A	N/A	N/A	E175A-108-G

Fuse type – “G” in the model number represents Class G fuses.

Thermostat staging – E models (Immersion thermostat) 24 kW and above (18 kW for 208V), may be ordered with additional thermostat(s) for staging. Add “S” after fuse type designation. Recommended on 81 and 108 kW models. Example: E175A-81-G becomes E175A-81-GS.

ASME Construction – E models (Immersion Thermostat) may be ordered with ASME certified construction. Add “A” after capacity designation. Example: E85-36-G becomes E85A-36-G.

UL Sanitation Compliance – all models except E175A are UL Sanitation (NSF5) compliant when equipped with the optional ring seal kits. E(S)50 – AS38355, E(S)85 – AS38356, E(S)120 – AS38357.

Solid State Low Water Cut-off – E models (Immersion Thermostat) may be ordered with probe type cut-off for field installation (AP8408).

Integral Fusing – all models have integral fusing for each element.

Anode Rods – two (2) magnesium anodes are installed in each tank to ensure long life and corrosion resistance.

Temperature and Pressure Relief Valve – CSA/ASME rated and factory installed.

Electrical Connections – pre-wired, accessible control box with multiple knock-outs on side in size selections to match the National Electric Code. Sizes range from 1/2" to 2-1/2". A grounding screw is provided for attaching an equipment grounding conductor.

Terminal Block – all models are equipped with U.L. listed terminal blocks for simplicity of installation. The terminal block will accept either copper or aluminum field connect wire.

120 Volt Control Circuit – all units are furnished with a fused 120 volt control circuit. All controls (thermostats, high temperature limit, etc.) are operated off of this basic 120 volt control circuit. This circuit is created by an internal multi-tap transformer of unique design that has four (4) taps for the primary voltages, 208, 240, 277 and 480.

Water Connections – hot outlet and cold inlet for the 50-120 gallon capacity models are 1-1/2" (175 gallon models are 2-1/2") NPT dielectric nipples which prevent excessive turbulence of heated water and results in optimum tank draw.

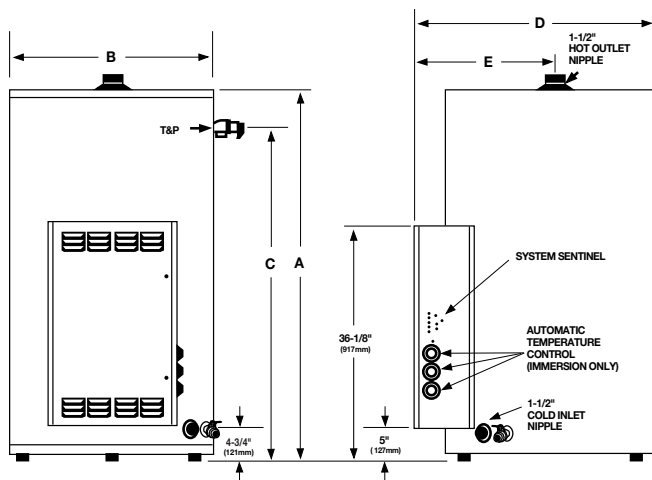


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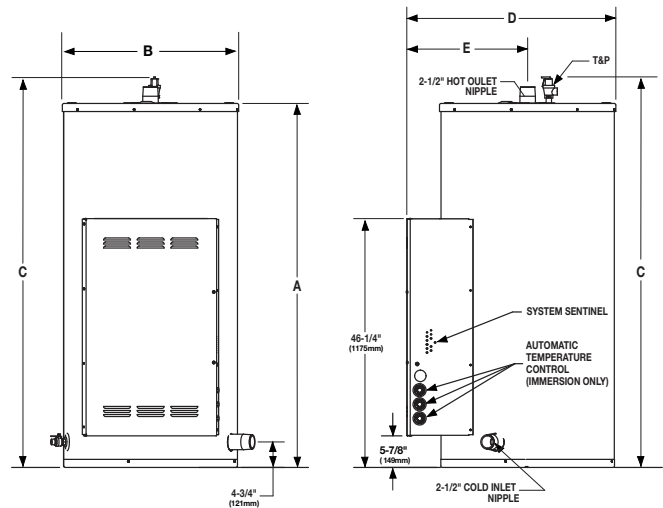


Commercial Electric
Heavy Duty Water Heaters

DIMENSIONAL INFORMATION All dimensions shown in English and Metric								
MODEL NUMBER	UNITS	A	B	C	D	E	APPROX. SHIPPING WEIGHT (LBS.)	
							STD.	ASME
E(S)50(A)	inches	43-5/8	26-1/4	36-1/4	32	19	270 lbs.	320 lbs.
	mm	1108	667	920	813	483	122 kgs.	145 kgs.
E(S)85(A)	inches	57-11/16	28-1/4	49-1/2	34	20	350 lbs.	380 lbs.
	mm	1465	718	1258	864	508	159 kgs.	172 kgs.
E(S)120(A)	inches	67-5/8	30-1/4	58-3/4	36	21	430 lbs.	460 lbs.
	mm	1718	768	1493	914	533	185 kgs.	209 kgs.
E175A	inches	69-1/2	32-1/4	72-1/2	38-1/2	22-1/4	-	700 lbs.
	mm	1765	832	1842	826	565	-	318 kgs.



50, 85 and 120 Gallon Models



175 Gallon Model

Recommended Specifications (for trade reference only)

Water heater(s) shall be model _____, manufactured by Rheem, having electrical input of _____ kW and a recovery rate of _____ GPH at a 100°F temperature rise. Water heater(s) shall have a storage capacity of _____ gallons. Water heater(s) shall have the UL seal of certification and be factory equipped with an CSA/ASME rated temperature and pressure relief valve. Tank(s) shall have a double coating of high temperature porcelain enamel and furnished with magnesium anode rods rigidly supported. Water heater(s) shall meet or exceed the standby loss requirements of ASHRAE. Tank(s) shall have a working pressure of 150 psi, and shall be completely assembled. Water heater(s) shall be approved-listed and constructed in accordance with UL Sanitation (NSF5). Water heater(s) shall be equipped with stainless steel "screw-in" type elements. Tank shall be insulated with thick polyurethane

foam insulation. Water heater(s) shall be constructed with a System Sentinel element diagnostic panel utilizing light emitting diodes. Each LED will correspond to the number and location of the heating elements and monitor their on-off function. Water heater(s) shall be provided with internal power circuit fusing, control circuit fusing, magnetic contactors, 120 volt control circuit transformer and surface mounted thermostat or immersion thermostat(s) with manual reset high limit control. 1-1/2" inlet and outlet water connections for 80 through 120 gallon models and 2-1/2" for 175 gallon units shall be provided. Water heater(s) shall be covered by a three year limited warranty against tank leaks.

When ordering ASME construction, place (A) after the model number (for trade reference only)

Water heater(s) shall be constructed in accordance with the requirements of the ASME Boiler and Pressure Vessel Code, Section IV Part HLW.

In keeping with its policy of continuous progress and product improvement, Rheem reserves the right to make changes without notice.

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Rheem Canada Ltd./Ltée • 125 Edgeware Road, Unit 1
Brampton, Ontario L6Y 0P5 • www.rheem.com



INTEGRATED AIR & WATER



INSTANT-TEMP® - STANDARD FLOW

APPLICATION: commercial, industrial, residential, lavatory, kitchen/bar sink, service sink, scrub sink, shower

PRODUCT FEATURES

- Uses a digital microprocessor for temperature control
Ultra quick response times for temperature variations - 120 times per second. Microprocessor use is the most energy efficient means of heating water
- Unlimited hot water
- Saves water and energy - 99% energy efficient
- Rugged steel housing
- Space saving compact size:
7-5/16" (H) x 10-3/4" x 2-3/4"
- Meets applicable building codes including ADA, UL, IAPMO, UPC and CSA.
- Environmentally friendly
- Made in the U.S.A.
- Field Adjustable

Chronomite Instant-Temp® - Standard Flow models are manufactured to provide reliable point-of-use hot water. There is no pressure and temperature relief valve needed (unless required by code), saving time and money on installation.

Housing is fabricated from rugged steel.

Element assembly is fabricated from Celcon/Ryton plastic.

Heating coils are nichrome.

Flow control and compression fittings are supplied with each unit.



Member of
U.S. Green
Building Council



Water
Conserving
Product



Made in
the USA

For the model being selected, please place the corresponding amps and volts values in the Guide Specifications to the right.



Instant-Temp® - Standard Flow

GUIDE SPECIFICATION

Tankless Water Heater shall be a Chronomite Laboratories Model

E - 80 S / 240 FLLP
x 100 WATTS VOLTS OPTIONS

with Amps and Volts

to heat to a preset temperature of:

- 104°F
- 110°F (Meets ADA)
- Other temperature settings available upon request (specify below)
- 120°F (Meets health code)

Unit shall be provided with Celcon waterways, and Nichrome heating coils.
Temperature controlled by microprocessor.

OPTIONS

- Factory Preset (F)
- Remote Accessory (R)
- Standard Flow Low Pressure (SLP)
- Pressure & Temp Relief Valve Assembly (TP)
- Satin Finish Stainless Steel Housing (SS)
- High Polish Stainless Steel Housing (SSP)
- De-ionized (DI)

MODEL	AMPS	VOLTS	WATTS	ACTIVATION	TEMP RISE @	TEMP RISE @	TEMP RISE @
				GPM	0.75 GPM	1.00 GPM	1.50 GPM
E-46S / 208	22	208	4600	0.65	42	31	21
E-46S / 240	19	240	4600	0.65	42	31	21
E-46S / 277	17	277	4600	0.65	42	31	21
E-60S / 208	29	208	6000	0.65	55	41	27
E-60S / 240	25	240	6000	0.65	55	41	27
E-60S / 277	22	277	6000	0.65	55	41	27
E-70S / 208	34	208	7000	0.65	64	48	32
E-70S / 240	29	240	7000	0.65	64	48	32
E-70S / 277	25	277	7000	0.65	64	48	32
E-80S / 208	38	208	8000	0.65	73	55	36
E-80S / 240	33	240	8000	0.65	73	55	36
E-80S / 277	29	277	8000	0.65	73	55	36
E-90S / 240	38	240	9000	0.65	82	61	41
E-90S / 277	32	277	9000	0.65	82	61	41

Complies with Standards for:



Federal Public Law 111-380 (No Lead)

CALGreen

CHRONOMITE LABORATORIES, INC.

17451 Hurley St. :: City of Industry, CA 91744
Phone 800-447-4962 :: 626-937-4270
Fax 626-937-4279 :: www.chronomite.com

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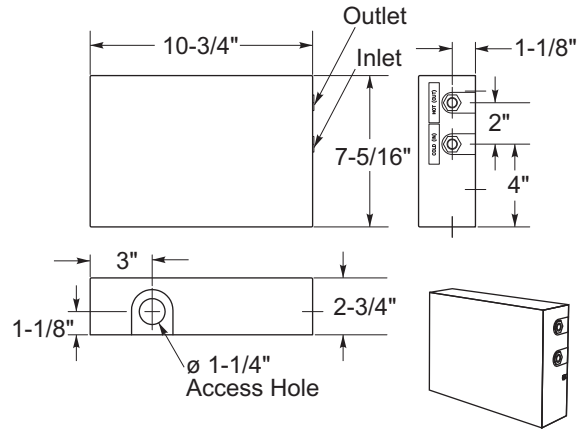


INSTANT-TEMP[®] - STANDARD FLOW

TECHNICAL DIMENSIONS

INSTANT-TEMP - STANDARD FLOW

Dimensions:	7-5/16" (H) x 10-3/4" x 2-3/4"
Weight:	8 lbs.
Materials:	Rugged steel housing Celcon/Ryton plastic element assembly with nichrome coils
Housing Color:	White
Minimum Operating Flow Rate:	.65 GPM
Minimum Operating Pressure:	45 PSI
Maximum Operating Pressure:	80 PSI
Maximum Pressure:	150 PSI
Maximum Operating Temperature:	160°F
Listing:	UL, IAPMO, UPC, ADA, CSA



GENERAL NOTES:

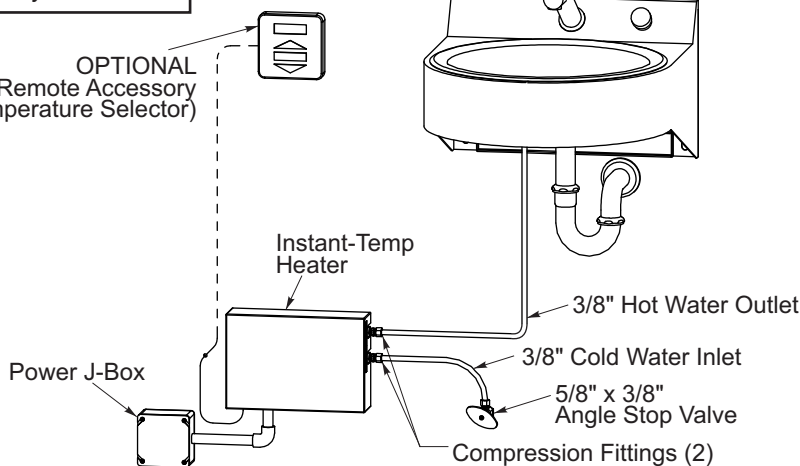
- The microprocessor adjusts the heater's power for variations in flow rates, inlet water temperature and pressure to assure the selected factory pre set water temperature.
- 240V models when operated at 220V will have approximately a 15% wattage decrease.

- Factory setting of 110°F or above require cold water mixing at the hand wash faucet.
- Microprocessor limits temperature increase according to the pre-selected temperature.

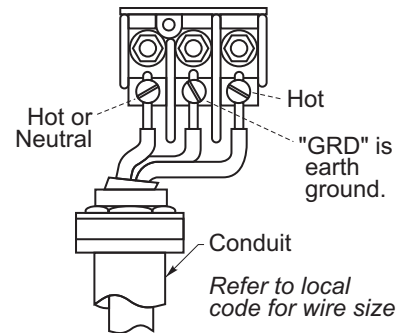
INSTALLATION DIAGRAM

Note: Heater to be installed below the level of all hot water outlets serviced by the heater

Shown installed in a single sink installation



WIRING CONNECTION



ATTENTION:

Unit must be hard wired.
NOTE: Heaters are single phase.
All tests are measured at the output of the heater.

Chronomite Laboratories assumes no responsibility for use of void or suspended data. © Copyright Chronomite Laboratories, Inc. Member of Morris Group International, City of Industry, CA Please visit www.chronomite.com for most current specifications.

SELECTION SUMMARY & APPROVAL FOR MANUFACTURING

Company _____

Model Number & Options _____ Quantity _____

Contact _____ Title _____

Signature (Approval for Manufacturing) _____ Date _____

CHRONOMITE
LABORATORIES, INC.

PH. 800-447-4962

626-937-4270

FAX 626-937-4279

www.chronomite.com



787 Spreckels Avenue
Manteca CA, 95336
P 209.825.1921

BUBBLER & DRINKING FOUNTAIN



MODEL: 2507A 2509 3041



These fountains are certified to NSF/ANSI 61.

Model 2507A

Two-stream, mound-building projector. Lead-free chrome-plated fittings. Lever handle self-closing stop. Removable shutoff seat. Volume regulator 3" center distance. 1/4" NPT supply.

Shipping weight: 3 lbs.

Model 2509

Two-stream, mound-building projector. Lead-free chrome-plated fittings. Lever handle self-closing stop. Removable chrome-plated shutoff seat. Volume regulator. Hood guard 3/8" NPT supply.

Shipping weight: 2 lbs.

Model 3041

Single-stream angle jet projector, chrome-plated unleaded brass. Combination self-closing pushbutton-type with integral automatic stream regulator. Hood guard 3/8" NPS connection. Use **A54881** when ordering.

Vandal-Resistant model includes set screw. Use **45660C** when ordering.

Shipping weight: 2 lbs.

NOTE: Continued product improvement makes specifications subject to change without notice. See Halsey Taylor website for most current spec sheet.

2507A Fountain Head



2509 Fountain Head



3041 Projector



JOB NAME: _____

ENGINEER/CONTRACTOR NAME: _____

APPROVAL: _____

DATE: _____

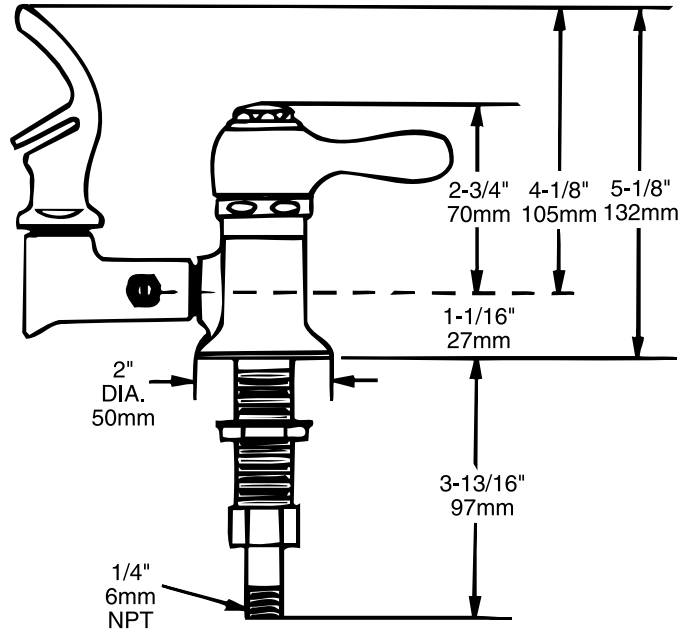


Fountain Heads and Projectors

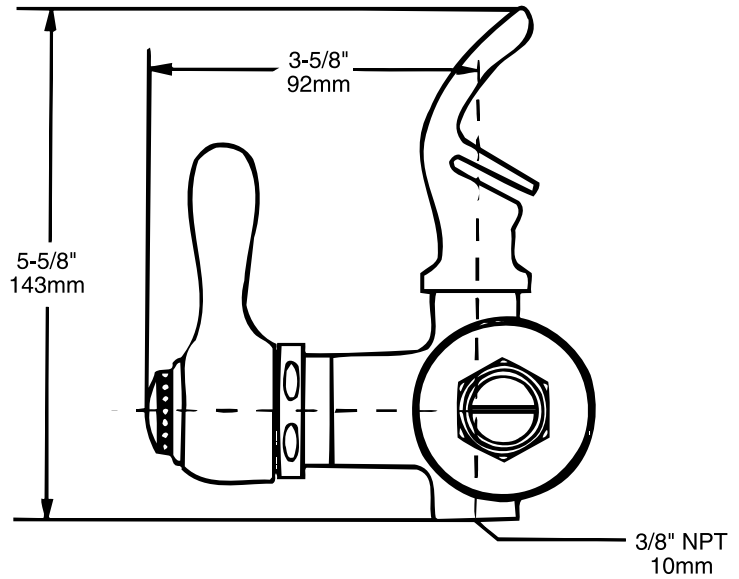
(CONTINUED)

OPERATING PRESSURES
Supply water-105 psi maximum

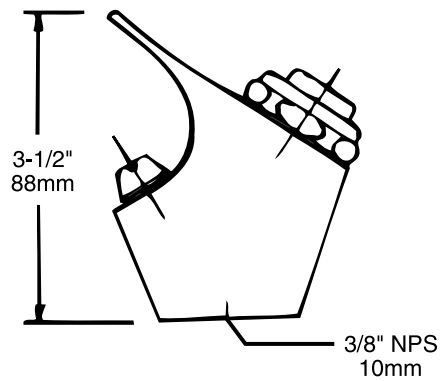
2507



2509



3041



Halsey Taylor®

PRODUCT SPECIFICATIONS

Elkay ezH2O[®] Vandal-Resistant Bottle Filling Station, & Bi-Level Cooler, Non-Filtered Refrigerated Stainless. Chilling Capacity of 8.0 GPH (gallons per hour) of 50° F drinking water, based on 80° F inlet water and 90° F ambient, per ASHRAE 18 testing. Features shall include Green Ticker™, Laminar Flow, Real Drain, Vandal Resistant. Furnished with Vandal Resistant bubbler. Electronic Bottle Filler Button with Mechanical Front Bubbler Button activation. Product shall be Wall Mount (On Wall), for Indoor + Outdoor applications, serving 2 station(s). Unit shall be certified to UL 399 and CAN/CSA C22.2 No. 120. Unit shall be lead-free design which is certified to NSF/ANSI 61 & 372 (lead free) and meets Federal and State low-lead requirements.



Special Features:	Green Ticker™, Laminar Flow, Real Drain, Vandal Resistant
Finish:	Stainless Steel
Power:	115V/60Hz
Bubbler Style:	Vandal Resistant
Activation by:	Electronic Bottle Filler Button with Mechanical Front Bubbler Button
Mounting Type:	Wall Mount (On Wall)
Chilling Capacity*:	8.0 GPH
Full Load Amps	1
Rated Watts:	370
Dimensions (L x W x H):	36-1/8" x 18-5/8" x 38-13/16"
Approx. Shipping Weight:	118 lbs.
Installation Location:	Indoor + Outdoor
No. of Stations Served:	2
*Based on 80° F inlet water & 90° F ambient air temp for 50° F chilled drinking water.	
**When used in non-temperature controlled environments, unit(s) must be adequately winterized and/or protected from extreme heat to prevent damage where climates dictate.	

- Mechanically-Activated bubbler continues to supply water in event of service disruptions.
- Green Ticker: Informs user of number of 20 oz. plastic water bottles saved from waste.
- Laminar flow provides clean fill with minimal splash.
- Real Drain System eliminates standing water.

COOLING SYSTEM

- Compressor: Hermetically-sealed, reciprocating type, single phase. Sealed-in lifetime lubrication.
- Condenser: Fan cooled, copper tube with aluminum fins. Fan motor is permanently lubricated.
- Cooling Unit: Combination tube-tank type. Continuous copper tubing with is fully insulated with EPS foam that meets UL requirements for self-extinguishing material.
- Refrigerant Control: Refrigerant R-134a is controlled by

PART: _____ QTY: _____

PROJECT: _____

CONTACT: _____

DATE: _____

NOTES: _____

APPROVAL: _____

Included with Product: Water Cooler (VRCTL8WSC), Bottle Filler (VRCWS)

▼ Ships in multiple boxes.

AMERICAN PRIDE. A LIFETIME TRADITION. Like your family, the Elkay family has values and traditions that endure. For almost a century, Elkay has been a family-owned and operated company, providing thousands of jobs that support our families and communities.



PRODUCT COMPLIANCE

ADA & ICC A117.1
ASME A112.19.3/CSA B45.4
Buy American Act
CAN/CSA C22.2 No. 120
GreenSpec[®]
NSF/ANSI 61 & 372 (lead free)
UL 399



Complies with ADA & ICC A117.1 accessibility requirements when installed according to the requirements outlined in these standards. Installation may require additional components and/or construction features to be fully compliant. Consult the local Authority Having Jurisdiction if necessary.

[Installation Instructions \(PDF\)](#)




5 Year Limited Warranty on the refrigeration system of the unit. Electrical components and water system are warranted for 12 months from date of installation. **Warranty pertains to drinking water applications only. Non-drinking water applications are not covered under warranty.**

[Warranty \(PDF\)](#)

In keeping with our policy of continuing product improvement, Elkay reserves the right to change product specifications without notice. Please visit elkay.com for the most current version of Elkay product specification sheets. This specification describes an Elkay product with design, quality, and functional benefits to the user. When making a comparison of other producers' offerings, be certain these features are not overlooked.

accurately calibrated capillary tube.

- Temperature Control: Easily accessible enclosed adjustable thermostat is factory preset. Requires no adjustment other than for altitude requirements.

Optional Accessories		
EWF3000	Elkay WaterSentry Plus Filter System Kit (Bottle Fillers) Spec Sheet (PDF)	
98324C	Accessory - Cane Apron for HAC HVR EMABF & VRC Models (Stainless) Spec Sheet (PDF)	
36292C	Accessory - Power Block for Multistation Bottle Filling Stations Spec Sheet (PDF)	

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IMPORTANT! INSTALLER PLEASE NOTE :

This water cooler has been designed and built to provide water to the user which has not been altered by materials in the cooler waterways. The grounding of electrical equipment such as telephone, computer, etc. to water lines is a common procedure. The grounding may be in the building but may also occur away from the building. This grounding can cause electrical feedback into a water cooler creating an electrolysis which creates a metallic taste or causes an increase in the metal content of the water. This condition is avoidable by installing the cooler using the proper materials as shown below.

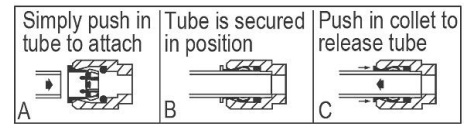
NOTICE

This water cooler must be connected to the water supply using a dielectric coupling. The cooler is furnished with a non-metallic strainer which meets this requirement. The drain trap which is provided by the installer should also be plastic to completely isolate the cooler from the building plumbing system.

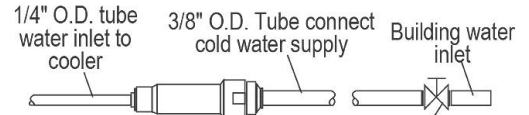
Bottle filler unit on bracket attached to wall by 6 holes (as shown). Water and electrical will connect through pre-punched hole in basin.

These products are designed to operate on 20 psi to 105 psi supply line pressure. Simultaneous operation of both bubblers on a bi-level unit may not be possible depending on water supply pressure. If simultaneous operation is desired, please ensure a minimum of 50 psi supply.

OPERATION OF QUICK CONNECT FITTINGS

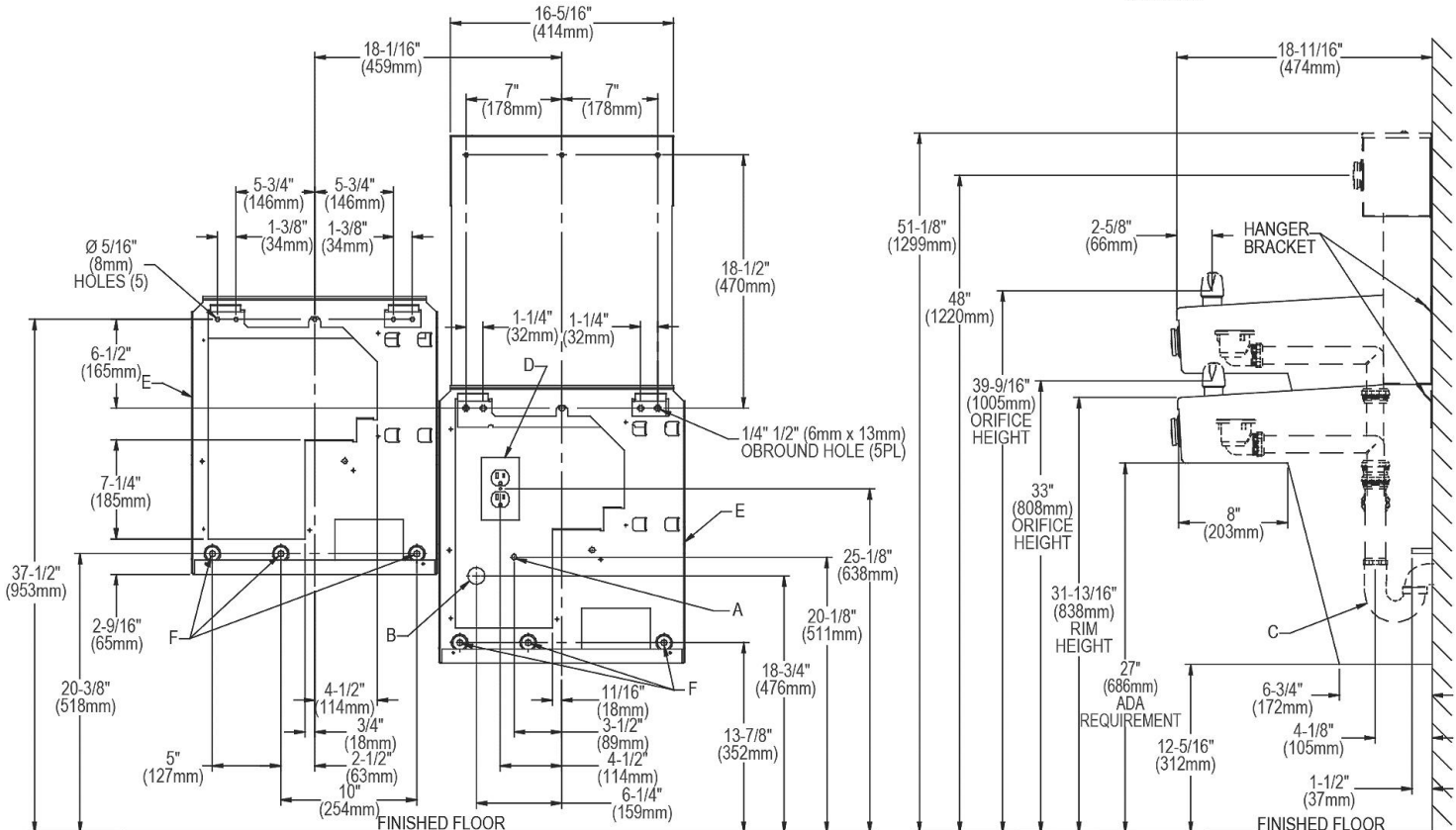


Pushing tube in before pulling it out helps to release tube



NOTE : Waterflow direction

Service stop (Not furnished)



LEGEND:

REDUCE HEIGHT BY 3" FOR INSTALLATION OF CHILDREN'S ADA COOLER

A = Recommended Water Supply location. Shut-off Valve (not furnished) to accept 3/8" O.D. unplated copper tube. Up to 3" (76mm) maximum out from wall.

B = Recommended Waste Outlet location. To accommodate 1-1/2" nominal drain. Drain stub 2" (51mm) out from wall.

C = 1-1/2" Trap (not furnished).

D = Electrical Supply (3) Wire Recessed Box Duplex Outlet.

E = Insure proper ventilation by maintaining 6" (152mm) minimum clearance from cabinet louvers to wall.

F = 7/16" (11mm) Bolt Holes for fastening to wall.

Note : New Installations Must Use Ground Fault Circuit Interrupter (GFCI). It is highly recommended that the circuit be dedicated and the load protection be sized for 20 amps.

In keeping with our policy of continuing product improvement, Elkay reserves the right to change product specifications without notice. Please visit elkay.com for the most current version of Elkay product specification sheets. This specification describes an Elkay product with design, quality, and functional benefits to the user. When making a comparison of other producers' offerings, be certain these features are not overlooked.



787 Spreckels Avenue
Manteca CA, 95336
P 209.825.1921

HOSE BIBB

FOR NON-FREEZING AREAS ONLY.

360° SWIVEL INLET

The Model 75 and B75 are anti-siphon wall hydrants designed for irrigation purposes in mild climate areas or within temperature controlled buildings. The Model 75 is only 2-5/8" deep and fits inside a stud wall. The B75 fits inside a 4" wall.

SPECIFICATIONS:

VACUUM BREAKER - ANTI-SIPHON - NIDEL® Model 34HF with 3/4 inch male hose thread, approved under ASSE Standard 1011, Canadian Standards Association and listed by IAPMO®.

VALVE SEAT – Permanent type brass valve body with hemispherical seating surface.

STEM – Hardened stainless steel stem resists damage.

PACKING – EPDM rubber with adjustable packing nut..

TEE KEY – Loose key operates hydrant.

INLET – 3/4" female pipe thread. Inlet swivels 360° to any position.

MAX PRESSURE – 125 p.s.i.

MAX TEMPERATURE - 120° F

OPTIONS - RK Bracket Kit

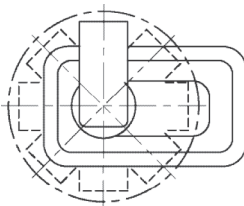
SHIPPING WEIGHT – **Model 75:** 3.1 lbs.
Model B75: 10.2 lbs.
Model RB75: 7.9 lbs.

For Installation / Troubleshooting Instructions go to
www.woodfordmfg.com or call 1-800-621-6032

Specify as follows:

Wall hydrant shall be Woodford Model 75 (exposed type) or B75 (concealed box type), with anti-siphon vacuum breaker listed by ASSE, CSA and IAPMO. 3/4" inlet and outlet. 360° inlet orientation. Hardened stainless steel operating stem. Packing nut secured with lock nut. Permanent type valve body with large hemispherical seating surface. Exterior finish to be Chrome Plated (options: Polished Brass or Rough Brass). Loose tee key to be furnished with each hydrant.

360 Degree Inlet Orientation



WOODFORD



Anti-Siphon Close Coupled Trimline Wall Hydrants Model 75/B75/RB75



MODEL 75

Exterior Finish:

Standard - Chrome (CH)

Optional - Brass (BR) Polished Brass (PB)



MODEL B75

Square Box & Door - Optional: Flat Door (F)

Exterior Finish:

Standard - Chrome (CH)

Optional - Brass (BR) Polished Brass (PB)



Patent
Pending

MODEL RB75

Optional Round Box & Door

Exterior Finish:

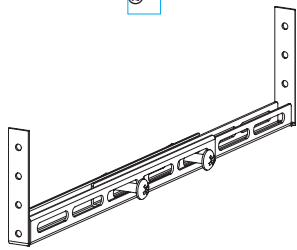
Standard - Chrome (CH)

Install through 6" diameter hole.

When ordering, specify model number, and finish.

WOODFORD

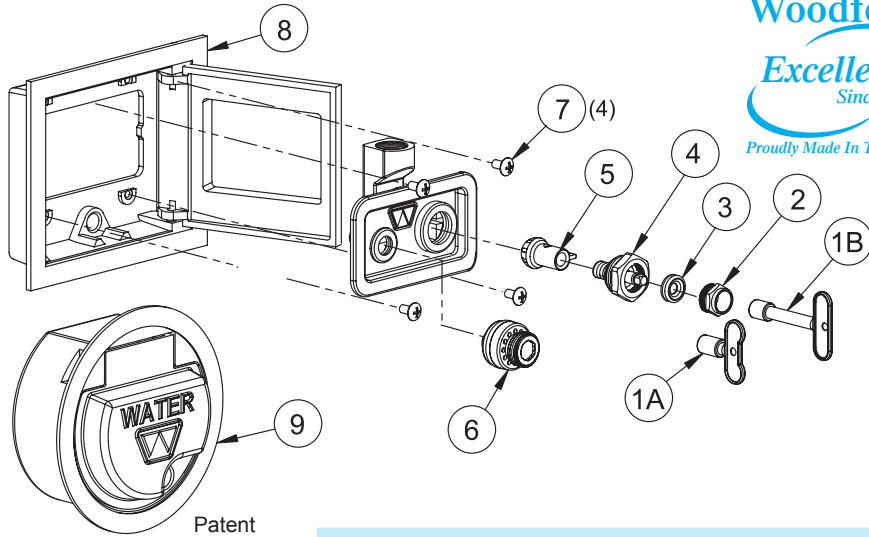
Woodford
Excellence
 Since 1929
 Proudly Made In The U.S.A.



**Mounting Bracket
 Included With B75**

Adjust and fasten bracket
 in stud wall. Attach box
 assembly to bracket for
 easy installation.

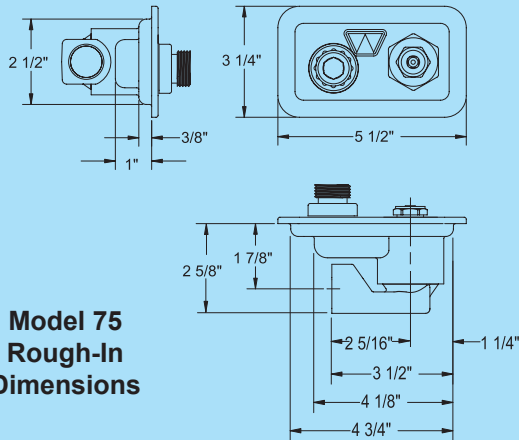
May be ordered as separate item:
RK-Bracket



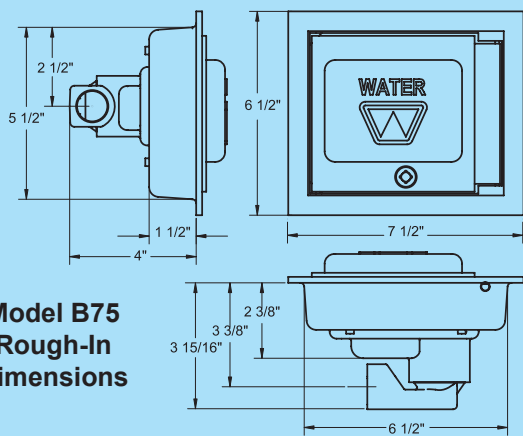
Patent
 Pending

MODEL 75/B75/RB75 PARTS LIST

ITEM	PART#	DESCRIPTION
1A	50009	Tee Key
1B	50010	Long Tee Key (Box Models)
2	30109 30107	Packing Nut - chrome Packing Nut - brass
3	30247	Packing
4	55183 55182	Head Nut Assembly - chrome Head Nut Assembly - brass
5	55105	Yoke Nut & Valve Assembly
6	34HF-CH 34HF-BR	Vacuum Breaker - chrome Vacuum Breaker - brass
7	51049	Truss Head Screws (4)
8	74BX	Square Box/Door Assembly - chrome standard
9	RB74BX	Round Box/Door Assembly - chrome
	RK-75	Chrome Repair Kit (Includes Items 1-5)



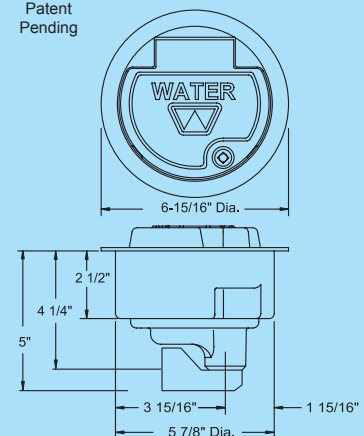
**Model 75
 Rough-In
 Dimensions**



**Model B75
 Rough-In
 Dimensions**

Patent
 Pending

**Model RB75
 Rough-In
 Dimensions**



Manufactured under one or more of the following patents: U.S. Patents: 3,414,001; 4,178,956; 4,316,481; 4,532,954
 D216,790; D216,791; D277,365; D277,366; Canada Patents: 852,529; 865,995; 1,146,438

For more information contact...

WOODFORD MANUFACTURING COMPANY

2121 Waynoka Road, Colorado Springs, Colorado 80915 • Phone: (800) 621-6032 • Fax: (800) 765-4115

To view our complete product line visit: www.woodfordmfg.com or email: sales@woodfordmfg.com

A Division Of WCM Industries, Inc.

URINAL & TOILETS

Features

- Washout urinal.
- 3/4" top spud.
- 1-pint or 0.125 gpf (0.47 lpf).
- Includes inlet and outlet spuds and hangers.
- Includes anti-backsplash wall.
- 14-3/4" (375 mm) extended rim.

Material

- Vitreous china.

Water Conservation & Rebates

- WaterSense® compliant when used with WaterSense flushometer.

Components

Additional included component/s: 3/4" Inlet Spud, 2" Outlet Spud, and Hanger (1 required).

**ADA**

Codes/Standards





ASME A112.19.2/CSA B45.1
DOE - Energy Policy Act 1992
EPA WaterSense®
ADA
ICC/ANSI A117.1

KOHLER® One-Year Limited Warranty

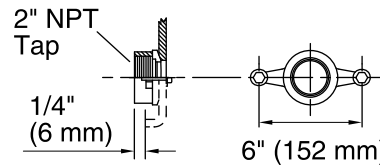
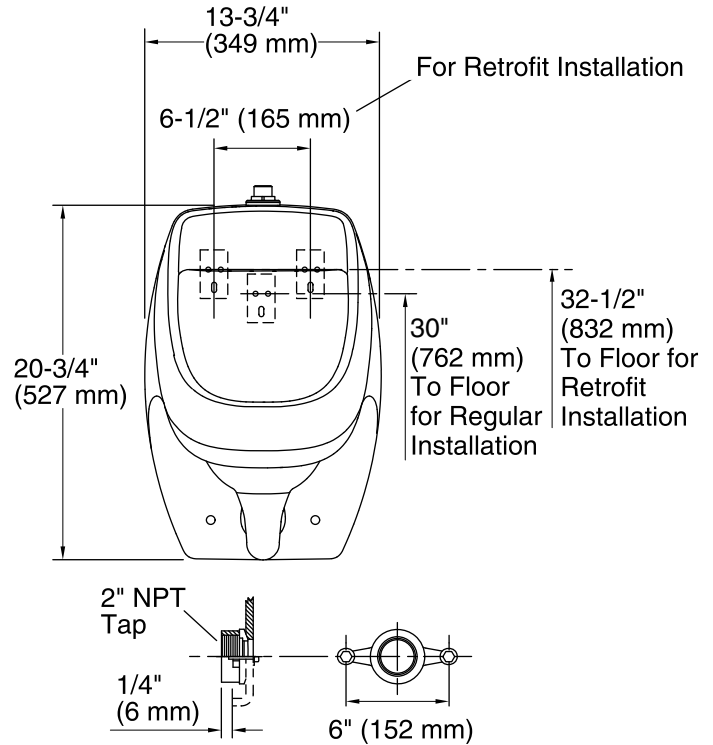
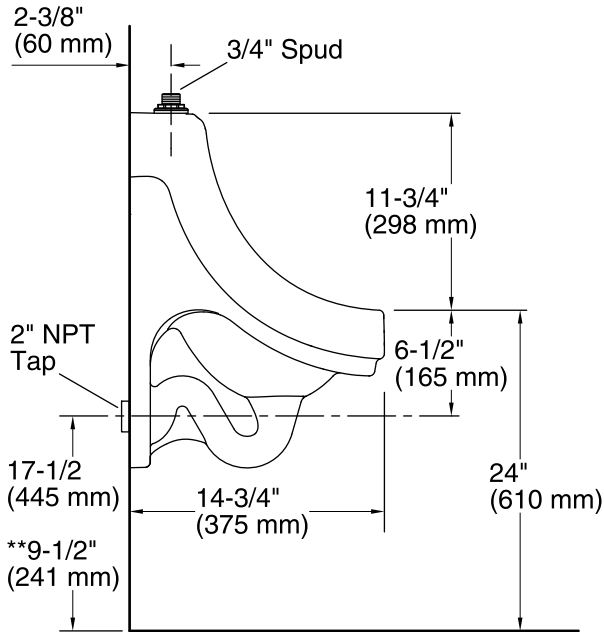
See website for detailed warranty information.

Available Color/Finishes

Color tiles intended for reference only.

Color	Code	Description
	0	White
	96	Biscuit
	47	Almond
	7	Black Black™

* Urinal complies with ADA
**Recommended outlet height for ADA compliance.



Spud Detail

Technical Information

All product dimensions are nominal.

Flush outlet technology: Washout

Spud size: 3/4", Inlet, Top

Min. Water per Flush: 0.125 gal (0.5 L)

Max. Water per Flush: 0.125 gal (0.5 L)

Designed for the above water use when installed with a water-saving flushometer.

Pressure and Supply Requirements

Fixture pressure min 25 psi (172.4 kPa)
(static):

Fixture pressure max 80 psi (551.6 kPa)
(static):

Notes

Designed only for use with a 0.125 gpf (0.5 lpf) flushometer.

Install this product according to the installation instructions.

ADA compliant when installed to the specific requirements of these regulations.



Highcliff™ Ultra

Elongated, Floor Mount, Flushometer Bowl
K-96057

Features

- Elongated bowl, ADA compliant.
- 1-1/2" top spud.
- Trap passageway 2-1/8"
- 10" x 7" water surface size
- Also available with antimicrobial finish K-96057-SS.

Material

- Vitreous china.

Technology

- Designed to outperform competitors in bowl cleanliness and plug resistance.
- Maximum waste removal.
- Improved toilet seat cover removal.
- Excellent bowl rinse.
- Engineered to flush effectively in buildings with low supply pressure and flow. Tested to 25 psi and 19 gpm.
- Maximum drain line carry at all flush volumes per ASME Standard.
- Reduced splashing.

Installation

- 26-3/8" L x 14-5/8" W x 16-7/8" H
- 10" or 12" rough-in
- ADA compliant bowl height.

Water Conservation & Rebates

- 1.1 to 1.6 gpf flush range (1.1, 1.28 and 1.6 gpf).
- WaterSense compliant when used with a 1.1 or 1.28 gpf WaterSense flushometer.

Optional Accessories

- K-4731-C Commercial Heavy-duty Toilet Seat
- K-4731-CA Commercial Heavy-duty Toilet Seat
- K-7531 Tripoint™ HES 1.28 GPF WC Flushometer
- K-7535 Tripoint™ HES 1.6 GPF WC Flushometer
- K-7521 WAVE HES 1.28 GPF WC Flushometer
- K-7523 WAVE HES 1.6 GPF WC Flushometer
- K-10673 WAVE Touchless Toilet 1.28 gpf Flushometer
- K-10674 Wave DC 1.6 GPF WC Flushometer
- K-76320 Manual 1.1 GPF WC Flushometer
- K-76321 Manual 1.28 GPF WC Flushometer
- K-76322 Manual 1.6 GPF WC Flushometer

Components

Additional included component/s: Spud, and Bolt Cap Accessory Pack.



ADA CSA B651 OBC

Codes/Standards

ASME A112.19.2/CSA B45.1
DOE - Energy Policy Act 1992
EPA WaterSense®
California Energy Commission (CEC)
ADA
ICC/ANSI A117.1
CSA B651
OBC




KOHLER® One-Year Limited Warranty

See website for detailed warranty information.

Available Color/Finishes

Color tiles intended for reference only.

Color Code Description

	0	White
	96	Biscuit
	47	Almond

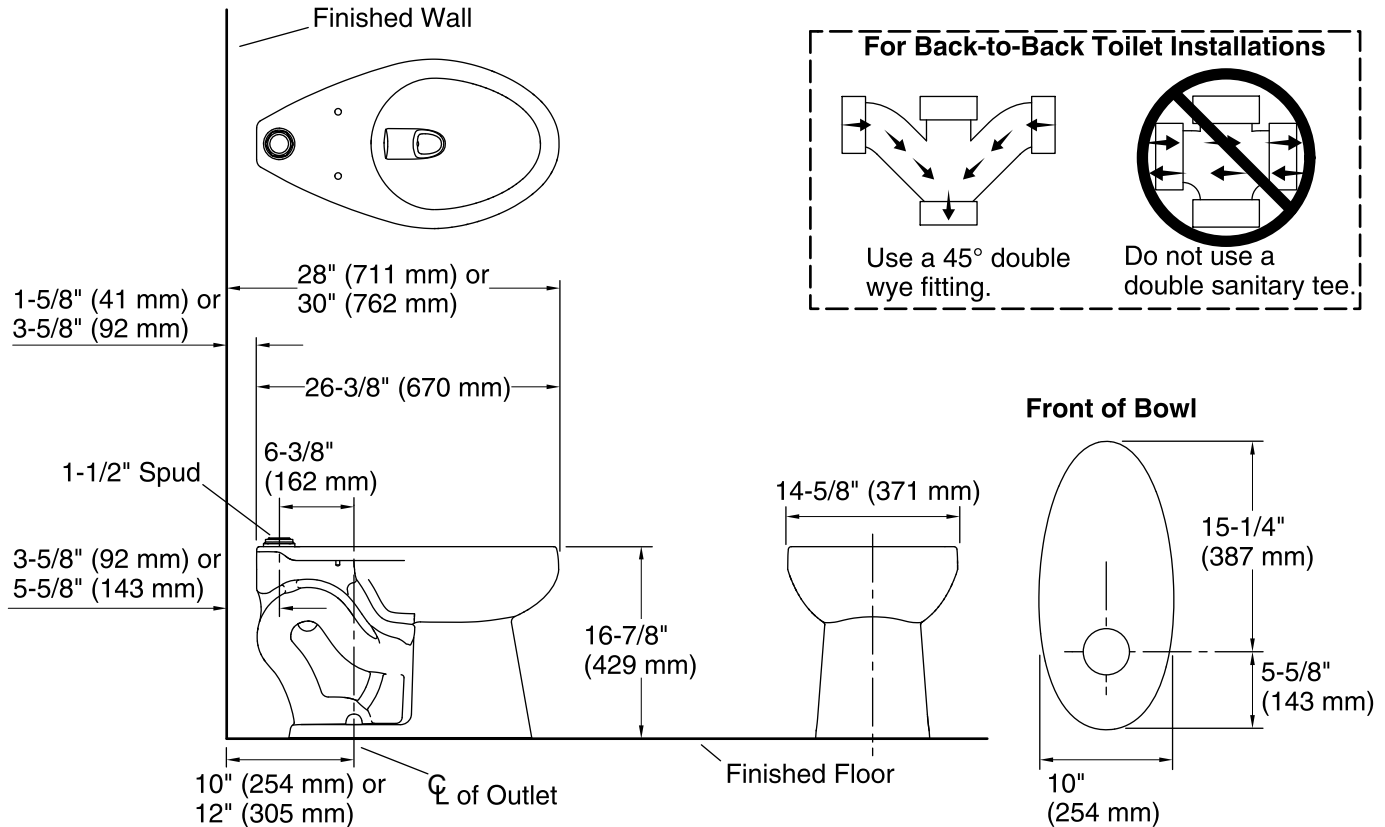
USA/Canada: 1-800-4KOHLER (1-800-456-4537)

Kohler Co. reserves the right to make revisions without notice to product specifications.

For the most current Specification Sheet, go to www.kohler.com.

5-6-2017 11:19

THE BOLD LOOK
OF **KOHLER**®



Technical Information

All product dimensions are nominal.

Toilet type:	Flushometer, Floor-mount
Waste Outlet:	Floor
Bowl shape:	Elongated front
Flush type:	Flushometer valve siphon
Spud size:	1-1/2", Inlet, Top
Trap passageway:	2-1/8" (54 mm)
Water Consumption	
Full:	1.1 gpf (4.3 lpf) or 1.28 gpf (4.8 lpf) or 1.6 gpf (6 lpf)
Water surface size:	10" x 7" (254 mm x 178 mm)
Rim to water surface:	6" (152 mm)
Rough-in:	10" or 12" (254 or 305 mm)
Seat-mounting holes:	5-1/2" (140 mm)

Fixture Supply Requirements

Min static pressure:	35 psi (241.3 kPa)
Max static pressure:	80 psi (551.6 kPa)
Min flowing pressure:	25 psi (172.4 kPa)
Min flow rate:	25 gpm (94.6 lpm)

Notes

Install this product according to the installation instructions.

For back-to-back toilet installations: Use only a 45° double wye fitting.

Requires flushometer valve to match desired water consumption 1.1 gpf (4.3 lpf) or 1.28 gpf (4.8 lpf) or 1.6 gpf (6 lpf).

ADA, OBC, CSA B651 compliant when installed to the specific requirements of these regulations.

Plumbing Codes require elongated toilets and elongated, open-front toilet seats in public bathrooms.

Accessibility standards require controls to be located on the open side of the toilet.



Juvenile™ Ultra
 Elongated, Floor Mount, Flushometer Bowl
K-96059

KG
 TOILETS.

Features

- Elongated bowl, Juvenile height bowl.
- 1-1/2" top spud.
- Trap passageway 2-1/8" .
- 10" x 7" water surface size .
- Also available with antimicrobial finish K-96059-SS.

Material

- Vitreous china.

Technology

- Designed to outperform competitors in bowl cleanliness and plug resistance.
- Maximum waste removal.
- Engineered for toilet seat cover removal.
- Excellent bowl rinse.
- Engineered to flush effectively in buildings with low supply pressure and flow.
- Maximum drain line carry at all flush volumes per ASME Standard.

Installation

- 25-15/16" L x 14-5/8" W x 13-3/4" H
- 10" or 12" rough-in.
- Meets ADA and Texas Accessibility Standard (TAS) height requirements for elementary school children, 5 through 8 years of age (12" to 15" to the top of the seat).

Water Conservation & Rebates

- 1.1 to 1.6 gpf flush range (1.1, 1.28 and 1.6 gpf).
- WaterSense compliant when used with a 1.1 or 1.28 gpf WaterSense flushometer.

Optional Accessories

- K-4670-C Commercial Elongated Toilet Seat
- K-4670-CA Commercial Elongated Toilet Seat
- K-76320 Manual 1.1 GPF WC Flushometer
- K-76321 Manual 1.28 GPF WC Flushometer
- K-76322 Manual 1.6 GPF WC Flushometer
- K-7531 Tripoint™ HES 1.28 GPF WC Flushometer
- K-7535 Tripoint™ HES 1.6 GPF WC Flushometer
- K-4731-C Commercial Heavy-Duty Toilet Seat
- K-4731-CA Commercial Heavy-Duty Toilet Seat

Components

Additional included component/s: Spud, and Bolt Cap Accessory Pack.



ADA CSA B651 OBC

Codes/Standards

- ASME A112.19.2/CSA B45.1
- DOE - Energy Policy Act 1992
- EPA WaterSense®
- California Energy Commission (CEC)
- ADA
- ICC/ANSI A117.1
- CSA B651
- OBC

KOHLER® One-Year Limited Warranty

See website for detailed warranty information.

Available Color/Finishes

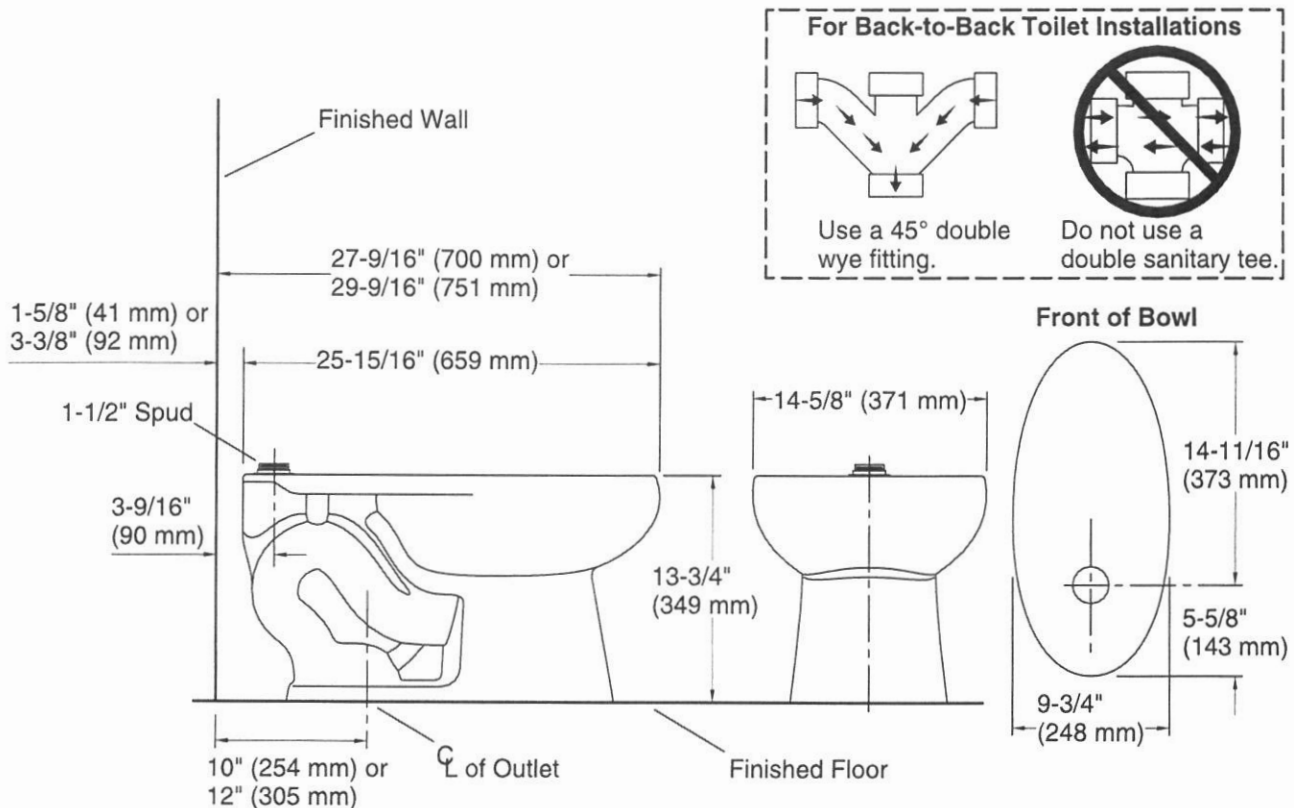
Color tiles intended for reference only.

Color	Code	Description
0		White

KOHLER®

KG
TOILETS

Juvenile™ Ultra Elongated, Floor Mount, Flushometer Bowl K-96059



Technical Information

All product dimensions are nominal.

Toilet type:	Flushometer, Floor-mount
Waste Outlet:	Floor
Bowl shape:	Elongated front
Flush type:	Flushometer valve siphon
Spud size:	1-1/2", Inlet, Top
Trap passageway:	2-1/8" (54 mm)
Water Consumption	
Full:	1.1 gpf (4.3 lpf) or 1.28 gpf (4.8 lpf) or 1.6 gpf (6 lpf)
Water surface size:	10" x 7" (254 mm x 178 mm)
Rim to water surface:	6" (152 mm)
Rough-in:	10" or 12" (254 or 305 mm)
Seat-mounting holes:	5-1/2" (140 mm)

Fixture Supply Requirements

Min static pressure:	35 psi (241.3 kPa)
Max static pressure:	80 psi (551.6 kPa)
Min flowing pressure:	25 psi (172.4 kPa)
Min flow rate:	25 gpm (94.6 lpm)

Notes

Install this product according to the installation instructions.

For back-to-back toilet installations: Use only a 45° double wye fitting.

Requires flushometer valve to match desired water consumption 1.1 gpf (4.3 lpf) or 1.28 gpf (4.8 lpf) or 1.6 gpf (6 lpf).

ADA, OBC, CSA B651 compliant when installed to the specific requirements of these regulations.

Plumbing Codes require elongated toilets and elongated, open-front toilet seats in public bathrooms.

Accessibility standards require controls to be located on the open side of the toilet.

USA/Canada: 1-800-4KOHLER (1-800-456-4537)

Kohler Co. reserves the right to make revisions without notice to product specifications.

For the most current Specification Sheet, go to www.kohler.com.

8-11-2017 02:56

THE BOLD LOOK
OF **KOHLER**®

SINKS & FAUCETS

K-2005-0

KOHLER®

Kingston™
Wall-Mount Bathroom Sink
K-2005

Features

- With hanger.
- With overflow.
- 4" (102 mm) centers.
- 21-1/4" (540 mm) x 18-1/8" (460 mm).

Material

- Vitreous china.

Installation

- Wall-mount

Recommended Accessories

K-8998 P-Trap

Components

Additional included component/s: Hanger.



ADA

CSA B651

Codes/Standards

ASME A112.19.2/CSA B45.1
ADA
ICC/ANSI A117.1
CSA B651





KOHLER® One-Year Limited Warranty

See website for detailed warranty information.

Available Color/Finishes

Color tiles intended for reference only.

Color Code Description

	0	White
	96	Biscuit
	47	Almond
	7	Black Black™

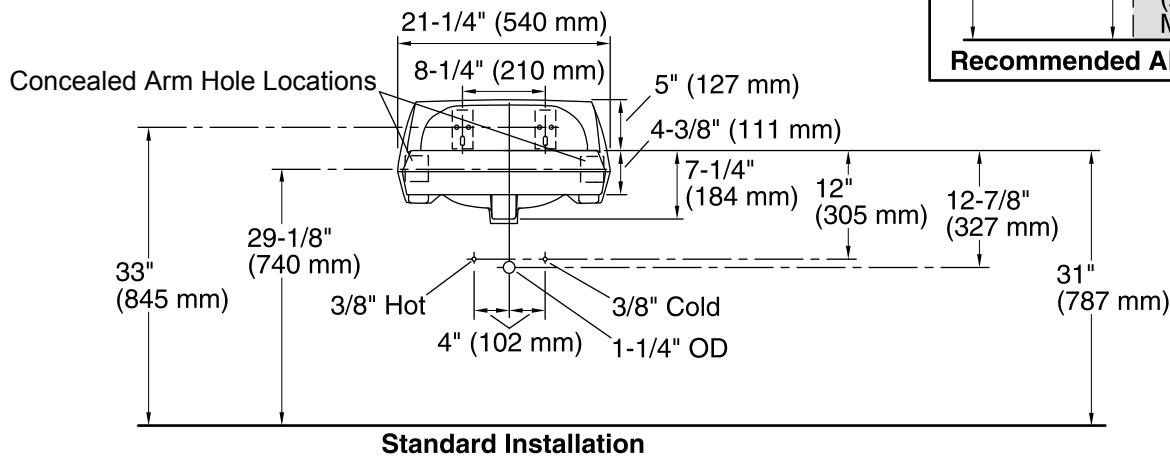
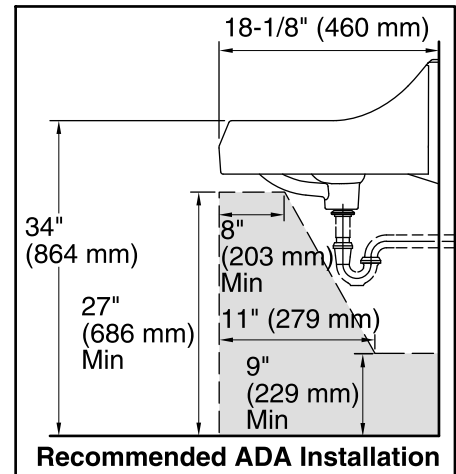
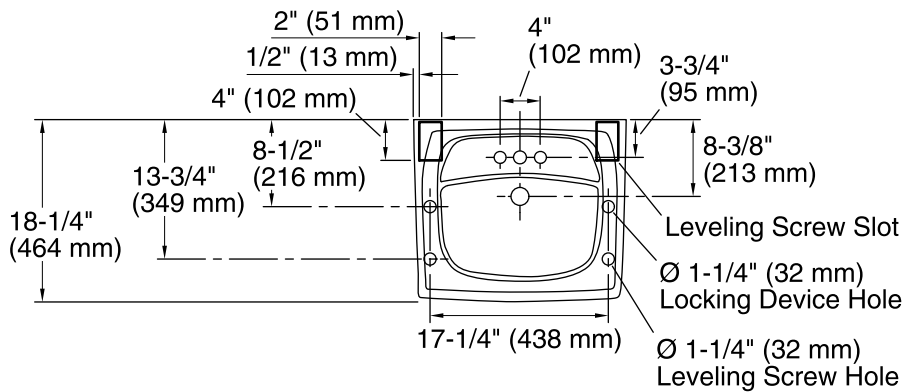
USA/Canada: 1-800-4KOHLER (1-800-456-4537)

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For the most current Specification Sheet, go to www.kohler.com.

3-18-2017 06:19

THE BOLD LOOK
OF **KOHLER®**



Technical Information

All product dimensions are nominal.

Bowl configuration:	Single
Installation:	Wall-mount
Bowl area (Only)	Length: 16" (406 mm) Width: 10" (254 mm) With overflow: Yes Water depth: 3-1/8" (79 mm)
Bowl area	With overflow: Yes
Number of deck holes:	3
Soap/Lotion hole:	1-1/4" (32 mm)
Drain hole:	1-3/4" (44 mm)

Notes

Install this product according to the installation instructions.

ADA, CSA B651 compliant when installed to the specific requirements of these regulations.



CENTERSET METERING Z86500-XL



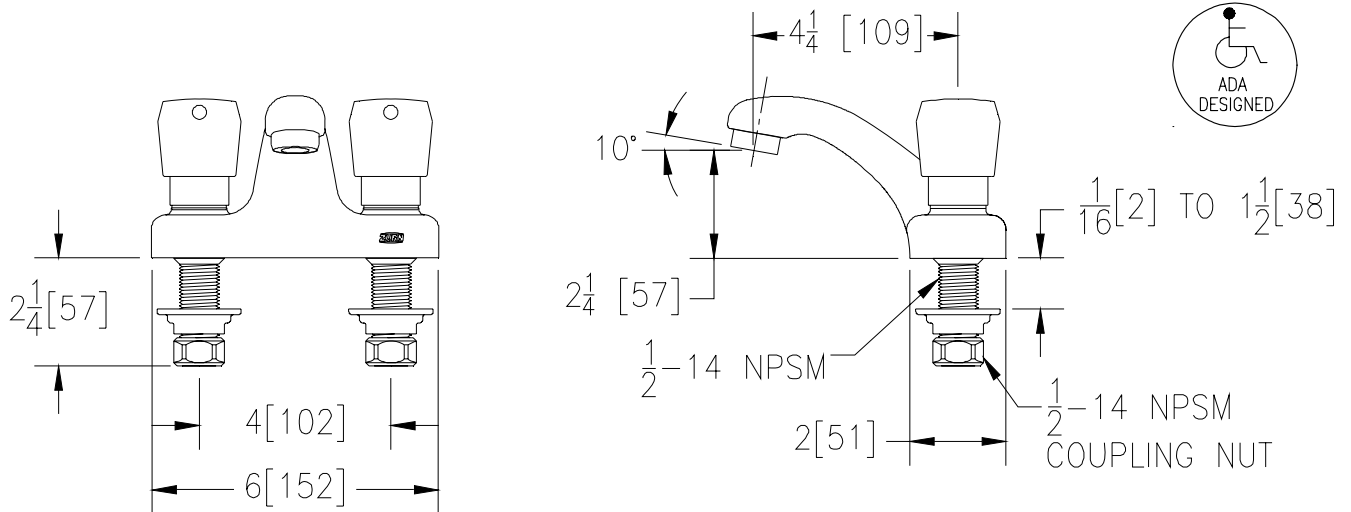
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Engineering Specifications: Zurn AquaSpec® Z86500-XL

Polished chrome-plated cast brass faucet body with integral shanks, slow-closing metering cartridges, a 4" [102mm] long integral cast spout, and vandal-resistant ADA compliant color-coded metal handles. Easy adjustable cycle time, preset to 10 seconds at 80 PSI. Unit is furnished with a water-conserving spray outlet which reduces flow to .25 GPC [1.0 GPM] (complying to ANSI A112.18.1 Standard for flow), integral shank filters, mounting hardware and 1/2" coupling nuts for standard lavatory risers.

Zurn Lead Compliant* "XL" products are a line of durable, high quality brass faucets and fixtures that are designed and manufactured to comply with state laws and local codes that mandate lead content levels. Zurn "XL" products are manufactured with *not more than 0.25% lead content when used with respect to wetted surfaces of pipes and pipe fittings, plumbing fitting and fixtures: California Health & Safety Code § 116875; Vermont 9 VCA § 2470h.



Note: All dimensions are for reference only. Do not use for pre-plumbing

OPTIONAL ACCESSORIES

Suffix	Description
___-G	1-1/4" [32mm] Grid Strainer Drain
___-GH	1-1/4" [32mm] Offset Handicap Drain
___-IN	Institutional Handle- Tamper-Proof and Vandal-Resistant
___-PT	1-1/4" [32mm] Cast Brass P-Trap with a 7-1/2" [191mm] Long 17-Gauge Wall Bend
___-RKR	ADA Compliant Rocker Handle
___-3M	.5 GPM [1.9 L] Vandal-Resistant Pressure Compensating Male Spray Outlet
___-16M	1.0 GPM [3.8 L] Vandal Resistant Pressure Compensating Male Spray Outlet
___-21M	1.0 GPM [3.8L] Pressure Compensating Male Laminar Flow Outlet
___-22M	1.0 GPM [3.8L] Pressure Compensating Vandal-Resistant Male Laminar Flow Outlet
___-24M	0.35 GPM [1.3 L] Pressure Compensating Male Spray Outlet
___-25M	0.35 GPM [1.3 L] Vandal-Resistant Pressure Compensating Male Spray Outlet

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Phone: 1-800-997-3876 ♦ Fax: 1-919-775-3541 ♦ www.zurn.com

In Canada: ZURN INDUSTRIES LIMITED ♦ 3544 Nashua Drive ♦ Mississauga, Ontario L4V1L2 ♦ Phone: 905/405-8272 Fax: 905/405-1292

PRODUCT SPECIFICATIONS

Dayton Stainless Steel 25" x 21-1/4" x 6-9/16", Single Bowl Drop-in Sink. Sink is manufactured from 22 gauge 300 series Stainless Steel with a Satin finish, Center drain placement, and Bottom only pads.

Installation Type:	Drop-in
Material:	300 series Stainless Steel
Finish:	Satin
Gauge:	22
Sound Deadening:	Bottom only pads
Number of Bowls:	1
Sink Dimensions:	25" x 21-1/4" x 6-9/16"
Bowl 1 Dimensions:	21" x 15-3/4" x 6-3/8"
Drain Size:	3-1/2" (89mm)
Drain Location:	Center
Minimum Cabinet Size:	30"
Mounting Hardware:	Part # 64090012 included for countertops up to 3/4" (19mm) thick
Cutout Template #:	1000001245

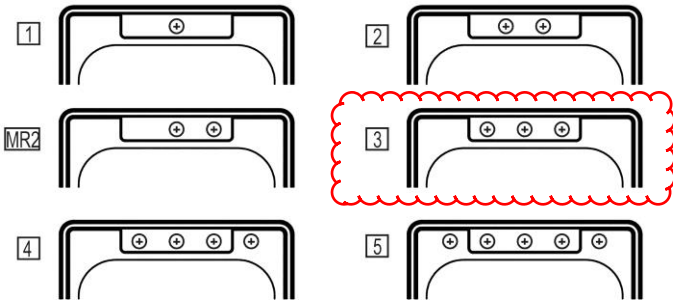
Template is available for download at [elkay.com](#)

Cutout Dimensions for Top Mount Installation:

24-3/8" x 20-5/8" (619mm x 524mm) with 1-1/2" (38mm) corner radius

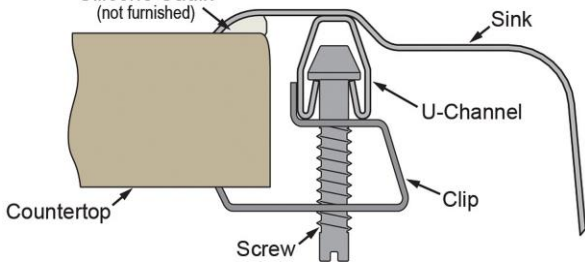
Hole Drilling Configurations:

1-1/2" (38mm) Diameter Faucet Holes on 4" (102mm) Centers



Installation Profile:

Silicone Caulk (not furnished)



AMERICAN PRIDE. A LIFETIME TRADITION.

Like your family, the Elkay family has values and traditions that endure. For almost a century, Elkay has been a family-owned and operated company, providing thousands of jobs that support our families and communities.



Product Compliance:

ADA & ICC A117.1
ASME A112.19.3/CSA B45.4
BUY AMERICAN ACT



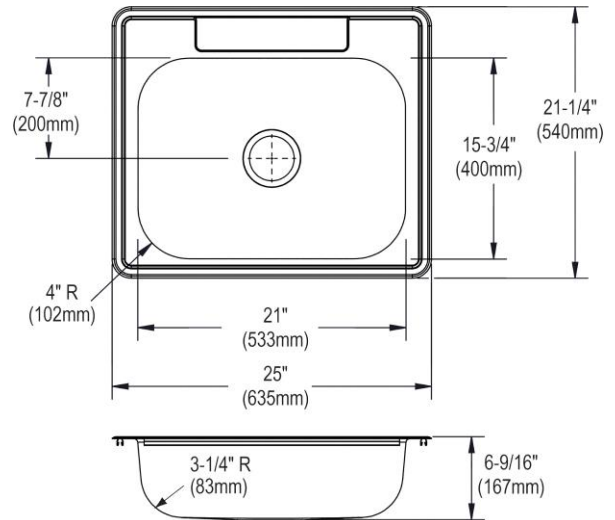
Sinks are listed by IAPMO[®] as meeting the applicable requirements of the Uniform Plumbing Code[®], International Plumbing Code[®], and National Plumbing Code of Canada.



Complies with ADA & ICC A117.1 accessibility requirements when installed according to the requirements outlined in these standards.

[Clean and Care Manual \(PDF\)](#)
[Installation Instructions \(PDF\)](#)
[Limited Lifetime Warranty \(PDF\)](#)

Similar models are available with: ADA Depths



PART: _____ QTY: _____

PROJECT: _____

CONTACT: _____

DATE: _____

NOTES: _____

APPROVAL: _____

In keeping with our policy of continuing product improvement, Elkay reserves the right to change product specifications without notice. Please visit [elkay.com](#) for the most current version of Elkay product specification sheets. This specification describes an Elkay product with design, quality, and functional benefits to the user. When making a comparison of other producers' offerings, be certain these features are not overlooked.



KITCHEN SINK FAUCET

Z871B4-XL

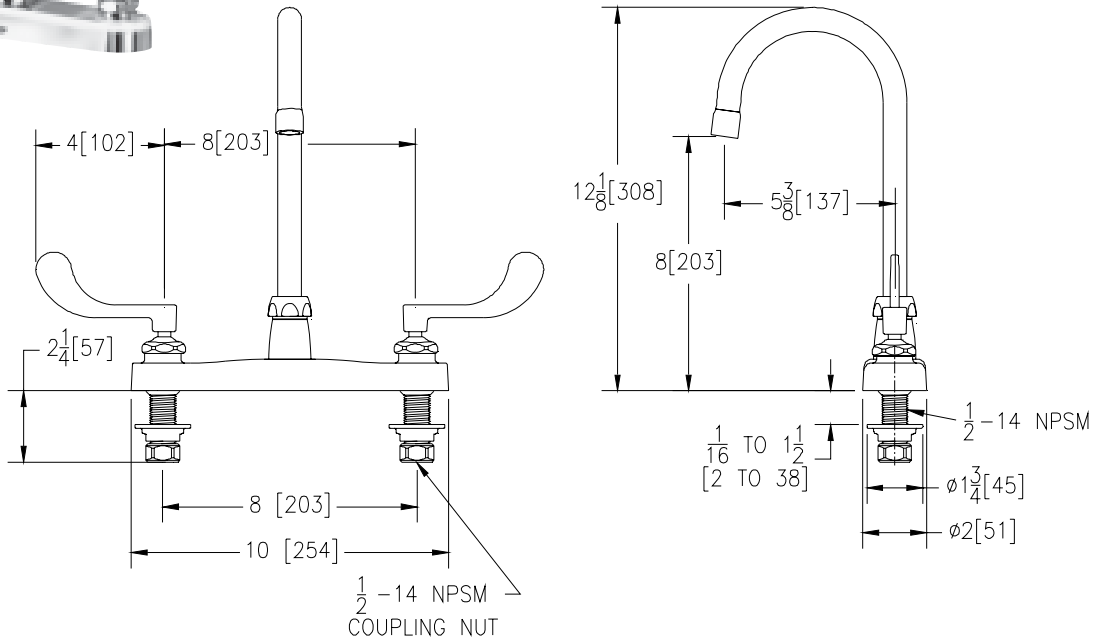


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Engineering Specifications: Zurn AquaSpec® Z871B4-XL

Polished chrome-plated 8" [203mm] brass deck faucet with a 5-3/8" [137mm] centerline rigid or swing gooseneck spout and quarter turn ceramic disc cartridges. Unit is furnished with a 2.2 GPM [8.3 L] pressure compensating aerator (complying with ANSI A112.18.1 Standard for flow), 4" [102mm] vandal-resistant color-coded metal wrist blade handles, mounting hardware and 1/2" NPSM coupling nuts for standard lavatory risers.

Zurn Lead Free products (-XL), is the line of durable, high quality brass faucets and fixtures that are designed and manufactured to comply with state laws and local codes that mandate lead content levels. Zurn Lead Free products (-XL) are manufactured with less than one quarter of one percent (0.25%) total lead content by weighted average.



Note: All dimensions are for reference only. Do not use for pre-plumbing

OPTIONAL ACCESSORIES

Suffix	Description
___FC	2.0 GPM [7.6L] Laminar Flow Control in Base of Spout
___HCT	Hot/Cold Text Indexes
___HS	Hose and Spray
___PT	1-1/4" [32mm] Cast Brass P-Trap with a 7-1/2" [191mm] Long 17-Gauge Wall Bend
___2F	2.2 GPM [8.3 L] Vandal-Resistant Pressure Compensating Female Aerator
___3F	0.5 GPM [1.9 L] Vandal-Resistant Pressure Compensating Female Aerator
___4F	2.2 GPM [8.3 L] Vandal-Resistant Pressure Compensating Female Laminar Flow
___7F	1.0 GPM [3.8 L] Pressure Compensating Female Spray Outlet
___16F	1.0 GPM [3.8 L] Vandal-Resistant Pressure Compensating Female Spray Outlet
___17F	1.5 GPM [5.7 L] Vandal-Resistant Pressure Compensating Female Aerator
___18F	1.5 GPM [5.7 L] Vandal-Resistant Pressure Compensating Female Laminar Flow
___19F	1.5 GPM [5.7 L] Anti-Microbial Pressure Compensating Female Laminar Flow Outlet
___20F	1.0 GPM [3.8L] Vandal-Resistant Pressure Compensating Anti-Microbial Female Laminar Flow Outlet
___21F	1.0 GPM [3.8L] Female Laminar Flow Outlet



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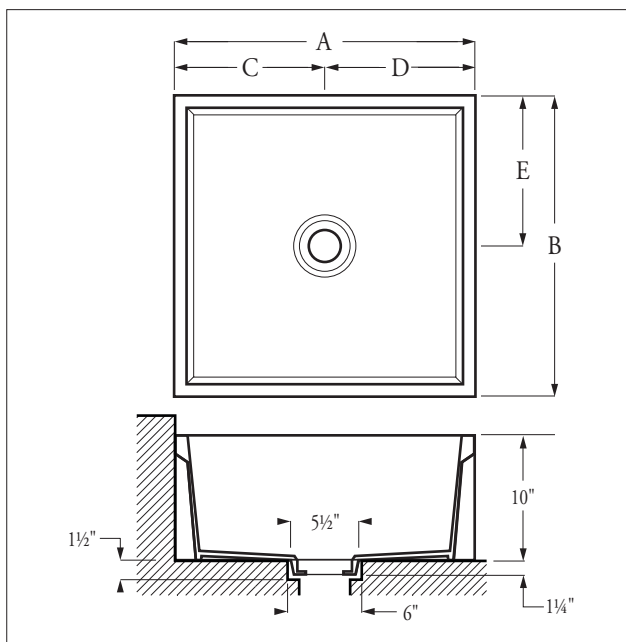
Molded one-piece construction for light weight and easy handling. Supplied with Wedge-Lok™ seal, integral drain and chrome strainer.

Florestone Models
MSR-2424/MSR-3624
Molded Mop Receptors

Architect's Specifications

Furnish and install molded Mop Receptor Model MSR-2424 / MSR-3624 (specify) as manufactured by Florestone Products Co. Molding will be done under heat and pressure using matched metal dies. The unit will be one piece with no seams. Shoulders will be no less than 1" wide and 9½" inside. Receptor will have ribbed underbody and integral drain providing for a no-caulked connection to a 2" or 3" ABS pipe (specify drain size). Drain grid will be 18-gauge stainless steel, flat type, #430.

Molded mop sinks are supplied with Wedge-Lok® seal for use on ABS pipe only.



Model	A	B	C	D	E	WT.
MSR-2424	24"	24"	12"	12"	12"	50
MSR-3624	36"	24"	18"	18"	12"	72

Standards:

- I.A.P.M.O. International Association of Plumbing and Mechanical Officials File No. 2646.
- ANSI American National Standards Institute - Specifications Z-124.6.
- HUD/FHA National Specifications UN-73.
- CSA TEST Warnock Hersey Listed: CAN / CSA - B45.0 - CAN / CSA - B45.5

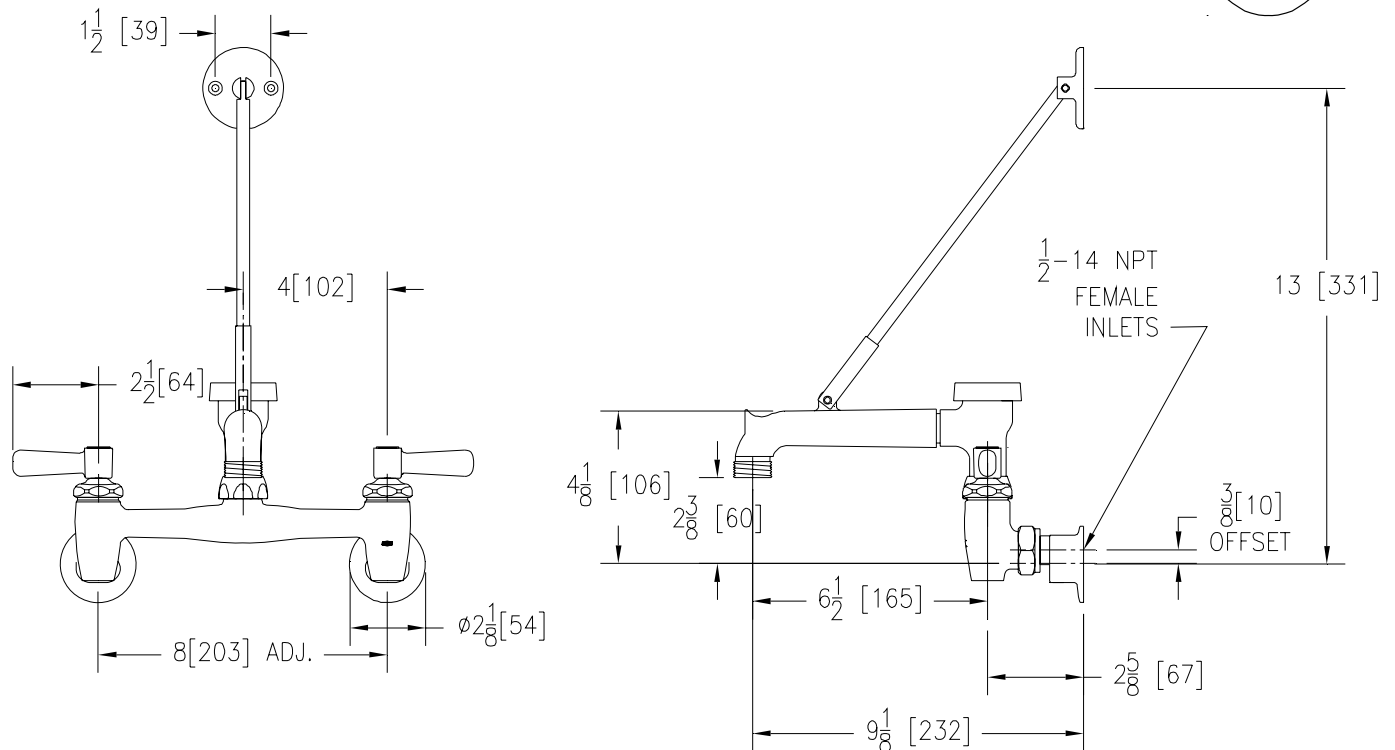


FLORESTONE PRODUCTS CO., INC.

2851 Falcon Drive • Madera, CA 93637
 T. 559.661.4171 • T. 800.446.8827
 F. 559.661.2070 • florestone.com

Engineering Specifications: Zurn AquaSpec® Z843M1-RC

Rough chrome-plated cast brass 8" [203mm] sink faucet with quarter turn ceramic disc cartridges, 3/8" [10mm] short swivel inlets providing adjustable centers from 7-1/4" [184mm] to 8-3/4" [222mm], integral service stops and a 6" [152mm] centerline cast brass spout with chemical resistant vacuum breaker, 3/4" hose threaded outlet, pail hook and adjustable wall brace. Unit is furnished with 2-1/2" [64mm] vandal-resistant color-coded metal lever handles. (Note: Atmospheric vacuum breaker not intended for continuous pressure applications.)



Note: All dimensions are for reference only. Do not use for pre-plumbing

OPTIONAL ACCESSORIES

Suffix	Description
___-CS	Check Stops
___-HCT	Hot/Cold Text Indexes
___-LSI	2-1/2" [64mm] Long Swivel Inlets
___-WHK	Wall Hook
___-5H	5' [152cm] Vinyl Hose
___-6P	Master Carton (Qty. 6)

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ACCESSORIES

Recessed Fixtures Technical Specification

Recessed Paper Holders

575, 576

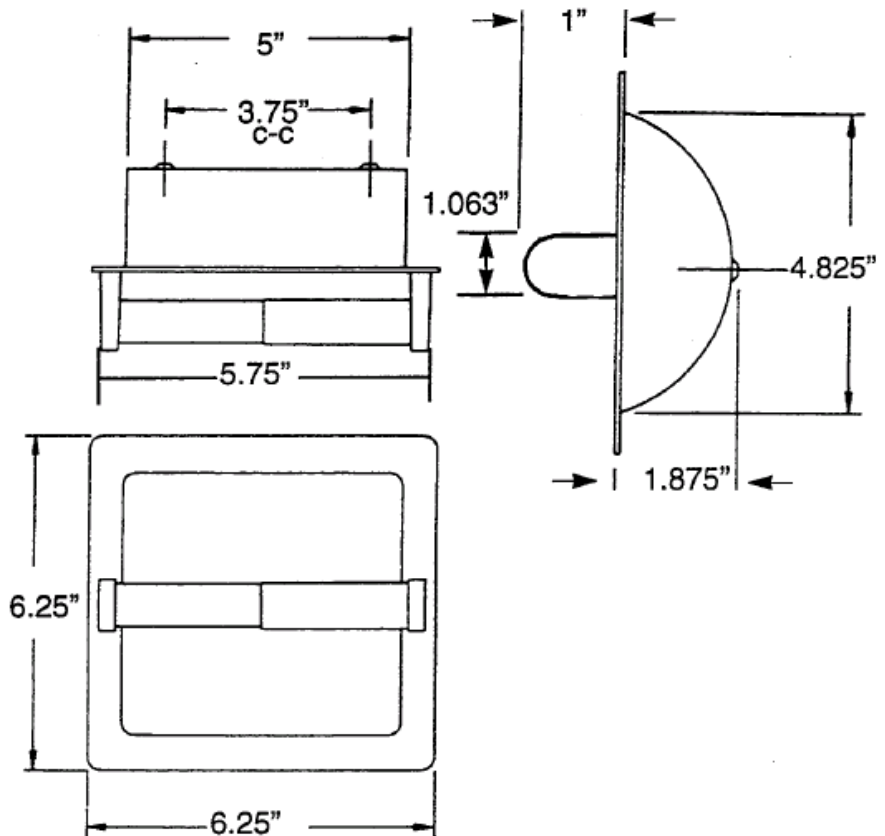
Stock Numbers:

- **575 – Recessed Paper Holder**
Polished Chrome Finish
Chrome Roller
- **576 – Recessed Paper Holder**
Polished Chrome Finish
White Roller

Materials:

Recessed Paper Holder shell is stamped from a special alloy brass strip and finished with a triple plated polished chrome finish with a lacquer coat for added protection. Roller is plastic and spring loaded.

Dimensions:



Installation Instructions:

Cut out wall opening $5\frac{1}{4}" \times 5\frac{1}{4}" \times 1\frac{7}{8}"$ depth. If wood blocking is available, install recess shell into opening using $1\frac{1}{4}"$ screws (provided). If wood blocking is not available, use optional installation clamp: BR587 or 588.

Stock Number: _____ **Recessed Paper Holder**
By Creative Specialties



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INTERNATIONAL: (440) 962-2000 • FAX: (440) 962-2726
CUSTOMER SERVICE (USA): 800-882-0116 • FAX: (888) 379-2720
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Literature #BA1610



MIRROR WITH STAINLESS STEEL CHANNEL FRAME



Designer's Notes:

1. Special-order sizes available on request.
2. Maximum size mirror available, 72" x 60" (183 x 152cm); minimum size, 12" x 12" (30 x 30cm).
3. All Bobrick framed mirrors are manufactured to overall width and height dimensions. EXAMPLE: A 24" x 36" (61 x 91cm) mirror will be furnished 24" x 36" (61 x 91cm) outside-of-frame to outside-of-frame.
4. To specify special sizes use Series Number followed by width then height in inches. EXAMPLE: B-165 2024.
5. Bobrick framed mirrors are manufactured to a tolerance 1/8" (3.2mm).
6. For sufficient space to lift mirror onto wall hanger(s), provide 3-1/4" (85mm) minimum clearance above center line of mounting screw holes.
7. Provide 1" (25mm) minimum clearance at bottom of mirror for engaging locking screws and 1" (25mm) clearance on each side.

**Snap Locking Design
(Rear View)**

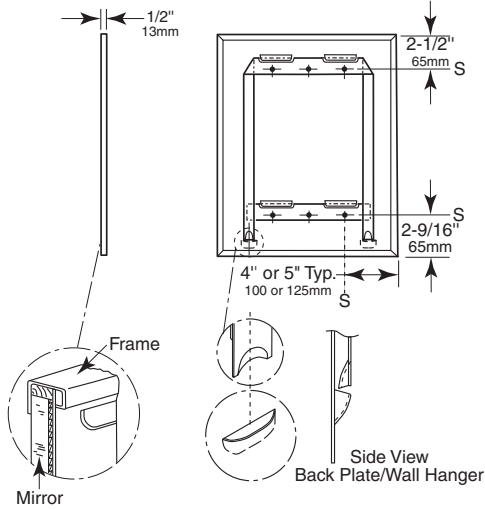


Figure: 1

**Lock Tab Design
(Rear View)**

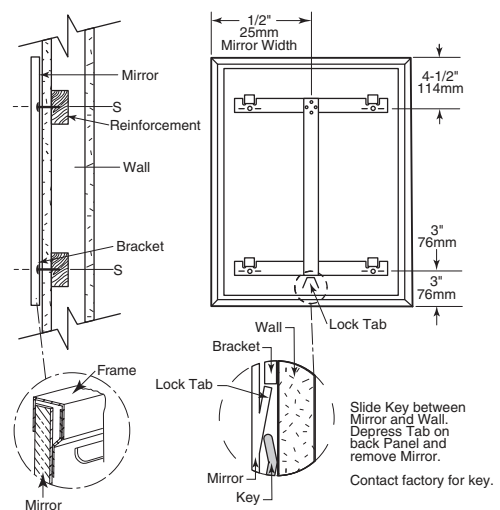


Figure: 2

STANDARD B-165 SERIES MIRRORS

MODEL NO.	OVERALL SIZE	
	W	H
B-165 1824	18" (46cm)	24" (61cm)
B-165 1830	18" (46cm)	30" (76cm)
B-165 1836	18" (46cm)	36" (91cm)
B-165 2436	24" (61cm)	36" (91cm)

STANDARD B-165 SERIES MIRRORS

MODEL NO.	OVERALL SIZE	
	W	H
B-165 2448	24" (61cm)	48" (122cm)
B-165 2460	24" (61cm)	60" (152cm)

All Other Size Mirrors

MATERIALS:

Frame — Type-430 stainless steel, 1/2" x 1/2" x 3/8" (13 x 13 x 9.5mm) channel with 1/4" (6mm) return at rear for Snap Locking Design; 1/2" x 1/2" x 1/2" (13 x 13 x 13mm) channel for Lock Tab Design, with bright polished finish. One piece frame with 90 degree mitered corners. Galvanized steel back has integral horizontal hanging brackets near the top for hanging the mirror and near the bottom to prevent the bottom of the mirror from pulling away from the wall. Locking devices secure mirror to concealed wall hanger.

Mirror — No. 1 quality, 1/4" (6mm) select float glass: selected for silvering, electrolytically copper-plated by the galvanic process, and guaranteed for 15 years against silver spoilage. Back is protected by full-size, shock-absorbing, water-resistant, nonabrasive, polyethylene padding.

Concealed Wall Hanger — Fabricated of galvanized steel. Incorporates lower support member, which engages lower backplate louvers to keep bottom of mirror against wall.

continued . . .

INSTALLATION:

Mount wall hanger on wall with screws (not furnished) at points indicated by an S. For plaster or dry wall construction, provide backing to comply with local building codes, then secure wall hanger with screws (not furnished). When providing a concealed backing, allow backing to cover minimum range of mounting hole locations shown on drawing. For other wall surfaces, provide fiber plugs or expansion shields for use with screws (not furnished), or provide 1/8" (3mm) toggle bolts or expansion bolts. Hang mirror on wall hanger with all four backplate louvers engaged behind horizontal wall hanger members. Hang mirror on wall hanger with all four backplate louvers engaged behind horizontal wall hanger members. To do this, mirror must be centered in front of the wall hanger horizontally, pressed flat against the wall approximately 1" (25mm) above final position and then lowered into final position.

Snap Locking Design — Locking devices automatically secure mirror to concealed wall hanger when it is lowered into final position (see figure 4). Locking devices may be unlocked by inserting two flat blade screwdrivers behind each side of mirror near the bottom or under the bottom of the mirror and pulling mirror bottom forward and then up.

Lock Tab Design — Locking device automatically secure mirror to concealed wall hanger when it is lowered into final position (see figure 5). Locking device may be unlocked by sliding Key between mirror and wall and depressing tab on back panel. If key is required, please the factory.

**Snap Locking Design
(Front View)**

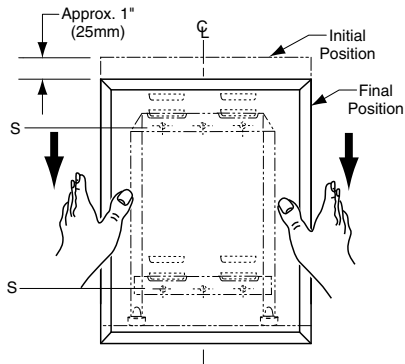


Figure: 4

**Lock Tab Design
(Front View)**

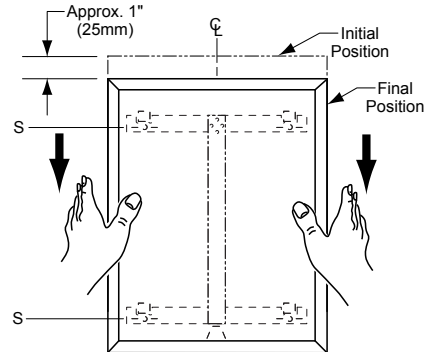


Figure: 5

SPECIFICATION:

Mirror shall have a one-piece type-430 stainless steel channel frame, with 90° mitered corners; all exposed surfaces shall have bright polished finish. Select float glass mirror shall be guaranteed for 15 years against silver spoilage. The back shall be protected by full-size, shock-absorbing, water-resistant, nonabrasive, polyethylene padding. Galvanized steel back shall have integral horizontal hanging brackets located at top and bottom for mounting on concealed wall hanger to prevent the mirror from pulling away from the wall. Locking devices secure mirror to concealed wall hanger. Mirror shall be removable from the wall.

Framed Mirror shall be Model B-165 _____ (insert width and height) of Bobrick Washroom Equipment, Inc., Clifton Park, New York; Jackson, Tennessee; Los Angeles, California; Bobrick Washroom Equipment Company, Scarborough, Ontario; Bobrick Washroom Equipment Pty. Ltd., Australia; and Bobrick Washroom Equipment Limited, United Kingdom.

Home Care Technical Specification

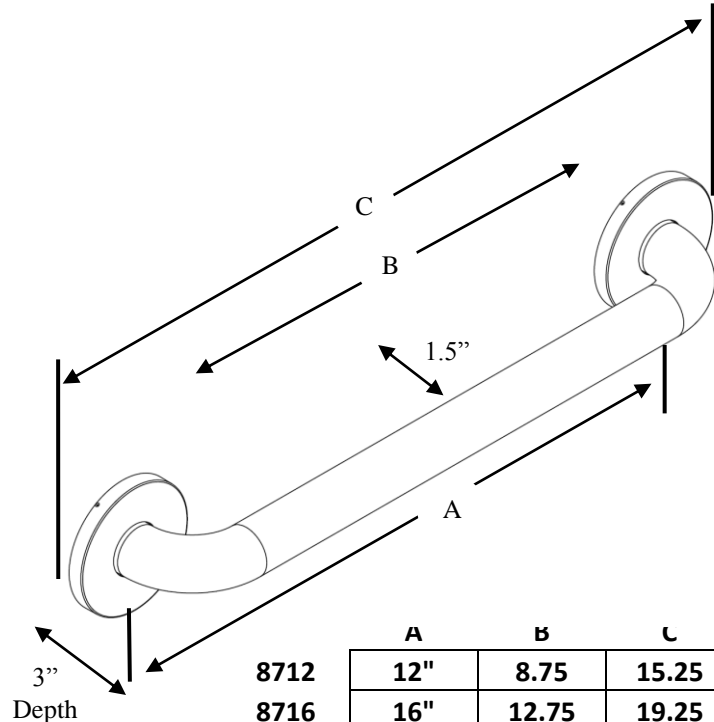
1 1/4" Grab Bars – Concealed Screw

8700

Stock Numbers:

- ❑ **R8712W, DN8712, LR8712W – 12" Grab Bar**
Stainless Steel or White Finish, 1 1/4" Bar
- ❑ **8716, R8716W, LR8716W – 16" Grab Bar**
Stainless Steel or White Finish, 1 1/4" Bar
- ❑ **8718, L8718, R8718PS, LR8718PS, R8718PB, LR8718W, R8718W – 18" Grab Bar**
Stainless Steel, Polished Stainless, Polished Brass, or White Finish, 1 1/4" Bar
- ❑ **8724, L8724, R8724PS, LR8724PS, LR8724W R8724PB, R8724W – 24" Grab Bar**
Stainless Steel, Polished Stainless, Polished Brass, or White Finish, 1 1/4" Bar
- ❑ **8730, R8730W – 30" Grab Bar**
Stainless Steel or White, 1 1/4" Bar
- ❑ **8732, R8732W – 32" Grab Bar**
Stainless Steel or White Finish, 1 1/4" Bar
- ❑ **R8736PS, R8736W, 8736, L8736– 36" Grab Bar**
Polished Stainless or White Finish, 1 1/4" Bar
- ❑ **8742, R8742PS, R8742W, R8748W– 42" Grab Bar**
Satin or Polished Stainless Finish, White Finish, 1 1/4" Bar
- ❑ **8748, R8748W – 48" Grab Bar**
Satin Finish or White Finish, 1 1/4" Bar

Dimensions:



	A	B	C
8712	12"	8.75	15.25
8716	16"	12.75	19.25
8718	18"	14.75	21.25
8724	24"	20.75	27.25
8730	30"	26.75	33.25
8732	32"	28.75	35.25
8736	36"	32.75	39.25
8742	42"	38.75	45.25
8748	48"	44.75	51.25

Materials:

1 1/4" Grab Bar rods are formed from type 304 stainless steel tubing. 12" – 42" length is 20 gauge 48" length is 18 gauge

Compliance:

- ADA, ANSI, ASTM, CSA
- Tested to 500 lbs. pull

Installation Instructions:

1. Position unit on wall in desired location.
2. Mark mounting holes.
3. Drill starter holes.
4. Mount unit on wall using 2" screws (provided).
5. Snap flange covers into place.

Note: SecureMount Anchors are recommended for use in non-stud (hollow-wall) applications per installation instructions. (Secure Mount Anchors are sold separately)

Stock Number: _____ 1 1/4" Grab Bars
By Creative Specialties



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Literature #BA1675

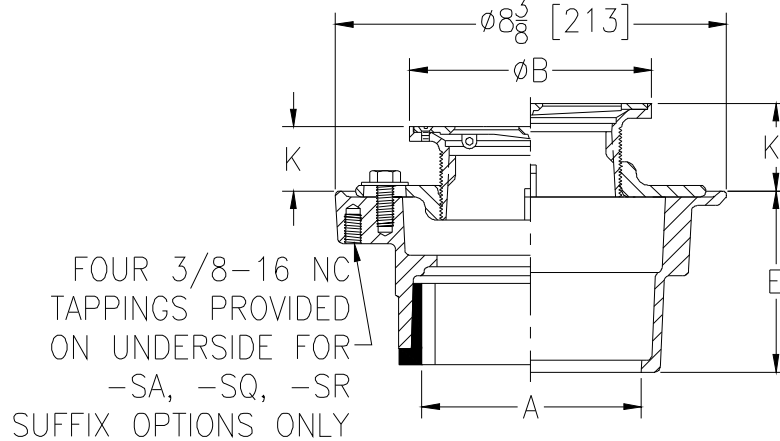


Z415C

BODY ASSEMBLY W/ "TYPE C" STRAINER

FLOOR DRAIN
SPECIFICATION SHEET
TAG _____

Dimensional Data (inches and [mm]) are Subject to Manufacturing Tolerances and Change Without Notice



Dimensions In Inches						Approx. Wt. Lbs. [kg]	Strainer Open Area Sq. In. [cm ²]
A - Pipe Size	B Strainer Dia.	K		K'			
		Min.	Max.	Min.	Max.		
2-3 [51-76]	5 [127]	1 [25]	1-1/2 [38]	1-3/32 [28]	2-1/4 [57]	11 [5]	8 [52]
2-3-4 [51-76-102]	6 [152]	1 [25]	1-25/32 [45]	1-13/32 [36]	2-17/32 [64]	13 [6]	9 [58]
2-3-4 [51-76-102]	7 [178]	1 [25]	2-1/8 [54]	1-23/32 [44]	2-7/8 [73]	14 [6]	13 [84]
3-4 [76-102]	8 [203]	1-5/32 [29]	2-1/8 [54]	1-3/4 [44]	2-7/8 [73]	16 [7]	18 [116]
6 [152]	8 [203]	1-5/32 [29]	2-1/8 [54]	1-3/4 [44]	2-7/8 [73]	18 [8]	18 [116]

ENGINEERING SPECIFICATION: ZURN ZN415C

Floor and shower drain, Dura-Coated cast iron body with bottom outlet, combination invertible membrane clamp and adjustable collar with seepage slots and "TYPE C" polished, hinged nickel bronze, light-duty strainer.

OPTIONS (Check/specify appropriate options)

PIPE SIZE	(Specify size/type)	OUTLET	'E' BODY HT. DIM.
2-3-4 [51-76-102]	_____	IC Inside Caulk	3-7/8 [98]
2-3-4 [51-76-102]	_____	IG Inside Gasket	3-7/8 [98]
2 [51]	_____	IP Threaded	2-3/8 [60]
3 [76]	_____	IP Threaded	2-5/8 [67]
4 [102]	_____	IP Threaded	2-7/8 [73]
6 [152]	_____	IP Threaded	2-3/4 [70]
2-3-4 [51-76-102]	_____	NH No-Hub	3-7/8 [98]
2-3-4 [51-76-102]	_____	NL Neo-Loc	3-3/4 [95]

PREFIXES

- _____ ZB D.C.C.I. Body Assembly w/ Polished Bronze Top
- _____ ZN D.C.C.I. Body Assembly w/ Polished Nickel Bronze Top*

SUFFIXES

- | | |
|--|--|
| _____ -AR Acid Resisting Epoxy Coated Cast Iron | _____ -TC Neo-loc Test Cap Gasket (2 - 4 [51 - 102] NL Bottom Outlet Only) |
| _____ -CP Chrome-Plated Bronze Top | _____ -U 1 - 3 [25 - 76] High Extension Adapter |
| _____ -G Galvanized Cast Iron | _____ -V Backwater Valve |
| _____ -P Trap Primer Connection (Specify 1/2 [13] or 3/4 [19]) | _____ -VP Vandal-Proof Secured Top |
| _____ -PC Protective Cover | _____ -Y Sediment Bucket |
| _____ -SA Stabilizer Assembly (See Z1035) | _____ -18 Leveling Ring (See Z400-18) |
| _____ -SQ Stabilizer Q-Deck (See Z1035-Q) | _____ -90 90° Threaded Side Outlet Body Assembly (2 [51], 3 [76] Only) |
| _____ -SR Stabilizer Ring | |

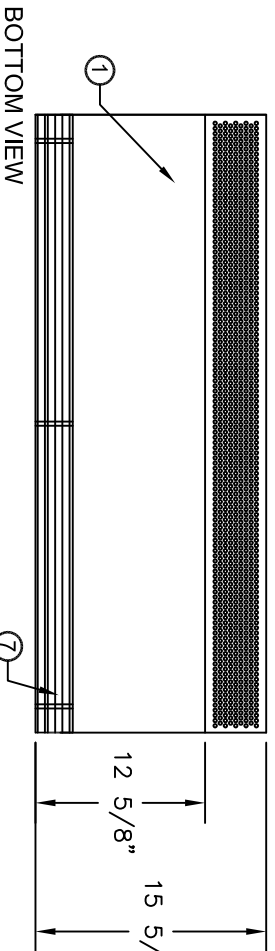
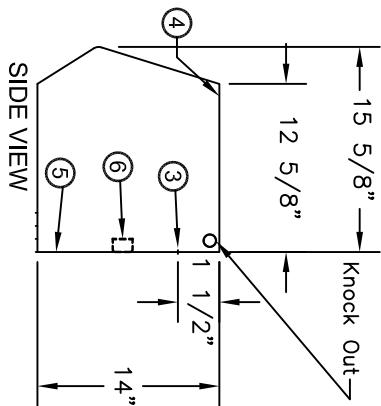
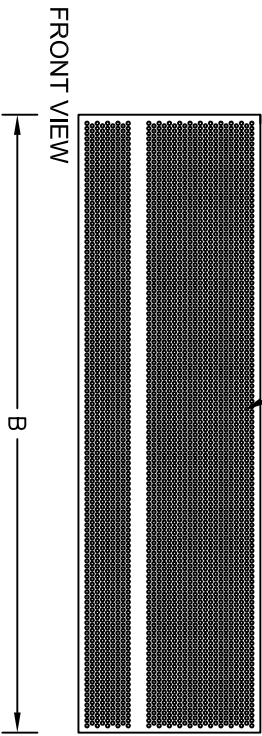
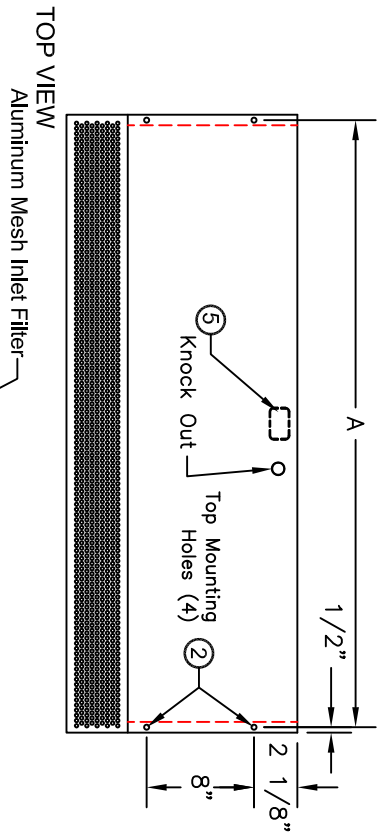
* Regularly furnished unless otherwise specified.



Project:
2021-0034 PVC Child
Development Center
Blythe

From:
Premier Culinary Solutions
Jeremy Carver
1530 S. Lewis St.
Anaheim , CA 92805
(714) 508-1880
7145081880 30 (Contact)

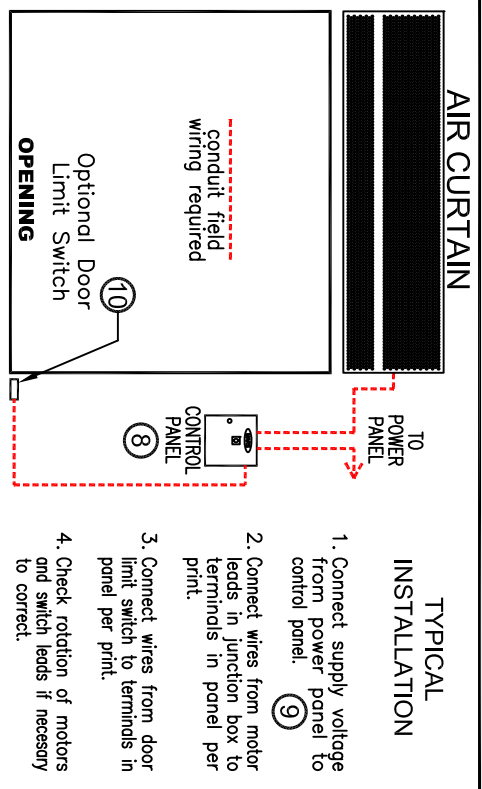
To:



*NOTE: Intake screen size and quantity varies with unit length.

2, -3 & -4 designates the number of motors.

MODEL NUMBER	MOUNTING CENTERS A	OVERALL LENGTH B
NH236-1U	35 1/8"	36"
NH242-1U	41 1/8"	42"
NH248-1U	47 1/8"	48"
NH272-2U	71 1/8"	72"
NH284-2U	83 1/8"	84"
NH296-2U	95 1/8"	96"
NH296-3U	95 1/8"	96"
NH2108-3U	107 1/8"	108"
NH2120-3U	119 1/8"	120"
NH2144-3U	143 1/8"	144"
NH2144-4U	143 1/8"	144"



1. Connect supply voltage from power panel to control panel. (8)
2. Connect wires from motor leads in junction box to terminals in panel per print.
3. Connect wires from door limit switch to terminals in panel per print.
4. Check rotation of motors and switch leads if necessary to correct.

NOTES:

- 1 This product is designed to meet the National Electric Code (NEC) and is ETL Listed for the US and Canada and bear the CE mark.
- 2 7/16" mounting holes (4) provided, (2) on each end.
- 3 1/2" key hole slots (2) provided, (1) on each end for wall mounting.
- 4 All units have a self contained one piece cabinet, fire retardant and corrosion proof paint lock metal, double protected with baked on Titanium Silver color, rust preventative electrostatic polyurethane powder coating.
- 5 Cabinet has sufficient strength for fastening to wall on both ends without intermediate support.
- 6 Internal J-Box(es) for electrical wiring.
- 7 Unit is to be installed such that air flow is unobstructed. Air discharge nozzle containing adjustable air directional vanes with 40° sweep front to back.
- 8 Optional motor control panel. Overloads are factory pre-set. Standard procedure is to ship panel loose for remote mount. Can be factory mounted on either left or right hand side of air curtain housing. Please specify.
- 9 Circuit protection as per NEC by others.
- 10 Optional door limit switch is field installed and is to be wired to the control panel. Switch to be mounted such that the air curtain turns on as door begins to open.



PROJECT	
LOCATION	Model No.:
ARCHITECT	Drawing No.:
ENGINEER	Date
	Sheet of
	Drawn By:
	Checked By:



14716 S. BROADWAY • GARDENA, CA 90248 • USA
 TEL:(310) 532-1555 • (800) 421-1266 • FAX:(310) 324-3030
 Web Site: www.marsair.com • E-mail:info@marsair.com

INDUSTRIAL NSF (NH2) INTERNATIONAL CERTIFIED MODELS

SQ4F2 11/2/12 M

MARK	HIGH VELOCITY MODEL NUMBER	NO. REQ'D	LENGTH	NET WEIGHT (lbs)	MOTOR HP	MOTOR RPM**	VOLTS & PHASE	FLA*			MAX FPM** at Nozzle	MAX CFM** at Nozzle	DBA Measured 10 ft. from Nozzle	REMARKS
								SINGLE PHASE	THREE PHASE	460V				
								115V	208 / 230V	208 / 230V				
	NH236-1U		3'	120	1	1750	9.0	5.0/5.0	3.3/3.2	1.6	5140	4000	70	
	NH242-1U		3' 6"	125	1	1750	9.0	5.0/5.0	3.3/3.2	1.6	4570	4000	70	
	NH248-1U		4'	130	1	1750	9.0	5.0/5.0	3.3/3.2	1.6	4000	4000	70	
	NH272-2U		6'	300	Two 1	1750	18.0	10.0/10.0	6.6/6.4	3.2	5140	8000	73	
	NH284-2U		7'	320	Two 1	1750	18.0	10.0/10.0	6.6/6.4	3.2	4570	8000	73	
	NH296-2U		8'	325	Two 1	1750	18.0	10.0/10.0	6.6/6.4	3.2	4000	8000	73	
	NH296-3U		8'	405	Three 1	1750	27.0	15.0/15.0	9.9/9.6	4.8	5000	10,000	75	
	NH2108-3U		9'	410	Three 1	1750	27.0	15.0/15.0	9.9/9.6	4.8	5500	12,000	75	
	NH2120-3U		10'	425	Three 1	1750	27.0	15.0/15.0	9.9/9.6	4.8	4800	12,000	75	
	NH2144-3U		12'	450	Three 1	1750	27.0	15.0/15.0	9.9/9.6	4.8	4000	12,000	75	
	NH2144-4U		12'	480	Four 1	1750	36.0	20.0/20.0	13.2/12.8	6.4	5140	16,000	75	

EQUIPMENT SPECIFICATIONS - Standard Features

GENERAL
Air curtain shall be a Mars® Air Systems brand air curtain: Type NH2 NSF Certified Industrial Unheated.

APPROVALS

Air curtain Shall be, Canadian Standard Association Certified, NSF Certified, meet the requirements of the National Electric Code (N.E.C.), ETL Certified, and bear the CE mark.

CABINET

Cabinet shall be a self contained one piece housing with sufficient strength for fastening to wall on both ends without intermediate support. Cabinet constructed of fire retardant, corrosion proof paint lock metal double protected with bake on Titanium Silver color, rust preventative electrostatic polyurethane powder coating. Cabinet to have washable aluminum mesh air intake filter. Discharge air outlet nozzle shall be wedge shaped containing adjustable air directional aluminum vanes with 40° sweep front to back. Motor/Fan assembly to be easily accessible for maintenance.

MOTORS AND BLOWER WHEELS

Motor(s) shall be totally enclosed air over (TEAO) type suitable for continuous heavy duty, all angle operation. Construction shall include sealed lifetime pre-lubricated ball bearings, resilient mounted and protected by an automatic reset thermal overload switch. Motor(s) to have double extended shaft and direct drive, double inlet, dynamically balanced forward curved squirrel cage blower wheels.

ELECTRICAL WIRING

All junction boxes are internally mounted: one motor-(1) 2"x 4"; two motors-(1) 4"x 4"; three or four motors-(2) 4"x 4".

GUARANTEE

Shall be 5 years on all parts.

ACCESSORIES

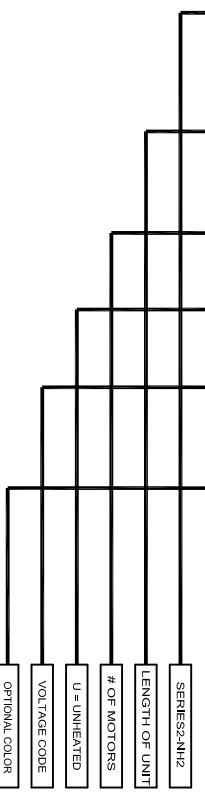
Refer to optional features and accessories page.

* - For Ampacity Multiply FLA X 1.25
** - 17% Reduction in Performance on units with 50Hz.

NSF Certified models shall produce 600 FPM velocity measured 3' off the floor on all customer entrance doors (N prefix models) and 1600 FPM velocity measured 3' off the floor on all receiving doors (NH prefix models).

EXAMPLE

NH2 42 - 3 U H - OB



SIZE	VOLTAGE	CODE
42"-144"	115/1/60	A
42"-144"	208-230/1/60	D
42"-144"	220/1/50	U
42"-144"	208-230/3/60	G
42"-144"	460/3/60	H
42"-144"	575/3/60	I

COLOR	CODE
OBSIDIAN BLACK	OB
TITANIUM SILVER	TS
PEARL WHITE	PW
SPARTAN BRONZE	SB
BATTLESHIP GRAY	BG

MADE WITH PRIDE IN THE U.S.A.

INDUSTRIAL NSF (NH2) INTERNATIONAL CERTIFIED MODELS



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 ph. 636.240.2400 • toll free 800.325.6152 • fax 636.272.2408 • parts fax 636.272.9471 • www.truemfg.com

PROJECT NAME		LOCATION		AIA #
ITEM #	QTY	MODEL #		SIS #

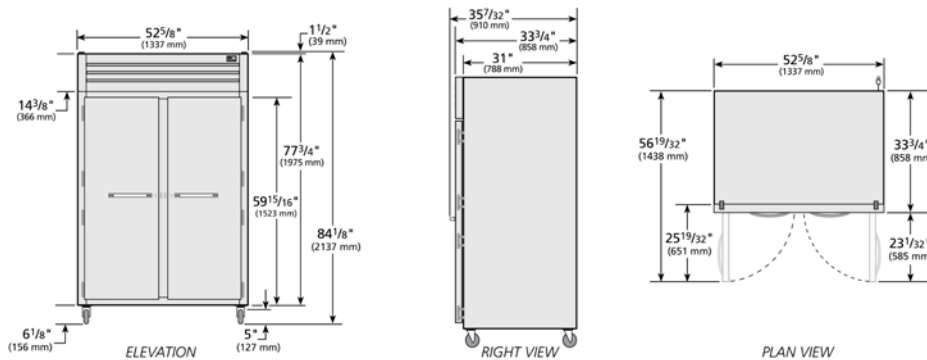
SPEC SERIES®

REACH-IN SOLID SWING DOOR REFRIGERATOR WITH HYDROCARBON REFRIGERANT

models	STR2R-2S-HC	STA2R-2S-HC	STG2R-2S-HC
--------	-------------	-------------	-------------



plan view



STR2R-2S-HC	
Exterior	Stainless steel door, front & sides.
Interior	Stainless steel side walls, back, floor, door liner, & ceiling.
Shelving	(1) Interior kit option included per full section.

STA2R-2S-HC	
Exterior	Stainless steel door, front & sides.
Interior	Aluminum side walls & back. Stainless steel floor & ceiling.
Shelving	(3) Heavy duty, chrome plated, wire shelves per section.

STG2R-2S-HC	
Exterior	Stainless steel door, with matching aluminum sides.
Interior	Aluminum side walls & back. Stainless steel floor & ceiling.
Shelving	(3) Heavy duty, PVC coated, wire shelves per section.

SPECIFICATIONS

Dimensions	in.	mm.
Length	52 5/8	1337
Depth	33 3/4	858
Height	77 3/4	1975
Electrical	U.S.	International
Horsepower	1/2	N/A
Amps	5.9	N/A
Voltage	115/60/1	
NEMA	5-15P	
Cord Length	9 ft.	2.74 M.

115/60/1 NEMA-5-15R

* Height does not include 6 1/8" (156 mm) for castors or 6" (153 mm) for optional legs.
 † Depth does not include 1 1/2" for door handle.

Specifications subject to change without notice.
 Chart dimensions are rounded up to the nearest 1/8" (millimeters rounded up to the next whole number).

	APPROVALS	AVAILABLE AT
	6/20	Printed in U.S.A.



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PROJECT NAME	LOCATION	AIA #
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SPEC SERIES®

REACH-IN SOLID SWING DOOR REFRIGERATOR WITH HYDROCARBON REFRIGERANT

models	STR2R-2S-HC	STA2R-2S-HC	STG2R-2S-HC
--------	-------------	-------------	-------------



standard features

REFRIGERATION SYSTEM

- Factory engineered, self-contained, capillary tube system using environmentally friendly R290 hydrocarbon refrigerant that has zero (0) ozone depletion potential (ODP), & three (3) global warming potential (GWP).
- High capacity, factory balanced refrigeration system that maintains cabinet temperatures of 33°F to 38°F (.5°C to 3.3°C) for the best in food preservation.
- State of the art, electronically commutated evaporator and condenser fan motors. ECM motors operate at higher peak efficiencies and move a more consistent volume of air which produces less heat, reduces energy consumption and provides greater motor reliability.
- Top mounted refrigeration system with evaporator positioned out of food zone to maximize capacity.
- Electronic control.

CABINET CONSTRUCTION

- Insulation - entire cabinet structure and solid door are foamed-in-place using Ecomate. A high density, polyurethane insulation that has zero ozone depletion potential (ODP) and zero global warming potential (GWP).
- 5" (127 mm) diameter plate castors - locks provided on front set.

DOORS

- Lifetime guaranteed bolt style door locks.

- Lifetime guaranteed heavy duty all metal working door handles.
- Positive seal self-closing doors with 120° stay open feature. Lifetime guaranteed external cam lift door hinges, four (4) per door section.
- Magnetic door gaskets of one piece construction, removable without tools for ease of cleaning.

LIGHTING

- LED interior lighting, safety shielded.

MODEL FEATURES

- Exterior digital temperature display, available with either °F or °C .
- Evaporator epoxy coated to eliminate the potential of corrosion.
- Curb mounting ready.
- NSF/ANSI Standard 7 compliant for open food product.

ELECTRICAL

- Unit completely pre-wired at factory and ready for final connection to a 115/60/1 phase, 15 amp dedicated outlet. Cord and plug set included.

OPTIONAL FEATURES/ ACCESSORIES

(upcharge & lead times may apply)

- 6" (153 mm) standard legs.
- 6" (153 mm) seismic/flanged legs.
- 6" (153 mm) stainless steel legs.
- Field reversible hinge.
- Additional shelves.
- Stainless back. (STR, STA, STG)
- Security package.

SHELVING KIT OPTIONS

- STR series kits factory installed at no charge. STA & STG series kits field installed, upcharge applies, lead times may apply.
- Kit #1: Nine (9) sets of #1 type tray slides and pilasters (field installed), bottom support of one (1) 18"L x 26"D (458 mm x 661 mm) pan or two (2) 14"L x 18"D (356 mm x 458 mm) pans.
- Kit #2: One (1) set half-section #2 steel rod tray slides and pilasters (field installed), rim support of one (1) 18"L x 26"D (458 mm x 661 mm) pan.
- Kit #3: Six (6) sets of universal type tray slides and pilasters (field installed), bottom support of one (1) 18"L x 26"D (458 mm x 661 mm) pan, two (2) 14"L x 18"D (356 mm x 458 mm) pans or two (2) 12"L x 20"D (305 mm x 508 mm) pans.
- Kit #4: Three (3) chrome shelves 26 5/16"L x 21 1/16"D (669 mm x 548 mm). Optional wall mounted shelf support pilasters (field installed) with four (4) shelf clips per shelf available; adjustable on 1/2" (13 mm) increments (must order at time of cabinet order).
- Additional kit option components available individually.



METRIC DIMENSIONS ROUNDED UP TO THE NEAREST WHOLE MILLIMETER
 SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE



Model	Elevation	Right	Plan	3D	Back
ST()2R-2S-HC					



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PROJECT NAME		LOCATION		AIA #
ITEM #	QTY	MODEL #		SIS #

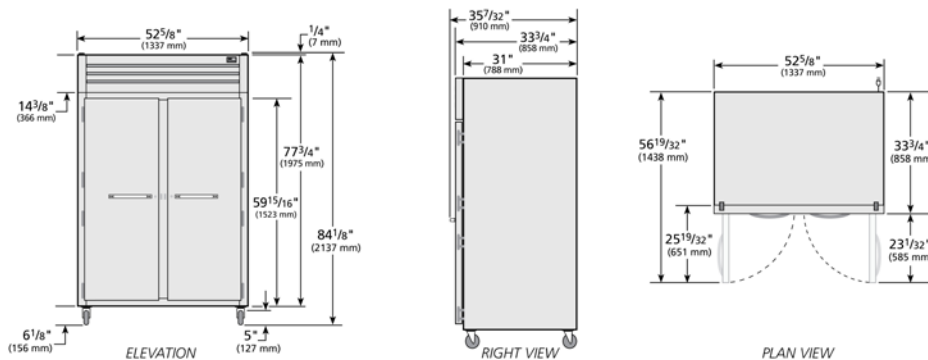
SPEC SERIES®

REACH-IN SOLID SWING DOOR FREEZERS WITH HYDROCARBON REFRIGERANT

models	STR2F-2S-HC	STA2F-2S-HC	STG2F-2S-HC
--------	-------------	-------------	-------------



plan view



STR2F-2S-HC	
Exterior	Stainless steel door, front & sides.
Interior	Stainless steel side walls, back, floor, door liner, & ceiling.
Shelving	(1) Interior kit option included per full section, factory installed.

STA2F-2S-HC	
Exterior	Stainless steel door, front & sides.
Interior	Aluminum side walls & back. Stainless steel floor & ceiling.
Shelving	(3) Heavy duty, chrome plated, wire shelves per section.

STG2F-2S-HC	
Exterior	Stainless steel door & front, with matching aluminum sides.
Interior	Aluminum side walls & back. Stainless steel floor & ceiling.
Shelving	(3) Heavy duty, PVC coated, wire shelves per section.

SPECIFICATIONS

Dimensions	in.	mm.
Length	52 ⁵ / ₈	1337
Depth	33 ³ / ₄	858
Height	77 ³ / ₄	1975
Electrical	U.S.	International
Horsepower	1 ¹ / ₄	N/A
Amps	9.4	N/A
Voltage	115/60/1	
NEMA	5-15P	
Cord Length	9 ft.	2.74 M.



* Height does not include 6¹/₈" (156 mm) for castors or 6" (153 mm) for optional legs. Height does not include 1/4" (7mm) for system mechanical components.
 † Depth does not include 1 1/2 for door handle.

Specifications subject to change without notice.
 Chart dimensions are rounded up to the nearest 1/8" (millimeters rounded up to the next whole number).

6/20 Printed in U.S.A.

APPROVALS	AVAILABLE AT
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PROJECT NAME	LOCATION	AIA #
ITEM #	QTY	MODEL #
		SIS #

SPEC SERIES®

REACH-IN SOLID SWING DOOR FREEZERS WITH HYDROCARBON REFRIGERANT

models	STR2F-2S-HC	STA2F-2S-HC	STG2F-2S-HC
--------	-------------	-------------	-------------



standard features

REFRIGERATION SYSTEM

- Factory engineered, self-contained, capillary tube system using environmentally friendly R290 hydrocarbon refrigerant that has zero (0) ozone depletion potential (ODP), & three (3) global warming potential (GWP).
- High capacity, factory balanced refrigeration system that maintains -10°F (-23.3°C) temperatures. Ideal for both frozen foods and ice cream.
- State of the art, electronically commutated evaporator and condenser fan motors. ECM motors operate at higher peak efficiencies and move a more consistent volume of air which produces less heat, reduces energy consumption and provides greater motor reliability.
- Top mounted refrigeration system with evaporator positioned out of food zone to maximize capacity.
- Automatic defrost system time-initiated, temperature-terminated. Saves energy consumption and provides shortest possible defrost cycle.
- Automatic evaporator fan motor delay during defrost cycle.

CABINET CONSTRUCTION

- Insulation - entire cabinet structure and solid door are foamed-in-place using a high density, polyurethane insulation that has zero ozone depletion potential (ODP) and zero global warming potential (GWP).
- 5" (127 mm) diameter plate castors - locks provided on front set.

DOORS

- Lifetime guaranteed bolt style door locks standard.
- Lifetime guaranteed heavy duty all metal working door handles.
- Positive seal self-closing door with 120° stay open feature. Lifetime guaranteed external cam lift door hinges, four (4) per door section.
- Magnetic door gaskets of one piece construction, removable without tools for ease of cleaning.

SHELVING

- One (1) factory installed interior kit option. Four (4) different interior kits available (see Kit Options). Pilasters and tray slides are factory installed at no charge.

LIGHTING

- LED interior lighting, safety shielded.

MODEL FEATURES

- Exterior digital temperature display, available with either °F or °C.
- Evaporator epoxy coated to eliminate the potential of corrosion
- Curb mounting ready.
- NSF/ANSI Standard 7 compliant for open food product.

ELECTRICAL

- Unit completely pre-wired at factory and ready for final connection to a 115/60/1 phase, 15 amp dedicated outlet. Cord and plug set included.

OPTIONAL FEATURES/ ACCESSORIES

(upcharge & lead times may apply)

- 6" (153 mm) standard legs.
- 6" (153 mm) seismic/flanged legs.
- 6" (153 mm) stainless steel legs.

- Field reversible hinge.
- Additional shelves.
- Stainless back. (STR, STA, STG)
- Security package.

SHELVING KIT OPTIONS

- STR series kits factory installed at no charge. STA & STG series kits field installed, upcharge applies, lead times may apply.
- Kit #1: Nine (9) sets of #1 type tray slides and pilasters (field installed), bottom support of one (1) 18"L x 26"D (458 mm x 661 mm) pan or two (2) 14"L x 18"D (356 mm x 458 mm) pans.
- Kit #2: One (1) set half-section #2 steel rod tray slides and pilasters (field installed), rim support of one (1) 18"L x 26"D (458 mm x 661 mm) pan.
- Kit #3: Six (6) sets of universal type tray slides and pilasters (field installed), bottom support of one (1) 18"L x 26"D (458 mm x 661 mm) pan, two (2) 14"L x 18"D (356 mm x 458 mm) pans or two (2) 12"L x 20"D (305 mm x 508 mm) pans.
- Kit #4: Three (3) chrome shelves 26 5/16"L x 21 9/16"D (669 mm x 548 mm). Optional wall mounted shelf support pilasters (field installed) with four (4) shelf clips per shelf available; adjustable on 1/2" (13 mm) increments (must order at time of cabinet order).
- Additional kit option components available individually.

3 YEAR PARTS + LABOR
7 YEAR COMPRESSOR
WARRANTY
 (U.S.A. and Canada only)

METRIC DIMENSIONS ROUNDED UP TO THE NEAREST WHOLE MILLIMETER
 SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

	Model	Elevation	Right	Plan	3D	Back
	ST()2F-2S-HC					

FISHER

SPECIFICATION BOOK

JOB NAME:

QUANTITY:

ITEM NO.:

SPEC: 29033 REV. A

PRODUCT NAME:

**DrainKing WASTE VALVE
ROUGH CHROME**

_____ SPECIAL CONFIGURATION
(CHECK BASE MODEL AND OPTIONS)

MODEL:

29033 w/ FLAT STRAINER & OVERFLOW BODY

OPTIONS OR MODIFICATIONS:

OTHER _____

FEATURES:

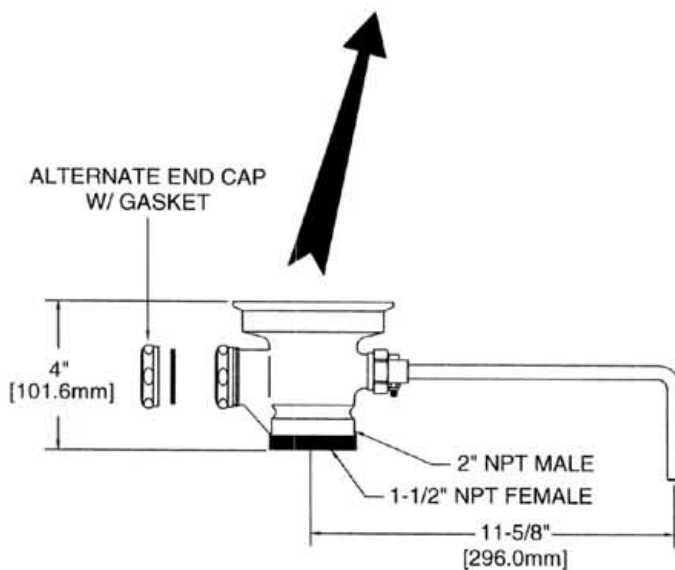
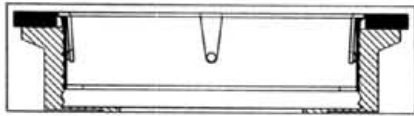
- * DUAL TEFLON SEALS
- * STAINLESS STEEL BALL
- * CAST RED BRASS BODY, CHROME PLATED
- * EXTRA STURDY STAINLESS STEEL CLAMPING RING
- * "CLEAR THROUGH " OPENING - NO NEED TO DISASSEMBLE IF SNAKING IS REQUIRED
- * INDUSTRY STANDARD "SEALING" ANGLE - FITS FLUSH TO STANDARD STAINLESS STEEL SINKS
- * STAINLESS STEEL FLAT STRAINER
- * 1/4 TURN FULLY OPENS AND CLOSES VALVE
- * END CAP W/ GASKET (INSTALLED)
- * SUPPLIED WITH:
ALTERNATE SLIP JOINT NUT & WASHER

DRAIN RATE:

- * 12 GPM

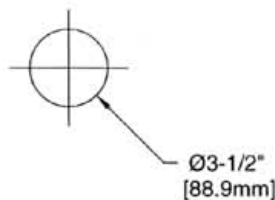
SHIPPING WEIGHT

- * 5.5 LBS



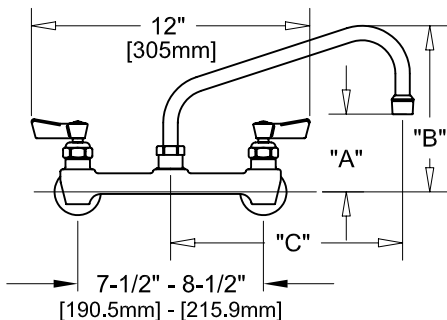
ROUGH-IN:

DRAIN:

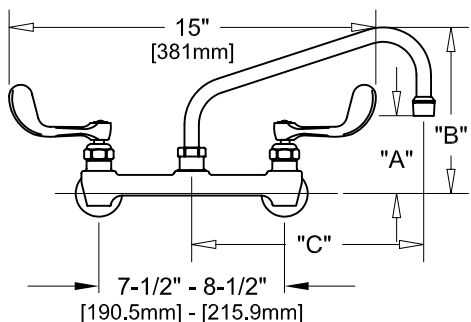


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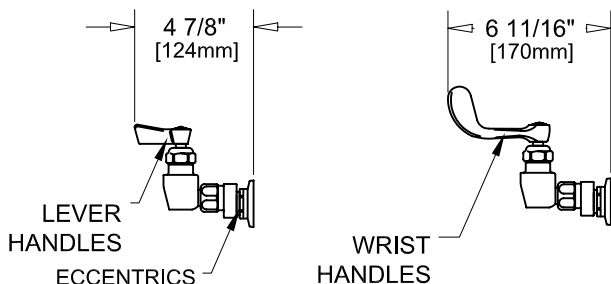
7-1/2" - 8-1/2" ADJ. WALL W/ LEVER HANDLES



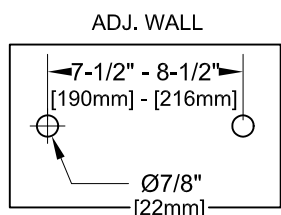
7-1/2" - 8-1/2" ADJ. WALL W/ WRIST HANDLES



7-1/2" - 8-1/2" ADJ. WALL



ROUGH-IN:



ANSI/A112.18.1-2005

PRODUCT NAME: STAINLESS STEEL
7-1/2" - 8-1/2" ADJUSTABLE WALL FAUCET

MODEL:

- 53104 W/ 6" SWING SPOUT W/ LEVER HANDLES
- 53112 W/ 8" SWING SPOUT W/ LEVER HANDLES
- 53120 W/ 10" SWING SPOUT W/ LEVER HANDLES
- 53139 W/ 12" SWING SPOUT W/ LEVER HANDLES
- 53147 W/ 14" SWING SPOUT W/ LEVER HANDLES
- 53155 W/ 16" SWING SPOUT W/ LEVER HANDLES
- 57452 W/ 6" SWING SPOUT W/ WRIST HANDLES
- 57460 W/ 8" SWING SPOUT W/ WRIST HANDLES
- 57479 W/ 10" SWING SPOUT W/ WRIST HANDLES
- 57487 W/ 12" SWING SPOUT W/ WRIST HANDLES
- 57495 W/ 14" SWING SPOUT W/ WRIST HANDLES
- 57509 W/ 16" SWING SPOUT W/ WRIST HANDLES

FEATURES

CONTROL VALVE

- * 7-1/2" - 8-1/2" ADJUSTABLE WALL MOUNT
- * ECCENTRICS
- * STAINLESS STEEL CONSTRUCTION
- * SWIVELLING SEAT DISKS
- * HOT SIDE STEM - RIGHT HAND
- * COLD SIDE STEM - LEFT HAND
- * LEVER HANDLES OR WRIST HANDLES
- * SWING SPOUT

SYSTEM LIMITS

- * TEMP: 40°F MIN. TO 140°F MAX.

SHIPPING WEIGHT

- * 5.0 LBS

* NSF 61-9 APPROVED & LISTED

www.truedail.com

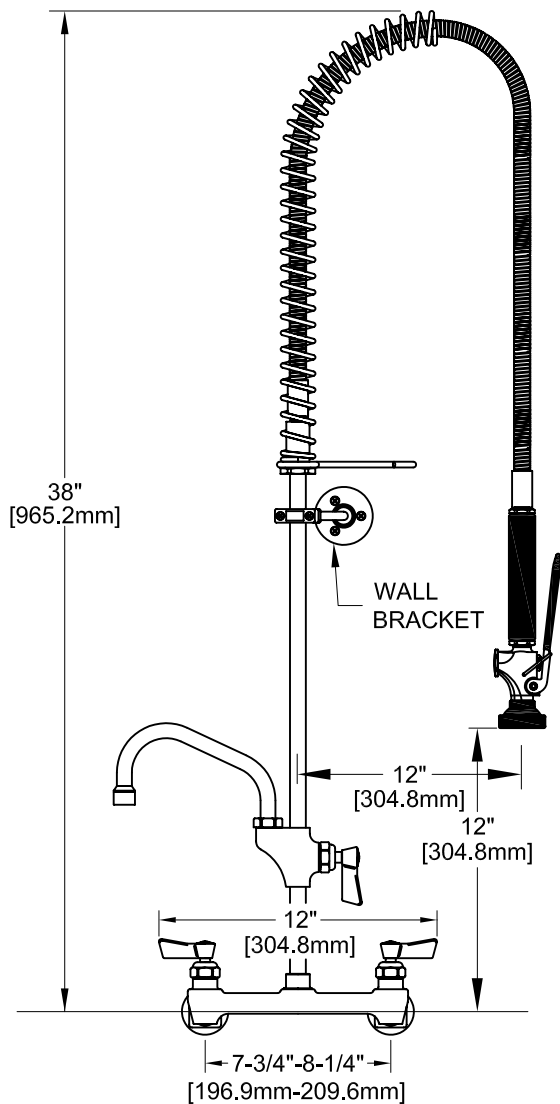
MODELS	DIM "A"	DIM "B"	DIM "C"
53104 57452	2-1/4" [57mm]	5-7/8" [149mm]	6" [152mm]
53112 57460	2-1/2" [64mm]	6-3/8" [162mm]	8" [204mm]
53120 57479	3-1/8" [79mm]	6-7/8" [175mm]	10" [254mm]
53139 57487	3-3/4" [95mm]	7-3/8" [187mm]	12" [305mm]
53147 57495	4-3/8" [111mm]	8-1/4" [210mm]	14" [356mm]
53155 57509	5" [127mm]	8-7/8" [225mm]	16" [406mm]



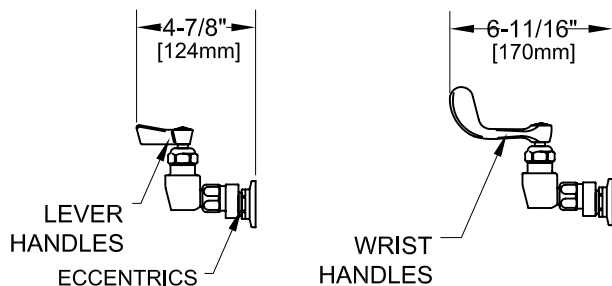
FISHER MANUFACTURING COMPANY

TOLL FREE: 800-421-6162 - FAX: 800-832-8238

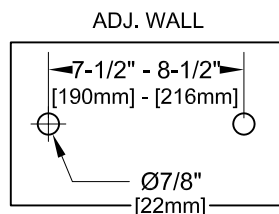
information@fisher-mfg.com - www.fisher-mfg.com



7-1/2" - 8-1/2" ADJ. WALL



ROUGH-IN:



PRODUCT NAME: STAINLESS STEEL
8" ADJ. WALL PRE-RINSE WITH ADD-ON

MODEL:

- 53449 6" SWING SPOUT W/ LEVER HANDLES
- 53457 8" SWING SPOUT W/ LEVER HANDLES
- 53465 10" SWING SPOUT W/ LEVER HANDLES
- 53473 12" SWING SPOUT W/ LEVER HANDLES
- 54631 14" SWING SPOUT W/ LEVER HANDLES
- 53503 16" SWING SPOUT W/ LEVER HANDLES
- 74020 6" SWING SPOUT W/ WRIST HANDLES
- 74039 8" SWING SPOUT W/ WRIST HANDLES
- 74047 10" SWING SPOUT W/ WRIST HANDLES
- 74055 12" SWING SPOUT W/ WRIST HANDLES
- 74063 14" SWING SPOUT W/ WRIST HANDLES
- 74071 16" SWING SPOUT W/ WRIST HANDLES

FEATURES:

MAIN CONTROL VALVE

- * WALL MOUNT
- * ECCENTRICS ADJUST FROM 7-1/2" TO 8-1/2"
- * INTERNAL SPRING LOADED CHECK VALVES
- * SWIVELLING SEAT DISKS
- * HOT SIDE STEM - RIGHT HAND CHECK
- * COLD SIDE STEM - LEFT HAND CHECK
- * STAINLESS STEEL SEATS, SEAT SCREWS AND HANDLE SCREWS

ADD-ON CONTROL VALVE

- * STEM - RIGHT HAND SWIVEL
- * HOT INDEX BUTTON
- * SWIVELLING SEAT DISKS
- * STAINLESS STEEL SEATS, SEAT SCREWS AND HANDLE SCREWS.

HOSE

- * 36" LENGTH
- * STAINLESS STEEL END FITTINGS
- * STAINLESS STEEL EXTERNAL JACKET
- * 3-PLY FIBER REINFORCED INTERNAL RUBBER HOSE
- * REPAIRABLE IN FIELD WITH SIMPLE TOOLS

ULTRA SPRAY VALVE

- * LOWEST ENERGY USER - 1.15 GPM @ 60 PSI
- * CLEANS FASTER - TEST PROVEN
- * ENGINEERED TO LAST - NO 'O' RINGS TO LEAK
- * INTERCHANGEABLE - FITS ALL BRANDS

WALL BRACKET

- * ADJUSTS FROM 2" TO 12"

SYSTEM LIMITS

- * TEMP: 40°F MIN. TO 140°F MAX. STATIC
- * PRESSURE 200 PSI MAX. STATIC
- * SHIPPING WEIGHT: 15.0 LBS

- * NSF 61-9 APPROVED & LISTED

www.truesdail.com

FISHER

FISHER MANUFACTURING COMPANY

TOLL FREE: 800-421-6162 - FAX: 800-832-8238

information@fisher-mfg.com - www.fisher-mfg.com

ANSI/A112.18.1-2005

Champion®

The Dishwashing Machine Specialists

Project _____

Item No. _____

Quantity _____

STANDARD FEATURES

- **ENERGY STAR® Qualified**
- **NEW "Shear Energy"** – a reduction in energy requirements while maximizing performance!
- **NEW "Multi-Power"** – includes **"Multi-Volt"** and **"Multi-Phase"**. Allows for infield conversion to 208-240 volt and/or single to three phase with ease.
- **StemSure™** – Soft start to protect glasses and dishes from chipping and breaking
- **Rinse Sentry** – extends the cycle time to ensure 180°F/82°C final rinse.
- **Built-in electric booster** for 180°F/82°C final rinse water (standard 70°F/39°C rise)
- Pumped drain
- Low-water tank heat protection
- Detergent and rinse aid pumps
- Quiet double-wall construction
- Door safety switch
- Independent stainless steel interchangeable upper and lower wash and rinse arms
- Top mounted slide-out controls
- Stainless steel top and side panels
- 90-second total cycle time
- Extended wash for difficult ware cleaning & de-liming
- Automatic drain cycle
- 1 Hp motor
- Advanced Digital Temperature Monitoring
- Stainless steel construction

UH230B

Undercounter High Temperature
Dishwashing Machine
with Built-in Booster Heater



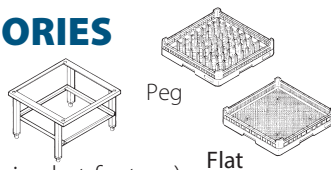
**NEW
FEATURES**

Photo is for general visual representation only. Please refer to specifications for the latest detailed product information.



OPTIONS & ACCESSORIES

- Additional Dish Racks**
- 17" Stand** Stainless Steel
- 6" Leg Stand**
- 3 Phase Connection** (prewired at factory)
- 9kW High Speed Rise Booster**
- 1" Roller Kit** (includes 4 casters)
- Power Cord kit**
- NEW Champion ION scale prevention system**
- C hemical alarm kit (mounted)**



SPECIFIER STATEMENT

Specified unit will be Champion model UH230B undercounter high temperature dishwashing machine with built-in booster heater.

Features 90 second total cycle, extended wash, LED temp display, Rinse Sentry, rinse aid and detergent pumps, flexible fill and drain hoses, stainless steel top and side panels. Constructed of stainless steel.

1 year parts and labor warranty.

Note: Vent hood is not recommended, as unit does not produce excessive steam.

Note: Always follow local building code guidelines.

Champion Industries, Inc.
3765 Champion Blvd, Winston-Salem, NC 27105
Tel: 336/661-1556 Fax: 336/661-1979

www.championindustries.com

UH230B UNDERCOUNTER

UH230B

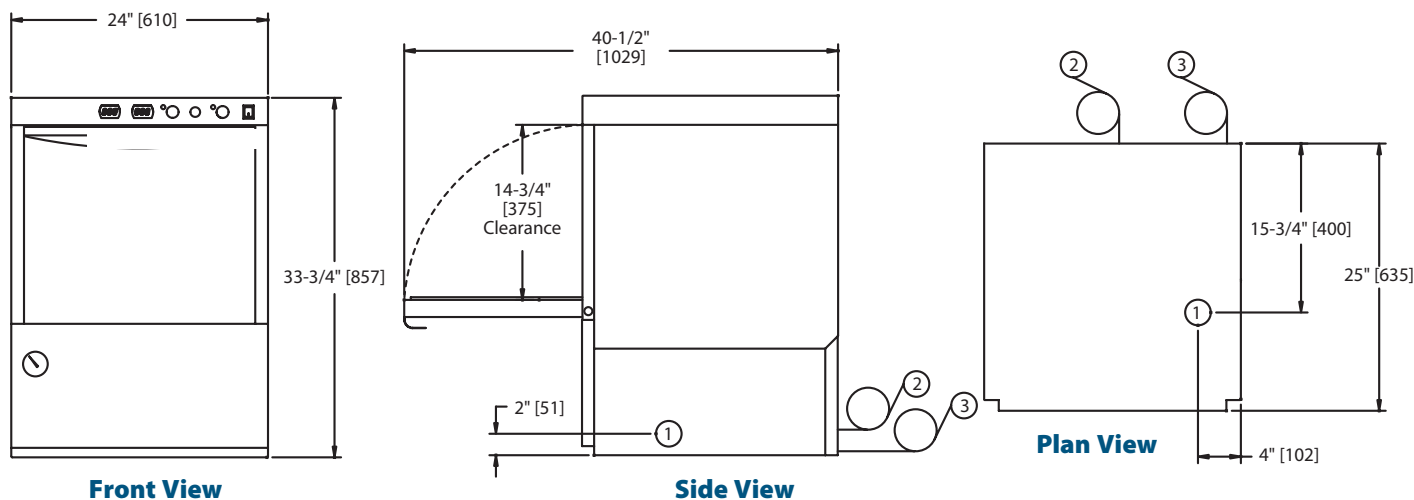
Undercounter High Temperature Dishwashing Machine with Built-in Booster Heater

Champion®

The Dishwashing Machine Specialists

Volume crated: **15 cu. ft./0.42 cu.m.**
Shipping weight crated: **215 lbs./97.5 kg.**

Dimensions shown in inches and [millimeters]



Utilities	
1 Electrical	208-240/60/1; 3 wire plus ground, (See Box). 208-240/60/3; 4 wire plus ground, (See Box). Field convertible to accept 3 phase power, see service manual for details
2 Hot Water	1/2" supply; 110°F/43°C Min. hot water connection for 70°F/39°C rise booster. Incoming supply pressure must maintain a Flow pressure of 20-22 PSI. If machine is sold without internal booster, a 1/2" PRV is required to be purchased. Machine equipped with 3/4" [19] hose connector.
3 Pumped Drain	5/8" [15.9] I.D. flexible reinforced hose, 6 ft. [1829] long. Max. drain flow 15 US gpm. [12.5 imp gal] Max. drain height 3 ft. [914]

SPECIFICATIONS

Capacities*	
Cycle time (seconds)	90
Racks per hr.	40
Motor horsepower	
Wash	1
Water consumption	
U.S. Gal./Imperial Gal. (Max. use) per hr.	23.4/19.2
U.S. Gal./Imperial Gal. per rack	0.78/0.64
Temperatures °F/°C	
Wash	150/66
Rinse	180/82
Heating	
Tank heat, electric, kW	2.0
Electric booster (kW) (required for 70°F/39°C rise)	6
Electric high speed booster (kW) (required for 100°F rise)	9
Time Cycle in Seconds	
Wash	70
Rinse	14
Total cycle	90
Standard 20" x 20" [508 x 508] Rack Complement	
Dish	1
Open	1
* at 140°F incoming water	

6kW UH230B with 70°F/39°C Rise Booster			
Elec. Specs.	Rated Amps	Minimum Supply Ckt. Conductor Ampacity	Maximum Overcurrent Protective Device
208/60/1	32	40	40
240/60/1	36	40	40
208/60/3	22	30	30
240/60/3	24	30	30

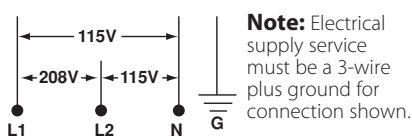
UH230B with 9kW High Speed Booster			
Elec. Specs.	Rated Amps	Minimum Supply Ckt. Conductor Ampacity	Maximum Overcurrent Protective Device
208/60/1	45	60	60
240/60/1	50	60	60
208/60/3	29	35	35
240/60/3	33	40	40

Field convertible to accept 3 phase power

Warning Plumbing and electrical connections should be made by qualified personnel who will observe all the applicable plumbing, sanitary and safety codes and the National Electrical Code.

Due to an ongoing value analysis program at Champion, specifications contained in this catalog are subject to change without notice.

Champion Industries, Inc.,
3765 Champion Blvd., NC 27105
336/661-1556 • Fax: 336/661-1979
ChampionIndustries.com



an Ali Group Company



The Spirit of Excellence



BRUTE® containers are guaranteed to never fade, warp, crack, or crush, with a proprietary design constructed with the highest quality material.

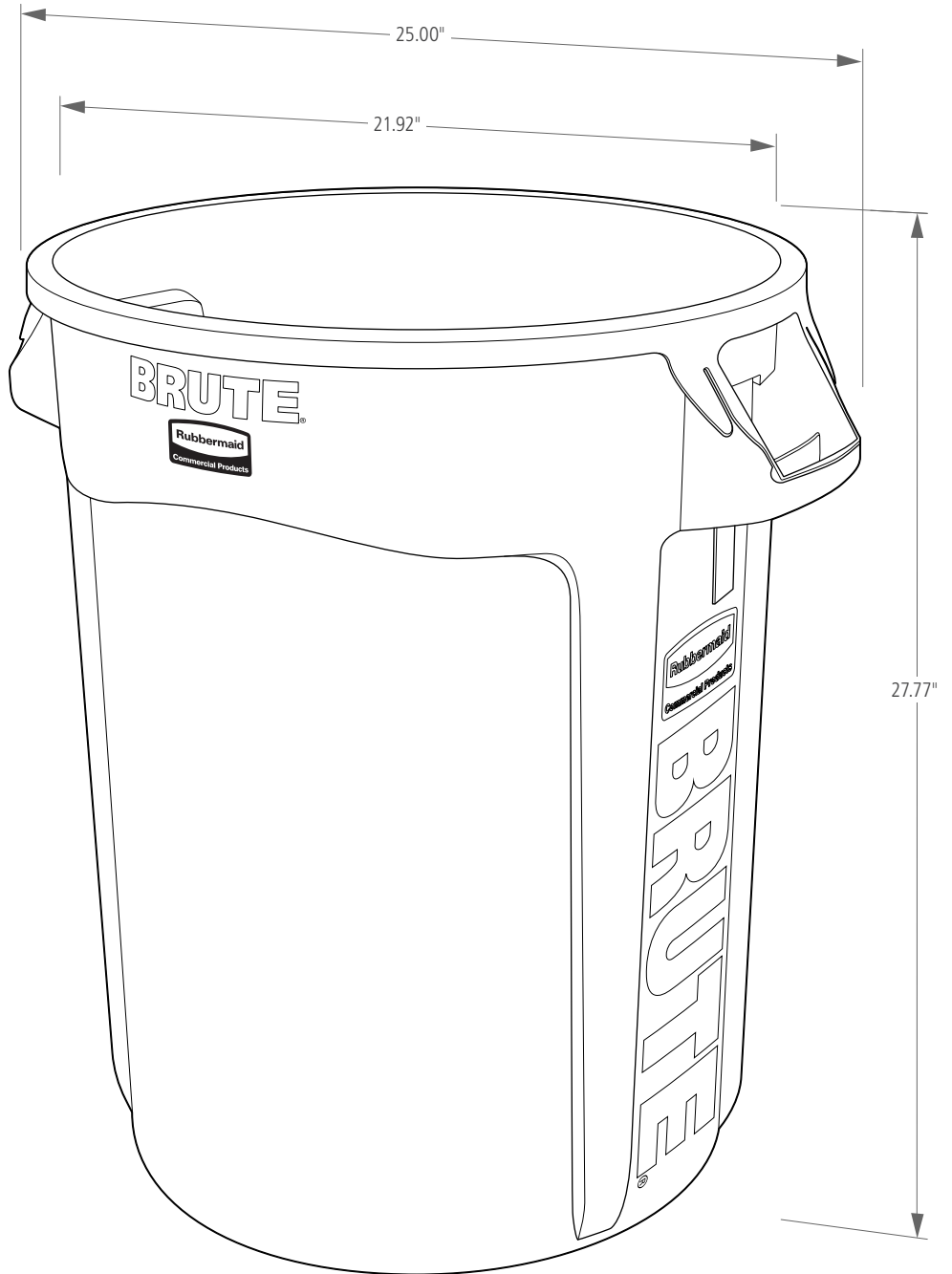
Features and Benefits:

- Venting channels make removing liners up to 50% easier, improving productivity and reducing the risk of injury
- Commercial-grade construction guaranteed to never fade, warp, crack, or crush
- Bag cinches secure liners, allowing for knot-free liner changes. Tested to 200,000 cycles
- Contoured base handles improve grip and ergonomics, reducing strain and improving efficiency
- Rim with rib-strengthened design increases strength and resists crushing
- Rounded handles make lifting and moving easier
- Reinforced base is specifically engineered to be dragged over rough surfaces in tough environments



2 & 21 Compliant

BRUTE® CONTAINERS



Vented BRUTE® 32-Gal. Container

BRUTE® CONTAINERS

SKU #	DESCRIPTION	COLOR	CAPACITY	HEIGHT	DIAMETER	DIAMETER WITH HANDLE	PACK SIZE
			GAL	IN	IN	IN	
FG261000GRAY	BRUTE® 10 GALLON CONTAINER	GRAY	10G	17.13	15.63	18.00	6
FG261000WHT	BRUTE® 10 GALLON CONTAINER	WHITE	10G	17.13	15.63	18.00	6
FG261000RED	BRUTE® 10 GALLON CONTAINER	RED	10G	17.13	15.63	18.00	6
FG261000YEL	BRUTE® 10 GALLON CONTAINER	YELLOW	10G	17.13	15.63	18.00	6
1779699	BRUTE® 10 GALLON CONTAINER	BLUE	10G	17.13	15.63	18.00	6
FG261000DGRN	BRUTE® 10 GALLON CONTAINER	DARK GREEN	10G	17.13	15.63	18.00	6
1926827	BRUTE® 10 GALLON CONTAINER	BLACK	10G	17.13	15.63	18.00	6
FG262000GRAY	BRUTE® 20 GALLON CONTAINER	GRAY	20G	22.91	19.38	22.50	6
FG262000WHT	BRUTE® 20 GALLON CONTAINER	WHITE	20G	22.91	19.38	22.50	6
FG262000RED	BRUTE® 20 GALLON CONTAINER	RED	20G	22.91	19.38	22.50	6
FG262000YEL	BRUTE® 20 GALLON CONTAINER	YELLOW	20G	22.91	19.38	22.50	6
FG262000BLUE	BRUTE® 20 GALLON CONTAINER	BLUE	20G	22.91	19.38	22.50	6
FG262000DGRN	BRUTE® 20 GALLON CONTAINER	DARK GREEN	20G	22.91	19.38	22.50	6
1779734	BRUTE® 20 GALLON CONTAINER	BLACK	20G	22.91	19.38	22.50	6
FG262073BLUE	BRUTE® 20 GALLON RECYCLING CONTAINER	BLUE	20G	22.91	19.38	22.50	6
1926828	BRUTE® 20 GALLON RECYCLING CONTAINER	DARK GREEN	20G	22.91	19.38	22.50	6
FG263200GRAY	BRUTE® 32 GALLON CONTAINER	GRAY	32G	27.77	21.92	25.00	6
FG263200WHT	BRUTE® 32 GALLON CONTAINER	WHITE	32G	27.77	21.92	25.00	6
FG263200RED	BRUTE® 32 GALLON CONTAINER	RED	32G	27.77	21.92	25.00	6
FG263200YEL	BRUTE® 32 GALLON CONTAINER	YELLOW	32G	27.77	21.92	25.00	6
FG263200BLUE	BRUTE® 32 GALLON CONTAINER	BLUE	32G	27.77	21.92	25.00	6
FG263200DGRN	BRUTE® 32 GALLON CONTAINER	DARK GREEN	32G	27.77	21.92	25.00	6
1867531	BRUTE® 32 GALLON CONTAINER	BLACK	32G	27.77	21.92	25.00	6
FG263273BLUE	BRUTE® 32 GALLON RECYCLING CONTAINER	BLUE	32G	27.77	21.92	25.00	6
1788472	BRUTE® 32 GALLON RECYCLING CONTAINER	DARK GREEN	32G	27.77	21.92	25.00	6
FG264360GRAY	BRUTE® 44 GALLON CONTAINER	GRAY	44G	31.50	24.00	27.75	4
1779740	BRUTE® 44 GALLON CONTAINER	WHITE	44G	31.50	24.00	27.75	4
FG264360RED	BRUTE® 44 GALLON CONTAINER	RED	44G	31.50	24.00	27.75	4
FG264360YEL	BRUTE® 44 GALLON CONTAINER	YELLOW	44G	31.50	24.00	27.75	4
FG264360BLUE	BRUTE® 44 GALLON CONTAINER	BLUE	44G	31.50	24.00	27.75	4
1779741	BRUTE® 44 GALLON CONTAINER	DARK GREEN	44G	31.50	24.00	27.75	4
FG264360BLA	BRUTE® 44 GALLON CONTAINER	BLACK	44G	31.50	24.00	27.75	4
FG264307BLUE	BRUTE® 44 GALLON RECYCLING CONTAINER	BLUE	44G	31.50	24.00	27.75	4
1926829	BRUTE® 44 GALLON RECYCLING CONTAINER	DARK GREEN	44G	31.50	24.00	27.75	4
FG265500GRAY	BRUTE® 55 GALLON CONTAINER	GRAY	55G	33.19	26.38	30.75	3
FG265500WHT	BRUTE® 55 GALLON CONTAINER	WHITE	55G	33.19	26.38	30.75	3
FG265500RED	BRUTE® 55 GALLON CONTAINER	RED	55G	33.19	26.38	30.75	3
FG265500YEL	BRUTE® 55 GALLON CONTAINER	YELLOW	55G	33.19	26.38	30.75	3
1779732	BRUTE® 55 GALLON CONTAINER	BLUE	55G	33.19	26.38	30.75	3
FG265500DGRN	BRUTE® 55 GALLON CONTAINER	DARK GREEN	55G	33.19	26.38	30.75	3
1779739	BRUTE® 55 GALLON CONTAINER	BLACK	55G	33.19	26.38	30.75	3



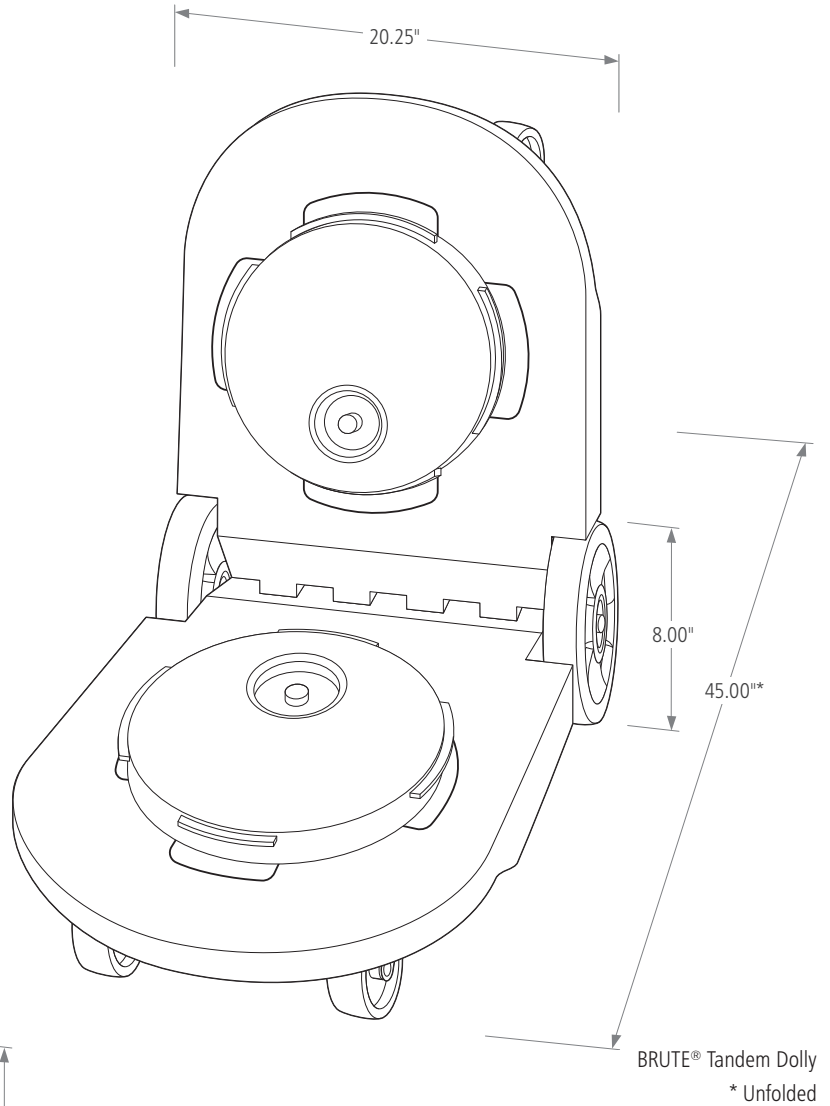


BRUTE® DOLLIES

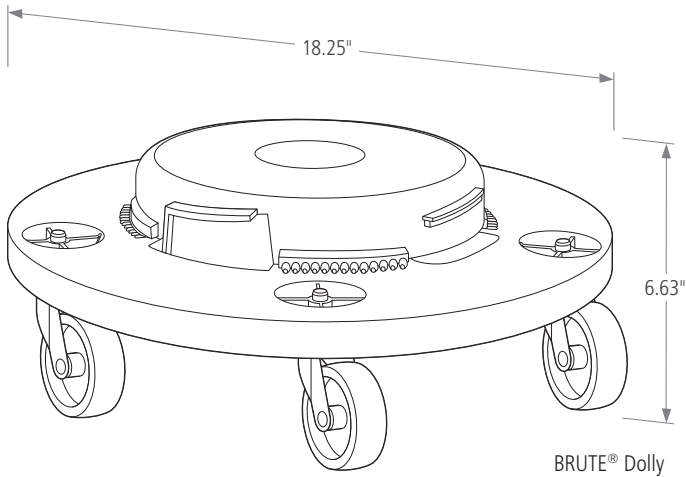
BRUTE® dollies are designed to be durable, long-lasting, and are able to withstand the toughest commercial environments while simplifying everyday tasks.

Features and Benefits:

- Rugged casters help keep fully loaded BRUTE® containers stable, even on rough and uneven floors, and swivel smoothly for easy maneuvering
- Twist locks hold containers securely in place and unlock easily for unloading, allowing for easy transport
- Structural foam construction provides superior strength and durability



BRUTE® Tandem Dolly
* Unfolded



BRUTE® Dolly

BRUTE® DOLLIES

SKU #	DESCRIPTION	COLOR	FITS	LENGTH	WIDTH	HEIGHT	DIAMETER	PACK SIZE
				IN	IN	IN	IN	
FG264000BLA	BRUTE® DOLLY	BLACK	ALL	-	-	6.63	18.25	2
FG264043BLA	BRUTE® QUIET DOLLY	BLACK	ALL	-	-	6.63	18.25	2
FG264600BLA	BRUTE® TANDEM DOLLY	BLACK	ALL	45.00	20.25	8.00	-	1



FISHER

SPECIFICATION BOOK

JOB NAME:

QUANTITY:

ITEM NO.:

SPEC: 29033 REV. A

PRODUCT NAME:

**DrainKing WASTE VALVE
ROUGH CHROME**

_____ SPECIAL CONFIGURATION
(CHECK BASE MODEL AND OPTIONS)

MODEL:

29033 w/ FLAT STRAINER & OVERFLOW BODY

OPTIONS OR MODIFICATIONS:

OTHER _____

FEATURES:

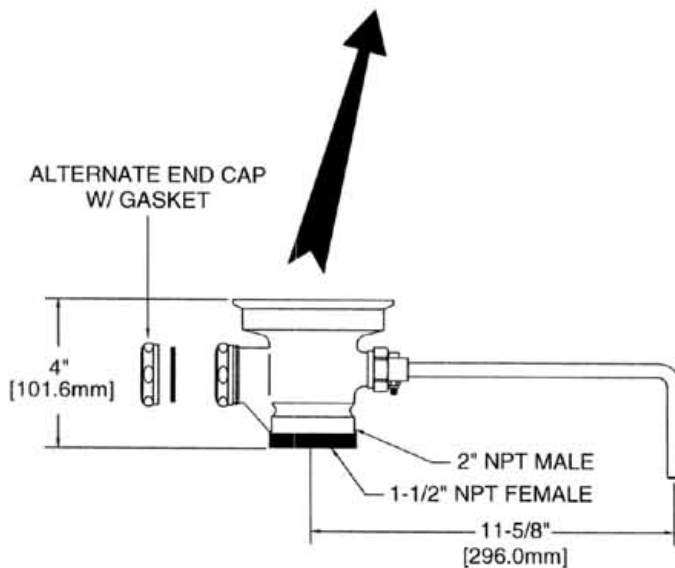
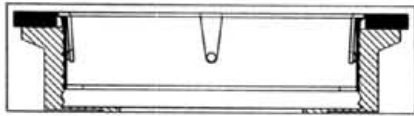
- * DUAL TEFLON SEALS
- * STAINLESS STEEL BALL
- * CAST RED BRASS BODY, CHROME PLATED
- * EXTRA STURDY STAINLESS STEEL CLAMPING RING
- * "CLEAR THROUGH " OPENING - NO NEED TO DISASSEMBLE IF SNAKING IS REQUIRED
- * INDUSTRY STANDARD "SEALING" ANGLE - FITS FLUSH TO STANDARD STAINLESS STEEL SINKS
- * STAINLESS STEEL FLAT STRAINER
- * 1/4 TURN FULLY OPENS AND CLOSES VALVE
- * END CAP W/ GASKET (INSTALLED)
- * SUPPLIED WITH:
ALTERNATE SLIP JOINT NUT & WASHER

DRAIN RATE:

- * 12 GPM

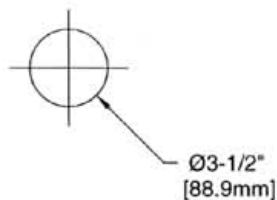
SHIPPING WEIGHT

- * 5.5 LBS



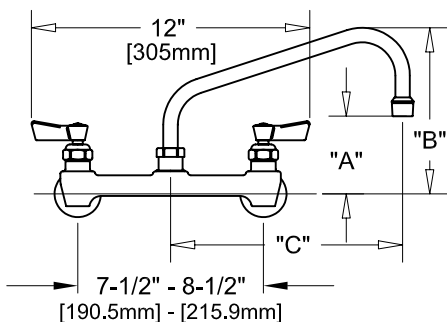
ROUGH-IN:

DRAIN:

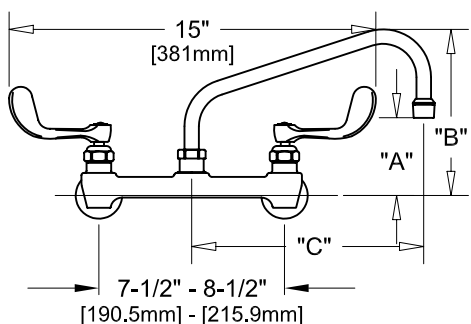


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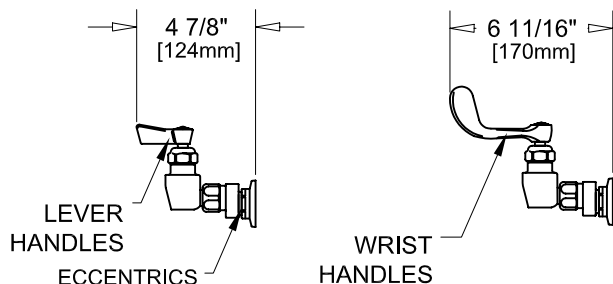
7-1/2" - 8-1/2" ADJ. WALL W/ LEVER HANDLES



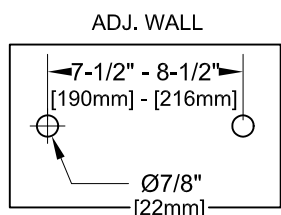
7-1/2" - 8-1/2" ADJ. WALL W/ WRIST HANDLES



7-1/2" - 8-1/2" ADJ. WALL



ROUGH-IN:



ANSI/A112.18.1-2005

PRODUCT NAME: STAINLESS STEEL
7-1/2" - 8-1/2" ADJUSTABLE WALL FAUCET

MODEL:

- 53104 W/ 6" SWING SPOUT W/ LEVER HANDLES
- 53112 W/ 8" SWING SPOUT W/ LEVER HANDLES
- 53120 W/ 10" SWING SPOUT W/ LEVER HANDLES
- 53139 W/ 12" SWING SPOUT W/ LEVER HANDLES
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- 57495 W/ 14" SWING SPOUT W/ WRIST HANDLES
- 57509 W/ 16" SWING SPOUT W/ WRIST HANDLES

FEATURES

CONTROL VALVE

- * 7-1/2" - 8-1/2" ADJUSTABLE WALL MOUNT
- * ECCENTRICS
- * STAINLESS STEEL CONSTRUCTION
- * SWIVELLING SEAT DISKS
- * HOT SIDE STEM - RIGHT HAND
- * COLD SIDE STEM - LEFT HAND
- * LEVER HANDLES OR WRIST HANDLES
- * SWING SPOUT

SYSTEM LIMITS

- * TEMP: 40°F MIN. TO 140°F MAX.

SHIPPING WEIGHT

- * 5.0 LBS

* NSF 61-9 APPROVED & LISTED

www.truedail.com

MODELS	DIM "A"	DIM "B"	DIM "C"
53104 57452	2-1/4" [57mm]	5-7/8" [149mm]	6" [152mm]
53112 57460	2-1/2" [64mm]	6-3/8" [162mm]	8" [204mm]
53120 57479	3-1/8" [79mm]	6-7/8" [175mm]	10" [254mm]
53139 57487	3-3/4" [95mm]	7-3/8" [187mm]	12" [305mm]
53147 57495	4-3/8" [111mm]	8-1/4" [210mm]	14" [356mm]
53155 57509	5" [127mm]	8-7/8" [225mm]	16" [406mm]



FISHER MANUFACTURING COMPANY

TOLL FREE: 800-421-6162 - FAX: 800-832-8238

information@fisher-mfg.com - www.fisher-mfg.com

Edlund S-11 NSF Manual Can Openers

For the very highest standard in food safety and sanitation, the S-11 manual can opener has over 17 years of success in foodservice worldwide utilizing proprietary can opening technology. The patented S-11 has successfully opened nearly one billion cans without a single complaint – giving it a stainless reputation. Add in the industry's longest warranty and you've got an opener that's a cut above any other.



- 5-year warranty
- NSF Certified
- Dishwasher safe
- Made in U.S.A.
- Rustproof stainless steel construction
- Parts remove easily for replacement
- Tamper proof model also available
- Available with screw down base or clamp on model
- Standard size or with long bar for taller cans
- Patented

Open up to a higher standard in food safety.



Dishwasher Safe

Toss in the dishwasher for easy cleaning. The industry's first all-stainless can opener, the S-11 resists rust and stays looking new, no matter how many times it's washed.



Fewer Parts

The S-11's advanced design means fewer parts than most other openers, and its patented Quick Change Mechanism makes knife and gear replacement fast and easy.

Quick Change Mechanism

Makes gear replacement fast and easy.



A tamper proof version of the S-11 is now available equipped with locking hardware.

SPECIFICATIONS:

MODEL #	DESCRIPTION	PRODUCT CODE	CASE CUBE FT ³ /M ³	CASE WEIGHT LBS./KGS
S-11	Stainless Steel Can Opener With cast stainless steel base	15000	3.3/0.1	30/13.6
S-11 L	With long bar for cans up to 17" high (50cm)	15300	3.3/0.1	30/13.6
S-11 E	Comes complete with ST-93 cleaning tool and extra knife and gear	15400	3.3/0.1	31/14.1
S-11 C	Clamping Base Model Now available with clamp instead of screws Secures to underside of table	15020	3.3/0.1	30/13.6
S-11 CL	Clamping Base Model With long bar for cans up to 17" high (50cm)	15320	3.3/0.1	30/13.6
S-11 CE	Clamping Base Model complete with ST-93 cleaning tool and extra knife and gear	15420	3.3/0.1	32/14.5
S-11 WB	Without Base	15200	3.3/0.1	21/9.5
S-11 TP	Tamper Proof Opener With tamper proof base	15080	3.3/0.1	30/13.6
ST-93	Rustproof can opener cleaning tool	38500		.5/2

Note: S-11 Series standard length bar is 16" (40.6 cm) long. Extra long bar is 22" (55.9 cm) long.



Edlund We're in your kitchen.™

Edlund Company, Inc., 159 Industrial Parkway, Burlington, VT 05401 800-772-2126 www.edlundco.com

WARRANTY INFORMATION: THE EDLUND COMPANY WARRANTS THESE PRODUCTS TO BE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF PURCHASE. THE COMPANY'S OBLIGATION UNDER THIS WARRANTY IS LIMITED TO REPAIRING OR REPLACING WITHOUT CHARGE ANY PART OR PARTS FOUND TO BE DEFECTIVE UNDER NORMAL USE. IT IS THE RESPONSIBILITY OF THE PURCHASER TO RETURN THE ENTIRE UNIT TO THE FACTORY, TRANSPORTATION CHARGES PREPAID. THIS WARRANTY DOES NOT COVER PARTS THAT MUST BE REPLACED UNDER NORMAL USE, INCLUDING KNIVES AND DRIVE GEARS ON CAN OPENERS. NO OTHER WARRANTY, WRITTEN OR VERBAL, IS AUTHORIZED BY THE COMPANY. WARRANTY INFORMATION OUTSIDE THE UNITED STATES MAY VARY, CONSULT YOUR DISTRIBUTOR.

12/07 ED01-4021

NSF Manual Can Openers

S-11 MANUAL CAN OPENERS

WITH 5 YEAR WARRANTY!



S-11 Made in U.S.A.

The most sanitary can opener in the world! Rustproof, NSF Certified and dishwasher safe. All stainless steel. Parts remove easily for replacement.

Model Number	Description	Product Code	Case Cube Ft ³ /M ³	Master Case	Case Weight lbs./kgs
S-11	Stainless Steel Can Opener (NSF Certified) With cast stainless steel base	15000	3.3/0.1	3	30/13.6
S-11L	With long bar for cans up to 17" high (50 cm)	15300	3.3/0.1	3	30/13.6
S-11E	"Extra Value" comes complete with ST-93 cleaning tool and 1 extra knife and gear	15400	3.3/0.1	3	31/14.1
S-11C	Clamping Base Model (NSF Certified) Now available with clamp instead of screws. Secures to underside of table	15020	3.3/0.1	3	30/13.6
S-11CL	With long bar for cans up to 17" high (50 cm)	15320	3.3/0.1	3	30/13.6
S-11CE	"Extra Value" – Clamping Base Model complete with ST-93 cleaning tool and extra knife and gear.	15420	3.3/0.1	3	32/14.5
S-11WB	Without Base	15200	3.3/0.1	3	21/9.5
S-11TP	Tamper resistant opener with tamper proof base	15080	3.3/0.1	3	30/13.6

Note: S-11 has standard bar length of 16" (40.6 cm) long. Extra long bar is 22" (55.9 cm) long.

U SERIES MANUAL CAN OPENERS

Edlund now offers the Universal Series Manual Can Openers. These can openers offer substantial improvements over our popular #1® and #2® models. The U-12 includes many of the same design features as our S-11 standard openers, with quick change gear, stainless steel shaft and pull pin for easy blade replacement. The base design features a replaceable insert for a tighter fit and easier slide action. Other base options are also available. NSF Certified.

Model Number	Description	Product Code	Case Cube Ft ³ /M ³	Master Case	Case Weight lbs./kgs
U-12	Quick change NSF can opener with standard length bar and new plated base	14100	3.3/0.1	3	21/9.5
U-12WB	NSF Opener without base	14000	3.3/0.1	3	21/9.5
U-12S	NSF Opener with stainless steel base	14200	3.3/0.1	3	21/9.5
U-12C	NSF Opener with cast stainless steel clamp base	14010	3.3/0.1	3	22/9.9
U-12L	NSF Opener with long bar and plated steel base	14500	3.3/0.1	3	22/9.9
U-12SL	NSF Opener with long bar and stainless steel base	14600	3.3/0.1	3	22/9.9
U-12CL	NSF Opener with long bar and cast stainless steel clamp base	14300	3.3/0.1	3	23/10.4

Note: U-12 Series standard bar length is 16" (40.6 cm) long. Extra long bar is 22" (55.9 cm) long.



U-12 Made in U.S.A.



SG-2 NSF STAINLESS MANUAL CAN OPENERS

WITH 2 YEAR WARRANTY!

For operators who only require a lighter duty manual can opener but want full stainless steel protection, Edlund introduces the SG-2 Model. The flagship of our popular G-2 Series Openers, this new model is all stainless steel, dishwasher safe, and features our patented quick change knife and gear system, and comes with a full two year warranty. A great opener for a Global Marketplace.



SG-2 Made in U.S.A.

Model Number	Description	Product Code	Case Cube Ft ³ /M ³	Master Case	Case Weight lbs./kgs
SG-2	NSF Stainless Opener with standard bar and stainless base	13100	3.3/0.1	3	18/8.1
SG-2C	NSF Stainless Opener with stainless clamp base	13200	3.3/0.1	3	20/9
SG-2L	NSF Stainless Opener with long bar and stainless base	13300	3.3/0.1	3	20/9
SG-2CL	NSF Stainless Opener with long bar and stainless clamp base	13400	3.3/0.1	3	22/9.8

Note: SG-2 Series standard bar length is 16" (40.6 cm) long. Extra long bar is 22" (55.9 cm) long.

Edlund blades are reversible for longer life and available through your dealer.

Edlund G-2 Manual Can Opener

The "G" in our new G-2 can openers stands for global. This new opener was designed to meet the requirements of most any Foodservice operation. If you search the world over, you would not find a better all-around opener.

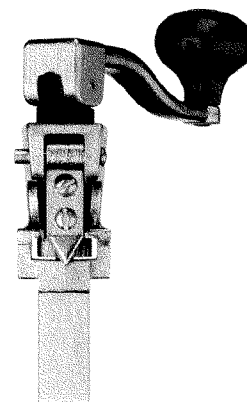


G-2 available with long or short bar and several base options.

FEATURES:

- Reversible blade for longer life
- Melonite arbor to resist rust
- Specially designed plastic bushing for longer life
- Bases available in plated or stainless steel screw down version or all stainless steel clamp mounting versions
- Welded stainless steel shaft
- New base design features a replaceable insert for tighter and smoother action
- Made in U.S.A.

G-2 as shown with reversible steel blade for long life.



SPECIFICATIONS:

MODEL #	DESCRIPTION	PRODUCT CODE	CASE CUBE FT ³ /M ³	CASE WEIGHT LBS./KGS
G-2	Can opener with standard length bar and plated base	16100	2.6/.07	31/14.1
G-2 S	Opener with standard length bar and stainless steel base	16200	2.6/.07	31/14.1
G-2 L	Can opener with long bar and plated steel base	16500	2.3/.07	4/1.8
G-2 SL	Can opener with long bar and stainless steel base	16600	2.3/.07	4/1.8
G-2 CL	Can opener with long bar and cast stainless steel clamp base	16700	2.3/.07	4/1.8
ST-93	Rustproof can opener cleaning tool	38500		.5/.2

Note: G-2 Series standard length bar is 16" (40.6 cm) long. Extra long bar is 22" (55.9 cm) long.



ST-93 Rustproof can opener cleaning tool



Edlund *Our reputation is virtually stainless.*

Edlund Company, Inc., 159 Industrial Parkway, Burlington, VT 05401 802-862-9661 www.edlundco.com

WARRANTY INFORMATION: THE EDLUND COMPANY WARRANTS THESE PRODUCTS TO BE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF PURCHASE. THE COMPANY'S OBLIGATION UNDER THIS WARRANTY IS LIMITED TO REPAIRING OR REPLACING WITHOUT CHARGE ANY PART OR PARTS FOUND TO BE DEFECTIVE UNDER NORMAL USE. IT IS THE RESPONSIBILITY OF THE PURCHASER TO RETURN THE ENTIRE UNIT TO THE FACTORY. TRANSPORTATION CHARGES PREPAID. THIS WARRANTY DOES NOT COVER PARTS THAT MUST BE REPLACED UNDER NORMAL USE, INCLUDING KNIVES AND DRIVE GEARS ON CAN OPENERS. NO OTHER WARRANTY, WRITTEN OR VERBAL, IS AUTHORIZED BY THE COMPANY. WARRANTY INFORMATION OUTSIDE THE UNITED STATES MAY VARY. CONSULT YOUR DISTRIBUTOR.

4/99 ED01-271

Electric Can Openers



USDA accepted



270 3 YEAR WARRANTY!

TWO SPEED ELECTRIC CAN OPENERS

ALL EDLUND ELECTRIC CAN OPENERS ARE MADE IN THE U.S.A.

The only NSF Certified electric can opener for heavy volume operators.

Now with 3 year warranty. Equipped with 2 speed motor and featuring knife and gear assemblies that can be removed without tools for easy cleaning. The slower second speed helps prevent spillage while opening smaller cans.

Model Number	Description	Product Code	Case Cube Ft3/M3	Master Case	Case Weight lbs./kgs
270	NSF Certified Electric Can Opener 115 Volt	27000	1/.03	1	19/8.6
270	NSF Certified Electric Can Opener 230 Volt (for U.S. specifications only)	27200	1/.03	1	19/8.6

Models available with permanent mounting bracket to prevent theft.

Model Number	Description	Product Code	Case Cube Ft3/M3	Master Case	Case Weight lbs./kgs
270B	NSF Certified Electric Can Opener with security lock-down bracket 115 Volt	27010	1/.03	1	20/9
270B	NSF Certified Electric Can Opener with security lock-down bracket 230 Volt (for U.S. specifications only)	27300	1/.03	1	20/9



270C

270 Continental! with gas shock slide bar mounting is safer and easier to use. Easily adjusts for multiple international can sizes. CE Certified.

Model Number	Description	Product Code	Case Cube Ft3/M3	Master Case	Case Weight lbs./kgs
270C	Electric Can Opener with gas shock Slide Bar 115 Volt	27400	3.3/.1	1	32/14.4
270C	Electric Can Opener with gas shock Slide Bar 230 Volt (for U.S. specifications only)	27500	3.3/.1	1	32/14.4



203

The #203 Electric Can Opener has been a reliable workhorse for over 30 years. Especially suited for schools and hospitals or operations that open more than one size of cans. The slower second speed for smaller cans prevents spilling of liquids.

Model Number	Description	Product Code	Case Cube Ft3/M3	Master Case	Case Weight lbs./kgs
203	Electric Can Opener 115 Volt 2 speeds	23100	1.1/.03	3	42/18.9
203	Electric Can Opener 230 Volt 2 speeds (for U.S. specifications only)	23200	1.1/.03	3	42/18.9



266

SINGLE SPEED ELECTRIC CAN OPENERS

Model Number	Description	Product Code	Case Cube Ft3/M3	Master Case	Case Weight lbs./kgs
266	Electric Can Opener 115 Volt	26100	1.1/.03	3	42/18.9
266	Electric Can Opener 230 Volt (for U.S. specifications only)	26200	1.1/.03	3	42/18.9

CLEANING TOOLS

Model Number	Description	Product Code	Case Cube Ft3/M3	Master Case	Case Weight lbs./kgs
ST-93	New Rustproof Can Opener Cleaning Tool – with stainless steel bristles and stainless scraper. Recommended for maintaining proper sanitation on all can openers	38500		1	.5/.2



ST-93



Item # _____

Job _____

SUPER ERECTA SHELF® WIRE SHELVING

- **Unique Design:** The open wire design of these heavy-gauge carbon-steel or stainless steel shelves minimizes dust accumulation and allows a free circulation of air, greater visibility of stored items and greater light penetration.
- **Versatile Construction:** Super Erecta Shelf® wire shelving can change as quickly as your needs change. By using various accessories, hundreds of shelving configurations become possible.
- **Fast, Secure Assembly:** SiteSelect™ Posts with the double-groove visual guide feature, have circular grooves at 1" (25mm) intervals and are numbered at 2" (50mm) intervals. A patented, tapered split sleeve (plastic or aluminum) snaps together around each post. Tapered openings in the shelf corners slide over the tapered split sleeves providing a positive lock. Shelf is assembled in minutes without the use of any special tools.
- **Shelf Ribs:** Run front to back, allowing you to slide items on and off shelves smoothly.
- **Shelf Accessibility:** Shelves can be loaded/unloaded easily from all sides. This open construction allows use of maximum storage space of cube.
- **Adjustability:** Shelves can be adjusted at 1" (25mm) intervals along the entire length of the post.
- **Durable:** Super Erecta Shelf® wire shelving is available in four options: Super Erecta Brite™, chrome-plated, stainless steel and Metroseal™.
- **Adjustable Feet:** Bolt levelers compensate for surface irregularities.



InterMetro Industries Corporation
North Washington Street
Wilkes-Barre, PA 18705
www.metro.com

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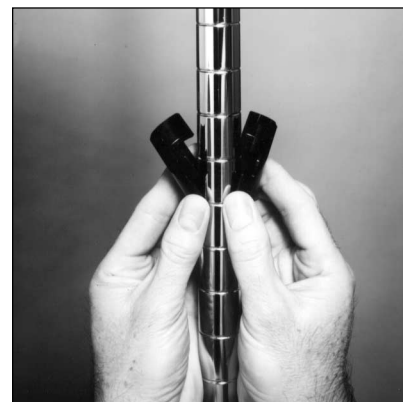
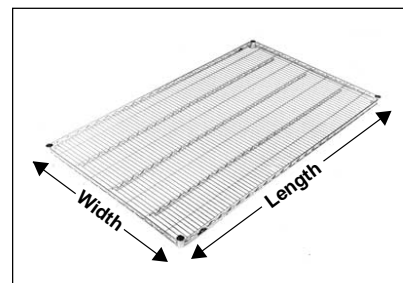
Job _____

SUPER ERECTA SHELF® WIRE SHELVING



Wire Shelves

Width		Length		Approx. Pkd. Wt.		Cat. No.	Cat. No.	Cat. No.
(in.)	(mm)	(in.)	(mm)	(lbs.)	(kg)	Super Erecta Brite	Chrome	Stainless
14	355	24	610	6	2.7	1424BR	1424NC	1424NS
14	355	30	760	7	3.2	1430BR	1430NC	1430NS
14	355	36	910	8	3.6	1436BR	1436NC	1436NS
14	355	42	1060	9½	4.3	1442BR	1442NC	1442NS
14	355	48	1220	10½	4.7	1448BR	1448NC	1448NS
14	355	60	1525	14	6.3	1460BR	1460NC	1460NS
14	355	72	1825	17	7.7	1472BR	1472NC	1472NS
<hr/>								
18	455	24	610	7	3.2	1824BR	1824NC	1824NS
18	455	30	760	8	3.6	1830BR	1830NC	1830NS
18	455	36	910	9½	4.3	1836BR	1836NC	1836NS
18	455	42	1060	11	5.0	1842BR	1842NC	1842NS
18	455	48	1220	12	5.4	1848BR	1848NC	1848NS
18	455	54	1370	14½	6.6	1854BR	1854NC	1854NS
18	455	60	1525	17	7.7	1860BR	1860NC	1860NS
18	455	72	1825	20	9.1	1872BR	1872NC	1872NS
<hr/>								
21	530	24	610	8	3.6	2124BR	2124NC	2124NS
21	530	30	760	9	4.1	2130BR	2130NC	2130NS
21	530	36	910	11	5.0	2136BR	2136NC	2136NS
21	530	42	1060	12	5.4	2142BR	2142NC	2142NS
21	530	48	1220	14	6.4	2148BR	2148NC	2148NS
21	530	54	1370	16	7.6	2154BR	2154NC	2154NS
21	530	60	1525	18	8.2	2160BR	2160NC	2160NS
21	530	72	1825	24	10.9	2172BR	2172NC	2172NS
<hr/>								
24	610	24	610	9	4.1	2424BR	2424NC	2424NS
24	610	30	760	11	5.0	2430BR	2430NC	2430NS
24	610	36	910	13	5.9	2436BR	2436NC	2436NS
24	610	42	1060	15	6.8	2442BR	2442NC	2442NS
24	610	48	1220	16	7.3	2448BR	2448NC	2448NS
24	610	54	1370	18	8.6	2454BR	2454NC	2454NS
24	610	60	1525	21	9.5	2460BR	2460NC	2460NS
24	610	72	1825	26	11.8	2472BR	2472NC	2472NS



NOTE:For Metroseal shelving information see sheet No. 10.10.
SUPER ERECTA SHELF meets U.S. Government Specifications MIL-S-40144E.
PLATED SHELVING has clear protective coating.

“S” Hooks

Used to “add-on” shelving units with only two posts required.

Cat. No. 9995Z



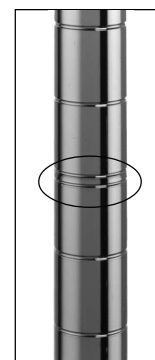
SiteSelect™ Posts

Height* (in.)	Height* (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)	Cat. No. Chrome	Cat. No. Stainless
7 ⁵ / ₈	194	½	0.23	7P	—
14 ¹ / ₂	370	1	0.5	13P	13PS
27 ¹ / ₂	700	1¾	0.75	27P	27PS
34 ¹ / ₂	877	2	0.9	33P	33PS
54 ⁹ / ₁₆	1386	3	1.4	54P	54PS
62 ⁹ / ₁₆	1589	3½	1.6	63P	63PS
74 ⁵ / ₈	1895	4	1.8	74P	74PS
86 ⁵ / ₈	2200	5	2.3	86P	86PS
96 ⁵ / ₈	2454	5½	2.3	**96P	—

* Height includes leveling bolt and cap.
 ** 96P should not be used on units less than 24" (610mm) deep.
 *** Post lengths to be specified as cut to a round number, ie: 74P cut to 69"... This will result in an overall post height with adjustment of 96⁵/₈ to 69⁵/₈.

SiteSelect™

Posts are grooved at 1" (25mm) increments and numbered at 2" (50mm) increments. Posts are double-grooved every 8" (203mm) for easy identification.



IMPORTANT: When ordering by components remember that stability decreases as the ratio of height to width increases. Units should be kept as wide and low as possible. With 14" shelving, foot plates should be used and secured to the floor on free-standing units; on mobile units, maximum post height is 54".

Manufactured by:



InterMetro Industries Corporation

North Washington Street, Wilkes-Barre, PA 18705
 Phone: 570-825-2741 • Fax: 570-825-2852
 For Product Information Call: 1-800-433-2232
 Visit Our Web Site: www.metro.com

L02-006
 Rev. 11/00
 Printed in U.S.A.

Information and specifications are subject to change without notice. Please confirm at time of order.





SE36 SERIES ELECTRIC RANGE



SE36A-BBB

Application

You can saute, braise, pan fry, griddle, boil, stew, simmer, bake, brown, roast and reconstitute with the Southbend heavyduty range.

General Information

Heavy-duty electric range with deck oven, convection oven, or TruVection oven base. Range is 36"W x 38-1/2"D x 38-1/4"H including legs.

Construction

The frame of the range and oven is welded aluminized steel with stainless steel front, sides and top. Grease troughs are located at front and rear for drainage, with grease chutes into two wide, drawertype receptacles. The griddle models are furnished with splash guards surrounding back and side of the griddle section. Range is 100% front serviceable.

Convection Oven (SE36A)

The convection oven is provided with stainless steel inner lining, stainless steel throat, vent with damper and shelf-type, stainless steel lined door. Removable rack supports to accommodate six racks are installed on the interior sides of the oven. The blower fan is powered by a sealed ball bearing motor. Oven is fully insulated on all sides.

Standard Oven (SE36D)

The deck oven is provided with aluminized steel inner lining; removable deck of rigidized steel; vent with damper; and shelf-type, stainless steel lined door. The oven is insulated on all sides. Comes with 1 rack capacity(1 rack position and 1 rack).

TruVection Oven (SE36T)

7.5KW, deck oven is provided with coved porcelain enamel finish, dependent doors with windows (Full180°opening), oven interior light, 1/2 hp two-speed fan motor, electronic ignition, cool down fan mode, oven "ready" light, and standard controls (150°F to 500°F solid state thermostat and 60 minute mechanical cook timer).

- SE36D Standard Oven SE36D
- SE36A Convection Oven SE36A
- SE36T TruVection Oven SE36T

Oven heating is regulated by an adjustable thermostat control. Blower fan circulates air within the cavity "scrubbing" heat to the oven interior for even heat distribution within the cavity.

Electrical

Wiring is connected at a terminal compartment in the base. Knockouts are provided in the bottom and back for power supply entrance. See electrical data for kW rating of range tops, ovens and TruVection oven base.

Heating

Heating is accomplished with formed tubular elements clamped underneath each griddle and rectangular hotplate. The TTT has 4 heating sections for the 36" x 24" griddle. The TTB and the TTH have two heating sections under the 24" x 24" griddle. The oven heating element is located on the side of the cavity encircling the oven blower fan. Oven will preheat to 450oF in 20 minutes.

Controls

Range-top section controls are mounted in a central ventilated control panel, hinged for easy service access. 9" solid round hotplates are controlled by an indicating 3-heat switch. The 12" x 24" hotplate sections on the HHH, HHB and TTH are controlled by a thermostat with a temperature range of 250oF to 850oF. The griddle sections on the TTT, TTB and TTH are controlled by a thermostat with a temperature range of 150oF to 450oF. Range is provided with a 2 hour timer adjustable from 6 to 120 minutes (timer has a bell signal). The oven temperature is controlled by a thermostat adjustable from 150oF to 450oF. Each thermostat is provided with an "OFF" position. Each 9" diameter hotplate is provided with a 4-position, 3-heat switch "HIGH"/"MEDIUM"/"LOW" and "OFF" settings. An indicator light is associated with each thermostat, indicating when preset temperature is reached and cycles on or off. Oven section includes a "HIGH"/"LOW" fan speed switch.

Convection Oven Capacity

The convection oven has a capacity for (6) 20-7/8" x 28-1/4" racks. Three racks with positive stops are furnished. Oven has a clearance height of 13-1/4".

Standard Oven Capacity

The standard oven is provided with a slide out removable rack. Oven has a total meat capacity of 60 lbs. Oven has a clearance height of 12-1/2".

Each oven rack will accommodate (2) 12" x 20" #200 pans, (1) 18" x 26" roll pan, (1) 18" x 24" meat pan, (10) standard 1 lb. loaf pans or (6) 9" pie tins.

TruVection Oven Capacity

Heavy-duty removable wire rack guides spaced on 1-5/8" centers offer 5 different rack positions. 3 wire racks provided with each oven. Oven interior dimensions: 29"x21.5"x 14".

Warranty

Warranted for one year covering parts and labor.

Ordering Information

Basic Models - 208VAC or 240VAC or 480VAC (3 phase) voltage must be specified. If unit has a standard oven or a convection oven base, specify "assembled" or "hatchable". Hatchable is packaged in two sections that can pass through a 26" wide door for assembly in kitchen. TruVection units are NOT hatchable.

OPTIONS & ACCESSORIES AT ADDITIONAL COST

- 480VAC, 3 Phase
- Extra intermediate slide-out oven rack
- Marine Kit Top
- Set of four, 6-1/4" high casters
- Stainless steel rear



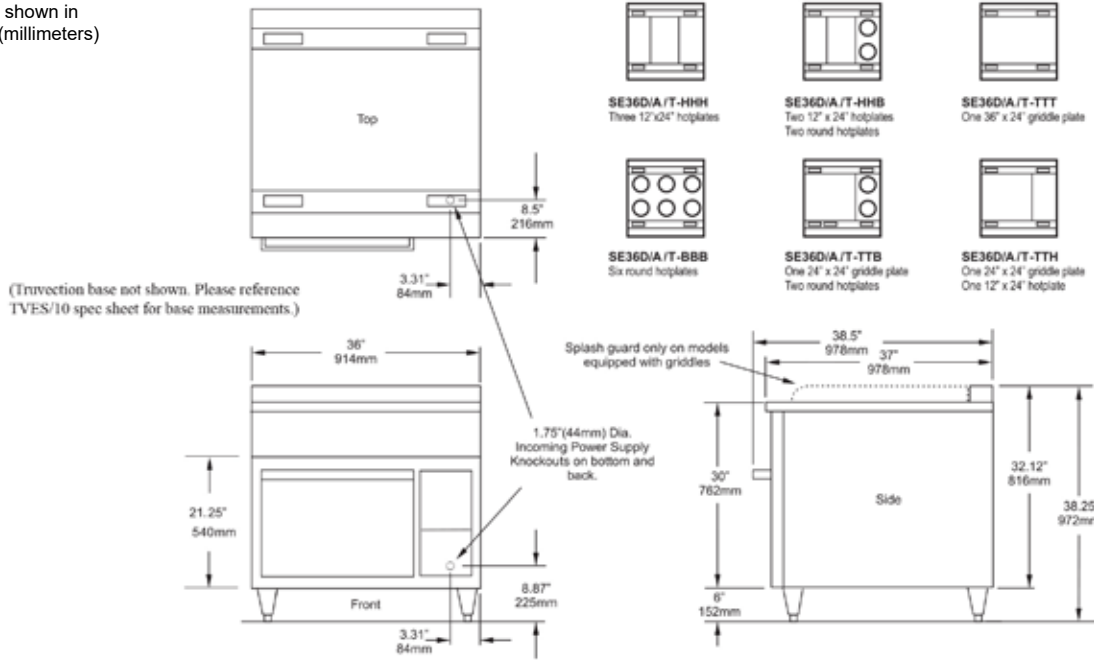
Approval Notes: _____

Models: SE36D SE36A SE36T

*See TVES/10SC spec sheet for TruVection oven information.

SE36

Dimensions shown in inches and (millimeters)



UTILITY INFORMATION

Model	in(mm) Height	in(mm) Width	Depth Overall	Convection Oven kW	Standard OvenkW	Range Top kW	12" x 24" Hotplate kW (QTY)	9" Round HotplatekW (QTY)	Griddle Heating Element kW (QTY)	Installed	Weights lbs(kg) Ship/Hatch	Ship/Assm	
SE36-HHH	36(914)	36(914)	38.5(978)	6.0	6.0	15.9	5.3 (3)	-	-	599(271.7)	700(317.5)	654(296.6)	
SE36-HHB	36(914)	36(914)	38.5(978)	6.0	6.0	15.8	5.3 (2)	2.6 (2)	-	559(253.5)	660(299.4)	624(283.0)	
SE36-TTT	36(914)	36(914)	38.5(978)	6.0	6.0	16.5	-	-	4.125 (4)	599(271.7)	700(317.5)	654(296.6)	
SE36-BBB	36(914)	36(914)	38.5(978)	6.0	6.0	15.6	-	2.6 (6)	-	549(249.0)	650(294.8)	627(284.4)	
SE36-TTB	36(914)	36(914)	38.5(978)	6.0	6.0	15.8	-	2.6 (2)	5.3 (2)	559(253.5)	660(299.4)	624(283.0)	
SE36-TTH	36(914)	36(914)	38.5(978)	6.0	6.0	15.9	-	-	5.3 (2)	559(253.5)	660(299.4)	624(283.0)	
TruVection Oven Models													
SE36T-HHH	36(914)	36(914)	38.5(978)	*	-	15.9	5.3 (3)	-	-	-	-	700 (317.5)	
SE36T-HHB	36(914)	36(914)	38.5(978)	*	-	15.8	5.3 (2)	2.6 (2)	-	-	-	660 (299.4)	
SE36T-TTT	36(914)	36(914)	38.5(978)	*	-	16.5	-	-	4.125 (4)	-	-	700 (317.5)	
SE36T-BBB	36(914)	36(914)	38.5(978)	*	-	15.6	-	2.6 (6)	-	-	-	650 (294.8)	
SE36T-TTB	36(914)	36(914)	38.5(978)	*	-	15.8	-	2.6 (2)	5.3 (2)	-	-	660 (299.4)	
SE36T-TTH	36(914)	36(914)	38.5(978)	*	-	15.9	5.3 (1)	-	5.3 (2)	-	-	660 (299.4)	
Conv Oven Models	Total kW	3 Phase Loading kW per Phase			208V			240V			480V		
		X-Y	Y-Z	X-Z	X	Y	Z	X	Y	Z	X	Y	Z
SE36A-HHH	21.9	6.0	10.6	5.3	49.2	72.0	67.4	43.0	62.6	58.4	21.9	31.6	29.2
SE36A-HHB	21.8	6.0	10.5	5.3	49.2	71.4	67.0	43.2	62.4	58.0	21.9	61.5	29.0
SE36A-TTT	22.5	6.0	8.25	8.25	51.6	61.6	68.7	53.9	55.9	59.5	27.2	27.2	29.8
SE36A-BBB	21.6	6.0	7.8	7.8	59.6	59.6	65.0	52.2	52.2	56.3	26.4	26.4	28.1
SE36A-TTB	21.8	6.0	10.5	5.3	71.4	49.2	67.0	62.4	43.2	58.0	31.5	21.9	29.0
SE36A-TTH	21.9	6.0	10.5	5.3	49.2	72.0	67.4	43.2	32.8	58.3	21.9	31.6	29.2
Std Oven Models	Total kW	3 Phase Loading kW per Phase			208V			240V			480V		
		X-Y	Y-Z	X-Z	X	Y	Z	X	Y	Z	X	Y	Z
SE36D-HHH	21.9	6.0	10.6	5.3	47.1	70.0	67.4	40.8	60.7	58.4	20.4	30.3	29.2
SE36D-HHB	21.8	6.0	10.5	5.3	47.1	69.5	66.9	40.8	60.3	58.0	20.4	30.1	29.0
SE36D-TTT	22.5	6.0	8.25	8.25	59.6	59.6	68.7	51.5	51.6	59.5	25.8	25.8	29.9
SE36D-BBB	21.6	6.0	7.8	7.8	57.6	57.6	64.9	49.9	49.9	56.3	25.0	25.0	28.1
SE36D-TTB	21.8	6.0	10.5	5.3	47.1	69.5	67.0	40.8	60.3	58.0	20.4	30.1	29.0
SE36D-TTH	21.9	6.0	10.6	5.3	47.1	70.0	67.4	40.8	60.7	58.4	20.4	330.3	29.2

*See TVES/10SC spec sheet for TruVection oven information.

INTENDED FOR COMMERCIAL USE ONLY.
NOT FOR HOUSEHOLD USE.





SE36 SERIES ELECTRIC RANGE



SE36A-BBB

Application

You can saute, braise, pan fry, griddle, boil, stew, simmer, bake, brown, roast and reconstitute with the Southbend heavyduty range.

General Information

Heavy-duty electric range with deck oven, convection oven, or TruVection oven base. Range is 36"W x 38-1/2"D x 38-1/4"H including legs.

Construction

The frame of the range and oven is welded aluminized steel with stainless steel front, sides and top. Grease troughs are located at front and rear for drainage, with grease chutes into two wide, drawertype receptacles. The griddle models are furnished with splash guards surrounding back and side of the griddle section. Range is 100% front serviceable.

Convection Oven (SE36A)

The convection oven is provided with stainless steel inner lining, stainless steel throat, vent with damper and shelf-type, stainless steel lined door. Removable rack supports to accommodate six racks are installed on the interior sides of the oven. The blower fan is powered by a sealed ball bearing motor. Oven is fully insulated on all sides.

Standard Oven (SE36D)

The deck oven is provided with aluminized steel inner lining; removable deck of rigidized steel; vent with damper; and shelf-type, stainless steel lined door. The oven is insulated on all sides. Comes with 1 rack capacity(1 rack position and 1 rack).

TruVection Oven (SE36T)

7.5KW, deck oven is provided with coved porcelain enamel finish, dependent doors with windows (Full180°opening), oven interior light, 1/2 hp two-speed fan motor, electronic ignition, cool down fan mode, oven "ready" light, and standard controls (150°F to 500°F solid state thermostat and 60 minute mechanical cook timer).

- SE36D Standard Oven SE36D
- SE36A Convection Oven SE36A
- SE36T TruVection Oven SE36T

Oven heating is regulated by an adjustable thermostat control. Blower fan circulates air within the cavity "scrubbing" heat to the oven interior for even heat distribution within the cavity.

Electrical

Wiring is connected at a terminal compartment in the base. Knockouts are provided in the bottom and back for power supply entrance. See electrical data for kW rating of range tops, ovens and TruVection oven base.

Heating

Heating is accomplished with formed tubular elements clamped underneath each griddle and rectangular hotplate. The TTT has 4 heating sections for the 36" x 24" griddle. The TTB and the TTH have two heating sections under the 24" x 24" griddle. The oven heating element is located on the side of the cavity encircling the oven blower fan. Oven will preheat to 450oF in 20 minutes.

Controls

Range-top section controls are mounted in a central ventilated control panel, hinged for easy service access. 9" solid round hotplates are controlled by an indicating 3-heat switch. The 12" x 24" hotplate sections on the HHH, HHB and TTH are controlled by a thermostat with a temperature range of 250oF to 850oF. The griddle sections on the TTT, TTB and TTH are controlled by a thermostat with a temperature range of 150oF to 450oF. Range is provided with a 2 hour timer adjustable from 6 to 120 minutes (timer has a bell signal). The oven temperature is controlled by a thermostat adjustable from 150oF to 450oF. Each thermostat is provided with an "OFF" position. Each 9" diameter hotplate is provided with a 4-position, 3-heat switch "HIGH"/"MEDIUM"/"LOW" and "OFF" settings. An indicator light is associated with each thermostat, indicating when preset temperature is reached and cycles on or off. Oven section includes a "HIGH"/"LOW" fan speed switch.

Convection Oven Capacity

The convection oven has a capacity for (6) 20-7/8" x 28-1/4" racks. Three racks with positive stops are furnished. Oven has a clearance height of 13-1/4".

Standard Oven Capacity

The standard oven is provided with a slide out removable rack. Oven has a total meat capacity of 60 lbs. Oven has a clearance height of 12-1/2".

Each oven rack will accommodate (2) 12" x 20" #200 pans, (1) 18" x 26" roll pan, (1) 18" x 24" meat pan, (10) standard 1 lb. loaf pans or (6) 9" pie tins.

TruVection Oven Capacity

Heavy-duty removable wire rack guides spaced on 1-5/8" centers offer 5 different rack positions. 3 wire racks provided with each oven. Oven interior dimensions: 29"x21.5"x 14".

Warranty

Warranted for one year covering parts and labor.

Ordering Information

Basic Models - 208VAC or 240VAC or 480VAC (3 phase) voltage must be specified. If unit has a standard oven or a convection oven base, specify "assembled" or "hatchable". Hatchable is packaged in two sections that can pass through a 26" wide door for assembly in kitchen. TruVection units are NOT hatchable.

OPTIONS & ACCESSORIES AT ADDITIONAL COST

- 480VAC, 3 Phase
- Extra intermediate slide-out oven rack
- Marine Kit Top
- Set of four, 6-1/4" high casters
- Stainless steel rear



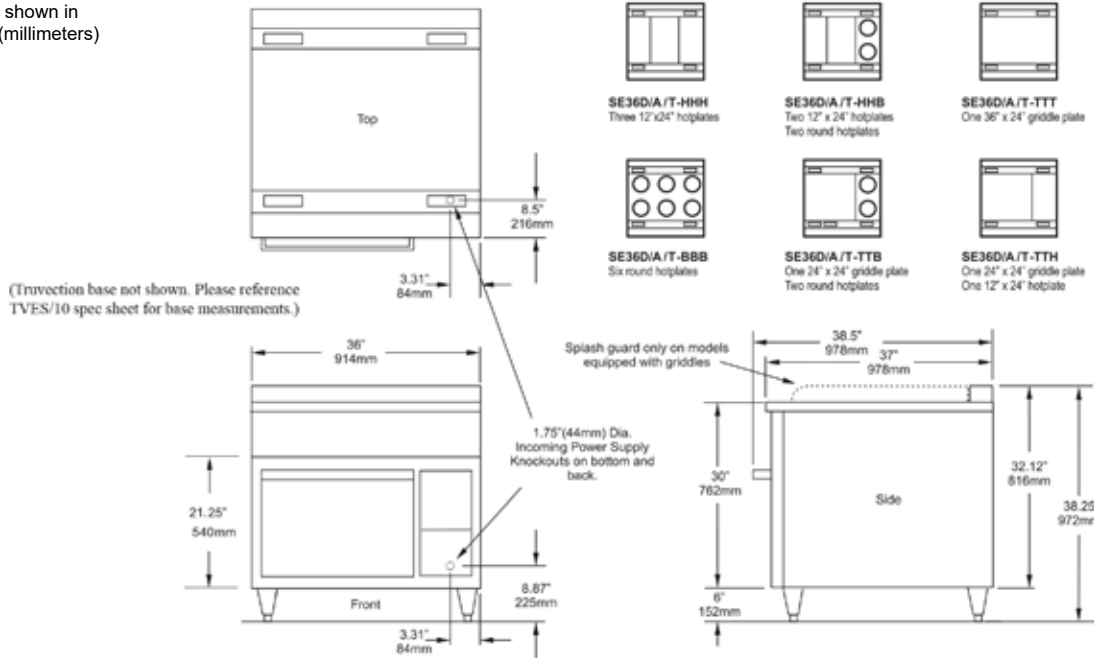
Approval Notes: _____

Models: SE36D SE36A SE36T

*See TVES/10SC spec sheet for TruVection oven information.

SE36

Dimensions shown in inches and (millimeters)



UTILITY INFORMATION

Model	in(mm) Height	in(mm) Width	Depth Overall	Convection Oven kW	Standard OvenkW	Range Top kW	12" x 24" Hotplate kW (QTY)	9" Round HotplatekW (QTY)	Griddle Heating Element kW (QTY)	Installed	Weights lbs(kg) Ship/Hatch	Ship/Assm	
SE36-HHH	36(914)	36(914)	38.5(978)	6.0	6.0	15.9	5.3 (3)	-	-	599(271.7)	700(317.5)	654(296.6)	
SE36-HHB	36(914)	36(914)	38.5(978)	6.0	6.0	15.8	5.3 (2)	2.6 (2)	-	559(253.5)	660(299.4)	624(283.0)	
SE36-TTT	36(914)	36(914)	38.5(978)	6.0	6.0	16.5	-	-	4.125 (4)	599(271.7)	700(317.5)	654(296.6)	
SE36-BBB	36(914)	36(914)	38.5(978)	6.0	6.0	15.6	-	2.6 (6)	-	549(249.0)	650(294.8)	627(284.4)	
SE36-TTB	36(914)	36(914)	38.5(978)	6.0	6.0	15.8	-	2.6 (2)	5.3 (2)	559(253.5)	660(299.4)	624(283.0)	
SE36-TTH	36(914)	36(914)	38.5(978)	6.0	6.0	15.9	-	-	5.3 (2)	559(253.5)	660(299.4)	624(283.0)	
TruVection Oven Models													
SE36T-HHH	36(914)	36(914)	38.5(978)	*	-	15.9	5.3 (3)	-	-	-	-	700 (317.5)	
SE36T-HHB	36(914)	36(914)	38.5(978)	*	-	15.8	5.3 (2)	2.6 (2)	-	-	-	660 (299.4)	
SE36T-TTT	36(914)	36(914)	38.5(978)	*	-	16.5	-	-	4.125 (4)	-	-	700 (317.5)	
SE36T-BBB	36(914)	36(914)	38.5(978)	*	-	15.6	-	2.6 (6)	-	-	-	650 (294.8)	
SE36T-TTB	36(914)	36(914)	38.5(978)	*	-	15.8	-	2.6 (2)	5.3 (2)	-	-	660 (299.4)	
SE36T-TTH	36(914)	36(914)	38.5(978)	*	-	15.9	5.3 (1)	-	5.3 (2)	-	-	660 (299.4)	
Conv Oven Models	Total kW	3 Phase Loading kW per Phase			208V			240V			480V		
		X-Y	Y-Z	X-Z	X	Y	Z	X	Y	Z	X	Y	Z
SE36A-HHH	21.9	6.0	10.6	5.3	49.2	72.0	67.4	43.0	62.6	58.4	21.9	31.6	29.2
SE36A-HHB	21.8	6.0	10.5	5.3	49.2	71.4	67.0	43.2	62.4	58.0	21.9	61.5	29.0
SE36A-TTT	22.5	6.0	8.25	8.25	51.6	61.6	68.7	53.9	55.9	59.5	27.2	27.2	29.8
SE36A-BBB	21.6	6.0	7.8	7.8	59.6	59.6	65.0	52.2	52.2	56.3	26.4	26.4	28.1
SE36A-TTB	21.8	6.0	10.5	5.3	71.4	49.2	67.0	62.4	43.2	58.0	31.5	21.9	29.0
SE36A-TTH	21.9	6.0	10.5	5.3	49.2	72.0	67.4	43.2	32.8	58.3	21.9	31.6	29.2
Std Oven Models	Total kW	3 Phase Loading kW per Phase			208V			240V			480V		
		X-Y	Y-Z	X-Z	X	Y	Z	X	Y	Z	X	Y	Z
SE36D-HHH	21.9	6.0	10.6	5.3	47.1	70.0	67.4	40.8	60.7	58.4	20.4	30.3	29.2
SE36D-HHB	21.8	6.0	10.5	5.3	47.1	69.5	66.9	40.8	60.3	58.0	20.4	30.1	29.0
SE36D-TTT	22.5	6.0	8.25	8.25	59.6	59.6	68.7	51.5	51.6	59.5	25.8	25.8	29.9
SE36D-BBB	21.6	6.0	7.8	7.8	57.6	57.6	64.9	49.9	49.9	56.3	25.0	25.0	28.1
SE36D-TTB	21.8	6.0	10.5	5.3	47.1	69.5	67.0	40.8	60.3	58.0	20.4	30.1	29.0
SE36D-TTH	21.9	6.0	10.6	5.3	47.1	70.0	67.4	40.8	60.7	58.4	20.4	330.3	29.2

*See TVES/10SC spec sheet for TruVection oven information.

INTENDED FOR COMMERCIAL USE ONLY.
NOT FOR HOUSEHOLD USE.





CONVECTION OVEN SL - SERIES ELECTRIC, DOUBLE DECK



SLES/20SC shown with optional casters

- SLES/20SC
- SLES/20CCH
- SLEB/20SC
- SLEB/20CCH

Standard Features

- Energy Star Compliant (Standard depth)
- 11 kW high efficiency heating elements
- Available standard and bakery depths
- Double deck convection oven is 64.8" in height
- Patented "plug-in, plug-out" control panel - easy to service
- Slide out control panel for full view servicing
- Stainless Steel front, top and sides
- Dependent glass doors (Full 180° opening)
- Energy saving high efficiency glass windows
- Heat keeping dual door seal system
- Coved, fastener-free, porcelain interior
- Stay cool heavy duty door handle
- Two speed, 1/2 hp, fan motor
- 11-position rack guides and 5 plated oven racks
- Solid state temperature controls
- Forced cool down fan mode
- Oven "heat" light cycles with burners
- Interior oven lights
- (1) year limited parts and labor warranty
(reference <http://www.southbendnc.com/service.html> for limited warranty details)

Available Controls

SC-Standard Controls

- 140°F to 500°F solid state thermostat and 60 minute mechanical cook timer.

CCH-Cycle / Cook & Hold Control

150°F to 550°F temperature controller with 140°F to 200°F "Hold" thermostat dual digital display shows time and temperature. A fan cycle timer pulses the fan.

OPTIONS & ACCESSORIES AT ADDITIONAL COST

- | | | |
|---|---|--|
| <input type="checkbox"/> List the voltage, frequency, and amps (see utility information).
____ VAC, ____ Phase, ____ Hz. | <input type="checkbox"/> Stainless steel exterior bottom | <input type="checkbox"/> Down draft diverter for direct flue |
| <input type="checkbox"/> Stainless steel rear jacket | <input type="checkbox"/> Casters 4" or 6" | <input type="checkbox"/> Export crating |
| | <input type="checkbox"/> Stainless steel dirt tray | <input type="checkbox"/> Marine edge top |
| | <input type="checkbox"/> Swivel Caster - front with locks | <input type="checkbox"/> Stainless steel doors |

STANDARD CONSTRUCTION SPECIFICATIONS

Exterior Finish: Stainless steel front, top and sides.

Doors: Dependent doors with windows. Low emission glass, stainless steel construction, heavy-duty welded steel frame and 5/8" diameter full-length hinge pin.

Oven Interior: Porcelain enamel finish, coved, fastener free.

Rack and Rack Guides: Heavy-duty removable wire rack guides spaced on 1-5/8" centers offer 11 different rack positions. 5 wire racks provided with each oven.

Blower Fan and Motor: 1/2hp, 2-speed motor, 1710/1120

Oven Heating: Oven heating is regulated by an adjustable solid state thermostat control. Blower fan circulates air within the cavity "scrubbing" heat to the oven interior for even heat distribution within the cavity. Manual reset high limit temperature control protects the oven from overheat condition.

Control Panel: Located on front, at right side of oven, away from heat zone. Slide out panel extends over 17" for easy servicing.

Interior Lights: Two 40 watt high temperature recessed lamps located within the oven cavity.

Legs: 6" stainless steel legs standard.

Electrical System: Terminal connections are located below oven section and are accessible from the front of the oven. These sheath type electrical heating elements located at the rear of the oven function as a single heating unit with a combined rating of 11 kW per deck. Available voltages include 208, 240, 380, and 480 VAC single or three phase, 50/60 Hz. Ovens equipped with 480VAC single or three phase heating elements use 240V controls and motors and do not require separate electrical lead wires.



Approval Notes: _____

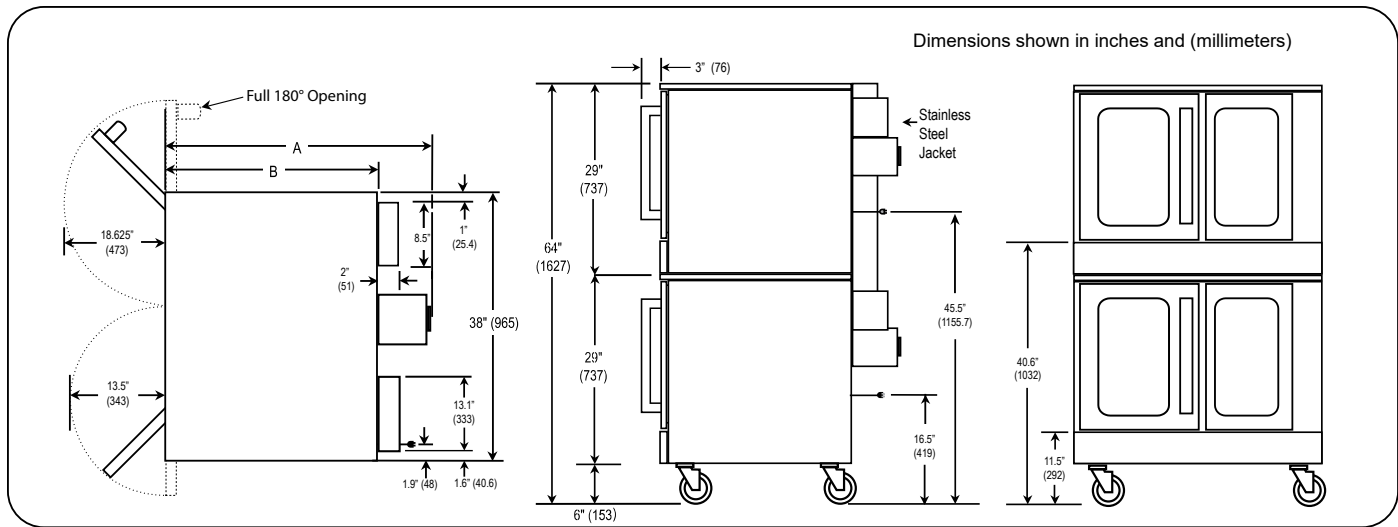
Models: SLES/20SC

SLES/20CCH

SLEB/20SC

SLEB/20CCH

SLE20



DIMENSIONS

MODEL	DEPTH		OVEN INTERIOR			RACK CLEARANCE		SHIPPING CRATE				
	A	B	WIDTH	DEPTH	HEIGHT	WIDTH	DEPTH	WIDTH	DEPTH	HEIGHT	VOLUME	WEIGHT
SLES/20	37.25" (946)	30.25" (768)	29" (737)	21.50" (546)	20" (508)	28.25" (718)	21" (533)	57.50" (1461)	45.5" (1156)	81.5" (2070)	123.4 cu. ft. (3.49 cu. m.)	1040 lbs (471.7 kg.)
SLEB/20	43.50" (1116)	36.50" (927)	29" (737)	29" (737)	20" (508)	28.25" (718)	27.25" (692)	57.50" (1397)	45.5" (1156)	81.5" (2070)	123.4 cu. ft. (3.49 cu. m.)	1180 lbs (535.2 kg.)

Dimensions shown in inches and (millimeters)

UTILITY INFORMATION

Standard: 1/2 horsepower, 2 speed motor, 1710/1120 r. p. m.

EACH OVEN	ELECTRICAL DATA		AMPS PER LINE			
	VOLTAGE	1 PHASE	3 PHASE			
			X	Y	Z	NEUT.
12 kW Heating Elements and Controls (11kW for Heating Elements, 1kW for Controls)	208 VAC, 60Hz	58	34	34	31	0
	220/240 VAC, 50Hz	46	28	28	24	0
	240 VAC, 60Hz	50	30	30	26	0
	380/220 VAC, 50Hz	32	17	17	21	4
	415/240 VAC, 50Hz	50	15	15	19	4
	480 VAC, 60Hz	25	14	14	13	0

* Electric units available for single or three phase operation and must be specified upon ordering.

MISCELLANEOUS

- Clearances from combustibles: Top, bottom, right, left side -0".
- Recommended - install under vented hood.
- Check local codes for fire and sanitary regulations.

NOTICE:

Southbend has a policy of continuous product research and improvement. We reserve the right to change specifications and product design without notice. Such revisions do not entitle the buyer to corresponding changes, improvements, additions or replacements for previously purchased equipment.

**INTENDED FOR COMMERCIAL USE ONLY.
NOT FOR HOUSEHOLD USE.**





Item # _____

Job _____

SUPER ERECTA SHELF® WIRE SHELVING

- **Unique Design:** The open wire design of these heavy-gauge carbon-steel or stainless steel shelves minimizes dust accumulation and allows a free circulation of air, greater visibility of stored items and greater light penetration.
- **Versatile Construction:** Super Erecta Shelf® wire shelving can change as quickly as your needs change. By using various accessories, hundreds of shelving configurations become possible.
- **Fast, Secure Assembly:** SiteSelect™ Posts with the double-groove visual guide feature, have circular grooves at 1" (25mm) intervals and are numbered at 2" (50mm) intervals. A patented, tapered split sleeve (plastic or aluminum) snaps together around each post. Tapered openings in the shelf corners slide over the tapered split sleeves providing a positive lock. Shelf is assembled in minutes without the use of any special tools.
- **Shelf Ribs:** Run front to back, allowing you to slide items on and off shelves smoothly.
- **Shelf Accessibility:** Shelves can be loaded/unloaded easily from all sides. This open construction allows use of maximum storage space of cube.
- **Adjustability:** Shelves can be adjusted at 1" (25mm) intervals along the entire length of the post.
- **Durable:** Super Erecta Shelf® wire shelving is available in four options: Super Erecta Brite™, chrome-plated, stainless steel and Metroseal™.
- **Adjustable Feet:** Bolt levelers compensate for surface irregularities.



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North Washington Street
Wilkes-Barre, PA 18705
www.metro.com

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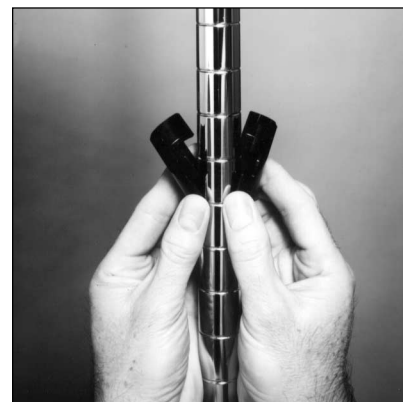
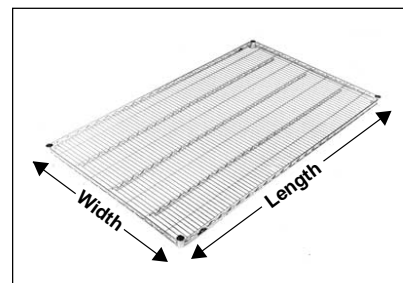
Job _____

SUPER ERECTA SHELF® WIRE SHELVING



Wire Shelves

Width		Length		Approx. Pkd. Wt.		Cat. No.	Cat. No.	Cat. No.
(in.)	(mm)	(in.)	(mm)	(lbs.)	(kg)	Super Erecta Brite	Chrome	Stainless
14	355	24	610	6	2.7	1424BR	1424NC	1424NS
14	355	30	760	7	3.2	1430BR	1430NC	1430NS
14	355	36	910	8	3.6	1436BR	1436NC	1436NS
14	355	42	1060	9½	4.3	1442BR	1442NC	1442NS
14	355	48	1220	10½	4.7	1448BR	1448NC	1448NS
14	355	60	1525	14	6.3	1460BR	1460NC	1460NS
14	355	72	1825	17	7.7	1472BR	1472NC	1472NS
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18	455	24	610	7	3.2	1824BR	1824NC	1824NS
18	455	30	760	8	3.6	1830BR	1830NC	1830NS
18	455	36	910	9½	4.3	1836BR	1836NC	1836NS
18	455	42	1060	11	5.0	1842BR	1842NC	1842NS
18	455	48	1220	12	5.4	1848BR	1848NC	1848NS
18	455	54	1370	14½	6.6	1854BR	1854NC	1854NS
18	455	60	1525	17	7.7	1860BR	1860NC	1860NS
18	455	72	1825	20	9.1	1872BR	1872NC	1872NS
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21	530	24	610	8	3.6	2124BR	2124NC	2124NS
21	530	30	760	9	4.1	2130BR	2130NC	2130NS
21	530	36	910	11	5.0	2136BR	2136NC	2136NS
21	530	42	1060	12	5.4	2142BR	2142NC	2142NS
21	530	48	1220	14	6.4	2148BR	2148NC	2148NS
21	530	54	1370	16	7.6	2154BR	2154NC	2154NS
21	530	60	1525	18	8.2	2160BR	2160NC	2160NS
21	530	72	1825	24	10.9	2172BR	2172NC	2172NS
<hr/>								
24	610	24	610	9	4.1	2424BR	2424NC	2424NS
24	610	30	760	11	5.0	2430BR	2430NC	2430NS
24	610	36	910	13	5.9	2436BR	2436NC	2436NS
24	610	42	1060	15	6.8	2442BR	2442NC	2442NS
24	610	48	1220	16	7.3	2448BR	2448NC	2448NS
24	610	54	1370	18	8.6	2454BR	2454NC	2454NS
24	610	60	1525	21	9.5	2460BR	2460NC	2460NS
24	610	72	1825	26	11.8	2472BR	2472NC	2472NS



NOTE:For Metroseal shelving information see sheet No. 10.10.
SUPER ERECTA SHELF meets U.S. Government Specifications MIL-S-40144E.
PLATED SHELVING has clear protective coating.

“S” Hooks

Used to “add-on” shelving units with only two posts required.

Cat. No. 9995Z



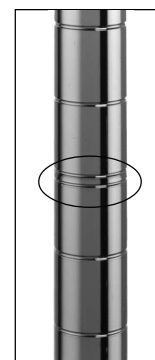
SiteSelect™ Posts

Height* (in.)	Height* (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)	Cat. No. Chrome	Cat. No. Stainless
7 ⁵ / ₈	194	½	0.23	7P	—
14 ¹ / ₂	370	1	0.5	13P	13PS
27 ¹ / ₂	700	1¾	0.75	27P	27PS
34 ¹ / ₂	877	2	0.9	33P	33PS
54 ⁹ / ₁₆	1386	3	1.4	54P	54PS
62 ⁹ / ₁₆	1589	3½	1.6	63P	63PS
74 ⁵ / ₈	1895	4	1.8	74P	74PS
86 ⁵ / ₈	2200	5	2.3	86P	86PS
96 ⁵ / ₈	2454	5½	2.3	**96P	—

* Height includes leveling bolt and cap.
 ** 96P should not be used on units less than 24" (610mm) deep.
 *** Post lengths to be specified as cut to a round number, ie: 74P cut to 69"... This will result in an overall post height with adjustment of 96⁵/₈ to 69⁵/₈.

SiteSelect™ Posts

Posts are grooved at 1" (25mm) increments and numbered at 2" (50mm) increments. Posts are double-grooved every 8" (203mm) for easy identification.



IMPORTANT: When ordering by components remember that stability decreases as the ratio of height to width increases. Units should be kept as wide and low as possible. With 14" shelving, foot plates should be used and secured to the floor on free-standing units; on mobile units, maximum post height is 54".

Manufactured by:



InterMetro Industries Corporation

North Washington Street, Wilkes-Barre, PA 18705
 Phone: 570-825-2741 • Fax: 570-825-2852
 For Product Information Call: 1-800-433-2232
 Visit Our Web Site: www.metro.com

L02-006
 Rev. 11/00
 Printed in U.S.A.

Information and specifications are subject to change without notice. Please confirm at time of order.

10.01

SUPER ERECTA SHELF®
Wire Shelving



Amana® Commercial

Project #: _____

Item #: _____



Low Volume

Amana® Commercial Microwave RMS Series

Power Output

- 1000 watts of power
- Perfect replacement for inappropriate domestic ovens used in foodservice applications

Available with Touch or Dial Controls

- **Touch controls:**
 - 20 programmable menu items simplifies cooking
 - 5 power levels and 4 cooking stages for cooking flexibility
 - Multiple quantity pad calculates the proper cooking times for multiple portions
- **Dial Controls:**
 - Timer automatically resets to zero if door is opened during heating
 - 6 minute digital timer lights up for "at-a-glance" monitoring
 - Full power only for simple operation

Easy to Use

- See-through door and lighted interior for monitoring without opening the door
- 0.8 cubic foot (23 liter) capacity accommodates a 12" (305mm) platter, prepackaged foods and single servings

Certified Oven for Commercial Applications

- Tested to higher standards for a commercial rating —required by most commercial insurance policies and health inspectors
- Interlock safety switch is tested to 4 times the standard of residential ovens
- Constructed to withstand the foodservice environment, multiple users and variable ambient temperatures
- Compared to a residential oven, this oven is more powerful for faster heating and better quality results
- Engineered for a simple, "self-service" operation

Easy to Maintain

- Stainless steel exterior wrap, door, and oven interior for increased durability
- Sealed-in Borosilicate Glass shelf for easy cleaning

Value Line | Low Volume
This category of microwave oven is ideal for...

Applications

- Convenience Stores
- Coffee shops
- Dessert stations
- Teachers/Staff lounge
- Nurses stations
- Vending

Boost heats and re-therms foods in seconds

- Slice of apple pie re-therms in 20 seconds
- 9 oz. (255g) cup of chili re-therms in 1:45

All ACP, Inc. commercial ovens are supported by our Culinary Center. Do not hesitate to contact us for any questions regarding food preparation, menu development and cooking times: testkitchen@acpsolutions.com



Service

All products are backed by the ACP, Inc.
24/7 ComServ Support Center

Warranty

Warranty Certificate for this product can be found on the ACP, Inc. website at www.acpsolutions.com/warranty

Safety and Sanitation

This ACP, Inc. product meets and exceeds safety and sanitation standards set for commercial microwave ovens by UL, ETL, NSF, CSA, and FDA.



866-426-2621

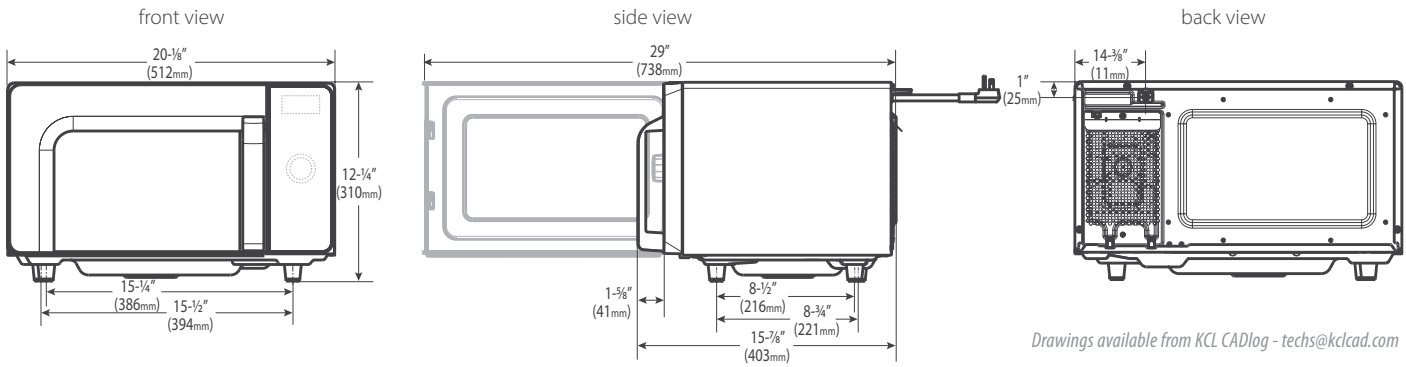


AIA File #:

Specification #:



Amana® Commercial Microwave RMS Series | Low Volume



Dimensions

Exterior	H 12 1/4" (310)	W 20 1/8" (512)	D+ 15 7/8" (403)
Cavity	H 7 3/4" (197)	W 13" (330)	D 13" (330)
Usable Cavity Space	0.8 cubic ft. (23 liter)		
Door Depth	29" (738), 90°+ door open		
Installation Clearances	Top: 7" (177.8)	Sides: 1" (25)	Back: None
Shipping Carton	H 15" (381)	W 23" (584)	D 18" (457)
Weight			
Product Weight	Ship weight (approx.)	UPS Shippable	
30 lbs. (13.6 kg.)	37 lbs. (16.8 kg.)	Yes	

Features

	Touch Models (TS)	Dial Models (DS)
Configuration	Countertop	Countertop
Stackable	No	No
Display	LED	Lighted Dial
Control System	Touchpad	Dial
Programmable Control	Yes, 10 pads	No
Braille	Overlay available	No
Settings Programmable	20	-
Max. Cooking Time	30:00	6:00
Microwave Distribution	Rotating stirrer, bottom	Rotating stirrer, bottom
Power Levels	5	1
Defrost	Yes, 20% power	No
Time Entry Option	Yes	Yes
Multiple Portion Setting	Yes, X2	No
Stage Cooking	4 stages	1 stage
Interior Light	Yes, LED, 42lm	Yes, LED, 42lm
Automatic Voltage Sensor	No	No
Air Filter	No	No
Signal	End of cycle, adjustable	End of cycle
Door Handle	Grab & Go	Grab & Go
Exterior Finish	Stainless steel	Stainless steel
Interior Finish	Stainless steel	Stainless steel

Optional Accessories

- Oven cavity shelf (SE10)
- Non-stick baskets (TB10/S, SB10/S, MB10/S)
- Stainless cart/equipment stands: (CA24, CA30)

Measurements are US Standard. Measurements in () are in millimeters

* IEC 60705 Tested

† Includes handle

Electrical Configuration

Region	Model#/UPC	Control System	Power Consumption	Power Output (microwave)	Power Source	Plug Configuration	Cord Length	Frequency	Magnetron
North America single phase	RMS10TSA 728028470208	Touch	1500 W, 13A	1000 W*	120 V, 60 Hz, 15 A, single phase	NEMA 5-15	5 ft. (1.5m)	2450MHz	1
North America single phase	RMS10DSA 728028470239	Dial	1500 W, 13A	1000 W*	120 V, 60 Hz, 15 A, single phase	NEMA 5-15	5 ft. (1.5m)	2450MHz	1

Specification #:

AIA File #:



225 49th Ave. Dr. SW, Cedar Rapids, IA 52404 U.S.A.
800-233-2366 • 319-368-8120 • Fax: 319-368-8198
www.acpsolutions.com

Part No. 20271101

Updated 06/07/2019

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an Ali Group Company



The Spirit of Excellence

RMS Series

VALUE LINE



RMS10TSA- 1000 Watts, Touch pad controls
 RMS10DSA- 1000 Watts, Dial controls

FEATURES AND BENEFITS

- 1000 watts of cooking power
 - Efficient reheating/defrosting reduces food waste
- 0.8 cubic ft. (23 L) oven capacity
 - Accommodates a 12" (305 mm) platter
- Motor driven bottom antenna system
 - Efficient energy distribution for reliable heating results

TOUCH CONTROL MODELS

- 20 programmable menu items
- 4 cooking stages
- 5 power levels

DIAL CONTROL MODELS

- 6:00 light up dial timer
- 100% power only
- Auto reset to zero when cooking is interrupted

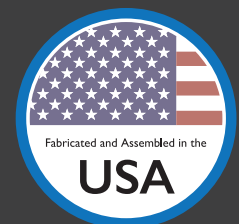


Reliable, long lasting Grab 'n Go handle with no moving parts

Available with touch pad or dial controls

IDEAL APPLICATIONS

- Convenience stores
- Dessert stations
- Nurses stations
- Coffee shops
- Teacher's lounge



BOOST HEATS AND RE-THERMS IN SECONDS!

- Slice of apple pie re-therms in 20 seconds
- 9 oz. (255 g) cup of chili re-therms in 1:45

Amana Commercial

ACP, Inc. | www.acpsolutions.com | 1-800-233-2366

13



Profit from the Eagle Advantage®

Specification Sheet

Short Form Specifications

Eagle Physically Challenged Hand Sink, model HSAP-14-FW. Constructed of type 304 stainless steel with 16" x 14" x 5" deep sink bowl, basket drain, inverted "V" edge to prevent spillage, and deck mounted gooseneck faucet with wrist handles.

Eagle Physically Challenged ADA Hand Sink, model _____ . Constructed of type 304 stainless steel all welded with fabricated sink bowl, drain, front loading C-fold paper towel dispenser, deck-mounted soap dispenser, stainless steel skirt, and splash-mounted faucet. #HSAP-14-ADA-FE-B features battery-powered electronic-eye faucet with low battery indicator light. #HSAP-14-ADA-FW features faucet with wrist handles (#313305), shipped with unit but not installed by Eagle.



#HSAP-14-ADA-FE-B



#HSAP-14-FW



#HSAP-14-ADA-FW

Options / Accessories

- P-trap* Temperature adjustment valve**
 Tail piece* Side splashes***
 Anti-scald valve**

* for #HSAP-14-FW sink

** for #HSAP-14-ADA-FE-B sink

*** for #HSAP-14-ADA-FE-B and HSAP-14-ADA-FW sinks

EAGLE GROUP

100 Industrial Boulevard, Clayton, DE 19938-8903 USA

Phone: 302-653-3000 • Fax: 302-653-2065

www.eaglegrp.com

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For custom configuration or fabrication needs, contact our SpecFAB® Division.

Phone: 302-653-3000 • Fax: 302-653-2065 • e-mail: quotes@eaglegrp.com

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Item No.: _____
 Project No.: _____
 S.I.S. No.: _____

Physically Challenged Hand Sinks

MODELS:

- HSAP-14-FW
 HSAP-14-ADA-FE-B
 HSAP-14-ADA-FW

Model #HSAP-14-FW

- 16 gauge type 304 stainless steel all-welded construction.
- 16" x 14" x 5" (406 x 356 x 127mm) bowl with generous ¾" (16mm) radius.
- Inverted "V" edge rim design to retard deck spillage.
- Deck mounting faucet comes standard with wrist handles.
- Standard wall brackets for added strength and stability.
- Water inlet: ½" (13mm) NPS.
- Drain outlet: 1½" (38mm) NPS.

"ADA" Hand Sinks

- 16 gauge type 304 stainless steel construction.
- 16" x 14" x 5" (406 x 356 x 127mm) sink bowl with 1½" (38mm) stainless steel basket drain.
- Deck mounted 16 oz. soap dispenser with chrome valve.
- C-fold paper towel dispenser, 4" x 10" (102 x 254mm).
- Heavy gauge type 304 stainless steel skirt assembly with accessibility from bottom to change faucet batteries.
- Marine edge on front and sides to retard spillage.
- Chrome-plated p-trap.
- Includes stainless steel "Z" bracket for mounting to wall.
- Water inlet: ½" (13mm) NPS.
- Drain outlet: 1½" (38mm) NPS.
- #HSAP-14-ADA-FE-B features battery-powered electronic-eye faucet with low battery indicator light.
- #HSAP-14-ADA-FW features #313305 faucet with wrist handles. Faucet shipped with unit, but not installed.

Certifications / Approvals



AUTOQUOTES

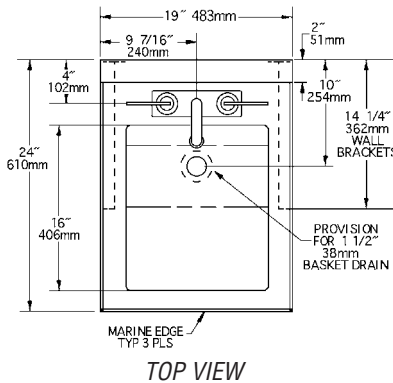




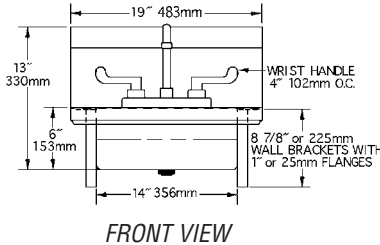
Profit from the Eagle Advantage®

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 Project No.: _____
 S.I.S. No.: _____

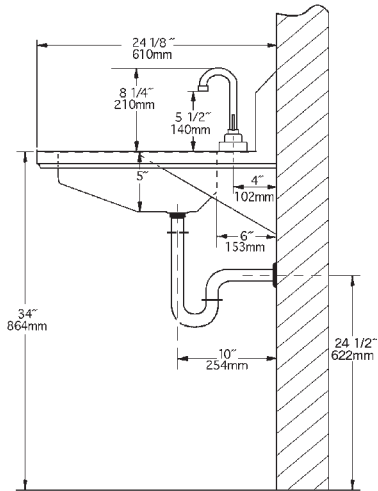
Model #HSAP-14-FW



TOP VIEW

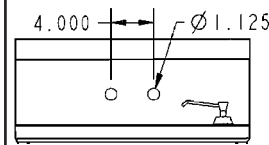


FRONT VIEW

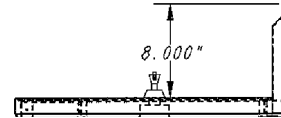


SIDE VIEW

Model #HSAP-14-ADA-FW



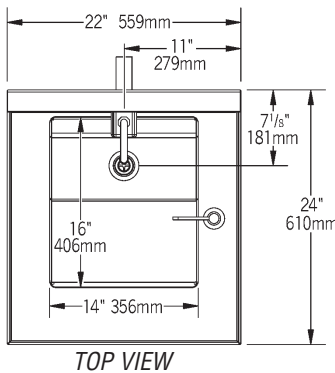
FRONT VIEW



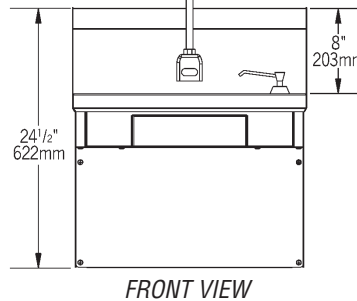
SIDE VIEW

(note: faucet set aside for field installation)

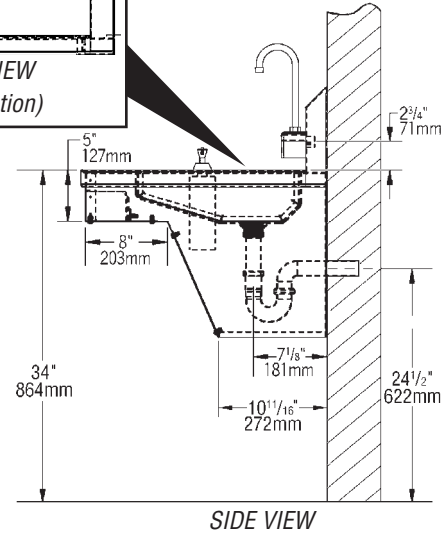
Model #HSAP-14-ADA-FE-B



TOP VIEW



FRONT VIEW



SIDE VIEW

model #	includes	bowl size		overall size		weight	
		width in.	length x depth mm	width in.	length x height mm	lbs.	kg
HSAP-14-FW	faucet, basket drain, wall brackets	16"	406 x 356 x 127	24 7/8"	613 x 483 x 419	26	11.8
HSAP-14-ADA-FE-B	battery-powered electronic-eye splash mount faucet, C-fold towel disp. in front, deck mount soap dispenser, skirt, basket drain	16"	406 x 356 x 127	24" x 22" x 24 1/2"	610 x 559 x 622	65	29.5
HSAP-14-ADA-FW	splash mount faucet with wrist handles, C-fold towel disp. in front, deck mount soap dispenser, skirt, basket drain	16"	406 x 356 x 127	24" x 22" x 24 1/2"	610 x 559 x 622	55	24.9

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Profit from the Eagle Advantage®

Specification Sheet



model #318496
towel dispenser



model #DP-10
towel dispenser



soap dispenser
with electric eye



conventional
soap dispenser



hand
sanitizing
dispenser



polymer rotary drain



waste
receptacle



p-trap



tail
piece

Hand Sink Accessories & Options —Miscellaneous

TOWEL/SOAP DISPENSERS

model #	description
DP-10*	towel dispenser with conventional soap dispenser
DP-20*	towel dispenser with electric-eye soap dispenser
318496	towel dispenser, type 304 stainless steel
377454	touchless, break-resistant plastic, wall mounted

*Fits all HSA hand sinks except Space Saver models

SOAP DISPENSERS

model #	description
300602	soap dispenser, conventional, 12-oz.
377456	soap dispenser, wall mounted with electric-eye
324074	soap dispenser, deck mounted, 16-oz.

HAND SANITIZING DISPENSER

model #	description
377455	Purell/LTX, wall mounted

DRAINS

model #	description	MAXIMUM FLOW RATE	
		gallons per minute	gallons per hour
319931	polymer rotary drain fits 3.5" (89mm)-diameter hole	11	660
319932	overflow assembly for #319931 drain (above)	-	-
300886	1.5" (38mm) drain assembly, fits 2" (51mm)-diameter hole	12	720
300966	mini crumb cup for 1.5" (38mm) drain	-	-
300287	crumb cup stainer assembly cast metal lever drain with overflow assembly, with 7.25" (185mm)-long lever, fits 3.5" (89mm)-diameter hole	18	1080
347771	cast metal lever drain with overflow assembly, with 7.25" (185mm)-long lever, fits 3.5" (89mm)-diameter hole	-	-

PLUMBING COMPONENTS

model #	description
300791	tail piece
300789	p-trap

WASTE RECEPTACLE

20 gauge stainless steel. Removable. Comes with skirt. Must be factory installed.

add suffix # for models:

-T*	HSA-10; HSA-10-F; HSA-10-FA; HSA-10-FDP; HSA-10-FE; HSA-10-FDPE; HSA-10-FDPEE; and HSA-10-FW
-----	--

* Example: HSA-10-FDP-T

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EG20.52B Rev. 07/17



Profit from the Eagle Advantage®



hand sink with hot water heater



hand sink with optional end splash



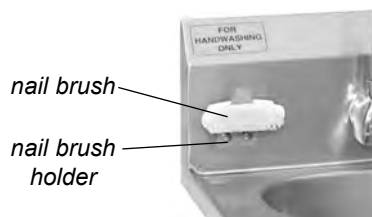
pair of end splashes for field installation



wall brackets



skirt assembly



nail brush

nail brush holder



hand sink with electropolished finish

Item No.: _____
 Project No.: _____
 S.I.S. No.: _____

HOT WATER HEATER

For Eagle hand sinks with 10" x 14" x 6" (254 x 356 x 152mm) rounded sink bowl. Energy-efficient self-contained tankless hot water heater by Eemax™. 120V, 29A. 0.5 gallons per minute, with 48° temperature rise. Maximum 150 PSI operating pressure (25 PSI min.). Flow switch activates heater only on demand—no stand-by heat loss. 3/8" compression fittings. Includes type 304 stainless steel pedestal base, which features notch for water heater electrical wiring and front access panel. No T&P relief valve needed (check local codes), reducing installation cost.

Note: Field wiring required.

add suffix # applicable models

-WH *	HSA-10; HSA-10-F; HSA-10-FA; HSA-10-FDP; HSA-10-FE; HSA-10-FDPE; HSA-10-FDPEE; HSA-10-FW; HSA-10-FA-P and HSAD-10-F
-------	---

*Example: HSA-10-FDPEE-WH

END SPLASHES

Type 304 stainless steel. *Note:* Will not work with Space Saver Hand Sinks that have faucets with wrist handles.

Note: MICROGARD® cannot be put on hand sinks with end splashes.

FACTORY-INSTALLED

add suffix # description

-LS *	left end splash only
-------	----------------------

-RS *	right end splash only
-------	-----------------------

-LRS *	left and right end splash
--------	---------------------------

* Example: HSA-10-F-LRS

FOR FIELD INSTALLATION

model # description

HSA-SSK	one self-adhesive side splash, can be used for right or left application
---------	--

HSAP-SSK	same as above, but fits only on Physically Challenged Hand Sinks
----------	--

WALL BRACKETS

model # description

606396	side mounting, one pair, does not fit Space Saver models
--------	--

611869	side mounting, one pair, for Space Saver models only
--------	--

SKIRT ASSEMBLIES

model # fits models

606215	HSA-10; HSA-10-F; HSA-10-FA; HSA-10-FDP; HSA-10-FE; HSA-10-FDPE; HSA-10-FDPEE; and HSA-10-FW
--------	--

607560	HSAN-10-F
--------	-----------

NAIL BRUSH AND NAIL BRUSH HOLDER

add suffix # * description

-NB *	Infectious-control nail brush made of FDO-approved material, with stainless steel splash mount holder
-------	---

* Example: HSA-10-F-NB

ELECTROPOLISHED FINISH

For material handling applications.

add suffix # * description

-EP *	Increases corrosion resistance, deburring, reduces product adhesion. Easier cleaning, Attractive appearance.
-------	--

* Example: HSA-10-F-EP

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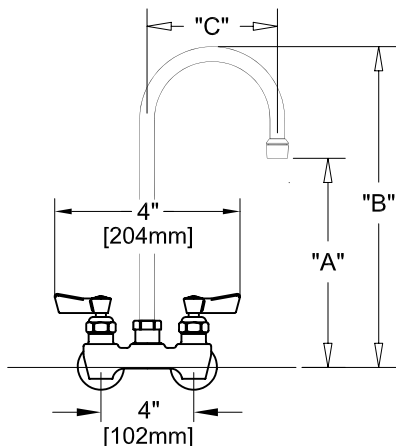
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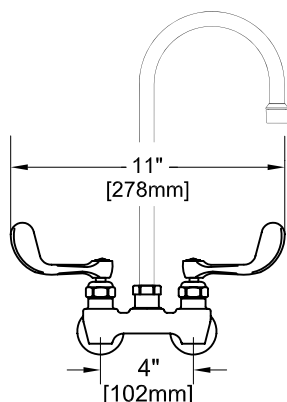
Rev. 07/17

SPEC. 62642

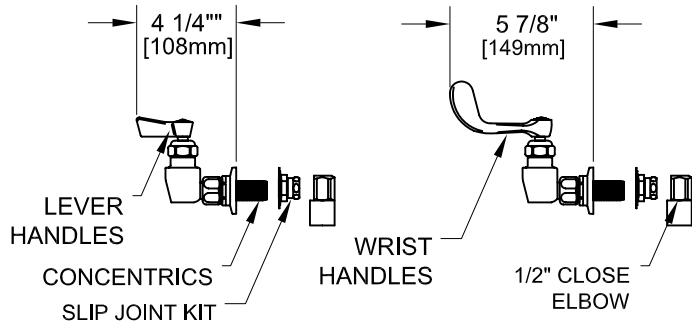
4" BACKSPLASH FAUCET W/ LEVER HANDLES



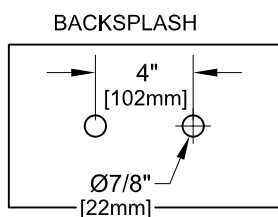
4" BACKSPLASH FAUCET W/ WRIST HANDLES



4" C/C BACKSPLASH FAUCET



ROUGH-IN:



ANSI/A112.18.1-2005

PRODUCT NAME:

STAINLESS STEEL 4" BACKSPLASH FAUCET WITH SWIVEL / RIGID GOOSENECK SPOUT WITH ELBOWS

MODEL:

- 62642 W/ 6" SWIVEL/RIGID GOOSENECK SPOUT W/ LEVER HANDLES
- 62480 W/ 12" SWIVEL/RIGID GOOSENECK SPOUT W/ LEVER HANDLES
- 62650 W/ 6" SWIVEL/RIGID GOOSENECK SPOUT W/ WRIST HANDLES
- 62499 W/ 12" SWIVEL/RIGID GOOSENECK SPOUT W/ WRIST HANDLES

FEATURES

CONTROL VALVE

- * 4" C/C BACKSPLASH MOUNT
- * CONCENTRICS
- * STAINLESS STEEL CONSTRUCTION
- * SWIVELLING SEAT DISKS
- * HOT SIDE STEM - RIGHT HAND
- * COLD SIDE STEM - LEFT HAND
- * LEVER HANDLES OR WRIST HANDLES
- * 1/2" CLOSE ELBOWS
- * GOOSENECK SPOUT

SYSTEM LIMITS

- * TEMP: 40°F MIN. TO 140°F MAX.

SHIPPING WEIGHT

- * 5.0 LBS

* NSF 61-9 APPROVED & LISTED

www.truesdail.com

MODELS	DIM "A"	DIM "B"	DIM "C"
62642	4-1/2"	8-1/16"	3-1/2"
62650	[114.3mm]	[204.8mm]	[88.90mm]
62480	8-1/4"	12-1/4"	5-1/2"
62499	[209.6mm]	[311.2mm]	[139.7mm]

FISHER

FISHER MANUFACTURING COMPANY

TOLL FREE: 800-421-6162 - FAX: 800-832-8238

information@fisher-mfg.com - www.fisher-mfg.com



Item # _____

Quantity _____

Stainless Steel Utility Carts

Heavy Duty - 700 Lb Capacity



Model 744

Models

710, 711, 721, 722, 743, 744, 758, 759
510, 511, 521, 522, 543, 544, 558, 559

“U” Shaped Angled Frame Provides The Strength Needed For Heavy-duty Jobs

- 700 lb. (300 kg) capacity is ideal for continuous moving of heavy loads over various standard floor surfaces
- Rugged 18 gauge reinforced stainless steel shelves are stain and rust resistant. Electronically welded for added strength.
- Easy to clean and sanitize, simply wipe down or steam clean
- Leg and handle bumpers protect walls and furniture
- NSF listed models available

Specifications

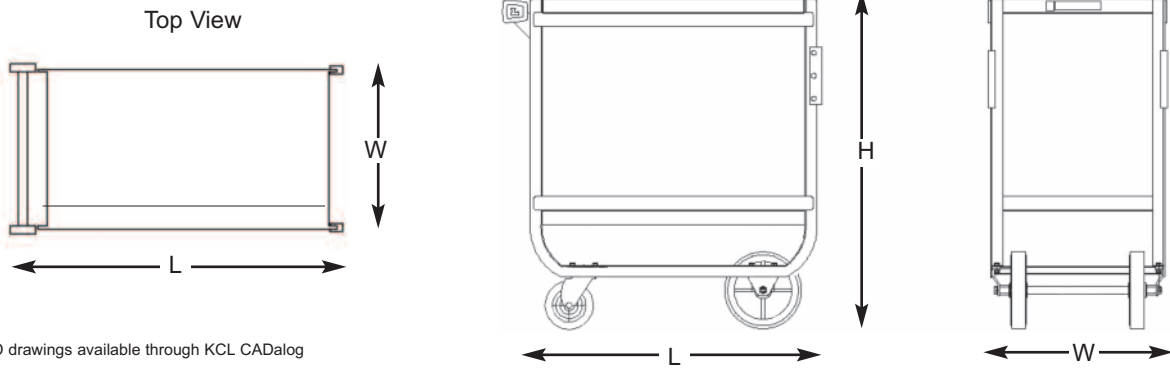
Unit shall be of fully welded stainless steel construction. Legs and frame shall be of U-frame design, eliminating the need for corner reinforcements. Leg/frame shall be .120 x 1" x 1" angle stainless steel. Shelves shall be of 18-gauge stainless steel and shall be welded to vertical leg frames. Shelves shall be double hemmed on all four edges for extra rigidity. Unit shall have two each 5" (127 mm) diameter extra-load swivel casters with 1-1/4" (32 mm) wide non-marking polyurethane wheels, and two each 8" diameter extra-load wheels mounted to a fixed axle. Swivel casters shall be plate type and shall be bolted to an 18-gauge 5" (127 mm) wide stainless steel cross member with a galvanized reinforcement. Unit shall have push handle made of 18 gauge 1" O.D. stainless steel tubing. Handle mounting brackets shall be welded to vertical leg frame. Unit shall have two each bumpers mounted to handle ends and two each 6" (152 mm) vertical bumpers riveted to front legs.

Lakeside Manufacturing, Inc.

4900 West Electric Avenue • West Milwaukee, WI 53219 U.S.A.
800-558-8565 • 414-902-6400 • Fax 414-902-6446 • info@eLakeside.com • www.eLakesideFoodservice.com

Stainless Steel Utility Carts

Heavy Duty - 700 Lb Capacity



AutoCAD drawings available through KCL CADalog

Model Information

Model	NSF Model	# of	Shelf Description		Overall Size			Case Weight	
			Size	Clearance	L	W	H	lbs.	(kg.)
710	510	2	15-1/2" x 24" (394 x 610)	19" (483)	30" (762)	16-1/4" (413)	34-1/4" (870)	49	(22.2)
711	511	3	15-1/2" x 24" (394 x 610)	10" (254)	30" (762)	16-1/4" (413)	34-1/4" (870)	57	(25.9)
721	521	2	18" x 27" (457 x 686)	19" (483)	32-5/8" (829)	19-3/8" (492)	34-1/2" (876)	53	(24)
722	522	3	18" x 27" (457 x 686)	10" (254)	32-5/8" (829)	19-3/8" (492)	34-1/2" (876)	63	(28.6)
743	543	2	21" x 33" (533 x 838)	21" (533)	38-5/8" (981)	22-3/8" (568)	37-1/8" (943)	64	(29)
744	544	3	21" x 33" (533 x 838)	11-3/8" (289)	38-5/8" (981)	22-3/8" (568)	37-1/8" (943)	78	(35.4)
758	558	2	21" x 49" (533 x 1245)	21" (533)	54-5/8" (1387)	22-3/8" (568)	37" (940)	87	(39.5)
759	559	3	21" x 49" (533 x 1245)	11-3/8" (289)	54-5/8" (1387)	22-3/8" (568)	37" (940)	108	(49)

Measurements in () denote metric millimeters, unless otherwise specified.

Optional Accessories

- Extended perimeter bumper
- All 5" swivel casters
- Set of 2 ea. 5" brake casters



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3 HEAVY DUTY
700 LBS | 320 KG

TRADITIONAL UTILITY CARTS | STAINLESS STEEL

Navigating large loads over long distances is a breeze for this heavy-duty version of Lakeside's classic cart.

- Larger 8" (203) front wheels allow cart to transition over uneven surfaces with ease
- Fixed front wheels help guide cart in a straight line, while making it easier to navigate corners
- Angled "U"-shaped frame design provides superior structural strength for larger loads
- All-welded construction for a stronger structure and easier to clean surface

- No-mark®, extra load, cushion tread wheels absorb impact, reducing vibration and strain
- Stainless steel is easy to clean and sanitize
- Bumpers on legs and handles protect walls and furniture



Model #744

FACTORY INSTALLED OPTIONS (PAGE 55):

- 5" (127) all swivel casters
- Sta-Clean® vinyl covers
- Offset perimeter bumper
- 5" (127) 2 ea. swivel w/brake caster
- Hi-Temp nylon casters, up to 400° F. (204° C.), 5" (127) 2 ea. fixed, 2 ea. swivel casters
- Lake-Glide casters and wheels



Fixed wheels and swivel casters are interchangeable at factory or in the field.

ACCESSORIES (PAGE 56):

- Detachable silverware and waste boxes



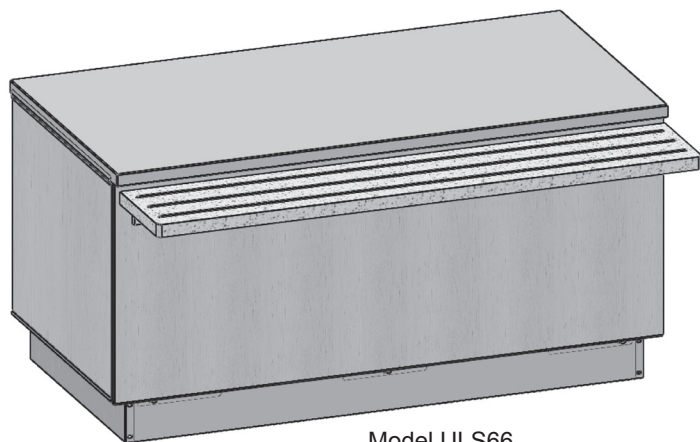
Model #758

Freight Class: 125
Ships in: 4 days or less!

Model	NSF Model	# of Shelves	Shelf Size	Shelf Clearance	Overall Size			Caster Type*	Caster Dia.	Case Weight Lbs. (Kg)	Case Cube Cu. ft. (m³)
					W	L	H				
710	510	2	15-1/2" x 24" (394 x 610)	19" (483)	16-1/4" (413)	30" 762	34-1/4" 870	2-swivel 2-fixed	5" (127) 8" (203)	49 (22.2)	14.3 (.55)
711	511	3	15- 1/2" x 24" (394 x 610)	10" (254)	16-1/4" (413)	30" 762	34-1/4" 870	2-swivel 2-fixed	5" (127) 8" (203)	57 (25.9)	14.3 (.55)
721	521	2	18" x 27" (457 x 686)	19" (483)	19-3/8" (492)	32-5/8" 829	35-1/2" 876)	2-swivel 2-fixed	5" (127) 8" (203)	53 (24)	27.4 (1.1)
722	522	3	18" x 27" (457 x 686)	10" (254)	19-3/8" (492)	32-5/8" 829	35-1/2" 876)	2-swivel 2-fixed	5" (127) 8" (203)	63 (28.6)	27.4 (1.1)
743	543	2	21" x 33" (533 x 838)	21" (533)	22-3/8" (568)	38-5/8" 981	37-1/8" 943)	2-swivel 2-fixed	5" (127) 8" (203)	64 (29)	27.4 (1.1)
744	544	3	21" x 33" (533 x 838)	11-3/8" (289)	22-3/8" (568)	38-5/8" 981	37-1/8" 943)	2-swivel 2-fixed	5" (127) 8" (203)	78 (35.4)	27.4 (1.1)
758	558	2	21" x 49" (533 x 1245)	21" (533)	22-3/8" (568)	54-5/8" 1387	37" 940)	2-swivel 2-fixed	5" (127) 8" (203)	87 (39.5)	32.3 (.90)
759	559	3	21" x 49" (533 x 1245)	11-3/8" (289)	22-3/8" (568)	54-5/8" 1387	37" 940)	2-swivel 2-fixed	5" (127) 8" (203)	108 (49)	32.3 (.90)

Measurements in () denote metric millimeters, unless otherwise specified. *Lake-Glide Casters are No-Mark, cushion tread.

MODULAR UTILITY / BEVERAGE COUNTERS



Model ULS66
(Shown with optional Corian tray slide
and toe plates.)



- ▶ Durable, welded stainless steel tubular frame
- ▶ Patented TIGHT LINK™ interlocking mechanism eliminates vertical and horizontal gaps between counters
- ▶ Heavy duty 14-gauge stainless steel countertop
- ▶ Millwork panels match or complement any décor
- ▶ Optional FS style food shield mounts into counter's vertical framework for strength and durability
- ▶ 6" high stainless steel adjustable legs

Item # _____ Quantity _____

Project _____

MODELS

- ULS30** **ULS36** **ULS42** **ULS48**
 ULS54 **ULS60** **ULS66** **ULS72**
 ULS78 **ULS84** **ULS90** **ULS96**

OPTIONS & ACCESSORIES

Counter Type

- Operator Service Self-service (wall)
 Double-sided island (35" wide)

Counter Top

- Stainless steel (std.) Corian® solid surface
 Quartz
 Backsplash/end splash where abutting walls

Tray Slide(s) (optional)

- V-ridge stainless steel Flat stainless steel
 Quartz Corian® solid surface
 Counter top extension-flat
 Counter top extension with stainless steel runners

Operator Work Ledge On Fold-Down Brackets

- White poly 8" wide carving board
 Stainless steel 8" wide work ledge
 Butcher block carving board

Counter Heights

- 34" high (standard) Available between 30" to 36"
Specify _____

Front & End Panels

- Plastic laminate (std.) Stainless steel
 Graphic panel

Food Shields, Display Stands, Overshelf

- FS food shield, convertible with glass shelf
 FS-DS double-sided self-serve with glass shelf
 FS-SS self service with glass shelf
 FS-TTD display shelf, two-tier with glass shelves
 Overshelf, stainless steel
 LED light*
 Heat lamp strip with lights*
 Food shield furnished by others, installed into counter by Multiteria

Electrical Options

- Duplex outlet, in cabinet base

Casters & Toe Plate(s)

- Stainless steel adjustable legs (std.)
 Stainless steel seismic legs with flanged feet
 6" casters with 5" wheels
 6" adjustable-height casters with 3" wheels
 Stainless steel toe plate(s)
 Black powder coat finish toe plate(s)

Other Options/Accessories

- Stainless steel doors on operator side (service type counter)
 Stainless steel doors
 Doors to match front panel with satin chrome tab handle (island and self-service/wall type counters)
 Locks on doors
 Grommets hole(s), 2³/₄" diameter on counter-top for power cords/utility services Quantity _____
 Drip trough with drain Specify length requirements _____
 Under counter clearance for under-counter equipment
 Recessed top section for cooking station
 Adjustable-height stainless steel intermediate shelf

* Changes power requirements.

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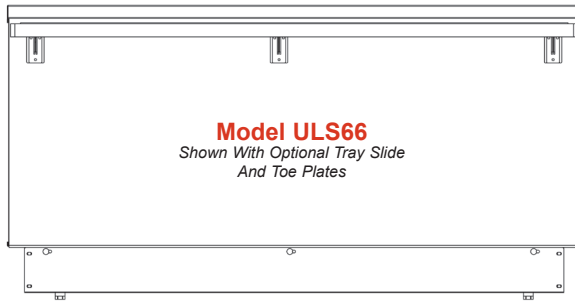
E-U

MODULAR UTILITY / BEVERAGE COUNTERS

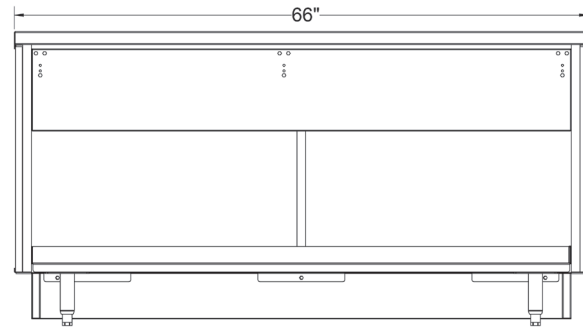
Essence™ Series

MODELS

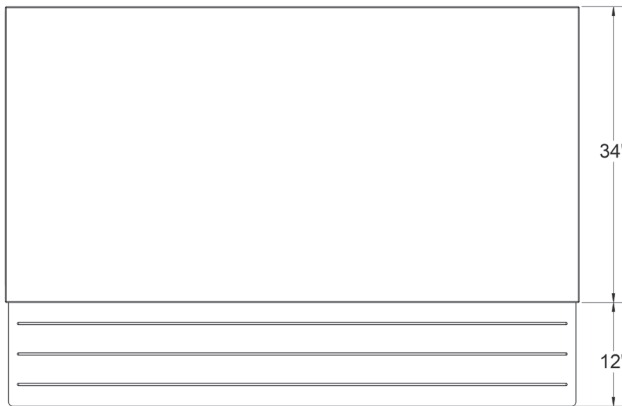
ULS30 ULS36
 ULS42 ULS48
 ULS54 ULS60
 ULS66 ULS72
 ULS78 ULS84
 ULS90 ULS96



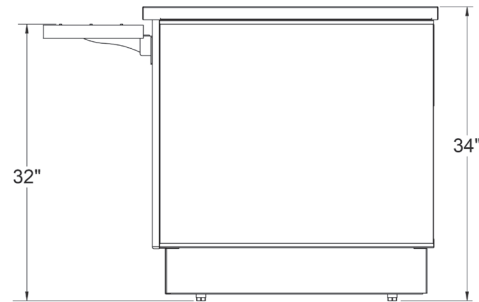
Front View ▲



Operator View ▲



Plan View ▲



End View ▲

SPECIFICATIONS

General:

Shall be Multiteria Model #ULS_____ to be constructed with heavy-duty welded stainless steel tubular frame. Countertop to be manufactured with 14-gauge stainless steel with 1½" top turndown all welds to be ground and polished to provide #4 finish. Counter to have easily removable ¾" laminated front and end panels. All millwork panels to have standard plastic laminate on front and white laminate interior.

Body Frame:

Shall be welded and polished, 1" stainless steel tubular framework. Body frame made to readily accept ¾" laminated panels to allow panel changing without the use of tools. Body frame made to accept TIGHT LINK™ (patented) fastening system. Base to be furnished with removable stainless steel undershelf. Undershelf depth to allow 4" clear open space for mechanical connections during installation. Unit shall rest on 6" high stainless steel legs with stainless steel adjustable feet.

TIGHT LINK™ system:

Furnish with patented slide-in panel(s) that link adjacent counters together their entire depth and height to eliminate top, front and rear horizontal and vertical gaps between equipment. Linking panels are open to allow mechanical connections to run through adjoining counters without having to cut access holes, reducing the number of building mechanicals required to connect equipment.

MODEL DETAILS

Model	Counter Length	Ship Wt. (Lbs.)	Model	Counter Length	Ship Wt. (Lbs.)
ULS30	30"	170	ULS66	66"	420
ULS36	36"	200	ULS72	72"	530
ULS42	42"	275	ULS78	78"	550
ULS48	48"	310	ULS84	84"	590
ULS54	54"	330	ULS90	90"	620
ULS60	60"	395	ULS96	96"	660

Front & End Millwork Panels:

Millwork panels to be constructed of ¾" wood substrate with standard plastic laminate on front and white laminate interior, color matching edge banding on top and sides, and black rubber T-molding on bottom edge. Panels are removable for service access. End panels are removable without use of tools.

Countertop:

Counter top is 14-gauge stainless steel with 1½" turned down edges and stainless steel support channels.

TIGHT
LINK
Panel



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STAINLESS STEEL FABRICATED FLOOR MOP SINKS

Item #: _____ Qty #: _____

Model #: _____

Project #: _____



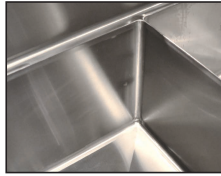
Standard Mop Sink
9-OP-20 Shown



Drop Front Mop Sink
9-OP-40DF Shown



Notched Out Front Allows
Ease of Emptying Mop Bucket



Fabricated Bowls are Welded
Together at the Seams

FEATURES:

Floor mounted unit eliminates the need of lifting heavy containers.
Tile edge furnished on the rear.
Bowls rectangular in design for increased capacity.
K-16 3-1/2" Free Flow Drain. Connects to a 2" drain pipe.

-DF models feature a notched out front which allows for ease of emptying mop bucket).

CONSTRUCTION:

All TIG welded.
Welded areas blended to match adjacent surfaces and to a satin finish.

MATERIAL:

16 Gauge type "304" series stainless steel sink bowl & Apron.

	Model #	Bowl Size (A x B x C)	O.A. Dimension (W x L x H)	Drain Distance (E)	Drain Distance (F)	Approx. Wt.	Approx. Cu.
STANDARD	9-OP-20	16" x 20" x 6"	21" x 25" x 10"	10-1/2"	12-1/2"	33 lbs.	4
	9-OP-28	20" x 28" x 6"	25" x 33" x 10"	12-1/2"	16-1/2"	47 lbs.	7
	9-OP-40	16" x 20" x 12"	21" x 25" x 16"	10-1/2"	12-1/2"	45 lbs.	6
	9-OP-48	20" x 28" x 12"	25" x 33" x 16"	12-1/2"	16-1/2"	62 lbs.	9
LARGE BOWL	9-OP-44	24" x 24" x 12"	29" x 29" x 16"	14-1/2"	14-1/2"	70 lbs.	9
DROP FRONT	9-OP-40DF	16" x 20" x 12"	18-1/2" x 25" x 16"	10-1/2"	12-1/2"	85 lbs.	9
	9-OP-48DF	20" x 28" x 12"	22-1/2" x 33" x 16"	12-1/2"	16-1/2"	110 lbs.	15

MOP SINK ACCESSORIES

16" High Side & Back Splashes for 9-OP Series Mop Sinks Splashes on All 3 Sides

Model #	Fits Units:	Model #	Fits Units:
K-298	9-OP-20	K-298D	9-OP-40DF
	9-OP-40		
K-299	9-OP-28	K-299D	9-OP-48DF
	9-OP-48		
K-300	9-OP-44	-	-

Splash on Left or Right & Back

Model #	Fits Units:	Model #	Fits Units:
K-288LorR	9-OP-20	K-288LDorRD	9-OP-40DF
	9-OP-40		
K-290LorR	9-OP-28	K-290LDorRD	9-OP-48DF
	9-OP-48		
K-291LorR	9-OP-44	-	-



Left & Right Splashes Shown

Height Above Finished Floor (A.F.F.)

9-OP-20/9-OP-28 = 26" High 9-OP-40/9-OP-40DF/9-OP-44/9-OP-48/ 9-OP-48DF = 32" High

- K-16** Replacement drain for floor mop sinks
- K-240** Service Faucet*
- K-242** 23" wide mop hanger
- K-243** Stainless steel mop drainage tray
- K-244** Hose and hanger
- K-245** 8" x 24" utility shelf
- K-246** 8" x 36" utility shelf

*Does not meet Federal Lead Free Standards as it is not intended for potable water.



Customer Service Available To Assist You 1-800-645-3166 8:30 am - 7:00 pm E.S.T.

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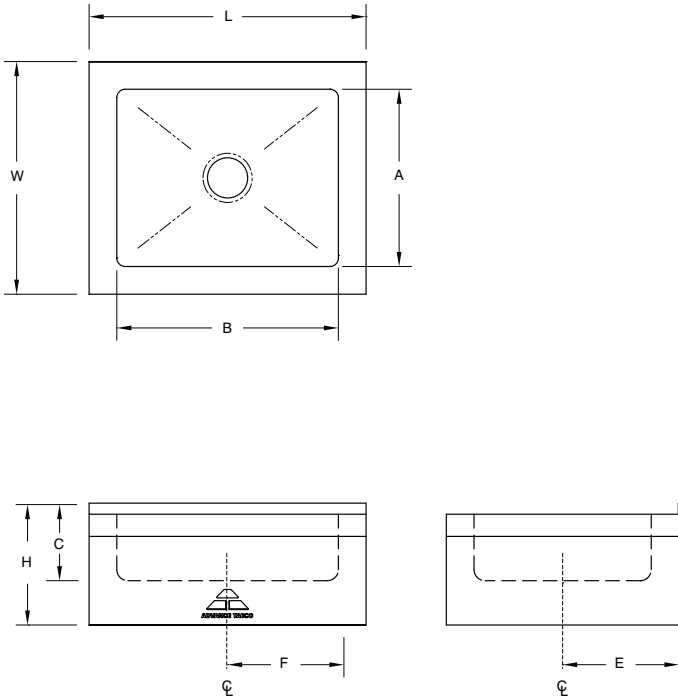
For Smart Fabrication™ Quotes:
Email: smartfab@advancetabco.com or Fax: 631-586-2933

DIMENSIONS and SPECIFICATIONS

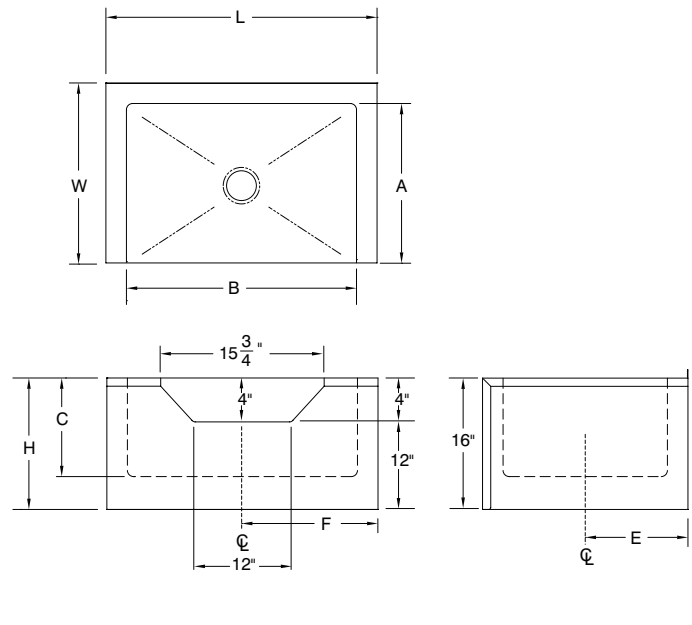
TOL Overall: ± .500"
 Interior: ± .250"

ALL DIMENSIONS ARE TYPICAL

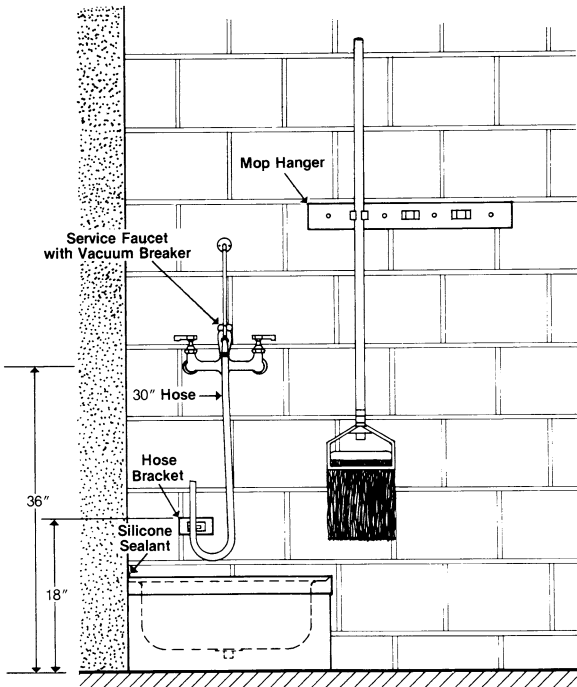
STANDARD MOP SINK



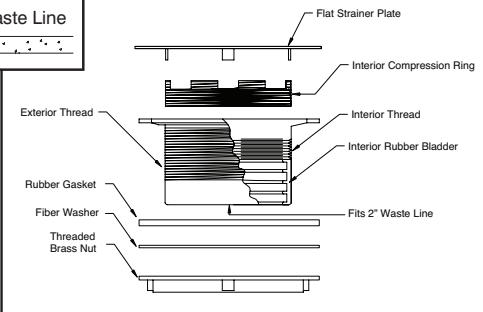
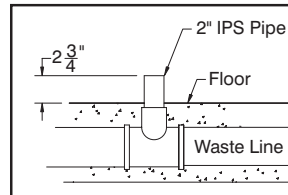
DROP FRONT MOP SINK



SUGGESTED INSTALLATION

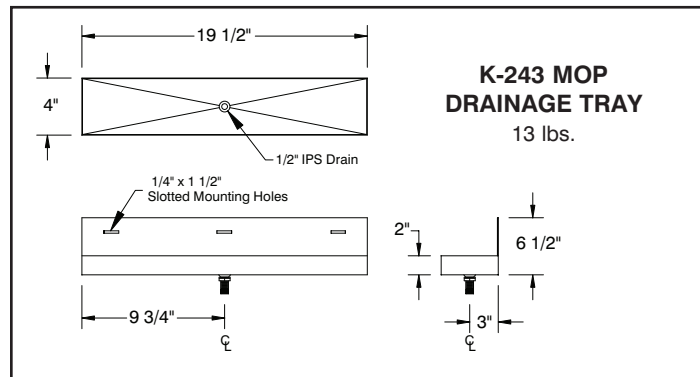


MOP SINK DRAIN ASSEMBLY



K-243 MOP DRAINAGE TRAY

13 lbs.



APPLICATION:

PRODUCT NAME:

FAUCET 8AWZWH 06SRV

JOB NAME:

MODEL:

 18031 FAUCET 8AWZWH 06SRV

QUANTITY:

ITEM NO.:

OPTIONS OR MODIFICATIONS:

 OTHER _____

FEATURES:

CONTROL VALVE

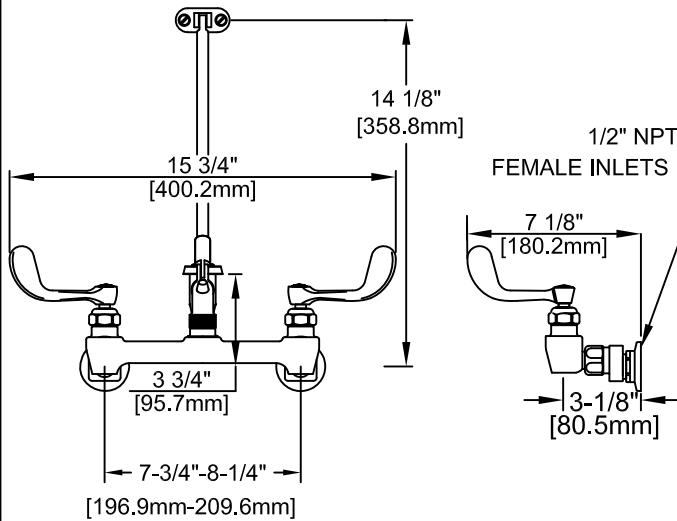
- * ECCENTRICS ADJUST FROM 7-3/4" TO 8-1/4"
- * INTERNAL SPRING LOADED CHECK VALVES
- * SWIVELING SEAT DISKS
- * HOT SIDE STEM - RIGHT HAND
- * COLD SIDE STEM - LEFT HAND
- * STAINLESS STEEL SEATS
- * STAINLESS STEEL SEAT SCREWS
- * STAINLESS STEEL HANDLE SCREWS
- * ATMOSPHERIC VACUUM BREAKER
- * 3/4" GARDEN HOSE THREAD OUTLET

SYSTEM LIMITS

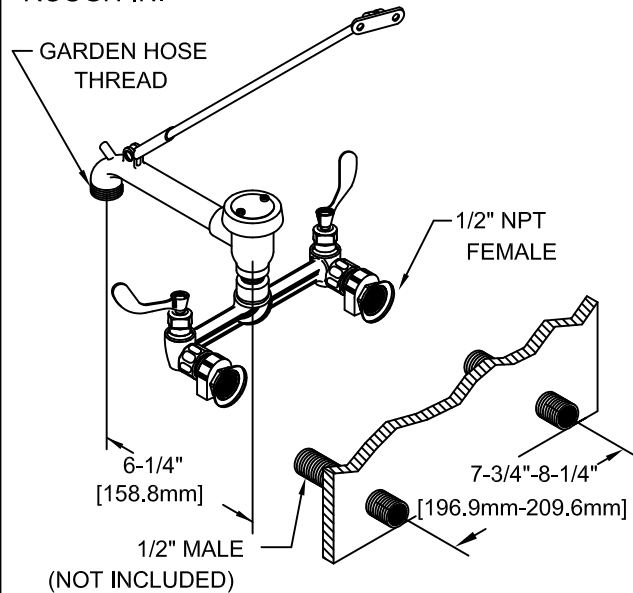
- * TEMP: 40°F MIN. TO 160°F MAX.
- * PRESSURE 200 PSI MAX. STATIC
- * 13.6 GPM AT 80 PSI

SHIPPING WEIGHT

- * 6.25 LBS



ROUGH-IN:



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FISHER MANUFACTURING COMPANY
 TOLL FREE: 800-421-6162 - FAX: 800-832-8238
 information@fisher-mfg.com - www.fisher-mfg.com

WARNING:

Proposition 65 requires that we provide you with the following notice: "This product Contains A Chemical Known To The State Of California To Cause Cancer Or Birth Defects Or Other Reproductive Harm."



STAINLESS STEEL FABRICATED FLOOR MOP SINKS

Item #: _____ Qty #: _____
 Model #: _____
 Project #: _____



Standard Mop Sink
9-OP-20 Shown



Drop Front Mop Sink
9-OP-40DF Shown

FEATURES:

Floor mounted unit eliminates the need of lifting heavy containers.
 Tile edge furnished on the rear.
 Bowls rectangular in design for increased capacity.
K-16 Free Flow Drain is included with each mop sink.
-DF models feature a notched out front which allows for ease of emptying mop bucket)

CONSTRUCTION:

All TIG welded.
 Welded areas blended to match adjacent surfaces and to a satin finish.

MATERIAL:

16 Gauge type "304" series stainless steel sink bowl & Apron.



Notched Out Front Allows Ease of Emptying Mop Bucket



Fabricated Bowls are Welded Together at the Seams

	Model #	Bowl Size (A x B x C)	O.A. Dimension (W x L x H)	Drain Distance (E)	Drain Distance (F)	Approx. Wt.	Approx. Cu.
STANDARD	9-OP-20	16" x 20" x 6"	21" x 25" x 10"	10-1/2"	12-1/2"	33 lbs.	4
	9-OP-28	20" x 28" x 6"	25" x 33" x 10"	12-1/2"	16-1/2"	47 lbs.	7
	9-OP-40	16" x 20" x 12"	21" x 25" x 16"	10-1/2"	12-1/2"	45 lbs.	6
	9-OP-48	20" x 28" x 12"	25" x 33" x 16"	12-1/2"	16-1/2"	62 lbs.	9
LARGE BOWL	9-OP-44	24" x 24" x 12"	29" x 29" x 16"	14-1/2"	14-1/2"	70 lbs.	9
DROP FRONT	9-OP-40DF	16" x 20" x 12"	18-1/2" x 25" x 16"	10-1/2"	12-1/2"	85 lbs.	9
	9-OP-48DF	20" x 28" x 12"	22-1/2" x 33" x 16"	12-1/2"	16-1/2"	110 lbs.	15

MOP SINK ACCESSORIES

16" High Side & Back Splashes for 9-OP Series Mop Sinks Splashes on All 3 Sides

Model #	Fits Units:	Model #	Fits Units:
K-298	9-OP-20 9-OP-40	K-298D	9-OP-40DF
K-299	9-OP-28 9-OP-48	K-299D	9-OP-48DF
K-300	9-OP-44	-	-

Splash on Left or Right & Back

Model #	Fits Units:	Model #	Fits Units:
K-288LorR	9-OP-20 9-OP-40	K-288LDorRD	9-OP-40DF
K-290LorR	9-OP-28 9-OP-48	K-290LDorRD	9-OP-48DF
K-291LorR	9-OP-44	-	-



Left & Right Splashes Shown

Height Above Finished Floor (A.F.F.)

9-OP-20/9-OP-28 = 26" High 9-OP-40/9-OP-40DF/9-OP-44/9-OP-48/ 9-OP-48DF = 32" High

- K-16 Replacement drain for floor mop sinks
- K-240 Service Faucet*
- K-242 23" wide mop hanger
- K-243 Stainless steel mop drainage tray
- K-244 Hose and hanger
- K-245 8" x 24" utility shelf
- K-246 8" x 36" utility shelf

*Does not meet Federal Lead Free Standards as it is not intended for potable water.



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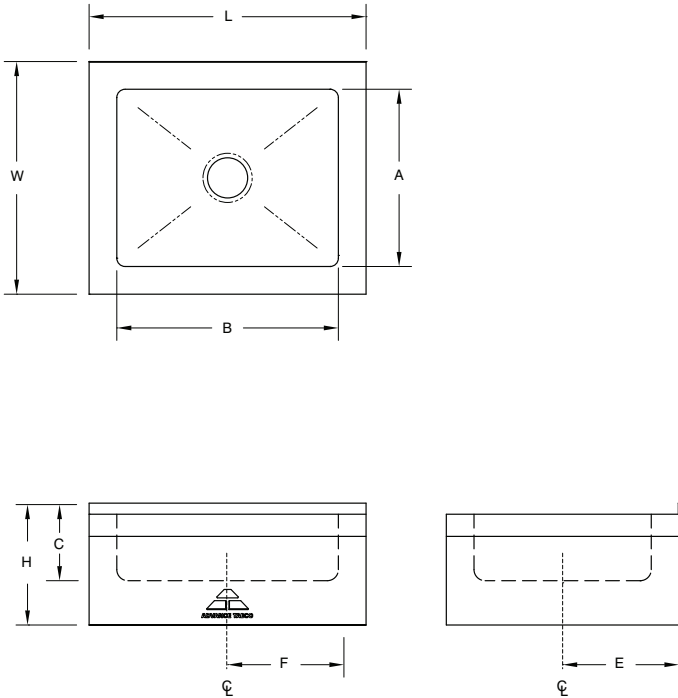
For Smart Fabrication™ Quotes:
 Email: smartfab@advancetabco.com or Fax: 631-586-2933

DIMENSIONS and SPECIFICATIONS

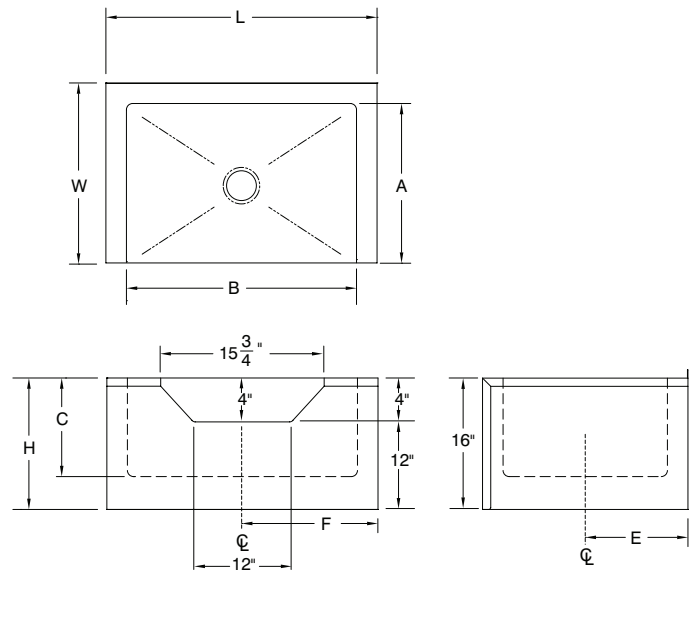
TOL Overall: ± .500"
 Interior: ± .250"

ALL DIMENSIONS ARE TYPICAL

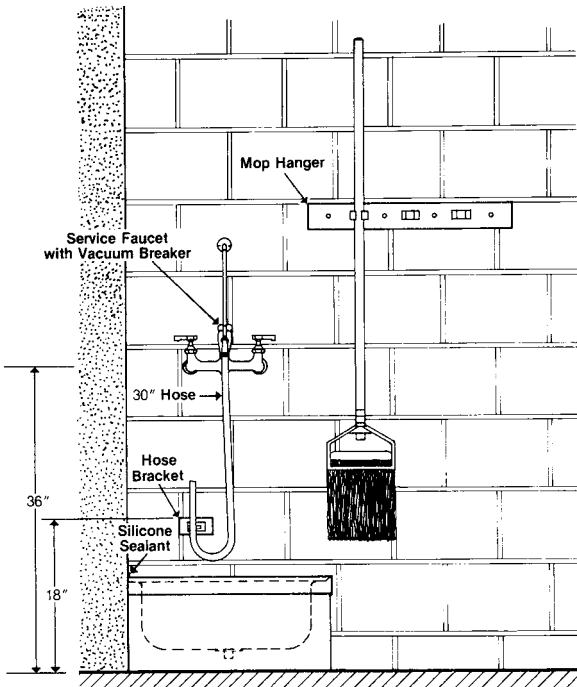
STANDARD MOP SINK



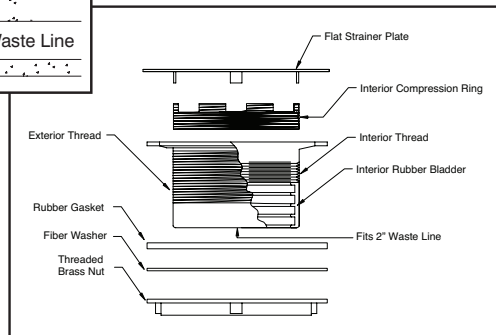
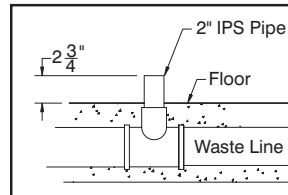
DROP FRONT MOP SINK



SUGGESTED INSTALLATION

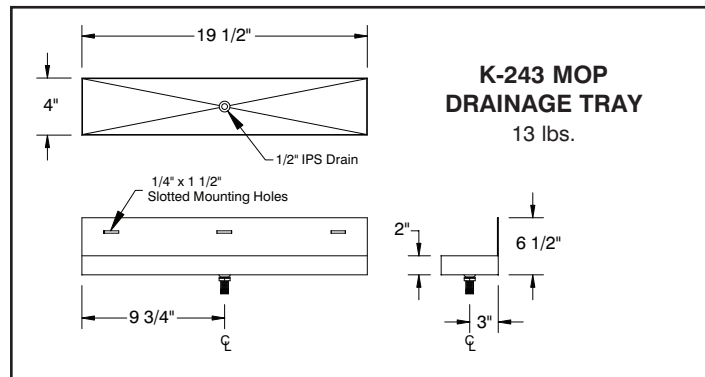


MOP SINK DRAIN ASSEMBLY



K-243 MOP DRAINAGE TRAY

13 lbs.





Item # _____

Job _____

SUPER ERECTA SHELF® WIRE SHELVING

- **Unique Design:** The open wire design of these heavy-gauge carbon-steel or stainless steel shelves minimizes dust accumulation and allows a free circulation of air, greater visibility of stored items and greater light penetration.
- **Versatile Construction:** Super Erecta Shelf® wire shelving can change as quickly as your needs change. By using various accessories, hundreds of shelving configurations become possible.
- **Fast, Secure Assembly:** SiteSelect™ Posts with the double-groove visual guide feature, have circular grooves at 1" (25mm) intervals and are numbered at 2" (50mm) intervals. A patented, tapered split sleeve (plastic or aluminum) snaps together around each post. Tapered openings in the shelf corners slide over the tapered split sleeves providing a positive lock. Shelf is assembled in minutes without the use of any special tools.
- **Shelf Ribs:** Run front to back, allowing you to slide items on and off shelves smoothly.
- **Shelf Accessibility:** Shelves can be loaded/unloaded easily from all sides. This open construction allows use of maximum storage space of cube.
- **Adjustability:** Shelves can be adjusted at 1" (25mm) intervals along the entire length of the post.
- **Durable:** Super Erecta Shelf® wire shelving is available in four options: Super Erecta Brite™, chrome-plated, stainless steel and Metroseal™.
- **Adjustable Feet:** Bolt levelers compensate for surface irregularities.



InterMetro Industries Corporation
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Wilkes-Barre, PA 18705
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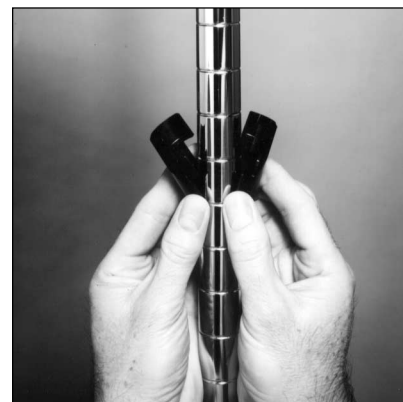
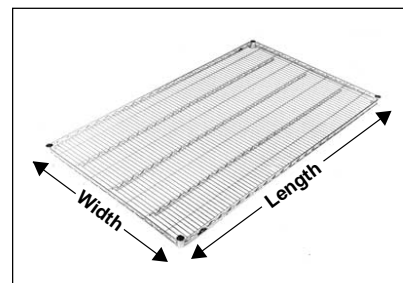
Job _____

SUPER ERECTA SHELF® WIRE SHELVING



Wire Shelves

Width		Length		Approx. Pkd. Wt.		Cat. No.	Cat. No.	Cat. No.
(in.)	(mm)	(in.)	(mm)	(lbs.)	(kg)	Super Erecta Brite	Chrome	Stainless
14	355	24	610	6	2.7	1424BR	1424NC	1424NS
14	355	30	760	7	3.2	1430BR	1430NC	1430NS
14	355	36	910	8	3.6	1436BR	1436NC	1436NS
14	355	42	1060	9½	4.3	1442BR	1442NC	1442NS
14	355	48	1220	10½	4.7	1448BR	1448NC	1448NS
14	355	60	1525	14	6.3	1460BR	1460NC	1460NS
14	355	72	1825	17	7.7	1472BR	1472NC	1472NS
<hr/>								
18	455	24	610	7	3.2	1824BR	1824NC	1824NS
18	455	30	760	8	3.6	1830BR	1830NC	1830NS
18	455	36	910	9½	4.3	1836BR	1836NC	1836NS
18	455	42	1060	11	5.0	1842BR	1842NC	1842NS
18	455	48	1220	12	5.4	1848BR	1848NC	1848NS
18	455	54	1370	14½	6.6	1854BR	1854NC	1854NS
18	455	60	1525	17	7.7	1860BR	1860NC	1860NS
18	455	72	1825	20	9.1	1872BR	1872NC	1872NS
<hr/>								
21	530	24	610	8	3.6	2124BR	2124NC	2124NS
21	530	30	760	9	4.1	2130BR	2130NC	2130NS
21	530	36	910	11	5.0	2136BR	2136NC	2136NS
21	530	42	1060	12	5.4	2142BR	2142NC	2142NS
21	530	48	1220	14	6.4	2148BR	2148NC	2148NS
21	530	54	1370	16	7.6	2154BR	2154NC	2154NS
21	530	60	1525	18	8.2	2160BR	2160NC	2160NS
21	530	72	1825	24	10.9	2172BR	2172NC	2172NS
<hr/>								
24	610	24	610	9	4.1	2424BR	2424NC	2424NS
24	610	30	760	11	5.0	2430BR	2430NC	2430NS
24	610	36	910	13	5.9	2436BR	2436NC	2436NS
24	610	42	1060	15	6.8	2442BR	2442NC	2442NS
24	610	48	1220	16	7.3	2448BR	2448NC	2448NS
24	610	54	1370	18	8.6	2454BR	2454NC	2454NS
24	610	60	1525	21	9.5	2460BR	2460NC	2460NS
24	610	72	1825	26	11.8	2472BR	2472NC	2472NS



NOTE:For Metroseal shelving information see sheet No. 10.10.
SUPER ERECTA SHELF meets U.S. Government Specifications MIL-S-40144E.
PLATED SHELVING has clear protective coating.

“S” Hooks

Used to “add-on” shelving units with only two posts required.

Cat. No. 9995Z



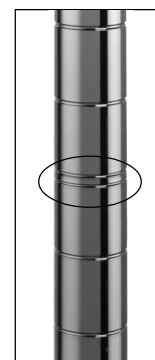
SiteSelect™ Posts

Height* (in.)	Height* (mm)	Approx. Pkd. Wt. (lbs.)	Approx. Pkd. Wt. (kg)	Cat. No. Chrome	Cat. No. Stainless
7 ⁵ / ₈	194	½	0.23	7P	—
14 ¹ / ₂	370	1	0.5	13P	13PS
27 ¹ / ₂	700	1¾	0.75	27P	27PS
34 ¹ / ₂	877	2	0.9	33P	33PS
54 ⁹ / ₁₆	1386	3	1.4	54P	54PS
62 ⁹ / ₁₆	1589	3½	1.6	63P	63PS
74 ⁵ / ₈	1895	4	1.8	74P	74PS
86 ⁵ / ₈	2200	5	2.3	86P	86PS
96 ⁵ / ₈	2454	5½	2.3	**96P	—

* Height includes leveling bolt and cap.
 ** 96P should not be used on units less than 24" (610mm) deep.
 *** Post lengths to be specified as cut to a round number, ie: 74P cut to 69"... This will result in an overall post height with adjustment of 96⁵/₈ to 69⁵/₈.

SiteSelect™ Posts

Posts are grooved at 1" (25mm) increments and numbered at 2" (50mm) increments. Posts are double-grooved every 8" (203mm) for easy identification.



IMPORTANT: When ordering by components remember that stability decreases as the ratio of height to width increases. Units should be kept as wide and low as possible. With 14" shelving, foot plates should be used and secured to the floor on free-standing units; on mobile units, maximum post height is 54".

Manufactured by:



InterMetro Industries Corporation

North Washington Street, Wilkes-Barre, PA 18705
 Phone: 570-825-2741 • Fax: 570-825-2852
 For Product Information Call: 1-800-433-2232
 Visit Our Web Site: www.metro.com

L02-006
 Rev. 11/00
 Printed in U.S.A.

Information and specifications are subject to change without notice. Please confirm at time of order.

10.01

SUPER ERECTA SHELF®
Wire Shelving



FIRE ALARM DATA SHEET SUBMITTAL

FOR

BLYTHE CDC

7/22/2022



PREPARED BY:



VELTRE ENGINEERING, INC.

FIRE PROTECTION ENGINEERING
LIFE SAFETY | CODE CONSULTING
2899 DICKENS ST, UNIT C-01
SAN DIEGO, CA 92106 (858)490-9043

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CSFM EQUIPMENT LISTING DOCUMENTS

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 7315-1637:0102

Page 1 of 1

CATEGORY: 7315 -- POWER UNITS

LISTEE: Honeywell International Inc. One Fire-Lite Place, Northford, CT 06472
Contact: Lisa Brant (203) 484-6105 Fax (203) 484-7309
Email: lisa.brant@honeywell.com

DESIGN: Models HPF24S6, **HPF24S8**, HPFF8, HPFF8E, HPFF8CM, HPFF8CME, HPFF12, HPFF12E, *HPFF12CM and *HPFF12CME power limited power supply/battery chargers used for supervision and expanded power driving capability of up to four Notification Appliance Circuits (FACP Fire Circuits, Signaling Devices) or resettable/non resettable outputs. Model ZNAC-4 Class A converter. Refer to listee's data sheet for additional detailed product description and operational considerations.

RATING: 120 VAC, 24 VDC

INSTALLATION: In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, product designation, electrical rating and UL label.

APPROVAL: Listed as power supply/battery chargers for use with separately listed compatible fire alarm control units.

XLF: 7315-0075:0206

*Rev. 10-20-10 bh



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Date Issued: **July 01, 2022**

Listing Expires **June 30, 2023**

Authorized By: **VICTOR WONG**, Program Coordinator
Fire Engineering Division

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 7320-1653:0201

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CATEGORY: 7320 -- SPEAKERS

LISTEE: System Sensor, Unincorporated Div of Honeywell Int'l Inc. 3825 Ohio Ave, St. Charles, IL 60174
Contact: Lisa Brant (203) 484-6105 Fax (203) 484-7309
Email: lisa.brant@honeywell.com

DESIGN: Models SPR, **SPW**, SPRV, and SPWV SpectrAlert Speakers - Rectangular enclosure.
Models SPCW, SPCR, SPCWV, and SPCRV SpectrAlert Speakers with round enclosure.
Models SPSR, SPSRH, SPSW, SPSW-ALERT, SPSW-CLR-ALERT, *SPSWK-CLR-ALERT, SPSWH, SPSRV, and SPSWV SpectrAlert Speaker/Strobe with rectangular enclosure. Models SPSCR, SPSCRH, SPSCW, *SPSCWK-CLR-ALERT, SPSCWH, SPSCRV, SPSCRVH, SPSCWV, and SPSCWVH SpectrAlert Speaker/Strobe with round enclosure. Model SPSCW-CLR-ALERT Speaker/Strobe. Model SPSW-ALERT has amber lens and is intended for non-fire use.
All models identified are intended for indoor use mounted on the wall or ceiling. Models with a "K" in the suffix are suitable for indoor or outdoor use with an operating temperature rating of -40°C to +66°C (-40°F to +151°F) and have a NEMA 4X enclosure rating when used with models PWBB, PWBBW (wall) or the model PWBBCW (ceiling) plastic weatherproof back boxes or with Model MWBBW (Wall), MWBB (Wall) or MWBBCW (Ceiling) metal weatherproof back boxes. Models with a " - P" in the suffix have plain housings with no lettering on the enclosure. Models not containing " - P", in the suffix have English lettering reading "FIRE" on the housing. Refer to listee's data sheet for additional detailed product description and operational considerations.

RATING: Nominal Voltage: 25 Vrms or 70 Vrms
Power Settings: ¼, ½, 1, 2 Watts
Frequency Range: 400 - 4000 Hz

INSTALLATION: In accordance with listee's printed installation instructions, NFPA 72, applicable codes & ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number, electrical rating and UL label.

APPROVAL: Listed as speaker/strobes when used with separately listed compatible fire alarm control units. Suitable for wall or ceiling mount.
These speaker/strobes do not generate a distinctive three-pulse temporal code pattern (for total evacuation) as required per NFPA 72, 2010 edition. If required, the appliances must be used with a fire alarm control unit that can generate the temporal pattern signal.

*Corrected 02-06-12 bh



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FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 7135-1653:0217

Page 1 of 1

CATEGORY: 7135 -- AUDIBLE DEVICES

LISTEE: System Sensor, Unincorporated Div of Honeywell Int'l Inc. 3825 Ohio Ave, St. Charles, IL 60174
Contact: Lisa Brant (203) 484-6105 Fax (203) 484-7309
Email: lisa.brant@honeywell.com

DESIGN: Models SSM24-6, -8, -10 and SSV120-6, -8, -10 audible signal devices. Models are AC or DC powered and available in 6", 8" and 10" bells. Refer to listee's data sheet for detailed product description and operational considerations. The units may be employed outdoors when used with NEMA 3R weather resistant back box Model WBB.

RATING: SSM24-6 Sound output: 82 dBA
SSM24-8 Sound output: 80 dBA
SSM24-10 Sound output: 81 dBA
SSV120-6 Sound output: 85 dBA
SSV120-8 Sound output: 82 dBA
SSV120-10 Sound output: 82 dBA
SSM Series Voltage Range: 16-33 VDC
SSV Series Voltage Range: 96-132 VAC
Temperature Range: -31°F to 150° F (-35°C to 66°C)

INSTALLATION: In accordance with listee's printed installation instruction, applicable codes & ordinances, and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number and UL label.

APPROVAL: Listed as audible devices for use with separately listed compatible fire alarm control units. If this appliance is required to produce a distinctive three-pulse Temporal Pattern Fire Alarm Evacuation Signal (for total evacuation) in accordance with NFPA 72, 2002 Edition, the appliance must be used with a fire alarm control unit that can generate the temporal pattern signal. Refer to manufacturer's Installation Manual for details.

07-30-10 fm



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Date Issued: **July 01, 2022**

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Fire Engineering Division

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 7320-1653:0505

Page 1 of 2

CATEGORY: 7320 -- SPEAKERS

LISTEE: System Sensor, Unincorporated Div of Honeywell Int'l Inc. 3825 Ohio Ave, St. Charles, IL 60174
Contact: Lisa Brant (203) 484-6105 Fax (203) 484-7309
Email: lisa.brant@honeywell.com

DESIGN: System Sensor Indoor Models:
SPRL and SPWL Wall Speakers;
SPCRL and SPCWL Ceiling Speakers;
SPSRL, **SPSWL**, SPSRL-P, SPSRL-SP, SPSWL-P, SPSWL-ALERT and SPSWL-CLR-ALERT Wall Speaker Stobes;
SPSCRL, **SPSCWL**, SPSCWL-P, SPSCWL-SP and SPSCWL-CLR-ALERT Ceiling Speaker Stobes.

Wall Bezel Parts:

BZSPR-P, BZSPR-AL, BZSPR-EV, BZSPR-AG, BZSPR-PG, BZSPR-F and BZSPR-SP,
BZSPW-P, BZSPW-AL, BZSPW-EV, BZSPW-AG, BZSPW-PG, BZSPW-F and BZSPW-SP,

Ceiling Bezel Parts:

BZSPRC-P, BZSPRC-AL, BZSPRC-EV, BZSPRC-AG, BZSPRC-PG, BZSPRC-F and BZSPRC-SP,
BZSPWC-P, BZSPWC-AL, BZSPWC-EV, BZSPWC-AG, BZSPWC-PG, BZSPWC-F and BZSPWC-SP,

Wall Trim Rings for Speaker Stobes:

TR2 and TR2W

Ceiling Trim Rings for Speaker Stobes:

TRC2 and TRC2W.

Wall Surface Mounted Back Boxes:

SBBSPRL and SBBSPWL,

Ceiling Surface Mounted Back Boxes:

SBBCRL and SBBCWL

Refer to listee's data sheet for detailed product description and operational considerations.

02-27-17 gt



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Date Issued: **July 01, 2022**

Listing Expires **June 30, 2023**

Authorized By: **VICTOR WONG, Program Coordinator**
Fire Engineering Division

- RATING:** 25 or 70.7 VAC, 1/4, 1/2, 1, 2 Watt outputs.
Regulated 12 VDC and 24 VDC/FWR is for 2-wire strobe portion.
- INSTALLATION:** In accordance with listee's printed installation instructions, NFPA 72, applicable codes & ordinances and in a manner acceptable to the authority having jurisdiction.
- MARKING:** Listee's name, model number, electrical rating, and UL label.
- APPROVAL:** Listed as speakers and speaker-strobes when used with separately listed compatible fire alarm control units. Suitable for indoor use, dry and damp environments. *Listed with software code, S05-0048-001 for low temperature compensation. Authority having jurisdiction should be consulted prior to installation. Refer to listee's Installation Instruction Manual for details.

02-27-17 gt



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Fire Engineering Division

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FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 7300-1703:0102 Page 1 of 1

CATEGORY: 7300 -- FIRE ALARM CONTROL UNIT ACCESSORIES/MISC. DEVICES

LISTEE: GAMEWELL-FCI12 Clintonville Road, Northford, CT 06472
Contact: Lisa Brant (203) 484-6105 Fax (203) 484-7309
Email: lisa.brant@honeywell.com

DESIGN: Models AMM-4, *AMM-4F, AMM-2 and *AMM-2F monitor modules and Models AOM, AOM-2, AOM-2R, *AOM-2RF, AOM-2S and *AOM-2SF control modules. Refer to listee's data sheet for detailed product description and operational considerations.

INSTALLATION: In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model designation, electrical rating and UL label.

APPROVAL: Listed as accessories for use with separately listed compatible control units. System Sensor Model SMB500 surface mount box (CSFM Listing No. 7300-1653:103) may be used as an enclosure for these modules

NOTE: FORMERLY: 7300-0694:178

XLF: 7300-1653:0103

12-4-07



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Date Issued: **July 01, 2022**

Listing Expires **June 30, 2023**

Authorized By: **VICTOR WONG, Program Coordinator**
Fire Engineering Division

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OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

Page 1 of 1

LISTING No. 7300-1703:0107

CATEGORY: 7300 -- FIRE ALARM CONTROL UNIT ACCESSORIES/MISC. DEVICES

LISTEE: GAMEWELL-FCI12 Clintonville Road, Northford, CT 06472
Contact: Lisa Brant (203) 484-6105 Fax (203) 484-7309
Email: lisa.brant@honeywell.com

DESIGN: Models AOM-MUX, *AOM-MUXF, AOM-TEL, *AOM-TELF control modules and Model AMM-2I, AMM-21F dual monitor module. Unit is intended to be installed in a standard 4" square junction box. Refer to listee's data sheet for additional detailed product description and operational considerations.

RATING: 16-32 VDC

INSTALLATION: In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number, electrical rating and UL label.

APPROVAL: Listed as control unit accessories for use with separately listed compatible fire alarm control units.

NOTE: FORMERLY: 7300-0694:232

12-4-07



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FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

Page 1 of 1

LISTING No. 7150-1703:0119

CATEGORY: 7150 -- FIRE ALARM PULL BOXES

LISTEE: GAMEWELL-FCI12 Clintonville Road, Northford, CT 06472
Contact: Lisa Brant (203) 484-6105 Fax (203) 484-7309
Email: lisa.brant@honeywell.com

DESIGN: Model **MS-7AF** dual action fire alarm pull box. Refer to listee's data sheet for detailed product description and operational considerations.

INSTALLATION: In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number, rating, and UL label.

APPROVAL: Listed as fire alarm pull boxes for use with separately listed compatible fire alarm control units. Refer to listee's Installation Instruction Manual for details.

* These manual pull boxes meet the requirements of UL Standard 38, 1999 Edition and California amendments.

NOTE: Formerly: 7150-0694:261

XLF: 7150-0028:0199

*Updated 09-08-2009 fm



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Date Issued: **July 01, 2022**

Listing Expires **June 30, 2023**

Authorized By: **VICTOR WONG, Program Coordinator**
Fire Engineering Division

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 7165-1703:0125
CATEGORY: 7165 -- FIRE ALARM CONTROL UNIT (COMMERCIAL)

Page 1 of 2

LISTEE: GAMEWELL-FCI12 Clintonville Road, Northford, CT 06472
Contact: Lisa Brant (203) 484-6105 Fax (203) 484-7309
Email: lisa.brant@honeywell.com

DESIGN: Model E3 Series® BROADBAND and E3 Series® CLASSIC Voice Evacuation System. The E3 Systems may also work in conjunction with all the sub-assemblies of listee's 7100 Series Control Panel and NetSOLO systems (CSFM Listing No. 7165-1703:0105 and 6911-1703:0116, and 6911-1703:0118).

Unit conveys all fire alarm, audio evacuation, voice paging, and fire fighter communications. Power-limited; non-coded, automatic, manual, smoke control, water flow, sprinkler supervisory, local auxiliary, central station, remote station, and proprietary service. Refer to listee's data sheet for additional detailed product description and operational considerations.

System components:

ILI-MB-E3; Intelligent Loop Interface Master Board
PM-9; PM-9G; Power Supply
ILI-95-MB-E3, ILI-95-S-E3; Loop Interface Subassemblies
E3BB-FLUSH-LCD; Enclosure for ICD-E3
E3BB-BA/-RA/-BAA/-RAA/-BB/-RB/-BC/-RC/-BD; Cabinets
RPT-E3-FO; or Repeater Sub-assembly, Fiber Optic or
RPT-E3-UTP; Repeater Sub-assembly, Unshielded twisted pair wire
LCD-E3; LCD Keypad Display
***LCD-SLP;** LCD Touchscreen Display Screen
DACT-E3 sub-assembly; Digital alarm communicator transmitter
ILI-S-E3; Intelligent Loop Unit, Expansion Board
ANX-SR, ANX-MR-FO, ANX-MR-UTR; Addressable Node Expanders Sub Assembly
INCC-E; Intelligent Network Enclosure
INCC; Intelligent Network Central Command
INI-VG; INI-VGC-UTP, INI-VGC-FO, INI-VGX-UTP; Intelligent Network Interface Sub Assembly
INI-VGX-FO, INI-VGE-UTP, INI-VGE-FO; Intelligent Network Interface Sub Assembly
ASM-16; Annunciator Switch Sub Assembly
INX; Network Audio Transponder Enclosure
ANU-48; Annunciator Sub Assembly
NGA; Touch Screen LCD Display Sub Assembly
LCD-7100; Remote LCD Display
SBB-C4, SBB-D4; Backbox

*Revision 09-18-20 VWW



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FCI-VDR-D4B, FCI-DR-C4B, FCI-CR-D4B; Doors with locks
 AA-100, AA-120; Amplifiers
 AM-50-25, AM-50-70; Amplifier Sub Assembly
 CHG120; Battery Charger with Cabinet
 BC-1/FCI-LBB; Backbox
 IPDACT-2; IP Digital Alarm Communicator
 FPJ; Firefighters's Telephone Jack Receptacle
 FHS; Portable Firefighters's Telephone Handset
 7100 Series#; Fire Alarm Control Panel or
 INI-7100 UTP#; Intelligent Network Interface Sub-assembly, [Twisted, unshielded wire] or
 INI-7100 FO#; Intelligent Network Interface

- RATING:** 120 V, 60 Hz, 3.5 A Primary; 24 V dc, 9A Secondary
- INSTALLATION:** In accordance with listee's printed installation instructions, NFPA 72, applicable codes and ordinances, and in a manner acceptable to the authority having jurisdiction.
- MARKING:** Listee's name, model designation, electrical rating, and UL label.
- APPROVAL:** Listed as fire alarm control unit for use with separately listed electrically and functionally compatible initiating and indicating devices. Suitable for high-rise applications when used with the above voice evacuation systems.

This control unit can generate a distinctive three-pulse Temporal Pattern Fire Alarm Evacuation Signal (for total evacuation) in accordance with NPFA 72.

This control unit meets the requirements of UL Standard 864, 9th Edition.

- NOTE:** For Fire Alarm Verification Feature (delay of alarm signaling), the Retard/Reset/Restart period shall be 30 seconds or less.

*Revision 09-18-20 VWW



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 Fire Engineering Division

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LISTING SERVICE

LISTING No. 7272-1703:0501
CATEGORY: 7272 -- SMOKE DETECTOR-SYSTEM TYPE-PHOTOELECTRIC

Page 1 of 1

LISTEE: GAMEWELL-FCI12 Clintonville Road, Northford, CT 06472
Contact: Lisa Brant (203) 484-6105 Fax (203) 484-7309
Email: lisa.brant@honeywell.com

DESIGN: Models **ASD-PL3**, ASD-PL3R, and ASD-PTL3 analog addressable, photoelectric smoke detectors for open area and duct installations. Model ASD-PTL3 has a complementary heat detector. All models are similar except for population/depopulation of components on the Printed Wiring Board for the intended features. All above models may be followed by two digit Suffix indicating the color of the detector enclosure: no suffix for white, -IV for ivory, -BL for black. Refer to listee's Installation and Maintenance Instruction for additional detailed product description and operational considerations

RATING: 24 VDC.

INSTALLATION: In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number, electrical rating, and UL label.

APPROVAL: Listed as photoelectric smoke detectors. Detectors are for use with separately listed System Sensor base Models *B501, *B210LP (CSFM Listing 7300-1653:0109), B200S and B200SR (CSFM Listing 7300-1653:0213), B200S-LF and B200SR-LF (CSFM Listing 7300-1653:0238), **B300-6** and B300-6-IS bases (CSFM Listing 7300-1653:0109), *B224BI and *B224RB (CSFM Listing 7300-1653:0126), System Sensor duct detector housings Models DNR and DNRW (CSFM listing 3240-1653:0209) and separately listed compatible fire alarm control units. Refer to manufacturer's Installation Manual for details. *All models comply with the applicable requirements in ANSI/UL 268, Smoke Detectors for Fire Alarm Systems, 7th Edition, January 11, 2016.

XLF: 7272-0028:0503

*Revision 12/17/19 DCC



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LISTING SERVICE

LISTING No. 7270-1703:0502

Page 1 of 1

CATEGORY: 7270 -- HEAT DETECTOR

LISTEE: GAMEWELL-FCI12 Clintonville Road, Northford, CT 06472
Contact: Lisa Brant (203) 484-6105 Fax (203) 484-7309
Email: lisa.brant@honeywell.com

DESIGN: Models ATD-L3, ATD-L3H (fixed temperature) and ATD-L3R (fixed temperature with Rate-of-Rise) electronic heat detectors. Suffix -IV for ivory color and -BL for black color. Refer to listee's data sheet for additional detailed product description and operational considerations.

RATING: Model **ATD-L3 (fixed temperature): 135°F.**
Model ATD-L3H (fixed temperature): 190°F.
Model ATD-L3R (fixed temperature with rate of rise):135°F.

INSTALLATION: In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number, electrical ratings, and UL label.

APPROVAL: Listed as heat detectors for use with Notifier base B710LP (CSFM#7300-0028:173); System Sensor bases B501, B210LP, B300-6, B300-6-IS (CSFM#7300-1653:0109); B224BI, B224RB (CSFM#7300-1653:0126); B200S, B200SR (CSFM#7300-1653:0213); B200S-LF, B200SR-LF (CSFM#7300-1653:238); and separately listed compatible fire alarm control units. Refer to listee's Installation Instructions Manual for details.

XLf: 7270-0028:0502

02-01-18 gt



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LISTING SERVICE

LISTING No. 7300-2105:0102 Page 1 of 1

CATEGORY: 7300 -- FIRE ALARM CONTROL UNIT ACCESSORIES/MISC. DEVICES

LISTEE: DITEK Corporation 1720 Starkey Road, Largo, FL 33771
Contact: Lisa Messinger (800) 753-2345 Fax (727) 812-5001
Email: lisa.messinger@ditekcorp.com

DESIGN: Models **DTK-120HW** and *DTK-120/240HW Surge protective devices.
Refer to listee's data sheet for additional detailed product description and operational considerations.

INSTALLATION: In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number, rating, and UL label.

APPROVAL: Listed as a surge protective device. For indoor use only.

*Rev 10-24-13 gt



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LISTING SERVICE

LISTING No. 7300-2105:0100 Page 1 of 1

CATEGORY: 7300 -- FIRE ALARM CONTROL UNIT ACCESSORIES/MISC. DEVICES

LISTEE: DITEK Corporation 1720 Starkey Road, Largo, FL 33771
Contact: Lisa Messinger (800) 753-2345 Fax (727) 812-5001
Email: lisa.messinger@ditekcorp.com

DESIGN: Models DTK-1P through -25P; DTK1LVLP through -4LVLP; DTK-1LVLP-F through -4VLP-F;
DTK-2MHLP-05B-12B, *-24B, -36B, 48B-75B Isolated Loop circuit protectors.
Models DTK-MB10, -2MB, -3MB, -4MB, -5MB, -MBV Protector bases.
Refer to listee's data sheet for additional detailed product description and operational considerations.

INSTALLATION: In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number, rating, and UL label.

APPROVAL: Listed as Isolated Loop circuit protectors and Protector bases. For indoor use only

*Rev. 01-17-13 gt



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Fire Engineering Division

FIRE ALARM SYSTEM PRODUCT DATA

E3 Series® Control Panel

Expandable Emergency Evacuation System

General

The E3 Series® Expandable Emergency Evacuation System by Gamewell-FCI is in the forefront of the latest generation of fire alarm control panels. The E3 Series System is designed for use in virtually any application because it features a modular assembly that is configured per project requirements. Employing the new high-speed Velociti® sensors, the E3 Series provides previously unattainable polling speed and response together with the flexibility demanded by today's emergency evacuation systems. In addition to the sensors' high-speed polling rate, the Velociti Series of sensors feature bi-polar LEDs that flash green for normal polling, and light red steadily to indicate an alarm.

The E3 Series is equipped with an 80-character LCD-E3 alphanumeric LCD display or 4.3" color touchscreen LCD-SLP display. Up to six keyboard LCD displays may be remotely located. In addition, you can install five of the familiar LCD-7100/RAN-7100 remote displays. The displays show instant system status information and can be connected in any desired area of an installation.



*E3 Series with
LCD-SLP Display*



*E3 Series with
LCD-E3 Display*

FEATURES & BENEFITS

- Styles 4, 6, or 7* signaling line circuits
- IBC Seismic Certified
- Listed under UL® Standard 864, 9th Edition
- Listed under UL Standard UL2572 for Mass Notification
- UL Listed for smoke control (dedicated and non-dedicated) when properly configured
- UL Listed and FM Approved for Pre-action/Deluge and Agent Releasing
- Two to 244 SLCs each supporting 159 sensors, 159 modules and 159 addressable sounder bases
- 625K bits per second ARCNET communications using wire, fiber, or mixed configurations for installation flexibility
- High-speed 32 bit processor and 8100 event history log
- Advanced Boolean logic-based programming such as AND, OR, NOT, time delay and calendar functions configurable via computer programming
- Supports up to (16), ASM-16 addressable switch or ANU-48 LED driver modules per ILI-MB-E3/ILI95-MB-E3
- Two Class A, Style Z or Class B, Style Y, notification appliance circuits rated at 2.0 amps. per circuit
- Integral city connection
- Up to 9 levels of sensitivity adjustment
- Flexible 115,200 baud high speed RS-232 interface
- 40 character user-defined text per device
- Supports the following:
 - 15 LCD-SLP displays/annunciators
 - 6 LCD-E3 displays/annunciators
 - 5 LCD-7100/RAN-7100 remote LED annunciators per ILI-MB-E3/ILI95-MB-E3
- Polls 318 devices in less than two seconds
- Activate up to 159 outputs in less than five seconds
- LED's blink associated device address during Walk Test.
- Fully digital, high-precision protocol
- Drift compensation
- Pre-Alarm adjustable between 15 levels for both Alert and Action
- Day/night automatic sensing adjustment
- Sensitivity windows
- Ion 0.05 - 2% obscuration
- Photo 1 - 3% obscuration
- Laser 0.02 - 2% obscuration
- MCS Acclimate 2.5 - 4%, also self-adjustable options: 1-2%, 2-3%, 3-4%
- HARSH 1-3% obscuration
- Each Loop Card has its own integral processor providing maximum survivability on loss of any other component. SLC provides full response on loss of any other system processor
- Optional programmable switches can be configured to enable, disable or group any combination of output devices
- Integrated point or Grouped Cross Zoning allows for numerous devices installed at any location to cooperate and determine alarm condition
- Automatic detector sensitivity testing
- Signals DIRTY and VERY DIRTY detector maintenance alerts

General

A high-speed 32-bit processor can easily implement a wide array of applications used in small office buildings or used in multi-complex, high-rise installations. The 64 node networking is made possible by 625K bits per second ARCNET communications using twisted-pair copper cable, fiber-optic cable, or a combination of both. In addition, the Addressable Node Expander (ANX) board expands the network to 122 nodes. The basic E3 Series is equipped with the following modules:

- PM-9 Power Supply
- ASM-16 (Addressable Switch Module)
- ILI-MB-E3/ILI95-MB-E3 (Intelligent Loop Interface-Main Board)
- ILI-S-E3/ILI95-S-E3 (Intelligent Loop Interface-Expansion Board)
- LCD-E3 (LCD Keypad Display)

The ASM-16 features 16 software programmable switches, each accompanied by red, green and yellow LEDs that can be programmed to indicate the operation of the switches. Additional ASM-16 modules may be added to expand the operation to a plateau previously unimagined.

The Intelligent Loop Interface - Expansion Board (ILI-S-E3/ILI95-S-E3) provides the E3 Series control panel with two additional electrically isolated signaling line circuits. The layout is similar to the ILI-MB-E3/ILI95-MB-E3 with the exception that a number of components are omitted. It occupies one node on the Broadband network.

Each ILI-MB-E3/ILI95-MB-E3 can support as many as sixteen ANU-48 LED Driver modules supporting hundreds of LEDs on a third party graphic annunciator to use for remote annunciation. The ANU-48 modules may be installed in any Listed remote annunciator. It can be remotely located via an RS-485 serial interface. An array of cabinets allows for neat, compact, attractive installations.

Installation

The E3 Series Expandable Emergency Evacuation System offers four cabinet size options. A typical cabinet includes a backbox, an inner door, and an outer door. The E3 Series cabinet assembly is a compact 19 3/8" (49 cm) wide, wall-mounted enclosure.

- Cabinet A includes the following four options:
 - Cabinet A1 inner door mounted to the backbox. The backbox houses one NGA module.
 - Cabinet A2 inner door mounted to the backbox. The backbox houses one LCD-E3 module.
 - Two or three-bay inner door mounted to the backbox.
 - The backbox typically houses one LCD-E3, or one NGA, and one or two ASM-16 modules.

- Cabinet B contains a space for the following modules installed inside the backbox:
 - ILI-MB-E3 - PM-9
 - ILI95-MB-E3 - PM-9G

Additional module options mounted on the backbox include the following:

- ANX - DACT-E3
- ILI-S-E3 - ILI95-S-E3
- RPT-E3-UTP -

The 2-bay inner door houses one LCD-E3 module and one ASM-16 module.

- Both Cabinets C and D include the following:
 - Pre-assembled outer door that provides visibility to the fire fighter's phone handset and a microphone voice messaging system.
 - Two inner door panel selections that may contain optional modules to meet the facility operation requirements.

In the Cabinet B, C and D backboxes, the ANX appears in the same place as the ILI-MB-E3/ILI95-MB-E3 and PM-9/PM-9G.

For information on the installation instructions for any of the E3 Series cabinets, refer to the E3 Series® Expandable Emergency Evacuation Manual, Part Number: LS10080-051GF-E.

For other options including information on the system's compatibility with the retrofit equipment, refer to the panel's installation manual, P/N:LS10080-051GF-E or the Compatibility Addendum for Gamewell-FCI Manuals, P/N: 9000-0427-L8.

Ordering Information

ILI-MB-E3: Intelligent Loop Interface-Main Board

ILI95-MB-E3: Intelligent Loop Interface-Main Board

ILI-S-E3: Intelligent Loop Interface-Expansion Board

ILI95-S-E3: Intelligent Loop Interface-Expansion Board

ANX-SR: Addressable Node Expander-Single Ring

ANX-MR-FO: Addressable Node Expander-Multi-Ring Fiber Optic

ANX-MR-UTP: Addressable Node Expander-Multi-Ring Twisted-pair

LCD-E3: LCD-E3, LCD Keypad Display

LCD-SLP: LCD Color Touchscreen with five programmable switches

RPT-E3-UTP: Network Repeater, unshielded, twisted-pair

FML-E3: Multi-Mode Fiber-Optic Module

FSL-E3: Single-Mode Fiber-Optic Module

DACT-E3: Digital Alarm Communicator Transmitter

ANU-48: ANU-48 LED Driver Module

ASM-16: Addressable Switch Module

NGA: LCD Network Graphic Annunciator

PM-9: Power Supply Module, 120 VAC

PM-9G: Power Supply Module, 220/240 VAC

LCD-7100: Remote LCD Display

RAN-7100: Remote LCD Display

Note: For additional information on the cabinets, refer to the E3 Series Cabinets data sheet (Part Number: 9020-0649).

E3 Series® Control Panel Technical Specifications

Seismic Battery Bracket Kits

For information on the types of Seismic Battery Bracket Kits that are available, the Seismic Battery Bracket Kit Part Numbers and the Installation Instructions, refer to the following documents:

- Seismic Battery Bracket Installation Guide, P/N: 53839
- E3 Series Cabinets Data Sheet, P/N: 9020-0649

SYSTEM

Operating Voltage: 24 VDC

Operating Temperature: Not to exceed the range of 32°-120° F (0 -49° C)

Relative Humidity: Not to exceed 93%, non-condensing at 90° F (32° C)

Primary Power Supply: 9 amps @ 55 AH capacity

TEMPERATURE AND HUMIDITY RANGES

This system meets NFPA requirements for operation at 0 – 49°C/32 – 120°F and at a relative humidity 93% ± 2% RH (noncondensing) at 32°C ± 2°C (90°F ± 3°F).

However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15 – 27°C/60 – 80°F.

STANDARDS

The E3 Series fire alarm control panel is designed to comply with the following standards:

UL Standards

UL 864 9th Edition:

- Automatic Fire Detector Alarm
- Manual Fire Alarm
- Waterflow Alarm
- Supervisory
- Releasing Device Service
- Releasing/Pre-Action Deluge
- Releasing/Agent Releasing
- Automatic Smoke Alarm,
- Non-coded and Master Coded Operation

UUKL for Smoke Control

UL 2572 for Mass Notification Systems

NFPA Standards

NFPA 13 - Standard for Installation of Sprinkler Systems

NFPA 16 - Standard for Foam-Water Sprinkler and Foam Water Spray Systems

NFPA 72 - National Fire Alarm Code:

Central Station Fire Alarm Systems

Auxiliary Fire Alarm Systems

Proprietary Fire Alarm Systems

Local Fire Alarm Systems

Remote Station Fire Alarm Systems

NFPA 13 Sprinkler

NFPA 12A Halon 1301

NFPA 15 Water Spray

NFPA 16 Foam Water

NFPA 750 Water Mist

NFPA 2001 Clean Agent

NFPA 12 CO2 Carbon Dioxide

NFPA 17 Dry Chemical/17A Wet Chemical

Seismic Codes

International Building Code

IBC 2013

IBC 2009

IBC 2006

IBC 2003

IBC 2000 (Seismic)

California Building Code CBC 2007 (Seismic)

STANDARDS

The E3 Series Control Panel is designed to comply with the following standards:

UL Standards: UL 864 9th Edition

UL 2572 for Mass Notification

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

UL: S1869, 2572 for Mass Notification

FM: 3025415

MEA FDNY: 6175, COA #: 231-06-E

CSFM: 7165-1703:0125

City of Chicago: Class 1, Class 2, High Rise

City of Denver Approved

The VMC Group, Reference Certificate of Compliance:

VMA-45894-02C (Revision 1)

ISO 9001 Certification

For a complete listing of all compliance approvals and certifications, please visit:

<http://www.gamewell-fci.com/en-US/documentation/Pages/Listings.aspx>

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This document is not intended to be used for installation purposes. We try to keep our product information up-to-date and accurate. We cannot cover all specific applications or anticipate all requirements. All specifications are subject to change without notice.

For more information

Learn more about Gamewell-FCI's E3 Series® Control Panel and other products available by visiting www.Gamewell-FCI.com

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E3 SERIES® CABINETS

Cabinets used for the E3 Series System

The E3 Series® Cabinets offer a variety of cabinet options to house either the E3 Series or S3 Series fire alarm control panel systems.

GENERAL

The E3 Series® Expandable Emergency Evacuation System by Gamewell-FCI offers several cabinet size options. The E3 Series System is a modular design that allows a wide range of configurations to form an integrated, distributed fire alarm system. These cabinet options allow for sturdy and modern installations. The E3 Series cabinet assembly is a compact, wall-mounted enclosure. A typical cabinet includes a backbox and an outer locking door. In addition, there are several inner door options and mounting plates to accommodate a variety of E3 Series sub-assemblies.

Each cabinet backbox includes mounting patterns for plates to allow the installer to arrange and secure the sub-assemblies to the backbox. The backbox knockouts are also positioned at numerous points to allow a conduit access into the enclosure.

There are four Annunciator cabinet sizes which provide the maximum flexibility that can meet any application:

- Cabinet AA offers 2 slot or 3 slot options to accommodate any of the following configurations:
 - Inner door, 2 slots allows space for one LCD-E3 or LCD-SLP and one ASM-16
 - Inner door, 3 slots allows space for any combination of three modules: ASM-16, NGA or an ANU-48
- Cabinet A1 houses one NGA or one ASM-16/ANU-48.
- Cabinet A2 accommodates a single LCD-E3.
- E3BB-FLUSH-LCD or E3BB-NGA-FLUSH.

The E3BB-R-B-Slim or B-Slim contains the 600 Series cabinet. Cabinet B includes a mounting plate that contains a space for the following modules:

- ILI-MB-E3/ILI95-MB-E3
- PM-9/PM-9G sub-assemblies
- Batteries set inside the backbox

Additional sub-assembly options mounted on the backbox include the DACT-E3 and RPT-E3. The 2 slot inner door houses the following options:

- one LCD-E3 module and
- either one ASM-16/ANU-48 or one NGA module

FEATURES AND BENEFITS

- IBC Seismic Certified
- 16-gauge steel backbox
- Offers cabinets available in either black or red
- Provides removable cabinet outer and inner doors
- Includes an inner door bonding strap used to provide electrical continuity for grounding
- Designed with Lexan® windows that appear on the outer doors of most cabinets, except the following cabinets that contain louvered doors:
 - Cabinet "C" INX
 - Cabinet "D" INX
 - Cabinet INX CAB-B
- Furnished backbox and door ground studs provide positive grounding. 180° opening door with full clearance
- Designed with a 90° opening door with zero clearance
- Contains a keylock with a quarter turn latch
- Optional Trim Ring accessories available



E3 Series® Cabinets

Honeywell



GENERAL

Both the C and D size Command Center cabinets house a variety of E3 Series Broadband sub-assemblies that can be used in multiple configurations that provide a solution to a wide range of applications. Two flexible inner door panel selections are available for C and D size Command Center cabinets that may contain any of the following:

- fire fighter's phone handset
- microphone
- optional modules to meet the facility operation requirements.

Refer to the Inner Door and Backbox Mounting Capacities in the Ordering Information Section.

ORDERING INFORMATION

Inner Door Mounting Capacity:

Cabinet "AA" Size:

Dimensions: 19 1/4"W x 10"H x 4 1/2"D, (49W x 25H x 11.4D cm)

E3BB-BAA: Enclosure, Black, "AA" (LOC) Size

E3BB-RAA: Enclosure, Red, "AA" (LOC) Size

E31D2-TA: Inner Door, 2 Slots, (INCC-TEL & ASM-16)

E31D2-A: Inner Door, 2 Slots, (LCD-E3 or LCD-SLP & ASM-16)

E31D3-A: Inner Door, 3 Slots, (NGA, ASM-16 and MIC)

Cabinet "AA1" Size:

Dimensions: 8 3/4"W x 10"H x 4 1/2"D, (22W x 25H x 11.4D cm)

E3BB-BAA1: Remote Enclosure, Black, w/Inner Door, 1 slot, (NGA)

E3BB-RAA1: Remote Enclosure, Red, w/Inner Door, 1 Slot, (NGA)

Cabinet "A2" Size:

Dimensions: 13 1/4"W x 10"H x 4 1/2"D, (40W x 25H x 11.4D cm)

E3BB-BA2: Remote Enclosure, Black, w/Inner Door, 1 Slot, (LCD-E3 or LCD-SLP)

E3BB-RA2: Remote Enclosure, Red, w/Inner Door, 1 Slot, (LCD-E3 or LCD-SLP)

Flush Cabinet A2 Annunciators:

Dimensions: 13 1/4"W x 10"H x 4 1/2"D, (40W x 25H x 11.4D cm)

E3BB-FLUSH-LCD: CAB A2 Remote Flush LCD ANN with Key switch operation

E3BB-NGA-FLUSH: CAB A2 Remote Flush NGA ANN with Password protected

Cabinet "B-Slim" Size: (Retrofit Kits):

Dimensions: 14"W x 20"H x 4 1/2"D, (35.5W x 50.8H x 11D cm)

E3BB-RBSLIM: Assembly, Enclosure, B-SLIM, Red with Backplate and LCD-E3 Keyswitch plate.

IF600-RETROFIT: Door and Cab mounting plates, disable key switch and door lock (PK-625) for E3 Series upgrade.

ORDERING INFORMATION (CONTINUED)

Cabinet "B" Size:

Dimensions: 19 3/8"W x 19 3/8"H x 4 1/2"D, (49W x 49H x 11D cm)

E3BB-BB: Assembly, Backbox Enclosure, Black, "B" Size

E3BB-RB: Assembly, Backbox Enclosure, Red, "B" Size

E31D2-B: Inner Door, 2 Slots, "B" Size

1100-0460: INX-Transponder 19" (cm) Backbox with Door, Black

Dimensions: 19 3/8"W x 19 3/8"H x 4 1/2"D, (49W x 49H x 11.43 D cm)

Cabinet "C" Size:

Dimensions: 19 3/8"W x 30"H x 4 1/2"D, (49W x 76H x 11D cm)

E3BB-BC/INCC: Enclosure, Command Ctr, Black, "C" Size

E3BB-RC/INCC: Enclosure, Command Ctr, Red, "C" Size

E31D2-C: Assembly, Inner Door, Command Center, 2-Bay "C" Size

E31D3-C: Assembly, Inner Door, Command Center, 3-Bay "C" Size

E3BB-BC/INX: Assembly, Transponder, Black, "C" Size

E3BB-RC/INX: Assembly, Transponder, Red, "C" Size

E3-INCC-CPLATE: Command Center module mounting plate, "C" Size

E3-INX-CPLATE: Transponder mounting plate, "C" Size

Inner Door Mounting Capacity:

E3-ILI-CPLATE: Intelligent loop module mounting plate "C" Size

Cabinet "D" Size:

Dimensions: 19 3/8"W x 41"H x 4 1/2"D, (49W x 104H x 11D cm)

E3BB-BD/INCC: Enclosure, Command Center, Black, "D" Size

E3BB-RD/INCC: Enclosure, Command Center, Red, "D" Size

E31D2-D: Assembly, Inner Door, 2-Bay, "D" Size

E31D3-D: Assembly, Inner Door, 3-Bay, "D" Size

E3BB-BD/INX: Enclosure, Transponder, Black "D" Size

E3BB-RD/INX: Enclosure, Transponder, Red, "D" Size

E3-INCC-D-PLATE: Command Center module mounting plate "D" Size

E3-INX-D-PLATE: Transponder module mounting plate, "D" Size

Optional Extender Plates:

AM-50 Plate: AM-50 Extender Plate

FPT-GATE-3-EXT: FPT-GATE-3 Extender Plate

Optional Accessories:

1100-0450: Command Center, blank plate, single size

E3-BP: Inner door panel, blank, double size

90375: PM-9/PM-9G Adapter Plate Kit, Hardware

E3-TRIMKIT-A: Trim kit for "A"/"AA" size enclosure, black

E3-TRIMKIT-A1: Trim kit for "AA1" size enclosure, black

E3-TRIMKIT-A2: Trim kit for "A2" size enclosure, black

E3-TRIMKIT-B: Trim kit for "B" size enclosure, black

E3-TRIMKIT-C: Trim kit for "C" size enclosure, black

E3-TRIMKIT-D: Trim kit for "D" size enclosure, black

ORDERING INFORMATION (CONTINUED)

Bulk Amplification:

AA-100: 100 W Audio Amplifier, @70.7 V_{RMS} with 120 VAC

AA-120: 120 W Audio Amplifier, @25 V_{RMS} with 120 VAC

ACT-1: Audio coupling transformer, for audio systems w/multiple supplies.

FCI-CHG-120: Battery Charger, 25-120 A/H Gel cell

FCI-LBB: Battery box, accommodates batteries up to 55 A/H, (Black).

Cabinet C:

FCI-DR-C4B: Large Battery Backbox, Blank door, lock & keys, for backbox accepting 3 chassis, (Black).

FCI-DR-C4BR: Blank door, lock & keys, for backbox accepting 3 chassis, (Red).

SBB-C4: Backbox, 3 chassis, (Black)

Cabinet D:

FCI-DR-D4B: Blank door, lock & keys, for backbox accepting 4 chassis, (Black)

FCI-DR-D4BR: Blank door, lock & keys, for backbox accepting 4 chassis, (Red)

SBB-D4: Backbox, 4 chassis, (Black)

90516: 7100-Slim 7 A/H Seismic Battery Bracket Kit

Seismic Battery Bracket Kits:

E3 B-Slim 7 A/H Seismic Battery Bracket Kit

90517: 7100-Slim 12 A/H Seismic Battery Bracket Kit

E3 B-Slim 12 A/H Seismic Battery Bracket Kit

90518: E3 CAB-B 7 A/H Seismic Battery Bracket Kit

E3 CAB-C 7 A/H Seismic Battery Bracket Kit

E3 CAB-D 7 A/H Seismic Battery Bracket Kit

NetSOLO NS-INX 7 A/H Seismic Battery Bracket Kit

NetSOLO 7100 7 A/H Seismic Battery Bracket Kit

90519: E3 CAB-C (INX only) 12 A/H Seismic Battery Bracket Kit

E3 CAB-D (INX only) 12 A/H Seismic Battery Bracket Kit

NetSOLO NS-INX 12 A/H Seismic Battery Bracket Kit

90520: E3 CAB-B 18 A/H Seismic Battery Bracket Kit

E3 CAB-C 18 A/H Seismic Battery Bracket Kit

E3 CAB-D 18 A/H Seismic Battery Bracket Kit

Retrofit Kits:

For information on the Gamewell and 7200 Retrofit Kits, refer to the following Data Sheets.

9021-60678: Gamewell Retrofit Kits Data Sheet

9021-60733: 7200 Retrofit Kits Data Sheet

Inner Door Mounting Capacity

Part Number	Number of Components
Cabinet AA	
E3ID2-A - (Cabinet AA, Inner Door, 2 Slots)	
LCD-E3 Display and	ONE
ASM-16/ANU-48	ONE
E3ID2-TA - (Assembly, Door, Inner, TEL-E3)	
E3ID3-A - (Cabinet A, Inner Door, 3 Slots)	
NGA or ASM-16	ONE
ASM-16s/ANU-48	TWO
Cabinet AA1	
E3ID-A1 - (Cabinet AA1, Inner Door (includes Box)	
NGA or ASM-16	ONE
Cabinet A2	
E3ID-A2 - (Cabinet A2, Inner Door, (includes Box)	
LCD-E3	ONE
Cabinet B	
E3ID2-B - (Cabinet B, Inner Door, (includes Box)	
LCD-E3 Display and one ASM-16/ANU-48	ONE
NGA and one ASM-16/ANU-48	ONE
B-Slim Cabinet	
LCD-E3 Display & one RPT-E3 or one DACT-E3	ONE
ILI-MB-E3 or one ILI95-MB-E3	ONE
PM-9 or one PM-9G	ONE
Cabinet C	
E3ID2-C - (Cabinet C, Inner Door, 2 Slots)	
LCD-E3 Display and	ONE
Any combination of ASM-16/ANU-48, NGA or	FIVE
Microphone Assemblies	
Telephone Assembly	ONE
E3ID3-C - (Cabinet C, Inner Door, 3 Slots)	
Any Combination of ASM-16/ANU-48, NGA, or	SEVEN
Microphone Assemblies	
Telephone Assembly	ONE
Cabinet D	
E3ID2-D - (Cabinet D, Inner Door, 2 Slots)	
LCD-E3 Display	ONE
Any Combination of ASM-16/ANU-48, or NGA or	ELEVEN
Microphone and	
Telephone Assembly	ONE
E3ID3-D - (Cabinet D, Inner Door, 3 Slots)	
Any Combination of ASM-16/ANU-48, NGA or	THIRTEEN
Microphone Assemblies	
Telephone Assembly	ONE
Backbox Mounting Capacity	
E3BB-BAA - (Enclosure, "AA" (LOC) Size, Black)	
INI-VG Series Voice Gateway	ONE
E3BB-BAA1 - (AA1 Size Box/Door, Black)	
RPT-E3 Network Repeater	ONE
E3BB-BB B-Size Box/Door, Black	
PM-9/PM-9G Power Supply	ONE
ILI-MB-E3/ILI95-MB-E3 and	ONE
Additional ILI-MB-E3/ILI95-MB-E3	ONE
Loop Interface or ANX or	ONE
DACT-E3 Digital Communicator and	ONE
RPT-E3 Network Repeater	ONE
INX CAB-B Mounting Plate	
PM-9 or PM-9G	ONE
INI-VGX	ONE
AM-50 Series amplifiers	FOUR

Backbox Mounting Capacity (Continued)

Part Number	Number of Components
E3-INCC-C Plate	
PM-9/PM-9G Power Supply	ONE
INI-VG Series Voice Gateway	ONE
ILI-MB-E3/ILI95-MB-E3 Loop Interface and Additional ILI-MB-E3/ILI95-MB-E3/ANX Loop Interface or DACT-E3 Digital Communicator and RPT-E3 Network Repeater	ONE
Optional AM-50 or FPT-GATE-3 Extender Plate	ONE
E3-ILI-C Plate	
PM-9/PM-9G Power Supply	ONE
ILI-MB-E3 or ILI95-MB-E3	ONE
Additional ILI-MB-E3/ILI95-MB-E3 or ILI-S-E3/ILI95-S-E3 or ANX	TWO
DACT-E3	ONE
RPT-E3	ONE
Optional FPT-GATE-3 Extender Plate	ONE
E3-INX-C Plate	
PM-9/PM-9G Power Supply with one PM-9/PM-9G Adapter Plate	ONE
INI-VGX Voice Gateway	ONE
ILI-MB-E3 Loop Interface and Additional ILI-MB-E3/ILI95-MB-E3/ANX	ONE
DACT-E3 Digital Communicator and RPT-E3 Network Repeater	ONE
AM-50 Series Amplifier	FOUR
Optional FPT-GATE-3 Extender Plate	ONE

Backbox Mounting Capacity (Continued)

Part Number	Number of Components
E3-INCC-D Plate	
PM-9/PM-9G Power Supply	ONE
ILI-MB-E3 or ILI95-MB-E3	ONE
Additional ILI-E3 or ILI95-E3 Series or ANX	FOUR
DACT-E3 Digital Communicator	ONE
RPT-E3 Network Repeater	ONE
INI-VG Series	ONE
Optional AM-50 or FPT-GATE-3 Extender Plate	ONE
E3-INX-D Plate	
PM-9/PM-9G Power Supply	ONE
ILI-MB-E3 or ILI95-MB-E3	ONE
DACT-E3 Digital Communicator	ONE
RPT-E3 Network Repeater	ONE
INI-VG Series	ONE
AM-50 Series Amplifier	FOUR
Optional FPT-GATE-3 Plate	ONE
E3BB-BD - (D Size Box/Command Center (Voice), Black)	
PM-9/PM-9G Power Supply	ONE
INI-VG Series Voice Gateway	ONE
ILI-MB-E3/ILI95-MB-E3/ANX Loop Interface	FOUR
Additional ILI-MB-E3/ILI95-MB-E3/ANX Loop Interface or DACT-E3 Digital Communicator and RPT-E3 Network Repeater	ONE
Optional FPT-GATE-3 Plate	ONE
E3BB-BD - (D Size Box/Command Center, Black)	
PM-9/PM-9G Power Supply	ONE
ILI-MB-E3/ILI95-MB-E3/ANX Loop Interface & Additional ILI-MB-E3/ILI95-MB-E3/ANX Loop Interface or DACT-E3 Digital Communicator and RPT-E3 Network Repeater	SEVEN
Optional Extender Plates	
AM-50 Extender Plate	
AM-50-25 or AM-50-70	ONE
FPT-GATE-3 Extender Plate	
FocalPoint® Gateway	ONE
PNET-1	ONE
Optional FPT-GATE-3 Extender Plate	ONE

E3 SERIES® CABINETS TECHNICAL SPECIFICATIONS

STANDARDS

The E3 Series fire alarm control panel cabinets are designed to comply with the following standards:

UL Standards: UL 864, 10th Edition:

- Automatic Fire Detector Alarm
- Manual Fire Alarm
- Waterflow Alarm
- Supervisory
- Releasing Device Service
- Releasing/Pre-Action Deluge
- Releasing/Agent Releasing
- Automatic Smoke Alarm, Non-coded and Master Coded Operation

Underwriters Laboratories Standard UL 2572, 2nd Edition (for Mass Notification Systems)

UUKL for Smoke Control

NFPA Standards

NFPA 13 - Standard for Installation of Sprinkler Systems

NFPA 16 - Standard for Foam-Water Sprinkler and Foam Water Spray Systems

NFPA 72 - National Fire Alarm Code:

- Central Station Fire Alarm Systems
- Auxiliary Fire Alarm Systems
- Proprietary Fire Alarm Systems
- Local Fire Alarm Systems
- Remote Station Fire Alarm Systems

NFPA 13 Sprinkler

NFPA 12A Halon 1301

NFPA 15 Water Spray

NFPA 16 Foam Water

NFPA 750 Water Mist

NFPA 2001 Clean Agent

NFPA 12 CO2 Carbon Dioxide

NFPA 17 Dry Chemical/17A Wet Chemical

Seismic Codes

International Building Codes:

IBC 2013

IBC 2009

IBC 2006

IBC 2003

IBC 2000 (Seismic)

California Building Code CBC 2007 (Seismic)

STANDARDS (CONTINUED)

The E3 Series Cabinets are designed to comply with the following standard:

UL Standard: UL 864, 10th Edition
UL 2572, 2nd Edition
for Mass Notification

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

UL Listed: S1869

ULS 864, 10th Edition

UL 2572, 2nd Edition

MEA Approved: 6177

MEA FDNY: COA# 6077

CSFM: 7165-1703-0125

FM Approved: 3025415

City of Chicago

City of Denver

VMA Seismic Certified

ISO 9001 Certification

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Country of origin: U.S.A.

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ILI-E3 Series

Intelligent Loop Interface-Main Board

ILI-MB-E3

The Intelligent Loop Interface-Main Board (ILI-MB-E3) is the main interface for the E3 Series® product line. With its state-of-the-art 32 bit RISC processor, this compact “panel on a board” provides a powerful addition to the Gamewell-FCI’s single-pair conductor solutions. The ILI-E3 Series is used in the following systems.

- E3 Series Expandable Emergency Evacuation System
- E3 Series Combined Fire and Mass Notification System
- E3 Series Broadband Voice Command Center

This intuitive design provides the following features:

- two signaling line circuits
- local energy city box output
- two notification application circuits
- auxiliary power output
- auxiliary relay functions

These features, combined with the built-in network and the serial protocols, allow this module to support a host of new and existing products, resulting in a building block approach to the fire alarm control panel design.

The ILI-MB-E3 is network-ready and occupies 1 of 64 nodes operating at 625K baud. In addition, the Addressable Node Expander (ANX) board expands the network to 122 nodes. When this sub-assembly is integrated with proven Broadband components, the result is a flexible yet powerful integrated audio solution. When the system transmits to remote locations, the optional RPT-E3-UTP provides the ILI-MB-E3 with valuable signal boosting and transient protection, as well as connectivity using both wire and fiber-optic cables.

The ILI-MB-E3 provides two signaling line circuits and terminals for the connections to up to 159 detectors, 159 modules and 159 addressable sounder bases per SLC in Velociti® mode. In CLIP™ mode, each SLC supports 99 detectors and 99 modules. The RS-485 interface can support a variety of peripheral devices.

The ILI-MB-E3 relay outputs include system alarm, supervisory, and system trouble contacts. The ILI-MB-E3 provides output for a local energy city master box or remote location which is non power-limited. All other wiring is Class 2 power-limited.

*Style 7 wiring requires the use of the System Sensor M500X Isolator Modules.

FEATURES & BENEFITS

ILI-MB-E3 & ILI-S-E3:

- Listed under UL® Standard 864, 9th Edition
- Listed under UL Standard UL2572 for Mass Notification
- UL Listed and FM Approved for Pre-Action/Deluge and Agent Releasing

- Provides signaling line circuits with the following:
 - 2 Class A, Style 6, 7* or Class B, Style 4 circuit
 - 40 Character user-defined text per device
- Capacity of 159 sensors, 159 addressable modules and 159 addressable sounder bases per circuit

- Includes 8100 Event History Log
- Uses a network ready integral 625K baud ARCNET
- Supports 115.2K baud RS-232

ILI-MB-E3 Only:

- Automatically adjusts to any NAC End-of-Line Resistor (EOL) value (1k-55k ohm) for legacy audible/visual appliances
- Two notification appliance circuits, Class “A”, Style Z or Class B, Style Y rated at 2.0 amps. per circuit

- Offers an RS-485 supporting 16 ASM-16 switch modules and/or ANU-48 LED driver modules



ILI-MB-E3



ILI-S-E3

ILI-S-E3

The Intelligent Loop Interface - Expansion Board (ILI-S-E3) provides the E3 Series control panel with two additional electrically isolated signaling line circuits. The layout is similar to the ILI-MB-E3 except a number of components are omitted. The ILI-S-E3 occupies one node on the Broadband network. The ILI-S-E3 provides two signaling line circuits and terminals for the connections to up to 159 detectors, 159 modules and 159 addressable sounder bases per SLC in Velocity mode. In CLIP mode, each SLC supports 99 detectors and 99 modules.

Installation

Typically, the ILI-MB-E3 or ILI-S-E3 can be mounted in the following E3 Series cabinets:

Cabinet B Backbox: B-Slim-E3

Cabinet C Backbox: E3-ILI-CPLATE
E3-INCC-CPLATE
E3-INX-CPLATE

Cabinet D Backbox: E3-INCC-DPLATE
E3-INX-DPLATE

ILI-MB-E3/ILI-S-E3

For instructions on the installation of the ILI-MB-E3 or ILI-S-E3, refer to the following documents:

- E3 Series® Expandable Emergency Evacuation Manual, Part Number: LS10080-051GF-E
- ILI-MB-E3 Installation Instructions, Part Number: 9000-0579
- ILI-S-E3 Installation Instructions, Part Number: 9000-0569

For information on the ILI95-MB-E3 and ILI95-S-E3, refer to the ILI95-E3 Series Data Sheet, Part Number, 9021-60336.

For information on the ANX, refer to the ANX Data Sheet, Part Number, 9021-60497.

Ordering Information

ILI-MB-E3: Intelligent Loop Interface-Main Board

ILI-S-E3: Intelligent Loop Interface-Expansion Board

ILI-E3 Series Technical Specifications

SYSTEM

ILI-MB-E3 only

ILI-MB-E3 Operating Current: 0.081 amp

ILI-MB-E3 Alarm Current: 0.150 amp max.

ILI-S-E3 Operating Current: 0.118 amp

ILI-S-E3 Alarm Current: 0.119 amp

ILI-MB-E3 and ILI-S-E3

Operating Voltage: 24 VDC FWR (from the PM-9/PM-9G Power Supply)

Operating Temperature: 32° to 120° F (0° to 49° C)

Relative Humidity: 0 to 93%, non-condensing at 90° F (32° C)

Supervised

Class 2 Power-Limited

SLC 40 Ohms maximum line impedance 0.5 if maximum line capacitance

TEMPERATURE AND HUMIDITY RANGES

This system meets NFPA requirements for operation at 0 – 49°C/32 – 120°F and at a relative humidity 93% ± 2% RH (noncondensing) at 32°C ± 2°C (90°F ± 3°F).

However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15 – 27°C/60 – 80°F.

STANDARDS

The ILI-E3 Series are designed to comply with the following standard:

UL Standard: UL 864 9th Edition
UL 2572 for Mass Notification

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult the factory for the latest listing status.

UL Listed: S1869, UL 2572 for Mass Notification

FM Approved: 3025415

MEA Approved, Fire Dept. of New York: COA# 6077

CSFM: 7165-1703-0125

City of Chicago : Class 1, Class 2 and High Rise

City of Denver

ISO 9001 Certification

For a complete listing of all compliance approvals and certifications, please visit:

<http://www.gamewell-fci.com/en-US/documentation/Pages/Listings.aspx>

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For more information

Learn more about Gamewell-FCI's ILI-E3 Series and other products available by visiting www.Gamewell-FCI.com

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Honeywell

AM-50 Series Amplifiers

50 Watt Digital Amplifiers

General

The Gamewell-FCI, AM-50 Series amplifiers are a 50 watt, digital, switching power amplifier. The following lists the two types of AM-50 Series amplifiers that may be ordered.

- The AM-50-25 amplifier produces 25 V_{RMS} audio output.
- The **AM-50-70** amplifier produces 70.7 V_{RMS} audio output.

The amplifiers are components of the following E3 Series® Systems.

- E3 Series Expandable Emergency Evacuation System
- E3 Series Combined Fire and Mass Notification System
- E3 Series Broadband Voice Evacuation System

Each AM-50 Series amplifier provides two speaker circuits that can be wired Style Y (Class “B”) or Style Z (Class “A”). The terminal connections can accommodate up to 12 AWG, twisted-pair, shielded wire. Both speaker circuits produce a combined total of 50 watts of power. The 50 watts of power can be divided between the two integral Class A/B speaker circuits. The two speaker circuits may be individually activated and supervised by an INI-VGX Transponder Voice Gateway.

The AM-50 Series amplifier can be programmed to broadcast sixteen messages generated from its local INI-VGX Voice Gateway. In addition, the AM-50 Series amplifiers produce superior clarity for intelligible LIVE voice paging.

When the selected System Sensor, speakers are used with the Manufacturer’s 520 Hz audiophile, the E3 Series® System is compliant with UL Standard 464 Low Frequency requirements.

Installation

As many as four AM-50 Series amplifiers can be installed in the following cabinets when supervised and controlled by an INI-VGX Voice Gateway.

- Cabinet B, INX CAB-B • Cabinet C, INX-CAB-C • Cabinet D, INX-CAB-D

WARNING: AM-50 Series Amplifiers Node Restriction:

The INI-VGX can support up to four AM-50 Series amplifiers with the same output voltage. However, you cannot wire an AM-50-25 amplifier and an AM-50-70 amplifier to the same INI-VGX Voice Gateway Node between the four amplifiers, max. of 150 watts are allowed.

The AM-50 Series amplifiers can be installed using the AM-50 Extender Plate whenever the E3 Series control panel is used in conjunction with the Autonomous Control Unit (ACU) of the E3 Series Combined Fire and Mass Notification System.



AM-50-25



AM-50-70

FEATURES & BENEFITS

- | | | | | |
|---|--|--|---|---|
| <ul style="list-style-type: none"> • Listed under UL® Standard 864, 9th Edition • Listed under UL Standard UL2572 for Mass Notification | <ul style="list-style-type: none"> • Complies with UL Standard 464 for 520 Hz Low Frequency | <ul style="list-style-type: none"> • Provides digital, switching amplifier technology • Produces 50 watts of digital power | <ul style="list-style-type: none"> • Includes 2 speaker circuits, wired Style Y (Class B) or Style Z (Class A) | <ul style="list-style-type: none"> • Up to 4 AM-50 Series amplifiers with the same output voltage can be controlled by the INI-VGX voice gateway |
|---|--|--|---|---|

AM-50 Series Amplifiers Technical Specifications

SPECIFICATIONS

AM-50-25 Amplifier

Operating Voltage: 27.3 to 20.4 VDC

Operating Current: 0.086 amp normal standby

Alarm Current: 2.206 amp max. alarm @ 50 Watt

Audio Output: 50 watts max. @ 25 V_{RMS}

AM-50-70 Amplifier

Operating Voltage: 27.3 to 20.4 VDC

Operating Current: 0.049 amp normal standby

Alarm Current: 2.30 amp max. alarm @ 50 watt

Audio Output: 50 watts max. @ 70.7 V_{RMS}

AM-50 Series Amplifiers

Relative Humidity: 0 to 93% max., (non-condensing) at 90° F (32° C)

Operating Temperature: 32° to 120° F (0° to 49° C)

Dimensions: 7 1/2" W x 3 1/2" H x 1 1/4" D
(19 W x 9 H x 3 D cm)

TEMPERATURE AND HUMIDITY RANGES

This system meets NFPA requirements for operation at 0 – 49°C/32 – 120°F and at a relative humidity 93% ± 2% RH (noncondensing) at 32°C ± 2°C (90°F ± 3°F).

However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15 – 27°C/60 – 80°F.

Ordering Information

1100-0456: AM-50, 25V_{RMS} audio output, 50 watt amplifier

AM-50-70: AM-50, 70.7V_{RMS} audio output, 50 watt amplifier

STANDARDS

The AM-50 Series amplifiers are designed to comply with the following standards:

UL Standards: 864 9th Edition
2572 for Mass Notification
464 Low Frequency

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult the factory for the latest listing status.

UL Listed: S1869

FM Approved: 3017416

MEA Approved, Fire Dept. of New York: COA# 6077

CSFM: 7165-1703-0125

City of Chicago: Class 1, Class 2, High Rise

City of Denver Approved

ISO 9001 Certification

For a complete listing of all compliance approvals and certifications, please visit:

<http://www.gamewell-fci.com/en-US/documentation/Pages/Listings.aspx>

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This document is not intended to be used for installation purposes. We try to keep our product information up-to-date and accurate. We cannot cover all specific applications or anticipate all requirements. All specifications are subject to change without notice.

For more information

Learn more about Gamewell-FCI's AM-50 Series Amplifiers and other products available by visiting www.Gamewell-FCI.com

Honeywell Gamewell-FCI

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www.honeywell.com

9020-0556 | L | 09/17
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Honeywell

ASM-16

ASM-16 Addressable Switch Module

General

The Gamewell-FCI, ASM-16 Addressable Switch Module serves as the point of interface between an operator and the system's audio evacuation, fire fighter intercom, and building control circuits. It is a component of the following systems:

- E3 Series® Expandable Emergency Evacuation System
- E3 Series Combined Fire and Mass Notification System
- E3 Series Broadband Voice Evacuation System

The ASM-16 is a configurable switch input sub-assembly with 16 switches and 48 status LEDs. It may be remotely located via the RS-485 serial interface. Each ASM-16 addressable switch module has 16 push-button switches that can be programmed to serve any function the application demands.

An ASM-16 switch can be programmed to operate as any of the following functions:

- Speaker circuit switch
- Auxiliary control switch (using a bank of 2 switches 1 switch each for on-off-auto functions).
- Fire fighter phone switch
- Switches with custom-defined functions:
 - System Reset
 - System Silence
 - System Acknowledge
 - All-call, phone patch
 - Lamp test, alarm tone on
 - Manual select, etc.

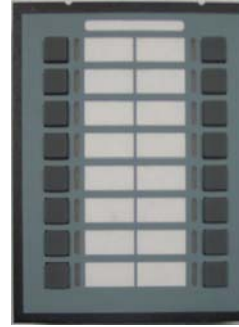
Each ASM-16 switch has three fully programmable LEDs that appear in red, yellow, and green. These LEDs can be programmed to work in concert with their associated pushbutton switch or they can be programmed to work independently as status indicators (for example, ON, OFF, NORMAL etc.). An INI-VGC assembly or ILI-MB-E3/ILI95-MB-E3 can accommodate up to 16 ASM-16 modules for a total of 256 switches and 768 LEDs.

Ordering Information

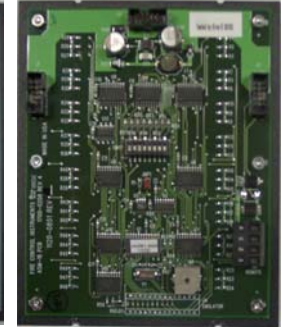
1100-0455: Programmable Addressable Switch Module

FEATURES & BENEFITS

- Listed under UL® Standard 864, 9th Edition
- Listed under UL® Standard UL2572 for Mass Notification
- Each INI-VGC supports up to 16 ASM-16 switch modules for a total of 256 switches
- All switch functions are fully software programmable
- Each ILI-MB-E3/ILI95-MB-E3 supports up to 16 ASM-16 switch modules for a total of 256 switches
- Each ASM-16 switch has three fully programmable status, indicating LEDs: red, yellow, and green
- Slip-in label inserts allow easily modified switch designations



ASM-16 Front View



ASM-16 Rear View

ASM-16 Technical Specifications

SPECIFICATIONS

Operating Voltage: 24 VDC (nominal) (from the PM-9/PM-9G power supply)

Operating Current: 0.011 amp. (with no LEDs lit)

Each LED draws 3mA when active.

With all 48 LEDs activated, the ASM-16 draws 155 mA.

Operating Temperature: 32° to 120° F (0° to 49° C)

Relative Humidity: 0 to 93% (non-condensing) at 90° F (32° C)

TEMPERATURE AND HUMIDITY RANGES

This system meets NFPA requirements for operation at 0 – 49°C/32 – 120°F and at a relative humidity 93% ± 2% RH (noncondensing) at 32°C ± 2°C (90°F ± 3°F).

However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15 – 27°C/60 – 80°F.

STANDARDS

The ASM-16 is designed to comply with the following standard:

UL Standard: UL 864 9th Edition

UL 2572 for Mass Notification

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult the factory for the latest listing status.

UL Listed: S1869, UL 2572

FM Approved: 3017416

MEA FDNY: COA 231-06-E

CSFM: 7165-1703:0125, 7165-1703:0126

City of Chicago Approved: Class 1, Class 2, High Rise

City of Denver Approved

ISO 9001 Certification

For a complete listing of all compliance approvals and certifications, please visit:

<http://www.gamewell-fci.com/en-US/documentation/Pages/Listings.aspx>

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For more information

Learn more about Gamewell-FCI's ASM-16 and other products available by visiting www.Gamewell-FCI.com

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INI-VG Series

Intelligent Network Interface Voice Gateway

General

The INI-VG Series (Intelligent Network Interface-Voice Gateway) is a network interface with superior Audio and Command/Control that is used for E3 Series fire alarm and voice evacuation systems. The modular design allows the INI-VG Series to be used in any type of system configuration to function as a voice network interface for any of the following:

- Fire Command Center
- Digital Audio Voice Transponder
- Analog Audio Voice Transponder
- Autonomous Control Unit (ACU) for Mass Notification
- Local Operating Console (LOC) for Mass Notification

With a Class B signaling line circuit (SLC), the INI-VG can monitor and control up to sixteen AOM-TELF telephone modules to use with the fire fighter telephones or serve as value Local Operating Consoles (LOC). In addition, it can support up to 16 AOM-2SF, signal output modules that can be used for distributed audio control.

Networked through single-mode fiber optics, multi-mode fiber optics, and/or twisted-pair wire, the INI-VG Series resides on the E3 Series and/or S3 Series network, represented as a node with fully independent control. Each INI-VG Series provides its own internal recorded message storage that operates as a redundant back-up in case another panel is no longer functional.

Each version of the INI-VG Series features a unique functionality that can operate as any of the following, depending on how each version is used with the application:

- Digital Audio Voice Transponder (INI-VGX) connects up to three main amplifiers and one back-up amplifier to control over 150 watts of audio per board.
- Analog Audio Voice Transponder (INI-VGE) connects to analog bulk amplifiers and distributes audio using 16 AOM-2SF modules.
- Fire Command Center (INI-VGC) connects hand-held microphones and main fire fighter telephones.



INI-VG Series

FEATURES & BENEFITS

- Listed under UL® Standard 864, 9th Edition
- Listed under UL Standard UL2572 for Mass Notification
- Supports a network data transfer rate at 625K baud
- Controls all communication signals and control-by-event sequences over twisted, unshielded pair of wires or fiber-optic cable
- All INI-VG Series Modules connect to a voice page microphone and fire fighter's handset
- Uses advanced Digital Signal Processor (DSP) technology that provides efficient audio compression and filtering
- Offers the following fiber-optic plug-in modules used for fiber-optic connectivity
 - FML-E3 (fiber-optic multi-mode)
 - FSL-E3 (fiber-optic single-mode)
- Supports Distributed Architecture, including Style 7 wiring configuration, that allows system components to continue normal operation with NO loss of function during single line fault conditions
- Provides Redundant Command Centers with a microphone and a fire fighter's handset which can easily be configured by adding INCCs

INI-VGC

The INI-VGC Voice Gateway Module is optimized to provide command and control functions for the INCC Command Center. The INCC serves as the point of interface between an operator and the system's audio evacuation, fire fighter intercom, and building control circuits.

A typical INCC assembly consists of the following:

- an Intelligent Network Interface-Voice Gateway (INI-VGC) Module
- one or more Addressable Switch Modules (ASM-16)
- a Voice Page Microphone (INCC-MIC)

Each INI-VGC can support up to 16 ANU-48 LED Driver Modules or ASM-16s for a total of 256 fully programmable switches and 768 LEDs that light in red, yellow, and green.

The INI-VGC occupies a single node on the E3 Broadband network and it is connected by a single, pair of twisted, unshielded wire, fiber-optic cable or any combination of the two. The INCC Command Center's INI-VGC module also provides connections for an optional fire fighter telephone handset.

The INI-VGC is a fully digital voice/tone generator using state-of-the-art Digital Signal Processing (DSP) technology to produce superior audio signals. The INI-VGC provides an output to a local speaker for message verification and testing.

INI-VGE

The INI-VGE Voice Gateway Module provides an audio interface to the bulk analog amplifiers and command and control functions for the INCC Command Center. A typical INCC assembly consists of the following:

- an Intelligent Network Interface-Voice Gateway (INI-VGE) Module
- one or more Addressable Switch Modules (ASM-16)
- a Voice Page Microphone (INCC-MIC)

Each INI-VGE can support up to 16 ANU-48 LED Driver Modules or ASM-16s for a total of 256 fully programmable switches and 768 LEDs that light in red, yellow, and green.

The INI-VGE occupies a single node on the E3 Series Classic network and is connected by a single pair of twisted, unshielded wire, fiber-optic cable or any combination of the two. The INCC Command Center's INI-VGE module also provides connections for an optional fire fighter telephone handset. The INI-VGE's one Signaling Line Circuit (SLC) loop supports the following:

- 16 remote Fire Fighter Phones
- 32 Supervised Audio Control Relays

The INI-VGE is a fully digital voice/tone generator using state-of-the-art Digital Signal Processing (DSP) technology to produce superior audio signals. The INI-VGE provides an audio output capable of driving up twenty 100 watt (AA-100) or 120 watt (AA-120) amplifiers.

INI-VGX

The INI-VGX Transponder Voice Gateway is a component of the E3 Broadband Audio Evacuation System and an optional component of the E3 Series Expandable Emergency Evacuation System. It is a multi-function module that incorporates the following:

- Software-programmable multi-channel digital audio applications.
- One Class B, Style 4 Signaling Line Circuit (SLC) supporting up to 32 addressable speaker circuits (AOM-2SF) and 16 addressable phone circuits (AOM-TELF).
- Supports up to 150 watts of audio power (using the AM-50 Series amplifiers operating at 50 watts of power @ either 25V_{RMS} or 70.7V_{RMS} output) with backup amplifier support.
- Offers a sixteen message capacity with up to 3 minute total duration per INI-VGX. The messages are easily field-configured via a laptop computer.
- Network interface using twisted, unshielded wire or fiber-optic cable.
- Local fire fighter phone riser.

The INI-VGX provides command and control for up to four AM-50 Series amplifiers, operating at 50 watts of power @ either 25V_{RMS} or 70.7V_{RMS} audio output (up to 150 W of audio may be delivered at any given time). The amplifiers are installed in a single cabinet. The INI-VGX uses advanced Digital Signal Processing (DSP) technology for audio compression and filtering. This feature allows the E3 Series Broadband System to produce superior clarity for intelligible LIVE voice paging. The background noise is automatically filtered during voice paging and fire fighter communications which increases the audibility and eliminates the need for Push-to-Talk devices.

INI-VG Series Technical Specifications

SPECIFICATIONS

INI-VGC, INI-VGE and **INI-VGX**:

Operating Voltage: 24 VDC (nominal) from the PM-9/PM-9G Power Supply

Operating Current: 0.150 amp. supervisory and alarm

Operating Temperature: 32 - 120° F (0 - 49° C)

Relative Humidity: 0 to 93% (non-condensing)

Supervised

Class 2 Power-Limited

Protocol: Asynchronous with half-duplex data flow

Wiring Specifications:

INI-VG Series (Third Generation Voice Gateway and Legacy-UTP Models):

Copper Wire: 16 to 18 AWG twisted-pair, unshielded. Up to 3,000 ft. (914.4 m) between each node.

Fiber-Optic Cable:

FML-E3 (Multi-Mode): Up to 200 microns (optimized for 62.5/125 microns). Up to 8dB loss between each node.

FSL-E3 (Single-Mode): Up to 1310nm (nanometer) (optimized for 9/125microns). Up to 30dB loss between nodes.

TEMPERATURE AND HUMIDITY RANGES

This system meets NFPA requirements for operation at 0 - 49°C/32 - 120°F and at a relative humidity 93% ± 2% RH (non-condensing) at 32°C ± 2°C (90°F ± 3°F).

However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15 - 27°C/60 - 80°F.

ORDERING INFORMATION

INI-VG Series (Third Generation-Voice Gateway Models):

INI-VGC: (Command Center Voice Gateway (UTP only)

INI-VGE: Command Center Classic Voice Gateway (UTP only)

INI-VGX: Transponder Voice Gateway (UTP only)

Accessories:

FML-E3: Multi-Mode Fiber-Optic Module

FSL-E3: Single-Mode Fiber-Optic Module

INI-VG Series Legacy Models:

1100-1321: INI-VGC-FO (Command Center Voice Gateway-fiber-optic module)

1100-1322: INI-VGC-UTP (Command Center Voice Gateway-unshielded twisted-pair only)

1100-1325: INI-VGE-FO (Classic Bulk Voice Gateway-fiber-optic module)

1100-1326: INI-VGE-UTP (Classic Bulk Voice Gateway-unshielded twisted-pair only)

1100-1323: INI-VGX-FO (Voice Transponder Gateway-fiber-optic module)

1100-1324: INI-VGX-UTP (Voice Transponder Gateway-unshielded twisted-pair only)

STANDARDS

The INI-VG Series is designed to comply with the following standards:

UL Standards: UL 864 9th Edition

UL 2572 for Mass Notification

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult the factory for the latest listing status.

UL Listed: S1869

S1949

2572 for Mass Notification

FM Approved: 30006578

MEA Approved FDNY: COA #-6077

CSFM: 7165-1703:125

City of Chicago Approved: Class 1 Class 2 High Rise

City of Denver Approved

ISO 9001 Certification

For a complete listing of all compliance approvals and certifications, please visit:

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For more information

Learn more about Gamewell-FCI's INI-VG Series and other products available by visiting www.Gamewell-FCI.com

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PM-9

120 VAC Power Supply

General

The Gamewell-FCI, PM-9 Power Supply is a 120 VAC, 60 Hz switching power supply that provides 9 amperes of filtered and regulated 24 VDC (nominal). It provides the power to all of the E3 Series components.

It is a component of the following systems:

- E3 Series® Expandable Emergency Evacuation System
- E3 Series Combined Fire and Mass Notification System
- E3 Series Broadband Voice Evacuation System

The PM-9 has an internal battery charging circuit capable of maintaining up to 55 A/H batteries.

Installation

Typically, the PM-9 Module can be mounted in the following E3 Series cabinets:

- Cabinet B backbox
- Cabinet C, INX-E3 sub-assembly plate
- Cabinet C, INCC-E3 sub-assembly plate
- Cabinet D, E3-INX-D Plate
- Cabinet D, E3-ILI-D Plate
- Retrofit Kits

For information on the installation of the PM-9, refer to the following documents:

- E3 Series Expandable Emergency Evacuation Manual, P/N: LS10080-000GF-E
- PM-9 Installation Instructions, P/N: 9000-0548
- Mass Notification System Manual, P/N:LS10013-000GF-E

Ordering Information

PM-9: Power supply and battery charger, 120 VAC

29229: AC Line Filter Kit

FEATURES & BENEFITS

- Listed under UL® Standard 864, 9th Edition
- Includes 9 ampere, filtered, regulated power supply
- Provides 1 ampere battery charging current
- Offers energy and space saving switching technology
- Contains an integral battery charger capable of recharging up to 55 AH batteries. (Batteries not furnished)
- Listed under UL Standard UL2572 for Mass Notification



PM-9

PM-9 Technical Specifications

SYSTEM

Input Voltage: 120 VAC 60 Hz @ 3.5 A. max.

Output Voltage: 24 VDC (nominal) FWR

Output Current: 9 amperes

Output Current: 1 ampere battery charging current

Alarm Current: 0.050 amp

Operating Temperature: 32° to 120° F (0° to 49° C)

Relative Humidity: 0 to 93% (non-condensing) at 90° F (32° C)

Dimensions: 10 1/2" W x 5" H x 2" D
(27 x 13 x 5 cm)

TEMPERATURE AND HUMIDITY RANGES

This system meets NFPA requirements for operation at 0 – 49°C/32 – 120°F and at a relative humidity 93% ± 2% RH (noncondensing) at 32°C ± 2°C (90°F ± 3°F).

However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15 – 27°C/60 – 80°F.

STANDARDS

The PM-9 is designed to comply with the following standards:

UL Standards: UL 864 9th Edition
UL 2572 for Mass Notification

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult the factory for the latest listing status.

UL Listed: S1869, Vol. 14

UL Listed: S1949, Vol. 19

FM Approved: 3017416

MEA FDNY: COA 6077

CSFM: 7165-1703:0125

City of Chicago Approved: Class 1, Class 2, High Rise

City of Denver Approved

ISO 9001 Certification

For a complete listing of all compliance approvals and certifications, please visit:

<http://www.gamewell-fci.com/en-US/documentation/Pages/Listings.aspx>

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For more information

Learn more about Gamewell-FCI's PM-9 and other products available by visiting www.Gamewell-FCI.com

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LCD-SLP

LCD Touchscreen Annunciator Display

General

The Gamewell-FCI, Liquid Crystal Display, Smart Loop Panel (LCD-SLP) is a touchscreen annunciator display used with the S3 Series and E3 Series® Systems. The LCD-SLP provides an easy-to-use, intuitive interface for the operator's control. The 4.3" (10.92 cm) color touchscreen display shows the following:

- System Status
- Event Details
- Service Modes

The following identify the LED Indicators that display on the panel.

- AC (green)
- Fire Alarm (red)
- Hazard (blue)
- Supervisory (yellow)
- Trouble (yellow)
- Silenced (yellow)

The five fully-programmable front panel switch/LED combinations provide a direct access to perform the following tasks:

- Device Bypass
- Lamp Test
- Enable/Disable Groups or Devices

The display features the following physical switches.

- Menu
- System Reset
- Drift Walk Test
- Five Programmable Switches

Installation

The LCD-SLP panel's adaptable design allows it to be mounted in a variety of S3 Series, E3® Series or Retrofit cabinet installations. For additional information, refer to the E3 Series Cabinets Data Sheet, P/N:9020-0649.

- S3 Series Cabinets
 - SLP-BB basic system enclosure
 - S3BB-BB/S3BB-RB system enclosure
- E3 Series® Cabinets
 - AA size cabinet (E3BB-BAA, E3BB-RAA)
 - A2 size cabinet (E3BB-BA2, E3BB-RA2)
 - A size flush cabinet (E3BB-FLUSH-LCD)
 - B-Slim cabinet (E3BB-RBSLIM)
 - B size cabinet (E3BB-BB, E3BB-RB)
 - C size cabinet (E3BB-BC/INCC, E3BB-RC/INCC)
 - D size cabinet (E3BB-BD/INCC, E3BB-RD/INCC)
- Retrofit Cabinets
 - 600-RETROFIT
 - 7200-B-RETROFIT
 - 7200-C-RETROFIT

Ordering Information

LCD-SLP: LCD Touchscreen display unit

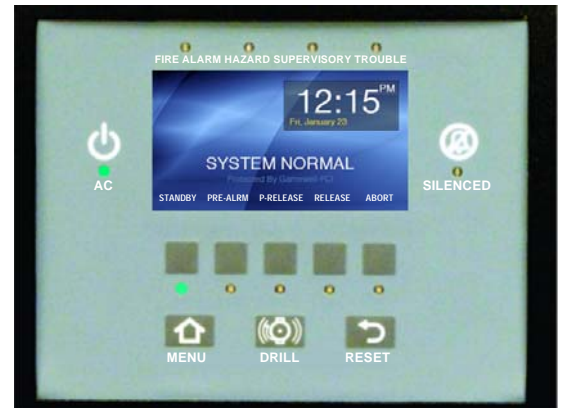
E3BB-BA2: Remote enclosure with inner door, black, one LCD slot

E3BB-RA2: Remote enclosure with inner door, red, one LCD slot

E3BB-FLUSH-LCD: Remote flush mounting enclosure, black, LCD slot

FEATURES & BENEFITS

- Listed per ANSI/UL® Standard 864 9th Edition
- UL Listed and FM approved for Pre-Action/Deluge and Agent Releasing
- Provides 4.3" (10.92 cm) color touchscreen display of System Events
- Includes five custom function buttons with LEDs for direct access to system controls.
- Shows the Hazard LED to indicate gas, carbon monoxide or other toxic gases
- Both the E3 Series (ILI-MB-E3/ILI95-MB-E3) and the S3 Series (SLP) support up to 15 LCD-SLP displays via the RS-485 serial interface
- Offers the following installation options:
 - Locally mounted in the E3 Series and S3 Series panels
 - Remotely mounted in the E3 Series, A2 cabinet
 - LCD Flush enclosure
- Displays the following six LED indicators:
 - AC Power
 - Alarm
 - Hazard
 - NAC Silence
 - Supervisory
 - Trouble



LCD-SLP

LCD-SLP Technical Specifications

SPECIFICATIONS

Operating Voltage: 24 VDC FWR

Operating Current: 0.030 amp

Alarm Current: 0.065 amp

Operating Temperature: 32°to120° F (0°to49° C)

Relative Humidity: 0 to 93%,non-condensing at 90° F (32° C)

TEMPERATURE AND HUMIDITY RANGES

This system meets NFPA requirements for operation at 0 – 49°C/32 – 120°F and at a relative humidity 93% ± 2% RH (non-condensing) at 32°C ± 2°C (90°F ± 3°F).

However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15 – 27°C/60 – 80°F.

STANDARDS

The LCD-SLP is designed to comply with the following standard:

UL Standard: UL 864 9th Edition:

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult the factory for the latest listing status.

UL Listed: S1869

FM Approved

MEA FDNY: COA # 6162

CSFM: ~~7165-1703:0176~~

City of Chicago Approved: Class 1

Reference Certificate of Compliance: MMA 45894-02C

ISO 9001 Certification

7165-1703:0125

PLEASE REFER TO
7165-1703:0125
WHICH INCLUDES LCD-SLP

For a complete listing of all compliance approvals and certifications, please visit:

<http://www.gamewell-fci.com/en-US/documentation/Pages/Listings.aspx>

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For more information

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INCC-MIC

Paging Microphone Module

General

The Gamewell-FCI, INCC-MIC Paging Microphone Module is a microphone interface used for emergency microphone paging. It is a component of the following Systems:

- E3 Series® Combined Fire and Mass Notification System
- E3 Series Broadband Voice Evacuation System

The INCC-MIC microphone provides a cost-effective microphone interface module that can be used for paging. When it is installed with the ASM-16 Addressable Switch Module, it provides easy paging to the selected speaker zones with visual indications of paging and zone status.

Installation

The INCC-MIC Paging Microphone Module can be installed in any of the following types of E3 Series cabinets:

- Cabinet AA
- Cabinet B
- Cabinet C
- Cabinet D

Note: Gamewell-FCI recommends that you install the speakers at 4 ft. (1.2 m) or more from the microphone.

Ordering Information

1100-0452: Paging Microphone Module



INCC-MIC

FEATURES & BENEFITS

- Listed under UL® Standard UL2572 for Mass Notification
- Listed under UL Standard S1869 9th Edition
- Delivers audio feedback cancellation
- Contains a supervised microphone
- Provides status bit activation when the microphone is in use
- Offers an easy installation
- Built with a pre-assembled microphone box and a microphone holder
- Includes a terminal block with an easy-to-use plug-in cable

INCC-MIC Technical Specifications

SYSTEMS

INCC-MIC : Paging Microphone Module

Microphone Box : Durable gauge steel construction with microphone holder

Dimensions: 5.5" W x 6.5" H x 2.75" D
(14 W x 16.5 H x 7 D cm)

TEMPERATURE AND HUMIDITY RANGES

This system meets NFPA requirements for operation at 0 – 49°C/32 – 120°F and at a relative humidity 93% ± 2% RH (non-condensing) at 32°C ± 2°C (90°F ± 3°F).

However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15 – 27°C/60 – 80°F.

STANDARDS

The INCC-MIC is designed to comply with the following standards:

UL Standards: 864 9th Edition
2572 for Mass Notification

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult the factory for the latest listing status.

UL Listed: S1869, 2572 for Mass Notification

MEA FDNY Approved: COA # 6077

ISO 9001 Certification

For a complete listing of all compliance approvals and certifications, please visit:

<http://www.gamewell-fci.com/en-US/documentation/Pages/Listings.aspx>

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This document is not intended to be used for installation purposes. We try to keep our product information up-to-date and accurate. We cannot cover all specific applications or anticipate all requirements. All specifications are subject to change without notice.

For more information

Learn more about Gamewell-FCI's INCC-MIC and other products available by visiting www.Gamewell-FCI.com

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DACT-E3

Digital Alarm Communicator Transmitter

General

The Digital Alarm Communicator Transmitter (DACT-E3) is a digital communications circuit. It is an optional component of the following systems.

- E3 Series® Expandable Emergency Evacuation System
- S3 Series Small Addressable Fire Alarm Control Panel

The DACT-E3 sends digital signals over the telephone network that transmits to a central station. This module can be located in the main cabinet or remotely located via a local RS-485 serial interface.

The DACT-E3 is compatible with digital alarm communicator receivers (DACRs) that receive the following signaling formats:

- SIA DC8
- SIA DCS20
- Ademco Contact ID
- 3+1 1400 Hz
- 3+1 2300 Hz
- 4+2 1400 Hz
- 4+2 2300 Hz

In addition to the DACT-E3 being compatible with digital signaling formats, the DACT-E3 features numerous formats for communication to a central station. As a digital communicator, the DACT-E3 complies with FCC Part 8, Telecommunication Standards for DC and AC Ringer Equivalence.

Installation

The DACT-E3 is adaptable for installation in the standard E3 Series and S3 Series System cabinets. Typically, the DACT-E3 module mounts on standoffs on top of the left side of the ILI-MB-E3/ILI95-MB-E3 or SLP (Smart Loop Panel) module. Either unit can be easily connected to the backbox or sub-assembly plate depending on the cabinet module.

For instructions on how to install the DACT-E3, refer to the following documents:

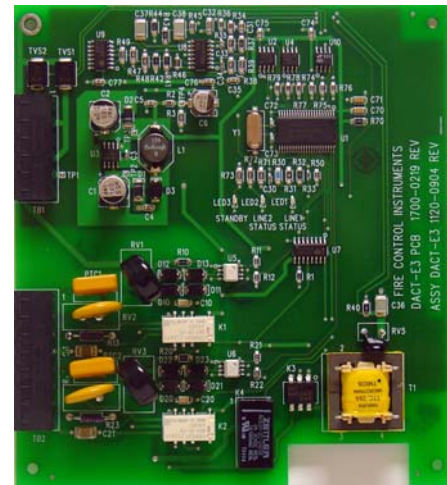
- E3 Series Expandable Emergency Evacuation Manual, P/N:LS10080-051GF-E
- DACT-E3 Installation Instructions, P/N:9000-0581
- S3 Series (Small Addressable Fire Alarm Control Panel) UL Listing Document, P/N:LS10005-051GF-E

Ordering Information

DACT-E3: Digital Alarm Communicator Transmitter

FEATURES & BENEFITS

- Listed under UL® Standard 864, 9th Edition
- Transmits and verifies data to the central station
- Communicates with the following sub-assemblies via the RS-485:
 - E3 Series
 - ILI-MB-E3
 - ILI95-MBE3
 - S3 Series, SLP
- Sends information in a variety of formats (including full Contact ID)
- Offers pre-programmed dialing to the central station phone number
- Performs on and off-hook status to the phone lines
- Traces proper central station "ACK" and "Kiss-off" tone
- Activates hang-up and release phone lines
- Compatible with the IPDACT Internet Communicator



DACT-E3

DACT-E3 Technical Specifications

SYSTEM

Operating Voltage: 24 VDC (from the PM-9/PM-9G power supply)

Operating Current: 0.018 amp

Alarm Current: 0.018 amp

Operating Temperature: 32° to 120° F (0° to 49° C)

Relative Humidity: 0 to 93%, non-condensing at 90° F (32° C)

TEMPERATURE AND HUMIDITY RANGES

This system meets NFPA requirements for operation at 0 – 49°C/32 – 120°F and at a relative humidity 93% ± 2% RH (noncondensing) at 32°C ± 2°C (90°F ± 3°F). However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15 – 27°C/60 – 80°F.

STANDARDS

The DACT-E3 is designed to comply with the following standard:

UL Standard: UL 864 9th Edition

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult the factory for the latest listing status.

UL Listed: S1869

FM Approved: 3025415

MEA Approved, Fire Dept. of New York: COA# 6077

CSFM: 7165-1703-0125

City of Chicago: Class 1, Class 2 and High Rise

City of Denver

For a complete listing of all compliance approvals and certifications, please visit:

<http://www.gamewell-fci.com/en-US/documentation/Pages/Listings.aspx>

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For more information

Learn more about Gamewell-FCI's DACT-E3 and other products available by visiting www.Gamewell-FCI.com

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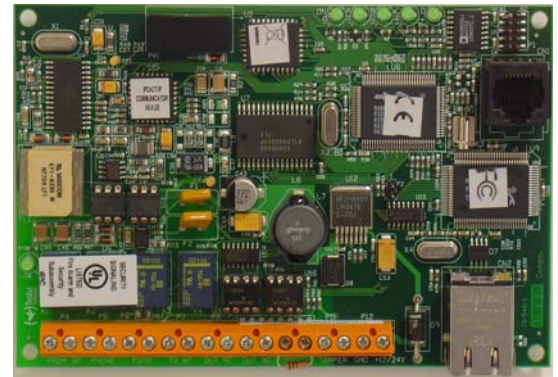
IPDACT-2

IP Fire Alarm Communicator

General

The IPDACT-2 is a compact Internet Protocol Digital Alarm Communicator/Transmitter Module. It is designed to transmit status communication to a Central Station via the Internet. During an alarm, a supervisory, or a trouble event, the IPDACT-2, using the Contact-ID protocol from the fire alarm control panel. The standard DACT phone communication is then converted to a highly encrypted Ethernet UDP packet, and then transmitted and received via the Internet to a compatible receiver at the Central Station. It can also test the connectivity between the fire alarm control panel and the Central Station. These features enable seamless integration into existing conventional Central Station architectures.

The IPDACT-2 operates in conjunction with the VisorALARM PLUS™ IP receiver located at the Central Station. The IPDACT-2 is designed to operate with Gamewell-FCI's, E3 Series® and GF505/GF510 Flex Series Systems. The IP Communicator provides faster and more economic digital alarm transmissions, improving response times and decreasing costs found with traditional analog systems. The IPDACT-2 offers value added features such as supervised line functionality, which allows a Central Station to detect any off-line alarm panels within seconds. No backup analog phone line is necessary. However, customers can still use a traditional backup phone line from the panel's second phone port if desired.



IPDACT-2

FEATURES & BENEFITS

- Listed under UL® Standard 864, 9th Edition
- Operates with the Gamewell-FCI's E3 Series panels equipped with DACT-E3 units and GF505/GF510 Flex Series Systems
- Saves the cost of two dedicated phone lines. Only the customer's shared IP equipment is required
- Provides compatibility to newer low-cost, non-analog, digital telephone services such as cable, or fiber optics
- Increases connection supervision to the Central Station from the once-a-day test signal to once every 90 seconds
- Produces fast alarm transmission (less than 10 second transmission time)
- Requires no change to the existing panel configuration. The IP Communicator connects directly to the primary and secondary analog panel telephone ports
- Performs over any type of customer-provided Ethernet
- 10/100Base network connection (LAN or WAN), DSL modem or cable modem
- Transmits data over standard Contact-ID protocol but is secured with the industry's highest level of encryption (AES 512 bit)
- Supports both dynamic (DHCP) or Public and Private Static IP addressing
- Maintains dual-destination IP receiver address for high redundancy configurations: all signals are sent to a secondary address should the primary become unavailable
- Offers user programmable UDP ports for flexibility and compatibility with firewalls and other network security components

Installation

To install the IDPDACT-2, the following criteria are required:

- Mounted locally next to the supported fire alarm control panel.
- The Central Station must be equipped with a compatible VisorALARM PLUS™ IP receiver
- At least 136mA of electrical power available from the power supply to use for the IPDACT-2 unit.
- Ethernet network connection (ITE-listed router/gateway).
- It is recommended to use a small UPS, to provide backup power for customer- provided router/switch/modem.
- Dynamic or static IP address (dynamic addressing requires DHCP server present on the local network).

Note: DSL and cable modems typically use dynamic addressing as supplied by network providers).

- UDP port for IP communication with the monitoring station (default port: 80 may be changed by the Central Station).
- Destination IP addresses of the IP receivers where the IP Communicator will be sending alarms and other events (If installed on a private Intranet, the gateway address of the public router will be required to allow the IP card to access the Internet and the public router at the Central Station).
- Panel account ID number (CID).
- Installer password (provided by the monitoring station managing the IP receiver).

Programming Options:

To configure the IPDACT-2, the following three options are available:

- Use a Hyper Terminal or Tera Term software program
- Local or Remote Telnet session via an Ethernet connection.
- Windows®-based configuration software (shipped with the IP Communicator).

Note: It is possible to pre-program the IP Communicator at the panel before the installation.

To pre-program the IP Communicator, the following tasks are required to be done:

1. An auto-registration password is entered (along with all other Central Station information) and saved in the unit's flash memory.
2. When the IP Communicator is installed at the site and connected to the Internet/Intranet, it auto-registers with the Central Station receiver.
3. This feature eliminates the need to program from a PC at the remote site.
4. The IP Receiver at the monitoring station will automatically configure other parameters during registration.

For most installations, the only parameters required are as follows:

- Selection of either DHCP or Static IP
- Destination primary and secondary receiver IP addresses
- Account identification number (CID) Port number
- Installation password

Ordering Information

IPDACT-2: IP communicator. Includes configuration software, manuals, and prepared 30" telephone cable for connection to panel's DACT telco ports.

IPENC: External mounting enclosure consisting of mounting bracket IPBRKT, and screws. Enclosure must be "close-nipple" to a panel no further than 6 in. (15 cm) via conduit. (Red)

IPSPLT: Y adapter option to allow connection of both panel dialer outputs to one cable input to IPDACT.

The IPSPLT is not required if the second dialer output is used for the phone backup.

ALMSC119: Serial programming cable and DB9 adapter.

VisorALARMPLUS: IP Receiver with LCD display and keypad

IPDACT-2 Technical Specifications

SYSTEM

Operating Voltage: 24VDC

Operating Temperature: Not to exceed the range of 32°C to 120°C (0 to 49°C)

Relativity Humidity: Not to exceed 93% non-condensing at 90°F (32°C)

TEMPERATURE AND HUMIDITY RANGES

This system meets NFPA requirements for operation at 0 – 49°C/32 – 120°F and at a relative humidity 93% ± 2% RH (non-condensing) at 32°C ± 2°C (90°F ± 3°F).

However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15 – 27°C/60 – 80°F.

STANDARDS

The IPDACT-2 is designed to comply with the following standard:

UL Standard: UL 864 9th Edition

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult the factory for the latest listing status.

UL Listed: S1869

CSFM: 7165-1703:0125

MEA Approved: FDNY COA# 6077

ISO 9001 Certification

For a complete listing of all compliance approvals and certifications, please visit:

<http://www.gamewell-fci.com/en-US/documentation/Pages/Listings.aspx>

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For more information

Learn more about Gamewell-FCI's IPDACT-2 and other products available by visiting www.Gamewell-FCI.com

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Description

The Gamewell-FCI, HPFF8 is a Notification Appliance Circuit (NAC) expansion panel designed to extend the power capabilities of existing NACs and provide power for the auxiliary devices. The HPFF8 connects to any 12 or 24V Fire Alarm Control Panel (FACP) or stand alone.

The HPFF8 is available in 8.0 amps. It provides regulated and filtered 24VDC power to each of the four NACs and an auxiliary output. The NAC outputs are rated at 3.0 amps each (the total output cannot exceed 8.0 amps). The auxiliary output is rated at 2.0 amps. This output is continuously supplied, even in alarm, and therefore must be taken into account for power supply loading and battery size calculations.

The NAC outputs may be configured as any of the following:

- Four Class B (Style Y)
- Two Class A (Style Z)
- Two Class B and one Class A
- Four Class A with the optional HPP31076 Class A adapter installed

These power supplies contain an internal Battery charger capable of charging up to 26.0 amp-hour (AH) batteries.

The HPFF8 is mounted in lockable wall cabinet units that can accommodate up to two (2), 18AH batteries. A multi-pack option allows for up to four chassis mount units installed in a single lockable SBB-D4 enclosure. These chassis mount units have a "CM" suffix, HPFF8CM and can accommodate two 12AH batteries. Power supplies are available in either 120VAC/60 Hz or 240VAC/50 Hz.

One of the most challenging aspects of a retrofit application is locating the existing End-of-Line (EOL) resistor. In these applications that have EOL values, other than the 3.9k normally used with the HPFF8, a single resistor matching the existing EOL can be used as a reference for all the outputs. This feature speeds the installation and the system checkout, because the actual EOL does not need to be located and changed in the circuit. The reference resistor must be within the range of 1.9k to 25k.

NAC Expander/Power Supply

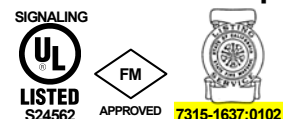


HPFF8

Features

- Four (4) supervised notification application circuits (NACs) capable of supplying +24VDC at 3.0 amp maximum each
- NAC output circuits may be configured as any of the following:
 - Four Class B (Style Y)
 - Two Class B & one Class A
 - Two Class A (Style Z)
 - Four Class A with the optional HPP31076 Class A adapter installed
- Four field-programmable operational modes
- 2.0 amp auxiliary continuously supplied output
- Two (2) fully supervised input/output control circuits
- Temporal coding and sync protocols compatible with the following notification appliance brands:
 - System Sensor
 - Faraday
 - Gamewell
 - Amseco
 - Cooper-Wheelock
 - Gentex
- Supervised AC input, battery voltage, auxiliary output, charger, and earth ground faults
- Trouble indication for supervision of the following:
 - NAC circuits
 - Auxiliary output
 - AC input
 - Charger
 - Battery voltage
 - Open contacts in the initiating device signal inputs (for FACP trouble notification)
 - Earth ground faults by individual status LED's
- Separate Trouble and AC Fail Form-C relay Contacts

An ISO 9001-2000 Company



GAMEWELL-FCI

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9021-60521 Rev. B page 1 of 2

Features (Continued)

- The Trouble Form-C relay contacts selectable for immediate or a 2 hour delay with AC failure
- 26 AH battery charger capability; the wall cabinet supports two 12V 18AH batteries, while the multi-pack equipment cabinets supports two 12V 12AH batteries.
- NAC Overload protection and indication
- Up to four chassis mount units (HPFF8CM) can be installed in the SBB-D4 backbox
- Wall mount units can be configured to internally house the following:
 - one AOM-2SF single control module
 - one AOM-2R single relay module

Specifications

Primary Input Power:	120VAC/60Hz, 3.6A or 220VAC/50Hz, 1.5A
Secondary Power:	24 volt operation: two (2), 7-24 AH batteries
Battery Charging Capacity:	Up to 26 AH batteries mounted
Battery Space:	
HPFF8 Cabinet:	Up to two 18AH batteries
SBB-D4 Cabinet:	Up to two 12AH batteries per supply
Total Output Power:	8.0A max
Standby Current:	0.030 A
Auxiliary Power Output:	0.15A under all conditions 2.0A if load is removed during operation (external relay or AC Fail Relay is required)

Specifications (Continued)

NAC Output Ratings:	24VDC fully regulated, 3.0A max per circuit (8.0A total)
End-of-Line Resistor Range:	2K to 25k ohm, ½ watt
Common Trouble Relay/AC Fail Relay:	2.0A at 28VDC or 120VAC
Input Control Circuit:	16-30VDC @ 5mA min.
Temperature Rating:	32°F to 120°F (0°C to 49°C)
Relative Humidity:	10% to 93% non-condensing
Cabinet Dimensions:	
HPFF8 Cabinet:	16.65" W x 19.0" H x 5.2" D (42.29 W x 48.26 H 13.23 D cm)
SBB-D4 Cabinet:	24" W x 45.9" H x 5.15" D (60.96 W x 116.52 H x 13.1D cm)

Ordering Information

Part Number	Description
HPFF8	8A fire rated power supply operating at 120VAC/60 Hz. Unit includes red enclosure with HPP lock and key
HPFF8CM	8A fire rated power supply - chassis mounted operating at 120VAC/60 Hz. Unit includes mounting hardware for installation in the SBB-D4 enclosure
HPFF8E	8A fire rated power supply operating at 240VAC/50 Hz
HPFF8CME	8A fire rated power supply chassis mounted operating at 240VAC/50 Hz
HPP31076	Class A (Style Z) NAC module
FCI-VDR-D4	Vented door, PK-625 lock and key for SBB-D4 backbox, black
SBB-D4	Backbox, accepts up to 4 chassis, black

GAMEWELL-FCI

MS-7 Series

Manual Fire Alarm Pull Stations

General

The Gamewell-FCI, MS-7 Series manual fire alarm pull stations are available in a wide variety of configurations. The pull stations comply with the Americans with Disabilities Act (ADA) 5-lb. maximum pull force requirement. Operating instructions and Braille text are engraved in the handle. All pull stations include a key lock/reset which is keyed alike with the Gamewell-FCI fire alarm control panels and other manual fire alarm pull stations.

MS-7AF Velociti Addressable Station

The MS-7AF Velociti[®] Series addressable station is a double action pull station designed for installation in the signaling line circuit of Gamewell-FCI analog addressable control panels. Activation of the pull station causes its assigned address to register at the fire alarm control panel. The door contains an LED which flashes green in normal condition and lights steady red when the station has been activated.* The station features screw terminals.

MS-7ASF Velociti Addressable Station

The MS-7ASF Velociti[®] Series addressable pull station is a single action station designed for installation in the signaling line circuit of Gamewell-FCI analog addressable control panels. Activation of the station causes its assigned address to register at the control panel. The door contains an LED which flashes green in normal condition and lights steady red when the pull station is activated.* The station features screw terminals.

The Velociti[®] Series pull stations use a communication protocol that substantially increases the speed of communication between the sensors and certain Gamewell-FCI analog addressable fire alarm controls. These devices operate in a grouped fashion. If one of the devices in the group has a status change, the panel's microprocessor stops the group poll and focuses on the single device. The net effect offers a response speed up to five times greater than earlier designs.

MS-7 Double Action Station

The MS-7 double action pull station is used with conventional fire alarm control panels. It features a set of single pole contacts and screw terminals for connection to an initiating circuit.

FEATURES & BENEFITS

- Addressable stations compatible with all Gamewell-FCI analog addressable fire alarm controls
- Conventional stations suitable for use with any UL[®] Listed control panel
- The pull stations (MS-7LOB) are Listed for outdoor applications
- Complies with ADA pull force requirements
- Offers surface or semi-flush mounting
- Shock and vibration resistant
- Both single and double action pull stations available
- Includes a tumbler lock for test and reset keyed alike with analog addressable fire alarm controls
- *Only the red LED is operative in panels that do not operate in Velociti mode



MS-7 Series

MS-7S Single Action Station

The MS-7S single action pull station is used with conventional fire alarm control panels. It features a set of single pole contacts and wire leads for connection to an initiating circuit.

MS-7SP Double Action Station

The MS-7SP is a double action pull station similar to the MS-7 station, with the additional feature of including both English and Spanish instructions molded into the unit.

MS-7LR Dual-action Agent Release Station

The MS-7LR is designed for use with the Gamewell-FCI fire alarm control panels with releasing capabilities and Flex Series releasing systems. It features a set of single pole contacts and screw terminals used to connect to an initiating circuit.

MS-7LRA Agent Release Station with Abort

The MS-7LRA is designed for use with the Gamewell-FCI fire alarm control panels with releasing capabilities and Flex Series releasing systems where system abort capabilities are required. It consists of the following:

- An MS-7LR mounted on a plate with an abort switch
- LED indicators that signal system normal and system activated status

MS-7LOB Double Action Station (Listed for Outdoor Applications)

The MS-7LOB station must be mounted on a Model SB-I/O backbox. In retrofit applications, the pull station is UL Listed for use with the WP-10 backbox. It is intended for use with conventional control panels and has a set of single pole contacts and screw terminals.

Mounting

The MS-7 interior pull stations may be surface mounted or semi-flush mounted on a standard double-gang, or 4-inch (10.2 cm) square electrical box. An optional trim ring (BG12TR) may also be used for semi-flush mounting.

NYC-Plate

The NYC-Plate provides the backplate for the manual pull station. (See Figure 1).



Figure 1 NYC-Plate

Ordering Information

MS-7: Double action station

MS-7AF:** Velociti addressable double action station

MS-7ASF:** Velociti addressable single action station

MS-7S: Single action station, wire leads

MS-7SP: Double action station, English and Spanish instructions

MS-7LR: Agent release station, dual-action

MS-7LRA: Agent release station with abort switch, LED indicators, dual- action

MS-7LOB: Double action station, outdoor use (Includes SB-I/O - Indoor/outdoor use backbox)

SB-I/O: Indoor/outdoor use backbackbox

SB-10: Surface backbox

BG12TR: Trim ring for semi-flush mount, plastic

NY-PLATE: NYC backplate for manual pull station

**For use with the Gamewell-FCI analog addressable control panels only.

MS-7 Series Technical Specifications

SYSTEMS

Material: Lexan®

Contact Ratings: 0.25 amps. @ 30 VAC/VDC (resistive)

Dimensions: 5 5/8" H x 4 1/4" W x 1 1/4" D
(14 x 10.1 x 3.2 cm)

Operating Temperature:

(MS-7AF, MS-7ASF): 32° to 120° F (0° to 49° C)

(MS-7LOB): -30° to 150° F (-35° to 66° C)

Relative Humidity :

(MS-7AF, MS-7ASF): 10 to 93% (non-condensing)

(MS-7LOB): 85% ± 5% @ 86° ± 3.6° (30° ± 2° C)

Alarm Current: .0030 amp. 0.007 for LED

Supervisory Current:

(MS-7AF, MS-7ASF): .00030 amps.

TEMPERATURE AND HUMIDITY RANGES

This system meets NFPA requirements for operation at 0 – 49°C/32 – 120°F and at a relative humidity 93% ± 2% RH (noncondensing) at 32°C ± 2°C (90°F ± 3°F).

However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15 – 27°C/60 – 80°F.

STANDARDS

The MS-7 Series is designed to comply with the following standard:

UL Standard: UL 864 9th Edition

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

UL: S2465

FM: 3023594

MEA FDNY: 67-02-E Vol. VII

CSFM:

7160-1703:0119

7160-1703:0170

7160-1703:0109

ISO 9001 Certification

For a complete listing of all compliance approvals and certifications, please visit: <http://www.gamewell-fci.com/en-US/documentation/Pages/Listings.aspx>

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For more information

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AMM-2F

Addressable Monitor Module

General

The Gamewell-FCI Velociti® Series, addressable monitor module AMM-2F is a single Style B, Class B initiating device circuit (IDC) with a 47KW end-of-line resistor. This module provides an address for any device or group of devices connected to this circuit on the signaling line circuit (SLC) of the Gamewell-FCI addressable series fire alarm control panel. Any initiating device with normally open (N.O.) dry contacts may be made addressable when connected to the AMM-2F module.

The Velociti® Series use a communication protocol that substantially increases the speed of communication between the sensors and certain Gamewell-FCI analog addressable fire alarm controls. These devices operate in a grouped fashion. If one of the devices in the group has a status change, the panel's microprocessor stops the group poll and concentrates on the single device. The net effect is response speed up to five times greater than earlier designs.

The AMM-2F module can be programmed to provide a wide variety of input functions to the Gamewell-FCI addressable series fire alarm control panels. It can be identified as a manual station, heat detector, plenum detector, waterflow switch, tamper switch, N.O. contact, smoke detector, projected beam smoke detector, sub loop, remote zone, etc. It can also serve as a remote system silence, system reset, system acknowledge or drill switch. It is even possible to customize its device type to meet specific job requirements.

The initiating device circuit of the AMM-2F can support a maximum line resistance of up to 40 ohms allowing the use of linear heat detection devices. The compact size facilitates the installation of the module inside manual stations, or mounting boxes of various types of alarm initiating devices.

Ordering Information

AMM-2F: Addressable monitor module, single circuit, Style B, Class B



AMM-2F

FEATURES & BENEFITS

- Compact size allows easy installation
- Class B, Style B, initiating circuit
- 40 Ohm line resistance for each initiating device circuit
- Connects to any normally open dry contact device

AMM-2F Technical Specifications

System

Supervisory Current: .000375 amps

Alarm Current: .00060 amps

Operating Temperature: 32° to 120° F (0° to 49° C)

Relative Humidity: 10 to 93% (non-condensing)

End-of-Line Resistance: 47K ohms

Dimensions: 1.3" L x 2.5" W x 0.5" D
(3.3 x 6.4 x 1.3 cm)

TEMPERATURE AND HUMIDITY RANGES

This system meets NFPA requirements for operation at 0 – 49°C/32 – 120°F and at a relative humidity 93% ± 2% RH (noncondensing) at 32°C ± 2°C (90°F ± 3°F).

However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15 – 27°C/60 – 80°F.

STANDARDS

The E3 Series Control Panel is designed to comply with the following standard:

UL Standard: UL 864 9th Edition

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

UL: S1949

FM: 3023594

MEA FDNY: 227-03-E VOL. IV

CSFM: 7300-1703:0102

ISO 9001 Certification

For a complete listing of all compliance approvals and certifications, please visit: <http://www.gamewell-fci.com/en-US/documentation/Pages/Listings.aspx>

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For more information

Learn more about Gamewell-FCI's AMM-2F and other products available by visiting www.Gamewell-FCI.com

Honeywell Gamewell-FCI

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Velociti® Series AMM-2IF

Addressable Dual Monitor Module

General

The Gamewell-FCI Velociti® Series, addressable dual monitor module, AMM-2IF, features two Style B, Class B initiating device circuits, each with an end-of-line resistor. This module provides addresses for any device or group of devices connected to each circuit. Any alarm initiating devices with normally open (N.O.) dry contacts, such as heat detectors, 4-wire projected beam smoke detectors, 4-wire smoke detectors, water flow switches, tamper switches, manual stations, etc. may be installed in these circuits.

The Velociti® Series use a communication protocol that substantially increases the speed of communication between the sensors and certain Gamewell-FCI analog addressable fire alarm controls. These devices operate in a grouped fashion. If one of the devices in the group has a status change, the panel's microprocessor stops the group poll and concentrates on the single device. The net effect is response speed up to five times greater than earlier designs.

The first circuit address is set via a rotary switch. The second circuit is automatically assigned the next higher address. The module has a single panel-controlled red LED.

The AMM-2IF module is designed for installation in the signaling line circuit of any Gamewell-FCI addressable control panel. The AMM-2IF is designed to mount in a 4" square junction box, 2 1/8" deep. The initiating device circuit of the AMM-2IF can support a maximum line resistance of up to 40 ohms allowing the use of linear heat detection devices.

Ordering Information

AMM-2IF: Monitor module, two circuit, Style B, Class B



AMM-2IF

FEATURES & BENEFITS

- Supports Class B, Style B, initiating device circuits
- Provides a visual rotary, decimal switch addressing (01-159)
- Offers 40 ohm line resistance for each initiating circuit
- Accommodates any normally open contact device
- Displays bi-color LEDs flash green whenever the module is addressed, and light steady red on alarm*
- Includes a compact size allows easy installation

*Note: Only the red LED is operative in panels that do not operate in Velociti® mode.

Velociti® Series AMM-2IF Technical Specifications

SYSTEMS

Supervisory Current: 0.0075 amp.

Alarm Current: .0057 amp. (LED lit)

Operating Temperature: 32° to 120° F (0° to 49° C)

Relative Humidity: 10 to 93% (non-condensing)

Dimensions: 4 1/2" H x 4" mW x 1 1/4" D
(11 H x 10.2 W x 3 D cm)

(Mounts in a 4" square by 2 1/8" deep box).

End-of-line Resistor: 47 K ohms

TEMPERATURE AND HUMIDITY RANGES

This system meets NFPA requirements for operation at 0 – 49°C/32 – 120°F and at a relative humidity 93% ± 2% RH (noncondensing) at 32°C ± 2°C (90°F ± 3°F).

However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15 – 27°C/60 – 80°F.

STANDARDS

The Velociti® Series AMM-2IF is designed to comply with the following standards:

UL Standards: UL 864 9th Edition

UL 2572 for Mass Notification

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

UL: S1949

2572 for Mass Notification

FM: 3023594

MEA FDNY: 227-03-E Vol. IV

CSFM: 7300-1703:0107

ISO 9001 Certification

For a complete listing of all compliance approvals and certifications, please visit: <http://www.gamewell-fci.com/en-US/documentation/Pages/Listings.aspx>

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For more information

Learn more about Gamewell-FCI's Velociti® Series AMM-2IF and other products available by visiting www.Gamewell-FCI.com

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Honeywell

Velociti Series® AOM-2RF

Addressable Output Relay Control Module

General

The Gamewell-FCI Velociti® Series, addressable output relay control module (AOM-2RF) allows a Gamewell-FCI analog addressable fire alarm control panel to switch discrete relay contacts by code command. The relay provides two isolated sets of Form-C contacts which transfer simultaneously. Circuit connections to the relay contacts are not supervised by the module.

The Velociti® Series use a communication protocol that substantially increases the speed of communication between the SLC devices and certain Gamewell-FCI analog addressable fire alarm control panels. These devices operate in a grouped fashion. If one of the devices in the group has a status change, the panel's microprocessor stops the group poll and concentrates on the single device. The net result produces a superior response speed up to five times greater than earlier designs.

The AOM-2RF Module is designed for installation in the signaling line circuit of any Gamewell-FCI analog addressable fire alarm control panel. The module contains a panel controlled LED. The AOM-2RF is designed to mount in a 4" (10.16 cm) square junction box 2 1/8" (5.53 cm) deep.

Ordering Information

AOM-2RF: Addressable output relay control module

Table 1 lists the relay contact ratings.

CURRENT RATING	MAXIMUM VOLTAGE	LOAD DESCRIPTION	APPLICATION
3A	30 VDC	Resistive	Non-Coded
2A	30 VDC	Resistive	Coded
0.9A	110 VDC	Resistive	Non-Coded
0.5A	125 VAC	Resistive	Non-Coded
0.5A	30 VDC	Inductive (L/R=5ms)	Coded
1A	30 VDC	Inductive (L/R=2ms)	Coded
0.5A	125 VAC	Inductive (PF=.35)	Non-Coded
0.7A	75 VAC	Inductive	Non-Coded

Table 1: Relay Contact Ratings



AOM-2RF

FEATURES & BENEFITS

- Listed under UL® Standard 864
 - Provides visual rotary, decimal switch addressing (01-159)
 - Includes a bi-color LED that flashes green whenever the module is addressed, and lights steady red upon activation*
 - Designed as a compact size to allow easy installation
- Note 1: Only the red LED is operative in panels that do not operate in Velociti® mode
 *Note 2: The bi-color LED functionality is not available on the GWF-7075 panel.

Velociti Series® AOM-2RF Technical Specifications

SYSTEMS

Supervisory Current: .000375 amps.

Average Operating Current:

255 uA (Velociti Mode)

230 uA (CLIP Mode)

Alarm Current: .0065 amps.

Operating Temperature: 32° to 120° F (0° to 49° C)

Relative Humidity: 10 to 93% relative humidity (non-condensing)

Dimensions: 4 1/2" H x 4" W x 1 1/4"
(11.4 x 10.2 x 3.2 cm)

TEMPERATURE AND HUMIDITY RANGES

This system meets NFPA requirements for operation at 0 – 49°C/32 – 120°F and at a relative humidity 93% ± 2% RH (noncondensing) at 32°C ± 2°C (90°F ± 3°F).

However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15 – 27°C/60 – 80°F.

STANDARDS

The Velociti Series® AOM-2RF is designed to comply with the following standard:

UL Standard: UL 864 9th Edition

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

UL: S1913

FM: 3023594

FDNY: COA-219-02-E Vol. VI

CSFM: 7300-1703:0102

ISO 9001 Certification

For a complete listing of all compliance approvals and certifications, please visit: <http://www.gamewell-fci.com/en-US/documentation/Pages/Listings.aspx>

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For more information

Learn more about Gamewell-FCI's Velociti Series® AOM-2RF and other products available by visiting www.Gamewell-FCI.com

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Honeywell

Velociti® Series AOM-2SF

Addressable Output Relay Supervised Control Module

General

The Gamewell-FCI Velociti® Series addressable output supervised control module (AOM-2SF) allows a Gamewell-FCI analog addressable fire alarm control panel to switch an external power supply, such as a DC supply or audio amplifier (up to 80 V_{RMS}) to notification appliances. The AOM-2SF notification appliance circuit can be wired either Class A (Style Z) or Class B (Style Y). It also supervises the wiring to the connected loads and reports their status to the panel as NORMAL, OPEN or SHORT CIRCUIT. The module contains a panel controlled LED.

The Velociti® Series use a communication protocol that substantially increases the speed of communication between the SLC devices and certain Gamewell-FCI analog addressable fire alarm control panels. These devices operate in a grouped fashion. If one of the devices in the group has a status change, the panel's microprocessor stops the group poll and concentrates on the single device. The net result is a superior response speed up to five times greater than the earlier designs.

The **AOM-2SF** module is designed for installation in the signaling line circuit of any Gamewell-FCI analog addressable fire alarm control panel. The signaling line circuits of Gamewell-FCI analog addressable fire alarm control panels are designed to accommodate up to 159 modules per circuit. The AOM-2SF is designed to mount in a 4" (10.16 cm) square junction box 2 1/8" (5.5 cm) deep.

Table 1 lists the relay contact ratings.

Current Rating	Maximum Voltage	Load Description	Application
3A	30 VDC	Resistive	Non-Coded
2A	30 VDC	Resistive	Coded
0.9A	110 VDC	Resistive	Non-Coded
0.5A	125 VAC	Resistive	Non-Coded
0.5A	30 VDC	Inductive (L/R=5ms)	Coded
1A	30 VDC	Inductive (L/R=2ms)	Coded
0.5A	125 VAC	Inductive (PF=.35)	Non-Coded
0.7A	75 VAC	Inductive	Non-Coded

Table 1: Relay Contact Ratings

Ordering Information

AOM-2SF: Addressable output supervised control module

FEATURES & BENEFITS

- Listed under UL® Standard 864 and UL2572 for Mass Notification
 - Designed as a compact size to allow easy installation
 - Includes Class A, Style Z, or Class B, Style Y notification appliance circuit
 - Accommodates audio amplifiers up to 80 V_{RMS}
 - FM Listed as suitable for a releasing device service
 - Includes a bi-color LED that flashes green whenever the module is addressed, and lights steady red upon activation*
- *Note 1: Only the red LED is operative in panels that do not operate in Velociti® mode
 *Note 2: The bi-color LED functionality is not available on the GWF-7075 panel.



AOM-2SF

Velociti® Series AOM-2SF Technical Specifications

SYSTEM

Supervisory Current: 0.00375 amps

Alarm Current: .0065 amps

Operating Temperature: 32° to 120° F (0° to 49° C)

Relative Humidity: 10 to 93% relative humidity (non-condensing)

Dimensions: 4 1/2" H x 4" W x 1 1/4" D
(11.4 H x 10.2 W x 3.2 D cm)

TEMPERATURE AND HUMIDITY RANGES

This system meets NFPA requirements for operation at 0 – 49°C/32 – 120°F and at a relative humidity 93% ± 2% RH (noncondensing) at 32°C ± 2°C (90°F ± 3°F).

However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15 – 27°C/60 – 80°F.

STANDARDS

The Velociti Series AOM-2SF are designed to comply with the following standard:

UL Standards: UL 864 9th Edition

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

UL: S1949

FM: 3023594

MEA FDNY: 227-03-E Vol. IV

CSFM: 7300-1703:0102

ISO 9001 Certification

For a complete listing of all compliance approvals and certifications, please visit:

<http://www.gamewell-fci.com/en-US/documentation/Pages/Listings.aspx>

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For more information

Learn more about Gamewell-FCI's Velociti® Series AOM-2SF and other products available by visiting www.Gamewell-FCI.com

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Honeywell

Velociti® Series 3 Detectors

Thermal Detectors

Description

The Gamewell-FCI, Velociti® Series 3 intelligent thermal detectors with integral communication provide point location for alarm communication and selective maintenance. Designed in a modern bright white color, the Velociti Series 3 is aesthetically pleasing for today's contemporary buildings.

The Velociti Series 3 heat detectors are intelligent addressable detectors with point ID capability that enable each detector address to be set with rotary address switches providing exact device locations. The thermal detector continually monitors the detected temperature and reports it to the fire alarm control panel. The modern design and expanded color options support a variety of contemporary aesthetic demands. In addition, each detector is constructed for exceptional installation and maintenance efficiency. Velociti Series 3 thermal detectors provide cost-effective, intelligent property protection using the following single thermistor:

- ATD-L3 offers 135°F fixed thermal detection.
- ATD-L3R offers 135°F fixed and rate-of-rise thermal detection.
- ATD-L3H provides fixed high-temperature detection at 190°F.

For legacy installations, service detectors are available in the classic ivory color that will operate in both Velociti and CLIP protocol for backwards compatibility. Service models are designated by the -IV part number that appears after the detector model.

Note: The E3 Series® and S3 Series panels support both the Velociti® and CLIP™ protocols, and the GWF-7075 panel supports only the Velociti® protocol. To obtain a complete list of panels that are listed to Velociti Series 3 detectors, refer to the Compatibility Addendum for Gamewell-FCI Manuals, P/N:9000-0427-L8.



Thermal Detector

FEATURES & BENEFITS

- Complies with UL® 268 7th Edition
- Contains a built-in functional test switch activated by an external magnet
- Provides rotary address switches (01-159)
- Includes dual LEDs used for 360° visibility
- Offers expanded color options
- Designed with a new profile to offer modern and improved aesthetics
- Supports a low standby current
- Supplies optional relay, isolator, or sounder bases (standard or low frequency)

Ordering Information

NOTE: "-IV" suffix indicates Ivory color model.

NOTE: "-BL" suffix indicates Black color model.

NOTE: "WH" suffix indicates Bright White color model.

ATD-L3: Thermal heat detector, 135°F fixed, bright white, Velociti

ATD-L3-IV: Thermal heat detector, 135°F fixed, ivory, Velociti/CLIP

ATD-L3R: Thermal heat detector, 135°F rate of rise, bright white, Velociti

ATD-L3R-IV: Thermal heat detector, 135°F rate of rise, ivory, Velociti/CLIP

ATD-L3H: Thermal heat detector, 190°F high temp, bright white, Velociti

ATD-L3H-IV: Thermal heat detector, 190°F high temp, ivory, Velociti/CLIP

Intelligent Bases

For details on intelligent bases, refer to Data Sheet P/N: 9021-60540.

B501-White: 4" Flangeless mounting base, bright white

B501-White-BP: 4" Flangeless mounting base bulk pack, bright white

B501-IV: 4" Flangeless mounting base, ivory
B501-BL

4" Flangeless mounting base,

B300-6: 6" Flanged mounting base, bright white

B300-6-IV: 6" Flanged mounting base, ivory

B300-6-BP: 6" Flanged mounting base bulk pack

B200SR-WH: Standard sounder base, bright white

B200SR-IV: Standard sounder base, ivory

B200S-WH: Intelligent addressable sounder base, bright white

B200S-IV: Intelligent addressable sounder base, ivory

B200SR-LF-WH: Standard low frequency sounder base, bright white

B200SR-LF-IV: Standard low frequency sounder base, ivory

B200S-LF-WH: Intelligent addressable low frequency sounder base, bright white

B200S-LF-IV: Intelligent addressable low frequency sounder base, ivory

B224RB-WH: Relay base, bright white

B224RB-IV: Relay base, ivory

B224BI-WH: Isolator base, bright white

B224BI-IV: Isolator base, ivory

Ordering Information

Accessories

SMB600: Surface Mounting Kit (flanged)

TR300: Accessory Flange Ring for B300 6" Base, bright white

TR300-IV: Accessory Flange Ring for B300 6" Base, ivory

RA100Z: Remote LED annunciator, 3-32 VDC

The annunciator mounts to a U.S. single-gang electrical box. For use with B501 and B300-6.

CK300: Bright White detector kit (Pack of 10)

CK300-IR: White, detector color kit for use with MCS-COF Series Detectors. (Pack of 10)

CK300-IV: Ivory, detector color kit. (Pack of 10)

CK300-IR-IV: Ivory, detector color kit for use with MCS-COF Series detectors. (Pack of 10)

CK300-BL: Black detector kit (Pack of 10)

CK300-IR-BL: Black, detector color kit for use with MCS-COF Series detectors. (Pack of 10)

M02-04-01: Detector test magnet.

M02-09-00: Test magnet with telescoping handle.

XR2B: Detector removal tool. Allows the installation and/or removal of the detector heads from the bases in high ceiling applications.

XP-4: Extension pole for XR2B. Shipped with three, 5-foot (1.524,m) sections.

Velociti® Series 3 Detectors Technical Specifications

SYSTEMS

Thermal Intelligent Detector

Physical Specifications

Height: 2.0 inches (51 mm) installed in B300-6 base

Diameter:

6.1 inches (15.6 cm) installed in B300-6 base

4 inches (10.2 cm) installed in B501 base

Shipping Weight: 3.4 oz (95 g)

Operating Temperature Range:

Thermal 135° F fixed: -4° F to 100° F
(-20° C to 38° C)

Thermal 135° F rate-of-rise: -4° F to 100° F
(-20° C to 38° C)

Thermal 190° F rate-of-rise: -4° F to 135° F
(-20° C to 57° C)

Operating Humidity Range: 10% to 93% non-condensing

Rate-of-Rise Detection: Responds to greater than 15°F/minute or 135°F (8.3° C/minute or 57°C)

Electrical Specifications

Voltage Range: : 15 to 32 VDC

Standby Current (@ 24 VDC): 200 uA (one communication every 5 seconds with green LED enabled)

Max Alarm Current (max.): : 2 mA @ 24 VDC (one communication every 5 seconds with red LED enabled)

Max Current (max.): : 4.5 mA @ 24 VDC (one communication every 5 seconds with amber LED enabled)

Isolator Load Rating: : 0.0063

STANDARDS

The Velociti® Series 3 Thermal Detectors are designed to comply with the following standard:

UL Standard: UL 268

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

UL: S2332

FM: 3023594

MEA-FDNY: 219-02-E Vol. VI

CSFM: 7270-1703-0502

ISO 9001 Certification

For a complete listing of all compliance approvals and certifications, please visit: <http://www.gamewell-fci.com/en-US/documentation/Pages/Listings.aspx>

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For more information

Learn more about Gamewell-FCI's Velociti® Series 3 Detectors and other products available by visiting www.Gamewell-FCI.com

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Honeywell

Velociti® Series 3 Detectors

Photoelectric Detectors

Description

The Gamewell-FCI, Velociti® Series 3 intelligent photoelectric detectors with integral communication provide point location for alarm communication and selective maintenance. Designed in a modern bright white color, the Velociti Series 3 is aesthetically pleasing for today's contemporary buildings.

The Velociti Series 3 smoke detectors are intelligent addressable detectors with point ID capability that enable each detector address to be set with rotary address switches providing exact device locations. The photoelectric detector continually monitors the detected temperature and reports it to the fire alarm control panel. The modern design and expanded color options support a variety of contemporary aesthetic demands. In addition, each detector is constructed for exceptional installation and maintenance efficiency.

The Gamewell-FCI, ASD-PL3 photoelectric detector's re-designed optical sensing chamber is engineered to sense smoke produced by a wide range of combustion sources in accordance with more stringent code standards. The sensitivity of Velociti series detectors can be programmed using the control panel software to suit the environment. The ASD-PL3R photoelectric detector is also remote test capable that may be used with a DNR (DNRW) duct smoke detector housing. The ASD-PTL3 multi-sensor detector offers either photoelectric detection or thermal detection through dual electronic thermistors at 135°F fixed temperature thermal sensing.

For legacy installations, service detectors are available in the classic ivory color that will operate in both Velociti and CLIP protocol for backwards compatibility. Service models are designated by the -IV part number after the detector model.

Note: Although the E3 Series® and S3 Series panels support both the Velociti® and CLIP™ protocols, the GWF-7075 panel does not support the CLIP protocol. To obtain a complete list of panels that are listed to Velociti Series 3 detectors, refer to the Compatibility Addendum for Gamewell-FCI Manuals, P/N:9000-0427-L8.



Photoelectric Detector

FEATURES & BENEFITS

- Complies with UL® Standard 268 7th Edition
- Contains a built-in functional test switch activated by external magnet
- Provides rotary address switches (01-159)
- Includes dual LEDs for 360° visibility
- Offers expanded color options
- Designed with a new profile to offer modern and improved aesthetics
- Supports a low standby current
- Supplies optional relay, isolator, or sounder bases (standard or low frequency)

Ordering Information

NOTE: "-IV" suffix indicates Ivory color model.

NOTE: "-BL" suffix indicates Black color model.

NOTE: "WH" suffix indicates Bright White color model.

ASD-PL3: Photoelectric smoke detector, bright white, Velociti

ASD-PL3R: Photoelectric smoke detector, remote test capable, for use with DNR(W) duct smoke detectors, bright white, Velociti

ASD-PTL3: Photoelectric smoke detector with thermal sensing, bright white, Velociti

ASD-PL3-IV : Photoelectric smoke detector, ivory, Velociti/CLIP

ASD-PL3R-IV: Photoelectric smoke detector, remote test capable, for use with DNR(W) duct smoke detectors, ivory, Velociti/CLIP

ASD-PTL3-IV : Photoelectric smoke detector with thermal sensing, ivory, Velociti/CLIP

Intelligent Bases

For details on intelligent bases, refer to Data Sheet P/N: 9021-60540.

Note: "IV" suffix indicates Flashscan and CLIP devices. "WH" suffix indicates bright white

B501-WHITE: 4" Flangeless mounting base, bright white

B501-WHITE-BP: 4" Flangeless mounting base bulk pack, bright white

B501-IV: 4" Flangeless mounting base, ivory

B300-6: 6" Flanged mounting base, bright white

B300-6-IV: 6" Flanged mounting base, ivory

B300-6-BP: 6" Flanged mounting base bulk (Pack of 10)

B200SR-WH: Standard sounder base, bright white

B200SR-IV: Standard sounder base, ivory

B200S-WH: Intelligent addressable sounder base, bright white

B200S-IV: Intelligent addressable sounder base, ivory

B200SR-LF-WH: Standard low frequency sounder base, bright white

B200SR-LF-IV: Standard low frequency sounder base, ivory

B200S-LF-WH: Intelligent addressable low frequency sounder base, bright white

B200S-LF-IV: Intelligent addressable low frequency sounder base, ivory

B224RB-WH: Relay base, bright white

B224RB-IV: Relay base, ivory

B224BI-WH: Isolator base, bright white

B224BI-IV: Isolator base, ivory

DNR: Intelligent duct detector housing, non-relay

DNRW: Intelligent duct detector housing, non-relay, watertight

Ordering Information

Accessories

SMB600: Surface Mounting Kit (flanged)

TR300: Accessory Flange Ring for B300 6" Base, bright white

TR300-IV: Accessory Flange Ring for B300 6" Base, ivory

RA100Z: Remote LED annunciator, 3-32 VDC

The annunciator mounts to a U.S. single-gang electrical box. For use with B501 and B300-6.

CK300: Bright White detector kit (Pack of 10)

CK300-IR: White, detector color kit for use with MCS-COF Series Detectors. (Pack of 10)

CK300-IV: Ivory, detector color kit. (Pack of 10)

CK300-IR-IV: Ivory, detector color kit for use with MCS-COF Series detectors. (Pack of 10)

CK300-BL: Black detector kit. (Pack of 10)

CK300-IR-BI: Black, detector color kit for use with MCS-COF Series detectors. (Pack of 10)

M02-04-01: Detector test magnet.

M02-09-00: Test magnet with telescoping handle.

XR2B: Detector removal tool. Allows the installation and/or removal of the detector heads from the bases in high ceiling applications.

XP-4: Extension pole for XR2B. Shipped with three, 5-foot (1.524,m) sections.

Velociti® Series 3 Detectors Technical Specifications

SYSTEMS

Photoelectric Intelligent Detector:

Physical Specifications

Height: 2.0 inches (51 mm) installed in B300-6 base

Diameter:

6.1 inches (15.49 cm) installed in B300-6 base

4 inches (10.16 cm) installed in B501 base

Shipping Weight: 3.4 oz (96.4 g)

Operating Temperature Range:

Photo: 32° F to 122° F (0° C to 50° C)

Photo in Duct Applications: -4° F to 158° F
(-20° C to 70° C)

Photo with Thermal: 32° F to 100° F (0° C to 38° C)

Operating Humidity Range: 10% to 93%
non-condensing

Rate-of-Rise Detection: Responds to greater than
15°F/minute or 135°F (8.3° C/minute or 57°C)

Air Velocity Range: 0 to 4,000 ft/min
(0 to 1219.2 m/min)

Electrical Specifications

Voltage Range: 15 to 32 VDC

Standby Current (@ 24 VDC): 200 UA (one
communication every 5 seconds with green LED
enabled)

Max Alarm Current (max.): 2 mA @ 24 VDC (one
communication every 5 seconds with red LED
enabled)

Max Current (max.): 4.5 mA @ 24 VDC (one
communication every 5 seconds with amber LED
enabled)

Isolator Load Rating: 0.0063

STANDARDS

The Velociti® Series 3 Photoelectric Detectors are designed to comply with the following standard:

UL Standard: UL 268

AGENCY LISTINGS AND APPROVALS

These listings and approvals apply to the modules specified in this document. In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

UL: S2332

FM: 3023594

MEA FDNY: COA-219-02-E Vol. VI

CSFM: 7272-1703:0501

ISO 9001 Certification

For a complete listing of all compliance approvals and certifications, please visit:
<http://www.gamewell-fci.com/en-US/documentation/Pages/Listings.aspx>

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This document is not intended to be used for installation purposes. We try to keep our product information up-to-date and accurate. We cannot cover all specific applications or anticipate all requirements. All specifications are subject to change without notice.

For more information

Learn more about Gamewell-FCI's Velociti® Series 3 Detectors and other products available by visiting www.Gamewell-FCI.com

Honeywell Gamewell-FCI

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Honeywell



Indoor Selectable-Output Speaker Strobes and Dual Voltage Evacuation Speakers for Ceiling Applications

System Sensor L-Series selectable-output speaker strobes and dual-voltage evacuation speakers can reduce ground faults and enable faster installation with lower current draw and modern aesthetics.

Features

- Plug-in design and protective cover reduce ground faults
- Universal mounting plate with an onboard shorting spring tests wiring continuity before installation
- No extension ring required
- Field selectable candela settings on ceiling units: 15, 30, 75, 95, 115, 150, and 177
- Automatic selection of 12- or 24-volt operation at 15 and 30 candela
- Rotary switch simplifies field selection of speaker voltage (25 and 70.7 Vrms) and power settings (¼, ½, 1 and 2 watts)
- Speakers offer high fidelity and high volume sound output
- 520 Hz +/- 10% square wave tone capable with compatible FACP
- Compatible with System Sensor synchronization protocol
- Electrical compatibility with existing SpectrAlert and SpectrAlert Advance products
- Tamper-resistant construction
- Updated modern aesthetics

Agency Listings



7320-1653-0505



System Sensor L-Series of speakers and speaker strobes reduce costly ground faults using a plug-in design and universal mounting plate that allow the installer to pre-wire mounting plates, dress the wires, and confirm wiring continuity before plugging in the speakers. In addition, a protective plastic cover prevents nicked wires by covering exposed speaker components.

These devices also enable faster installations by providing instant feedback to ensure that wiring is properly connected, rotary switches to select voltage and power settings, and 7 field-selectable candela settings for both wall and ceiling speaker strobes.

The low total harmonic distortion of the SP speaker offers high fidelity sound output while still offering high volume sound output for use in high ambient noise applications.

L-Series makes installation easy

- Attach a universal mounting plate to a 4 × 4 × 2¹/₈ inch back box . Flush-mount applications do not require an extension ring.
- Connect the notification appliance circuit or speaker wiring to the terminals on the mounting plate.
- Attach the speaker or speaker strobe to the mounting plate by inserting the product tabs into the mounting plate grooves. Hinge the device into position to lock the product pins into the mounting plate terminals. The device will temporarily hold in place with a catch until it is secured with a captured mounting screw.

L-Series Speaker and Speaker Strobe Specifications

Architectural/Engineering Specifications

General

L-Series speaker and speaker strobes shall mount to a 4 × 4 × 2¹/₈-inch back box. A universal mounting plate shall be used for mounting ceiling and wall products. The notification appliance circuit and amplifier wiring shall terminate at the universal mounting plate. Also, L-Series speaker strobes, when used with the Sync•Circuit™ Module accessory, shall be powered from a non-coded notification appliance circuit output and shall operate on a nominal 12 or 24 volts. When used with the Sync•Circuit Module, 12-volt rated notification appliance circuit outputs shall operate between 8.5 and 17.5 volts; 24-volt rated notification appliance circuit outputs shall operate between 16.5 and 33 volts. Indoor L-Series products shall operate between 32°F and 120°F from a regulated DC, or full-wave rectified, unfiltered power supply. Speaker strobes shall have field-selectable candela settings including 15, 30, 75, 95, 115, 150, 177.

Speaker

The speaker shall be a System Sensor L-Series model _____ dual-voltage transformer speaker capable of operating at 25.0 or 70.7 nominal Vrms. It should be listed to UL 1480 and shall be approved for fire protective service. The speaker shall have a frequency range of 400 to 4,000 Hz and shall have an operating temperature between 32°F and 120°F. The speaker shall have power taps and voltage that are selected by rotary switches.

Speaker Strobe combination

The speaker strobe shall be a System Sensor L-Series model _____ listed to UL1480 and UL 1971 and be approved for fire protective signaling systems. The speaker shall be capable of operating at 25.0 or 70.7 nominal Vrms selected via rotary switch, and shall have a frequency range of 400 to 4,000 Hz. The speaker shall have power taps that are selected by rotary switch. The strobe shall comply with the NFPA 72 requirements for visible signaling appliances, flashing at 1 Hz over the strobe's entire operating voltage range. The strobe light shall consist of a xenon flash tube and associated lens/reflector system.

Synchronization Module

The module shall be a System Sensor Sync•Circuit model MDL3 listed to UL 464 and shall be approved for fire protective service. The module shall synchronize SpectrAlert strobes at 1 Hz. The module shall mount to a 4¹¹/₁₆ × 4¹¹/₁₆ × 2¹/₈-inch back box. The module shall also control two Style Y (class B) circuits or one Style Z (class A) circuit. The module shall synchronize multiple zones. Daisy chaining two or more synchronization modules together will synchronize all the zones they control. The module shall not operate on a coded power supply.

Physical Specifications

Operating Temperature	32°F to 120°F (0°C to 49°C)	
Humidity Range	10 to 93% non-condensing	
Dimensions, Ceiling-Mount	Diameter	Depth
SPC Speaker	6.8 in, 173 mm	1.0 in, 25 mm
With Surface Mount Back Box	6.9 in, 176 mm	3.5 in, 89 mm
SPSC Speaker Strobe	6.8 in, 173 mm	2.8 in, 73 mm
With Surface Mount Back Box	6.9 in, 176 mm	5.37 in, 136 mm

*When using 12AWG, 14 AWG, or adding extra wires in the box, a deeper box or extension ring is recommended.

Electrical/Operating Specifications

Nominal Voltage (speakers)	25 Volts or 70.7 Volts (nominal)
Maximum Supervisory Voltage (speakers)	50 VDC
Strobe Flash Rate	1 flash per second
Nominal Voltage (strobes)	Regulated 12 VDC or regulated 24 VDC/FWR ^{1,2}
Operating Voltage Range (includes fire alarm panels with built in sync)	8 to 17.5 V (12 V nominal) or 16 to 33 V (24 V nominal)
Operating Voltage with MDL3 Sync Module	8.5 to 17.5 V (12 V nominal) or 16.5 to 33 V (24 V nominal)
Frequency Range	400 to 4,000 Hz ³
Power	¼, ½, 1, 2 watts

1. Full Wave Rectified (FWR) voltage is a non-regulated, time-varying power source that is used on some power supply and panel outputs.
2. Strobe products will operate at 12 V nominal only for 15 and 30 cd.
3. 520 Hz +/- 10% square wave tone capable with compatible FACP.

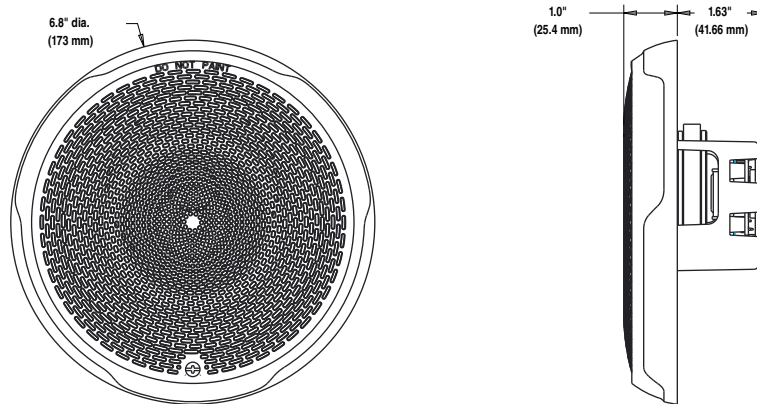
UL Current Draw Data

UL Max. Strobe Current Draw (mA RMS)			
	8 to 17.5 Volts	16 to 33 Volts	
Candela	DC	DC	FWR
15	87	41	60
30	153	63	86
75	NA	111	142
95	NA	134	164
115	NA	158	191
150	NA	189	228
177	NA	226	264

Ceiling-Mount Speaker Sound Output		
Setting	UL Reverberant (dBA @ 10 ft)	UL Anechoic (dBA @ 10 ft)
1/4 W	79	79
1/2 W	82	82
1 W	85	85
2 W	88	88

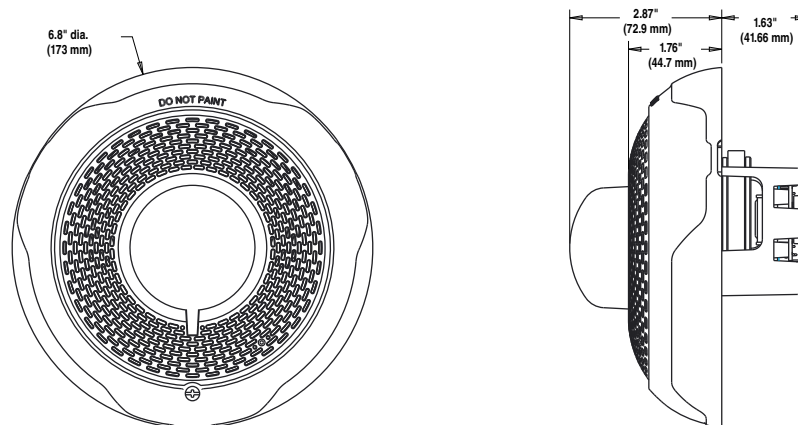
Ceiling-Mount Speaker Strobe Sound Output		
Setting	UL Reverberant (dBA @ 10 ft)	UL Anechoic (dBA @ 10 ft)
1/4 W	77	77
1/2 W	80	80
1 W	83	83
2 W	86	86

L-Series Dimensions



Ceiling Speaker

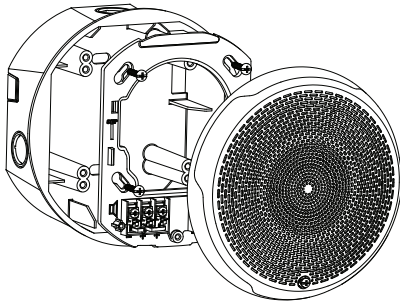
A0543-00



Ceiling Speaker Strobe

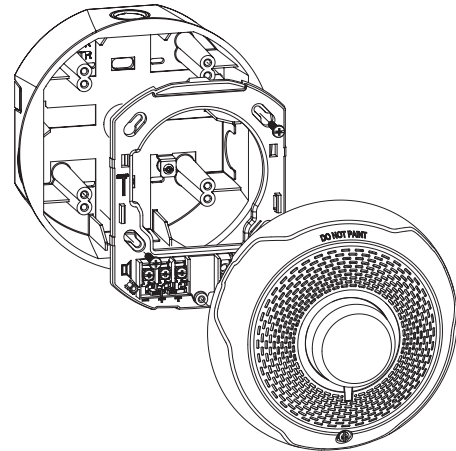
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Surface Mounting



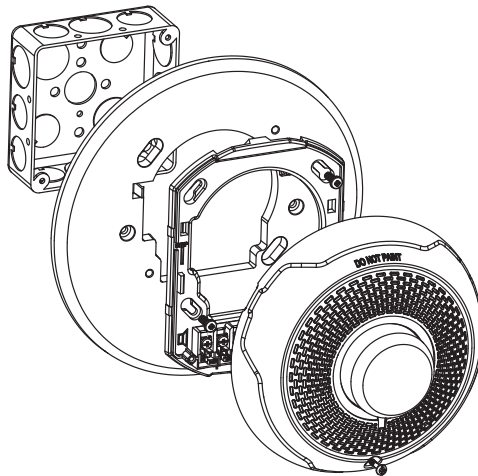
A0504-01

Ceiling Speaker with Surface Mount Back Box



A0520-01

Ceiling Speaker Strobe with Surface Mount Back Box



A0542-00

Ceiling Speaker Strobe with Trim Ring and 4" Square Electrical Box

L-Series Ordering Information

Ceiling Mount		
White	Red	Description
SPCWL	SPCRL	Speaker only
SPSCWL	SPSCRL	Speaker Strobe
SPSCWL-P	—	Plain, Speaker Strobe
SPSCWL-SP	—	Fuego, Speaker Strobe
SPSCWL-CLR-ALERT	—	Alert, Speaker Strobe, Clear Lens

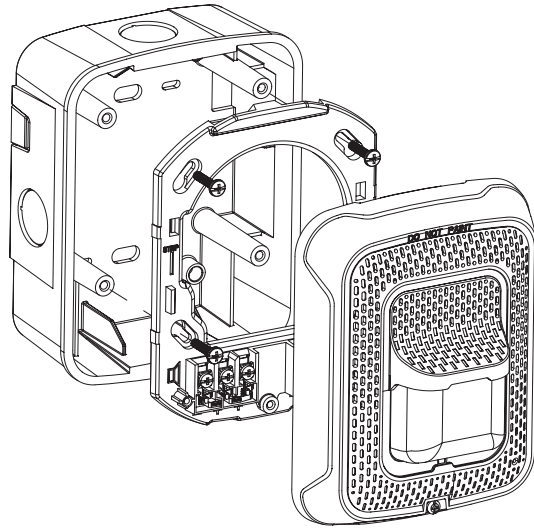
Accessories		
White	Red	Description
SBBCWL	SBBCRL	Universal Ceiling Surface Mount Back Box
TRC-2W	TRC-2	Universal Ceiling Trim Ring



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 AVDS866-03 • 03/23/2018

Surface Mounting



A0523-01

**Wall-Mount Speaker Strobe
with SBBSPRL/ SBBSPWL Surface Mount Back Box**

L-Series Ordering Information

Wall Mount		
White	Red	Description
SPWL	SPRL	Speaker only
SPSWL	SPSRL	Speaker Strobe
SPSWL-P	SPSRL-P	Plain Speaker Strobe
SPSWL-ALERT	—	Speaker Strobe, Amber Lens
SPSWL-CLR-ALERT	—	Speaker Strobe Clear Lens
—	SPSRL-SP	Speaker Strobe, Fuego

Accessories		
White	Red	Description
RFPW	RFP	7 in × 9.5 in Retrofit Plate
SBBSPWL	SBBSPRL	Surface Mount Back Box for Speakers and Speaker Strobes
TR-2W	TR-2	Wall Mount Trim Ring

Notes:

All -P models have a plain housing (no "FIRE" marking on the cover)



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AVDS867-03 • 6/6/2019



Outdoor, Selectable-Output Speaker Strobes and Dual-Voltage Evacuation Speakers for Wall Applications

SpectrAlert® Advance outdoor, selectable-output speaker strobes and dual-voltage evacuation speakers meet virtually any outdoor application requirement.

Features

- Weatherproof per NEMA 4X, IP56
- Rated from -40°F to 151°F
- Plug-in design reduces ground faults
- Universal mounting plate with onboard shorting spring that tests wiring continuity before devices are installed
- Field-selectable candela settings: 15, 15/75, 30, 75, 95, 110, 115, 135, 150, 177, and 185
- Automatic selection of 12- or 24-volt operation at 15 and 15/75 candela
- Rotary switch for speaker voltage (25 and 70.7 Vrms) and power settings (1/4, 1/2, 1 and 2 watts)
- Compatible with System Sensor synchronization protocol and legacy SpectrAlert products
- Tamper-resistant construction
- Listed for ceiling or wall mounting

Agency Listings



SPECTRAlert
ADVANCE
From System Sensor

SpectrAlert Advance offers the broadest line of outdoor speakers and speaker strobes in the industry. From metal and plastic outdoor back boxes, to white and red plastic housings, to wall and ceiling mounting options, SpectrAlert Advance can meet virtually any application requirement.

Wall-mount outdoor speakers and speaker strobes can be used indoors or outdoors in wet or dry applications, and can provide reliable operation from -40°F to 151°F. These speakers provide a broad frequency response range, low harmonic distortion and maintain a high sound pressure level at all tap settings to provide accurate and intelligible broadcast of evacuation messages.

Like the entire SpectrAlert Advance line, wall-mount outdoor speakers and speaker strobes include a variety of features that increase application flexibility and simplify installation. First, field-selectable settings, including candela, speaker voltage and power settings, and automatic selection of 12- or 24-volt operation enable installers to easily adapt devices to meet requirements.

Next, these devices use a universal mounting plate with an onboard shorting spring that ensures wiring continuity before devices are installed, so installers can verify proper wiring without mounting the devices and exposing them to potential construction damage. Once the plates are mounted, all SpectrAlert Advance devices utilize a plug-in design with a single captured screw to speed installation and virtually eliminate costly ground faults.

Outdoor devices ship with weatherproof plastic back boxes (metal back boxes are available separately) that accommodate in-and-out wiring for daisy chaining devices. Plastic back boxes feature removable side flanges and improved resistance to saltwater corrosion. Knock-outs located on the back eliminate the need to drill holes for screw-in mounting. Plastic and metal weatherproof back boxes come with 3/4-inch top and bottom conduit entries and 3/4-inch knock-outs at the back. A screw-in NPT plug with an O-ring gasket for a watertight seal is included with each back box.

SpectrAlert® Advance Outdoor Speaker and Speaker Strobe Specifications

Architectural/Engineering Specifications

General

SpectrAlert Advance outdoor speakers and speaker strobes shall mount to a weatherproof back box. A universal mounting plate shall be used for mounting ceiling and wall products. The notification appliance circuit and amplifier wiring shall terminate at the universal mounting plate. Also, SpectrAlert Advance speaker strobes, when used with the Sync•Circuit™ Module accessory, shall be powered from a non-coded notification appliance circuit output and shall operate on a nominal 12 or 24 volts. When used with the Sync•Circuit Module, 12-volt-rated notification appliance circuit outputs shall operate between 8.5 and 17.5 volts; 24-volt-rated notification appliance circuit outputs shall operate between 16.5 and 33 volts. Outdoor SpectrAlert Advance products shall operate between -40°F and 151°F from a regulated DC, or full-wave rectified, unfiltered power supply.

Speaker

Speaker shall be a System Sensor SpectrAlert Advance Model _____ dual-voltage transformer speaker capable of operating at 25.0 or 70.7 nominal Vrms. Speaker shall be listed to Underwriters Laboratories Standard S4048 for outdoor fire protective signaling systems. Speaker shall have a frequency range of 400 to 4,000 Hz and shall have an operating temperature from -40°F to 150.8°F. Speaker shall have power taps and wattage settings that are selected by rotary switches. The speaker must be installed with its weatherproof back box in order to remain outdoor approved per UL listing S4048. The speaker shall be suitable for use in air handling spaces and wet environments.

Speaker Strobe Combination

The speaker strobe shall be a System Sensor Model _____ listed to UL 1638 and UL 1480 and be approved for fire protective signaling systems. Speaker shall be capable of operating at 25.0 or 70.7 nominal Vrms and shall have a frequency range of 400 to 4,000 Hz. Speaker shall have power taps that are selected by rotary switch. The strobe shall consist of a xenon flash tube with associated lens/reflector system and operate on either 12 or 24 volts. The strobe shall also feature selectable candela output, providing options for 15 or 15/75 candela when operating on 12 volts and 15, 15/75, 30, 75, 110, 115, 135, 150, 177 or 185 candela when operating on 24 volts. The strobe shall comply with the Americans with Disabilities Act requirement for visible signaling appliances, flashing at 1 Hz over the strobe's entire operating voltage range. The speaker strobe must be installed with its weatherproof back box in order to remain outdoor approved per UL. The speaker strobe shall be suitable for use in wet environments.

Physical Specifications

Operating Temperature	-40°F to 151°F (-40°C to 66°C)
------------------------------	--------------------------------

Dimensions, Wall-Mount

SPS Speaker Strobe	6.0" L x 5.0" W x 4.7" D (including lens and speaker)
SP Speaker	6.0" L x 5.0" W x 2.9" D

Dimensions, Wall-Mount Weatherproof Back Box	6.5" L x 5.5" H x 2.9" D
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Electrical/Operating Specifications

Nominal Voltage (speakers)	25 V or 70.7 V (nominal)
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Maximum Supervisory Voltage (speakers)	50 VDC
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Strobe Flash Rate	1 flash per second
--------------------------	--------------------

Nominal Voltage (strobes)	Regulated 12 VDC/FWR or regulated 24 DC/FWR
----------------------------------	---

Operating Voltage Range (includes fire alarm panels with built in sync)	8 to 17.5 V (12 V nominal) or 16 to 33 V (24 V nominal)
--	---

Operating Voltage with MDL3 Sync Module	8.5 to 17.5 V (12 V nominal) or 16.5 to 33 V (24 V nominal)
--	---

Frequency Range	400 to 4,000 Hz
------------------------	-----------------

Power	¼, ½, 1, 2 watts
--------------	------------------

UL Current Draw Data

UL Max. Strobe Current Draw (mA RMS)					
	Candela	8 to 17.5 Volts		16 to 33 Volts	
		DC	FWR	DC	FWR
Standard Candela Range	15	123	128	66	71
	15/75	142	148	77	81
	30	NA	NA	94	96
	75	NA	NA	158	153
	95	NA	NA	181	176
	110	NA	NA	202	195
	115	NA	NA	210	205
High Candela Range	135	NA	NA	228	207
	150	NA	NA	246	220
	177	NA	NA	281	251
	185	NA	NA	286	258

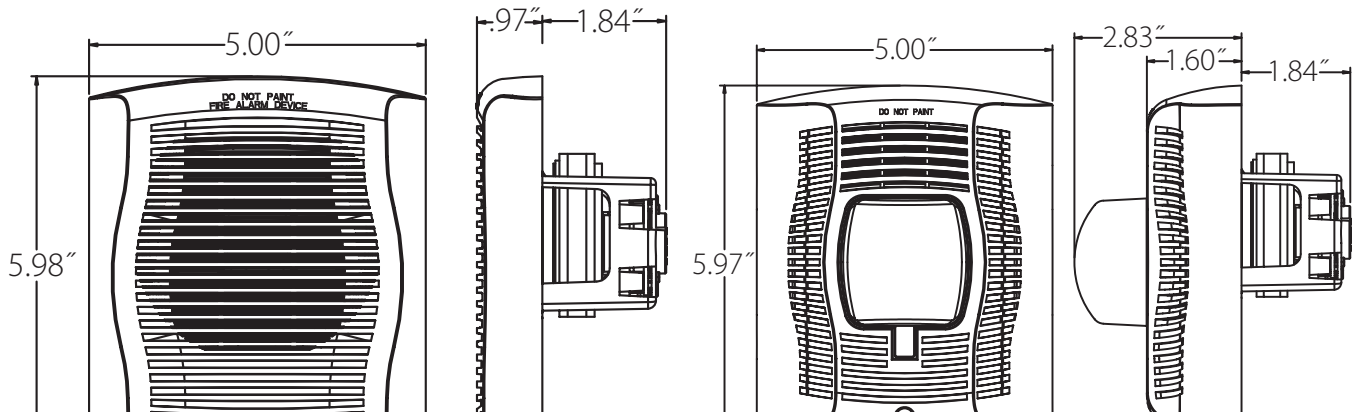
Sound Output				
UL Reverberant (dBA @ 10 ft.)	2W	1W	½ W	¼ W
Outdoor Speaker	90	87	84	81
Outdoor Speaker/Strobe	89	86	83	80

Candela Derating

For K series products used at low temperatures, listed candela ratings must be reduced in accordance with this table.

Strobe Output (cd)	
Listed Candela	Candela rating at -40°F
15	Do not use below 32°F
15/75	
30	
75	44
95	70
110	110
115	115
135	135
150	150
177	177
185	185

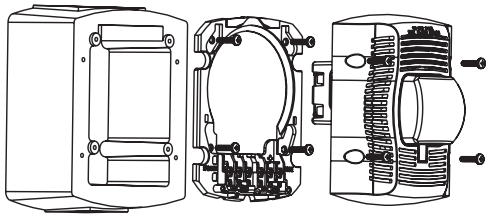
Dimensions



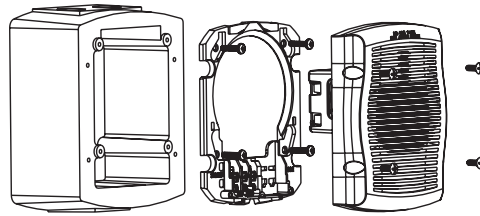
Wall-Mount Outdoor Speaker

Wall-Mount Outdoor Speaker Strobe

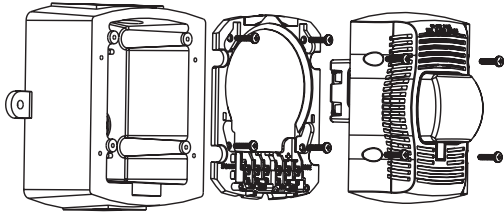
Surface Mounting



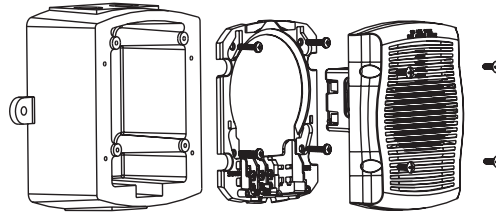
Wall-Mount Speaker Strobe with Plastic Weatherproof Back Box



Wall-Mount Speaker with Plastic Weatherproof Back Box



Wall-Mount Speaker Strobe with Metal Weatherproof Back Box



Wall-Mount Speaker with Metal Weatherproof Back Box

Ordering Information for SpectrAlert® Advance Outdoor Speakers and Speaker Strobes

Wall Mount		
White	Red	Description
SPWK	SPRK	Outdoor Speaker (includes plastic weatherproof back box)
SPWK-R	SPRK-R	Outdoor Speaker (does not include plastic weatherproof back box)
SPSWK	SPSRK	Outdoor Speaker Strobe, Standard cd (includes plastic weatherproof back box)
SPSWK-P	SPSRK-P	Plain Outdoor Speaker Strobe, Standard cd (includes plastic weatherproof back box)
SPSWK-R	SPSRK-R	Outdoor Speaker Strobe, Standard cd (does not include weatherproof back box)
SPSWK-CLR-ALERT	—	Outdoor Speaker Strobe, Standard cd, Clear Lens, ALERT Printed (includes plastic weatherproof back box)
—	SPSRHK	Outdoor Speaker Strobe, High cd (135, 150, 177, 185) (includes plastic weatherproof back box)
Accessories		
White	Red	Description
MWBBW	MWBB	Wall, Metal Weatherproof Back Box

Notes:

All -P models have a plain housing (no "FIRE" marking on cover)

"Standard cd" refers to strobes that include 15, 15/75, 30, 75, 95, 110, and 115 candela settings. "High cd" refers to strobes that include 135, 150, 177, and 185 candela settings. **When replacing standard outdoor units, both the device and back box must be replaced.**



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AVDS11301 • 09/12



SSM/SSV Series Alarm Bells

System Sensor's SSM and SSV series alarm bells are low current, high decibel notification appliances for use in fire and burglary systems or other signaling applications.



Features

- Approved for indoor and outdoor use
- Low current draw
- High dB output
- Available in six-inch, eight-inch, and ten-inch sizes
- AC and DC models
- DC models polarized for use with supervision circuitry
- Mount directly to standard four-inch square electrical box indoors
- SSM and SSV series come pre-wired

Reliable Performance. The SSM and SSV series provide loud resonant tones. The SSM series operates on 24VDC and are motor driven, while the SSV series operates on 120VAC utilizing a vibrating mechanism.

Simplified Installation. For indoor use, the SSM and SSV series mount to a standard four-inch square electrical box. For outdoor applications, weatherproof back box, model number WBB, is used.

The SSM and SSV series come pre-wired, to reduce installation time. The SSM series incorporates a polarized electrical design for use with supervision circuitry.

Agency Listings



SSM/SSV Specifications

Architectural/Engineering Specifications

Model shall be a SSM or SSV Series alarm bell. Bells shall have underdome strikers and operating mechanisms. Gongs on said bells shall be no smaller than nominal 6⁷/₈"/10" (specify size) with an operating voltage of 24VDC or 120VAC (specify by part number). Bells shall be suitable for surface or semi-flush mounting. Outdoor surface mounted installations shall be weatherproof (using optional WBB weatherproof electrical box). Otherwise bells shall mount to a standard 4" square electrical box having a maximum projection of 2¹/₂". Bells shall be located as shown on the drawings or as determined by the Authority Having Jurisdiction. Bells shall be listed for indoor/outdoor use by Underwriters Laboratories and the California State Fire Marshal, and approved by Factory Mutual and MEA.

Physical/Operating Specifications

Operating Temperature Range -31°F to 140°F

Operating Voltage SSM series: 24 VDC
SSV series: 120 VAC

Termination Provided with 2 sets of leads for in/out wiring

Service Use Fire Alarm, General Signaling, Burglar Alarm

Warranty 3 years

Electrical Specifications

Model	Gong Diameter (inches)	Nominal Voltage	Operating Voltage Limit	Maximum Current	Sound Output (dBA)
SSM24-6	6	Regulated 24VDC	16 to 33VDC	DC-31.1mA/ FWR-53.5mA	82
SSM24-8	8	Regulated 24VDC	16 to 33VDC	DC-31.1mA/ FWR-53.5mA	80
SSM24-10	10	Regulated 24VDC	16 to 33VDC	DC-31.1mA/ FWR-53.5mA	81
SSV120-6	6	Regulated 120VAC	96 to 132VAC	53mA	85
SSV120-8	8	Regulated 120VAC	96 to 132VAC	53mA	82
SSV120-10	10	Regulated 120VAC	96 to 132VAC	53mA	82

* Sound output measured at Underwriter Laboratories, as specified in UL464

Ordering Information

UL/FM Model No.	ULC/Canadian Model No.	Description
SSM24-6	SSM24-6A	Bell, 6", 24VDC, Polarized, 82dBA
SSM24-8	SSM24-8A	Bell, 8", 24VDC, Polarized, 80dBA
SSM24-10	SSM24-10A	Bell, 10", 24VDC, Polarized, 81dBA
SSV120-6	SSV120-6A	Bell, 6", 120VAC, 85dBA
SSV120-8	SSV120-8A	Bell, 8", 120VAC, 82dBA
SSV120-10	SSV120-10A	Bell, 10", 120VAC, 82dBA
WBB		Weatherproof back box for SSM and SSV series, when installed outdoors



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WFDS74501 • 3/12

DTK-HW Series

Parallel Connected Surge Protective Device



Product Features

- Approved for 20A circuit breakers
- NEMA 4X Weatherproof enclosure allows for use in harsh environments
- Diagnostic LED indicates ground presence, system power and SPD function
- Complies with ANSI/IEEE C62.41 and C62.45 Category B standards

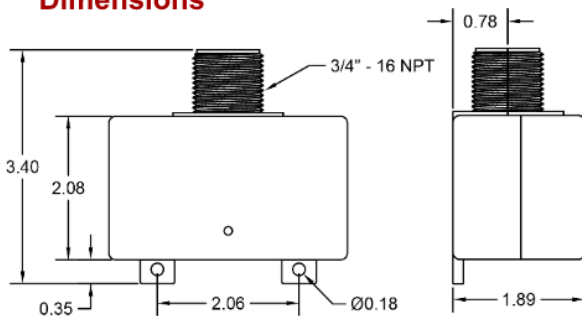
Applications

- Fire Alarm Control Panels
- Equipment Panels
- Dedicated Branch Circuits
- Pumps, Motors and Lift Pump Stations

Accessories

- DIN Rail Mounting Kit – DTK-DRK

Dimensions



DITEK's DTK-HW Series of surge protective devices are designed and manufactured to meet the standards of the life safety industry. These compact, parallel-mount SPD's are available for 120V, 240V and 120/240V systems; and are widely used to protect fire alarm panels and other dedicated branch circuit loads. Their small footprint enables installation in a variety of locations.

Technical Specifications

Part Number:	DTK-120HW	DTK-240HW	DTK-120/240HW
Service Voltage:	Single Φ (2W + G), 120VAC	Single Φ (2W + G), 240VAC	Split Φ (3W + G), 120/240VAC
MCOV:	150V	320V	150/320V
Protection Modes:	L-G, L-N, N-G	L-G, L-N, N-G	L-G, L-L, L-N, N-G
Voltage Protection Rating:	700V L-G 700V L-N 1,500V N-G	1,200V L-G, 1,200V L-N 2,000V N-G	700V L-G, L-N 1,500V L-L, 1,500V N-G
Surge Current Rating:	50,000A	50,000A	100,000A
SCCR:		10kA	
Nominal Discharge Current Rating (I_n):		10kA	

Mechanical Characteristics

Connection Method:	3/4" NPT Parallel Wired
Housing:	NEMA 4X
Temperature Range:	-31°F - 176°F (-35°C - 80°C)
Maximum Humidity:	95% non-condensing
Dimensions:	3.5"L x 1.89"W x 3.4"H (88.9mm x 48.3mm x 86.4mm)
Weight:	0.55 lb. (0.25 kg)

Quality, Standards & Approval

Agency Approvals:	UL 1449 4 th Edition, cUL
SPD Type:	Type 1 SPD
Warranty:	Ten Year Limited

Every precaution has been taken to ensure that this literature is accurate and complete. DITEK Corporation assumes no responsibility and disclaims all liability for damages resulting from the use of this information or for any errors or omissions.

DTK-2MHLPB Series

Voice, Data and Signaling Circuit Modular Surge Protection



DTK-2MHLP24B



DTK-2MHLP24BWB

Product Features

- Protects two pairs per module
- Multi-stage, SAD technology, hybrid design, provides the best possible protection
- Field replaceable, modular edge card connection design with a single point ground for fast installation, saves time
- Six voltage levels available to protect all types of voice/data applications
- Hard-wired multi-base mounting system allows you to protect up to ten pairs with a common ground. See next page for base part numbers
- Suitable for use on both AC and DC circuits

Applications

- Fire Alarm Panel NAC, SLC, PIV and IDC Circuits
- Burglar Alarm Panels NAC and IDC Circuits
- 70V Speakers and Audio Equipment
- Low-Voltage Landscape Lighting and Lighting Control Circuits
- 4-20mA Current Loops

Accessories

- To order Module with Base, add "WB" to end of part number
- Test Module Kit – Part Number DTK-2MHLPTM
- DIN Rail Mounting Kit – Part Number DTK-DRK

DITEK's DTK-2MHLPB series of signal, data and loop circuit surge protectors provide robust protection in a compact package. This series was designed for ease of installation, with convenient field-replaceable modules and a Snap-Track base system, allowing the installer to protect multiple circuits while utilizing a common ground point.

Technical Specifications

DTK-2MHLP	5B	12B	24B	36B	48B	75B
Service Voltage:	5V	12V	24V	36V	48V	75V
MCOV:	6V	18V	33V	48V	64V	90V
Clamping Voltage:	6.8V	21.6V	39V	57V	76V	108V
Protection Modes:	Line-Ground (All)					
Surge Current Rating:	20,000 Amps					
Max Continuous Current:	5 Amps					
Data Rate:	200kbps to 2Mbps					

Mechanical Characteristics

Base Connection Method:	10AWG max screw terminals	
Module Connection Method:	Edge card into mounting base	
Housing:	ABS	
Operating Temperature:	-40°F - 158°F (-40°C - 70°C)	
Maximum Humidity:	95% non-condensing	
Dimensions:	Module	Module with Base
	2.1"L x 1.4"W x 1.9"H (53mm x 36mm x 48mm)	3.25"L x 1.5"W x 2.6"H (83mm x 38mm x 66mm)
Weight:	1.2 oz (34g)	2.8 oz (79g)

Quality, Standards & Approval

Agency Approvals:	UL497B
Warranty:	Ten Year Limited Warranty

Every precaution has been taken to ensure that this literature is accurate and complete. DITEK Corporation assumes no responsibility and disclaims all liability for damages resulting from the use of this information or for any errors or omissions.



MATERIAL BROCHURE

FOR: GARDEN GROVE
HIGH SCHOOL
MODULAR BUILDING

CONTRACTOR:

AMERICAN MODULAR
787 SPRECKELS AVE
MANTECA, CA.,
209-825-1921

SUBMITTED BY:

D&B FIRE PROTECTION, INC.
1623 LEESON LANE
CORONA, CA. 92879
951-737-9965

DATE:

FEBRUARY 2022

Schedule 10 and Schedule 40

FM Approved and UL Listed Sprinkler Pipe

Bull Moose Tube Company is a recognized producer of quality pipe products. Our Schedule 10 and Schedule 40 are FM Approved and UL Listed (for U.S. and Canada), even though these products do not require separate approvals and listings. Bull Moose Tube made the decision to have them approved and listed for your peace of mind. Our Sch. 10 and Sch. 40 have been through the same rigorous testing as our other fine pipe products.

Bull Moose Tube's Sch. 10 and Sch. 40 pipes are made to ASTM A135 and ASTM A795. These products are typically supplied with our protective coating but can be supplied without the coating so they can be hot-dip galvanized to meet FM requirements for use in dry systems in accordance with the zinc coating specifications of ASTM A795 or ASTM A53.

Schedule 10 Pipe

Nominal Pipe Size (in)	Nominal O.D. (in)	Nominal I.D. (in)	Weight/Ft	Bundle Size
1	1.315	1.097	1.41 lbs/ft	91
1 1/4	1.660	1.442	1.81 lbs/ft	61
1 1/2	1.900	1.682	2.09 lbs/ft	61
2	2.375	2.157	2.64 lbs/ft	37
2 1/2	2.875	2.635	3.53 lbs/ft	30
3	3.500	3.260	4.34 lbs/ft	19
4	4.500	4.260	5.62 lbs/ft	19

Schedule 40 Pipe

Nominal Pipe Size (in)	Nominal O.D. (in)	Nominal I.D. (in)	Weight/Ft	Bundle Size
1	1.315	1.049	1.68 lbs/ft	70
1 1/4	1.660	1.380	2.27 lbs/ft	51
1 1/2	1.900	1.610	2.72 lbs/ft	44
2	2.375	2.067	3.66 lbs/ft	30
2 1/2	2.875	2.468	5.80 lbs/ft	30
3	3.500	3.068	7.58 lbs/ft	19
4	4.500	4.260	10.80 lbs/ft	19

PIPE PREPARATION

For proper operation, all pipe surfaces should be cleaned prior to installation. In order to provide a leak-tight seat for the gasket, pipe surfaces should be free from indentations and projections from the end of the pipe to the groove. All loose paint, scale, dirt, chips, grease, and rust must be removed prior to installation. Failure to take these important steps may result in improper coupling assembly, causing leakage. Also, check the manufacturer's instructions for the specific fitting used.



A CAPARO company

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e-mail: sales@bullmoosetube.com

For additional information,
contact your salesperson
today at (800) 325-4467 or
(636) 537-2600 in the USA,
or from Canada
call (800) 882-4666



Series TY-FRB, 5.6 K-factor Upright, Pendent, and Recessed Pendent Sprinklers Quick Response, Standard Coverage

General Description

The TYCO Series TY-FRB, 5.6 K-factor, Upright (TY313) and Pendent (TY323) Sprinklers described in this data sheet are quick response, standard coverage, decorative 3 mm glass bulb-type spray sprinklers designed for use in light or ordinary hazard, commercial occupancies such as banks, hotels, and shopping malls.

The recessed version of the Series TY-FRB Pendent Sprinkler, where applicable, is intended for use in areas with a finished ceiling. This recessed pendent sprinkler uses one of the following:

- A two-piece Style 15 Recessed Escutcheon with recessed adjustment up to 5/8 in. (15,9 mm) from the flush pendent position.
- A two-piece Style 20 Recessed Escutcheon with recessed adjustment up to 1/2 in. (12,7 mm) from the flush pendent position.

The adjustment provided by the Recessed Escutcheon reduces the accuracy to which the fixed pipe drops to the sprinklers must be cut.

Intermediate level versions of Series TY-FRB Sprinklers are described in Technical Data Sheet TFP357. Sprinkler guards and shields are described in Technical Data Sheet TFP780.

IMPORTANT

Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information.

Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.

NOTICE

The TYCO Series TY-FRB Sprinklers described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions.

Sprinkler Identification Number (SIN)

TY313 . . . Upright 5.6K, 1/2 in. NPT
TY323 . . . Pendent 5.6K, 1/2 in. NPT

Technical Data

Approvals
Refer to Table A

Maximum Working Pressure
175 psi (12.1 bar)
250 psi (17.2 bar)*

* The maximum working pressure of 250 psi (17.2 bar) only applies to the listing by Underwriters Laboratories, Inc. (UL).

Discharge Coefficient
K=5.6 GPM/psi^{1/2} (80,6 LPM/bar^{1/2})

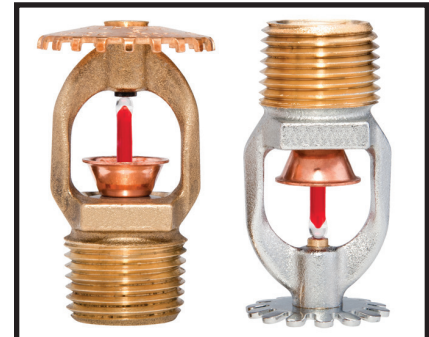
Temperature Rating
Refer to Table A

Finishes
Sprinkler: Refer to Table B

Recessed Escutcheon: White Coated, Black Coated, Chrome Plated, or Brass Plated

Physical Characteristics

Frame	.....	Bronze
Button	.....	Brass/Copper
Sealing Assembly	.....	Stainless Steel w/TEFLON
Bulb	.....	Glass
Compression Screw	.....	Bronze
Deflector	.....	Bronze

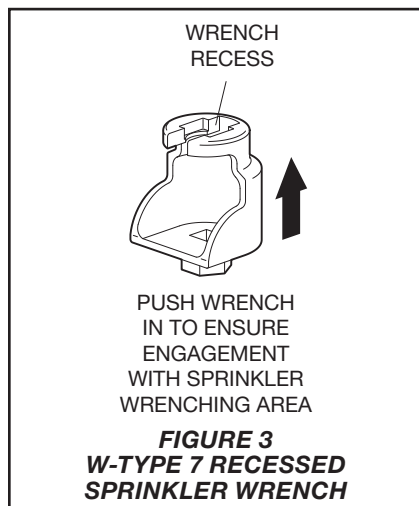
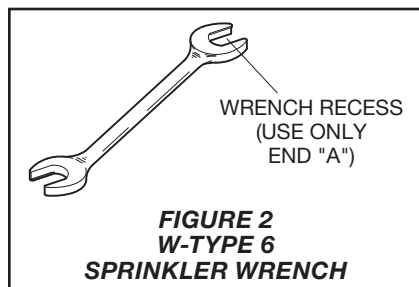
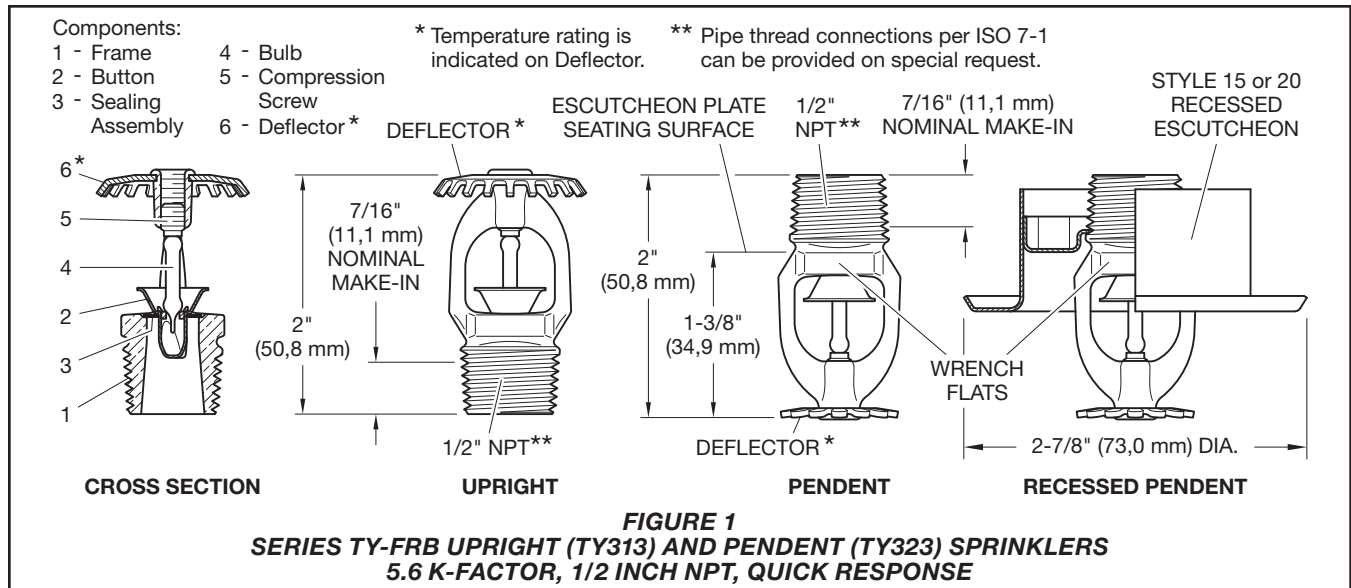


Operation

The glass bulb contains a fluid which expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, allowing the sprinkler to activate and water to flow.

Design Criteria

The TYCO Series TY-FRB, 5.6 K-factor, Upright (TY313) and Pendent (TY323) Sprinklers are intended for fire protection systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency (such as, UL Listing is based on the requirements of NFPA 13, and FM Approval is based on the requirements of FM's Loss Prevention Data Sheets). Only the Style 15 or Style 20 Recessed Escutcheon is to be used for recessed pendent installations.



Installation

The TYCO Series TY-FRB, 5.6 K-factor, Upright (TY313) and Pendent (TY323) Sprinklers must be installed in accordance with this section.

General Instructions

Do not install any bulb-type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 in. (1,6 mm) for the 135°F (57°C) and 3/32 in. (2,4 mm) for the 286°F (141°C) temperature ratings.

A leak-tight 1/2 in. NPT sprinkler joint should be obtained by applying a minimum to maximum torque of 7 to 14 lb-ft (9,5 to 19,0 N·m). Higher levels of torque can distort the sprinkler Inlet with consequent leakage or impairment of the sprinkler.

Do not attempt to compensate for insufficient adjustment in the Escutcheon Plate by under- or over-tightening the sprinkler. Re-adjust the position of the sprinkler fitting to suit.

Upright and Pendent Sprinklers

The Series TY-FRB Upright and Pendent Sprinklers must be installed in accordance with the following instructions.

Step 1. Install Pendent sprinklers in the pendent position. Install upright sprinklers in the upright position.

Step 2. With pipe-thread sealant applied to the pipe threads, hand-tighten the sprinkler into the sprinkler fitting.

Step 3. Tighten the sprinkler into the sprinkler fitting using only the W-Type 6 Sprinkler Wrench (Figure 2). With reference to Figure 1, apply the W-Type 6 Sprinkler Wrench to the wrench flats. Torque sprinklers 7 to 14 lb-ft (9,5 to 19,0 N·m).

Recessed Pendent Sprinklers

The Series TY-FRB Recessed Pendent Sprinklers must be installed in accordance with the following instructions.

Step A. After installing the Style 15 or Style 20 Mounting Plate over the sprinkler threads, and with pipe-thread sealant applied to the pipe threads, hand-tighten the sprinkler into the sprinkler fitting.

Step B. Tighten the sprinkler into the sprinkler fitting using only the W-Type 7 Recessed Sprinkler Wrench (Figure 3). With reference to Figure 1, apply the W-Type 7 Recessed Sprinkler Wrench to the sprinkler wrench flats. Torque sprinklers 7 to 14 lb-ft (9,5 to 19,0 N·m).

Step C. After ceiling installation and finishing, slide on the Style 15 or Style 20 Closure over the Series TY-FRB Sprinkler and push the Closure over the Mounting Plate until its flange comes in contact with the ceiling.

Care and Maintenance

The TYCO Series TY-FRB, 5.6 K-factor, Upright (TY313) and Pendent (TY323) Sprinklers must be maintained and serviced in accordance with this section.

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, obtain permission to shut down the affected fire protection systems from the proper authorities and notify all personnel who may be affected by this action.

Absence of the outer piece of an escutcheon, which is used to cover a clearance hole, can delay sprinkler operation in a fire situation.

The owner must assure that the sprinklers are not used for hanging any objects and that the sprinklers are only cleaned by means of gently dusting with a feather duster; otherwise, non-operation in the event of a fire or inadvertent operation may result.

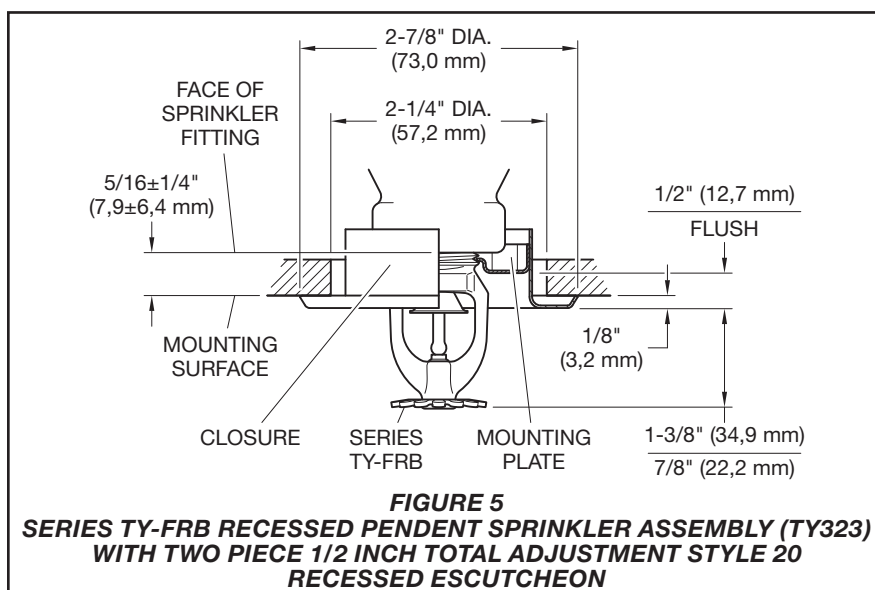
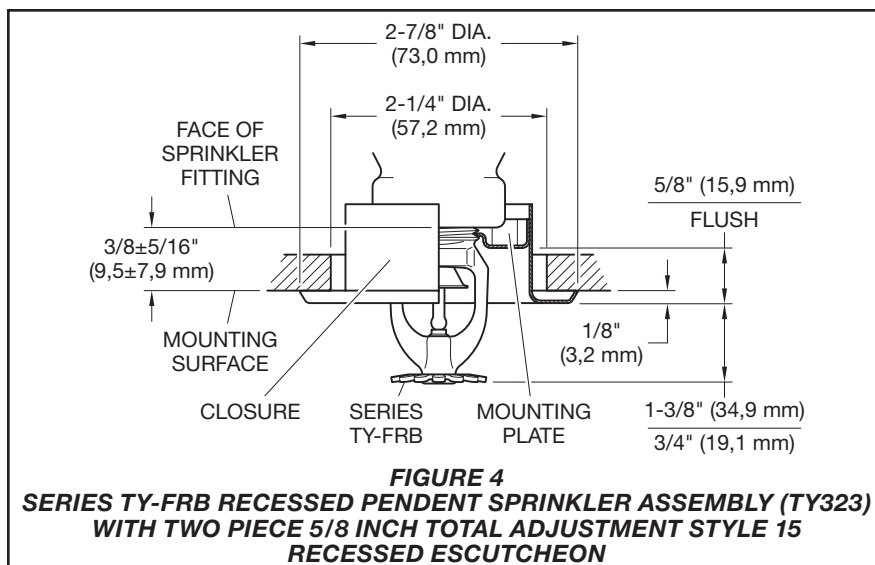
Sprinklers which are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be painted, plated, coated, or otherwise altered after leaving the factory. Modified sprinklers must be replaced. Sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be replaced if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

Care must be exercised to avoid damage to the sprinklers before, during, and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. (Ref. Installation Section.)

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any other authorities having jurisdiction. Contact the installing contractor or product manufacturer with any questions.

Automatic sprinkler systems are recommended to be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.



Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name and Part Number (P/N).

Sprinkler Assemblies with NPT Thread Connections

Specify: Series TY-FRB Upright or Pendent (specify) Sprinkler, SIN (specify), K=5.6, Quick Response, (specify) temperature rating, (specify) finish, P/N (specify, refer to Table A).

Recessed Escutcheon

Specify: Style 15 Recessed Escutcheon with (specify*) finish, P/N (specify*)

Specify: Style 20 Recessed Escutcheon with (specify*) finish, P/N (specify*)

* Refer to Technical Data Sheet TFP770

Sprinkler Wrench

Specify: W-Type 6 Sprinkler Wrench, P/N 56-000-6-387

Specify: W-Type 7 Sprinkler Wrench, P/N 56-850-4-001

K FACTOR	TYPE	TEMPERATURE	SPRINKLER FINISH (See Note 7)						
			BULB LIQUID COLOR	NATURAL BRASS	CHROME PLATED	POLYESTER ^c			
5.6 1/2 in. NPT	UPRIGHT (TY313) and PENDENT (TY323)	135°F (57°C)	Orange			1, 2, 3, 4, 5, 6			
		155°F (68°C)	Red						
		175°F (79°C)	Yellow						
		200°F (93°C)	Green						
		286°F (141°C)	Blue						
	RECESSED PENDENT (TY323) Figures 4 ^a and 5 ^b	135°F (57°C)	Orange						1, 2, 3, 4
		155°F (68°C)	Red						
		175°F (79°C)	Yellow						
		200°F (93°C)	Green						
		200°F (93°C)	Green						

Notes:

1. Listed by Underwriters Laboratories, Inc., (UL) as Quick Response Sprinklers.
2. Listed by Underwriters Laboratories, Inc., for use in Canada (C-UL) as Quick Response Sprinklers.
3. Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers.
4. Approved by the City of New York under MEA 354-01-E.
5. VdS Approved (For details, contact Johnson Controls, Enschede, Netherlands, Tel. 31-53-428-4444/Fax 31-54-428-3377.)
6. Approved by the Loss Prevention Certification Board (LPCB Ref. No. 094a/06) as Quick Response Sprinklers.
7. Where Polyester Coated Sprinklers are noted to be UL and C-UL Listed, the sprinklers are UL and C-UL Listed as Corrosion-Resistant Sprinklers.
- a. Installed with Style 15 (1/2 in. NPT) 5/8 in. Total Adjustment Recessed Escutcheon, as applicable.
- b. Installed with Style 20 (1/2 in. NPT) 1/2 in. Total Adjustment Recessed Escutcheon, as applicable.
- c. Frame and Deflector only. Listings and approvals apply to color (Special Order).

TABLE A
LABORATORY LISTINGS AND APPROVALS FOR
5.6 K-FACTOR SPRINKLERS

P/N^a 77 - XXX - X - XXX

		SIN	SPRINKLER FINISH		TEMPERATURE RATINGS	
370	5.6K UPRIGHT (1/2 in.NPT)	TY313	1	NATURAL BRASS	135	135°F (57°C)
371	5.6K PENDENT (1/2 in.NPT)	TY323	3	PURE WHITE (RAL9010) ^a POLYESTER	155	155°F (68°C)
			4	SIGNAL WHITE (RAL9003) POLYESTER	175	175°F (79°C)
			5	JET BLACK (RAL9005) POLYESTER	200	200°F (93°C)
			9	CHROME PLATED	286	286°F (141°C)

Notes:

- a. Use suffix "I" for ISO 7-1 connection; for example, 77-370-4-175-I

Notes:

- a. Eastern Hemisphere sales only

TABLE B
SERIES TY-FRB UPRIGHT AND PENDENT SPRINKLERS
PART NUMBER SELECTION

Series TY-FRB — 5.6 K-factor Horizontal and Vertical Sidewall Sprinklers Quick Response, Standard Coverage

General Description

The Series TY-FRB, 5.6 K-factor, Horizontal and Vertical Sidewall Sprinklers described in this data sheet are quick response -standard coverage, decorative 3 mm glass bulb type spray sprinklers designed for use in light and ordinary hazard, commercial occupancies such as banks, hotels, shopping malls, etc. They are designed for installation along a wall or the side of a beam and just beneath a smooth ceiling. Sidewall sprinklers are commonly used instead of pendent or upright sprinklers due to aesthetics or building construction considerations, where piping across the ceiling is not desirable.

The recessed version of the Series TY-FRB Horizontal Sidewall Sprinkler is intended for use in areas with a finished wall. It uses a two-piece Style 10 Recessed Escutcheon with 1/2 in. (12,7 mm) of recessed adjustment or up to 3/4 in. (19,1 mm) of total adjustment from the flush sidewall position, or a two-piece Style 20 Recessed Escutcheon with 1/4 in. (6,4 mm) of recessed adjustment or up to 1/2 in. (12,7 mm) of total adjustment from the flush sidewall position. The adjustment provided by the Recessed Escutcheon reduces the accuracy to which the fixed pipe nipples to the sprinklers must be cut.

Corrosion resistant coatings, where applicable, are utilized to extend the life

IMPORTANT

Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information.

Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.

of copper alloy sprinklers beyond that which would otherwise be obtained when exposed to corrosive atmospheres. Although corrosion resistant coated sprinklers have passed the standard corrosion tests of the applicable approval agencies, the testing is not representative of all possible corrosive atmospheres. Consequently, it is recommended that the end user be consulted with respect to the suitability of these coatings for any given corrosive environment. The effects of ambient temperature, concentration of chemicals, and gas/chemical velocity, should be considered, as a minimum, along with the corrosive nature of the chemical to which the sprinklers will be exposed.

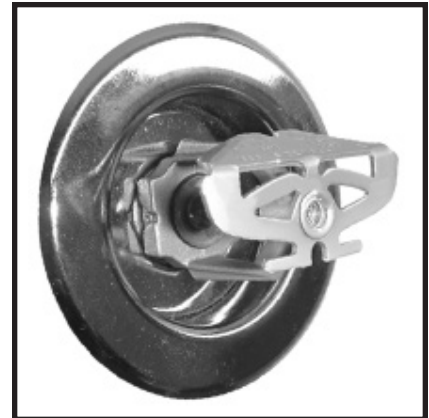
NOTICE

The Series TY-FRB Sprinklers described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions.

Sprinkler Identification Numbers

TY3331..... Horizontal
TY3431..... Vertical



Technical Data

Approvals

UL and C-UL Listed
FM Approved
LPCB Approved
NYC Approved

(Refer to Table A for complete approval information including corrosion resistant status.)

Maximum Working Pressure

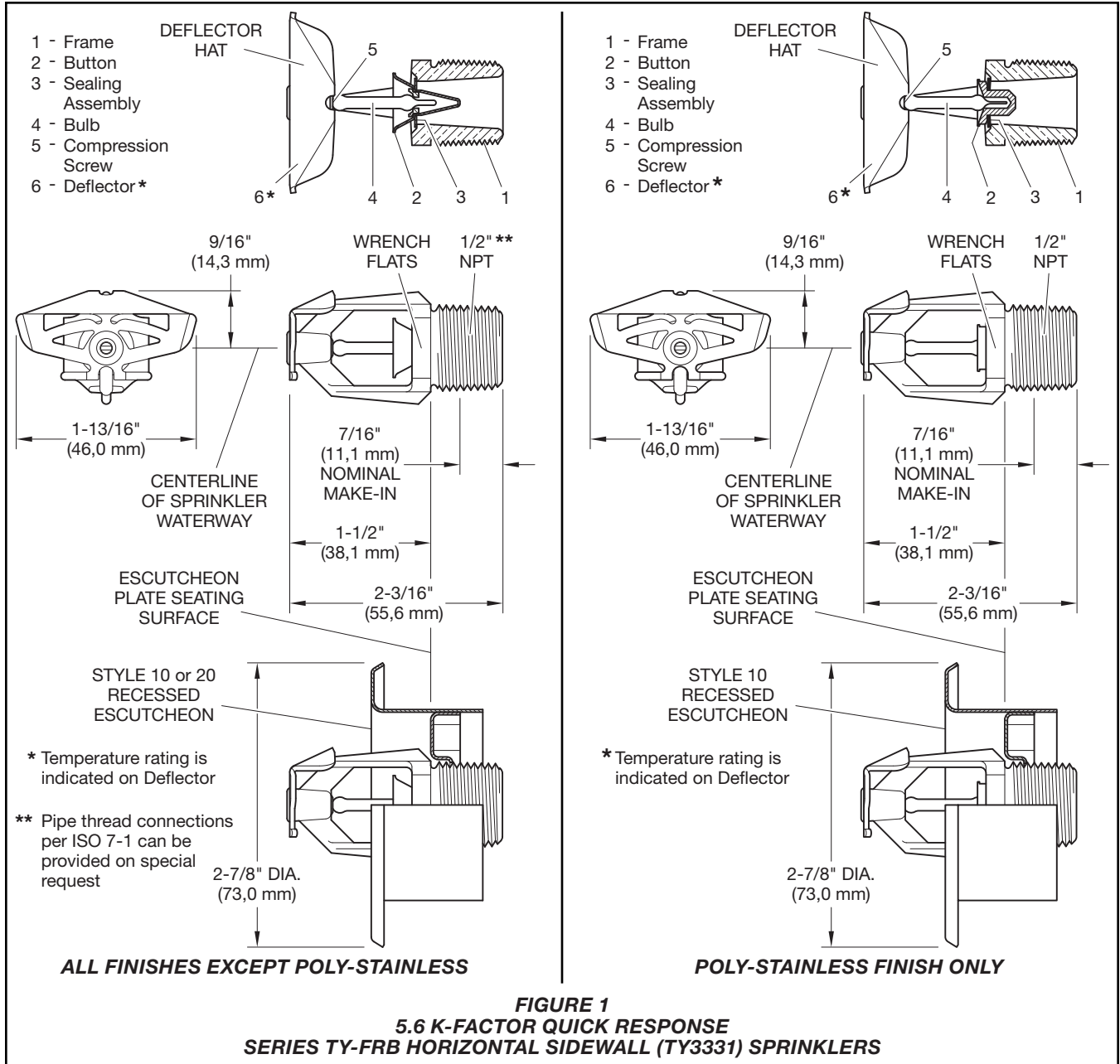
Refer to Table B

Discharge Coefficient

K=5.6 GPM/psi^{1/2} (80,6 LPM/bar^{1/2})

Temperature Ratings

Refer to Table A



Finishes

Sprinkler: Refer to Table C

Recessed Escutcheon: Signal or Pure White, Jet Black, Grey Aluminum, Chrome Plated, or Brass Plated

Physical Characteristics

Frame	.....	Bronze
Button	.....	Brass/Copper
Sealing Assembly	.....	Beryllium Nickel w/TEFLON
Bulb	.....	Glass
Compression Screw	.....	Bronze
HSW Deflector	.....	Bronze
VSW Deflector	.....	Copper

Poly-Stainless

Physical Characteristics

Frame	.....	Bronze
Button	.....	L316 Stainless Steel*
Bulb	.....	Glass
Compression Screw	.....	L316 Stainless Steel*
HSW Deflector	.....	Copper/Bronze
Sealing Assembly	.....	Gold Plated Beryllium Nickel w/TEFLON

*Type L316 stainless steel (UNS 31603) per ASTM A479/479M or BS EN 1008 WN1.4404.

Operation

The glass bulb contains a fluid which expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, allowing the sprinkler to activate and water to flow.

Design Criteria

The Series TY-FRB, 5.6 K-factor, Horizontal and Vertical Sidewall Sprinklers are intended for fire protection systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency (e.g., UL Listing is based on the requirements of NFPA 13, and FM Approval is based on the requirements of FM's Loss Prevention Data Sheets). Only the Style 10 or 20 Recessed Escutcheon, as applicable, is to be used for recessed horizontal installations.

Installation

The Series TY-FRB, 5.6 K-factor, Horizontal and Vertical Sidewall Sprinklers must be installed in accordance with this section.

General Instructions

Do not install any bulb type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 in. (1,6 mm) for the 135°F (57°C) to 3/32 in. (2,4 mm) for the 286°F (141°C) temperature ratings.

A leak tight 1/2 in. NPT sprinkler joint should be obtained with a torque of 7 to 14 lb-ft (9,5 to 19,0 N·m). Higher levels of torque may distort the sprinkler and cause leakage or impairment of the sprinkler.

Do not attempt to make-up for insufficient adjustment in the escutcheon plate by under-or over-tightening the sprinkler. Readjust the position of the sprinkler fitting to suit.

Series TY-FRB Horizontal and Vertical Sidewall Sprinkler Installation

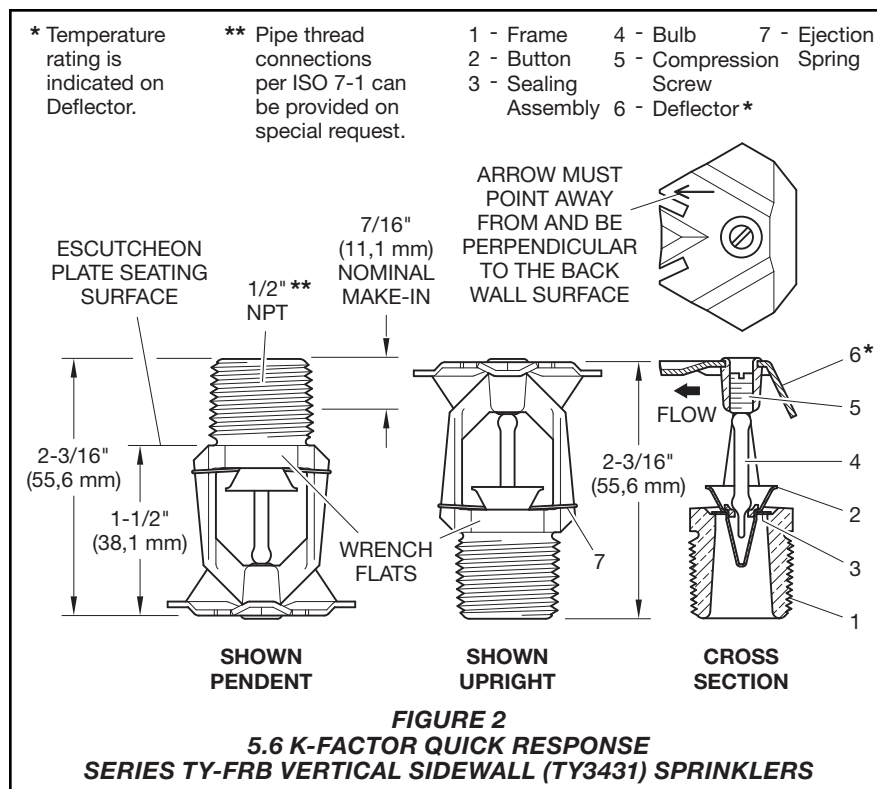
The Series TY-FRB Horizontal and Vertical Sidewall Sprinklers must be installed in accordance with the following instructions.

Step 1. Horizontal sidewall sprinklers are to be installed in the horizontal position with their centerline of waterway perpendicular to the back wall and parallel to the ceiling. The word "TOP" on the Deflector is to face towards the ceiling.

Vertical sidewall sprinklers are to be installed in the pendent or upright position with the arrow on the Deflector pointing away from the wall.

Step 2. With pipe thread sealant applied to the pipe threads, hand tighten the sprinkler into the sprinkler fitting.

Step 3. Tighten the sprinkler into the sprinkler fitting using only the W-Type 6 Sprinkler Wrench (Ref. Figure 5), With reference to Figure 1 or 2, the W-Type 6 Sprinkler Wrench is to be applied to the wrench flats.



Series TY-FRB Recessed Horizontal Sidewall Sprinkler Installation

The Series TY-FRB Recessed Horizontal Sidewall Sprinklers must be installed in accordance with this section.

Step A. Recessed horizontal sidewall sprinklers are to be installed in the horizontal position with their centerline of waterway perpendicular to the back wall and parallel to the ceiling. The word "TOP" on the Deflector is to face towards the ceiling.

Step B. After installing the Style 10 or 20 Mounting Plate over the sprinkler threads, hand tighten the sprinkler into the sprinkler fitting.

Step C. Tighten the sprinkler into the sprinkler fitting using only the W-Type 7 Recessed Sprinkler Wrench (Ref. Figure 6). With reference to Figure 1, the W-Type 7 Recessed Sprinkler Wrench is to be applied to the sprinkler wrench flats.

Step D. After the ceiling has been installed or the finish coat has been applied, slide on the Style 10 or 20 Closure over the Series TY-FRB Sprinkler and push the Closure over the Mounting Plate until its flange comes in contact with the ceiling.

Care and Maintenance

The Series TY-FRB, 5.6 K-factor, Horizontal and Vertical Sidewall Sprinklers must be maintained and serviced in accordance with this section.

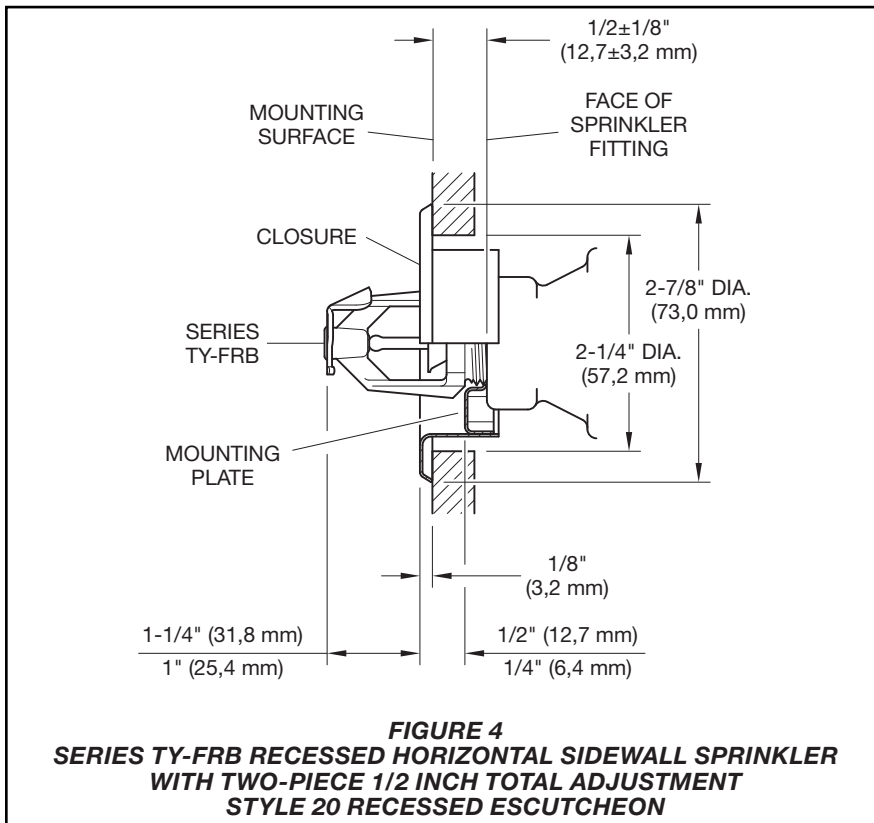
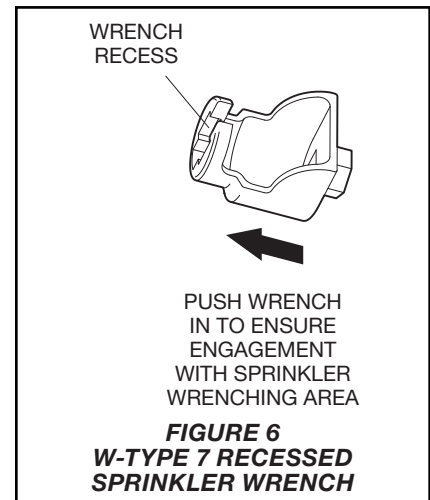
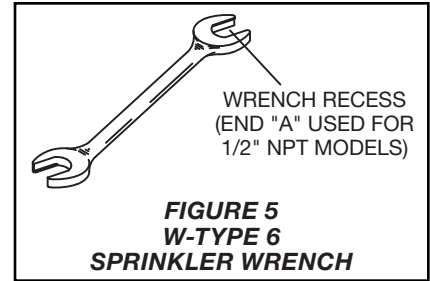
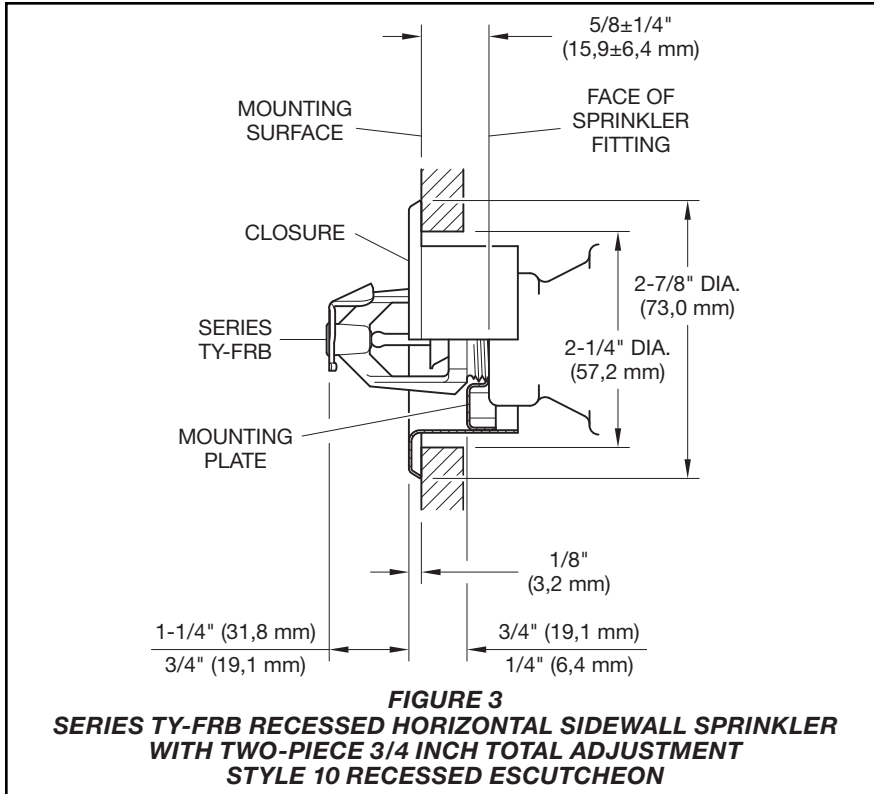
Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, permission to shut down the affected fire protection system must be obtained from the proper authorities and all personnel who may be affected by this action must be notified.

Absence of an escutcheon, which is used to cover a clearance hole, may delay the time to sprinkler operation in a fire situation.

Sprinklers that are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be painted, plated, coated or otherwise altered after leaving the factory. Modified sprinklers must be replaced. Sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be replaced if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

Care must be exercised to avoid damage to the sprinklers before, during, and after installation. Sprinklers



K	TYPE	TEMP.	BULB LIQUID	SPRINKLER FINISH (See Note 11)				
				NATURAL BRASS	CHROME PLATED	POLYESTER ^c	POLY-STAINLESS ^c	LEAD COATED
5.6 1/2 in. NPT	HORIZ. SIDEWALL (TY3331)	135°F (57°C)	Orange	1, 2, 3, 4, 9, 10		1, 2, 3, 9	1, 2	1, 2, 3, 9
		155°F (68°C)	Red					
		175°F (79°C)	Yellow					
		200°F (93°C)	Green					
		286°F (141°C)	Blue					
	RECESSED HORIZ. SIDEWALL (TY3331) ^a Figure 3	135°F (57°C)	Orange	1, 2, 4, 9, 10		1, 2, 9	1, 2	N/A
		155°F (68°C)	Red					
		175°F (79°C)	Yellow					
		200°F (93°C)	Green					
	RECESSED HORIZ. SIDEWALL (TY3331) ^b Figure 4	135°F (57°C)	Orange	1, 2, 3, 4, 9			N/A	N/A
		155°F (68°C)	Red					
		175°F (79°C)	Yellow					
200°F (93°C)		Green						
5.6 1/2 in. NPT	VERTICAL SIDEWALL (TY3431) Installed Pendent or Upright	135°F (57°C)	Orange	5, 6, 7, 8, 9			N/A	5, 6, 7, 9
		155°F (68°C)	Red					
		175°F (79°C)	Yellow					
		200°F (93°C)	Green					
		286°F (141°C)	Blue					

NOTES:

- Listed by Underwriters Laboratories, Inc. (UL) as Quick Response Sprinklers for use in Light and Ordinary Hazard Occupancies at a 4 to 12 in. (100 to 300 mm) top of deflector to ceiling distance.
- Listed by Underwriters Laboratories Inc. for use in Canada (C-UL) as Quick Response Sprinklers for use in Light and Ordinary Hazard Occupancies at a 4 to 12 in. (100 to 300 mm) top of deflector to ceiling distance.
- Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers for use in Light Hazard Occupancies at a 4 to 12 in. (100 to 300 mm) top of deflector to ceiling distance.
- Approved by the Loss Prevention Certification Board (LPCB Ref. No. 007a/04) at a 4 to 6 in. (100 to 150 mm) top of deflector to ceiling distance. The LPC does not rate the thermal sensitivity of horizontal sidewall sprinklers.
- Listed by Underwriters Laboratories, Inc. as Quick Response Sprinklers for use in Light and Ordinary Hazard Occupancies.
- Listed by Underwriters Laboratories for use in Canada (C-UL) as Quick Response Sprinklers for use in Light and Ordinary Hazard Occupancies.
- Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers for use in Light Hazard Occupancies.
- Approved by the Loss Prevention Certification Board (LPCB Ref. No. 094a/06 & 007a/04) as Quick Response Sprinklers.
- Approved by the City of New York under MEA 354-01-E.
- Approved by the Loss Prevention Certification Board (LPCB Ref. No. 094a/06) at a 4 to 6 in. (100 to 150 mm) top of deflector to ceiling distance. The LPC does not rate the thermal sensitivity of horizontal sidewall sprinklers.
- Where Polyester Coated and Lead Coated Sprinklers are noted to be UL and C-UL Listed, the sprinklers are UL and C-UL Listed as Corrosion Resistant Sprinklers. Where Lead Coated Sprinklers are noted to be FM Approved, the sprinklers are FM Approved as Corrosion Resistant Sprinklers.
- Installed with Style 10 (1/2 in. NPT) 3/4 in. Total Adjustment Recessed Escutcheon.
- Installed with Style 20 (1/2 in. NPT) 1/2 in. Total Adjustment Recessed Escutcheon.
- Frame and deflector only.

**TABLE A
LABORATORY LISTINGS AND APPROVALS**

damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. (Ref. Installation Section).

The owner must assure that the sprinklers are not used for hanging any objects and that the sprinklers are only cleaned by means of gently dusting with a feather duster; otherwise, non-operation in the event of a fire or inadvertent operation may result.

Frequent visual inspections are recommended to be initially performed for corrosion resistant coated sprinklers, after the installation has been completed, to verify the integrity of the corrosion resistant coating.

Thereafter, annual inspections per NFPA 25 should suffice; however, instead of inspecting from the floor level, a random sampling of close-up visual inspections should be made, so as to better determine the exact sprinkler condition and the long term integrity of the corrosion resistant coating, as it may be affected by the corrosive conditions present.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any other authorities having jurisdiction. Contact the install-

ing contractor or product manufacturer with any questions.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

		SPRINKLER FINISH			
K	TYPE	NATURAL BRASS	CHROME PLATED	POLYESTER	LEAD COATED
5.6 1/2 in. NPT	HORIZONTAL SIDEWALL (TY3331)	250 PSI (17,2 BAR) or 175PSI (12,1 BAR) (SEE NOTE 1)			
	RECESSED HORIZ. SIDEWALL (TY3331)				
	VERTICAL SIDEWALL (TY3431)	175 PSI (12,1 BAR)			

NOTES:

1. The maximum working pressure of 250 psi (17,2 bar) only applies to the Listing by Underwriters Laboratories, Inc. (UL); the Listing by Underwriters Laboratories, Inc. for use in Canada (C-UL); and, the Approval by the City of New York.

TABLE B
MAXIMUM WORKING PRESSURE

P/N 57 - XXX - X - XXX

		SIN	SPRINKLER FINISH		TEMPERATURE RATINGS	
378	HORIZONTAL SIDEWALL	TY3331	1	NATURAL BRASS	135	135°F (57°C)
375	VERTICAL SIDEWALL	TY3431	2	POLY-STAINLESS GREY ALUMINUM (RAL9007) ¹ POLYESTER	155	155°F (68°C)
			3	PURE WHITE (RAL9010) ² POLYESTER	175	175°F (79°C)
			4	SIGNAL WHITE (RAL9003) POLYESTER	200	200°F (93°C)
			5	JET BLACK (RAL9005) ³ POLYESTER	286	286°F (141°C)
			7	LEAD COATED		
			9	CHROME PLATED		

NOTES:
 1. Available for TY3331 only.
 2. Eastern Hemisphere sales only.
 3. Available in 155°F (68°C) or 200°F (93°C) temperature rating only.

TABLE C
PART NUMBER SELECTION
SERIES TY-FRB HORIZONTAL AND VERTICAL SIDEWALL SPRINKLERS

Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com

Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name and Part Number (P/N).

Sprinkler Assemblies with NPT Thread Connections:

Specify: Series TY-FRB (specify SIN), (specify K-factor), (specify) Horizontal Sidewall or Vertical Sidewall Sprinkler, Standard Response, Standard Coverage, (specify) temperature rating, (specify) finish or coating, P/N (specify from Table C)

Recessed Escutcheon

Specify: Style (10 or 20) Recessed Escutcheon with (specify*) finish, P/N (specify*)

* Refer to Technical Data Sheet TFP770

Sprinkler Wrench

Specify: W-Type 6 Sprinkler Wrench, P/N 56-000-6-387

Specify: W-Type 7 Sprinkler Wrench, P/N 56-850-4-001



Anvil standard and extra heavy cast iron threaded fittings are manufactured in accordance with ASME B16.4. Plugs and bushings are manufactured in accordance with ASME B16.14.

NOTE: Figure 367 Concentric Reducers do not meet the overall length requirement of ASME B16.4. All other dimensions are in compliance.



For Listings/Approval Details and Limitations, visit our website at www.anvilintl.com or contact an Anvil Sales Representative.

Cast Iron Threaded Fittings Pressure - Temperature Ratings					
Temperature		Pressure			
		Class 125		Class 250	
(°F)	(°C)	psi	bar	psi	bar
-20° to 150°	-28.9 to 65.6	175	12.1	400	27.6
200°	93.3	165	11.4	370	25.5
250°	121.1	150	10.3	340	23.4
300°	148.9	140	9.7	310	21.4
350°	176.7	125	8.6	300	20.7
400°	204.4	-	-	250	17.2

Standards and Specifications					
	Dimensions	Material	Galvanizing*	Thread	Pressure Rating
CAST IRON THREADED FITTINGS					
Class 125	ASME B16.4	ASTM A-126 (A)	ASTM A-153	ASME B1.20.1	ASME B16.4
Class 250	ASME B16.4	ASTM A-126 (A)	ASTM A-153	ASME B1.20.1	ASME B16.4
CAST IRON PLUGS AND BUSHINGS					
	ASME B16.14	ASTM A-126 (A)	ASTM A-153	ASME B1.20.1	ASME B16.14

* ASTM B 633, Type I, SC 4, may be supplied as alternate zinc coating per applicable ASME B16 product standard.

General Assembly of Threaded Fittings

- 1) Inspect both male and female components prior to assembly.
 - Threads should be free from mechanical damage, dirt, chips and excess cutting oil.
 - Clean or replace components as necessary.
- 2) Application of thread sealant
 - Use a thread sealant that is fast drying, sets-up to a semi hard condition and is vibration resistant. Alternately, an anaerobic sealant may be utilized.
 - Thoroughly mix the thread sealant prior to application.
 - Apply a thick even coat to the male threads only. Best application is achieved with a brush stiff enough to force sealant down to the root of the threads.
- 3) Joint Makeup
 - For sizes up to and including 2" pipe, wrench tight makeup is considered three full turns past handtight. Handtight engagement for 1/2" through 2" thread varies from 4 1/2 turns to 5 turns.
 - For 2 1/2" through 4" sizes, wrench tight makeup is considered two full turns past handtight. Handtight engagement for 2 1/2" through 4" thread varies from 5 1/2 turns to 6 3/4 turns.

Styles 920 and 920N *Mechanical-T* Bolted Branch Outlets



⚠ WARNING

- Read and understand all instructions before attempting to install any Victaulic products.
- Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
- Confirm that any equipment, branch lines, or sections of piping that may have been isolated for/during testing or due to valve closures/positioning are identified, depressurized, and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
- Wear safety glasses, hardhat, and foot protection.

Failure to follow these instructions could result in death or serious personal injury and property damage.

⚠ WARNING

- For proper installation, some new sizes of Style 920N products require a different hole size than the Style 920 or Style 921 they replace. Verify that the proper size hole is prepared for the size and style being installed (refer to the table below for requirements).
- **STYLE 920 AND STYLE 920N HOUSINGS CANNOT BE MATED TO EACH OTHER TO ACHIEVE CROSS CONNECTIONS.**

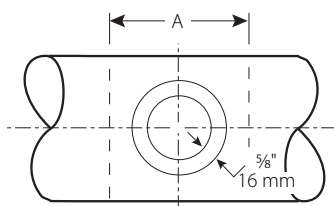
Failure to follow these instructions could result in death or serious personal injury and property damage.

PIPE PREPARATION FOR *MECHANICAL-T* OUTLET INSTALLATION

NOTICE

- Victaulic hole-cutting tools are recommended for proper hole preparation.
- Cross connections can be made **ON METAL PIPE ONLY** by using two upper housings of the same size. Different branch sizes are allowable. **DO NOT** make cross assemblies on HDPE pipe.

1. Proper preparation of the hole is essential for sealing and performance. Verify that the correct hole saw size is being used. Refer to the “Style 920/920N *Mechanical-T* Outlet Pipe Preparation Dimensions” table to the right for the proper hole saw size.
2. Holes shall be drilled on the centerline of the pipe.
3. Verify that a 5/8-inch/16-mm area around the hole is clean, smooth, and generally free from indentations and/or projections that could affect gasket sealing (refer to the sketch below). Remove any burrs or rough edges from the hole. Burrs and rough edges might affect assembly, proper seating of the locating collar, flow from the outlet, or gasket sealing.
4. The pipe around the entire circumference within the “A” dimension shall be generally free of any dirt, scratches, abrasions, or projections that might prevent the housing from seating fully on the pipe. Refer to the “Style 920/920N *Mechanical-T* Outlet Pipe Preparation Dimensions” table to the right for the “A” dimension.



Style 920/920N *Mechanical-T* Outlet Pipe Preparation Dimensions

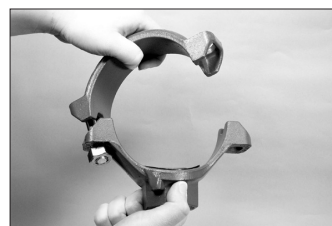
Nominal Outlet Size in/mm	Hole Dimensions in/mm		Surface Preparation “A” Dimension in/mm
	Minimum Hole Diameter/ Hole Saw Size	Maximum Allowable Diameter	
All 1/2-inch/ 21.3 outlets	1 1/2 38	1 3/8 41	3 1/2 89
All 3/4-inch/ 26.9 outlets	1 1/2 38	1 3/8 41	3 1/2 89
All 1-inch/ 33.7 outlets	1 1/2 38	1 3/8 41	3 1/2 89
All 1 1/4-inch/ 42.4 outlets	1 3/4 44	1 7/8 48	4 102
All 1 1/2-inch/ 48.3 outlets <i>Except for</i> 920N 2 x 1 1/2-inch/ 60.3 x 48.3 outlets	2 51 1 3/4 44	2 1/8 54 1 7/8 48	4 102 4 102
All 2-inch/ 60.3 outlets <i>Except for</i> 920 8 x 2-inch/ 219.1 x 60.3 outlets	2 1/2 64 2 3/4 70	2 5/8 67 2 7/8 73	4 1/2 114 4 1/2 114
All 2 1/2-inch/ 73.0 outlets	2 3/4 70	2 7/8 73	5 127
All 76.1-mm outlets	2 3/4 70	2 7/8 73	5 1/2 140
All 3-inch/ 88.9 outlets	3 1/2 89	3 3/8 92	5 1/2 140
All 4-inch/ 114.3 outlets	4 1/2 114	4 3/8 118	6 1/2 165
All 108.0-mm outlets	4 1/2 114	4 3/8 118	6 1/2 165

MECHANICAL-T INSTALLATION

⚠ CAUTION

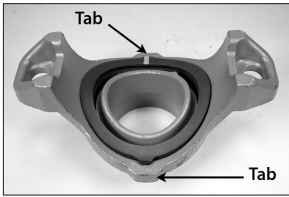
- Verify that pipe is prepared properly in accordance with the instructions on this page.

Failure to prepare pipe according to these instructions could cause improper gasket sealing, resulting in property damage.



1. **ASSEMBLE HOUSINGS:** Insert a bolt into the two housings. Thread a nut loosely onto the end of the bolt.

Styles 920 and 920N Mechanical-T Bolted Branch Outlets



2. CHECK GASKET: Check the gasket to verify that it is suitable for the intended service. The color code identifies the material grade. Refer to Victaulic publication 05.01 for the color code chart, which can be downloaded at victaulic.com.

Inspect the sealing surface of the gasket to verify that no debris is present. For Style 920N Mechanical-T Outlets, it is not necessary to remove the gasket from the housing. **GASKETS FOR THE STYLE 920 ARE NOT INTERCHANGEABLE WITH GASKETS FOR THE STYLE 920N. THE CORRECT GASKET IS SHIPPED WITH THE APPROPRIATE PRODUCT.**

Style 920 Gaskets have a narrower gasket sealing area and two pronounced alignment tabs for proper positioning inside the housing. Style 920N gaskets have a wider gasket sealing area. Refer to the above photos for differences between the gaskets.

3: LUBRICATE GASKET: Lubricate the exposed sealing surface of the gasket using a thin coat of compatible lubricant. Always consult the pipe manufacturer for lubricant compatibility requirements.

⚠ CAUTION

- A thin coat of a compatible lubricant shall be applied to the gasket sealing surface to help prevent pinching, rolling, or tearing during installation.
- DO NOT use excessive lubricant.

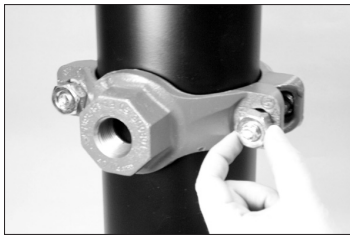
Failure to use a compatible lubricant may cause gasket damage, resulting in joint leakage and property damage.



4. INSTALL HOUSINGS: Rotate the lower housing so that it is positioned approximately 90° to the upper (outlet) housing, as shown above. The upper housing's collar shall be placed into the outlet hole. Rotate the lower housing around the pipe.



5. CHECK COLLAR: Verify that the locating collar engages the outlet hole properly. Check this engagement by rocking the upper (outlet) housing in the hole.



6. INSTALL REMAINING BOLT/NUT: Insert the remaining bolt. Thread a nut onto the bolt finger-tight. **NOTE:** Verify that the oval neck of each bolt seats properly in the bolt hole.



7. TIGHTEN NUTS: Verify that the locating collar is still positioned properly in the outlet hole. Tighten the nuts evenly by alternating sides until the upper (outlet) housing contacts the pipe completely.

7a. For Metal Pipe: The nuts shall be torqued to 50ft-lbs/68N•m with even gaps between the bolt pads. **DO NOT** exceed 70ft-lbs/95N•m of torque on the nuts.

7b. For HDPE Pipe: The nuts shall be torqued to 50ft-lbs/68N•m. **NOTE:** On HDPE pipe, it is normal for bolt pads to contact when the nuts are tightened to 50ft-lbs/68N•m. **DO NOT** exceed 70ft-lbs/95N•m of torque on the nuts.

⚠ WARNING

- Nuts shall be torqued to 50 ft-lbs/68 N•m.
- DO NOT exceed 70 ft-lbs/95 N•m of torque on the nuts. Increased bolt torque will not improve sealing and may cause product failure.

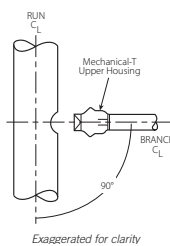
NOTICE

- For grooved outlets, refer to the applicable coupling installation instructions.
- For threaded outlets, complete the assembly using standard threading practices.

BRANCH CONNECTIONS

If a branch connection is made to the upper housing before the Mechanical-T is installed on the pipe, verify that the branch connection is 90° to the pipe run before completing the tightening sequence of the Mechanical-T assembly.

- When the Mechanical-T is used as a transition piece between two runs, it shall be assembled onto the runs before the branch connection is made.
- Victaulic female threaded products are designed to accommodate standard ANSI male pipe threads only. Use of male threaded products with special features, such as probes, dry pendent sprinkler heads, etc., should be verified as suitable for use with this Victaulic product. Failure to verify suitability in advance may result in assembly issues or leakage, which can compromise the integrity of the system and/or cause property damage.



STYLE 920 OR STYLE 920N MECHANICAL-T CROSSES

- Cross connections can be made **ON METAL PIPE ONLY** by using two upper housings of the same size and style. Different branch sizes are allowable. **DO NOT make cross assemblies on HDPE pipe.**
- Install the cross connection in accordance with the instructions on this page. Verify that the locating collar on each side is positioned securely inside the hole. Nuts shall be torqued to 50ft-lbs/68N•m, with even gaps between the bolt pads, to ensure the cross assembly is rigid. **DO NOT** exceed 70ft-lbs/95N•m of torque on the nuts.
- **DO NOT MIX STYLE 920 OUTLETS WITH STYLE 920N OUTLETS WHEN MAKING CROSS ASSEMBLIES.**



For complete contact information, visit victaulic.com

I-920/920N 3838 REV C UPDATED 10/2020 Z00092092N

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Victaulic® FireLock™ Rigid Coupling

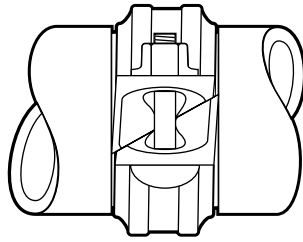
Style 005H



10.02



Patented



Exaggerated for clarity

1.0 PRODUCT DESCRIPTION

Available Sizes

- 1 ¼ – 8"/DN32 – DN200

Maximum Working Pressure

- Up to 350 psi/2413 kPa

Function

- Joins carbon steel pipe with grooved ends conforming to [publication 25.01](#)
- This product is designed for fire protection systems only

Pipe Material

- Schedule 10, Schedule 40 or specialty carbon steel pipe listed in Section 5. For use with alternative materials and wall thicknesses please contact Victaulic
- For exceptions reference section 6.0 Notifications

2.0 CERTIFICATION/LISTINGS



104-1a/02

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.



3.0 SPECIFICATIONS – MATERIAL

Housing: Ductile iron conforming to ASTM A-536, grade 65-45-12. Ductile iron conforming to ASTM A-395, grade 65-45-15, is available upon special request.

Housing Coating: (specify choice)

Orange coating.

Red coating (standard for EMEA-I and Asia Pacific).

Optional: Hot dipped galvanized.

Coupling Gasket (specify choice):

Grade “E” EPDM Type A Vic-Plus™ Gasket System¹

EPDM (Violet color code). FireLock products have been Listed by Underwriters Laboratories Inc. and Approved by Factory Mutual Research for wet and dry (oil free air) sprinkler services up to the rated working pressure using the Grade “E” Type A Vic-Plus™ Gasket System, requiring no field lubrication for most installation conditions.

Grade “L” silicone

Recommended for dry heat, air without hydrocarbons to +350°F and certain chemical service.

For dry services, Victaulic continues to recommend the use of Grade “E” Type A FlushSeal® Gasket. Contact Victaulic for details.

¹ Standard gasket and FlushSeal gasket approved for dry pipe systems to –40°F/–40°C. Based on “typical” pipe surface conditions, supplemental lubricant is recommended for services installed below 0°F/–18°C and for all dry pipe systems or systems to be subjected to air tests prior to being filled with water. Supplemental lubrication may also be required on pipe with raised or undercut weld seams or pipe that has voids and/or cracks at the weld seams. Victaulic continues to recommend the use of FlushSeal gaskets for dry services.

NOTE

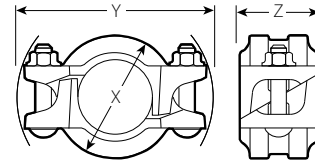
- Additional gasket styles are available. Contact Victaulic for details.

Bolts/Nuts: Carbon steel oval neck track bolt(s) meeting the mechanical property requirements of ASTM A449 (imperial) and ISO 898-1 Class 9.8 (M10-M16) Class 8.8 (M20 and greater). Carbon steel hex nuts meeting the mechanical property requirements of ASTM A563 Grade B (imperial) and ASTM A563M Class 9 (metric). Track bolts and hex nuts are zinc electroplated per ASTM B633 Fe/Zn 5, finish Type III (imperial) or Type II (metric).

4.0 DIMENSIONS

Style 005H

Rated for wet and dry sprinkler systems at 350 psi/2413 kPa for 1 ¼ – 4"/32 – 100 mm sizes and 300 psi /2068 kPa for 4 ¼ – 8"/108 – 200 mm sizes; Schedule 10 roll grooved or Schedule 40 cut or roll grooved steel pipe. Style 005H is rigid and does not accommodate expansion, contraction or angular deflection.



Style 005H

Size		Maximum Working Pressure ^{1 4}	Maximum End Load ¹	Allow. Pipe End Separation ²	Bolt/Nut ³	Dimensions			Approx. Weight Each
Nominal	Actual Outside Diameter					X	Y	Z	
inches	inches	psi	lbs	inches	No –size	inches	inches	inches	lbs
mm	mm	kPa	N	mm	inches	mm	mm	mm	kg
1 ¼	1.660	350	755	0.05	2 – ¾ × 2 ¼	2.75	4.50	1.88	1.2
32	42.4	2413	3370	1.2		70	114	48	0.5
1 ½	1.900	350	990	0.05	2 – ¾ × 2 ¼	3.00	4.75	1.88	1.2
40	48.3	2413	4415	1.2		76	121	48	0.5
2	2.375	350	1550	0.07	2 – ¾ × 2 ½	3.50	5.25	1.88	1.6
50	60.3	2413	6900	1.7		89	133	48	0.7
2 ½	2.875	350	2270	0.07	2 – ¾ × 2 ½	4.00	5.75	1.88	1.9
65	73.0	2413	10110	1.7		102	146	48	.09
76.1 mm	3.000	350	2475	0.07	2 – ¾ × 2 ½	4.13	5.75	1.88	1.9
	76.1	2413	11010	1.7		105	146	48	0.9
3	3.500	350	3365	0.07	2 – ¾ × 2 ½	4.63	6.13	1.88	2.1
80	88.9	2413	14985	1.7		118	156	48	1.0
4	4.500	350	5565	0.16	2 – ¾ × 2 ½	5.75	7.25	2.13	3.1
100	114.3	2413	24770	4.1		146	184	54	1.4
108.0 mm	4.250	300	4255	0.16	2 – ¾ × 2 ½	5.63	7.25	2.13	3.1
	108.0	2068	18940	4.1		143	184	54	1.4
5	5.563	300	7290	0.16	2 – ½ × 3	6.88	9.00	2.13	4.5
125	141.3	2068	32445	4.1		175	229	54	2.0
133.0 mm	5.250	300	6495	0.16	2 – ½ × 2 ¾	6.63	9.00	2.13	4.5
	133.0	2068	28900	4.1		168	229	54	2.0
139.7 mm	5.500	300	7125	0.16	2 – ½ × 2 ¾	6.88	9.00	2.13	4.8
	139.7	2068	31715	4.1		175	229	54	2.2
6	6.625	300	10340	0.16	2 – ½ × 3	8.00	10.00	2.13	5.0
150	168.3	2068	46020	4.1		203	254	53	2.3
159.0 mm	6.250	300	9200	0.16	2 – ½ × 2 ¾	7.63	10.00	2.13	5.5
	159.0	2068	40955	4.1		194	254	54	2.5
165.1 mm	6.500	300	9955	0.16	2 – ½ × 3	8.15	10.00	2.13	5.5
	165.1	2068	44295	4.1		207	254	54	2.5
8	8.625	300	17525	0.19	2 – ¾ × 4 ¼	10.50	13.14	2.63	11.3
200	219.1	2068	78000	4.8		267	334	67	5.1

¹ Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe. WARNING: FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1½ times the figures shown.

² The allowable pipe separation dimension shown is for system layout purposes only. Style 005H couplings are considered rigid connections and will not accommodate expansion or contraction of the piping system.

³ Number of bolts required equals number of housing segments. Metric thread size bolts are available (color coded gold) for all coupling sizes upon request. Contact Victaulic for details.

⁴ Style 005H couplings are VdS and LPC Approved to 16 Bar/235 psi.

5.0 PERFORMANCE

Style 005H

The information provided below is based on the latest listing and approval data at the time of publication. Listings/ Approvals are subject to change and/or additions by the approvals agencies.

Contact Victaulic for performance on other pipe and the latest listings and approvals.

Related Working Pressure					Related Working Pressure					Related Working Pressure				
psi					psi					psi				
Pipe Sch.	Size	UL	ULC	FM	Pipe Sch.	Size	UL	ULC	FM	Pipe Sch.	Size	UL	ULC	FM
	inches					inches					inches			
5	1¼ – 3	175	175	175	EL	1¼ – 2	300	N/A	N/A	MT	1¼ – 2	300	N/A	N/A
10, 40	1¼ – 3	350	350	350	ET	1¼ – 2	300	N/A	N/A	STF	1¼ – 4	N/A	N/A	300
	5 – 8	300	300	300	EZ	4 – 6	300 ⁶	N/A	300	Steady Thd.	1¼ – 2	N/A	N/A	300
BLT	1¼ – 2	300	300	N/A	FF	1¼ – 4	N/A	N/A	300	TF	3 – 8	N/A	N/A	300
DF	1¼ – 4	300	300	300	GAL -7	1¼ – 2	300	N/A	N/A	WLS	1¼ – 2	300	300	N/A
DT	1¼ – 2	300	300	N/A	MLT	1¼ – 2	300	N/A	N/A	XL	1¼ – 3	300	300	300
EF	1¼ – 4	175 ⁷	N/A	175	MF	1¼ – 4	300	N/A	300 ⁵					


⁵ FM approved for service in 1½ – 4" pipe.

⁶ UL Listed for service up to 4" pipe only.

⁷ UL Listed for service up to 3" only.

6.0 NOTIFICATIONS

⚠ WARNING



- Read and understand all instructions before attempting to install any Victaulic products.
- Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.
- Wear safety glasses, hardhat, and foot protection.

Failure to follow these instructions could result in death or serious personal injury and property damage.

- These products shall be used only in fire protection systems that are designed and installed in accordance with current, applicable National Fire Protection Association (NFPA 13, 13D, 13R, etc.) standards, or equivalent standards, and in accordance with applicable building and fire codes. These standards and codes contain important information regarding protection of systems from freezing temperatures, corrosion, mechanical damage, etc.
- The installer shall understand the use of this product and why it was specified for the particular application.
- The installer shall understand common industry safety standards and potential consequences of improper product installation.
- It is the system designer's responsibility to verify suitability of materials for use with the intended fluid media within the piping system and external environment.
- The material specifier shall evaluate the effect of chemical composition, pH level, operating temperature, chloride level, oxygen level, and flow rate on materials to confirm system life will be acceptable for the intended service.

Failure to follow installation requirements and local and national codes and standards could compromise system integrity or cause system failure, resulting in death or serious personal injury and property damage.

NOTICE

- Victaulic does not recommend the use of any furnace butt-welded pipe with sizes 2"/DN50 and smaller Victaulic gasketed joint products. This includes, but is not limited to, ASTM A53 Type F pipe.

7.0 REFERENCE MATERIALS

- [10.01 Victaulic Products for Fire Protection Piping Systems – Regulatory Approval Reference Guide](#)
- [I-100 Victaulic Field Installation Handbook](#)

User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, and the applicable building codes and related regulations as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

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Note

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

Installation

Reference should always be made to the [Victaulic installation handbook](#) or installation instructions of the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on WeChat.

Warranty

Refer to the Warranty section of the current Price List or contact Victaulic for details.


Trademarks

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5





1.0 PRODUCT DESCRIPTION

Available Sizes

- 1 ¼ – 8"/DN32 – DN200

Maximum Working Pressure

- Pressure ratings for Victaulic FireLock™ Fittings conform to the ratings of Victaulic FireLock EZ™ Style 009N couplings (refer to [publication 10.64](#) for more information).

Application

- FireLock™ fittings are designed for use exclusively with Victaulic couplings that have been Listed or Approved for Fire Protection Services. Use of other couplings or flange adapters may result in bolt pad interference.
- Connects pipe, provides change in direction and adapts sizes or components

Pipe Materials

- Carbon steel

2.0 CERTIFICATION/LISTINGS



EN 10311
Regulation (EU)
No. 305/2011

3.0 SPECIFICATIONS – MATERIAL

Fitting: Ductile iron conforming to ASTM A536, Grade 65-45-12.

Fitting Coating: (specify choice)

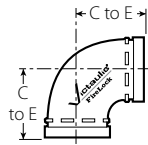
Orange coating.

Red coating (standard for EMEA-I and Asia Pacific).

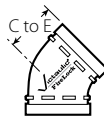
Optional: Hot dipped galvanized.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

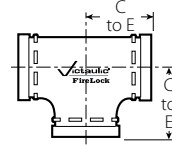
4.0 DIMENSIONS



No. 001



No. 003



No. 002



No. 006

Nominal Size inches DN	Actual Outside Diameter inches mm	No. 001 90° Elbow		No. 003 45° Elbow		No. 002 Straight Tee		No. 006 Cap	
		C to E inches mm	Approximate Weight Each lb kg	C to E inches mm	Approximate Weight Each lb kg	C to E inches mm	Approximate Weight Each lb kg	T inches mm	Approximate Weight Each lb kg
1 ¼ DN32	1.660 42.4	— —	— —	— —	— —	— —	— —	0.82 21	0.3 0.1
1 ½ DN40	1.900 48.3	— —	— —	— —	— —	— —	— —	0.82 21	0.4 0.2
2 DN50	2.375 60.3	2.75 70	1.7 0.8	2.00 51	1.8 0.8	2.75 70	2.4 1.1	0.88 22	0.6 0.3
2 ½ DN65	2.875 73.0	3.00 76	3.1 1.4	2.25 57	2.2 1.0	3.00 76	3.6 1.6	0.88 22	1.0 0.5
	3.000 76.1	3.00 76	3.30 1.5	2.25 57	2.4 1.1	3.00 76	3.8 1.7	— —	— —
3 DN80	3.500 88.9	3.38 86	4.0 1.8	2.50 64	3.1 1.4	3.38 86	5.3 2.4	0.88 22	1.2 0.5
	4.250 108.0	4.00 102	5.7 2.6	3.00 76	5.1 2.3	4.00 102	7.5 3.4	— —	— —
4 DN100	4.500 114.3	4.00 102	6.7 3.0	3.00 76	5.6 2.5	4.00 102	8.7 3.9	1.00 25	2.4 1.1
	5 DN125	5.563 141.3	4.88 124	12.6 5.7	8.3 3.8	4.88 124	15.7 7.1	1.00 25	4.1 1.9
5 DN150	5.500 139.7	4.88 124	12.4 5.6	3.25 82.6	8.2 3.7	4.88 124	15.4 6.9	— —	— —
	6.250 158.8	5.50 140	12.6 5.7	3.50 89	9.2 4.2	5.50 140	17.9 8.0	— —	— —
6 DN200	6.625 168.3	5.50 140	18.3 8.3	3.50 89	11.7 5.3	5.50 140	22.7 10.3	1.00 25	5.9 2.7
	6.500 165.1	5.43 140	17.6 7.9	3.50 89	11.4 5.2	5.50 140	22.0 9.9	— —	— —
8 DN200	8.625 219.1	6.81 173	25.5 11.6	4.25 108	20.4 9.3	6.94 176	38.7 17.6	1.13 29	12.7 5.8
	8.515 216.3	6.81 173	23.1 10.5	— —	— —	6.94 176	33.6 15.2	— —	— —

5.0 PERFORMANCE

Flow Data

Size		Frictional Resistance Equivalent of Straight Pipe ¹			
Nominal Size inches DN	Actual Outside Diameter inches mm	Elbows		No. 002 Straight Tee	
		No. 001 90° Elbow feet meters	No. 003 45° Elbow feet meters	Branch feet meters	Run feet meters
1 ¼ DN32	1.660 42.4	— —	— —	— —	— —
1 ½ DN40	1.900 48.3	— —	— —	— —	— —
2 DN50	2.375 60.3	3.5 1.1	1.8 0.5	8.5 2.6	3.5 1.1
2 ½	2.875 73.0	4.3 1.3	2.2 0.7	10.8 3.3	4.3 1.3
DN65	3.000 76.1	4.5 1.4	2.3 0.7	11.0 3.4	4.5 1.4
3 DN80	3.500 88.9	5.0 1.5	2.6 0.8	13.0 4.0	5.0 1.5
	4.250 108.0	6.4 2.0	3.2 0.9	15.3 4.7	6.4 2.0
4 DN100	4.500 114.3	6.8 2.1	3.4 1.0	16.0 4.9	6.8 2.1
5	5.563 141.3	8.5 2.6	4.2 1.3	21.0 6.4	8.5 2.6
DN125	5.500 139.7	8.3 2.5	4.1 1.3	20.6 6.3	8.3 2.5
	6.250 158.8	9.4 2.9	4.9 1.5	25.0 7.6	9.6 2.9
6 DN150	6.625 168.3	10.0 3.0	5.0 1.5	25.0 7.6	10.0 3.0
	6.500 165.1	9.8 3.0	4.9 1.5	24.5 7.5	9.8 3.0
8 DN200	8.625 219.1	13.0 4.0	5.0 1.5	33.0 10.1	13.0 4.0
	8.515 216.3	13.0 4.0	— —	33.0 10.1	13.0 4.0

¹ The flow data listed is based upon the pressure drop of Schedule 40 pipe.

6.0 NOTIFICATIONS

General Notes

NOTE: When assembling FireLock EZ™ couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop. For FireLock EZ™ Style 009N/009H couplings, use FireLock™ No. 006 end caps containing the “EZ” marking on the inside face or No. 60 end caps containing the “QV EZ” marking on the inside face. Non-Victaulic end cap products shall not be used with Style 009/009V/009H/009N couplings.

7.0 REFERENCE MATERIALS

[10.64: Victaulic® FireLock™ Rigid Coupling Style 009N](#)

[10.02: Victaulic® FireLock™ Rigid Coupling Style 005H with Vic-Plus™ Gasket System](#)

[29.01: Victaulic® Terms and Conditions of Sale](#)

User Responsibility for Product Selection and Suitability

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Note

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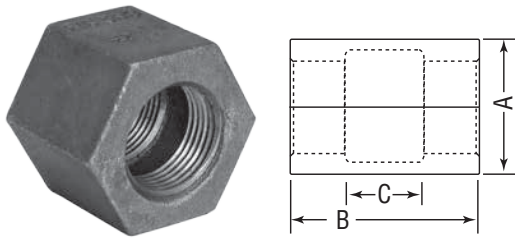
Trademarks



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CAST IRON THREADED FITTINGS



Class 125 (Standard)

 FIGURE 366 Screwed Hex Coupling	Size		Across Flats A		B		C		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	Black	
									lbs	kg
	1	25	1 ¹⁵ / ₁₆	49	1 ¹¹ / ₁₆	43	9/ ₁₆	14	0.82	0.37

 FIGURE 487 Flanged Union Gasket Type	Size		Diam. of Flanges		No. of Bolts	Unit Weight			
	NPS	DN	in	mm		Black		Galv.	
					–	lbs	kg	lbs	kg
Assembled with gaskets 	1/2	15	2 ¹⁵ / ₁₆	75	3	1.75	0.79	1.75	0.79
	3/4	20	3	76	3	2.00	0.91	2.00	0.91
	1	25	3 ¹ / ₄	83	3	2.25	1.02	2.25	1.02
	1 ¹ / ₄	32	4 ³ / ₁₆	106	4	4.75	2.15	4.75	2.15
	1 ¹ / ₂	40	4 ³ / ₈	111	4	5.00	2.27	5.00	2.27
	2	50	5	127	4	6.50	2.95	6.50	2.95
	2 ¹ / ₂	65	5 ⁵ / ₈	143	4	8.50	3.85	8.50	3.85
	3	80	6 ³ / ₈	162	4	11.00	4.99	11.00	4.99
	3 ¹ / ₂	90	6 ⁷ / ₈	175	4	12.75	5.78	–	–
	4	100	7 ¹¹ / ₁₆	195	5	18.00	8.16	18.00	8.16
	5	125	8 ¹⁵ / ₁₆	227	5	22.00	9.98	–	–
	6	150	10 ¹ / ₄	260	6	30.00	13.61	30.00	13.61
	8	200	12 ¹⁵ / ₁₆	329	8	51.00	23.13	51.00	23.13

Note: See following page for pressure-temperature ratings.

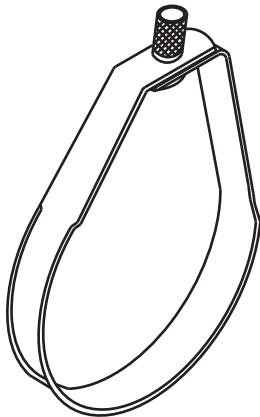
PROJECT INFORMATION		APPROVAL STAMP	
Project:		<input type="checkbox"/> Approved	
Address:		<input type="checkbox"/> Approved as noted	
Contractor:		<input type="checkbox"/> Not approved	
Engineer:		Remarks:	
Submittal Date:			
Notes 1:			
Notes 2:			



P.O. Box 3365 South El Monte, CA 91733 626.444.0541 Fax 626.444.3887 www.Afcon.org

300

RING HANGER



1 thru 4 inch pipe
LISTED FOR STEEL/CPVC



1/2 & 3/4 inch pipe
5 thru 8 inch pipe

SIZE - ROD- 3/8" or 1/2"

SIZE - SYSTEM PIPE - 1/2" thru 8"

MATERIAL - Carbon Steel, Mil. Galvanized to G-90 spec.

LISTING/APPROVAL -



203-EX 2551 1" - 8"



Approval guide - 1" - 8"

OSHPD OPA-0601 See Website.

CONFORMS WITH: Federal Specification WW-H-171E, Type 10.

Manufacturers Standardization Society ANSI/MSS-SP-58 Type 10.

MAXIMUM TEMPERATURE - 650°F.

FUNCTION - Pipe hanger component of an *AFCON* hanger.

To support steel, CPVC or copper pipe.

INSTALLATION - Per NFPA 13, 13R, 13D, these instructions and the CPVC or copper pipe manufacturers instructions.

FEATURES -

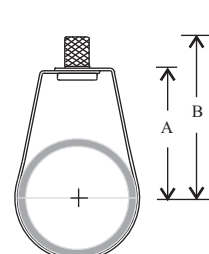
* Sized and listed exclusively for use with #310 Surge Restrainer.

* Band edge is offset for EASY pipe insertion.

* Custom fit swivel nut for better retention in ring.

ORDERING - Part #, pipe size.

NFPA 13				
PIPE	ROD	1 WT.	5 WT.+250	UL TEST LOAD
1	3/8	30.75	403.75	750
1 1/4	3/8	43.95	469.75	750
1 1/2	3/8	54.15	520.75	750
2	3/8	76.95	634.75	750
2 1/2	3/8	118.35	841.75	850
3	3/8	162.30	1061.50	1050
4	3/8	246.00	1480.00	1500
5	1/2	349.45	1996.75	2000
6	1/2	476.35	2631.75	2650
8	1/2	711.00	3805.00	4050



PIPE	A	B
1	1.8793	2.5259
1 1/4	2.1382	2.7850
1 1/2	2.2673	2.9140
2	2.6048	3.2516
2 1/2	3.4920	4.1150
3	3.7845	4.4311
4	4.3582	4.9992
6	6.0668	6.8180
8	7.5768	8.3290



Revolver Bracket Fig. 551

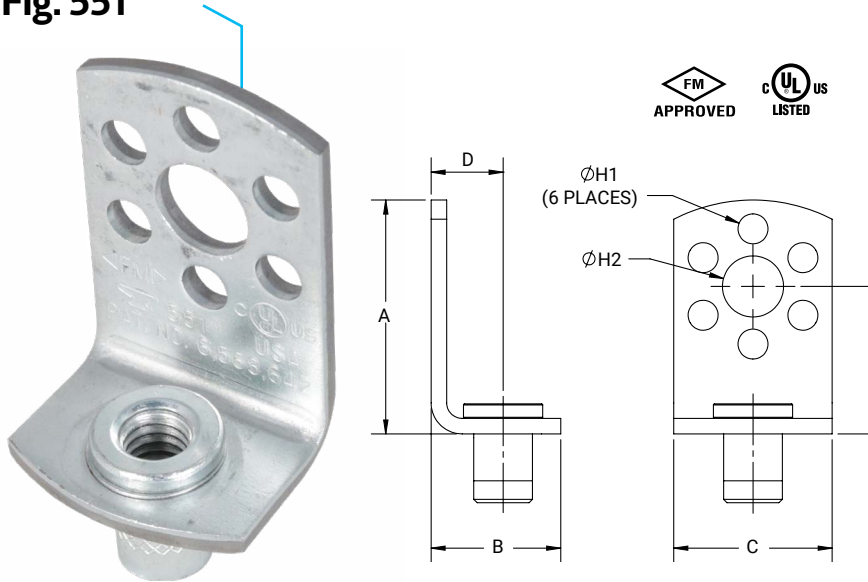


Fig. 551: Load Rating (lbs) Weight (lbs) • Dimension (in)

Rod Size	Rod Size	A	B	C	D	E	ØH	Approx. Weight/100
3/8	425	2	2 1/8	1 3/8	5/8	1 1/4	1/4	12

Material Specifications

Size Range
3/8" rod

Material
Carbon steel

Finish
Pre-Galvanized per ASTM A653

Service
For use on the side of wood, steel, and concrete walls and beams to support up to 4" NPS horizontal piping.

Patents
No. 6,568,642

Approvals
cULus Listed (UL 203), FM Approved (FM 1951-1952-1953), Complies with the requirements of MSS SP-58.

Installation

- Mount on the side of wood, steel, or concrete walls and beams using the fasteners listed in NFPA 13, the fasteners detailed in the cULus Listed Mounting Fasteners for Steel Pipe table, or alternate approved fasteners.
- Engage threaded rod with threaded knurl nut.

Features

- Universal fastener array optimizes the fastener size and placement for various structure types and pipe sizes.
- Backing nuts are not required for steel applications.
- Center mounting hole accepts 3/8" and 1/2" fasteners.

Ordering

Specify figure number, finish, and description.



PROJECT INFORMATION	APPROVAL STAMP
Project:	Approved
Address:	Approved as noted
Contractor:	Not approved
Engineer:	Remarks:
Submittal Date:	
Notes 1:	
Notes 2:	

Model Q Lateral Sway Brace Fig. AF001

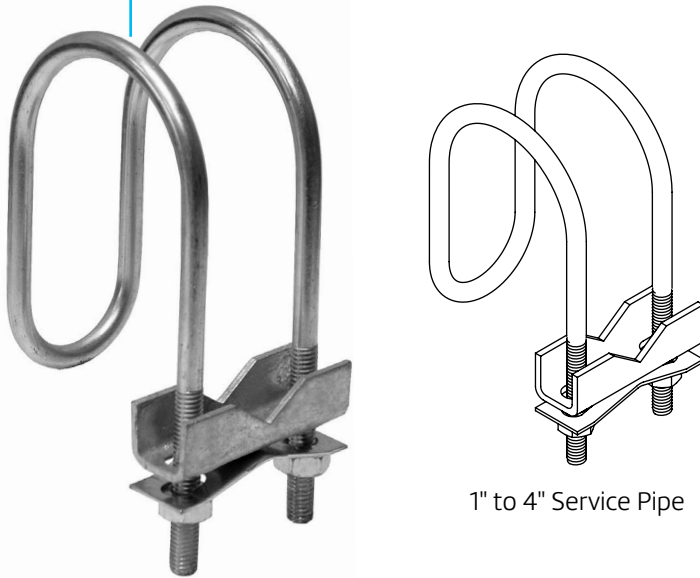


FIG. AF001: Weight and Installation Torque

Service Pipe Size	Brace Member Size		Installation Torque
	1" (DN25)	1" (DN25)	
1" (DN25)	0.82 lbs	0.87 lbs	14 ft-lbs
1¼" (DN32)	0.86 lbs	0.90 lbs	
1½" (DN40)	0.90 lbs	0.95 lbs	
2" (DN50)	0.96 lbs	1.00 lbs	16 ft-lbs
2½"	1.02 lbs	1.06 lbs	
DN65	1.05 lbs	1.09 lbs	
3" (DN80)	1.09 lbs	1.13 lbs	
4" (DN100)	1.23 lbs	1.26 lbs	
			17 ft-lbs

Notes:

ASC Engineered Solutions™ brand bracing components are designed to be compatible ONLY with other ASC Engineered Solutions brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com and updated FM approval information may be viewed at www.approval-guide.com.

Material Specifications

Size Range:

Service Pipe Size: 1" – 4", DN25 – DN100
Brace Member: 1" – 1¼", DN25 – DN32

Material

Carbon Steel

Finish

- Plain
- Electro-Galvanized

Service

A seismic lateral brace designed to connect a brace member to the service pipe. The AF001 rigidly braces steel piping systems subjected to horizontal and vertical seismic loads.

Approvals

cULus Listed (ANSI/UL 203a), FM Approved (FM 1950-13), & OSHPD (OPM-0351-13). Complies with NFPA 13, ASCE 7, IBC, & MSS SP-127 bracing requirements.

Features

The indicator clip provides a visual indication that proper installation has been achieved..

Ordering

Specify figure number, service pipe size, brace size, finish, and description.

Disclaimer:

ASC Engineered Solutions does not provide any warranties and specifically disclaims any liability whatsoever with respect to ASC bracing products and components that are used in combination with products, parts or systems not manufactured or sold by ASC. In no event shall ASC be liable for any incidental, direct, consequential, special or indirect damages or lost profits where non-ASC bracing components have been, or are used.

Seis Brace® Seismic Fire Protection Design Tool may be accessed at www.seisbrace.com



PROJECT INFORMATION	APPROVAL STAMP
Project:	Approved
Address:	Approved as noted
Contractor:	Not approved
Engineer:	Remarks:
Submittal Date:	
Notes 1:	
Notes 2:	

Longitudinal & Lateral Seismic Clamp Fig. AF775

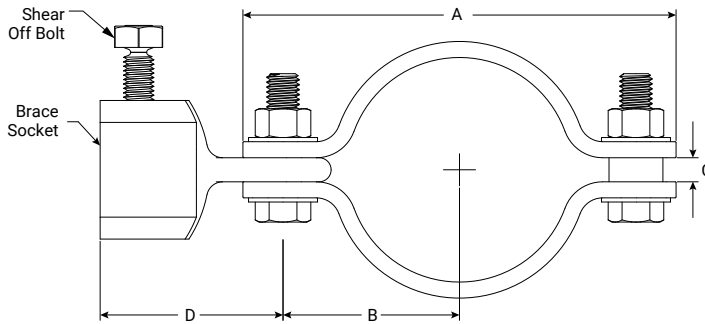
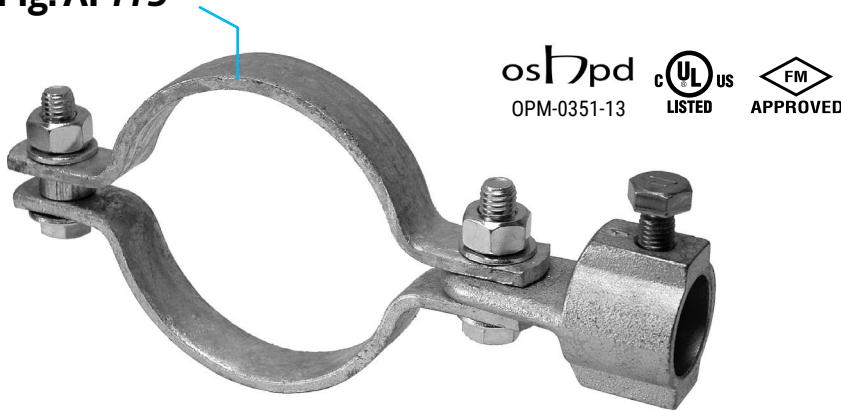


FIG. AF775 Dimensions, Weight and Installation Torque

Brace Size	A	B	C	D	Socket Depth	Weight per Brace Size		Installation Torque
						1" (DN25)	1 1/4" (DN25)	
2 1/2"	6 in	2 3/8 in				2.19 lbs	2.54 lbs	80 ft-lbs
DN65	6 1/8 in	2 1/2 in				2.25 lbs	2.60 lbs	
3" (DN80)	6 3/4 in	2 3/4 in	3/8 in			2.36 lbs	2.71 lbs	100 ft-lbs
4" (DN100)	8 1/2 in	3 1/2 in					2.62 lbs		2.97 lbs
DN125	9 1/2 in	4 in		2 7/8 in	3 in	3.74 lbs	4.09 lbs	
5"	9 1/2 in	4 in			1 3/8 in	3.74 lbs	4.09 lbs	
DN150	11 3/8 in	4 7/8 in	1 in			6.32 lbs	6.67 lbs	120 ft-lbs
6"	11 1/2 in	4 7/8 in					6.32 lbs		6.67 lbs
DN200	13 3/8 in	6 in					7.42 lbs	7.77 lbs
8"	13 3/4 in	6 in				7.42 lbs	7.77 lbs	

Notes:

ASC Engineered Solutions™ brand bracing components are designed to be compatible ONLY with other ASC Engineered Solutions brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com and updated FM approval information may be viewed at www.approvalguide.com.

Material Specifications

Size Range:
Flange Thickness: 2 1/2" – 8"
Flange Widths: 1" – 1 1/4"

Material
Carbon Steel with a Ductile Iron Socket

Finish
Plain
Electro-Galvanized per ASTM B633

Service
A seismic longitudinal & lateral brace designed to connect a brace member to the service pipe. The AF775 rigidly braces steel piping systems subjected to horizontal and vertical seismic loads.

Approvals
cULus Listed (ANSI/UL 203a), FM Approved (FM 1950-13), & OSHPD (OPM-0351-13).
Complies with NFPA 13, ASCE 7, IBC, & MSS SP-127 bracing requirements.

Features
The set screw provides a visual indication that proper installation has been achieved.

Ordering
Specify figure number, service pipe size, brace size, finish, and description.

Disclaimer:

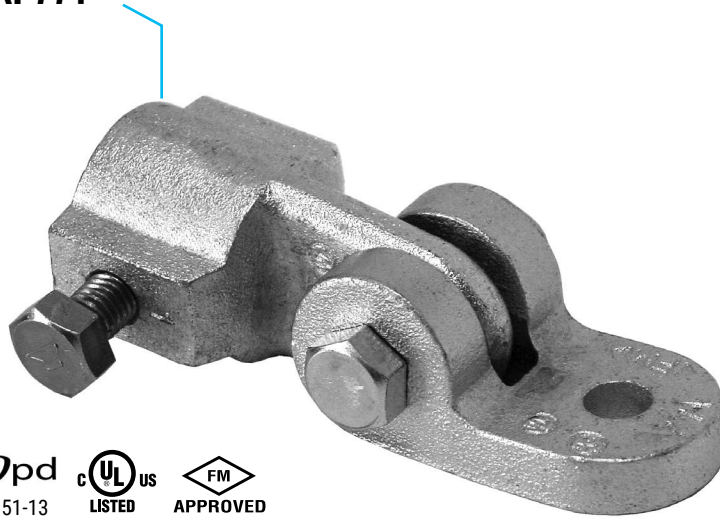
ASC Engineered Solutions does not provide any warranties and specifically disclaims any liability whatsoever with respect to ASC bracing products and components that are used in combination with products, parts or systems not manufactured or sold by ASC. In no event shall ASC be liable for any incidental, direct, consequential, special or indirect damages or lost profits where non-ASC bracing components have been, or are used.

Seis Brace® Seismic Fire Protection Design Tool may be accessed at www.seisbrace.com



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Submittal Date:	
Notes 1:	
Notes 2:	

Swivel Attachment Fig. AF771



Material Specifications

Size Range:

Brace Member: See Table

Anchor Size: ½" - ¾" (M12 - M18)

Material

Carbon Steel

Finish

Plain

Electro-Galvanized per ASTM B633

Service

A seismic swivel attachment designed to connect a brace member to the building structure or to a seismic structural attachment. The AF771 rigidly braces piping systems subjected to horizontal and vertical seismic loads.

Approvals

cULus Listed (ANSI/UL 203a), FM Approved (FM 1950-13), & OSHPD (OPM-0351-13). Complies with NFPA 13, ASCE 7, IBC, & MSS SP-127 bracing requirements.

Features

- The set screw provides a visual indication that proper installation has been achieved
- Eliminates brace member eccentricity by concentrically loading brace pipes

Ordering

Specify figure number, brace size, fastener size, finish, and description.

Disclaimer:

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Seis Brace® Seismic Fire Protection Design Tool may be accessed at www.seisbrace.com

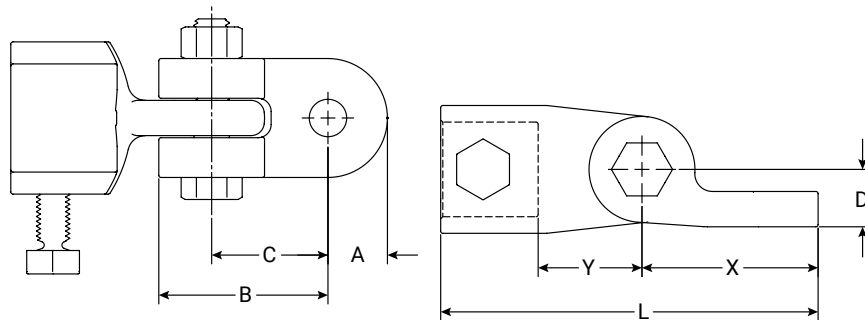


FIG. AF771 Dimensions and Weight

Brace Size	Anchor Size	A	B	C	D	L	X	Y	Weight
		in./mm	in./mm	in./mm	in./mm	in./mm	in./mm	in./mm	
1" DN25	½" - ¾" (M12-M18)	0.840	1.650	1.650	0.810	5.34	2.49	1.47	1.95
1¼" DN32		21.34	41.91	41.91	20.57	135.6	63.2	37.3	0.88
									2.28
									1.03

Notes:

ASC Engineered Solutions™ brand bracing components are designed to be compatible ONLY with other ASC Engineered Solutions brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com and updated FM approval information may be viewed at www.approvalguide.com.



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Contractor:	Not approved
Engineer:	Remarks:
Submittal Date:	
Notes 1:	
Notes 2:	

Sway Brace Swivel Attachment Fig. AF077

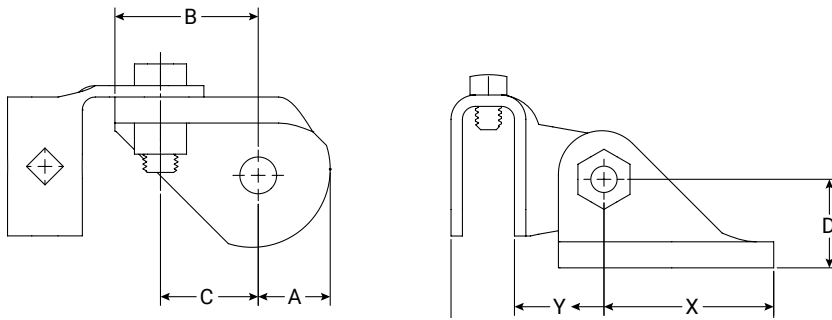


FIG. AF077: Dimensions and Weight

Brace Size	A	B	C	D	L	X	Y	Weight lbs/kg
	In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	In./mm	
1"	1.000 25.40	1.830 46.48	1.250 31.75	1.380 25.40	4.46 113.2	2.25 in 57.2	1.13 28.6	1.12 0.51
1¼"								1.28 0.58

Notes:

ASC Engineered Solutions™ brand bracing components are designed to be compatible ONLY with other ASC Engineered Solutions brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com and updated FM approval information may be viewed at www.approvalguide.com.

Material Specifications

Size Range:

Brace Pipe: 1"- 1¼" NPS Sch 40 Steel Pipe
Anchor Size: ½" (M12)

Material

Carbon Steel

Finish

- Plain
- Electro-Galvanized

Service

A seismic swivel attachment designed to connect a brace member to the building structure or to a seismic structural attachment. The AF077 rigidly braces piping systems subjected to horizontal and vertical seismic loads.

Approvals

cULus Listed (UL 203a) and FM Approved (FM 1950-13). Complies with NFPA 13, ASCE 7, IBC, & MSS SP-127 bracing requirements.

Features

The set screw provides a visual indication that proper installation has been achieved.

Ordering

Specify figure number, brace size, finish, and description.

Disclaimer:

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Seis Brace® Seismic Fire Protection Design Tool may be accessed at www.seisbrace.com



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Submittal Date:	
Notes 1:	
Notes 2:	

Longitudinal & Lateral Seismic Clamp
Fig. AF730

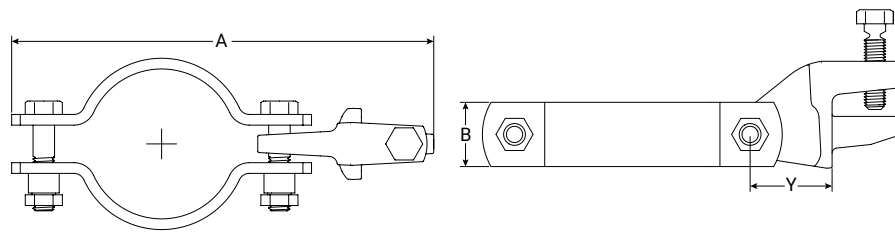


FIG. AF730 Dimensions and Weight

Size	A	B	Y	Weight	
	In./mm	In./mm	In./mm	lbs/kgs	
1" (DN25)	7.6 193			2.49	1.13
1½" (DN32)	8.0 203			2.55	1.13
1½" (DN40)	8.2 208			2.64	1.20
2" (DN50)	8.7 221			2.78	1.26
2½"	9.2 234			2.92	1.32
3" (DN80)	9.8 249			3.13	1.42
4" (DN100)	10.8 274	1.50 38.1	1.91 48.5	3.38	1.53
5"	12.1 307			3.81	1.73
6"	13.2 335			4.12	1.87
8"	15.2 386			4.72	2.14
10"	18.1 460			7.60	3.45
12"	20.1 511			8.60	3.90

Notes:

ASC Engineered Solutions™ brand bracing components are designed to be compatible ONLY with other ASC Engineered Solutions brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com and updated FM approval information may be viewed at www.approvalguide.com.

Material Specifications

Size Range

Service Pipe Size: 1" - 12", DN25-DN100

Material

Carbon Steel Clamp and Hardware. Ductile Iron Brace Member Attachment Fitting.

Finish

- Plain
- Electro-Galvanized per ASTM B633

Service

A seismic longitudinal and lateral brace clamp designed to connect a piping system to a brace member. The AF730 rigidly braces piping systems subjected to horizontal and vertical seismic loads.

Approvals

cULus Listed (ANSI/UL 203a) and FM Approved (FM 1950-13). FM Tested (ANSI/FM 1950-16). Complies with NFPA 13, ASCE 7, IBC, & MSS SP-127 bracing requirements.

Features

- Torque off set screw and nuts provide a visual indication that the desired installation torque values have been achieved.
- Eliminates brace member eccentricity by concentrically loading 1" and 1¼" brace pipes.

Ordering

Specify figure number, service pipe size, finish, and description.

Disclaimer:

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SeisBrace® Seismic Fire Protection Design Tool may be accessed at www.seisbrace.com



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Notes 2:	

300 PSI Butterfly Valve | Grooved

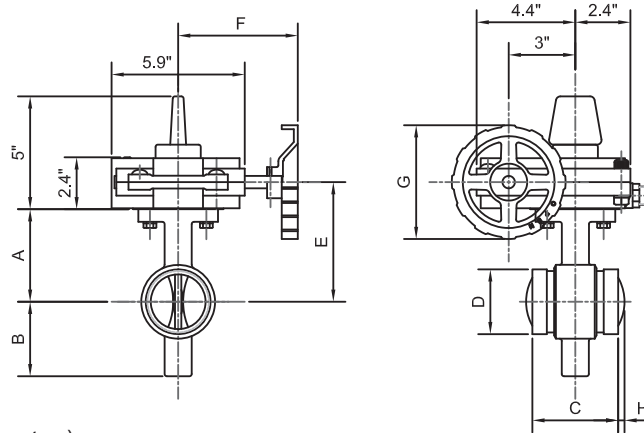
Technical Features

- **Connections:** Grooved ends, AWWA C606
- **Sizes:** 2-1/2", 3", 4", 6", 8"
- **Approvals:** UL, ULC, FM, and California State Fire Marshal
- **Maximum Working Pressure:** 300 PSI (Max. Test Pressure: 600 PSI)
- **Maximum Working Temperature:** 250°F (120°C)
- **Application:** Indoor and Outdoor Use
- **Double-Seal Disc;** Resilient EPDM Coating
- **Factory Installed Supervisory Tamper Switch Assembly**



Fireriser® Model: HPG

Component	Material	Specification
Body	Ductile Iron	ASTM A536 Nylon-11 Coated
Disc	Ductile Iron	ASTM A536 EPDM Encapsulated
Indicator	Ductile Iron	ASTM A536
Housing	Ductile Iron	ASTM A536
Handwheel	Ductile Iron	ASTM A536
Stem	Stainless Steel	AISI 420
Worm Shaft	Stainless Steel	AISI 410
Shear Pin	Steel	ASTM A510
Gear Segment	Brass	ASTM B584
Housing Gasket	EPDM	EPDM Grade E
O-Ring (All)	EPDM	EPDM Grade E



Dimensions: Inches (Millimeters)

Size in/mm	A	B	C	D	E	F	G	H
2-1/2"	4.1 (105)	3.7 (95)	3.8 (96.4)	2.9 (73)	5.3 (135)	5.3 (135)	5.0 (128)	
3"	4.4 (112)	3.6 (92)	3.8 (96.4)	3.5 (88.9)	5.6 (142)	5.3 (135)	5.0 (128)	
4"	5.7 (145)	4.3 (108)	4.5 (115.4)	4.5 (114.3)	6.9 (175)	5.3 (135)	5.0 (128)	
6"	7.0 (179)	5.7 (146)	5.2 (132.4)	6.6 (168)	8.2 (209)	7.6 (193)	8.7 (220)	0.3 (6.8)
8"	8.0 (204)	6.7 (170)	5.8 (147.4)	8.6 (219.1)	9.2 (234)	7.6 (193)	8.7 (220)	1.0 (24.2)

H: Disc clearance of body surface through end of disc in open position.

400 PSI WWP Bronze Side Outlet Globe Valves

Fire Protection Valve • 3-Way Valve • Screw-In Bonnet • Integral Seat • Renewable Disc

400 PSI/27.6 Bar Non-Shock Cold Water

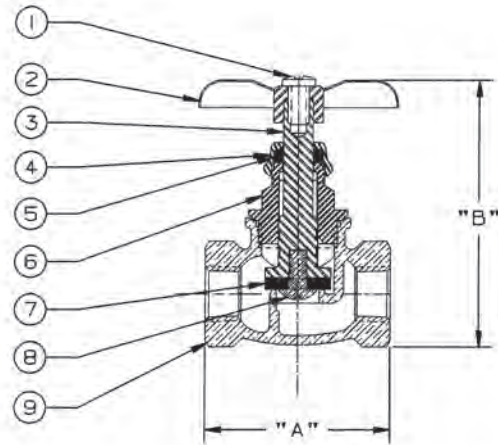
Dezincification
Resistant

MATERIAL LIST

PART	SPECIFICATION
1. Handwheel Screw	Zinc Plated Steel
2. Handwheel	Aluminum ASTM B85 Alloy C38000
3. Stem	ASTM B133 Alloy C10200
4. Packing Nut	ASTM B16 Alloy C36000
5. Packing	Non Asbestos Aramid Fibers w/Graphite
6. Bonnet	Bronze ASTM B584 Alloy C84400
7. Disc	Nitrile
8. Disc Screw	Stainless Steel ASTM A276 Alloy S43000
9. Body	Bronze ASTM B584 Alloy C84400



KT-291-W3
Threaded

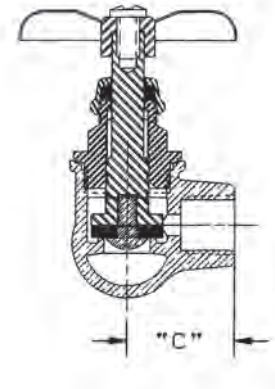


KT-291-W3
NPT x NPT x NPT

DIMENSIONS—WEIGHTS—QUANTITIES

Size	Dimensions						Weight		Box Qty.	Master Ctn.	Qty.
	A		B		C		Lbs.	Kg.			
In.	mm.	In.	mm.	In.	mm.	In.	mm.				
1/4	8	1.75	44	2.25	57	.94	24	.41	.19	10	100

⚠ WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.



Visit our website for the most current information.

300 PSI WWP Bronze Ball Valves

Fire Protection Valve • Two-Piece Body • Chrome Plated Ball •
Blowout-Proof Stem • Reinforced PTFE Seats

300 PSI/20.7 Bar Non-Shock Cold Water

CONFORMS TO MSS SP-110 • UL LISTED† •
FM APPROVED†



MATERIAL LIST

PART	SPECIFICATION
1. Handle Nut	Zinc Plated Steel
2. Handle	Zinc Plated Steel Clear Chromate with Plastisol Grip
3. Threaded Pack Gland	Brass ASTM B16
4. Packing	PTFE
5. Stem	Silicon Bronze ASTM B371 Alloy C69430 or ASTM B99 Alloy C65100
6. Thrust Washer	Reinforced PTFE
7. Ball	Brass ASTM B124 Alloy C37700 or ASTM B16 Alloy C36000 with Hard Chrome Plate
8. Seat Ring (2)	Reinforced PTFE
9. Body	Cast Red Bronze ASTM B584 Alloy C84400
10. Body End Piece	Cast Red Bronze ASTM B584 Alloy C84400

¼" and ¾" size only has A304 stainless steel grounding washer.

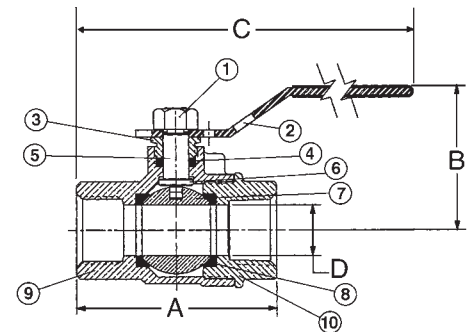


KT-585-70-UL

¼" - 1" Full Port
Threaded

KT-580-70-UL

1¼" - 2" Standard Port
Threaded



DIMENSIONS—WEIGHTS—QUANTITIES

KT-585-70-UL Dimensions

Size	A		B		C		D Port		Weight		Box Qty.	Master Ctn. Qty.	
	In.	mm.	In.	mm.	In.	mm.	In.	mm.	Lbs.	Kg.			
¼	8	2.00	51	1.75	44	5.00	127	.38	10	.45	.20	10	100
¾	10	2.00	51	1.75	44	5.00	127	.38	10	.45	.20	10	100
½	15	2.44	62	1.88	48	5.19	132	.50	13	.64	.29	10	100
¾	20	2.94	75	2.25	57	6.25	159	.75	19	1.33	.60	5	50
1	25	3.34	85	2.38	59	6.44	164	1.00	25	1.79	.81	5	20

KT-580-70-UL Dimensions

Size	A		B		C		D Port		Weight		Box Qty.	Master Ctn. Qty.	
	In.	mm.	In.	mm.	In.	mm.	In.	mm.	Lbs.	Kg.			
1¼	32	3.94	100	2.63	67	6.75	171	1.00	25	2.17	.99	5	20
1½	40	4.31	110	3.00	76	8.91	228	1.25	32	3.27	1.49	5	20
2	50	4.63	117	3.25	83	9.06	230	1.50	38	5.09	2.31	5	10
*2½	65	5.84	148	3.53	90	9.66	245	2.00	51	8.25	3.79	2	6
*3	80	7.09	202	4.41	112	11.53	293	2.50	64	15.65	7.11	1	4

KT-585-70-UL
Full Port
NPT x NPT

KT-580-70-UL
Standard Port
NPT x NPT

† UL Listed, FM Approved for trim and drain use (UL Subject 258) – 585-70-UL ¼" thru 1" – 580-70-UL 1¼" thru 2".

*2½"-3" supplied as T-580-70-UL subject to AHJ approval.

DO NOT USE FOR NATURAL GAS

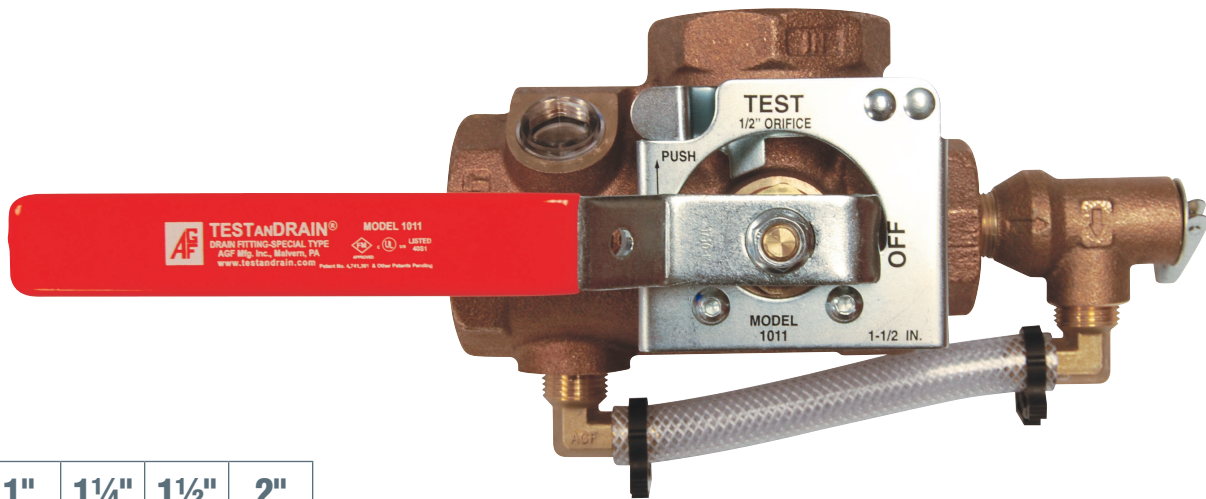
⚠ WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Visit our website for the most current information.



Model 1011A **TEST_{AND}DRAIN[®]**

Sectional Floor Control Test and Drain Valve
for Systems Requiring Pressure Relief Valve



Sizes:

3/4"	1"	1 1/4"	1 1/2"	2"
------	----	--------	--------	----

The AGF **Model 1011A TEST_{AND}DRAIN[®]** provides the test and express drain functions for wet fire sprinkler systems on multi-story installations requiring pressure relief (NFPA 13 and NFPA 13R). The **Model 1011A** features a **Model 7000 Pressure Relief Valve** with drain pipe.

The **Model 1011A** is available in a full range of sizes (3/4" to 2") with NPT connections (BSPT available). The **Model 7000 Pressure Relief Valve** (UL/FM) features a flushing handle and a 175 PSI factory rating (other pressure ratings available).

- Complies with NFPA 13 and NFPA 13R Requirements
- Compact, Single-Handle Ball Valve
- Tamper-Resistant Test Orifice and Sight Glasses
- 300 PSI rated.
- Specifiable orifice sizes: 3/8" (2.8K), 7/16" (4.2K), 1/2" (5.6K), 17/32" (8.0K), 5/8" (11.2K, ELO), 3/4" (14.0K, ESFR), and K25
- Relieves Excess System Pressure caused by Surges or Temperature Changes
- Shipped with Relief Valve and Bypass Drain Ports Plugged to Expedite Pressure Testing
- Locking Kit Available

Repair kits are available for all **TEST_{AND}DRAIN[®]** valves. Kit includes: Adapter Gasket (1), Ball (1), Valve Seats (2), Stem Packing (1), and Stem Washer (1). *Valve and orifice size must be specified when ordering.*

NOTE: It is important to note that the pressure rating of the relief valve indicates an operating range of pressure for both opening and closing of the valve. Standard relief valves are required to OPEN in a range of pressure between 90% and 105% of their rating. The valves are required to CLOSE at a pressure above 80% of that rating. The relief valve should be installed where it is easily accessible for maintenance. Care should be taken that the relief valve CANNOT be isolated from the system when the system is operational. A relief valve should NEVER have a shutoff valve or a plug downstream of its outlet.

Reliability, Versatility, Code Compatibility



Model 1011A TEST AND DRAIN®

Model 1011A 300 PSI Bronze Ball Valve, Model 7000 Pressure Relief Valve
Factory Rated at 175 PSI with other setting available

Dimensions

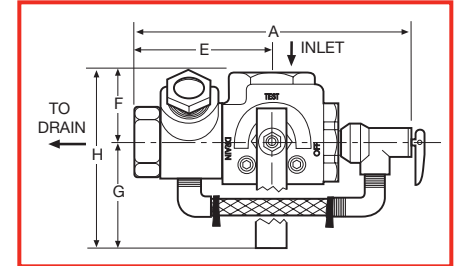
SIZE	A	B	C	D	E	F	G	H
3/4"	7 9/16" (191 mm)	1 1/2" (37.5 mm)	2 3/16" (57 mm)	3 5/8" (93 mm)	3 3/8" (86 mm)	1 13/16" (46 mm)	4 9/16" (117 mm)	6 3/8" (162.5 mm)
1"	7 9/16" (191 mm)	1 1/2" (37.5 mm)	2 3/16" (57 mm)	3 5/8" (93 mm)	3 3/8" (86 mm)	1 13/16" (46 mm)	4 9/16" (117 mm)	6 3/8" (162.5 mm)
1 1/4"	7 15/16" (201 mm)	1 11/16" (43 mm)	2 9/16" (65 mm)	4 1/4" (108 mm)	3 5/8" (91 mm)	1 15/16" (51 mm)	5 9/16" (141 mm)	7 1/2" (192 mm)
1 1/2"	8 15/16" (227 mm)	1 13/16" (45 mm)	3 1/4" (81.5 mm)	5 1/16" (127 mm)	3 7/8" (99 mm)	2 5/8" (67 mm)	8 1/4" (207 mm)	10 7/8" (274 mm)
2"	8 15/16" (227 mm)	1 13/16" (45 mm)	3 1/4" (81.5 mm)	5 1/16" (127 mm)	3 7/8" (99 mm)	2 5/8" (67 mm)	8 1/4" (207 mm)	10 7/8" (274 mm)

The Model 1011A provides the following...

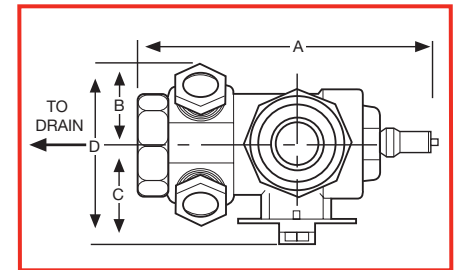
From the 2019 Edition of NFPA 13

- Chapter 16.10.4.1* Provisions shall be made to properly drain all parts of the system.
- Chapter 16.10.4.2 Drain connections, interior sectional or floor control valve(s) –
- & 16.10.4.3 shall be provided with a drain connection having a minimum size as shown in Table 16.10.4.2.
- Chapter 16.10.4.4 Drains shall discharge outside or to a drain capable of handling the flow of the drain.
- Chapter A.16.4.1 (Wet Pipe System) test connection is permitted to terminate into a drain capable of accepting full flow... using an approved sight test connection containing a smooth bore corrosion-resistant orifice giving a flow equivalent to one sprinkler...
- Chapter 16.14.1.2 The test connection valve shall be accessible.
- Chapter 16.14.1.4 shall be permitted to be installed in any location... downstream of the waterflow alarm.
- Chapter 16.14.2.1 (Dry Pipe System) a trip test connection not less than 1" in diameter, terminating in a smooth bore corrosion-resistant orifice, to provide a flow equivalent to one sprinkler...
- Chapter 16.14.2.2 The trip test connection... with a shutoff valve and plug not less than 1", at least one of which shall be brass.
- Chapter 8.1.2.1 - a wet pipe system shall be provided with a listed relief valve not less than 1/2" in size and set to operate at 175 PSI or 10 PSI in excess of the maximum system pressure, whichever is greater.
- Chapter 16.9.8.3* A listed relief valve of not less than 1/2" in size shall be provided on the discharge side of the pressure-reducing valve set to operate at a pressure not exceeding rated pressure of the components of the system.
- Chapter A.16.9.8.3 - consideration should be given to piping the discharge from the (pressure relief) valve

Model 1011A - Front View



Model 1011A - Plan View



Orifice Sizes

3/8", 7/16", 1/2", 17/32", 5/8" ELO*,
3/4" ESFR*, and K25**

Materials

- Handle Steel
- Stem Rod Brass
- Ball C.P. Brass
- Body Bronze
- Valve Seat Impregnated Teflon®
- Indicator Plate Steel
- Relief Valve Bronze
- Bypass Fittings... Brass
- Bypass Tubing.... Nylobraid

Approvals

UL and ULC Listed:
(EX4019 & EX4533)
FM Approved
NYC-BSA No. 720-87-SM



USA Patent # 4741361 and Other Patents Pending



AGF Manufacturing Inc.
100 Quaker Lane, Malvern, PA 19355
Phone: 610-240-4900
Fax: 610-240-4906
www.testandrain.com

Job Name: _____
Architect: _____
Engineer: _____
Contractor: _____

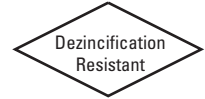
*Available on 1 1/4" to 2" size units only • **Available on 1 1/2" and 2" size units only

175 PSI WWP Bronze Angle Valves

Fire Protection Valve • Screw-in Bonnet • Integral Seat • Renewable Disc

175 PSI/12.1 Bar Non-Shock Cold Water

CONFORMS TO MSS SP-80 • UL/ULC LISTED*

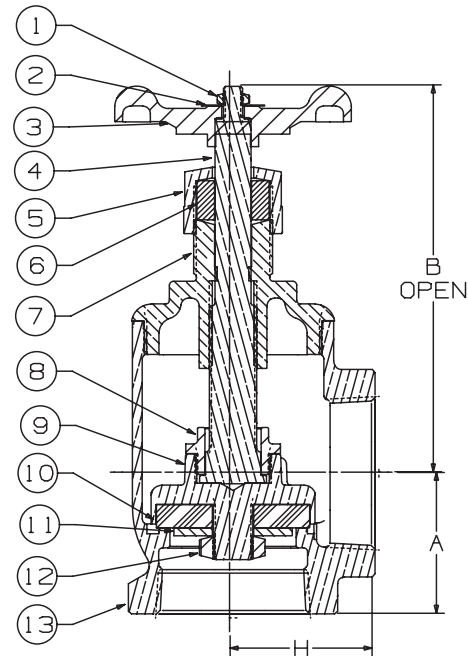


T-301-W
Threaded

MATERIAL LIST

PART	SPECIFICATION
1. Handwheel Nut	300 Series Stainless Steel
2. Identification Plate	Aluminum
3. Handwheel	Aluminum Commercial Alloy C38000
4. Stem	Silicon Bronze ASTM B371 Alloy C69430
5. Packing Gland	Bronze ASTM B62/ ASTM B16†/ ASTM B584 Alloy C84400
6. Packing Nut	Bronze ASTM B62/ ASTM B584 Alloy C84400/ASTM B16
7. Packing	Non Asbestos Aramid Fibers w/Graphite
8. Bonnet	Bronze ASTM B62 Alloy C83600
9. Disc Holder Nut	Bronze ASTM B62 Alloy C83600
10. Disc Holder	Bronze ASTM B62 Alloy C83600
11. Seat Disc	Nitrile (W) (1 1/4" - 2") PTFE (Y) (2 1/2" - 3")
12. Seat Disc Nut	Bronze ASTM B62†/ ASTM B96 Alloy C65100 w/SS Washer
13. Body	Bronze ASTM B62/B584 Alloy C83600

‡ 2 1/2" and 3" size only.
† Not on 2"



T-301-W
NPT x NPT

DIMENSIONS—WEIGHTS—QUANTITIES

Size	Dimensions						Weight		Box Qty.	Master Ctn. Qty.
	A		B		H		Lbs.	Kg.		
In. mm.	In.	mm.	In.	mm.	In.	mm.				
1 1/4 32	2.19	56	6.13	156	2.19	56	3.71	1.69	1	10
1 1/2 40	2.38	60	7.19	183	2.38	60	5.54	2.52	1	10
2 50	2.25	57	7.25	184	2.25	57	6.72	3.05	1	10
**2 1/2 65	3.19	81	10.56	268	3.19	81	16.13	7.33	1	2
**3 80	3.88	86	11.13	283	3.88	86	21.72	9.87	1	2

* UL/ULC Listed for sizes for trim and drain use (Subject 258) - Sizes 1 1/4", 1 1/2", 2".

** Sizes 2 1/2" and 3" supplied as T-311-Y with PTFE seat disc. Subject to AHJ Approval.

NOTE: See KT-67-UL for 1/2"-1" sizes.

WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Visit our website for the most current information.

Features

- Listed for indoor and outdoor use
- Outdoor use requires BBK-1 or HC-BB weatherproof back box
- Indoor use mounts directly to standard 4” box
- Low current draw
- High dB output
- AC and DC models
- DC models are motor driven, polarized, and have built in transient protection for supervised alarm circuits
- Available in 6”, 8” and 10” sizes



* ULC on PDC-DC Only
** FM on PBA-AC Only

Description

These vibrating type bells are designed for use as fire or general signaling devices. They have low power consumption and high decibel ratings. The unit mounts on a standard 4” (101mm) square electrical box for indoor use or on a model BBK-1 or HC-BB weatherproof backbox for outdoor applications. Weatherproof backbox model BBK-1 or HC-BB, Stock No. 1500001.

Notes

1. Minimum dB ratings are calculated from integrated sound pressure measurements made at Underwriters Laboratories as specified in UL Standard 464. UL temperature range is -30° to 150°F (-34° to 66°C)
2. Typical dB ratings are calculated from measurements made with a conventional sound level meter and are indicative of output levels in an actual installation.
3. ULC only applies to PDC-DC bells.

Size inches (mm)	Voltage	Model Number	Stock Number	Current (Max.)	Typical dB at 10 ft. (3m) (2)	Minimum dB at 10 ft. (3m) (1)
6 (150)	12VDC	PDC-6-12	1750500	200mA	96	76
8 (200)	12VDC	PDC-8-12	1750502	.200mA	96	77
10 (250)	12VDC	PDC-10-12	1750504	.200mA	96	78
6 (150)	24VDC	PDC-6-24	1750501	.20mA	95	77
8 (200)	24VDC	PDC-8-24	1750503	20mA	83	79
10 (250)	24VDC	PDC-10-24	1750505	20mA	85	80
6 (150)	24VAC	PBA246	1806024*	.17A	91	78
8 (200)	24VAC	PBA248	1808024*	.17A	94	77
10 (250)	24VAC	PBA2410	1810024*	.17A	94	78
6 (150)	120VAC	PBA1206	1806120*	.05A	92	83
8 (200)	120VAC	PBA1208	1808120*	.05A	99	84
10 (250)	120VAC	PBA12010	1810120*	.05A	99	86

All DC bells are polarized and have built-in transient protection. * Does not have ULC listing.

Technical Specifications

Dimensions	6” (150mm), 8” (200mm) and 10” (250mm)
Enclosure	Cover: Steel Finish: Red Powder Coat Base: non-corrosive composite material All parts have corrosion resistant finishes Model BBK-1 or HC-BB weatherproof backbox (optional)
Voltages Available	24VAC 120VAC 12VDC (10.2 to 15.6) Polarized 24VDC (20.4 to 31.2) Polarized
Environmental Limitations	Indoor or outdoor use (See Note 1) -40° to 150°F (-40° to 66°C) (Outdoor use requires weatherproof backbox.)
Termination	AC Bells - 4 No. 18 AWG stranded wires DC Bells - 18 AWG stranded wire
Service Use	NFPA 13, 72, local AHJ

*Specifications subject to change without notice.

⚠ WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.

⚠ WARNING

In outdoor or wet installations, bell must be mounted with weatherproof backbox, BBK-1 or HC-BB. Standard electrical boxes will not provide a weatherproof enclosure. If the bell and/or assembly is exposed to moisture, it may fail or create an electrical hazard.

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 7135-0328:0119

Page 1 of 1

CATEGORY: 7135 -- AUDIBLE DEVICES

LISTEE: Potter Electric Signal Co 1609 Park 370 Place, Hazelwood, MO 63042 United States
Contact: Brad Serangeli (314) 595-6900 Fax (314) 595-6999
Email: brads@pottersignal.com

DESIGN: Models SB624-153075, SB624-75110, PBA246, PBA248, PBA2410, PBA1206, PBA1208, PBA12010, *PBD-126, *PBD-128, *PBD-1210, *PBD-246, *PBD-248, * PBD-2410 vibrating bells. Suitable for outdoor use when used with Model BBK-1 backbox. Models are AC or DC powered and available in 6", 8" and 10". Models MBA-6, -8 and -10 bells, suitable for outdoor use when used with Model BBX-1 backbox. Refer to listee's data sheet for detailed product description and operational considerations.

RATING: PBA-246, -248, -2410: 24 VAC
PBA-1206, -1208, -12010: 120 VAC
MBA-6, -8, -10: 12 or 24 VDC
*PBD-126, -128, -1210: 12VDC, .12A
*PBD-246, -248, -2410: 24VDC, .06A

INSTALLATION: In accordance with listee's printed installation instruction, applicable codes & ordinances, and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number and UL label.

APPROVAL: Listed as audible devices for use with separately listed compatible fire alarm control units. If this appliance is required to produce a distinctive three-pulse Temporal Pattern Fire Alarm Evacuation Signal (for total evacuation) in accordance with NFPA 72, 2002 Edition, the appliance must be used with a fire alarm control unit that can generate the temporal pattern signal. Refer to manufacturer's Installation Manual for details.

*Revision 01-31-2017 dcc



This listing is based upon technical data submitted by the applicant. CSFM Fire Engineering staff has reviewed the test results and/or other data but does not make an independent verification of any claims. This listing is not an endorsement or recommendation of the item listed. This listing should not be used to verify correct operational requirements or installation criteria. Refer to listee's data sheet, installation instructions and/or other

Date Issued: **July 01, 2021**

Listing Expires **June 30, 2022**

Authorized By: **DAVID CASTILLO, M.E., F.P.E.**
Fire Engineering Division



Specifications subject to change without notice.

Ordering Information			
Nominal Pipe Size		Model	Part Number
2"	DN50	VSR-2	1144402
2 1/2"	DN65	VSR-2 1/2	1144425
3"	DN80	VSR-3	1144403
3 1/2"	-	VSR-3 1/2	1144435
4"	DN100	VSR-4	1144404
5"	-	VSR-5	1144405
6"	DN150	VSR-6	1144406
8"	DN200	VSR-8	1144408

Optional: Cover Tamper Switch Kit, stock no. 0090148

Replaceable Components: Retard/Switch Assembly, stock no. 1029030

UL, CUL and CSFM Listed, FM Approved, LPCB Approved, For CE Marked (EN12259-5) / VdS Approved model use VSR-EU

Service Pressure: 450 PSI (31 BAR) - UL

Flow Sensitivity Range for Signal:

4-10 GPM (15-38 LPM) - UL

Maximum Surge: 18 FPS (5.5 m/s)

Contact Ratings: Two sets of SPDT (Form C)

10.0 Amps at 125/250VAC

2.0 Amps at 30VDC Resistive

10 mAmps min. at 24VDC

Conduit Entrances: Two knockouts provided for 1/2" conduit.

Individual switch compartments suitable for dissimilar voltages.

Environmental Specifications:

- NEMA 4/IP54 Rated Enclosure suitable for indoor or outdoor use with factory installed gasket and die-cast housing when used with appropriate conduit fitting.
- Temperature Range: 40°F - 120°F, (4.5°C - 49°C) - UL
- Non-corrosive sleeve factory installed in saddle.

Service Use:

Automatic Sprinkler

NFPA-13

One or two family dwelling

NFPA-13D

Residential occupancy up to four stories

NFPA-13R

National Fire Alarm Code

NFPA-72

WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.

CAUTION

Waterflow switches that are monitoring wet pipe sprinkler systems shall not be used as the sole initiating device to discharge AFFF, deluge, or chemical suppression systems. Waterflow switches used for this application may result in unintended discharges caused by surges, trapped air, or short retard times.

Important: This document contains important information on the installation and operation of the VSR waterflow switches. Please read all instructions carefully before beginning installation. A copy of this document is required by NFPA 72 to be maintained on site.

General Information

The Model VSR is a vane type waterflow switch for use on wet sprinkler systems. It is UL Listed for use on a steel pipe; schedules 5 through 40, sizes 2" - 6" and is UL Listed and FM Approved for use on steel pipe; schedules 10 through 40, sizes 2" thru 8" (50 mm thru 200 mm). LPC approved sizes are 2" thru 8" (50 mm thru 200 mm). See Ordering Information chart.

The VSR may also be used as a sectional waterflow detector on large systems. The VSR contains two single pole, double throw, snap action switches and an adjustable, instantly recycling pneumatic retard. The switches are actuated when a flow of 10 GPM (38 LPM) or more occurs downstream of the device. The flow condition must exist for a period of time necessary to overcome the selected retard period.

Enclosure

The VSR switches and retard device are enclosed in a general purpose, die-cast housing. The cover is held in place with two tamper resistant screws which require a special key for removal. A field installable cover tamper switch is available as an option which may be used to indicate unauthorized removal of the cover. See bulletin number 5401103 for installation instructions of this switch.

Potter Electric Signal Company, LLC • St. Louis, MO • Phone: 866-956-1211/Canada 888-882-1833 • www.pottersignal.com

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL
FIRE ENGINEERING - BUILDING MATERIALS LISTING PROGRAM



LISTING SERVICE

LISTING No. 7770-0328:0001
CATEGORY: 7770 -- VALVES/SWITCHES

Page 1 of 1

LISTEE: Potter Electric Signal Co 1609 Park 370 Place, Hazelwood, MO 63042 United States
Contact: Brad Serangeli (314) 595-6900 Fax (314) 595-6999
Email: brads@pottersignal.com

DESIGN: Vane and pressure type water flow alarm switches listed below. Refer to listee's data sheet for detailed product description and operational considerations.

Vane Types:

VSR-CF	VSR-D	VSR-F	VSR-SF
VSR-FE-2	VS-SP	VS-F	VSR-SFG
VSR-SFT	VSG	VSR	VSR-S
VSR-C	VSR-ST	VSR-SG	

Pressure Type:

WFS-B	WFSR-C	WFSPD-B	PS10
PS-10A	PS-100A	WFSR-F	PS100

INSTALLATION: In accordance with listee's printed installation instructions, applicable codes and ordinances and in a manner acceptable to the authority having jurisdiction.

MARKING: Listee's name, model number and UL or FM label.

APPROVAL: Listed as waterflow alarm switches for use with fire sprinkler systems. Vane models may be used in wet pipe systems; pressure models may be used in wet or dry systems. Model VSR-CF is for use on K, L or M copper pipe (2", 2-1/2", 3", 4") and listed CPVC pipe (2", 2-1/2", 3"). Model VSR-SF for use on 1", 1-1/4", 1-1/2" and *2" steel, copper or listed plastic pipe. Model VSG is for low flow rate. Model VSR-SFG and VSR-SFT are for use on 1", 1-1/4", 1-1/2" and *2" plastic pipe. Models VS-F, VSR-F, VSR-FE and VSR-FE-2 is for use on 2", 2-1/2", 3", 3-1/2", 4", 5", 6", 8" and 10" pipe. *Model VSR is for use on steel pipe sizes from 2" through 8". Vane type switches may be used outdoors when the outdoor temperature never falls below 40oF.

Rev*5-17-2007 jw



This listing is based upon technical data submitted by the applicant. CSFM Fire Engineering staff has reviewed the test results and/or other data but does not make an independent verification of any claims. This listing is not an endorsement or recommendation of the item listed. This listing should not be used to verify correct operational requirements or installation criteria. Refer to listee's data sheet, installation instructions and/or other

Date Issued: **July 01, 2021**

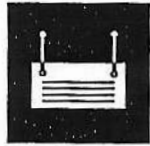
Listing Expires **June 30, 2022**

Authorized By: **DAVID CASTILLO, M.E., F.P.E.**
Fire Engineering Division

Signs

For sprinkler systems & devices

Manufactured by: Central Sprinkler Company
451 North Cannon Avenue, Lansdale, Pennsylvania 19446



Product Description

Central's Identification Signs are designed to provide information to the end user about the sprinkler system and its components. They are available with a variety of wording combinations to meet the signing requirements of NFPA 13.

The five basic types of signs are as follows:

- Type A - Control Valve Sign
- Type B - Multi-purpose Text Signs
- Type C - Cold Weather Sign
- Type D - Fire Alarm Sign
- Type E - Hydraulic Calculation Sign

The Signs are constructed of 18 gauge steel or aluminum with a porcelain enamel or printed mylar facing respectively. The signs have corner holes or slots for easy attachment in the field.

Sign Type B is available with the following text options:

- Air control
- Air control valve
- Air line
- Alarm test
- Alarm line
- Antifreeze system
- Auxiliary drain
- Control
- Control valve
- Drain
- Drain valve
- Entire system
- From city main
- In this building
- In this section
- Inspectors test
- Main control

- Main drain
- Open sprinkler control
- Open sprinkler drain
- Test valve
- Triangular main drain
- Water motor
- Water motor line



Technical Data

- Model: Sign
- Style: Flat, rectangular
- Standard Finish: porcelain or mylar
- Size:
 - Type A - 9" x 7"
 - Type B - 6" x 2"
 - Type C - 7 $\frac{1}{4}$ " x 1 $\frac{1}{4}$ "
 - Type D - 9" x 7"
 - Type E - 5" x 7"
- Weight:
 - Type A - 4.5 oz.
 - Type B - 0.5 oz.
 - Type C - 2.0 oz.
 - Type D - 4.0 oz.
 - Type E - 1.5 oz.



Installation

The Identification Signs are provided with $\frac{1}{8}$ " diameter or larger holes (or slots) in the corners for easy attachment using standard hardware chain, wire, plastic lock ties, or light gauge metal strap (not included).



Identification Signs



Installation

Central's Sprinkler Head Cabinet is designed with two $\frac{3}{16}$ " diameter holes for wall mounting or direct attachment to the system riser with a strap-type hanger. The Cabinet should be installed at or near the system control valve and must be stocked with an adequate supply of spare sprinklers and a sprinkler wrench.

The stock of spare sprinklers should include sprinklers of each type and temperature rating as are installed in the sprinkler system, in the following quantities:

Sprinklers In System	Spare Sprinklers Required
under 300	6
300-1000	12
over 1000	24

The Cabinets are designed to accept both $\frac{1}{2}$ " and $\frac{3}{4}$ " N.P.T. threaded sprinklers. For $\frac{1}{2}$ " N.P.T. sprinklers, leave the removable knockout in the hole. For $\frac{3}{4}$ " N.P.T. sprinklers, insert a screwdriver blade from the front top of the shelf and under the near bottom part of the knockout annular ring. Press the screwdriver handle down to remove the knockout ring. The hole, with the knockout ring removed, will accept a $\frac{3}{4}$ " N.P.T. sprinkler.



Care & Maintenance

The Cabinet, wrench, and stock of spare sprinklers should be inspected at least quarterly. The following items should be checked:

1. The Cabinet should be readily accessible, and not exposed to a corrosive atmosphere or temperatures in excess of 100°F/38°C.
2. The stock of spare sprinklers should include an adequate number of each type and temperature rating.
3. The stock of sprinklers must be in good condition.
4. A sprinkler wrench of the appropriate type must be included in the Cabinet.



Ordering Information

When placing an order, indicate the full product name. Please specify the quantity, model, style, capacity, and size.

Sprinklers, wrenches, and hardware for hanging are not supplied with the Cabinet. They must be ordered separately.

Availability and Service: Central sprinklers, accessories, and other products are available throughout the U.S. and Canada, and internationally through a network of Central Sprinkler distribution centers. You may write directly to Central Sprinkler Company, or call (215) 362-0700 for the distributor nearest you.

Guarantee: Central Sprinkler Company will repair and/or replace any products found to be defective in material or workmanship within a period of one year from date of shipment. Please refer to the current Price List for further details of the warranty.

Conversion Table:
 1 inch = 25.400 mm
 1 foot = 0.3048 M
 1 pound = 0.4536 kg

Conversions are approximate.



Central Sprinkler Company

451 North Cannon Avenue, Lansdale, PA 19446
 Phone (215) 362-0700
 FAX (215) 362-5385

Sign - Type A

THIS VALVE CONTROLS
 SUPPLY TO **AUTOMATIC SPRINKLERS**

MUST BE **OPEN** AT ALL TIMES

TO BE HANDLED ONLY BY AUTHORIZED PERSON OR BY EMPLOYEE CARING FOR SPRINKLER SYSTEM

IN CASE OF FIRE
DO NOT SHUT VALVE UNTIL FIRE IS ENTIRELY OUT

WHEN VALVE IS SHUT FOR EMERGENCY - REPAIRS - OR FIRE-NOTIFY:

REQUEST DIRECTIONS - RESTORE PROTECTION QUICKLY

The blank spaces on this sign may be utilized to provide message flexibility. Simply add combinations of sign Type B and Type C as desired.

Sign - Type B

AUXILIARY DRAIN

Sign - Type C

FRONT

VALVE SHUT MUST BE OPENED IN CASE OF FIRE. VALVE SHUT ALSO DURING SUMMER MONTHS

BACK

AND MUST BE KEPT OPEN EXCEPT DURING WINTER MONTHS. WHEN VALVE IS TO BE CLOSED AND PIPES DRAINED.

Sign - Type D

SPRINKLER FIRE - ALARM

WHEN BELL RINGS
 CALL
 FIRE DEPT OR POLICE

Sign - Type E

HYDRAULIC-SYSTEM
 This Building is Protected by a
 Hydraulically Designed Automatic
 Sprinkler System

Location

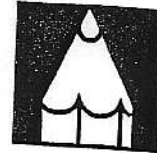
No. of Sprinklers

Basis of Design

1. DENSITY	<input type="text"/>	GPM/SQ.FT.
2. DESIGNED AREA OF DISCHARGE	<input type="text"/>	SQ.FT.

System Demand

1. WATER FLOW RATE	<input type="text"/>	GPM
2. RESIDUAL PRESSURE AT THE BASE OF THE RISER	<input type="text"/>	PSI



Ordering Information

When placing an order, indicate the full product name. Please specify the quantity and type. Hardware for hanging is not supplied with the Sign. It must be ordered separately.

Availability and Service:
 Central sprinklers, accessories, and other products are available throughout the U.S. and Canada, and internationally through a network of Central Sprinkler distribution centers. You may write directly to Central Sprinkler Company, or call (215) 362-0700 for the distributor nearest you.

Guarantee: Central Sprinkler Company will repair and/or replace any products found to be defective in material or workmanship within a period of one year from date of shipment. Please refer to the current Price List for further details of the warranty.

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Central Sprinkler Company
 451 N. Cannon Avenue, Lansdale, PA 19446
 Phone (215) 362-0700
 FAX (215) 362-5385

Hazardous Building Materials Survey

Palo Verde Masonic Lodge

141 S. 2nd Street

Blythe, California

Sillman Architects

31045 Temecula Parkway, Suite 204 | Temecula, California

January 31, 2022 | Project No. 109364001



Geotechnical | Environmental | Construction Inspection & Testing | Forensic Engineering & Expert Witness

Geophysics | Engineering Geology | Laboratory Testing | Industrial Hygiene | Occupational Safety | Air Quality | GIS

Ninyo & Moore

Geotechnical & Environmental Sciences Consultants

January 31, 2022
Project No. 109364001

Mr. Jose Amador
Project Manager
Sillman Architects
31045 Temecula Parkway, Suite 204
Temecula, California 92592

Subject: Hazardous Building Materials Survey
Palo Verde Masonic Lodge
141 S. 2nd Street
Blythe, California 92225

Dear Mr. Amador:

In accordance with your request, Ninyo & Moore has performed a hazardous building materials (HBM) survey for the former Palo Verde Masonic Lodge (subject building), located at 141 S. 2nd Street in Blythe, California. It is our understanding that the subject building is slated for demolition. The attached report presents our methodology, findings, and recommendations regarding the HBM at the subject building.

Sincerely,

NINYO & MOORE



Nicolas Carpenter, CAC# 12-4867
Senior Project Environmental Scientist

NJC/SJW

Distribution: (1) Addressee (via e-mail)



Stephen J. Waide, CIH, CSP
Principal Environmental Scientist

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FIGURES

- 1 – Site Location
- 2 – Sample Locations

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- 1 – Asbestos Survey Results
- 2 – Summary of Asbestos-Containing Materials
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- 4 – Summary of Other Potential Hazardous Building Materials

APPENDICES

- A – Suspect Asbestos-Containing Materials Sampling Protocol
- B – Laboratory Analytical Report and Chain-of-Custody Records
- C – XRF Testing Methodology
- D – CDPH Form 8552 – Lead Hazard Evaluation Report

1 INTRODUCTION

Ninyo & Moore has conducted a HBM survey for the subject building addressed 141 S. 2nd Street, in the City of Blythe and County of Riverside, California (Figure 1). Our services included an asbestos-containing materials (ACM) survey, a lead-containing surfaces (LCS) survey, and visual identification and quantification of building materials potentially falling under the California Department of Toxic Substances Control (DTSC) Universal Waste Rule (UWR) and other potential hazardous building materials.

The purpose of this survey was to locate suspect building materials/surfaces, to sample and test identified suspect materials/surfaces, and to assess conditions and quantities of materials/surfaces identified as hazardous that may be impacted by proposed demolition activities. For the purposes of this assessment, LCS refers to both lead-based paint, as defined by the California Department of Public Health (CDPH) and U.S. Department of Housing and Urban Development (HUD), and other potential lead-containing materials, including, but not limited to, ceramic tile and porcelain bathroom fixtures.

The survey was performed in accordance with established guidelines for the assessment of ACM and LCS, and is based upon conditions of the subject building at the time of the surveying activities.

2 OBJECTIVE AND SCOPE OF SERVICES

The purpose of this report is to provide information regarding the current site conditions to assist Sillman Architects in implementing demolition of the subject building. Our scope of work performed for the study is identified below.

- Conducted a visual reconnaissance of the subject building to document homogeneous areas and locate suspect ACM, LCS, building materials potentially falling under the UWR, and other potential hazardous building materials.
- Collected 37 bulk samples of suspect ACM and submitted them to an independent laboratory for analysis of asbestos content. Samples were analyzed via the U.S. Environmental Protection Agency (USEPA) recommended method of polarized light microscopy (PLM) in accordance with USEPA Method 600/R-93/116 July 93.
- Collected 57 X-Ray Fluorescence (XRF) readings of potential LCS.
- Visually assessed building materials potentially falling under the UWR, including, but not limited to non-incandescent light bulbs, mercury-containing thermostat triggers, batteries, and electronic devices. Other potentially hazardous building materials, including, but not limited to, polychlorinated biphenyl-containing light ballasts, tritium-containing exit signs, americium-

containing smoke detectors, and Freon™-containing air conditioning units and refrigerators, were noted, if observed.

- Prepared sample location maps showing locations where suspect ACM were collected and locations of XRF readings of surfaces with lead concentrations in excess of 1.0 milligram per square centimeter (mg/cm²), if encountered.
- Prepared this report presenting our data and summarizing our findings and recommendations regarding ACM, LCS, and other potential hazardous building materials for the subject building.

3 SITE DESCRIPTION

Ninyo & Moore performed survey activities in December 2021. The subject building is located on S. 2nd Street between Hobson Way and E. Rice Street. Exterior surfaces consist of concrete masonry-unit (CMU) bricks, wood window systems, and built-up roofing materials. Interior finishes include spray-on acoustic ceilings and plaster, plaster and CMU walls, and ceramic tile or vinyl floor tile flooring materials and associated black mastic throughout.

4 PHYSICAL LIMITATIONS

Survey activities were limited to the aboveground structures. Underground utilities, such as suspect cementitious water lines or suspect insulated/coated gas or electrical lines were not assessed during survey activities.

Physical limitations, such as inaccessible rooms or spaces, were not encountered during survey activities. However, since non-destructive sampling techniques were used, there is a possibility that additional suspect materials and/or surfaces may be encountered in inaccessible areas (e.g., interstitial wall and ceiling spaces and canopy soffits) during building renovation and/or demolition activities. For instance, untested thermal system insulation may be present within wall and ceiling cavities and/or behind plumbing and heating fixtures (e.g., sinks, boilers, and radiators). Suspect materials and/or surfaces encountered during building renovation and/or demolition activities that have not been assessed either may be assumed to be asbestos- and/or lead-containing and handled accordingly, or may be sampled and analyzed to assess whether they are asbestos- and/or lead-containing.

5 SAMPLE COLLECTION AND ANALYSES

The subject building was assessed for the presence of ACM and LCS, and other potential hazardous building materials. The ACM and LCS surveys followed USEPA guidelines, or

industry standards, within the limitations of the scope of this assessment. Survey activities are discussed below.

5.1 Asbestos-Containing Materials Survey

Ninyo & Moore's objective was to collect representative samples of suspect ACM observed in the subject building. The asbestos survey was performed by a State of California Certified Site Surveillance Technician, under the supervision of a Certified Asbestos Consultant. Survey activities included a preliminary visual assessment, bulk sampling of suspect ACM, and logging and mapping of collected samples. Representative samples of suspect ACM were collected after identification of homogeneous sampling areas (areas in which the materials are uniform in color, texture, construction or application date, and general appearance). Material type, location, condition, and friability were noted for each homogeneous area. For the purposes of the assessment, the subject building was treated as a single homogenous area. Thirty-seven (37) samples of suspect ACM were collected, using USEPA-recommended sampling procedures (Appendix A).

The suspect ACM samples were delivered to EMSL Analytical, Inc. (EMSL) of San Diego, California for analysis. EMSL is accredited in the National Voluntary Laboratory Accreditation Program for bulk asbestos fiber analysis. The samples were analyzed for the presence and quantification of asbestos fibers, using PLM with dispersion staining, in accordance with USEPA Method 600/R-93/116 July 93. Due to material layering, seventy-four (74) separate PLM analyses were performed. The lower limit of reliable detection for asbestos using the PLM method is approximately 1% by weight. Currently, the USEPA and the State of California stipulate that materials containing greater than 1% asbestos constitute ACM and the State of California stipulates that materials containing greater than 0.1% asbestos constitute asbestos-containing construction materials (ACCM).

Building materials that were sampled and analyzed for the presence of asbestos in this survey are presented in the attached Table 1, and the locations from which bulk asbestos samples were collected during this survey are shown on Figure 2. Copies of the laboratory analytical report and chain-of-custody records for this survey are presented in Appendix B.

5.2 Lead-Containing Surfaces Survey

Ninyo & Moore's objective was to test suspect LCS observed in the subject building and to assess the condition of surfaces found to be lead-containing. The testing was conducted by a CDPH-certified Inspector/Assessor using a portable Viken Detection Pb200i XRF Lead Paint Analyzer spectrum analyzer, in accordance with accepted environmental science and engineering practices for renovation projects. The testing methodology used is presented in

Appendix D. Fifty-seven (57) XRF readings (including calibration checks) were collected during the survey. Building components that were tested for the presence of lead during this survey are presented in the attached Table 3. The XRF testing orientation (A, B, C, and D wall orientations) used during the testing is depicted on Figure 2. A copy of CDPH Form 8552 “Lead Hazard Evaluation Report” for the subject building is included in Appendix D.

For the purposes of this assessment, LCS refers to both lead-based paint, as defined by CDPH and HUD, and other potential lead-containing materials, including, but not limited to, ceramic tile and porcelain bathroom fixtures. LCS, based on the CDPH and HUD lead-based paint regulatory standards, are surfaces containing concentrations of lead greater than or equal to 1.0 mg/cm², or 0.5% by weight.

5.3 Other Potential Hazardous Building Materials

Ninyo & Moore performed a visual assessment of building materials potentially falling under the UWR, including, but not limited to non-incandescent light bulbs, mercury-containing thermostat triggers, batteries, and electronic devices. Other potentially hazardous building materials, including, but not limited to, polychlorinated biphenyl-containing light ballasts, tritium-containing exit signs, americium-containing smoke detectors, and Freon™-containing air conditioning units and refrigerators, were noted, if observed. **In accordance with the scope of work, positive identification of the suspect hazardous material, via analytical testing, was not performed.** Other potentially hazardous building materials are summarized in Table 4.

6 FINDINGS AND RECOMMENDATIONS

The findings of these surveys are based on our visual observations and analysis of suspect building materials/surfaces. Our findings are presented below.

6.1 Asbestos-Containing Materials

Based on the analytical results from this survey, ACMs are located in the subject building and are summarized in Table 2. Materials that were not sampled as part of this assessment and that are uniform in color, texture, construction or application date, and/or general appearance to materials found to be asbestos-containing, should also be assumed to be asbestos-containing.

The National Emission Standard for Hazardous Air Pollutants (Code of Federal Regulations Title 40, Part 61, Subpart M) recommends that material found to contain less than 10% asbestos by PLM be further analyzed, or “point-counted,” in accordance with a subsection of the EPA recommended PLM analysis method. Further, the PLM laboratory analytical report states “Due to the magnification limitations inherent in PLM, asbestos fibers below the resolution capability

of PLM may not be detected. Samples reported as <1% or none detected may require additional testing by transmission electron microscopy to confirm asbestos quantities.” No samples collected in this survey were reported as containing <1% asbestos.

The identified ACM should not be disturbed. Prior to building renovation and/or demolition activities, a licensed asbestos abatement contractor should remove the ACM in accordance with federal, state, and local regulations. Should additional suspect materials, not sampled or assessed in this report, be uncovered during building renovation and/or demolition: (a) samples of suspect materials should be collected for laboratory analysis, and all activities that may impact the materials should cease until laboratory analytical results are reviewed; or (b) the materials should be assumed to be asbestos-containing and handled as such. Note that any work involving the disturbance of materials containing asbestos should be performed using appropriate work practices and be conducted by, and under the supervision of, properly trained, experienced, and certified personnel.

6.2 Lead-Containing Surfaces

Based on the results of the XRF assays collected during this survey, surfaces containing concentrations of lead greater than or equal to 1.0 mg/cm², or 0.5% by weight, were not identified in the subject building.

Please note that disturbing surfaces containing lead concentrations below the LCS criteria, as defined by CDPH and HUD, (e.g., lead concentrations less than 1.0 mg/cm², or 0.5% by weight) may still trigger the California Occupational Safety and Health Administration (Cal-OSHA) lead in construction standard (Title 8 California Code of Regulations Section 1532.1).

Should suspect surfaces, not tested or assessed in this report, be uncovered during building renovation and/or demolition: (a) XRF testing of the surfaces should occur and all activities that impact the suspect surfaces should cease until XRF testing results become available; (b) paint chip or bulk samples of suspect surfaces should be collected for laboratory analysis and all activities that impact the suspect surfaces should cease until laboratory analytical results are reviewed; or (c) the surfaces should be assumed to contain concentrations of lead greater than or equal to 1.0 mg/cm², or 0.5% by weight, and handled as such. Note that any work involving the disturbance of surfaces containing lead should be performed using appropriate work practices and be conducted by, and under the supervision of, properly trained, experienced, and certified personnel.

6.3 Other Potential Hazardous Building Materials

A visual assessment and quantification of building materials falling under the UWR and other potential hazardous building materials that could be impacted by demolition activities was performed. Other potential hazardous building materials observed throughout the subject building are summarized in Table 4 and include:

- Fluorescent light tubes and associated ballasts,
- Non-incandescent lights,
- Smoke detectors
- Air conditioning units, and
- Freon-containing refrigerators.

Prior to renovation and/or demolition activities that could potentially disturb these materials, building materials falling under the UWR and other potential hazardous building materials should be removed and properly recycled or disposed of by a licensed contractor in accordance with federal, state, and local regulations. **It is the contractor's responsibility to confirm miscellaneous hazardous building materials quantities and locations present prior to bid submittals and initiating demolition activities for the subject building.** The Contractor is also responsible for waste characterization for all materials removed from the subject building.

7 LIMITATIONS

Ninyo & Moore's opinions and recommendations regarding environmental conditions, as presented in this report, are based on limited sampling and chemical analysis. Further assessment of potential adverse environmental impacts may be accomplished by conducting a more comprehensive assessment. The samples collected and used for testing, and the observations made, are believed to be representative of the area evaluated. However, if additional suspect building materials are encountered during renovation and/or demolition activities, these materials should be sampled by qualified personnel, and analyzed for content prior to further disturbance. In addition, please note that quantities of impacted building materials are approximate. It is the contractor's responsibility to confirm quantities present.

The environmental services described in this report have been conducted in general accordance with current regulatory guidelines and the standard of care exercised by environmental consultants performing similar work in the project area. No warranty, expressed or implied, is made regarding the professional opinions presented in this report. Variations in site conditions may exist and conditions not observed or described in this report may be encountered during subsequent activities.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should

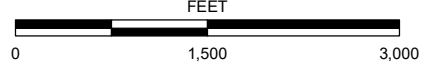
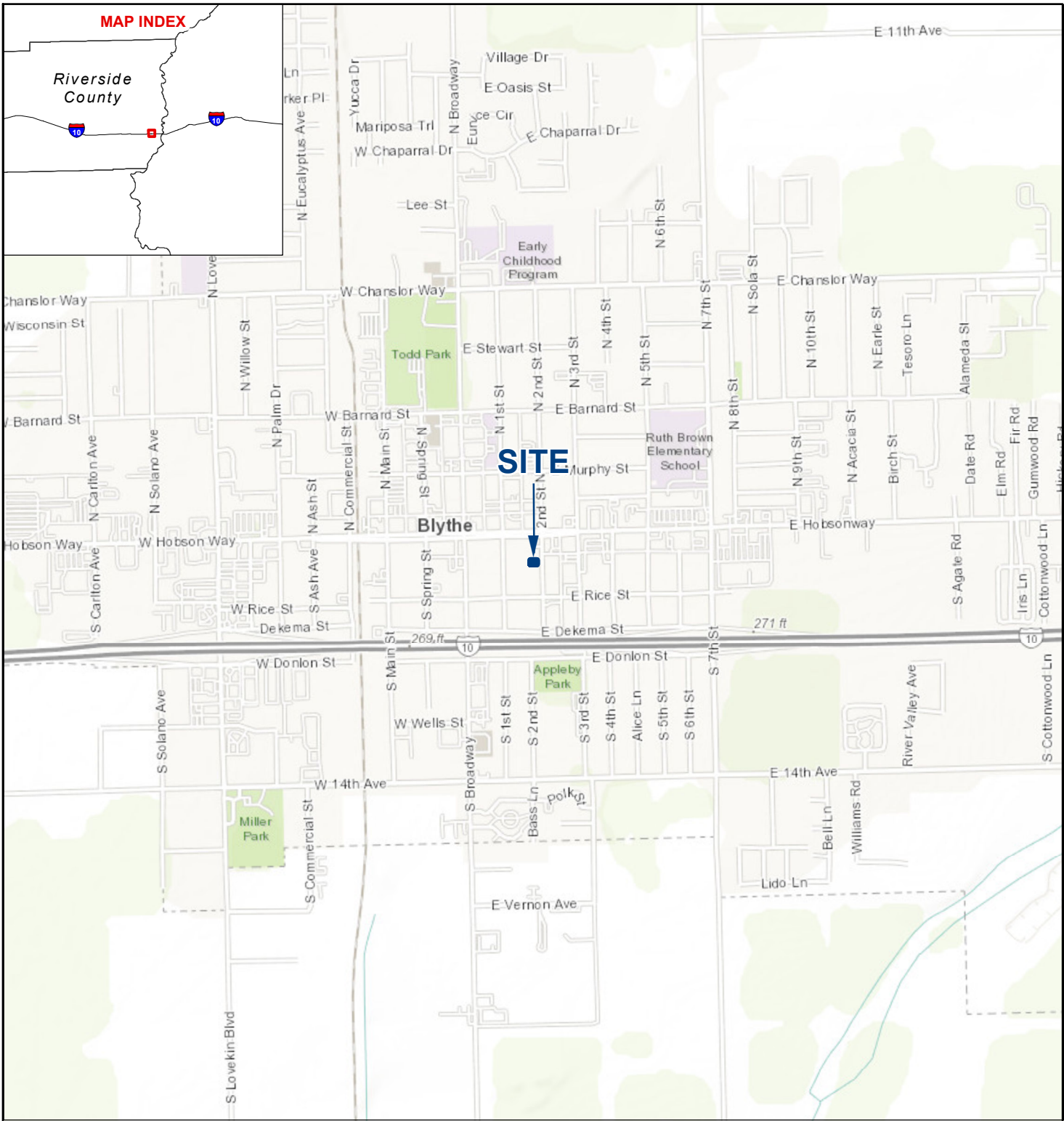
be contacted if the reader requires any additional information, or has questions regarding content, interpretations presented, or completeness of this document.

The environmental interpretations and opinions contained in this report are based on the results of laboratory tests and analyses intended to detect the presence and concentration of specific chemical or physical constituents in samples collected from the subject site. The testing and analyses have been conducted by an independent laboratory that is certified by the State of California to conduct such tests. Ninyo & Moore has no involvement in, or control over, such testing and analysis. Ninyo & Moore, therefore, disclaims responsibility for any inaccuracy in such laboratory results. Please note the laboratory analytical report states “Due to the magnification limitations inherent in PLM, asbestos fibers below the resolution capability of PLM may not be detected. Samples reported as <1% or none detected may require additional testings by transmission electron microscopy to confirm asbestos quantities.”

Our findings, opinions, and recommendations are based on an analysis of the observed site conditions. It should be understood that the conditions of the site can change with time as a result of natural processes or the activities of humans at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.



FIGURES



NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE. | SOURCE: ESRI WORLD TOPO, 2021

FIGURE 1

SITE LOCATION

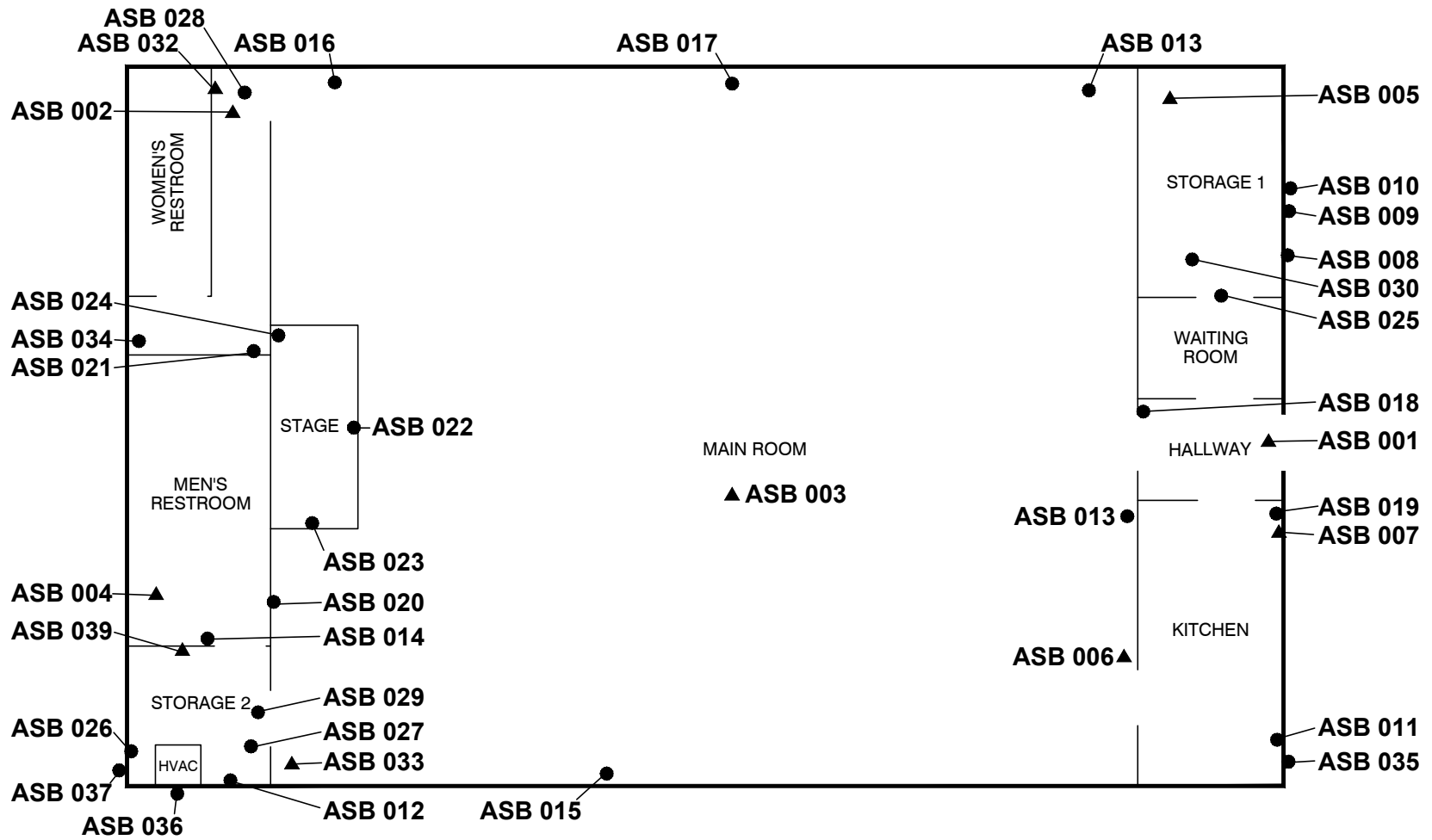
**PALO VERDE MASONIC LODGE
141 SOUTH 2ND AVENUE, BLYTHE, CALIFORNIA**

109364001 | 1/22

1_109364001_SL.mxd 12/30/2021 AOB



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LEGEND

- ASB 034 ASBESTOS SAMPLE
- ▲ ASB 039 ASBESTOS ROOF SAMPLE

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

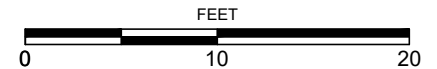


FIGURE 2



TABLES

Table 1 - Asbestos Survey Results

Sample No.	Bldg. No.	Room No.	Sample Location	Sample Description	Approx. Quantity ⁽¹⁾	Friable Y/N	Condition	Asbestos Content
ASB-001	141 S. 2nd St.	Roof	East roof	Roof assembly - white/black shingle	--	N/A	N/A	ND
ASB-001A	141 S. 2nd	Roof	East roof	Roof assembly - black tar	--	N/A	N/A	ND
ASB-001B	141 S. 2nd	Roof	East roof	Roof assembly - black felt	--	N/A	N/A	ND
ASB-002	141 S. 2nd	Roof	Northwest roof	Roof assembly - white/black shingle	--	N/A	N/A	ND
ASB-002A	141 S. 2nd	Roof	Northwest roof	Roof assembly - black tar	--	N/A	N/A	ND
ASB-002B	141 S. 2nd	Roof	Northwest roof	Roof assembly - black felt	--	N/A	N/A	ND
ASB-003	141 S. 2nd	Roof	Center	Roof assembly - white/black shingle	--	N/A	N/A	ND
ASB-003A	141 S. 2nd	Roof	Center	Roof assembly - black tar	--	N/A	N/A	ND
ASB-003B	141 S. 2nd	Roof	Center	Roof assembly - black felt	--	N/A	N/A	ND
ASB-004	141 S. 2nd	Roof	West roof	Roof penetration mastic - silver paint	--	N/A	N/A	ND
ASB-004A	141 S. 2nd	Roof	West roof	Roof penetration mastic - black mastic, layer 1	--	N/A	N/A	ND
ASB-004B	141 S. 2nd	Roof	West roof	Roof penetration mastic - black mastic, layer 2	225 SF	N	Good	6% chrysotile
ASB-004C	141 S. 2nd	Roof	West roof	Roof penetration mastic - black tar	--	N/A	N/A	ND
ASB-005	141 S. 2nd	Roof	North roof	Roof penetration mastic - silver paint	--	N/A	N/A	ND
ASB-005A	141 S. 2nd	Roof	North roof	Roof penetration mastic - black mastic, layer 1	--	N/A	N/A	ND
ASB-005B	141 S. 2nd	Roof	North roof	Roof penetration mastic - black mastic, layer 2	See ASB-004B	N	Good	6% chrysotile
ASB-005C	141 S. 2nd	Roof	North roof	Roof penetration mastic - black tar	--	N/A	N/A	ND
ASB-006	141 S. 2nd	Roof	South roof	Roof penetration mastic - silver paint	--	N/A	N/A	ND
ASB-006A	141 S. 2nd	Roof	South roof	Roof penetration mastic - black mastic, layer 1	--	N/A	N/A	ND

Table 1 - Asbestos Survey Results

Sample No.	Bldg. No.	Room No.	Sample Location	Sample Description	Approx. Quantity ⁽¹⁾	Friable Y/N	Condition	Asbestos Content
ASB-006B	141 S. 2nd	Roof	South roof	Roof penetration mastic - black mastic, layer 2	See ASB-004B	N	Good	4% chrysotile
ASB-006C	141 S. 2nd	Roof	South roof	Roof penetration mastic - black tar	--	N/A	N/A	ND
ASB-007A	141 S. 2nd	Roof	East flashing and tape	Roof penetration mastic - black mastic, layer 1	--	N/A	N/A	ND
ASB-007B	141 S. 2nd	Roof	East flashing and tape	Roof penetration mastic - black mastic, layer 2	See ASB-004B	N	Good	4% chrysotile
ASB-007C	141 S. 2nd	Roof	East flashing and tape	Roof penetration mastic - black tar	--	N/A	N/A	ND
ASB-008	141 S. 2nd	Exterior	East window	White window putty, layer 1	--	N/A	N/A	ND
ASB-008A	141 S. 2nd	Exterior	East window	Gray window putty, layer 2	--	N/A	N/A	ND
ASB-009	141 S. 2nd	Exterior	East window	White window putty, layer 1	--	N/A	N/A	ND
ASB-009A	141 S. 2nd	Exterior	East window	Gray window putty, layer 2	--	N/A	N/A	ND
ASB-010	141 S. 2nd	Exterior	East window	White window putty, layer 1	--	N/A	N/A	ND
ASB-010A	141 S. 2nd	Exterior	East window	Gray window putty, layer 2	--	N/A	N/A	ND
ASB-011	141 S. 2nd	Kitchen	East ceiling	Plaster - blue skim coat	--	N/A	N/A	ND
ASB-011A	141 S. 2nd	Kitchen	East ceiling	Plaster - white base coat	--	N/A	N/A	ND
ASB-012	141 S. 2nd	Storage 2	South ceiling	Plaster - white skim coat	--	N/A	N/A	ND
ASB-012A	141 S. 2nd	Storage 2	South ceiling	Plaster - white base coat	--	N/A	N/A	ND
ASB-013	141 S. 2nd	Main Room	North ceiling	Plaster - white skim coat	--	N/A	N/A	ND
ASB-013A	141 S. 2nd	Main Room	North ceiling	Plaster - white base coat	--	N/A	N/A	ND
ASB-014	141 S. 2nd	Men's RR	West ceiling	Plaster - white skim coat	--	N/A	N/A	ND
ASB-014A	141 S. 2nd	Men's RR	West ceiling	Plaster - tan base coat	--	N/A	N/A	ND

Table 1 - Asbestos Survey Results

Sample No.	Bldg. No.	Room No.	Sample Location	Sample Description	Approx. Quantity ⁽¹⁾	Friable Y/N	Condition	Asbestos Content
ASB-015	141 S. 2nd	Main Room	South wall	White concrete masonry unit brick	--	N/A	N/A	ND
ASB-016	141 S. 2nd	Main Room	North wall	White/gray concrete masonry unit brick	--	N/A	N/A	ND
ASB-017	141 S. 2nd	Main Room	North wall	White/gray concrete masonry unit brick	--	N/A	N/A	ND
ASB-018	141 S. 2nd	Corridor	West wall	Plaster - green skim coat	--	N/A	N/A	ND
ASB-018A	141 S. 2nd	Corridor	West wall	Plaster - white base coat	--	N/A	N/A	ND
ASB-019	141 S. 2nd	Kitchen	East wall	Plaster - green skim coat	--	N/A	N/A	ND
ASB-019A	141 S. 2nd	Kitchen	East wall	Plaster - white base coat	--	N/A	N/A	ND
ASB-020	141 S. 2nd	Main Room	West wall	Plaster - green skim coat	--	N/A	N/A	ND
ASB-020A	141 S. 2nd	Main Room	West wall	Plaster - white base coat	--	N/A	N/A	ND
ASB-021	141 S. 2nd	Women's RR	South wall	Plaster - green skim coat	--	N/A	N/A	ND
ASB-021A	141 S. 2nd	Women's RR	South wall	Plaster - white base coat	--	N/A	N/A	ND
ASB-022	141 S. 2nd	Stage	East floor	12"x12" beige vinyl floor tile	--	N/A	N/A	ND
ASB-022A	141 S. 2nd	Stage	East floor	Black/yellow mastic	4,000 SF	N	Good	3% chrysotile
ASB-023	141 S. 2nd	Stage	South floor	12"x12" beige vinyl floor tile	--	N/A	N/A	ND
ASB-023A	141 S. 2nd	Stage	South floor	Black/yellow mastic	See ASB-022A	N	Good	3% chrysotile
ASB-024	141 S. 2nd	Stage	West floor	12"x12" beige vinyl floor tile	--	N/A	N/A	ND
ASB-024A	141 S. 2nd	Stage	West floor	Black/yellow mastic	See ASB-022A	N	Good	3% chrysotile
ASB-025	141 S. 2nd	Storage 1	South floor	9"x9" gray/white vinyl floor tile	250 SF	N	Good	3% chrysotile
ASB-025A	141 S. 2nd	Storage 1	South floor	Black mastic	See ASB-022A	N	Good	3% chrysotile

Table 1 - Asbestos Survey Results

Sample No.	Bldg. No.	Room No.	Sample Location	Sample Description	Approx. Quantity ⁽¹⁾	Friable Y/N	Condition	Asbestos Content
ASB-026	141 S. 2nd	Storage 2	West floor	9"x9" gray/white vinyl floor tile	See ASB-025	N	Good	3% chrysotile
ASB-026A	141 S. 2nd	Storage 2	West floor	Black mastic	See ASB-022A	N	Good	3% chrysotile
ASB-027	141 S. 2nd	Storage 2	South floor	9"x9" gray/white vinyl floor tile	See ASB-025	N	Good	3% chrysotile
ASB-027A	141 S. 2nd	Storage 2	South floor	Black mastic	See ASB-022A	N	Good	3% chrysotile
ASB-028	141 S. 2nd	Women's RR	North floor, under casework	9"x9" gray vinyl floor tile	See ASB-025	N	Good	3% chrysotile
ASB-029	141 S. 2nd	Storage 2	South floor, under ceramic tile	White leveling compound	--	N/A	N/A	ND
ASB-029A	141 S. 2nd	Storage 2	South floor, under ceramic tile	Black mastic	See ASB-022A	N	Good	4% chrysotile
ASB-030	141 S. 2nd	Storage 1	North floor, under ceramic tile	White leveling compound	--	N/A	N/A	ND
ASB-030A	141 S. 2nd	Storage 1	North floor, under ceramic tile	Black mastic	See ASB-022A	N	Good	4% chrysotile
ASB-031	141 S. 2nd	Main Room	East floor, under ceramic tile	White leveling compound	--	N/A	N/A	ND
ASB-031A	141 S. 2nd	Main Room	East floor, under ceramic tile	Black mastic	See ASB-022A	N	Good	4% chrysotile
ASB-032	141 S. 2nd	Roof	North flue	Gray transite flue	3 EA x 8LF	N	Good	10% chrysotile, 5% crocidolite
ASB-033	141 S. 2nd	Roof	South flue	Gray transite flue	See ASB-032	N	Good	10% chrysotile, 5% crocidolite
ASB-034	141 S. 2nd	Women's RR	West flue	Gray transite flue	See ASB-032	N	Good	10% chrysotile, 5% crocidolite
ASB-035	141 S. 2nd	Exterior	East wall	Gray concrete masonry unit brick	--	N/A	N/A	ND
ASB-036	141 S. 2nd	Exterior	South wall	Gray concrete masonry unit brick	--	N/A	N/A	ND
ASB-037	141 S. 2nd	Exterior	West wall	Gray concrete masonry unit brick	--	N/A	N/A	ND

Table 1 - Asbestos Survey Results

Sample No.	Bldg. No.	Room No.	Sample Location	Sample Description	Approx. Quantity ⁽¹⁾	Friable Y/N	Condition	Asbestos Content
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NOTES:
Bulk asbestos sample analysis via USEPA 600/R-93/116 method using polarized light microscopy, unless otherwise noted.
⁽¹⁾ = **Material quantities are approximate and are not intended to be used or interpreted as actual quantities. It is the contractor's responsibility to confirm material quantities prior to bid submittals and initiating renovation and/or demolition activities at the site.**

HVAC = Heating, ventilation and air conditioning
EA = Each
LF = Linear feet
SF = Square feet
N/A = Not applicable
ND = None detected

Table 2 - Summary of Asbestos-Containing Materials

Sample No.(s)	ACM Location ⁽¹⁾	ACM Description	Approx. Quantity ⁽²⁾	Friable Y/N	Condition	Asbestos Content
ASB-004B, ASB-005B, ASB-006B, and ASB-007B	Roof throughout	Roof penetration mastic	225 SF	N	Good	4-6% chrysotile
ASB-022A, ASB-023A, ASB-024A, ASB-025A, ASB-026A, ASB-027A, ASB-029A, ASB-030A, and ASB-031A	Floors throughout - under ceramic tile and vinyl floor tile	Black and black/yellow mastic	4,000 SF	N	Good	3-4% chrysotile
ASB-025, ASB-026, ASB-027, and ASB-028	Floors in Storage 1, Storage 2, and Women's Restroom (under casework)	9"x9" vinyl floor tile and associated mastic	225 SF	N/A	Good	3% chrysotile
ASB-032, ASB-033, and ASB-034	Roof and Women's Restroom	Transite (asbestos cement) flue	3 EA x 8LF	N	Good	10% chrysotile, 5% crocidolite

NOTES:

⁽¹⁾ = ACM locations are based upon Ninyo & Moore's visual observations during survey activities. Materials that are uniform in color, texture, construction or application date, and/or general appearance to materials found to be asbestos-containing, should be presumed to be asbestos-containing.

⁽²⁾ = **Material quantities are approximate and are not intended to be used or interpreted as actual quantities. It is the contractor's responsibility to confirm material quantities prior to bid submittals and initiating renovation and/or demolition activities at the site.**

EA = Each

LF = Linear feet

SF = Square feet

Table 3 - XRF Data Sheet

Reading No.	Building	Floor	Side	Room / Area	Source / Component	Substrate	Condition	Color	Results (Pos/Neg)	Approx. Quantity ⁽¹⁾	Lead Reading (mg/cm ²)	Precision (+/- mg/cm ²)	
1	--	PCS Standard Calibration Check - 1.04 +/- 0.064mg/cm ²									--	1.00	0.30
2	--	PCS Standard Calibration Check - 1.04 +/- 0.064mg/cm ²									--	1.00	0.30
3	--	PCS Standard Calibration Check - 1.04 +/- 0.064mg/cm ²									--	1.00	0.30
4	--	Blank Calibration Check									--	-0.20	0.30
5	--	Blank Calibration Check									--	-0.30	0.30
6	--	Blank Calibration Check									--	-0.20	0.30
7	141 S. 2nd Street	1	A	Exterior	Wall	Brick	Intact	Tan	NEG	--	0.00	0.30	
8	141 S. 2nd Street	1	A	Exterior	Door	Metal	Intact	White	NEG	--	0.00	0.30	
9	141 S. 2nd Street	1	A	Exterior	Door frame	Metal	Intact	White	NEG	--	-0.10	0.30	
10	141 S. 2nd Street	1	B	Exterior	Wall	Brick	Blistered	Tan	NEG	--	0.10	0.30	
11	141 S. 2nd Street	1	C	Exterior	Door	Metal	Peeling	White	NEG	--	0.00	0.30	
12	141 S. 2nd Street	1	C	Exterior	Door frame	Metal	Peeling	White	NEG	--	0.60	0.20	
13	141 S. 2nd Street	1	A	Hallway	Wall	Plaster	Intact	White	NEG	--	-0.10	0.30	
14	141 S. 2nd Street	1	C	Hallway	Wall	Plaster	Intact	Blue	NEG	--	0.10	0.30	
15	141 S. 2nd Street	1	C	Hallway	Double door frame	Wood	Intact	White	NEG	--	0.10	0.30	
16	141 S. 2nd Street	1	C	Hallway	Ceiling	Plaster	Intact	White	NEG	--	-0.10	0.30	
17	141 S. 2nd Street	1	C	Kitchen	Ceiling	Plaster	Intact	Blue	NEG	--	0.00	0.30	
18	141 S. 2nd Street	1	A	Kitchen	Wall	Plaster	Intact	Blue	NEG	--	0.00	0.30	
19	141 S. 2nd Street	1	C	Kitchen	Cabinets	Wood	Intact	Blue	NEG	--	0.10	0.30	
20	141 S. 2nd Street	1	C	Kitchen	Window	Wood	Intact	Blue	NEG	--	-0.20	0.30	
21	141 S. 2nd Street	1	C	Kitchen	Window casing	Wood	Intact	Blue	NEG	--	0.00	0.30	

Table 3 - XRF Data Sheet

Reading No.	Building	Floor	Side	Room / Area	Source / Component	Substrate	Condition	Color	Results (Pos/Neg)	Approx. Quantity ⁽¹⁾	Lead Reading (mg/cm ²)	Precision (+/- mg/cm ²)
22	141 S. 2nd Street	1	D	Kitchen	Door frame	Wood	Intact	White	NEG	--	-0.20	0.30
23	141 S. 2nd Street	1	B	Kitchen	Countertop	Wood	Intact	Brown	NEG	--	-0.10	0.30
24	141 S. 2nd Street	1	B	Kitchen	Floor	Ceramic tile	Intact	Gray	NEG	--	0.20	0.20
25	141 S. 2nd Street	1	C	Waiting	Floor	Ceramic tile	Intact	Gray	NEG	--	0.30	0.20
26	141 S. 2nd Street	1	B	Waiting	Wall	Plaster	Intact	Blue	NEG	--	-0.50	0.30
27	141 S. 2nd Street	1	C	Waiting	Ceiling	Plaster	Intact	White	NEG	--	-0.20	0.30
28	141 S. 2nd Street	1	C	Storage 1	Ceiling	Plaster	Intact	White	NEG	--	-0.20	0.30
29	141 S. 2nd Street	1	B	Storage 1	Wall	Plaster	Intact	Green	NEG	--	-0.30	0.30
30	141 S. 2nd Street	1	A	Main	Wall	Plaster	Intact	Blue	NEG	--	-0.50	0.30
31	141 S. 2nd Street	1	C	Main	Wall	Plaster	Intact	Blue	NEG	--	0.20	0.20
32	141 S. 2nd Street	1	D	Main	Wall	Concrete	Intact	Blue	NEG	--	-0.10	0.30
33	141 S. 2nd Street	1	D	Main	Ceiling	Plaster	Intact	Blue	NEG	--	-0.10	0.30
34	141 S. 2nd Street	1	B	Main	Beam	Plaster	Intact	Blue	NEG	--	0.00	0.30
35	141 S. 2nd Street	1	A	Main	Floor	Ceramic tile	Intact	Gray	NEG	--	0.30	0.20
36	141 S. 2nd Street	1	C	Main	Floor	Ceramic tile	Intact	Gray	NEG	--	0.30	0.20
37	141 S. 2nd Street	1	A	Women's Restroom	Floor	Ceramic tile	Intact	Gray	NEG	--	0.50	0.20
38	141 S. 2nd Street	1	D	Women's Restroom	Cabinets	Wood	Intact	Blue	NEG	--	-0.10	0.30
39	141 S. 2nd Street	1	A	Women's Restroom	Wall	Plaster	Intact	Blue	NEG	--	0.10	0.30

Table 3 - XRF Data Sheet

Reading No.	Building	Floor	Side	Room / Area	Source / Component	Substrate	Condition	Color	Results (Pos/Neg)	Approx. Quantity ⁽¹⁾	Lead Reading (mg/cm ²)	Precision (+/- mg/cm ²)
40	141 S. 2nd Street	1	B	Women's Restroom	Sink	Porcelain	Intact	White	NEG	--	-0.20	0.30
41	141 S. 2nd Street	1	B	Women's Restroom	Toilet	Porcelain	Intact	White	NEG	--	-0.10	0.30
42	141 S. 2nd Street	1	D	Men's Restroom	Toilet	Porcelain	Intact	White	NEG	--	-0.10	0.30
43	141 S. 2nd Street	1	D	Men's Restroom	Urinal	Porcelain	Intact	White	NEG	--	-0.20	0.30
44	141 S. 2nd Street	1	D	Men's Restroom	Sink	Porcelain	Intact	White	NEG	--	0.00	0.30
45	141 S. 2nd Street	1	C	Men's Restroom	Wall	Brick	Intact	Blue	NEG	--	0.10	0.20
46	141 S. 2nd Street	1	B	Men's Restroom	Wall	Plaster	Intact	Blue	NEG	--	-0.40	0.30
47	141 S. 2nd Street	1	A	Storage 2	Wall	Plaster	Intact	Blue	NEG	--	0.10	0.30
48	141 S. 2nd Street	1	A	Storage 2	Cabinets	Wood	Intact	Blue	NEG	--	0.20	0.20
49	141 S. 2nd Street	1	C	Storage 2	Cabinets	Wood	Intact	Blue	NEG	--	-0.40	0.30
50	141 S. 2nd Street	1	A	Storage 2	Door frame	Wood	Intact	Blue	NEG	--	0.00	0.30
51	141 S. 2nd Street	1	A	Storage 2	Door frame	Wood	Intact	Blue	NEG	--	0.10	0.20
52	--	PCS Standard Calibration Check - 1.04 +/- 0.064mg/cm ²								--	0.90	0.20
53	--	PCS Standard Calibration Check - 1.04 +/- 0.064mg/cm ²								--	1.00	0.30
54	--	PCS Standard Calibration Check - 1.04 +/- 0.064mg/cm ²								--	1.10	0.30
55	--	Blank Calibration Check								--	-0.20	0.30
56	--	Blank Calibration Check								--	-0.20	0.30
57	--	Blank Calibration Check								--	-0.30	0.30

Table 3 - XRF Data Sheet

Reading No.	Building	Floor	Side	Room / Area	Source / Component	Substrate	Condition	Color	Results (Pos/Neg)	Approx. Quantity ⁽¹⁾	Lead Reading (mg/cm ²)	Precision (+/- mg/cm ²)
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NOTES:

XRF assays were collected using a portable NITON XLp 300A XRF spectrum analyzer.

⁽¹⁾ = **Surface quantities are approximate and are not intended to be used or interpreted as actual quantities. It is the contractor's responsibility to confirm material quantities prior to bid submittals and initiating renovation and/or demolition activities at the site.**

RR = restroom

POS = Positive

NEG = Negative

INCOM = Incomplete

EA = Each

LF = Linear feet

mg/cm² = milligrams per square centimeter

Table 4 - Summary of Other Potential Hazardous Building Materials

Building	Fluorescent Light Tubes	Fluorescent Light Ballasts	Non-Incandescent Lights	Smoke Detectors	Mercury Thermostats and Switches	A/C Units	Tritium-Powered Exit Signs	Freon Refrig. Systems	Wet Transformers	Cooling Towers	Lead Acid Batteries	Halon Fire Suppression Systems	Other
Roof	--	--	--	--	--	3	--	--	--	--	--	--	--
Kitchen	--	--	1	--	--	--	--	1	--	--	--	--	--
Corridor	--	--	1	--	--	--	--	--	--	--	--	--	--
Storage 1	--	--	1	--	--	--	--	--	--	--	--	--	--
Main Room	24	12	9	1	--	--	2	--	--	--	--	--	--
Stage	--	--	--	--	--	--	--	--	--	--	--	--	--
WRR	--	--	3	--	--	--	--	--	--	--	--	--	--
MRR	--	--	1	--	--	--	--	--	--	--	--	--	--
Storage 2	--	--	1	--	--	--	1	--	--	--	--	--	--

NOTES:

Material quantities are approximate and are not intended to be used or interpreted as actual quantities. It is the contractor's responsibility to confirm material quantities prior to bid submittals and initiating renovation and/or demolition activities at subject site.

A/C = Air Conditioning



APPENDIX A

Suspect Asbestos-Containing Materials Sampling Protocol

SUSPECT ASBESTOS-CONTAINING MATERIALS SAMPLING PROTOCOL

Personal Protection Equipment

Inhalation of asbestos fibers during asbestos survey poses a serious health and safety hazard, the use of personal protection equipment (PPE) by building inspectors is recommended during sampling activities. Our building inspectors generally wear a respirator (either a full- or half-face mask) equipped with high-efficiency disposable filter cartridges. If utilized, full-face masks will also prevent eye irritation from dust, fibers, and debris released during sampling activities. When necessary, disposable clothing is worn during sampling activities. Our building inspectors utilize plastic bags to handle the disposal of drop cloths, protective clothing, wet cloths, and debris.

Sampling Equipment

Our building inspector(s) will need various tools and materials to accomplish their sampling tasks, including those listed below:

- A ladder to access areas and a flash light to aid visibility,
- Airtight, sampling containers (e.g., resealable plastic bags),
- A plastic spray bottle, filled with amended water, to wet the material to be sampled,
- Plastic drop cloths to spread beneath the area to be sampled,
- A utility knife, linoleum cutter, or other tool appropriate for collecting samples,
- A caulking gun and compound for filling holes once a sample has been extracted,
- Spray acrylic or adhesive to encapsulate the small areas from which samples were collected,
- Duct tape for repairing thermal system insulation jackets,
- Cloths and cleaner for decontaminating tools,
- A vacuum cleaner equipped with high efficiency particulate air (HEPA) filters, when necessary,
- Indelible ink pen for labeling sample containers, and
- Camera for photographic documentation, and
- Chain-of-Custody documentation forms.

Sampling Procedures

ACM are divided into three categories: Surfacing Materials, Thermal System Insulation (TSI), and Miscellaneous Materials. The procedures for sampling these three types of materials are as follows:

Surfacing Materials

1. Select a location where the material has been previously damaged or a low profile area.
2. Spread a plastic drop cloth on the floor and set up other equipment, (e.g., ladder).
3. Put on protective equipment (respirator at all times when sampling friable material and protective clothing, when needed).
4. Moisten area where sample is to be collected (spray the area with amended water).
5. Collect sample using a clean knife or other tool appropriate to cut out or scrape off a small piece of the material. Care is taken to ensure that all layers of material are collected, without disturbing any adjacent material.
6. Place the sample in the labeled container and tightly seal it.
7. Wipe the exterior of the container with a wet wipe to remove any residue which may have adhered to the container it during sampling.
8. Clean tools with wet wipes and vacuum area with a HEPA vacuum to clean all debris.
9. Fill hole with caulking compound or appropriate filler (to minimize subsequent fiber release and for appearance).
10. Label container with its sample identification number and fill out location and type of material being sampled on a Chain-of-Custody documentation form.
11. Mark the location and sample identification number on the sample location map.
12. Repeat the above steps at each sample location. Place sample containers in plastic bags.
13. Discard protective clothing, rags, and drop cloth in a plastic bag.

Thermal System Insulation

Sampling TSI follows the same procedural sequence as laid out above. Obtain samples from exposed or damaged areas, if possible. However, random sampling will require sampling of some intact material. Sampling holes can be patched with plastic spackling, caulk, or fibrous glass.

Miscellaneous Materials

Sampling miscellaneous materials follows the same procedural sequence as laid out above, making sure that a cross section of the materials have been obtained.

Forwarding Samples to Laboratory

The samples are transferred, using standard chain-of-custody procedures, to a laboratory accredited in the National Voluntary Laboratory Accreditation Program (NVLAP), for bulk asbestos fiber analysis. The samples are analyzed using polarized light microscopy with dispersion staining (PLM/ds) for the presence and quantification of asbestos fibers, in general accordance with either United States Environmental Protection Agency (USEPA) Method 600/M4-82-020 or USEPA Method 600/R-93/116. The lower limit of reliable detection for asbestos using the PLM/ds method is approximately 1% by volume. California regulations require certain worker protection standards and have certain contractor requirements for disturbing those materials having an asbestos content of greater than one tenth of 1% (0.1%).



APPENDIX B

Laboratory Analytical Report and Chain-Of-Custody Records



EMSL Analytical, Inc.

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EMSL Order: 432109732

Customer ID: 32NIN63

Customer PO:

Project ID:

Attention: Nicolas Carpenter
Ninyo & Moore
5710 Ruffin Road
San Diego, CA 92123

Phone: (858) 688-8306

Fax: (858) 576-9600

Received Date: 12/14/2021 12:19 PM

Analysis Date: 12/22/2021

Collected Date: 12/13/2021

Project: 109364001 / 141 S. 2ND STREET, BLYTHE, CA

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
ASB - 001-Shingle <small>432109732-0001</small>	BLDG. 141 SOUTH / ROOF / E. ROOF - ROOF ASSEMBLY	White/Black Fibrous Heterogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
ASB - 001-Tar <small>432109732-0001A</small>	BLDG. 141 SOUTH / ROOF / E. ROOF - ROOF ASSEMBLY	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 001-Felt <small>432109732-0001B</small>	BLDG. 141 SOUTH / ROOF / E. ROOF - ROOF ASSEMBLY	Black Fibrous Homogeneous	80% Cellulose	20% Non-fibrous (Other)	None Detected
ASB - 002-Shingle <small>432109732-0002</small>	BLDG. 141 SOUTH / ROOF / N.W. ROOF - ROOF ASSEMBLY	White/Black Fibrous Heterogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
ASB - 002-Tar <small>432109732-0002A</small>	BLDG. 141 SOUTH / ROOF / N.W. ROOF - ROOF ASSEMBLY	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 002-Felt <small>432109732-0002B</small>	BLDG. 141 SOUTH / ROOF / N.W. ROOF - ROOF ASSEMBLY	Black Fibrous Homogeneous	20% Glass	80% Non-fibrous (Other)	None Detected
ASB - 003-Shingle <small>432109732-0003</small>	BLDG. 141 SOUTH / ROOF / CENTER ROOF - ROOF ASSEMBLY	White/Black Fibrous Heterogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
ASB - 003-Tar <small>432109732-0003A</small>	BLDG. 141 SOUTH / ROOF / CENTER ROOF - ROOF ASSEMBLY	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 003-Felt <small>432109732-0003B</small>	BLDG. 141 SOUTH / ROOF / CENTER ROOF - ROOF ASSEMBLY	Black Fibrous Homogeneous	80% Cellulose	20% Non-fibrous (Other)	None Detected
ASB - 004-Silver Paint <small>432109732-0004</small>	BLDG. 141 SOUTH / ROOF / W. ROOF - ROOF PENETRATION MASTIC	Silver Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 004-Mastic 1 <small>432109732-0004A</small>	BLDG. 141 SOUTH / ROOF / W. ROOF - ROOF PENETRATION MASTIC	Black Non-Fibrous Homogeneous	20% Cellulose	80% Non-fibrous (Other)	None Detected
ASB - 004-Mastic 2 <small>432109732-0004B</small>	BLDG. 141 SOUTH / ROOF / W. ROOF - ROOF PENETRATION MASTIC	Black Non-Fibrous Homogeneous		94% Non-fibrous (Other)	6% Chrysotile
ASB - 004-Tar <small>432109732-0004C</small>	BLDG. 141 SOUTH / ROOF / W. ROOF - ROOF PENETRATION MASTIC	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 12/22/2021 18:47:47



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EMSL Order: 432109732
Customer ID: 32NIN63
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
ASB - 005-Silver Paint 432109732-0005	BLDG. 141 SOUTH / ROOF / N. ROOF - ROOF PENETRATION MASTIC	Silver Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 005-Mastic 1 432109732-0005A	BLDG. 141 SOUTH / ROOF / N. ROOF - ROOF PENETRATION MASTIC	Black Non-Fibrous Homogeneous	20% Cellulose	80% Non-fibrous (Other)	None Detected
ASB - 005-Mastic 2 432109732-0005B	BLDG. 141 SOUTH / ROOF / N. ROOF - ROOF PENETRATION MASTIC	Black Non-Fibrous Homogeneous		94% Non-fibrous (Other)	6% Chrysotile
ASB - 005-Tar 432109732-0005C	BLDG. 141 SOUTH / ROOF / N. ROOF - ROOF PENETRATION MASTIC	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 006-Silver Paint 432109732-0006	BLDG. 141 SOUTH / ROOF / S. ROOF - ROOF PENETRATION MASTIC	Silver Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 006-Mastic 1 432109732-0006A	BLDG. 141 SOUTH / ROOF / S. ROOF - ROOF PENETRATION MASTIC	Black Non-Fibrous Homogeneous	20% Cellulose	80% Non-fibrous (Other)	None Detected
ASB - 006-Mastic 2 432109732-0006B	BLDG. 141 SOUTH / ROOF / S. ROOF - ROOF PENETRATION MASTIC	Black Non-Fibrous Homogeneous	10% Cellulose	86% Non-fibrous (Other)	4% Chrysotile
ASB - 006-Tar 432109732-0006C	BLDG. 141 SOUTH / ROOF / S. ROOF - ROOF PENETRATION MASTIC	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 007-Silver Paint 432109732-0007	BLDG. 141 SOUTH / ROOF / E. ROOF FLASHING TAPE - ROOF PENETRATION MASTIC				Insufficient Material
ASB - 007-Mastic 1 432109732-0007A	BLDG. 141 SOUTH / ROOF / E. ROOF FLASHING TAPE - ROOF PENETRATION MASTIC	Black Non-Fibrous Homogeneous	20% Cellulose	80% Non-fibrous (Other)	None Detected
ASB - 007-Mastic 2 432109732-0007B	BLDG. 141 SOUTH / ROOF / E. ROOF FLASHING TAPE - ROOF PENETRATION MASTIC	Black Non-Fibrous Homogeneous	10% Cellulose	86% Non-fibrous (Other)	4% Chrysotile

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EMSL Order: 432109732
Customer ID: 32NIN63
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
ASB - 007-Tar <i>432109732-0007C</i>	BLDG. 141 SOUTH / ROOF / E. ROOF FLASHING TAPE - ROOF PENETRATION MASTIC	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 008-Putty 1 <i>432109732-0008</i>	BLDG. 141 SOUTH / EXTERIOR / E. WINDOW - WINDOW PUTTY	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 008-Putty 2 <i>432109732-0008A</i>	BLDG. 141 SOUTH / EXTERIOR / E. WINDOW - WINDOW PUTTY	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 009-Putty 1 <i>432109732-0009</i>	BLDG. 141 SOUTH / EXTERIOR / E. WINDOW - WINDOW PUTTY	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 009-Putty 2 <i>432109732-0009A</i>	BLDG. 141 SOUTH / EXTERIOR / E. WINDOW - WINDOW PUTTY	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 010-Putty 1 <i>432109732-0010</i>	BLDG. 141 SOUTH / EXTERIOR / E. WINDOW - WINDOW PUTTY	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 010-Putty 2 <i>432109732-0010A</i>	BLDG. 141 SOUTH / EXTERIOR / E. WINDOW - WINDOW PUTTY	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 011-Skim Coat <i>432109732-0011</i>	BLDG. 141 SOUTH / KITCHEN / E. CEILING (NO SOAC) - SOAC & PLASTER <i>Paint excluded.</i>	Blue Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 011-Base Coat <i>432109732-0011A</i>	BLDG. 141 SOUTH / KITCHEN / E. CEILING (NO SOAC) - SOAC & PLASTER	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 012-Skim Coat <i>432109732-0012</i>	BLDG. 141 SOUTH / STORAGE 2 / S. CEILING - SOAC & PLASTER <i>Paint excluded.</i>	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 012-Base Coat <i>432109732-0012A</i>	BLDG. 141 SOUTH / STORAGE 2 / S. CEILING - SOAC & PLASTER	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 013-Skim Coat <i>432109732-0013</i>	BLDG. 141 SOUTH / MAIN ROOM / N. CEILING - SOAC & PLASTER <i>Paint excluded.</i>	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 013-Base Coat <i>432109732-0013A</i>	BLDG. 141 SOUTH / MAIN ROOM / N. CEILING - SOAC & PLASTER	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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Customer ID: 32NIN63
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Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
ASB - 014-Skim Coat <small>432109732-0014</small>	BLDG. 141 SOUTH / MENS RESTROOM / W. CEILING - SOAC & PLASTER	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
<i>Paint excluded.</i>					
ASB - 014-Base Coat <small>432109732-0014A</small>	BLDG. 141 SOUTH / MENS RESTROOM / W. CEILING - SOAC & PLASTER	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 015 <small>432109732-0015</small>	BLDG. 141 SOUTH / MAIN ROOM / S. WALL - TEXTURED CMU	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 016 <small>432109732-0016</small>	BLDG. 141 SOUTH / MAIN ROOM / S. WALL - TEXTURED CMU	Gray/White Non-Fibrous Heterogeneous		100% Non-fibrous (Other)	None Detected
<i>Paint excluded.</i>					
ASB - 017 <small>432109732-0017</small>	BLDG. 141 SOUTH / MAIN ROOM / S. WALL - TEXTURED CMU	Gray/White Non-Fibrous Heterogeneous		100% Non-fibrous (Other)	None Detected
<i>Paint excluded.</i>					
ASB - 018-Skim Coat <small>432109732-0018</small>	BLDG. 141 SOUTH / CORRIDOR / W. WALL - PLASTER	Green Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
<i>Paint excluded.</i>					
ASB - 018-Base Coat <small>432109732-0018A</small>	BLDG. 141 SOUTH / CORRIDOR / W. WALL - PLASTER	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 019-Skim Coat <small>432109732-0019</small>	BLDG. 141 SOUTH / KITCHEN / E. WALL - PLASTER	Green Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
<i>Paint excluded.</i>					
ASB - 019-Base Coat <small>432109732-0019A</small>	BLDG. 141 SOUTH / KITCHEN / E. WALL - PLASTER	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 020-Skim Coat <small>432109732-0020</small>	BLDG. 141 SOUTH / MAIN ROOM / W. WALL - PLASTER	Green Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
<i>Paint excluded.</i>					
ASB - 020-Base Coat <small>432109732-0020A</small>	BLDG. 141 SOUTH / MAIN ROOM / W. WALL - PLASTER	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 021-Skim Coat <small>432109732-0021</small>	BLDG. 141 SOUTH / WOMENS RESTROOM / S. WALL - PLASTER	Green Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
<i>Paint excluded.</i>					
ASB - 021-Base Coat <small>432109732-0021A</small>	BLDG. 141 SOUTH / WOMENS RESTROOM / S. WALL - PLASTER	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 022-VFT <small>432109732-0022</small>	BLDG. 141 SOUTH / STAGE / E. FLOOR - 12 x 12 VFT w/ GLUE	Beige Non-Fibrous Heterogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 12/22/2021 18:47:47



EMSL Analytical, Inc.

8145 Ronson Road, Suite B San Diego, CA 92111

Tel/Fax: (858) 499-1303 / (858) 499-1304

<http://www.EMSL.com> / sandiegolab@emsl.com

EMSL Order: 432109732
Customer ID: 32NIN63
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
ASB - 022-Glue <small>432109732-0022A</small> <i>Mastics are inseperable.</i>	BLDG. 141 SOUTH / STAGE / E. FLOOR - 12 x 12 VFT w/ GLUE	Black/Yellow Non-Fibrous Heterogeneous		97% Non-fibrous (Other)	3% Chrysotile
ASB - 023-VFT <small>432109732-0023</small>	BLDG. 141 SOUTH / STAGE / S. FLOOR - 12 x 12 VFT w/ GLUE	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 023-Glue <small>432109732-0023A</small> <i>Mastics are inseperable.</i>	BLDG. 141 SOUTH / STAGE / S. FLOOR - 12 x 12 VFT w/ GLUE	Black/Yellow Non-Fibrous Heterogeneous		97% Non-fibrous (Other)	3% Chrysotile
ASB - 024-VFT <small>432109732-0024</small>	BLDG. 141 SOUTH / STAGE / W. FLOOR - 12 x 12 VFT w/ GLUE	Beige Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 024-Glue <small>432109732-0024A</small>	BLDG. 141 SOUTH / STAGE / W. FLOOR - 12 x 12 VFT w/ GLUE	Black Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
ASB - 025-VFT <small>432109732-0025</small>	BLDG. 141 SOUTH / STORAGE 1 / S. FLOOR - 9 x 9 VFT w/ GLUE	Gray/White Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
ASB - 025-Glue <small>432109732-0025A</small>	BLDG. 141 SOUTH / STORAGE 1 / S. FLOOR - 9 x 9 VFT w/ GLUE	Black Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
ASB - 026-VFT <small>432109732-0026</small>	BLDG. 141 SOUTH / STORAGE 2 / W. FLOOR - 9 x 9 VFT w/ GLUE	Gray/White Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
ASB - 026-Glue <small>432109732-0026A</small>	BLDG. 141 SOUTH / STORAGE 2 / W. FLOOR - 9 x 9 VFT w/ GLUE	Black Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
ASB - 027-VFT <small>432109732-0027</small>	BLDG. 141 SOUTH / STORAGE 2 / S. FLOOR - 9 x 9 VFT w/ GLUE	Gray/White Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
ASB - 027-Glue <small>432109732-0027A</small>	BLDG. 141 SOUTH / STORAGE 2 / S. FLOOR - 9 x 9 VFT w/ GLUE	Black Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
ASB - 028-VFT <small>432109732-0028</small> <i>No Glue present</i>	BLDG. 141 SOUTH / WOMENS RESTROOM / N. FLOOR UNDER CASEWORK - 9 x 9 VFT w/ GLUE	Gray Non-Fibrous Homogeneous		97% Non-fibrous (Other)	3% Chrysotile
ASB - 029-Float <small>432109732-0029</small>	BLDG. 141 SOUTH / STORAGE 2 / S. FLOOR UNDER CERAMIC TILE - FLOAT & MASTIC	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 029-Mastic <small>432109732-0029A</small>	BLDG. 141 SOUTH / STORAGE 2 / S. FLOOR UNDER CERAMIC TILE - FLOAT & MASTIC	Black Non-Fibrous Homogeneous		96% Non-fibrous (Other)	4% Chrysotile

Initial report from: 12/22/2021 18:47:47



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EMSL Order: 432109732
Customer ID: 32NIN63
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
ASB - 030-Float <small>432109732-0030</small>	BLDG. 141 SOUTH / STORAGE 1 / N. FLOOR UNDER CERAMIC TILE - FLOAT & MASTIC	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 030-Mastic <small>432109732-0030A</small>	BLDG. 141 SOUTH / STORAGE 1 / N. FLOOR UNDER CERAMIC TILE - FLOAT & MASTIC	Black Non-Fibrous Homogeneous		96% Non-fibrous (Other)	4% Chrysotile
ASB - 031-Float <small>432109732-0031</small>	BLDG. 141 SOUTH / MAIN ROOM / E. FLOOR UNDER CERAMIC TILE - FLOAT & MASTIC	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 031-Mastic <small>432109732-0031A</small>	BLDG. 141 SOUTH / MAIN ROOM / E. FLOOR UNDER CERAMIC TILE - FLOAT & MASTIC	Black Non-Fibrous Homogeneous		96% Non-fibrous (Other)	4% Chrysotile
ASB - 032 <small>432109732-0032</small>	BLDG. 141 SOUTH / ROOF / N. FLUE - TRANSITE FLUE	Gray Fibrous Homogeneous		85% Non-fibrous (Other)	10% Chrysotile 5% Crocidolite
ASB - 033 <small>432109732-0033</small>	BLDG. 141 SOUTH / ROOF / S. FLUE - TRANSITE FLUE	Gray Fibrous Homogeneous		85% Non-fibrous (Other)	10% Chrysotile 5% Crocidolite
ASB - 034 <small>432109732-0034</small>	BLDG. 141 SOUTH / WOMANS RESTROOM / W. FLUE - TRANSITE FLUE	Gray Fibrous Homogeneous		85% Non-fibrous (Other)	10% Chrysotile 5% Crocidolite
ASB - 035 <small>432109732-0035</small> <i>Paint excluded.</i>	BLDG. 141 SOUTH / EXTERIOR / E. WALL - CMU	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 036 <small>432109732-0036</small> <i>Paint excluded.</i>	BLDG. 141 SOUTH / EXTERIOR / S. WALL - CMU	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
ASB - 037 <small>432109732-0037</small>	BLDG. 141 SOUTH / EXTERIOR / W. WALL - CMU	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Analyst(s)

Jillian Gessner (40)

Nathan Stancik (3)

Shelby Baker (31)

Mariah Curran, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 "Interim Method") but augmented with procedures outlined in the 1993 ("final") version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. Phoenix, AZ NVLAP Lab Code 200811-0, AZ0937, CO AL-19027

Initial report from: 12/22/2021 18:47:47

Please Analyze enclosed sample(s) by USEPA 600/R-93/116 method

ASBESTOS BULK SAMPLE DATA SHEET

Ninyo & Moore 5710 Ruffin Road San Diego, CA 92123 Tel: (858) 576-1000 Fax: (858) 576-9600		Project Name: 141 S. 2ND STREET Project No.: 109364001 Project Manager: NJC Site Address: 141 S. 2ND STREET, BLYTHE, CA		Sampled By: BRIAN FORD Sampled By: Sampled By: Date Sampled: 12/13/21		Laboratory: EMSL San Diego, California Tel: (858) 499-1303 Fax: (858) 499-1304							
Relinquished By: (sign/print) <i>Brian Ford</i>				Company Ninyo & Moore		Date 12/13/21		Time(24 hr) 5 DAYS		Received By: (sign/print) <i>Stimdon Kim Jimson</i>		Laboratory 12.14.2021 @ 12:19pm	

Sample ID	Building Number	Room Number	Sample Location			Sample Description	Quantity (SF/LF/E)	Friable (Y/N)	Condition
			Company	Date	Time(24 hr)				
ASB-001	141	Bath	Roof	EAST	Roof	Roof Assembly		N	Good
ASB-002			Roof	Northwest	Roof				
ASB-003			Roof	Center	Roof				
ASB-004			Roof	WEST	Roof	Roof penetration plate 2021		N	Good
ASB-005			Roof	North	Roof				
ASB-006			Roof	South	Roof				
ASB-007			Roof	EAST	Flashing & Tape				
ASB-008			Exterior	EAST	Window	Window		N	Good
ASB-009			Exterior	EAST	Window				
ASB-010			Exterior	EAST	Window				
ASB-011			Kitchen	EAST (now gone)	Ceiling	JOAC #1 PASTER		N	Good
ASB-012			Storage	South	Ceiling				
ASB-013			main	North	Ceiling				
ASB-014			MEH	WEST	Ceiling				
ASB-015			main	South	Wall	Textured con		N	Good

#432109732

Please Analyze enclosed sample(s) by USEPA 600/R-93/116 method

ASBESTOS BULK SAMPLE DATA SHEET

Ninyo & Moore 5710 Ruffin Road San Diego, CA 92123 Tel: (858) 576-1000 Fax: (858) 576-9600		Project Name: 141 S. 2ND STREET Project No.: 109364001 Project Manager: NJC Site Address: 141 S. 2ND STREET, BLYTHE, CA		Sampled By: BRIAN FORD Sampled By: Sampled By: Date Sampled: 12/13/02		Laboratory: EMSL San Diego, California Tel: (858) 499-1303 Fax: (858) 499-1304	
---	--	--	--	---	--	---	--

CHAIN OF CUSTODY INFORMATION:

Relinquished By: (sign/print)		Company	Date	Time(24 hr.)	Received By: (sign/print)	Laboratory		
Brian Ford		Ninyo & Moore	12/13/02		B.F.			
Sample ID	Building Number	Room Number	Sample Location		Sample Description	Quantity (SF/LF/E)	Friable (Y/N)	Condition
ASB-016	141 South	Main Rm	North	wall	Textured CMU		N	Good
ASB-017		Main Rm	North	wall			↓	↓
ASB-018		Corridor	West	wall	Plaster		N	Good
ASB-019		Kitchen	East	wall			↓	↓
ASB-020		Main Rm	West	wall			↓	↓
ASB-021		WR	South	wall			Y	Y
ASB-022		STAGE	East	Floor	12X12 VFT ^W GUC		N	Good
ASB-023		STAGE	South	Floor			↓	↓
ASB-024		STAGE	West	Floor			↓	↓
ASB-025		STAGE 1	South	Floor	9X9 ^W VFT ^W Plastic		N	Good
ASB-026		STAGE 2	West	Floor			↓	↓
ASB-027		↓	South	Floor			↓	↓
ASB-028		WR	North	under Floor			↓	↓
ASB-029		STAGE 2	South	under Floor	Floor Plastic		N	Good
ASB-030		STAGE 1	North	Floor			↓	↓

#432109732

Please Analyze enclosed sample(s) by USEPA 600/R-93/116 method

ASBESTOS BULK SAMPLE DATA SHEET

Ninyo & Moore 5710 Ruffin Road San Diego, CA 92123 Tel: (858) 576-1000 Fax: (858) 576-9600		Project Name: 141 S. 2ND STREET Project No.: 109364001 Project Manager: NJC Site Address: 141 S. 2ND STREET, BLYTHE, CA		Sampled By: BRIAN FORD Sampled By: Sampled By: Date Sampled: 12/13/21		Laboratory: EMSL San Diego, California Tel: (858) 499-1303 Fax: (858) 499-1304	
---	--	--	--	---	--	---	--

CHAIN OF CUSTODY INFORMATION:

Sample ID	Building Number	Room Number	Company	Date	Time(24 hr.)	Received By: (sign/print)	Sample Description	Quantity (SF/LF/E)	Friable (Y/N)	Condition
ASB-031	141 South	Main Room	Ninyo&Moore	12/13/21		<i>Brian Ford</i>	Float & Plastic		N	Good
ASB-032		Roof				<i>VF</i>	TRANSITE FLUC	3EA	N	Good
ASB-033		Roof								
ASB-034		WALL								
ASB-035		EXHAUSE								
ASB-036		EXHAUSE								
ASB-037		EXHAUSE								
ASB-038										
ASB-039										
ASB-040										
ASB-041										
ASB-042										
ASB-043										
ASB-044										
ASB-045										



APPENDIX C

XRF Testing Methodology

XRF TESTING METHODOLOGY

To assess the painted surfaces for future contractor worker safety, x-ray fluorescence (XRF) testing technologies were utilized. The testing was conducted in general accordance with the following regulation: *Title 17, California Code of Regulations, Division 1, Chapter 8, Accreditation Certification, and Work Practice in Lead Related Construction, Section 36000.*

After a visual assessment, accessible painted surfaces were screened for lead content with a NITON XLp 300A XRF spectrum analyzer. XRF readings were taken using the standard paint mode. Standard paint mode measurements have no predetermined testing length, and automatically adjust to account for various types of substrates and material's densities. In the standard paint mode, the NITON 300A XLp XRF collects an XRF assay until either a K-shell or L-shell result is indicated as either positive or negative, compared to the threshold level based on the current precision of the test. Correction for paint matrix and substrate effects is performed automatically by the XRF analyzer.

XRF readings were made on testing combinations in all room equivalents in an effort to test typical materials that are representative of the room equivalent. Testing combinations were tested non-destructively by holding the shutter of the XRF against the surface being tested. At each XRF assay location, the trigger is depressed to open the shutter, and one reading was made using the standard paint testing mode. Results of each assay were recorded in the memory of the XRF spectrum analyzer and downloaded via the software provided by the manufacturer. In addition, the results of each assay were read and recorded on the XRF Data Sheet field data sheet.

The XRF testing orientation is depicted on the attached sample location maps. The "A" direction was initially assigned to the direction of the street, and the subsequent directions ("B", "C", and "D") were assigned clockwise from the "A" direction. Should the subject site be located on the corner of two streets, the "A" direction is assigned to the direction of the street address of the subject site.

To ensure that the XRF equipment was working properly, various quality control tests were performed before, during, and after the on-site work. At the beginning of the work day, three start up validation measurements were made in the K and L calibration mode, using the calibration check standard associated with the particular XRF that was used. This painted standard contains a known quantity of lead and allows the XRF operator to determine whether the instrument is functioning within acceptable tolerance ranges for accuracy and precision, as determined by the manufacturer. Calibration checks were generally collected on the red 1.06 mg/cm² and/or yellow 1.57 mg/cm² Standard Reference Material (SRM) paint film, developed by the National Institute of Standards and Technology (NIST).

In addition to the three starts up tests, calibration readings are collected between each building, after four hours, and at the completion of XRF testing. Results of each calibration reading were recorded within the memory of the XRF spectrum analyzer and on the XRF Data Sheet. The quality control tests taken during testing at the subject site were within the acceptable performance range prescribed by the XRF equipment manufacturer. Documentation of the quality control calibration check is included in the XRF Data Sheet, Table 3.



APPENDIX D

CDPH Form 8552 – Lead Hazard Evaluation Report

LEAD HAZARD EVALUATION REPORT

Section 1 – Date of Lead Hazard Evaluation _____

Section 2 – Type of Lead Hazard Evaluation (Check one box only)

Lead Inspection Risk assessment Clearance Inspection Other (specify) _____

Section 3 – Structure Where Lead Hazard Evaluation Was Conducted

Address [number, street, apartment (if applicable)]		City	County	Zip Code
Construction date (year) of structure	Type of structure <input type="checkbox"/> Multi-unit building <input type="checkbox"/> School or daycare <input type="checkbox"/> Single family dwelling <input type="checkbox"/> Other _____		Children living in structure? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't Know	

Section 4 – Owner of Structure (if business/agency, list contact person)

Name		Telephone number		
Address [number, street, apartment (if applicable)]		City	State	Zip Code

Section 5 – Results of Lead Hazard Evaluation (check all that apply)

No lead-based paint detected
 Intact lead-based paint detected
 Deteriorated lead-based paint detected
 No lead hazards detected
 Lead-contaminated dust found
 Lead-contaminated soil found
 Other _____

Section 6 – Individual Conducting Lead Hazard Evaluation

Name		Telephone number		
Address [number, street, apartment (if applicable)]		City	State	Zip Code
CDPH certification number	Signature			Date

Name and CDPH certification number of any other individuals conducting sampling or testing (if applicable)

Section 7 – Attachments

- A. A foundation diagram or sketch of the structure indicating the specific locations of each lead hazard or presence of lead-based paint;
- B. Each testing method, device, and sampling procedure used;
- C. All data collected, including quality control data, laboratory results, including laboratory name, address, and phone number.

First copy and attachments retained by inspector
 Second copy and attachments retained by owner

Third copy only (no attachments) mailed or faxed to:
 California Department of Public Health
 Childhood Lead Poisoning Prevention Branch Reports
 850 Marina Bay Parkway, Building P, Third Floor
 Richmond, CA 94804-6403
 Fax: (510) 620-5656



Ninyo & Moore

Geotechnical & Environmental Sciences Consultants

5710 Ruffin Road | San Diego, California 92123 | p. 858.576.1000

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SAN JOSE | PHOENIX | TUCSON | PRESCOTT | LAS VEGAS | DENVER | BROOMFIELD | HOUSTON

www.ninyoandmoore.com



December 3, 2021

Mr. Marc Stock
Sillman
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Temecula, CA 92592

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El Centro, CA 92243
(760) 370-3000
landmark@landmark-ca.com

77-948 Wildcat Drive
Palm Desert, CA 92211
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gchandra@landmark-ca.com

Geotechnical Report – Addendum No. 1
Child Development Center
141 S. 2nd Street
Blythe, California
LCI Report No. LP21061

Dear Mr. Stock:

This addendum to our geotechnical report for the proposed new Child Development Center located at 141 S. 2nd Street in Blythe, California is provided to clarify recommendations provided in the original report dated June 15, 2021. It is our understanding that the building will be of modular construction with an elevated floor. Perimeter grade beam footings will be used to support the modular unit.

Site Preparation

The native soils within the modular building area should be removed to sub-excavation level. The sub-excavation level is approximately 2 to 2½ feet below the existing grade. Footings shall be excavated into undisturbed soil at the bottom of the modular unit excavation. A minimum of 12 inches of native soil that have been moisture conditioned (2% below to 4% above optimum) and recompacted to a minimum of 90% of ASTM D1557 maximum density (if sand) or uniformly moisture conditioned to 5 to 10% above optimum moisture content and recompacted to 85 to 90% of the maximum density (if clays) should underlie the foundations.

Foundations

All footings should be embedded a minimum of 12 inches below the modular building sub-excavation pad. Interior and exterior footing embedment depths listed herein are minimum depths and actual depths/widths shall be determined by the structural engineer/designer. The grade-beam wall footings may be designed using an allowable soil bearing pressure of 2,000 pounds per square foot for dead and live loads when foundations are supported on reinforced structural fill (extending a minimum of 1.0 feet below footings).

Settlements

Based on empirical relationships, total induced settlements are estimated to be about 5½ to 7½ inches should liquefaction occur at the project site. Based on the distance of 50 feet between the boring locations, differential settlement is estimated to be 2 inches over a distance of 50 feet or 4 inches over a distance of 100 feet.

Differential settlement may be reduced by using reinforced structural fill which should consist of a minimum of two layers of geogrid reinforcing. After removal of the subgrade soil to a minimum depth of 24 inches below the bottom of the foundation, a layer of geotextile stabilization/separation fabric such as Mirafi RS580i or equivalent shall be placed directly on the bottom of the excavation after fine grading of the subgrade soils. The geotextile stabilization/separation fabric should be placed in accordance with the manufacturer’s recommendations (24-inch end and side lap). A geogrid layer such as Tensar TX130S or equivalent should then be placed over the geofabric. The geogrid should be placed in accordance with the manufacturer’s recommendations (24-inch end and side lap).

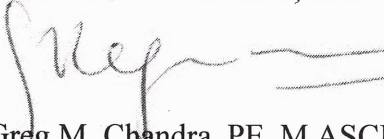
After placement of the geotextile separation fabric and geogrid, 12 inches of Caltrans Class 2 aggregate base shall be end dumped on the geotextile fabric/geogrid and spread by methods which will avoid direct contact with wheels on the fabric. The aggregate base shall be compacted to a minimum of 95% of ASTM D1557 maximum dry density.

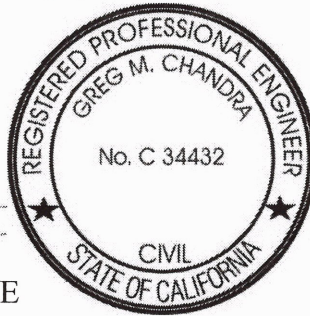
After placement and compaction of the 12-inch layer aggregate base material, a second geogrid layer and 12-inch aggregate base material shall be placed and compacted as specified above. Subsequent layers of non-expansive engineered fill soils shall be placed directly over the stabilization aggregate base layer and compacted to a minimum of 90% of ASTM D1557 maximum dry density.

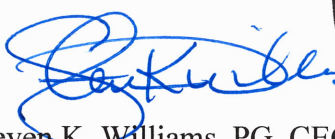
Closure

We appreciate the opportunity to provide our findings and professional opinions regarding geotechnical conditions at the site. Please provide our office with a set of the foundation plans and civil plans for review to insure that the geotechnical site constraints have been included in the design documents. If you have any questions or comments regarding our findings, please call our office at (760) 360-0665.

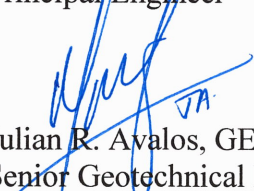
Respectfully Submitted,
LandMark Consultants, Inc.


Greg M. Chandra, PE, M.ASCE
Principal Engineer




Steven K. Williams, PG, CEG
Senior Engineering Geologist




Julian R. Avalos, GE
Senior Geotechnical Engineer



Geotechnical Report

Proposed Child Development Center

141 S. 2nd Street
Blythe, California

Prepared for:

Sillman

31045 Temecula Parkway, Suite 204
Temecula, CA 92592



Prepared by:



Landmark Consultants, Inc.
77948 Wildcat Drive
Palm Desert, CA 92211
(760) 360-0665

June 2021

June 15, 2021

Mr. Marc Stock
Sillman
31045 Temecula Parkway, Suite 204
Temecula, CA 92592

Geotechnical Report
Child Development Center
141 S. 2nd Street
Blythe, California
LCI Report No. LP21061


Dear Mr. Stock:

This geotechnical report is provided for design and construction of the proposed new Child Development Center located at 141 S. 2nd Street in Blythe, California. Our geotechnical exploration was conducted in response to your request for our services. The enclosed report describes our soil engineering site evaluation and presents our professional opinions regarding geotechnical conditions at the site to be considered in the design and construction of the project.

Based on the geotechnical conditions encountered at the points of exploration, the project site appears suitable for the proposed construction provided the professional opinions contained in this report are considered in the design and construction of this project.

We appreciate the opportunity to provide our findings and professional opinions regarding geotechnical conditions at the site. Please provide our office with a set of the foundation plans and civil plans for review to insure that the geotechnical site constraints have been included in the design documents. If you have any questions or comments regarding our findings, please call our office at (760) 360-0665.

Respectfully Submitted,
LandMark Consultants, Inc.


Greg M. Chandra, PE, M.ASCE
Principal Engineer


Julian R. Avalos, GE
Senior Geotechnical Engineer



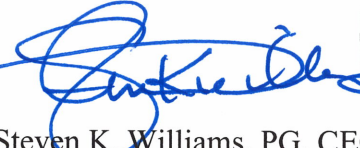

Steven K. Williams, PG, CEG
Senior Engineering Geologist



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EXECUTIVE SUMMARY

This executive summary presents *selected* elements of our findings and professional opinions. This summary *may not* present all details needed for the proper application of our findings and professional opinions. Our findings, professional opinions, and application options are *best related through reading the full report*, and are best evaluated with the active participation of the engineer of record who developed them. The findings of this study are summarized below:

- The findings of this study indicate the site is underlain by interbedded sands/silty sands (SP-SM) with near surface silts (ML) and clays (CL/CH) soils. The near surface clays are expected to be expansive. The subsurface soils are loose to dense in nature.
- Groundwater was encountered in the borings at a depth of approximately 12 feet at the time of exploration. Static groundwater should be expected to be encountered at about 7 feet below ground surface.
- The native soils are aggressive to steel corrosion. Concrete mixes for concrete placed in contact with native soils shall have a maximum water cement ratio of 0.45 and a minimum compressive strength of 4,500 psi (minimum of 6.0 sacks Type V cement per cubic yard).
- Design soil bearing pressure = 2,000 psf when foundations are supported on imported granular material. Settlement due to structural loads have been estimated as $\frac{3}{4}$ -inch.
- A minimum of 36 inches of non-expansive compacted fill soils (sands) should underlie building slabs. The use of a stabilization fabric at the bottom of the excavation may be anticipated.
- The risk of liquefaction induced settlement is high. Liquefaction may occur in the loose to medium dense sand layers encountered at depths of 7.5 to 40 feet below ground surface. Potential liquefaction induced settlements of $5\frac{1}{2}$ to $7\frac{1}{2}$ inches has been estimated for the project site. There is a moderate to high risk of sand boil formation should liquefaction occur.
- All reinforcing bars, anchor bolts and hold down bolts shall have a minimum concrete cover of 3.0 inches unless epoxy coated (ASTM D3963/A934). Hold-down straps are not allowed at the foundation perimeter. No pressurized water lines are allowed below or within the foundations.
- Pavement structural sections should be designed for subgrade soils (R-Value = 10) and an appropriate Traffic Index (TI) selected by the civil designer.

Section 1

INTRODUCTION**1.1 Project Description**

The proposed project will consist of two (2) buildings with an approximately construction area of 7,700 square foot (total), a shade lunch structure, a playground area, and car parking area located at 141 S. 2nd Street in Blythe, California.

The building construction is planned to consist of concrete slab-on-grade, wood and/or metal frame walls. Foundations are expected to be moderately loaded. For the purposes of our analysis and report, we have assumed that structural loads will not exceed 5 kips per linear foot for wall footings and 30 kips for the column footings.

If structural loads exceed those used in our analysis, we should be notified so we may evaluate their impact on settlement estimates for the foundation recommendations. Site development will include grading, building pad preparation, installation of underground utilities, concrete sidewalk and hardscape construction.

1.2 Purpose and Scope of Work

The purpose of this geotechnical study was to investigate the subsurface soil at selected locations within the site for evaluation of physical/engineering properties and liquefaction potential during seismic events. Professional opinions were developed from field and laboratory test data and are provided in this report regarding geotechnical conditions at this site and the effect on design and construction. The scope of our services consisted of the following:

- ▶ Field exploration and in-situ testing of the site soils at selected locations and depths.
- ▶ Laboratory testing for physical and/or chemical properties of selected samples.
- ▶ Review of the available literature and publications pertaining to local geology, faulting, and seismicity.
- ▶ Engineering analysis and evaluation of the data collected.
- ▶ Preparation of this report presenting our findings and professional opinions regarding the geotechnical aspects of project design and construction.

This report addresses the following geotechnical parameters:

- ▶ Subsurface soil and groundwater conditions
- ▶ Site geology, regional faulting and seismicity, near source factors, and site seismic accelerations
- ▶ Liquefaction potential and its mitigation
- ▶ Expansive soil and methods of mitigation
- ▶ Aggressive soil conditions to metals and concrete
- ▶ Soil infiltration rates of the native soil for storm-water retention basin design

Professional opinions with regard to the above parameters are provided for the following:

- ▶ Site grading and earthwork
- ▶ Building pad and foundation subgrade preparation
- ▶ Allowable soil bearing pressures and expected settlements
- ▶ Concrete slabs-on-grade
- ▶ Excavation conditions and buried utility installations
- ▶ Mitigation of the potential effects of salt concentrations in native soil to concrete mixes and steel reinforcement
- ▶ Seismic design parameters
- ▶ Preliminary pavement structural sections

Our scope of work for this report did not include an evaluation of the site for the presence of environmentally hazardous materials or conditions, storm water infiltration, groundwater mounding, or landscape suitability of the soil.

1.3 Authorization

Mr. Mark Baker of Sillman provided authorization by written agreement to proceed with our work on March 12, 2021. We conducted our work in general accordance with our written proposal dated February 25, 2021.

Section 2

METHODS OF INVESTIGATION**2.1 Field Exploration**

Subsurface exploration was performed on May 13, 2021 using 2R Drilling of Ontario, California to advance five (5) borings to depths of 21.5 to 51.5 feet below existing ground surface. The borings were advanced with a truck-mounted, CME 75 drill rig using 8-inch diameter, hollow-stem, continuous-flight augers. The approximate boring locations were established in the field and plotted on the site map by sighting to discernible site features. The boring locations are shown on the Site and Exploration Plan (Plate A-2).

A geo-technician observed the drilling operations and maintained logs of the soil encountered with sampling depths. Soils were classified during drilling according to the Unified Soil Classification System using the visual-manual procedure in accordance with ASTM D2488. Relatively undisturbed and bulk samples of the subsurface materials were obtained at selected intervals. The relatively undisturbed soil samples were retrieved using a 2-inch outside diameter (OD) split-spoon sampler or a 3-inch OD Modified California Split-Barrel (ring) sampler lined with 6-inch stainless-steel sleeves. In addition, Standard Penetration Tests (SPT) were performed in accordance with ASTM D1586 and ASTM D6066. The samples were obtained by driving the samplers ahead of the auger tip at selected depths using a 140-pound CME automatic hammer with a 30-inch drop. The number of blows required to drive the samplers the last 12 inches of an 18-inch drive depth into the soil is recorded on the boring logs as “blows per foot”. Blow counts (N values) reported on the boring logs represent the field blow counts. No corrections have been applied to the blow counts shown on the boring logs for effects of overburden pressure, automatic hammer drive energy, drill rod lengths, liners, and sampler diameter

After logging and sampling the soil, the exploratory borings were backfilled with the excavated material. The backfill was loosely placed and was not compacted to the requirements specified for engineered fill.

The subsurface logs are presented on Plates B-1 thru B-5 in Appendix B. A key to the log symbols is presented on Plate B-6. The stratification lines shown on the subsurface logs represent the approximate boundaries between the various strata. However, the transition from one stratum to another may be gradual over some range of depth.

2.2 Laboratory Testing

Laboratory tests were conducted on selected bulk (auger cuttings) and relatively undisturbed soil samples obtained from the soil borings to aid in classification and evaluation of selected engineering properties of the site soils.

The tests were conducted in general conformance to the procedures of the American Society for Testing and Materials (ASTM) or other standardized methods as referenced below. The laboratory testing program consisted of the following tests:

- ▶ Particle Size Analyses (ASTM D422)
- ▶ Unit Dry Densities (ASTM D2937)
- ▶ Moisture Contents (ASTM D2216)
- ▶ Atterberg Limits (ASTM D4318)
- ▶ Moisture-Density Relationship (ASTM D1557)
- ▶ Chemical Analyses (soluble sulfates & chlorides, pH, and resistivity) (Caltrans Methods)

The laboratory test results are presented on the subsurface logs (Appendix B) and in Appendix C. Engineering parameters of soil strength, compressibility and relative density utilized for developing design criteria provided within this report were obtained from the field and laboratory testing program.

Section 3

DISCUSSION**3.1 Site Conditions**

The project site is approximately square in plan view, flat-lying and currently vacant. The coordinates of the project site (latitude/longitude) are 33.6093N / -114.5945W. The proposed modular building is located in the northern and eastern portions of the project site as shown on Plate A-2. The project site is bounded on the east by S. 2nd Street and the west by an alley. Commercial businesses are located to the north and residential homes are located to the south. Adjacent properties are flat-lying and are approximately at the same elevation with the site. The topography in the site vicinity is planar as depicted on Plate A-4, Topographic Map.

3.2 Geologic Setting

The site is located in the Palo Verde Valley of the Colorado River Desert Province in southern California. The province is bounded on the east by the Colorado River, on the south by the Mexican border, and on the west by the Peninsular Ranges. The northern border lies along the southern edge of the eastern Transverse Ranges.

The Palo Verde Valley is situated between the Palo Verde Mesa to the west, the Big Marie Mountains to the north and the Dome Rock Mountains to the east. The Colorado River meanders through the eastern portion of the valley. The site is directly underlain by alluvium and flood plain deposits of the Colorado River, which consist of interbedded, lenticular and tabular sand, silt, and clay with lenses of gravel. The predominant surface soil is silty sand. The adjacent mountains to the north and east are composed of Precambrian through Mesozoic age gneiss, schist, and granitic rocks overlain by Tertiary through Quaternary age volcanic and nonmarine sedimentary rocks. The surface geology of the site is depicted on Plate A-9.

3.3 Site Subsurface Conditions

The results of our subsurface investigation at the site, along with the review of available geologic maps and literature, indicate that the site is underlain by fluvial and flood plain deposits of the Colorado River to the maximum depth explored of 50 feet.

The USDA Natural Resources Conservation Service “Web Soil Survey” website indicates that surficial deposits at the project site consist predominantly of sandy loams of the Ripley and Meloland soil groups (see Plate A-3). These loams are formed in sediment and alluvium from Colorado River overflows.

The subsurface soils encountered during the field exploration conducted on May 13, 2021 consist of interbedded layers of silty clay/clay (CL-CH) and sandy silt/silty sand (ML-SM) to a depth of 7 to 13 feet. Very loose to dense sands (SP) extend from 13 to 50 feet below ground surface, the maximum depth of exploration. The subsurface logs (Plates B-1 through B-5) depict the stratigraphic relationships of the subsurface soil encountered at the points of exploration. Variations in subsurface stratigraphy may occur between the boring locations. The stratification lines shown on the subsurface log represent the approximate boundaries between the various strata. However, the transition from one stratum to another may be gradual over some range of depth. A schematic geologic cross section is presented on Plate A-10.

Groundwater was detected in the borings during the time of exploration at a depth of between 12 to 13 feet below ground surface. Stabilized groundwater is typically encountered at a depth of approximately 7 feet below ground surface in this area of Blythe. However, wet/pumping soils may be encountered at a depth of 4 to 5 feet below ground surface. Groundwater levels may fluctuate with precipitation, irrigation of adjacent properties, drainage, and site grading. The referenced groundwater level should not be interpreted to represent an accurate or permanent condition.

Historic groundwater levels are approximately 7 feet below ground surface at the project site. USGS Professional Paper 486-G, Plate 5 shows the project site lies at approximately 258 foot groundwater elevation contour. Historical groundwater is estimated at an elevation of 258 feet at the project site. The site elevation is approximately 265 feet above sea level which would equate to a historical groundwater depth of 7 feet below ground surface.

3.4 Seismic Hazards

3.4.1 Faulting and Seismicity

The project site is located in the seismically active southern California region and is expected to be subjected to moderate to strong ground shaking during the design life of the project. A fault map illustrating known active faults relative to the site is presented on Figure 1, *Regional Fault Map*. Figure 2 shows the project site in relation to local faults.

The criterion for fault classification adopted by the California Geological Survey defines Earthquake Fault Zones along Holocene-active or pre-Holocene faults (CGS, 2018b). Earthquake Fault Zones are regulatory zones that address the hazard of surface fault rupture. A Holocene-active fault is one that has ruptured during Holocene time (within the last 11,700 years). A pre-Holocene fault is a fault that has not ruptured in the last 11,700 years. Pre-Holocene faults may still be capable of surface rupture in the future, but are not regulated by the A-P act. Table 1 lists known faults or seismic zones that lie within a 93 mile radius of the project site.

The site is not located within a currently designated Earthquake Fault-Rupture Hazard Zone (CGS, 2018b). Review of the current Alquist-Priolo Earthquake Fault Zone maps (CGS, 2018a) indicates that the nearest mapped Earthquake Fault Zone is the San Andreas fault, located approximately 67 miles west-southwest of the project site. The possibility of ground surface rupture related to active faulting on currently unrecognized faults exists throughout Palo Verde Valley region. However, given the current state of knowledge regarding seismicity of the Palo Verde Valley, the potential for fault rupture at the project site is considered low.

3.4.2 Historic Seismicity

The Coachella Valley is one of the most seismically active regions in the United States and has experienced several historical events of magnitude 5.9 or greater. The following briefly outlines seismic events that have significantly affected the Coachella Valley in the past 60 years.

- ▶ ***Desert Hot Springs Event*** - On December 4, 1948, a magnitude 6.5Mw earthquake occurred east of Desert Hot Springs (Proctor, 1968).

- ▶ ***Palm Springs Event*** - A magnitude 6.2M_w earthquake occurred on July 8, 1986 in the Painted Hills causing minor surface creep of the Banning segment of the San Andreas Fault (USGS, 1987).
- ▶ ***Joshua Tree Event*** - On April 22, 1992, a magnitude 6.1 M_w earthquake occurred in the mountains 9 miles east of Desert Hot Springs (OSMS, 1992). Some structural damage and minor injuries occurred in the Palm Springs area during this earthquake.
- ▶ ***Landers Event*** - Early on June 28, 1992, the Coachella Valley was subjected to the largest seismic event to strike Southern California in 40 years. The Landers earthquake had a main shock with a 7.3M_w magnitude. Surface rupture occurred just south of the town of Yucca Valley and extended some 43 miles north toward Barstow. Surface horizontal offsets attained a maximum of 21 feet (OSMS, 1992).
- ▶ ***Big Bear Event*** - Approximately three hours after the Landers Event on June 28, 1992, a magnitude 6.4M_w earthquake occurred 10 miles southeast of Big Bear Lake. The earthquake occurred on a previously unknown fault trending northeast from the San Andreas Fault in the San Bernardino Mountains (OSMS, 1992).
- ▶ ***Hector Mine Event*** – On October 16, 1999, a magnitude 7.1 M_w earthquake occurred on the Lavic Lake and Bullion Mountain Faults north of Twentynine Palms.
- ▶ ***El Mayor-Cucapah Event***: A magnitude 7.2M_w earthquake ruptured the Laguna Salada, Borrego and Pescadores faults south of Mexicali, Mexico on April 4, 2010. The Borrego and Pescadores faults exhibited approximately 60 miles of surface rupture with a dip-slip displacement of up to 250 cm (8 feet). Widespread liquefaction and lateral spreading occurred in the Mexicali and Imperial Valleys during this event.

3.5 General Ground Motion Analysis

The project site is considered likely to be subjected to moderate to strong ground motion from earthquakes in the region. Ground motions are dependent primarily on the earthquake magnitude and distance to the seismogenic (rupture) zone. Acceleration magnitudes also are dependent upon attenuation by rock and soil deposits, direction of rupture and type of fault; therefore, ground motions may vary considerably in the same general area.

2019 CBC General Ground Motion Parameters: The 2019 CBC general ground motion parameters are based on the Risk-Targeted Maximum Considered Earthquake (MCE_R). The Structural Engineers Association of California (SEAOC) and Office of Statewide Health Planning and Development (OSHPD) Seismic Design Maps Web Application (SEAOC, 2021) was used to obtain the site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters.

Landmark obtained SPT blow counts and samples of the subsurface soils at 2.5 to 5 foot intervals from the boreholes completed on May 13, 2021 in order to determine the Soil Site Class. The Site Class E was determined based on the average blow counts (N) of the site soils in accordance with ASCE 7-16, Section 20.4.2 which yields an average N value of 9 to 10 as shown on Table 3.

The granular soils underlying the project site may liquefy during a strong seismic event resulting in a Site Class F classification. In accordance with ASCE 7-16, Section 20.3.1, for structures having a fundamental period of vibration less than 0.5 seconds, classification as Site Class F and a site specific response analysis are not required. Rather, the Site Class may be determined by standard means. It is anticipated that the proposed structure to have a period less than 0.5 seconds; therefore, a Site Class E is applicable for site design.

The California Building Code (CBC) requires that a site-specific ground motion hazard analysis be performed in accordance with ASCE 7-16 Section 11.4.8 for structures on Site Class D and E sites with S_1 greater than or equal to 0.2 and Site Class E sites with S_s greater than or equal to 1.0. **This project site has been classified as Site Class E and has a S_1 value of 0.15, which would not require a site-specific ground motion hazard analysis.**

Design spectral response acceleration parameters are defined as the earthquake ground motions that are two-thirds (2/3) of the corresponding MCE_R ground motions. The Maximum Considered Earthquake Geometric Mean (MCE_G) peak ground acceleration adjusted for soil site class effects (PGAM) value to be used for liquefaction and seismic settlement analysis in accordance with 2019 CBC Section 1803.5.12 ($PGAM = F_{PGA} * PGA$) is estimated at 0.29g for the project site. **Design earthquake ground motion parameters are provided in Table 2.**

3.6 Liquefaction

Liquefaction occurs when granular soils below the water table are subjected to vibratory motions, such as those produced by earthquakes. With strong ground shaking, the pore water pressure increases as the soil tends to reduce in volume. If the increase in pore water pressure is sufficient to reduce the vertical effective stress (suspending the soil particles in water), the soil strength decreases and the soil behaves as a liquid (similar to quicksand). Liquefaction can produce excessive settlement, ground rupture, lateral spreading, or failure of shallow bearing foundations. Four conditions are generally required for liquefaction to occur:

- (1) the soil must be saturated (relatively shallow groundwater);
- (2) the soil must be loosely packed (low to medium relative density);
- (3) the soil must be relatively cohesionless (not clayey); and
- (4) ground shaking of sufficient intensity must occur to function as a trigger mechanism.

All of these conditions exist to some degree at this site.

Methods of Analysis: The liquefaction potential at the project site was evaluated using the 1997 NCEER Liquefaction Workshop and the Idriss and Boulanger (2008) methods. The 1997 NCEER methods utilize direct SPT blow counts from site exploration and earthquake magnitude/PGA estimates from the seismic hazard analysis. The resistance to liquefaction is plotted on a chart of cyclic shear stress ratio (CSR) versus a corrected blow count $N_{1(60)}$. The analysis was performed using a $PGAM$ value of 0.29g with a 7-foot historical groundwater depth and a threshold factor of safety (FS) of 1.3. A computer printout of the liquefaction analyses is provided in Appendix D.

The fine content of the liquefiable sands and silts increases their liquefaction resistance in that more ground motion cycles are required to fully develop the increased pore pressures. Prior to calculating the settlements, the field SPT blow counts were corrected to account for the type of hammer, borehole diameter, overburden pressure and rod length $N_{1(60)}$ in accordance with Idriss and Boulanger (2008). The corrected blow counts were then converted to equivalent clean sand blow counts ($N_{1(60)cs}$).

The soils encountered at the points of exploration included saturated silts and silty sands that could liquefy during a Maximum Considered Earthquake. The potential for liquefaction is considered high in the loose to medium dense sand layers between depths of 7.5 to 45 feet.

The likely triggering mechanism for liquefaction appears to be strong groundshaking associated with the rupture of the San Andreas fault.

Liquefaction Induced Settlements: *Based on empirical relationships, total induced settlements are estimated to be about 5½ to 7½ inches should liquefaction occur.* Differential settlement is estimated at be two-thirds of the total potential settlement in accordance with California Special Publication 117. Accordingly, there is a potential for 3¾ to 5 inches of liquefaction induced differential settlement at the project site. The differential settlement based on seismic settlements is estimated at 1 inch over a distance of 100 feet. Foundations should be designed for a maximum deflection of L/720.

Liquefaction Induced Ground Failure: Based on research from Ishihara (1985) and Youd and Garris (1995) small ground fissure or sand boil formation is possible because of the relatively thin unliquefiable layer overlying the liquefiable layer and shallow ground water, typically at depths of 10 feet or less. Sand boils are conical piles of sand derived from the upward flow of groundwater caused by excess porewater pressures created during strong ground shaking. Sand boils are not inherently damaging by themselves, but are an indication that liquefaction occurred at depth (Jones, 2003). Groundwater was encountered at depths of about 12 feet. Available information indicate local groundwater levels at a depth of 7 feet. The site has a moderate to high potential for the development of sand boils.

Liquefaction induced lateral spreading is not expected to occur at this site due to the planar topography. According to Youd (2005), if the liquefiable layer lies at a depth greater than about twice the height of a free face, lateral spread is not likely to develop. No slopes or free faces occur at this site.

Mitigation: Ground improvement methods are available to mitigate liquefaction such as deep soil mixing (cement), vibro-compaction, vibro-replacement, geopiers, stone columns, compaction grouting, or deep dynamic compaction. Ground improvement is typically utilized when structural mitigation is not feasible. The applicability of these methods is dependent on the type of soil and the level of improvement desired. Additional field explorations may be necessary if deep densification is required.

Other means to mitigate liquefaction damage include either a deep foundation system or rigid mat foundations and grade-beam reinforced foundations that can withstand the differential movement or tilting, but will not protect buried utilities from damage.

Because of the potential for differential settlement due to liquefaction, the designer should consider the structures be supported by foundations that use grade-beam footings to tie floor slabs and isolated columns to continuous footings (conventional or post-tensioned).

3.7 Other Geologic Hazards

Landsliding. No indications of landsliding were observed within the immediate vicinity of the project site from the geologic maps and during our site investigation. Based on the relatively planar topography of the site, the potential for landsliding is considered remote.

Volcanic hazards. The site is not located proximal to any known volcanically active area and the risk of volcanic hazards is considered very low.

Tsunamis, sieches, and flooding. The site does not lie near any large bodies of water, so the threat of tsunami, sieches, or other seismically-induced flooding is unlikely. The project site is located in FEMA Flood Zone D, an area in which flood hazards are undetermined, but possible (FEMA (2008) FIRM Panel 06065C3230C). The project site is not located within Flood Potential Zone designated by Riverside County (Plate A-6).

Expansive soil. The near surface soils (upper 8 feet) at the project site consist of silty clays (CL) and clays (CH) with a moderate to high expansion potential (EI = 51 to 130).

Hazardous Materials. The site is not located in proximity to any known hazardous materials (methane gas, tar seeps, hydrogen sulfide gas), and the risk of hazardous materials is considered very low.

Radon 222 Gas. Radon gas is not believed to be a potential hazard at the site.

Naturally occurring asbestos. The site is not located in proximity to any known naturally occurring asbestos, and the risk of naturally occurring asbestos is considered very low.

Hydrocollapse. The site is dominantly underlain by near surface clayey silts and saturated sands that are not susceptible to collapse with the addition of water. The risk of hydrocollapse is considered very low.

Regional Subsidence. The project site is located within a Riverside County designated area that is susceptible for regional subsidence (Plate A-7).

Section 4

CONCLUSIONS

Based on the results of our field investigation and laboratory tests, it is our opinion that the construction of the Child Development Center building is feasible from a geotechnical standpoint, provided that the recommendations, conclusions and professional opinions contained in this report are incorporated in the project plans and specifications, and implemented during construction of the project. The following summarizes some of the pertinent geotechnical issues identified in our study:

- No known active or potentially active faults cross the site. The closest active fault to the site is the San Andreas fault located approximately 67 miles to the southwest.
- The site is considered likely to be subjected to moderate ground accelerations related to regional fault activity. A peak ground acceleration value of 0.29g was estimated for use in the liquefaction and seismic settlement analysis in accordance with CGS Note 48.
- The on-site near surface soils consist of moderate plasticity silty clay (CL) and high plasticity clays (CH). These soils have a moderate to high expansion potential (EI = 51 to 130).
- To provide more uniform foundation support, the near surface soils should be removed and replaced as compacted fill.
- Geotextiles may be required to stabilize the bottom of the excavation.
- The loose to medium dense soils encountered between depths of 7.5 to 40 feet may liquefy, potentially resulting in about 5½ to 7½ inches of settlement.
- The potential for other geologic hazards including landsliding, tsunamis/seiches, volcanic hazards, hazardous materials, radon gas, naturally occurring asbestos, hydrocollapse, and regional subsidence are considered low.
- Available documents indicate that groundwater may be expected at a depth of about 7 feet below ground surface at the project site. It is possible that wet, pumping soils may be encountered at 4 to 5 feet below ground surface.
- The on-site native soils have a high potential for corrosivity with respect to buried steel and concrete materials.

Section 5

DESIGN CRITERIA**5.1 Site Preparation****5.1.1 Clearing and Grubbing**

At the time of construction, all existing pavement, debris and vegetation such as grass or trees on the site should be removed. Organic strippings should be hauled from the site and should not be incorporated into any engineered fills. Any trash, construction debris, concrete slabs, old pavement, landfill, and buried obstructions should be located by the grading contractor and removed under our observation. Excavations resulting from site clearing should be dish-shaped to the lowest depth of disturbance and backfilled with engineered fill as described below under continuous observations by the geotechnical engineer's representative.

5.1.2 Building Pad Preparation

The existing soils should be overexcavated to a minimum depth of 3 feet below the existing ground surface and should extend at least five (5) feet beyond all exterior wall/column lines (including concreted areas adjacent to the building). After the removal, the bottom of the excavation should be scarified to a depth of 8 inches, moisture conditioned to 2% below to 4% above optimum, and recompact to a minimum of 90% of ASTM D1557 maximum density (if sand) and uniformly moisture conditioned to 5 to 10% above optimum moisture content and recompact to 85 to 90% of the maximum density (if clays).

If wet and/or pumping conditions are encountered at the bottom of the excavation, an additional 12 inches of subgrade soil should be removed below the existing excavation depth. After removal of the subgrade soil, a layer of geotextile stabilization/separation fabric such as Mirafi RS580i or equivalent shall be placed directly on the bottom of the excavation after fine grading of the subgrade soils. The geotextile stabilization/separation fabric should be placed in accordance with the manufacturer's recommendations (24-inch end and side lap).

After placement of the geotextile stabilization/separation fabric, 12 inches of Caltrans Class 2 aggregate base shall be end dumped on the geotextile fabric and spread by methods which will avoid direct contact with wheels on the fabric. The aggregate base shall be compacted to a minimum of 90% of ASTM D1557 maximum dry density. Subsequent layers of non-expansive engineered fill soils (3.0 feet) shall be placed directly over the stabilization aggregate base layer and compacted as described in Section 5.1.3.

Overexcavation beneath walkways and non-structural flatwork may be limited to a depth of 1 foot below and beyond the limits of the walkways.

5.1.3 Engineered Fill Soils

The building support pad should consist of 3.0 feet of imported non-expansive soil. The imported non-expansive fill material shall be placed in maximum 8-inch lifts (loose), compacted to a minimum of 90% of ASTM D1557 maximum density at 2% below to 4% above optimum moisture, should be placed below the bottom of the slab. The imported non-expansive soils should be placed over a minimum of 12 inches of uniformly moisture conditioned and compacted native soil.

Imported fill soils for the building support pad should consist of non-expansive (Expansion Index less than 5) granular soils that meet the USCS classifications of SM, SP-SM, or SW-SM, with a maximum rock size of 3 inches, and 5 to 20% passing the No. 200 sieve and a minimum Sand Equivalent of 25.

The geotechnical engineer should approve the fill soils prior to importing. Granular imported fill should be placed in lifts no greater than 8 inches in loose thickness and compacted to a minimum of 90% of ASTM D1557 maximum dry density. The moisture content of the non-expansive soils should be maintained within 2% of optimum moisture at the time of compaction.

5.1.4 Utility Trench Backfill

Trench backfill for utilities should conform to the specifications shown on Plate E-1 (Appendix E), Riverside County Standard No. 818.

On-site soil free of debris, vegetation, and other deleterious matter may be suitable for use as utility trench backfill above pipezone, but may be difficult to uniformly maintain at specified moistures and compact to the specified densities. Native backfill should only be placed and compacted after encapsulating buried pipes with suitable bedding and pipe envelope material.

The native soil is suitable for use as compacted fill and utility trench backfill. The native soil should be placed in maximum 8 inch lifts (loose) and compacted to a minimum of 90% of ASTM D1557 maximum dry density at optimum moisture $\pm 2\%$.

Backfill soil of utility trenches within paved areas should be uniformly moisture conditioned to $\pm 2\%$ of optimum moisture, placed in layers not more than 6 inches in thickness and mechanically compacted to a minimum of 90% of the ASTM D1557 maximum dry density, except that the top 12 inches shall be compacted to 95% (if granular trench backfill).

5.1.5 Observation and Density Testing

All site preparation and fill placement should be continuously observed and tested by a representative of a qualified geotechnical engineering firm as required by the CBC. This includes the excavation and scarification process to detect any undesirable materials, conditions or soft areas that may be encountered in the construction area.

The geotechnical firm that provides observation and testing during construction shall assume the responsibility of "*geotechnical engineer of record*", and as such, shall perform additional testing/investigation as necessary to satisfy themselves as to the site conditions and the geotechnical recommendations for site development. The geotechnical engineer should provide a verified report of the as-graded site and building support pad conditions.

5.1.6 Auxiliary Structures Foundation Preparation

Auxiliary structures such as retaining walls may be supported in the manner recommended for building pads, except the overexcavation and replacement may be limited to 3 feet beyond the footing line.

5.2 Foundations and Settlements

Spread and continuous wall footings are suitable for building support provided they are designed with rigid elements to reduce the potential for differential settlement due to liquefaction (see Section 3.6 of this report). The spread and continuous wall footings may be designed using an allowable soil bearing pressure of 2,000 pounds per square foot for dead and live loads when foundations are supported on imported sands (extending a minimum of 1.0 feet below footings).

The allowable soil pressure may be increased by one-third for short-term loads induced by winds or seismic events. The bearing capacity of the imported fill soils should be verified during construction. Foundations placed on granular fill should be embedded a minimum of 1.5 feet below the lowest adjacent final grade. Interior footings should extend at least 1.5 feet below the lowest adjacent floor slab. Continuous wall footings should have a minimum width of 18 inches. Column footings should have a minimum width of 30 inches. Design of foundation reinforcement should be provided by the structural engineer.

Resistance to horizontal loads will be developed by passive earth pressure on the sides of footings and frictional resistance developed along the bases of footings and concrete slabs. The passive resistance of the engineered fill may be assumed to be equal to an equivalent fluid pressure of 300 pounds per cubic foot. The top one foot of embedment should not be considered in computing passive resistance unless the adjacent area is confined by a slab or pavement. An allowable friction coefficient of 0.35 may be used between the base of the footings and the engineered fill to resist lateral loading.

Flat plate structural mats or grade-beam reinforced foundations may be used to mitigate liquefaction related movement.

Flat Plate Structural Mats: Flat plate structural mats may be used to mitigate the liquefaction induced settlement or expansive soils at the project site. The structural mat shall have a double mat of steel (minimum No. 4's @ 12 inches O.C. each way – top and bottom) and a minimum thickness of 10 inches. Mat edges shall have a minimum edge footing of 12 inches width and 24 inches depth (below the building pad surface). Mats may be designed in accordance with the CBC Chapter 18, Section 1808A.6.2 methods (*WRI/CRSI Design of Slab-on-Ground Foundations*).

Structural mats may be designed for a modulus of subgrade reaction (K_s) of 300 pci when placed on 3 feet of compacted granular fill. Mats shall overlay 2 inches of sand and a 10-mil polyethylene vapor retarder. The building support pad shall be moisture conditioned and recompacted as specified in Section 5.1 of this report.

Grade-beam Reinforced Foundations: Structures with grade beam reinforced foundations placed on the import granular fill shall have a maximum grade-beam spacing of 20 feet. All exterior footings should be embedded a minimum of 18 inches below the building support pad or lowest adjacent final grade, whichever is deeper. Minimum embedment depth of interior slab stiffening elements should be at least 18 inches into the building support pad.

Interior and exterior embedment depths listed herein are minimum depths and greater depths/widths may be required by the structural engineer/designer and should be sufficient to limit differential movement to $L/480$ for center lift and $L/720$ for edge lift to comply with the current standards. Continuous wall footings should have a minimum width of 12 inches. Spread footings should have a minimum dimension of 30 inches and should be structurally tied to perimeter footings or grade beams. Concrete reinforcement and sizing for all footings should be provided by the structural engineer.

Settlements: Foundation movement under the estimated static (non-seismic) loadings and static site conditions are estimated to not exceed $\frac{3}{4}$ - inch with differential movement of about two-thirds of total movement for the loading assumptions stated above when the subgrade preparation guidelines given above are followed. Seismically induced (post-liquefaction) settlements are addressed in Section 3.6 of this report.

5.3 Slabs-On-Grade

Concrete floor slabs should be a minimum of 5 inches thick when placed over 36 inches of non-expansive, imported compacted fill. Concrete floor slabs should be monolithically placed with the foundations or dowelled to footings placed in a 2-stage pour. The concrete slabs should be placed on a 2-inch concrete sand layer and a 10-mil polyethylene vapor retarder placed over the granular fill that has been compacted to 90% of ASTM D1557 maximum dry density and moistened to approximately optimum moisture just before the concrete placement. Concrete slab and flatwork reinforcement should consist of a minimum of No. 3 bars at 18-inch centers, both horizontal directions for slabs placed over non-expansive fill.

Slab and steel reinforcement should be provided by the structural engineer/architect knowing the actual project loadings. The *inspector of record* should continually observe all reinforcing steel in slabs during placement of concrete to check for proper location within the slab.

Control joints may be provided in all concrete slabs-on-grade at a maximum spacing of 2 to 3 times (in feet) the slab thickness (in inches) (12 feet maximum on-center, each way) as recommended by American Concrete Institute (ACI). All joints should form approximately square patterns to reduce randomly oriented contraction cracks. Contraction joints in the slabs should be tooled at the time of the pour or sawcut ($\frac{1}{4}$ of slab depth) within 8 hours of concrete placement.

Construction (cold) joints should either be thickened butt-joints with dowels or a thickened keyed-joint designed to resist vertical deflection at the joint. All construction joints in exterior flatwork should be sealed to prevent moisture or foreign material intrusion. Precautions should be taken to prevent curling of slabs in this arid desert region.

All exterior flatwork (sidewalks, hardscape, and patios) should be placed on a minimum of 12 inches of compacted granular fill over 12 inches of native subgrade soils that has been compacted to 85 to 90% of the ASTM D1557 maximum density. The moisture content of the clay soils should be maintained 5 to 10% above optimum by pre-saturating the subgrade soils to a depth of 24 inches within 2 days prior to placement of concrete. If some movement of exterior flatwork is acceptable, exterior concrete may be placed over 4 inches of concrete sand, aggregate base, or crushed rock directly overlying 24 inches of prewetted native clay soils. Concrete flatwork may be doweled to the perimeter foundations where adjacent to the building, and sloped 1.5 to 2% away from the building.

5.4 Concrete Mixes and Corrosivity

Selected chemical analyses for corrosivity were conducted on samples from the project site (Plate C-4). The native soils were found to have severe sulfate ion concentrations (2,063 ppm). Sulfate ions in high concentrations can attack the cementitious material in concrete, causing weakening of the cement matrix and eventual deterioration by raveling.

The following table provides American Concrete Institute (ACI) recommended cement types, water-cement ratio and minimum compressive strengths for concrete in contact with soils:

Concrete Mix Design Criteria due to Soluble Sulfate Exposure

Sulfate Exposure Class	Water-soluble Sulfate (SO ₄) in soil, ppm	Cement Type	Maximum Water-Cement Ratio by weight	Minimum Strength f' _c (psi)
S0	0-1,000	–	–	–
S1	1,000-2,000	II	0.50	4,000
S2	2,000-20,000	V	0.45	4,500
S3	Over 20,000	V (plus Pozzolon)	0.45	4,500

Note: From ACI 318-14 Table 19.3.1.1 and Table 19.3.2.1

A minimum of 6.0 sacks per cubic yard of concrete (4,500 psi) of Type V Portland Cement with a maximum water/cement ratio of 0.45 (by weight) should be used for concrete placed on this project (sitework including sidewalks, hardscape areas, and foundations). Admixtures may be required to allow placement of this low water/cement ratio concrete. Thorough concrete consolidation and hard trowel finishes should be used due to the aggressive soil exposure.

The native soils were also found to have very severe chloride ion concentrations (4,480 ppm). Chloride ions can cause corrosion of reinforcing steel and buried utilities. Resistivity determinations on the soils indicate very severe potential for metal loss due to electrochemical corrosion processes. Mitigation of the corrosion of steel can either be achieved by using steel pipes coated with epoxy corrosion inhibitors, asphaltic coatings, cathodic protection or by encapsulating the portion of the pipe with densely consolidated concrete.

A minimum concrete cover of three (3) inches should be provided around steel reinforcing or embedded components exposed to native soil or landscape water (to 18 inches above grade). Additionally, the concrete should be thoroughly vibrated during placement to decrease the permeability of the concrete.

Due to the potential for corrosion of metallic piping, all water supply lines should be placed overhead, not beneath the slab. No portion of metallic piping on site should be placed in direct contact with native soils.

Copper water lines shall be wrapped or fully encapsulated prior to installation in native soils. A corrosion engineer should be consulted to obtain final design recommendations. Fire protection piping (risers) should be placed outside of the building foundation.

5.5 Excavations

All site excavations should conform to CalOSHA requirements for Type B soil. The contractor is solely responsible for the safety of workers entering trenches. Temporary excavations with depths of 4 feet or less may be cut nearly vertical for short duration. Excavations deeper than 4 feet will require shoring or slope inclinations in conformance to CAL/OSHA regulations for Type C soil. Surcharge loads of stockpiled soil or construction materials should be set back from the top of the slope a minimum distance equal to the height of the slope. All permanent slopes should not be steeper than 3:1 to reduce wind and rain erosion. Protected slopes with ground cover may be as steep as 2:1. However, maintenance with motorized equipment may not be possible at this inclination.

Groundwater was encountered at depths of 12 feet on May 13, 2021, but static groundwater levels are estimated at about 7 feet below ground surface. Wet and pumping soils may be encountered below a depth of 4 to 5 feet. The contractor is cautioned to evaluate soil moisture and groundwater conditions at the time of bidding.

5.6 Seismic Design

This site is located in the seismically active southern California area and the site structures are subject to strong ground shaking due to potential fault movements along the San Andreas fault. Engineered design and earthquake-resistant construction are the common solutions to increase safety and development of seismic areas. Designs should comply with the latest edition of the CBC for Site Class E using seismic coefficients given in Section 3.5 and Table 2 of this report.

5.7 Pavements

Pavements should be designed according to the 2020 Caltrans Highway Design Manual or other acceptable methods. Traffic indices were not provided by the project engineer or owner; therefore, we have provided structural sections for several traffic indices for comparative evaluation. The public agency or design engineer should decide the appropriate traffic index for the site.

Maintenance of proper drainage is necessary to prolong the service life of the pavements. Based on the current Caltrans method, an estimated R-value of 10 for the subgrade soil and assumed traffic indices, the following table provides our estimates for asphaltic concrete (AC) and Portland Cement Concrete (PCC) pavement sections.

Pavement Structural Sections

R-Value of Subgrade Soil - 10 (estimated)

Design Method - Caltrans 2020

Traffic Index	Flexible Pavements		Rigid (PCC) Pavements	
	Asphaltic Concrete Thickness (in.)	Aggregate Base Thickness (in.)	Concrete Thickness (in.)	Aggregate Base Thickness (in.)
4.0	3.0	6.5	5.0	6.0
5.0	3.0	10.0	5.5	6.0
6.0	4.0	11.5	6.0	8.0
6.5	4.0	14.0	7.0	8.0

Notes:

- 1) Asphaltic concrete shall be Caltrans, Type A HMA (Hot Mix Asphalt), $\frac{3}{4}$ inch maximum ($\frac{1}{2}$ inch maximum for parking areas), with PG70-10 asphalt concrete, compacted to a minimum of 95% of the Hveem density (CAL 308) or a minimum of 92% of the Maximum Theoretical Density (ASTM D2041).
- 2) Aggregate base shall conform to Caltrans Class 2 ($\frac{3}{4}$ in. maximum), compacted to a minimum of 95% of ASTM D1557 maximum dry density.
- 3) Place pavements on 12 inches of moisture conditioned (minimum 4% above optimum if clays) native clay soil compacted to a minimum of 90% (95% if sand subgrade) of the maximum dry density determined by ASTM D1557.
- 4) Portland cement concrete for pavements should have Type V cement, a minimum compressive strength of 4,500 psi at 28 days, and a maximum water-cement ratio of 0.45.
- 5) Typical Street Classifications.

Parking Areas:	TI = 4.0
Cul-de-Sacs:	TI = 5.0
Local Streets:	TI = 6.0
Minor Collectors:	TI = 6.5 (trash truck areas)

Final pavement sections may need to be determined by sampling and R-Value testing during grading operations when actual subgrade soils are exposed.

Section 6

LIMITATIONS AND ADDITIONAL SERVICES**6.1 Limitations**

The findings and professional opinions within this report are based on current information regarding the proposed new Child Development Center located at 141 S. 2nd Street in Blythe, California. The conclusions and professional opinions of this report are invalid if:

- ▶ Structural loads change from those stated or the structures are relocated.
- ▶ The Additional Services section of this report is not followed.
- ▶ This report is used for adjacent or other property.
- ▶ Changes of grade or groundwater occur between the issuance of this report and construction other than those anticipated in this report.
- ▶ Any other change that materially alters the project from that proposed at the time this report was prepared.

This report was prepared according to the generally accepted *geotechnical engineering standards of practice* that existed in Riverside County at the time the report was prepared. No express or implied warranties are made in connection with our services.

Findings and professional opinions in this report are based on selected points of field exploration, geologic literature, limited laboratory testing, and our understanding of the proposed project. Our analysis of data and professional opinions presented herein are based on the assumption that soil conditions do not vary significantly from those found at specific exploratory locations. Variations in soil conditions can exist between and beyond the exploration points or groundwater elevations may change. The nature and extend of such variations may not become evident until, during or after construction. If variations are detected, we should immediately be notified as these conditions may require additional studies, consultation, and possible design revisions.

Environmental or hazardous materials evaluations were not performed by *LandMark Consultants, Inc.* for this project. *LandMark Consultants, Inc.* will assume no responsibility or liability whatsoever for any claim, damage, or injury which results from pre-existing hazardous materials being encountered or present on the project site, or from the discovery of such hazardous materials.

The client has responsibility to see that all parties to the project including designer, contractor, and subcontractor are made aware of this entire report within a reasonable time from its issuance. This report should be considered invalid for periods after two years from the date of report issuance without a review of the validity of the findings and professional opinions by our firm, because of potential changes in the Geotechnical Engineering Standards of Practice.

This report is based upon government regulations in effect at the time of preparation of this report. Future changes or modifications to these regulations may require modification of this report. Land or facility use, on and off-site conditions, regulations, design criteria, procedures, or other factors may change over time, which may require additional work. Any party other than the client who wishes to use this report shall notify **LandMark Consultants, Inc.** of such intended use. Based on the intended use of the report, **LandMark Consultants, Inc.** may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release **LandMark Consultants, Inc.** from any liability resulting from the use of this report by any unauthorized party and client agrees to defend, indemnify, and hold **LandMark Consultants, Inc.** harmless from any claim or liability associated with such unauthorized use or non-compliance.

This report contains information that may be useful in the preparation of contract specifications. However, the report is not worded in such a manner that we recommend its use as a construction specification document without proper modification. The use of information contained in this report for bidding purposes should be done at the contractor's option and risk.

6.2 Plan Review

Landmark Consultants, Inc. should be retained during development of design and construction documents to check that the geotechnical professional opinions are appropriate for the proposed project and that the geotechnical professional opinions are properly interpreted and incorporated into the documents. **Landmark Consultants, Inc.** should have the opportunity to review the final design plans and specifications for the project prior to the issuance of such for bidding.

Governmental agencies may require review of the plans by the geotechnical engineer of record for compliance to the geotechnical report.

6.3 Additional Services

We recommend that ***Landmark Consultants, Inc.*** be retained to provide the tests and observations services during construction. *The geotechnical engineering firm providing such tests and observations shall become the geotechnical engineer of record and assume responsibility for the project.*

Landmark Consultants, Inc. recommendations for this site are, to a high degree, dependent upon appropriate quality control of subgrade preparation, fill placement, and foundation construction. Accordingly, the findings and professional opinions in this report are made contingent upon the opportunity for ***Landmark Consultants, Inc.*** to observe grading operations and foundation excavations for the proposed construction.

*If parties other than **Landmark Consultants, Inc.** are engaged to provide observation and testing services during construction, such parties must be notified that they will be required to assume complete responsibility as the geotechnical engineer of record for the geotechnical phase of the project by concurring with the recommendations in this report and/or by providing alternative recommendations.*

Additional information concerning the scope and cost of these services can be obtained from our office.

Section 7

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TABLES

Table 1
Summary of Characteristics of Closest Known Active Faults

Fault Name	Approximate Distance (miles)	Approximate Distance (km)	Maximum Moment Magnitude (Mw)	Fault Length (km)	Slip Rate (mm/yr)
Algodones *	57.3	91.7			
Hot Springs *	62.3	99.7			
Elmore Ranch	66.8	106.8	6.6	29 ± 3	1 ± 0.5
San Andreas - Coachella	67.5	108.0	7.2	96 ± 10	25 ± 5
Brawley *	68.7	109.9			
Imperial	71.7	114.6	7	62 ± 6	20 ± 5
Rico *	72.0	115.2			
Superstition Hills	78.7	125.9	6.6	23 ± 2	4 ± 2
Superstition Mountain	80.5	128.8	6.6	24 ± 2	5 ± 3
Blue Cut *	80.8	129.3			
Pisgah Mtn. - Mesquite Lake	82.2	131.5	7.3	89 ± 9	0.6 ± 0.4
Pinto Mtn.	86.1	137.8	7.2	74 ± 7	2.5 ± 2
Unnamed 2*	89.6	143.4			
Unnamed 1*	89.9	143.8			
Indio Hills *	89.9	143.8			
San Jacinto - Borrego	90.2	144.3	6.6	29 ± 3	4 ± 2
Cerro Prieto *	90.9	145.4			
San Jacinto - Anza	91.1	145.8	7.2	91 ± 9	12 ± 6
Painted Gorge Wash*	91.2	145.9			
Yuha*	91.9	147.0			
Yuha Well *	92.6	148.1			
Shell Beds	92.7	148.4			

* Note: Faults not included in CGS database.

**Table 2
2019 California Building Code (CBC) and ASCE 7-16 Seismic Parameters**

Soil Site Class:	E	<u>ASCE 7-16 Reference</u>
Latitude:	33.6093 N	Table 20.3-1
Longitude:	-114.5945 W	
Risk Category:	II	
Seismic Design Category:	D	

Maximum Considered Earthquake (MCE) Ground Motion

Mapped MCE _R Short Period Spectral Response	S_s	0.290 g	ASCE Figure 22-1
Mapped MCE _R 1 second Spectral Response	S₁	0.154 g	ASCE Figure 22-2
Short Period (0.2 s) Site Coefficient	F_a	2.29	ASCE Table 11.4-1
Long Period (1.0 s) Site Coefficient	F_v	3.75	ASCE Table 11.4-2
MCE _R Spectral Response Acceleration Parameter (0.2 s)	S_{MS}	0.664 g	= F _a * S _s ASCE Equation 11.4-1
MCE _R Spectral Response Acceleration Parameter (1.0 s)	S_{MI}	0.578 g	= F _v * S ₁ ASCE Equation 11.4-2

Design Earthquake Ground Motion

Design Spectral Response Acceleration Parameter (0.2 s)	S_{DS}	0.442 g	= 2/3*S _{MS}	ASCE Equation 11.4-3
Design Spectral Response Acceleration Parameter (1.0 s)	S_{DI}	0.385 g	= 2/3*S _{MI}	ASCE Equation 11.4-4
Risk Coefficient at Short Periods (less than 0.2 s)	C_{RS}	0.954		ASCE Figure 22-17
Risk Coefficient at Long Periods (greater than 1.0 s)	C_{RI}	0.941		ASCE Figure 22-18
	T_L	8.00 sec		ASCE Figure 22-12
	T_O	0.17 sec	= 0.2*S _{DI} /S _{DS}	
	T_S	0.87 sec	= S _{DI} /S _{DS}	
Peak Ground Acceleration	PGA_M	0.29 g		ASCE Equation 11.8-1

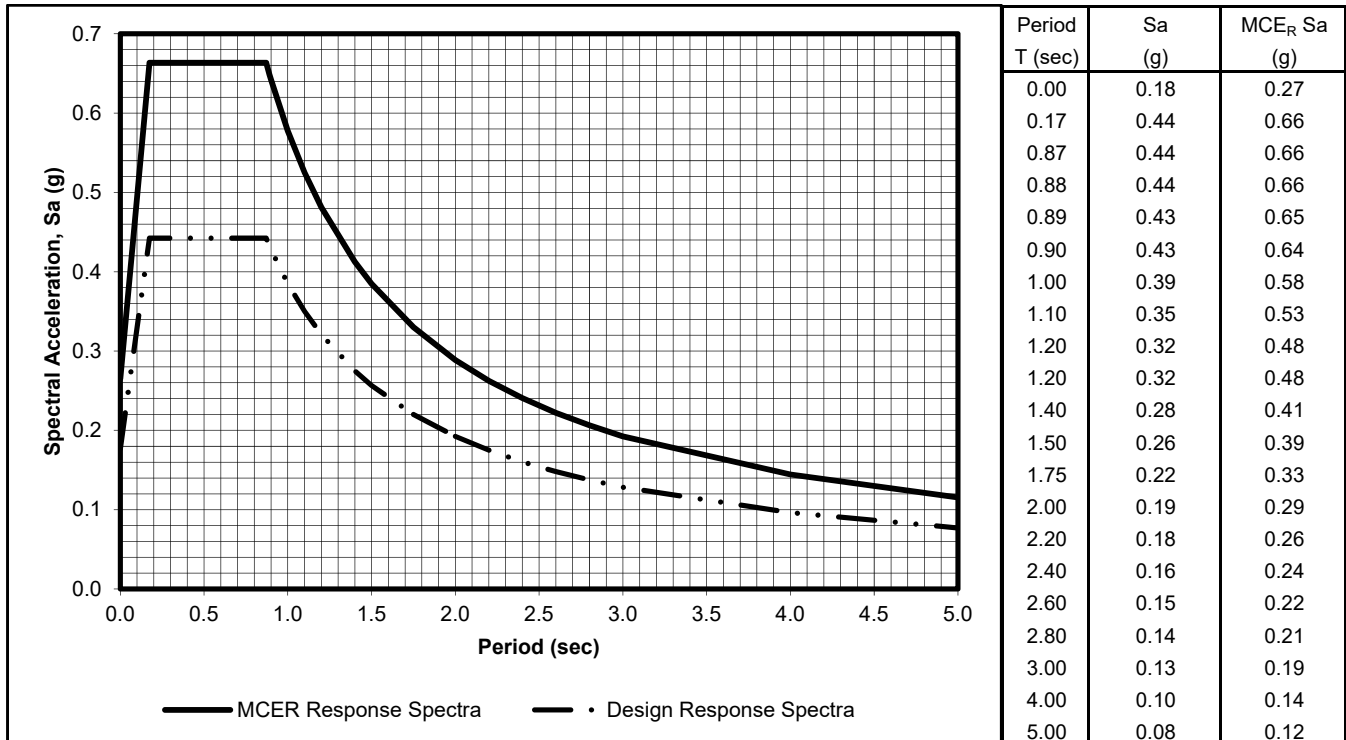


Table 3
Soil Site Class Determination per ASCE 7-16, Section 20.4
Child Development Center - Blythe, CA
LCI Project No. LP21061

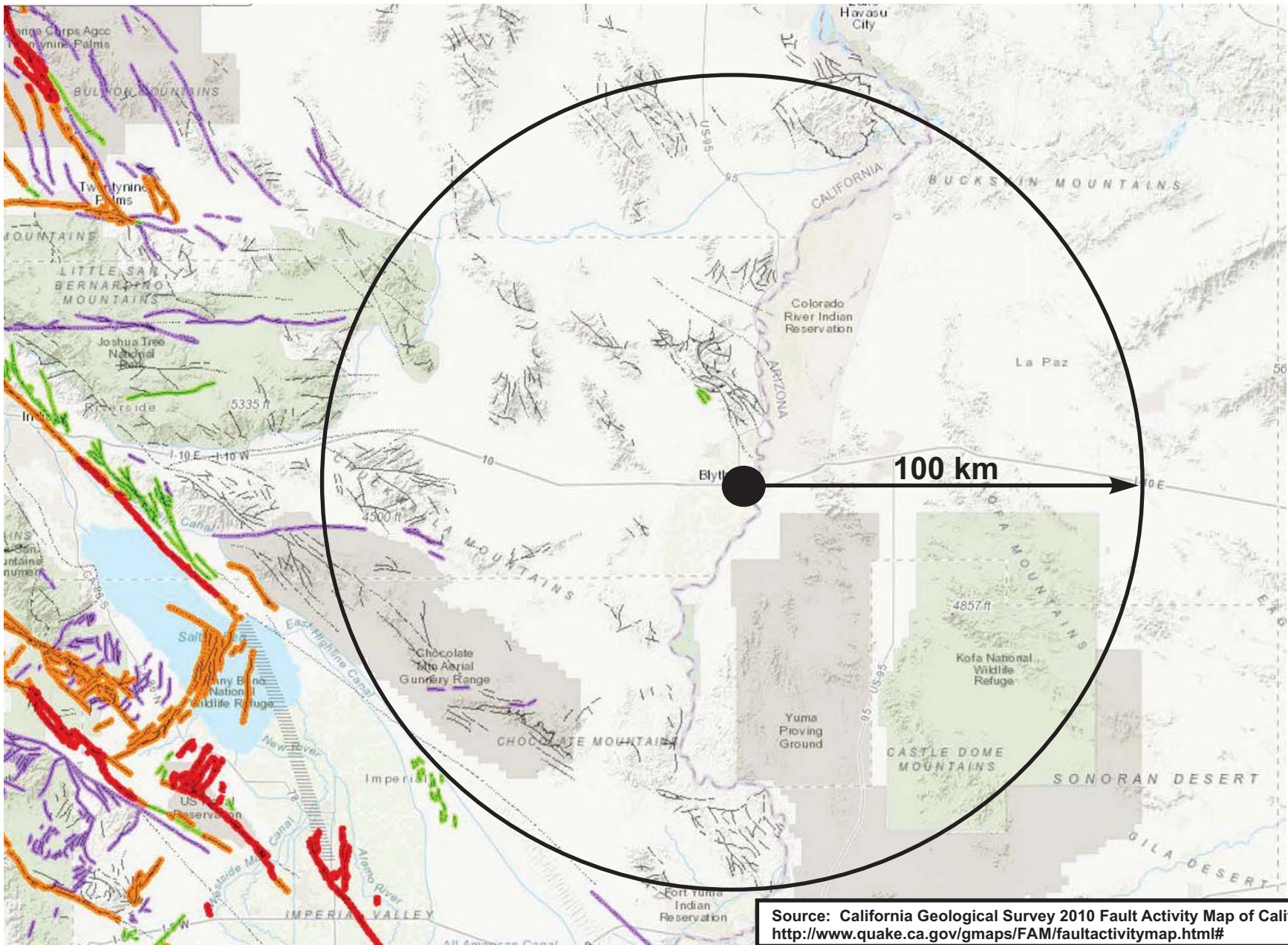
Boring B-1

Sample Depth	SPT Blow Count	di/Ni	Sum di/Ni	Avg. Nch
0				
2.5	10	0.25	4.36	9
5	13	0.19		
7.5	15	0.17		
10	14	0.18		
15	68	0.07		
20	25	0.20		
25	3	1.67		
30	8	0.63		
35	6	0.83		
40	28	0.18		

Boring B-2

Sample Depth	SPT Blow Count	di/Ni	Sum di/Ni	Avg. Nch
0				
2.5	15	0.17	4.84	10
5	16	0.16		
7.5	10	0.25		
10	22	0.11		
15	54	0.09		
20	30	0.17		
25	3	1.67		
30	5	1.00		
35	14	0.36		
40	10	0.50		
45	23	0.22		
50	32	0.16		

FIGURES

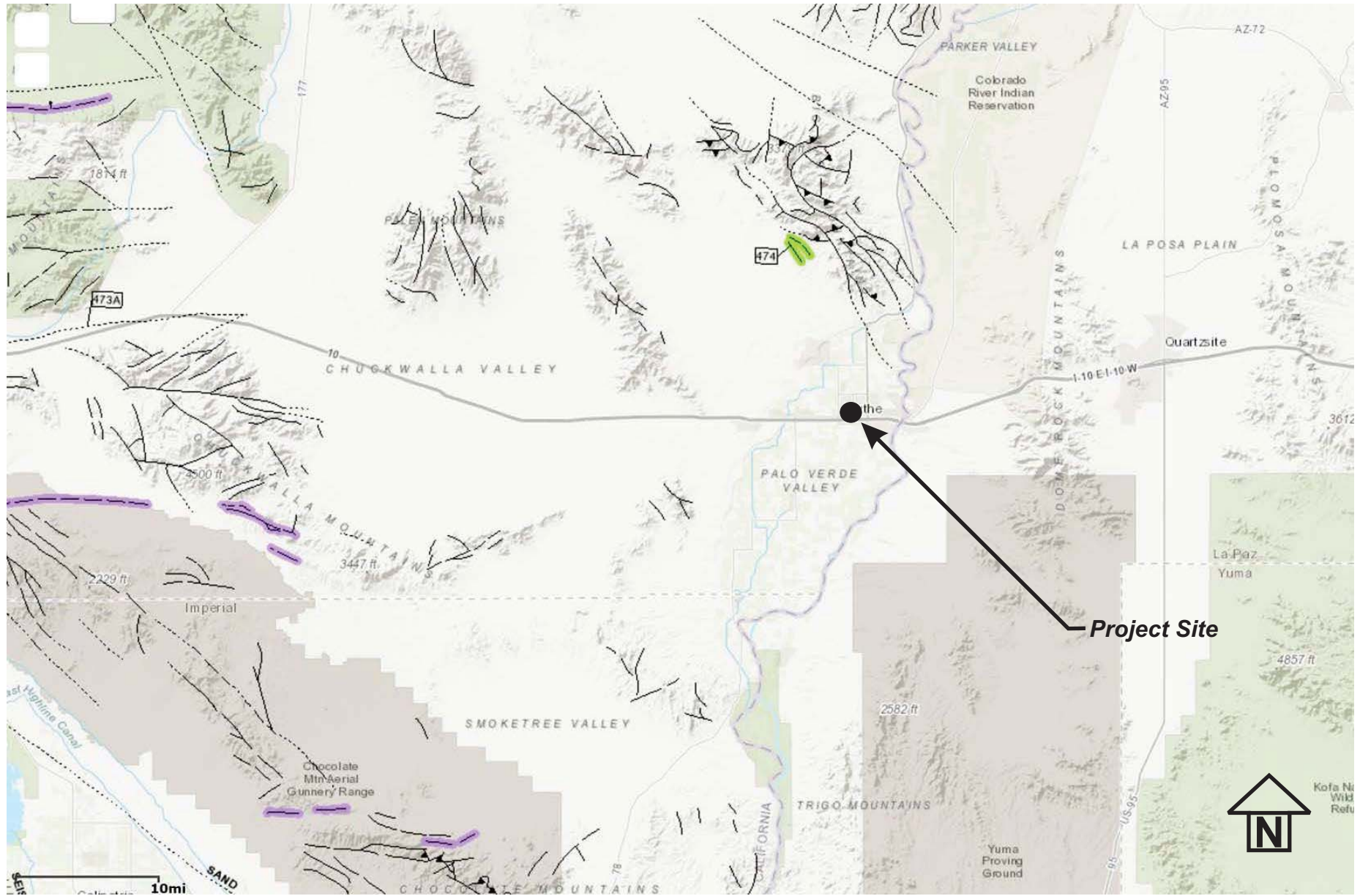


Source: California Geological Survey 2010 Fault Activity Map of California
<http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html#>

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Regional Fault Map

Figure 1



Source: California Geological Survey 2010 Fault Activity Map of California
<http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html#>

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Project No.: LP21061

Map of Local Faults

Figure 2

EXPLANATION

Fault traces on land are indicated by solid lines where well located, by dashed lines where approximately located or inferred, and by dotted lines where concealed by younger rocks or by lakes or bays. Fault traces are queried where continuation or existence is uncertain. Concealed faults in the Great Valley are based on maps of selected subsurface horizons, so locations shown are approximate and may indicate structural trend only. All offshore faults based on seismic reflection profile records are shown as solid lines where well defined, dashed where inferred, queried where uncertain.

FAULT CLASSIFICATION COLOR CODE (Indicating Recency of Movement)



Fault along which historic (last 200 years) displacement has occurred and is associated with one or more of the following:

- (a) a recorded earthquake with surface rupture. (Also included are some well-defined surface breaks caused by ground shaking during earthquakes, e.g. extensive ground breakage, not on the White Wolf fault, caused by the Arvin-Tehachapi earthquake of 1952). The date of the associated earthquake is indicated. Where repeated surface ruptures on the same fault have occurred, only the date of the latest movement may be indicated, especially if earlier reports are not well documented as to location of ground breaks.
- (b) fault creep slippage - slow ground displacement usually without accompanying earthquakes.
- (c) displaced survey lines.



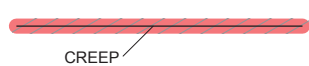
A triangle to the right or left of the date indicates termination point of observed surface displacement. Solid red triangle indicates known location of rupture termination point. Open black triangle indicates uncertain or estimated location of rupture termination point.



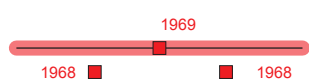
Date bracketed by triangles indicates local fault break.



No triangle by date indicates an intermediate point along fault break.



Fault that exhibits fault creep slippage. Hachures indicate linear extent of fault creep. Annotation (creep with leader) indicates representative locations where fault creep has been observed and recorded.



Square on fault indicates where fault creep slippage has occurred that has been triggered by an earthquake on some other fault. Date of causative earthquake indicated. Squares to right and left of date indicate terminal points between which triggered creep slippage has occurred (creep either continuous or intermittent between these end points).



Holocene fault displacement (during past 11,700 years) without historic record. Geomorphic evidence for Holocene faulting includes sag ponds, scarps showing little erosion, or the following features in Holocene age deposits: offset stream courses, linear scarps, shutter ridges, and triangular faceted spurs. Recency of faulting offshore is based on the interpreted age of the youngest strata displaced by faulting.



Late Quaternary fault displacement (during past 700,000 years). Geomorphic evidence similar to that described for Holocene faults except features are less distinct. Faulting may be younger, but lack of younger overlying deposits precludes more accurate age classification.



Quaternary fault (age undifferentiated). Most faults of this category show evidence of displacement sometime during the past 1.6 million years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age. Unnumbered Quaternary faults were based on Fault Map of California, 1975. See Bulletin 201, Appendix D for source data.



Pre-Quaternary fault (older than 1.6 million years) or fault without recognized Quaternary displacement. Some faults are shown in this category because the source of mapping used was of reconnaissance nature, or was not done with the object of dating fault displacements. Faults in this category are not necessarily inactive.

ADDITIONAL FAULT SYMBOLS



Bar and ball on downthrown side (relative or apparent).



Arrows along fault indicate relative or apparent direction of lateral movement.



Arrow on fault indicates direction of dip.



Low angle fault (barbs on upper plate). Fault surface generally dips less than 45° but locally may have been subsequently steepened. On offshore faults, barbs simply indicate a reverse fault regardless of steepness of dip.

OTHER SYMBOLS



Numbers refer to annotations listed in the appendices of the accompanying report. Annotations include fault name, age of fault displacement, and pertinent references including Earthquake Fault Zone maps where a fault has been zoned by the Alquist-Priolo Earthquake Fault Zoning Act. This Act requires the State Geologist to delineate zones to encompass faults with Holocene displacement.



Structural discontinuity (offshore) separating differing Neogene structural domains. May indicate discontinuities between basement rocks.

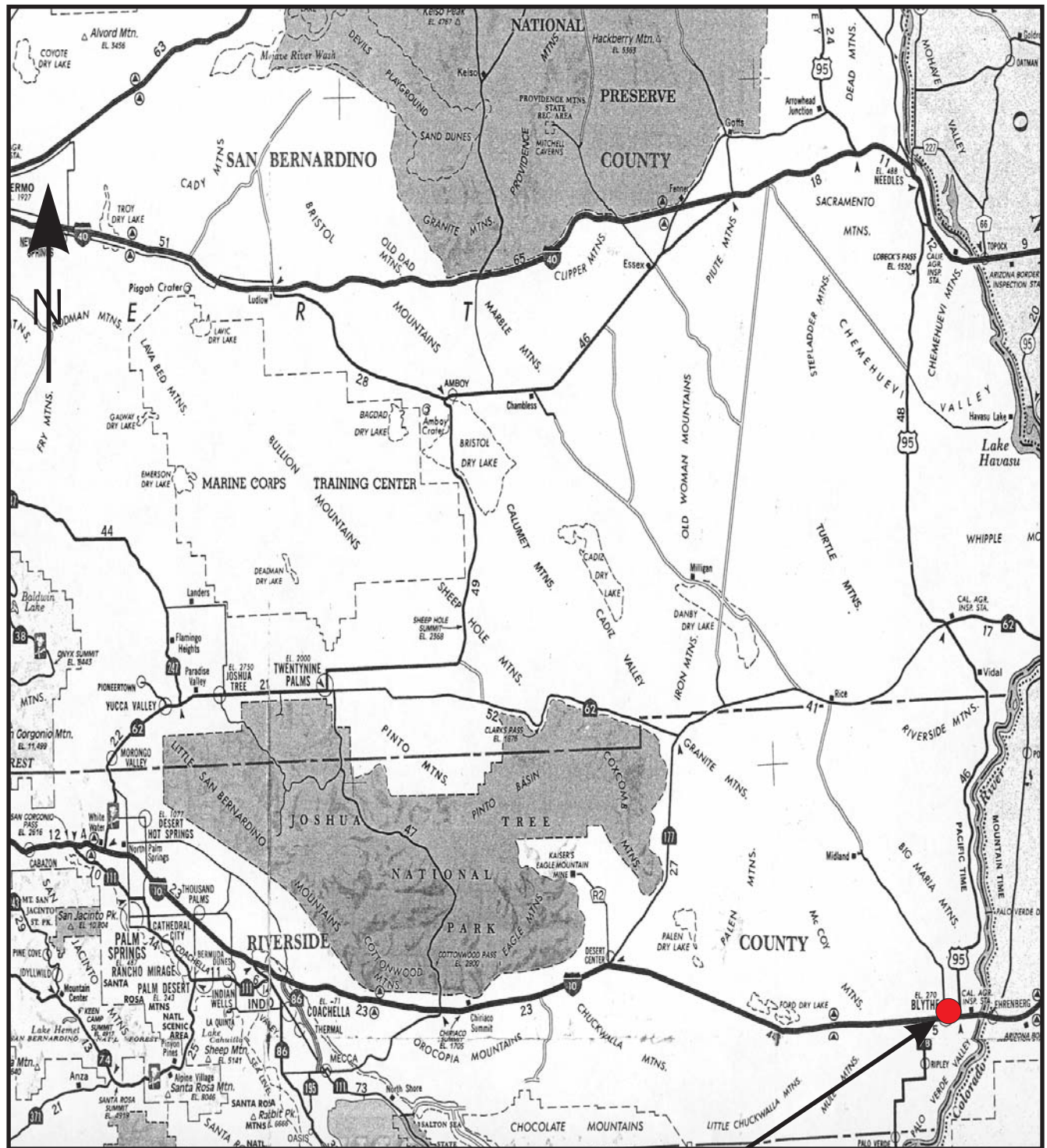


Brawley Seismic Zone, a linear zone of seismicity locally up to 10 km wide associated with the releasing step between the Imperial and San Andreas faults.

Geologic Time Scale	Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION	
				ON LAND	OFFSHORE
Quaternary	Historic			Displacement during historic time (e.g. San Andreas fault 1906). Includes areas of known fault creep.	
	200			Displacement during Holocene time.	Fault offsets seafloor sediments or strata of Holocene age.
	11,700			Faults showing evidence of displacement during late Quaternary time.	Fault cuts strata of Late Pleistocene age.
	700,000			Undivided Quaternary faults - most faults in this category show evidence of displacement during the last 1,600,000 years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age.	Fault cuts strata of Quaternary age.
Pre-Quaternary	1,600,000*			Faults without recognized Quaternary displacement or showing evidence of no displacement during Quaternary time. Not necessarily inactive.	Fault cuts strata of Pliocene or older age.
	4.5 billion (Age of Earth)				

* Quaternary now recognized as extending to 2.6 Ma (Walker and Geissman, 2009). Quaternary faults in this map were established using the previous 1.6 Ma criterion.

APPENDIX A



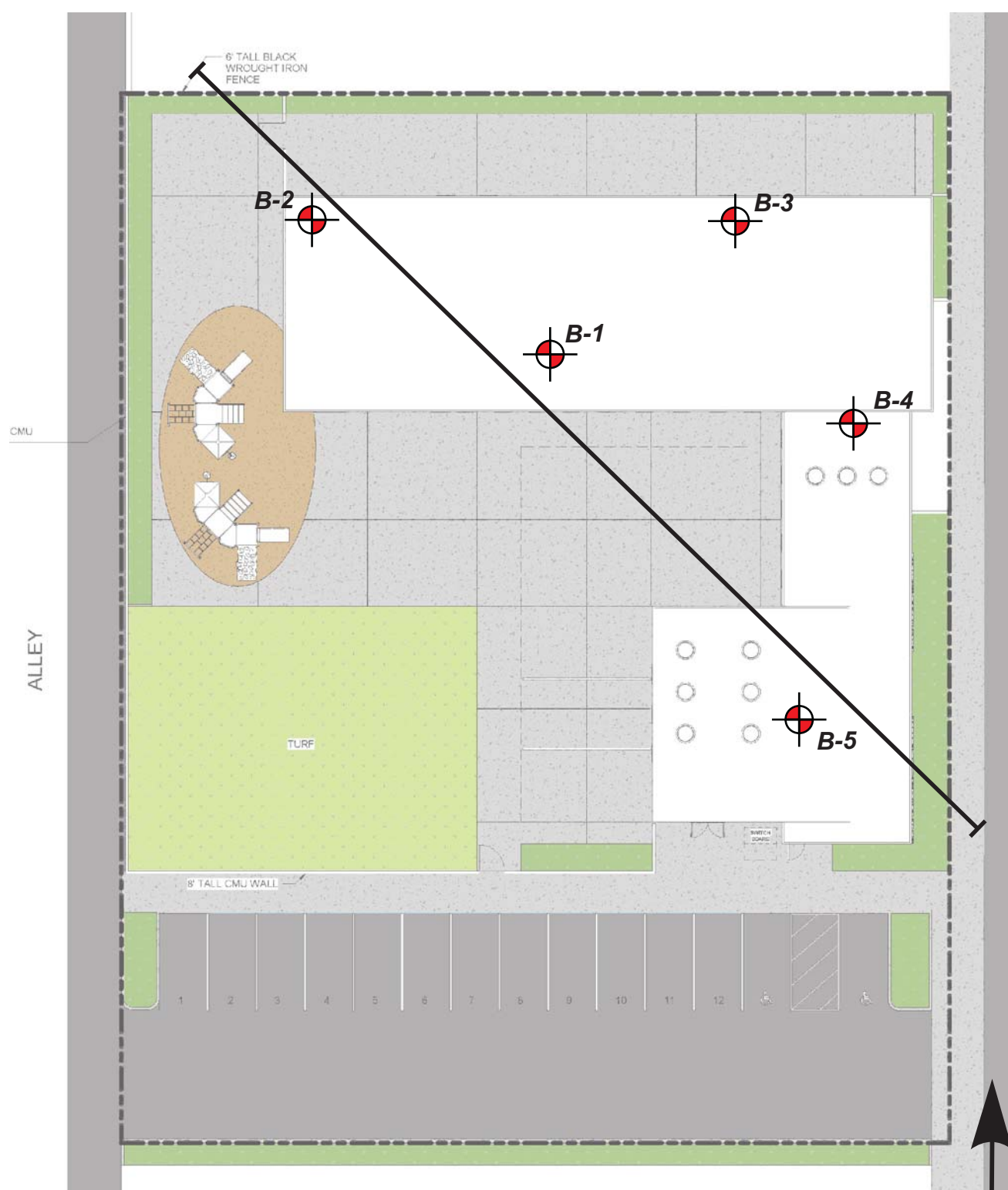
Project Site

LANDMARK
Geo-Engineers and Geologists


Project No.: LP21061

Vicinity Map

Plate
A-1



Legend

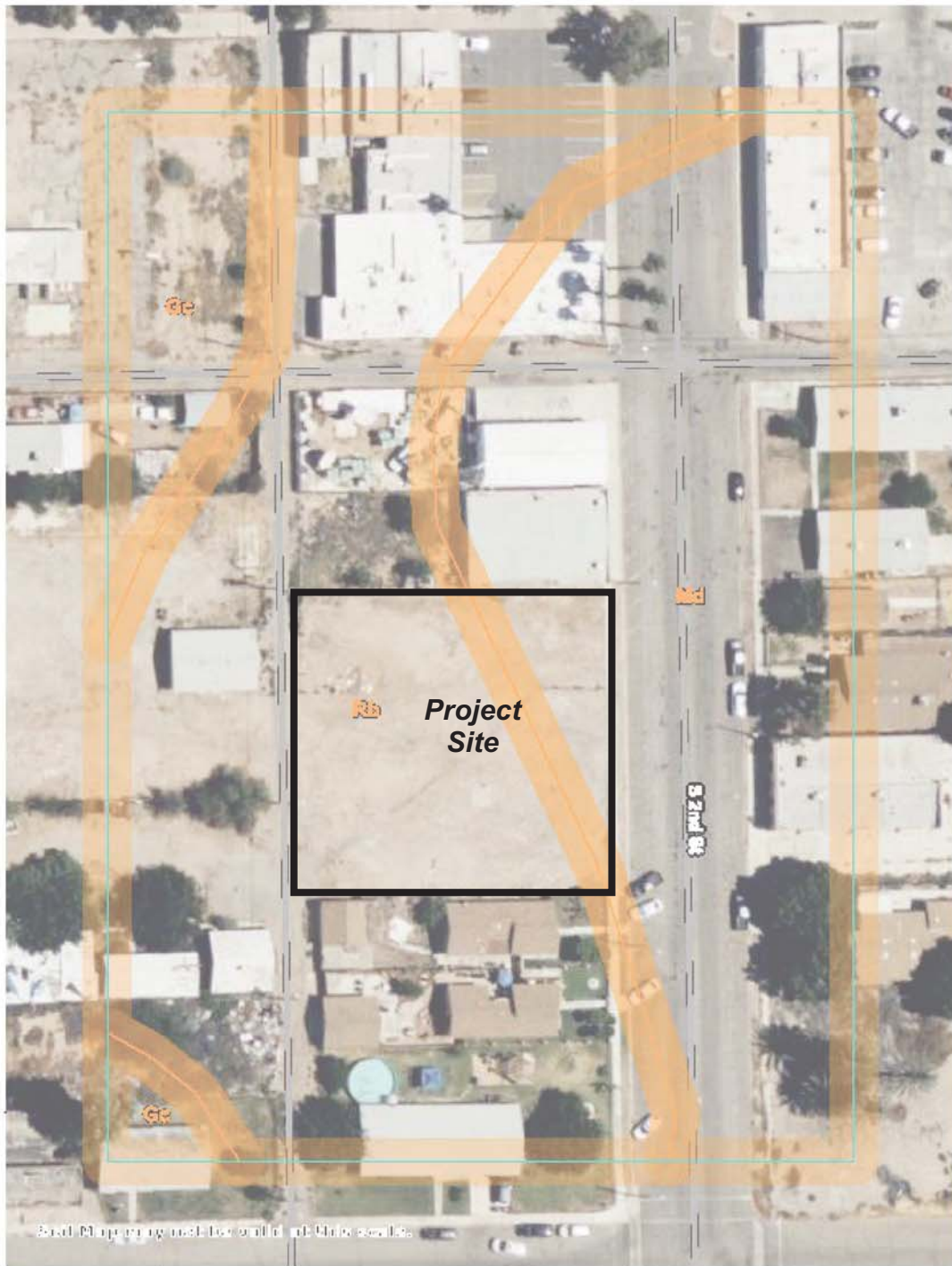
 Approximate Boring Location

LANDMARK
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Project No.: LP21061

Site and Exploration Plan

Plate
A-2



Aerial Mapping by web-soil.com. All other data scales.

N 42° 28' 40" W



Map Scale: 1:926 if printed on A portrait (8.5" x 11") sheet.

0 10 20 40 60 Meters

0 45 90 180 270 Feet

Map projection: Web Mercator. Corner coordinates: WGS84

N 42° 28' 40" W



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

6/10/2021
Page 1 of 3

LANDMARK

Geo-Engineers and Geologists

Project No.: LP21061

USDA Soil Conservation
Soil Service Map

Plate
A-3

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Palo Verde Area, California

Survey Area Data: Version 11, May 27, 2020

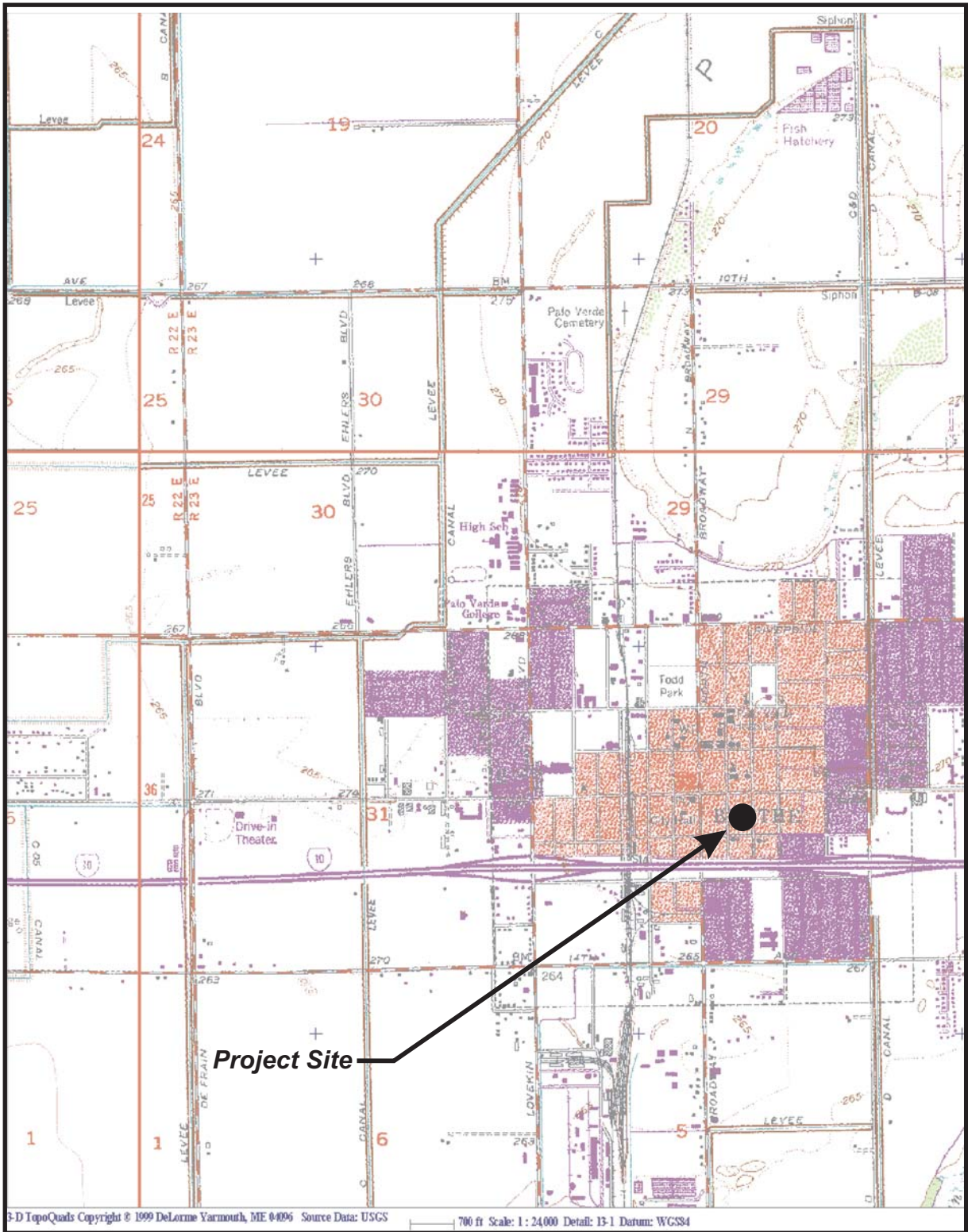
Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 4, 2020—Jun 7, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Gc	Gilman silty clay loam	0.4	9.1%
Md	Meloland fine sandy loam	1.8	40.7%
Rb	Ripley very fine sandy loam	2.2	50.2%
Totals for Area of Interest		4.4	100.0%



Reference: USGS Topographic Map
 Blythe, CA Quadrangle
 Scale 1:25,000

Site Coordinates
 Lat: 33.6093N
 Long: -114.5945W



LANDMARK

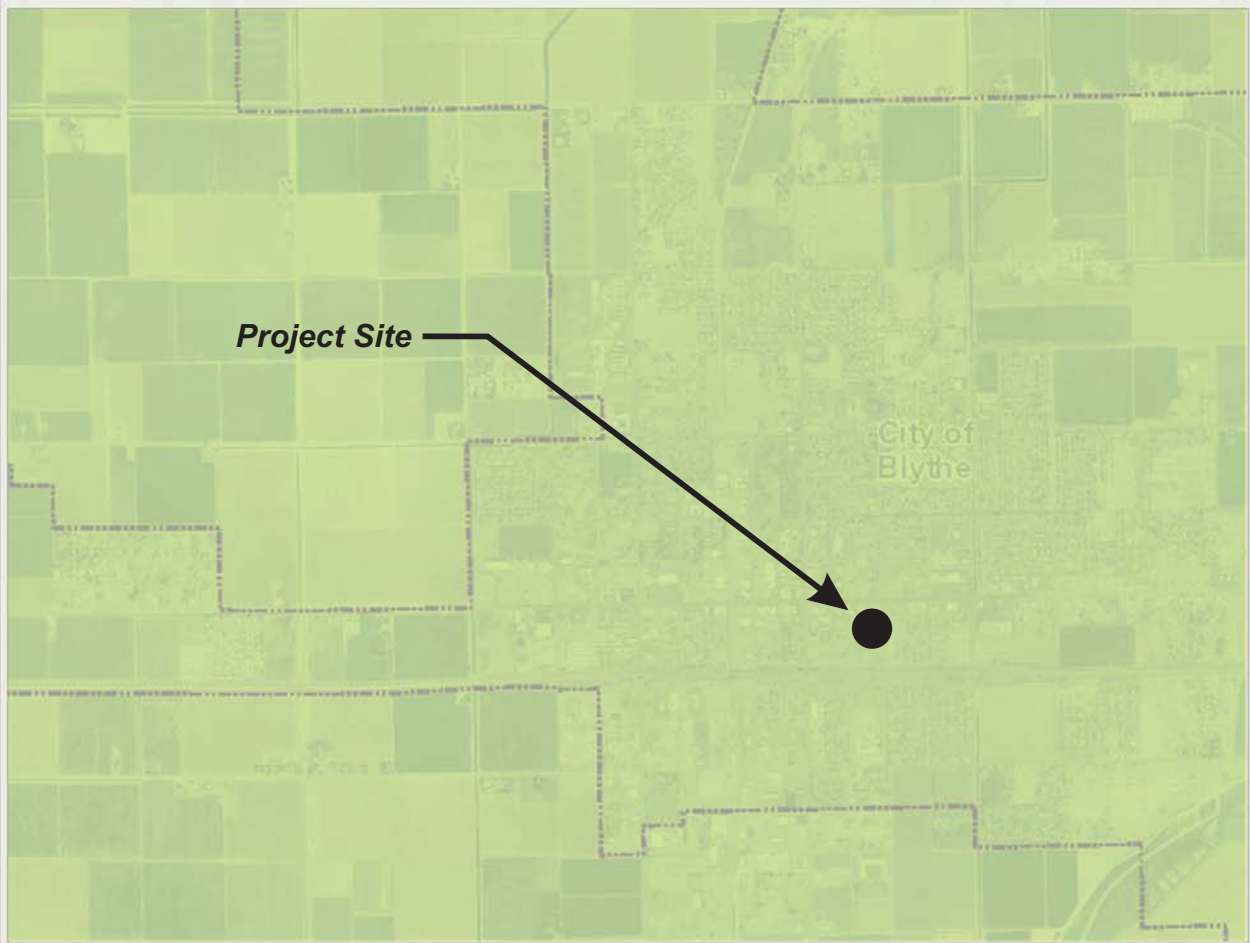
Geo-Engineers and Geologists

Project No.: LP21061

Topographic Map

Plate
 A-4

Liquefaction Map



Legend

- Liquefaction
 - Other Susceptibility
 - High
 - Low
 - Moderate
 - Very High
 - Very low
- Blueline Streams
- City Areas

Notes



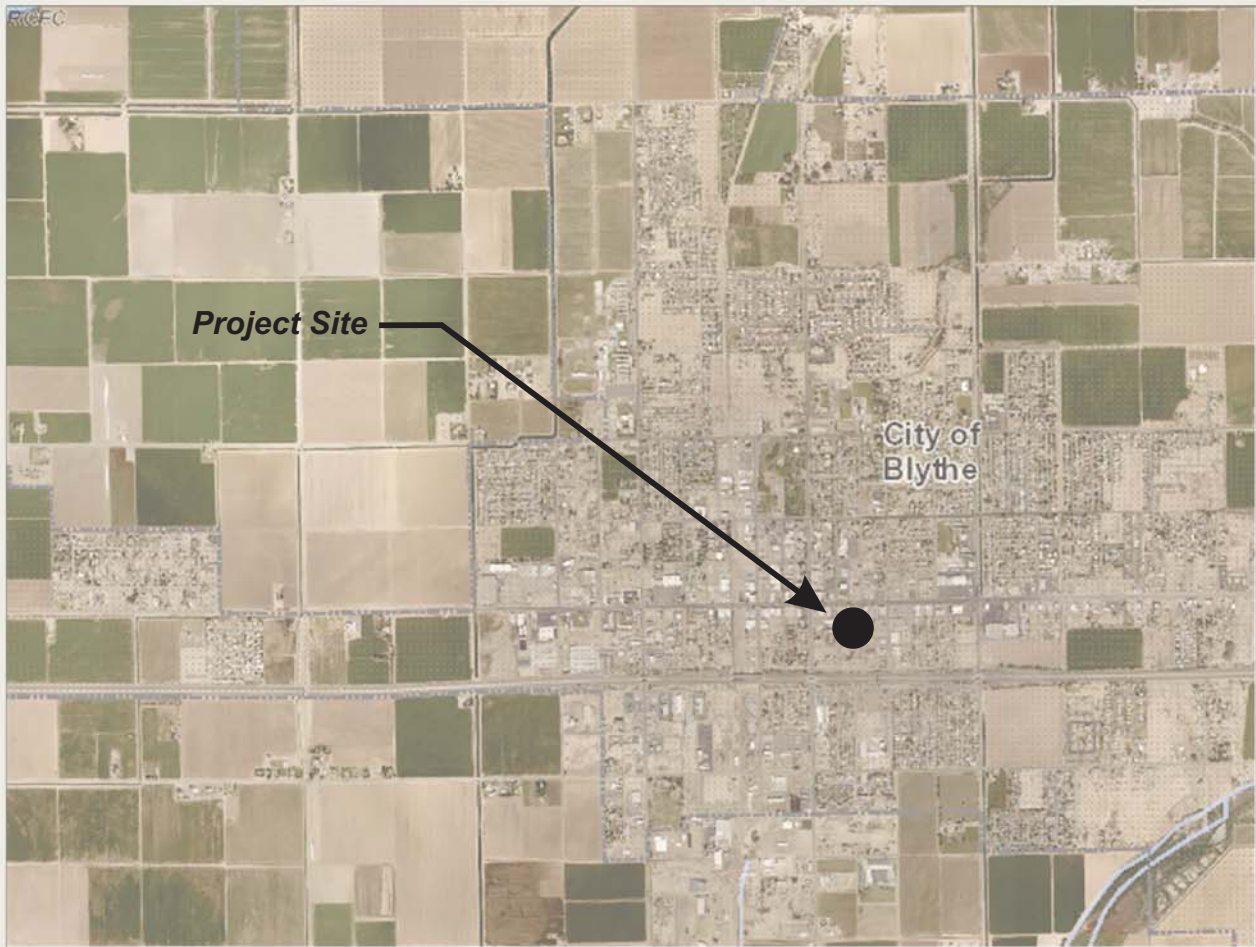
0 3,009 6,019 Feet

IMPORTANT Maps and data are to be used for reference purposes only. Map features are approximate, and are not necessarily accurate to surveying or engineering standards. The County of Riverside makes no warranty or guarantee as to the content (the source is often third party), accuracy, timeliness, or completeness of any of the data provided, and assumes no legal responsibility for the information contained on this map. Any use of this product with respect to accuracy and precision shall be the sole responsibility of the user.

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Flood Map



Legend

- Flood
- Blue-line Streams
- City Areas

Notes



0 3,009 6,019 Feet

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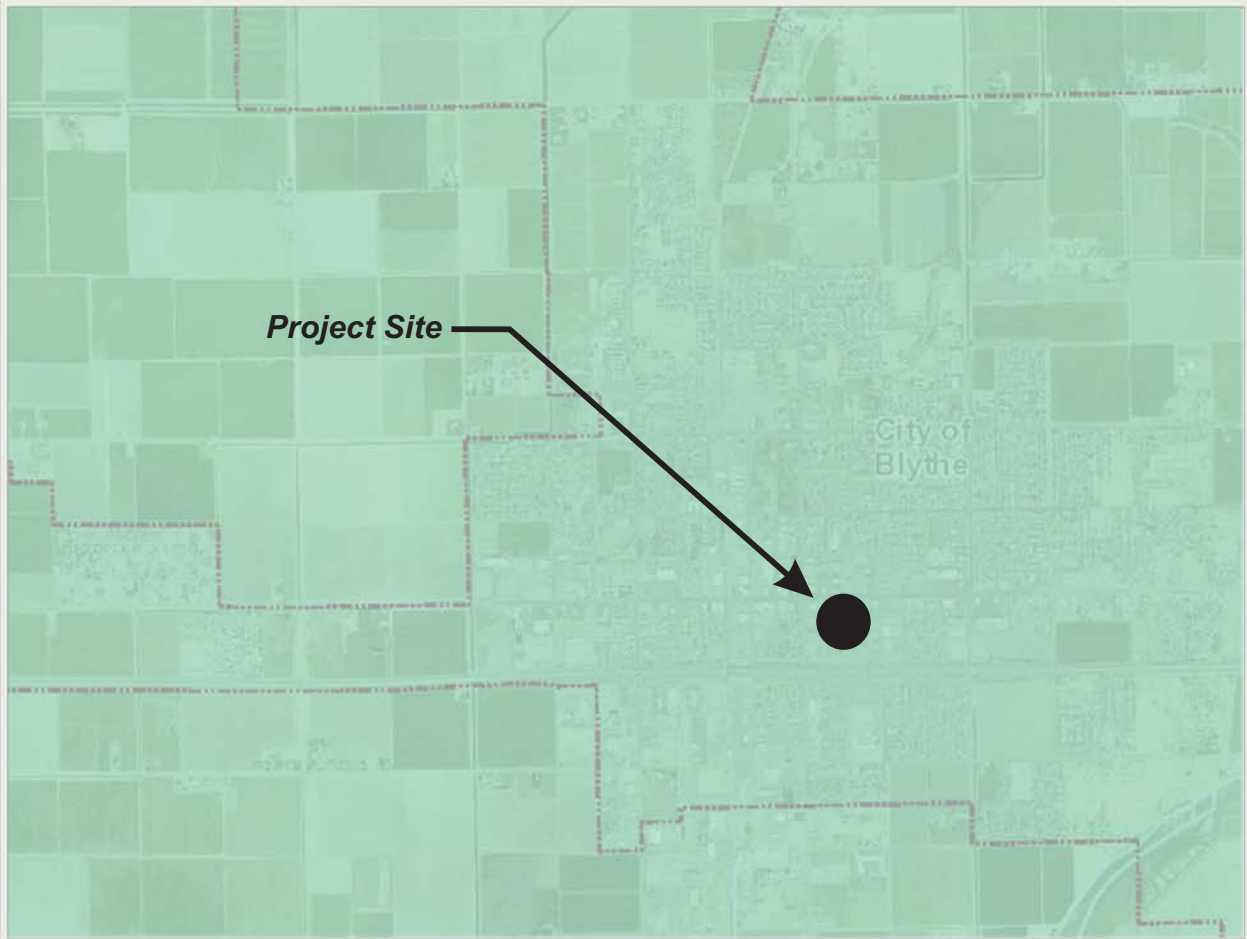
Geo-Engineers and Geologists

Project No.: LP21061

Riverside County
Geographic Information System (GIS)
Flood Zones

Plate
A-6

Subsidence Map



Legend

- Subsidence
 - Other Susceptibility (diagonal hatching)
 - Active (blue square)
 - Susceptible (green square)
- BlueLine Streams (dashed line)
- City Areas (dotted pattern)

Notes



0 3,009 6,019 Feet

'IMPORTANT' Maps and data are to be used for reference purposes only. Map features are approximate, and are not necessarily accurate to surveying or engineering standards. The County of Riverside makes no warranty or guarantee as to the content (the source is often third party), accuracy, timeliness, or completeness of any of the data provided, and assumes no legal responsibility for the information contained on this map. Any use of this product with respect to accuracy and precision shall be the sole responsibility of the user.

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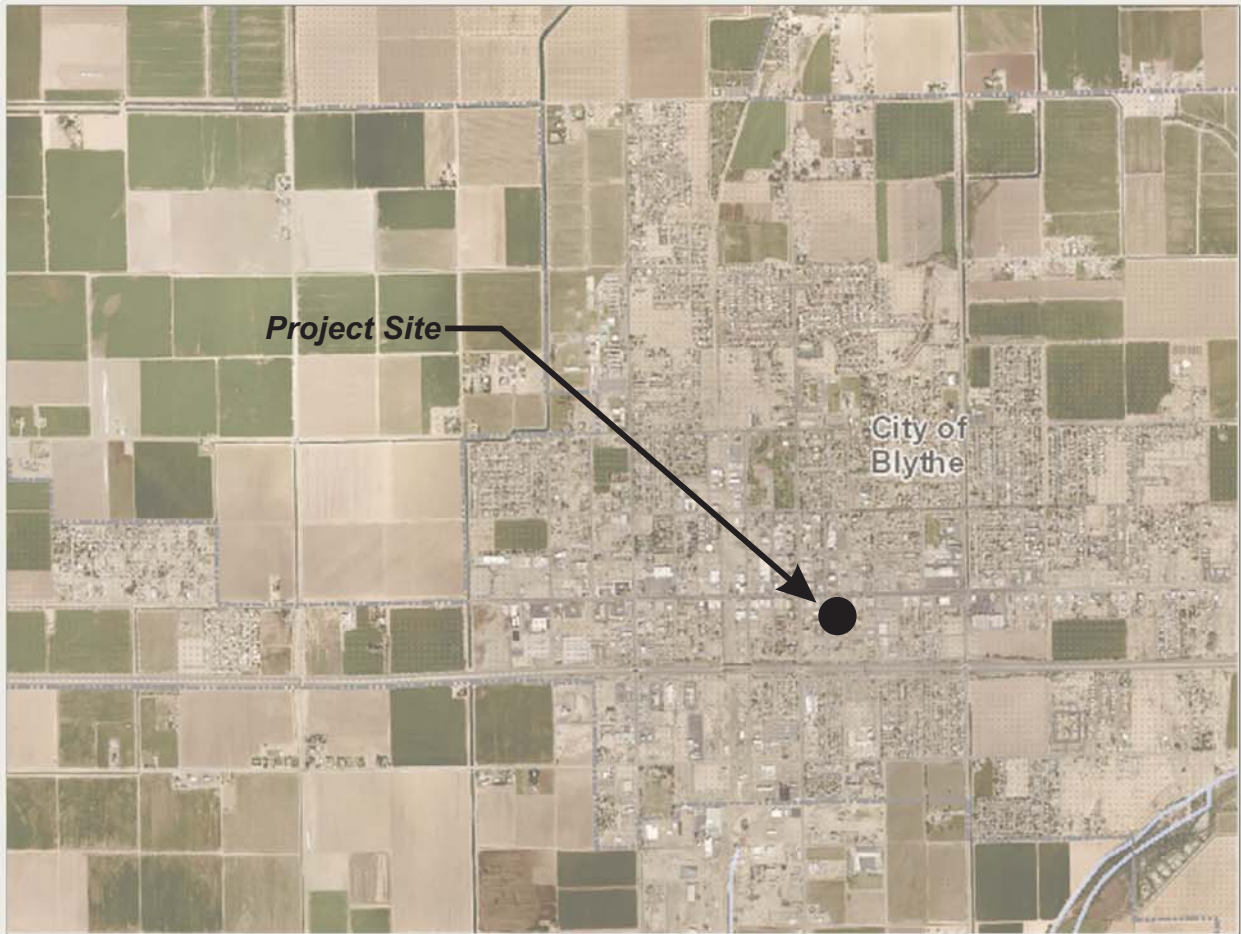
Geo-Engineers and Geologists

Project No.: LP21061

Riverside County
Geographic Information System (GIS)
Subsidence

Plate
A-7

Fault Map



Legend

- Faults**
 - OTHER AUTHORITY
 - ALQUIST-PRIGLO
 - RIVERSIDE COUNTY
- Fault Zones**
 - OTHER FAULT ZONE
 - COUNTY FAULT ZONE
 - ELSINORE FAULT ZONE
 - SAN ANDREAS FAULT ZONE
 - SAN JACINTO FAULT ZONE

Notes



0 3,009 6,019 Feet

IMPORTANT Maps and data are to be used for reference purposes only. Map features are approximate, and are not necessarily accurate to surveying or engineering standards. The County of Riverside makes no warranty or guarantee as to the content (the source is often third party), accuracy, timeliness, or completeness of any of the data provided, and assumes no legal responsibility for the information contained on this map. Any use of this product with respect to accuracy and precision shall be the sole responsibility of the user.

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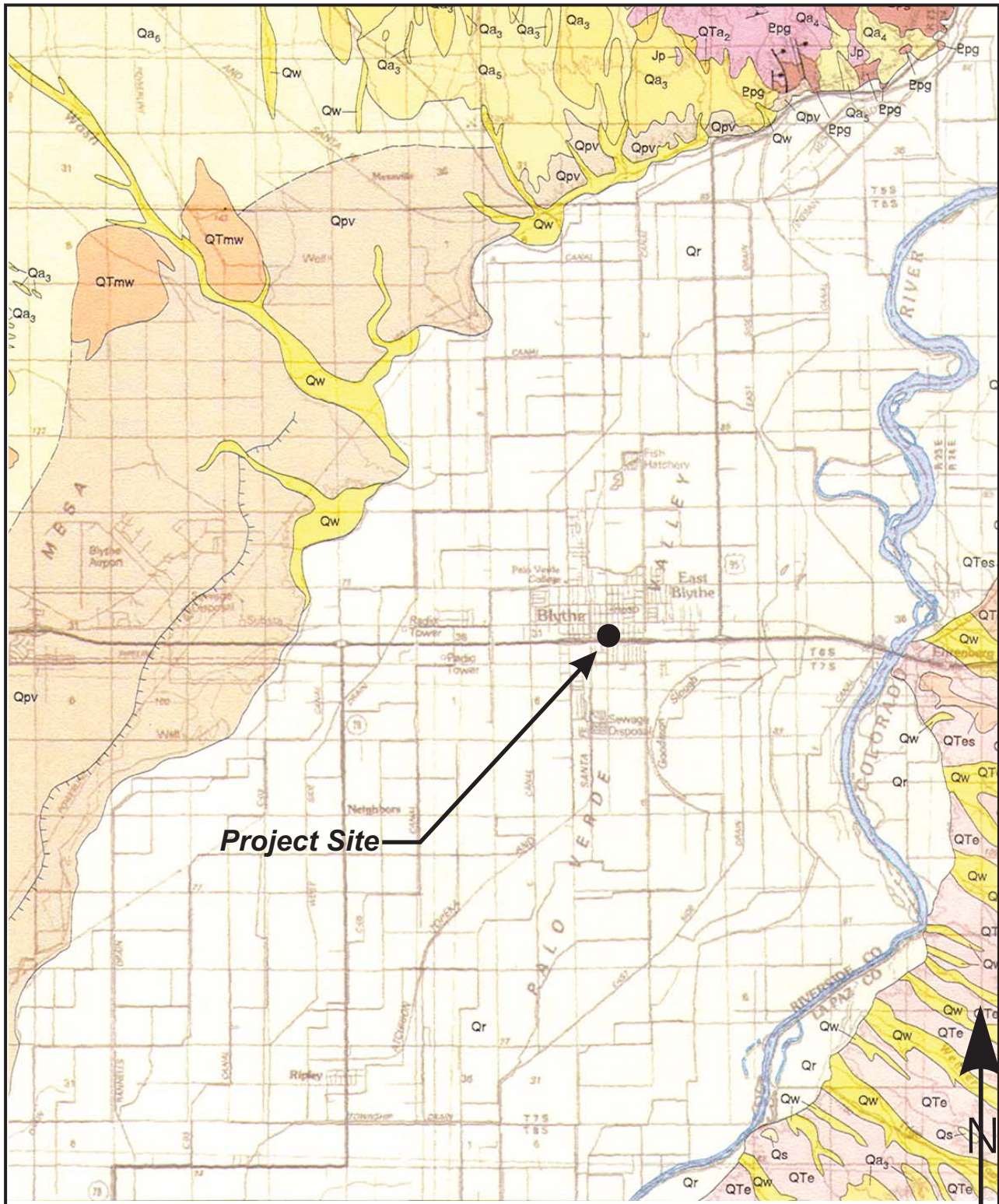
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LANDMARK
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Project No.: LP21061

Riverside County
Geographic Information System (GIS)
Fault and Fault Zone Map

Plate
A-8



LANDMARK
Geo-Engineers and Geologists

Project No.: LP21061

**Geologic Map of the West Half of the
Blythe 30' by 60' Quadrangle, Riverside County,
California, and La Paz County, Arizona**

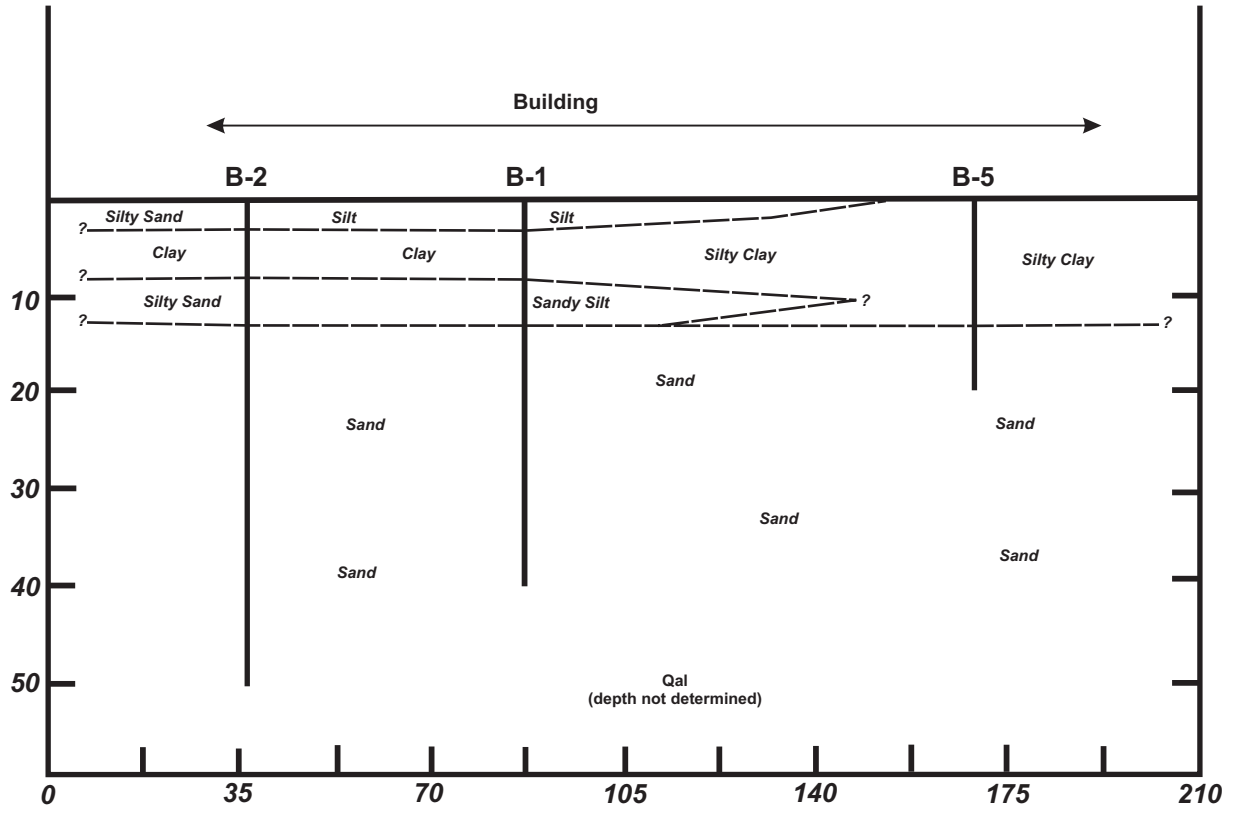
**Plate
A-9**

NW

SE

A

A'



Scale
 1" = 35' Horizontal
 1" = 20' Vertical

LANDMARK
 Geo-Engineers and Geologists

Project No.: LP21061

Schematic Geologic
 Cross-section

Plate
 A-10

APPENDIX B

DEPTH	FIELD				LOG OF BORING No. B-1 SHEET 1 OF 1	LABORATORY		
	SAMPLE	USCS CLASS.	BLOW COUNT	POCKET PEN. (tsf)		DESCRIPTION OF MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
5			10		SANDY SILT (ML): Reddish yellow, damp, medium dense, fine grained sand	92.3	8.1	Passing #200 = 81.3%
			13		CLAY (CH): Dark brown, very moist, stiff	93.7	27.2	Passing #200 = 97.8%
10			15		SANDY SILT (ML): Reddish yellow, damp, medium dense, fine grained sand	95.3	19.0	Passing #200 = 60.5%
			14			99.2	26.4	
15			68		SAND (SP): Brown, saturated, medium dense to dense, fine to medium grained very loose loose No recovery	112.6	17.5	Passing #200 = 4.4%
20			25					
25			3					
30			8					
35			6					
40			28					Passing #200 = 2.2%
45								
50								
55								
60								

Anticipated GW level

Total Depth = 41.5 ft
Groundwater measured at 12.5 ft. at time of drilling
Backfilled with excavated soil

DATE DRILLED: 5/13/21 TOTAL DEPTH: 41.5 feet DEPTH TO WATER: ~7 ft.
 LOGGED BY: L. Jackson TYPE OF BIT: Hollow Stem Auger DIAMETER: 8 in.
 SURFACE ELEVATION: Approximately 265' HAMMER WT.: 140 lbs. DROP: 30 in.

PROJECT NO. LE21061



PLATE B-1

DEPTH	FIELD				LOG OF BORING No. B-2 SHEET 1 OF 1	LABORATORY		
	SAMPLE	USCS CLASS.	BLOW COUNT	POCKET PEN. (tsf)		DESCRIPTION OF MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
5			15		SILTY SAND (SM): Yellow brown, damp, medium dense, fine grained	110.3	9.1	Passing #200 = 41.0%
			16		CLAY (CH): Dark brown, very moist, stiff	94.5	27.5	Passing #200 = 97.0% LL=66% PI=55%
10			10		SILTY SAND (SP): Reddish brown, saturated, medium dense, fine to medium grained	103.8	17.3	
			22			104.5	22.7	Passing #200 = 16.3%
15			54		SAND (SP): Brown, saturated, medium dense to dense, fine to medium grained	104.5	19.4	Passing #200 = 2.7%
20			30		No recovery			
25			3		very loose		21.8	
30			5		loose		20.7	Passing #200 = 1.8%
35			14					
40			10				20.1	Passing #200 = 2.3%
45			23		No recovery			
50			32				16.8	Passing #200 = 1.9%
55					Total Depth = 51.5 ft Groundwater measured at 12 ft. at time of drilling Backfilled with excavated soil			
60								

DATE DRILLED: 5/13/21 TOTAL DEPTH: 51.5 feet DEPTH TO WATER: ~7 ft.
LOGGED BY: L. Jackson TYPE OF BIT: Hollow Stem Auger DIAMETER: 8 in.
SURFACE ELEVATION: Approximately 265' HAMMER WT.: 140 lbs. DROP: 30 in.

PROJECT NO. LE21061



PLATE B-2

DEPTH	FIELD			LOG OF BORING No. B-3 SHEET 1 OF 1	LABORATORY					
	SAMPLE	USCS CLASS.	BLOW COUNT		POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS	
5			11		SILTY CLAY (CL): Reddish brown, very moist, stiff	102.3	7.7	Passing #200 = 81.7%		
			7						26.0	Passing #200 = 95.3%
			13						96.9	19.6
10			7		SAND (SP-SM): Yellow brown, saturated, loose, fine to medium grained	105.7	18.4	Passing #200 = 5.7%		
15			90		SAND (SP): Dark brown, saturated, very dense to medium dense, fine to medium grained					
20			23					Passing #200 = 1.8%		
25										
30										
35										
40										
45										
50										
55										
60										
					Total Depth = 21.5 ft Groundwater measured at 12.5 ft. at time of drilling Backfilled with excavated soil					

DATE DRILLED: 5/13/21 TOTAL DEPTH: 21.5 feet DEPTH TO WATER: ~7 ft.
LOGGED BY: L. Jackson TYPE OF BIT: Hollow Stem Auger DIAMETER: 8 in.
SURFACE ELEVATION: Approximately 265' HAMMER WT.: 140 lbs. DROP: 30 in.

PROJECT NO. LE21061



PLATE B-3

DEPTH	FIELD			LOG OF BORING No. B-4 SHEET 1 OF 1	LABORATORY			
	SAMPLE	USCS CLASS.	BLOW COUNT		POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS
5			2		SILTY CLAY (CL): Reddish brown, moist to very moist, stiff	97.5	19.9	Passing #200 = 95.2%
			12				▼ Anticipated GW level	28.6	Passing #200 = 98.5%
10			15		SANDY SILT (ML): Reddish brown, moist to saturated, medium dense to dense, fine grained sand	100.9	24.0	
			34				20.6	Passing #200 = 5.7%
15			30		SAND (SP): Dark brown, saturated, dense, fine to medium grained	104.4	20.1	Passing #200 = 3.8%
20			47				17.1	
25								
30								
35								
40								
45								
50								
55								
60								

Total Depth = 21.5 ft
 Groundwater measured at 12.0 ft. at time of drilling
 Backfilled with excavated soil

DATE DRILLED: 5/13/21 TOTAL DEPTH: 21.5 feet DEPTH TO WATER: ~7 ft.
 LOGGED BY: L. Jackson TYPE OF BIT: Hollow Stem Auger DIAMETER: 8 in.
 SURFACE ELEVATION: Approximately 265' HAMMER WT.: 140 lbs. DROP: 30 in.

PROJECT NO. LE21061



PLATE B-4

DEPTH	FIELD			LOG OF BORING No. B-5 SHEET 1 OF 1	LABORATORY					
	SAMPLE	USCS CLASS.	BLOW COUNT		POCKET PEN. (tsf)	DESCRIPTION OF MATERIAL	DRY DENSITY (pcf)	MOISTURE CONTENT (% dry wt.)	OTHER TESTS	
5			8		SILTY CLAY (CL): Reddish brown, very moist, stiff Anticipated GW level	96.7	14.6	Passing #200 = 98.6%		
			3					28.9	Passing #200 = 99.5%	
10			10					95.9	24.4	Passing #200 = 94.5%
			2					28.1		
15			21		SAND (SP): Dark brown, saturated, medium dense, fine to medium grained	101.7	17.5	Passing #200 = 2.7%		
20			17							
25										
30										
35										
40										
45										
50										
55										
60										

Total Depth = 21.5 ft
 Groundwater measured at 12.5 ft. at time of drilling
 Backfilled with excavated soil

DATE DRILLED: 5/13/21 TOTAL DEPTH: 21.5 feet DEPTH TO WATER: ~7 ft.
 LOGGED BY: L. Jackson TYPE OF BIT: Hollow Stem Auger DIAMETER: 8 in.
 SURFACE ELEVATION: Approximately 265' HAMMER WT.: 140 lbs. DROP: 30 in.

PROJECT NO. LE21061



PLATE B-5

DEFINITION OF TERMS

PRIMARY DIVISIONS	SYMBOLS	SECONDARY DIVISIONS
Coarse grained soils More than half of material is larger than No. 200 sieve	Gravels Clean gravels (less than 5% fines) Gravel with fines	GW Well graded gravels, gravel-sand mixtures, little or no fines
		GP Poorly graded gravels, or gravel-sand mixtures, little or no fines
		GM Silty gravels, gravel-sand-silt mixtures, non-plastic fines
		GC Clayey gravels, gravel-sand-clay mixtures, plastic fines
	Sands Clean sands (less than 5% fines) Sands with fines	SW Well graded sands, gravelly sands, little or no fines
		SP Poorly graded sands or gravelly sands, little or no fines
		SM Silty sands, sand-silt mixtures, non-plastic fines
		SC Clayey sands, sand-clay mixtures, plastic fines
Fine grained soils More than half of material is smaller than No. 200 sieve	Silts and clays Liquid limit is less than 50%	ML Inorganic silts, clayey silts with slight plasticity
		CL Inorganic clays of low to medium plasticity, gravelly, sandy, or lean clays
		OL Organic silts and organic clays of low plasticity
	Silts and clays Liquid limit is more than 50%	MH Inorganic silts, micaceous or diatomaceous silty soils, elastic silts
		CH Inorganic clays of high plasticity, fat clays
		OH Organic clays of medium to high plasticity, organic silts
Highly organic soils		PT Peat and other highly organic soils

GRAIN SIZES

Silts and Clays	Sand			Gravel		Cobbles	Boulders
	Fine	Medium	Coarse	Fine	Coarse		
	200	40	10	4	3/4"	3"	12"
	US Standard Series Sieve				Clear Square Openings		

Sands, Gravels, etc.	Blows/ft. *
Very Loose	0-4
Loose	4-10
Medium Dense	10-30
Dense	30-50
Very Dense	Over 50

Clays & Plastic Silts	Strength **	Blows/ft. *
Very Soft	0-0.25	0-2
Soft	0.25-0.5	2-4
Firm	0.5-1.0	4-8
Stiff	1.0-2.0	8-16
Very Stiff	2.0-4.0	16-32
Hard	Over 4.0	Over 32

* Number of blows of 140 lb. hammer falling 30 inches to drive a 2 inch O.D. (1 3/8 in. I.D.) split spoon (ASTM D1586).

** Unconfined compressive strength in tons/s.f. as determined by laboratory testing or approximated by the Standard Penetration Test (ASTM D1586), Pocket Penetrometer, Torvane, or visual observation.

Type of Samples:

Ring Sample
 Standard Penetration Test
 Shelby Tube
 Bulk (Bag) Sample

Drilling Notes:

1. Sampling and Blow Counts
 - Ring Sampler - Number of blows per foot of a 140 lb. hammer falling 30 inches.
 - Standard Penetration Test - Number of blows per foot.
 - Shelby Tube - Three (3) inch nominal diameter tube hydraulically pushed.
2. P. P. = Pocket Penetrometer (tons/s.f.).
3. NR = No recovery.
4. GWT = Ground Water Table observed @ specified time.

LANDMARK

Geo-Engineers and Geologists

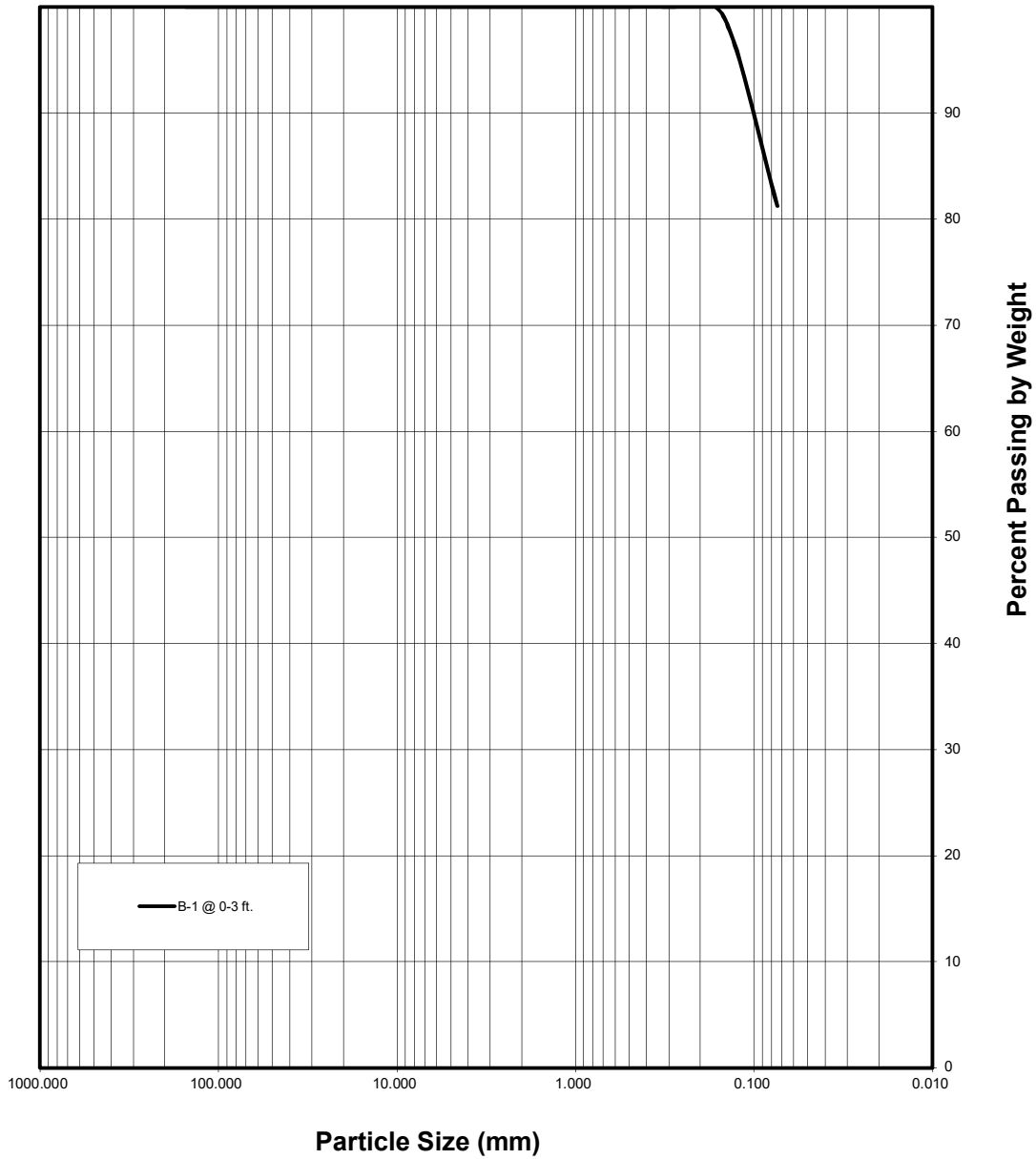
Project No. LP21061

Key to Logs

Plate
B-6

APPENDIX C

SIEVE ANALYSIS						
Cobbles and Boulders	Gravel		Sand			Silt and Clay
	Coarse	Fine	Coarse	Medium	Fine	



LANDMARK
Geo-Engineers and Geologists
Project No.: LP21061

Grain Size Analysis

Plate
C-1

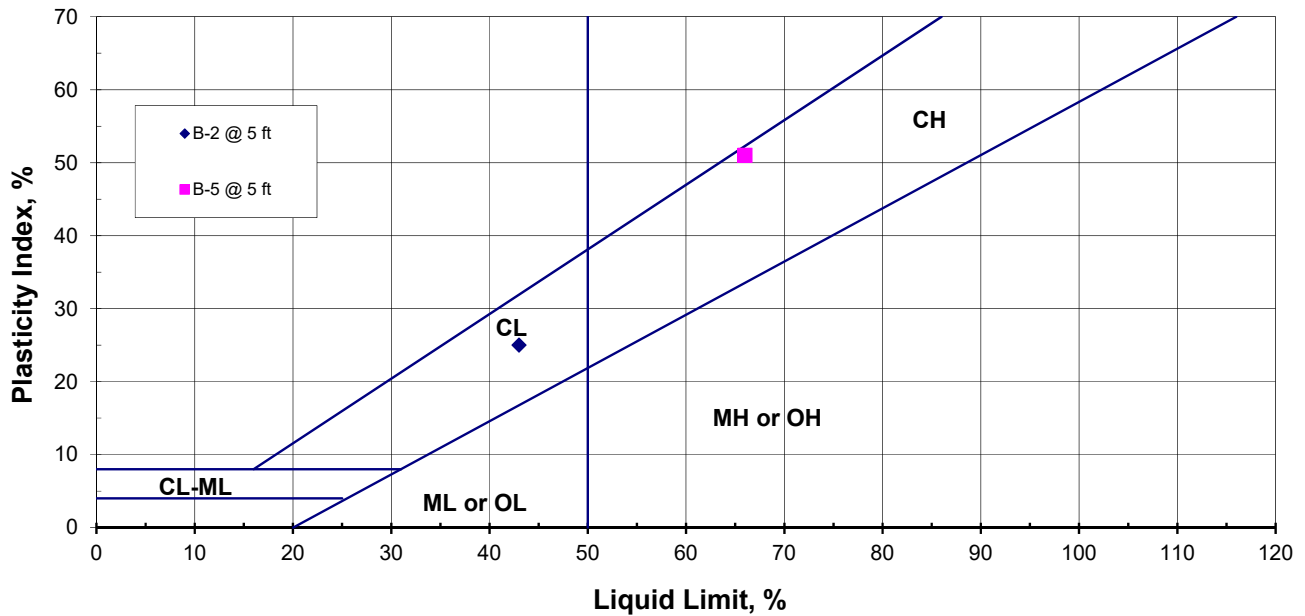
LANDMARK CONSULTANTS, INC.

CLIENT: Sillman
PROJECT: Child Development Center -- Blythe, CA
JOB No.: LP21061
DATE: 06/09/21

ATTERBERG LIMITS (ASTM D4318)

Sample Location	Sample Depth (ft)	Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	USCS Classification
B-2	5	43	18	25	CL
B-5	5	66	15	51	CH

PLASTICITY CHART



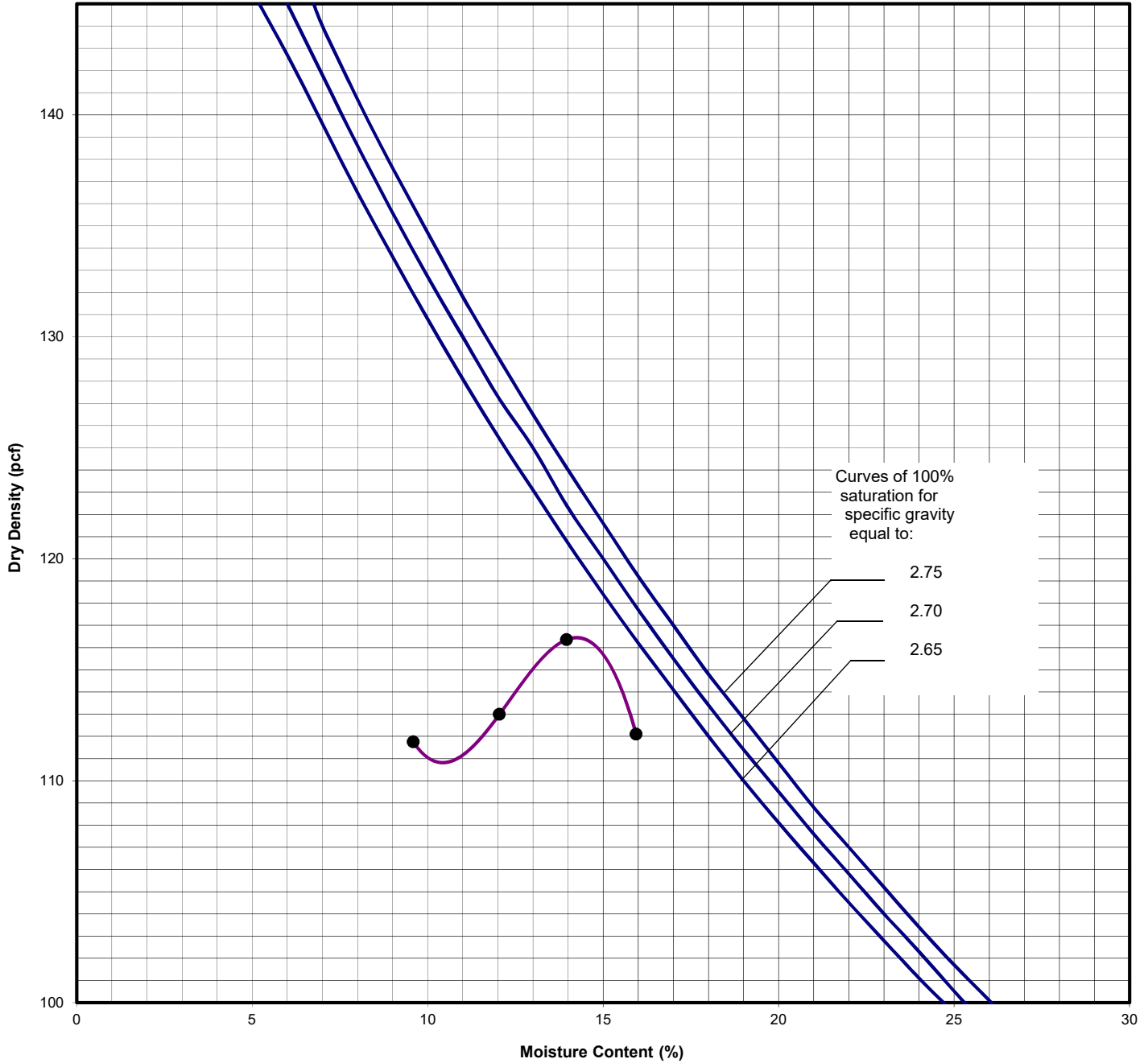
Project No.: LP21061

**Atterberg Limits
Test Results**

**Plate
C-2**

Client: Sillman
Project: Child Development Center - Blythe, CA
Project No.: LP21061
Date: 5/17/2021
Lab. No.: EC19-319

Soil Description: Silty Clay (CL)
Sample Location: B-1 @ 0-3 ft.
Test Method: ASTM-D-1557 (A)
Maximum Dry Density (pcf): 116.4
Optimum Moisture Content (%): 14.3



Project No.: LP21061

Moisture Density Relationship

Plate
C-3

LANDMARK CONSULTANTS, INC.

CLIENT: Sillman
PROJECT: Child Development Center - Blythe, CA
JOB No.: LP21061
DATE: 06/07/21

CHEMICAL ANALYSIS

Boring:	B-1	Caltrans Method
Sample Depth, ft:	0-3	
pH:	8.3	643
Electrical Conductivity (mmhos):	--	424
Resistivity (ohm-cm):	100	643
Chloride (Cl), ppm:	4,480	422
Sulfate (SO₄), ppm:	2,063	417

General Guidelines for Soil Corrosivity

Material Affected	Chemical Agent	Amount in Soil (ppm)	Degree of Corrosivity
Concrete	Soluble Sulfates	0 - 1,000	Low
		1,000 - 2,000	Moderate
		2,000 - 20,000	Severe
		> 20,000	Very Severe
Normal Grade Steel	Soluble Chlorides	0 - 200	Low
		200 - 700	Moderate
		700 - 1,500	Severe
		> 1,500	Very Severe
Normal Grade Steel	Resistivity	1 - 1,000	Very Severe
		1,000 - 2,000	Severe
		2,000 - 10,000	Moderate
		> 10,000	Low



Project No.: LP21061

Selected Chemical Test Results

Plate C-4

APPENDIX D

Liquefaction Evaluation and Settlement Calculation

Project Name: Child Development Center - Blythe, CA

Project No.: LP21061

Location: B-2

Maximum Credible Earthquake	7.4	Borehole Diameter	8 in.
Design Ground Motion	0.29 g	Rod Length	3 ft.
Total Unit Weight,	110 pcf	Rod Length	0.91 m.
Water Unit Weight,	62.4 pcf	Liners	N
Depth to Groundwater	7 ft	K aging	1
Depth to Groundwater	2.13 m		3
Hammer Efficiency	85	Percentile of Liquefaction	84
Required Factor of Safety	1.3		

Boring Data						Sampling Corrections							Corrected SPT (N ₁) ₆₀	Fines %	Compute Deterministic Vertical Strain					Individual Layer Subsidence (inches)
Depth (ft)	Depth (m)	Blow Counts SPT	Mod. Cal.	Liquefiable Soil (0 / 1)	σ _v ' (kPa)	Sampler Diameter	SPT N _m	Energy C _E	Borehole C _B	Rod C _R	Liner C _L	Overburden C _N			Content %	(N ₁) _{60,Cs} ^{site}	CRR(N ^{site})	CSR ^{site}	FS _L ^{site}	
2.5	0.76		15	0	13.17	1	15	1.42	1.15	0.75	1.0	1.70	31	41	36.74	1.42		10.00	0.00	
5	1.52		16	0	26.33	1	16	1.42	1.15	0.75	1.0	1.61	31	97	36.96	1.50		10.00	0.00	
7.5	2.29		10	1	38.01	1	10	1.42	1.15	0.80	1.0	1.54	20	16	23.64	0.23	0.16	1.37	0.17	
10	3.05		22	1	43.70	1	22	1.42	1.15	0.80	1.0	1.30	37	16	40.93	4.90	0.17	10.00	0.00	
15	4.57		54	1	55.10	1	54	1.42	1.15	0.85	1.0	1.06	79	3	79.45	10.00	0.30	10.00	0.00	
20	6.10		30	1	66.50	1	30	1.42	1.15	0.95	1.0	1.10	51	3	51.25	10.00	0.24	10.00	0.00	
25	7.62	3		1	77.89	1	3	1.42	1.15	0.95	1.0	1.17	5	2	5.44	0.08	0.29	0.27	3.20	
30	9.14	5		1	89.29	1	5	1.42	1.15	1.00	1.0	1.07	9	2	8.74	0.09	0.30	0.32	2.17	
35	10.67	14		1	100.68	1	14	1.42	1.15	1.00	1.0	1.00	23	2	22.87	0.21	0.30	0.72	0.91	
40	12.19	10		1	112.08	1	10	1.42	1.15	1.00	1.0	0.95	16	2	15.52	0.14	0.30	0.46	0.99	
45	13.72	23		1	123.47	1	23	1.42	1.15	1.00	1.0	0.94	35	2	35.11	0.98	0.31	3.21	0.00	
50	15.24	32		1	134.87	1	32	1.42	1.15	1.00	1.0	0.93	49	2	48.55	10.00	0.31	10.00	0.00	

Based on *Proceeding of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils*, Technical Report NCEER-97-0022, December 31, 1997.
 Sampling Corrections from Idriss and Boulanger (2010)

Total Settlement (in.) 7.43

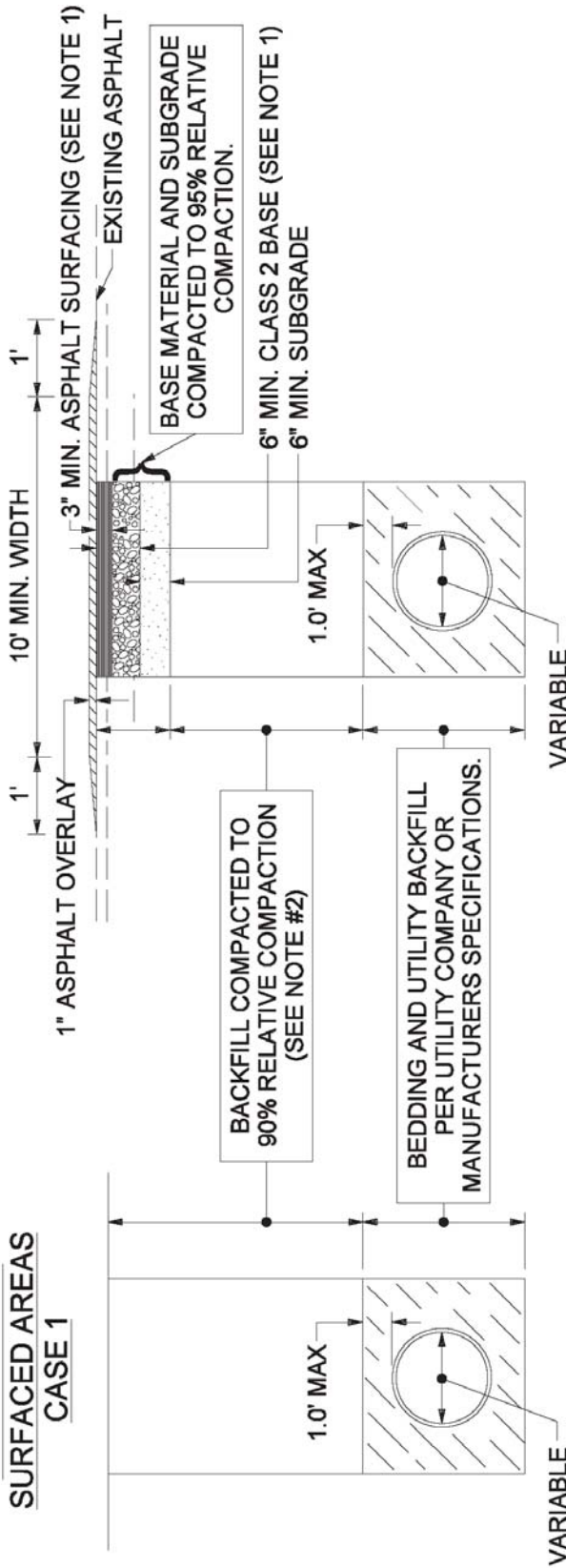
APPENDIX E

**ASPHALT SURFACED STREETS WITH
OVERLAY PARALLEL INSTALLATION**

CASE 2

**NON-ASPHALT
SURFACED AREAS**

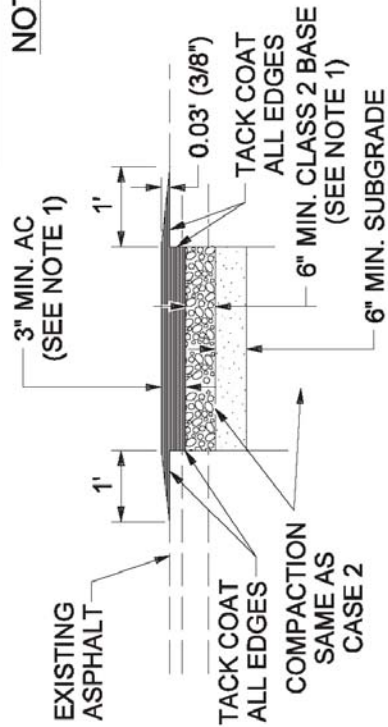
CASE 1



NOT TO SCALE

NOTES:

1. REPLACE STRUCTURAL SECTION AS FOLLOWS:
SURFACING: EXISTING THICKNESS; OR 3" MIN. A.C., TYPE B.
BASE: CLASS 2 A.B. IN SAME THICKNESS AS EXISTING
BASE MATERIAL, 6" MIN. AS DIRECTED BY THE INSPECTOR.
2. MAXIMUM LIFT THICKNESS IS 8 INCHES; MAXIMUM LIFT THICKNESS WHEN PONDING AND JETTING IS 4 FEET.
3. WHEN A FIRM FOUNDATION IS NOT ENCOUNTERED, DUE TO SOFT, SPONGY OR OTHER UNSUITABLE MATERIAL, SUCH MATERIAL SHALL BE REMOVED TO THE LIMITS DIRECTED BY THE DIRECTOR OF TRANSPORTATION OR AFFECTED UTILITY COMPANY AND THE RESULTING EXCAVATION BACKFILLED WITH PIPE BEDDING MATERIAL.



**ASPHALT SURFACED STREET WITHOUT
OVERLAY PERPENDICULAR INSTALLATION**

CASE 3

PROJECT SPECIFICATIONS
FOR CONSTRUCTION OF

**CHILD DEVELOPMENT CENTER
BLYTHE**

PREPARED FOR:

CHILD DEVELOPMENT CENTER BLYTHE
141 South 1st Street
Blythe, CA 92225

ARCHITECT:

SILLMAN
7515 METROPOLITAN DRIVE, SUITE 400
SAN DIEGO, CA 92108

DSA SUBMITTAL_V2
07/28/2022



SILLMAN



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PROFESSIONAL LICENSE STAMPS AND SIGNATURES

ARCHITECT

SILLMAN
7515 Metropolitan Drive, Suite 400
San Diego, CA 92108
Tel.: (619) 294-7515
Email: mbaker@sillmanwright.com



Mark L. Baker, C-18627

CIVIL

THE HOLT GROUP
36951 Cook Street, Suite 103
Palm Desert, CA 92211
Tel.: (760) 427-8533
Email: lholt@theholtgroup.net



Robert Holt

LANDSCAPE

MSLA LANDSCAPE ARCHITECTURE INC.
306 Canyon Falls Drive
Folsom, CA 95630
Tel.: (916) 989-3372
Email: mshular@msladesign.com



Michael Shular,

STRUCTURAL

CORE STRUCTURE, INC.
23172 Plaza Pointe Drive, Suite 145
Laguna Hills, CA 92653
Tel.: (949) 954-7244
Email: amir@corestructure.com



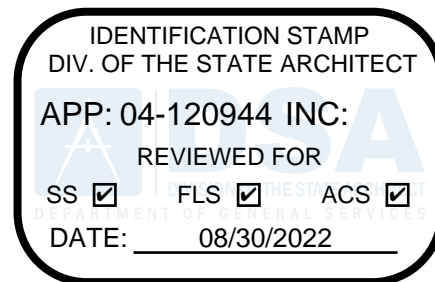
Shahram Noori, SE

ELECTRICAL

THE ENGINEERING PARTNERS, INC.
9565 Waples Street, Suite 100
San Diego, CA 92121
Tel.: (858) 824-1761
Email: bobby@engineeringpartners.com



Bendick Balisi, E21213



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Palo Verde College
Child Development Center Blythe

SECTION 01 10 00
SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Project information.
 - 2. Contract
 - 3. Engineers Estimate
 - 4. Access to site.
 - 5. Coordination with occupants.
 - 6. Work restrictions.
 - 7. Specification and drawing conventions.

1.3 PROJECT INFORMATION

- A. Summary of Work: The project consists of construction of (1) new building. The building is a one-story building totaling 8,912 S.F. Fire alarm and approved automatic sprinkler system will be installed throughout.

Project consists of permanent 24' x 40' modular buildings. Uses of space for building includes four (4) classrooms, office space, kitchen, and multipurpose room.

Exterior improvements include a lunch shelter, playground and green space for play, gardening, and parking. Off-site improvements will be per City of Blythe and will follow the guidelines provided by the City on the project review submittal.

- B. Project Identification: Palo Verde Community College, Child Development Center Blythe

- 1. Project Location: 141 South 2nd Street, Blythe, CA 92225

- C. District: Palo Verde Community College District

- D. Architect Identification: SILLMAN Architects. 7515 Metropolitan Drive, Suite 400, San Diego, CA 92108.

1.4 CONTRACT

- A. The Project will be constructed under a single prime contract.

1.5 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- B. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Driveways, Walkways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to District, District's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.
- D. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.6 COORDINATION WITH OCCUPANTS

- A. Partial District Occupancy: District will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with District during construction operations to minimize conflicts and facilitate District usage. Perform the Work so as not to interfere with District's operations. Maintain existing exits unless otherwise indicated.
 - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from District and authorities having jurisdiction.
 - 2. Provide not less than 72 hours' notice to District of activities that will affect District's operations.
- B. District Limited Occupancy of Completed Areas of Construction: District reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
 - 1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to District acceptance of the completed Work.
 - 2. On occupancy, District will assume responsibility for maintenance and custodial service for occupied portions of Work.

SUMMARY OF WORK

01 11 00 - 2

**Palo Verde Community College District
Child Development Center - Blythe**

1.7 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work to hours indicated in General Conditions. Exceptions to these hours include utility shutdowns and noisy activity.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by District or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 - 1. Notify District not less than seven days in advance of proposed utility interruptions.
 - 2. Obtain District's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to District occupancy with District.
 - 1. Notify District not less than seven days in advance of proposed disruptive operations.
 - 2. Obtain District's written permission before proceeding with disruptive operations.
- E. Controlled Substances: Use of tobacco products and other controlled substances on District property is not permitted.
- F. Summer break will occur from June 3 through August 13. Work must be performed between June 3 and August 1, 2017

1.8 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard] [and] [scheduled on Drawings.

SUMMARY OF WORK

01 11 00 - 3

**Palo Verde Community College District
Child Development Center - Blythe**

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 10 00

SUMMARY OF WORK

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**Palo Verde Community College District
Child Development Center - Blythe**

SECTION 01 25 00
SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Divisions 02 through 10 Sections for specific product and manufacturer requirements and for limitations on substitutions.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor. Substitutions include "or equal" products.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use form provided at the end of this Section.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by District and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.

- e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and Districts.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Submit requests for substitution not later than 7 days after the Notice to Proceed.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Requested substitution provides sustainable design characteristics that specified product provided.
 - c. Substitution request is fully documented and properly submitted.
 - d. Requested substitution will not adversely affect Contractor's construction schedule.
 - e. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - f. Requested substitution is compatible with other portions of the Work.
 - g. Requested substitution has been coordinated with other portions of the Work.
 - h. Requested substitution provides specified warranty.
 - i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 25 00

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REQUEST FOR SUBSTITUTION

Re: _____
 Section # _____ Project Name _____

 Date _____ Item _____

To: _____
 Architect _____

From: _____
 General Contractor _____

We hereby submit for your consideration the following product comparisons of the specified item and the proposed substitution:

A. Comparison	<u>Specified Item</u>	<u>Substitution</u>
1. Product Name/Model	_____	_____
2. Manufacturer	_____	_____
Address	_____	_____
Phone Number	_____	_____
3. Product Cost	_____	_____
Installation/Labor Cost	_____	_____
4. Delivery Time	_____	_____
Installation Time	_____	_____
5. Product Characteristics	_____	_____
	_____	_____
	_____	_____
	_____	_____
6. Dimensions	_____	_____
Effects	_____	_____
7. Guarantee/Warranty	_____	_____
8. CBC-ES No.	_____	_____
9. UL Rating	_____	_____

B. Substantiating Data: Attach manufacturer's literature for both specified item and substitution.

C. Samples: Provide samples for both specified item and substitution.

D. Similar Projects

1. _____ Date _____
Name
Address

2. _____ Date _____
Name
Address

E. Maintenance Service/Parts:

Name: _____
Address: _____

What effect does this substitution have on applicable code requirements?

G. Changes to Drawings and Specifications:

Attach information completely describing changes to be made to drawings and specifications.

- Contractor hereby certifies equal performance and assumes of liability for equal performance.
- Contractor hereby agrees to pay for all costs involved with changing the building design, including engineering, drafting, specifications editing, coordination, and preparation of detailed cost estimates, caused by the proposed substitution.

Submitted by:

Signature Printed Name

Title

Company Date

Address

Address

Telephone Email

Signature must be by person having authority to legally bind Contractor to the above terms. Failure to provide legally binding signature will result in retraction of approval.

For Use by District's Representative:

District's Design Consultant Date: _____	School District Date: _____
<input type="checkbox"/> Accepted <input type="checkbox"/> Not Accepted	<input type="checkbox"/> Accepted <input type="checkbox"/> Not Accepted
By (print): _____	By (print): _____
Title: _____	Title: _____
Signature: _____	Signature: _____

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SECTION 01 31 00
PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General coordination procedures.
2. Administrative and supervisory personnel.
3. Coordination drawings.
4. RFIs.
5. Project meetings.

- B. Related Requirements:

1. Section 01 32 01 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
2. Section 01 73 00 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
3. Section 01 77 00 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. RFI: Request for Information. Request from Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Key Personnel Names: Within ten (10) days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1. Post copies of list in project meeting room, in temporary field office, in web-based Project software directory, in prominent location in each built facility, and by each temporary telephone. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for District and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities, including those of the District and separate contractors, to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Pre-installation conferences.
 - 7. Project closeout activities.
 - 8. Startup and adjustment of systems.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1.6 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
 - 1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

- a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
- b. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
- c. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
- d. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
- e. Indicate required installation sequences.
- f. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling, raised access floor, and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:
 - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
 - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
7. Review: Architect will review coordination drawings to confirm that in general the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.
8. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 01 33 00 "Submittal Procedures."

1.7 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, prepare and submit an RFI using the District's

PROJECT MANAGEMENT AND COORDINATION

01 31 00 - 3

Palo Verde College

Child Development Center Blythe

Document Control Software. Immediately notify the District Construction Manager, Project Inspector, District Project Manager, Architect, and Document Controls Specialist of all RFIs submitted.

1. Architect will return RFIs submitted by other entities controlled by Contractor with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
 2. RFI number, numbered sequentially (for revised RFIs, keep the original RFI number, but add an R1, R2, etc. as a suffix.)
 3. Date of RFI Question.
 4. Name of Contractor, as well as name of individual from Contractor submitting the RFI.
 5. Name of Architect.
 6. RFI subject.
 7. Detailed description of item needing information or interpretation.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution, if any. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow five (5) working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day. Incomplete RFIs or inaccurately prepared RFIs will be returned without action.
13. RFIs will be returned without action if they are used for any purpose other than a request for information. Such uses may include, but are not limited to the following:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 14. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
- E. RFI Log: The contractor shall prepare an RFI Log. The Log will be brought to each weekly Project meeting by the contractor.

1.8 PROJECT MEETINGS

- A. General: Attend all project meetings. Contractor will schedule and conduct meetings and conferences at Project site unless otherwise indicated.
1. Attendees: Contractor will inform participants and others involved, and individuals whose presence is required, of date and time of each meeting.
 2. Minutes: Contractor will record meeting results.
- B. Preconstruction Conference: District will schedule a preconstruction conference before starting construction, at a time convenient to District, but no later than fourteen (14) calendar days after execution of the Notice to Proceed.
1. District will conduct the conference to review responsibilities and personnel assignments.
 2. Attendees: Authorized representatives of District, District's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect progress. Agenda may include, but is not limited to, the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for RFIs.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.
 - j. Distribution of the Contract Documents.
 - k. Submittal procedures.
 - l. Commissioning requirements and procedures.
 - m. Indoor environmental air quality management during construction.
 - n. Preparation of record documents.
 - o. Use of the premises and existing building.
 - p. Work restrictions.
 - q. Working hours.
 - r. District's occupancy requirements.
 - s. Responsibility for temporary facilities and controls.
 - t. Procedures for moisture and mold control.
 - u. Procedures for disruptions and shutdowns.
 - v. Construction waste management and recycling.
 - w. Parking availability.
 - x. Office, work, and storage areas.
 - y. Equipment deliveries and priorities.
 - z. First aid.
 - aa. Security.
 - bb. Progress cleaning.
 - cc. Request for Information procedures.
 - dd. Request for Substitution procedures.
 - ee. Use of District's Document Control Software for RFIs.

4. District will record meeting results and distribute them to all parties in attendance within two (2) days of meeting.
- C. Project Closeout Conference: District will schedule and conduct a project closeout conference, at a time convenient to District and Architect, but no later than thirty (10) days prior to the scheduled date of Substantial Completion.
1. Conference will be conducted to review requirements and responsibilities related to Project closeout.
 2. Attendees: Authorized representatives of District, District's Commissioning Authority, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect or delay Project closeout including, but not limited to, the following:
 - a. Preparation of record documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties.
 - d. Requirements for preparing operations and maintenance data.
 - e. Requirements for delivery of additional stock and spare parts.
 - f. Requirements for demonstration and training.
 - g. Commissioning requirements and procedures.
 - h. Indoor environmental air quality requirements prior to occupancy.
 - i. Preparation of Contractor's punch list.
 - j. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - k. Submittal procedures.
 - l. The District's partial occupancy requirements.
 - m. Installation of the District's furniture, fixtures, and equipment.
 - n. Responsibility for removing temporary facilities and controls.
 4. Minutes: Contractor will record meeting results and distribute to all parties in attendance within two (2) days of meeting.
- D. Progress Meetings: District will conduct two Project Progress Meetings. Project Progress Meetings are in addition to specific meetings held for other purposes, such as Schedule Review Meetings.
1. Attendees: In addition to representatives of District and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: District will review minutes of previous progress meeting. District will review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Schedule Updating: Revise Look-Ahead Schedule prior to each Progress Meeting. Send (by Email) the revised Look-Ahead Schedule to the District and Architect no later than 24 hours before the next Progress Meeting. The Look-Ahead Schedule shall be submitted in PDF electronic file format using computer software acceptable to District.

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- b. Review present and future needs of each entity present including, but not limited to, the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Progress cleaning.
 - 11) Quality and work standards.
 - 12) Status of correction of deficient items.
 - 13) Field observations.
 - 14) Status of RFIs.
 - 15) Status of proposal requests.
 - 16) Pending changes.
 - 17) Status of Change Orders.
 - 18) Documentation of information for payment requests.

- 3. Minutes: Contractor will record meeting results and distribute to all parties in attendance within two (2) days of the meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

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SECTION 01 31 10
CONTRACTOR PERSONNEL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes Contractor personnel to be assigned to this Project.
- B. Related Requirements:
 - 1. Section 01 31 00 "Project Management and Coordination" for project management procedures.

1.3 KEY CONTRACTOR PERSONNEL

- A. Contractor shall assign the following minimum personnel to the project:
 - 1. Contractor Construction Superintendent: Full Time on-site.

1.4 REQUIREMENTS FOR KEY PERSONNEL

- A. Contractor Construction Manager shall have a minimum of ten years experience as Construction Manager or Superintendent on projects of similar size and scope.
- B. Contractor Construction Superintendent shall have a minimum of ten years experience as Construction Superintendent on projects of similar size and scope.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 10

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SECTION 01 32 01
CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's construction schedule.
 - 2. Daily construction reports.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary".
 - 2. Section 01 33 00 "Submittal Procedures" for submitting schedules and reports.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Except for Milestone Activities, activities included in a schedule consume time and resources.
 - 1. Critical Activity: An activity, if delayed, would result in the delay to the overall completion.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
 - 4. Milestone Activity: An activity that does not occupy time or resources, but highlights an event.
- B. Calendar: Defines the week for different activities within the CPM schedule. Examples of calendars include 5-day week minus holidays, 7-day week, and 6-day week. Different calendar types may be used in the CPM schedule.
- C. Constraint: In the CPM schedule, a constraint is used to affect the float, duration, or date of an activity.
- D. CPM: Critical path method, which is a method of planning and scheduling a project where activities are arranged based on activity relationships.
 - 1. CPM Network: A sequence of inner-connected activities. Network calculations determine the Critical (Longest) Path and when activities can be performed.

- E. Critical (Longest) Path: The network of schedule activities that establishes the minimum overall Project duration.
- F. Data Date: The date used as the starting point for schedule calculations. For baseline CPM schedules, the Data Date is the first date of Contract Time. For monthly updates, the Data Date is the first workday of the month.
- G. Day: A calendar day, unless otherwise specifically defined. Where "Day" is inherently differently defined, such as in schedules prepared using Microsoft Project, convert days to account for specified calendar days.
- H. Delay: An interruption of work.
- I. Milestone: The starting or ending point of an activity or linked series of activities. A milestone in the schedule contains zero duration.
 - 1. Key Milestone: A major event. A Key Milestone includes, but is not limited to the following: Notice to Proceed, Substantial Completion, Phase Start Date, and Phase Finish Date. The District Construction Manager may direct the Contractor to add additional Key Milestones.
 - 2. Contractual Milestone: A milestone tied to Liquidated Damages. Substantial Completion is both a Key and Contractual Milestone.
- J. Float: The measure of leeway in starting and completing an activity.
 - 1. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - 2. Total float is the amount of time by which a part of the Work may be delayed from its early dates before it delays a succeeding activity.
 - 3. Contract Float: The amount of time between the Contractor's anticipated dates for early completion of the Work, or specified part, and the corresponding Contract Time.
 - 4. Ownership of Float: Total float and contract float belong to the project and are not for the exclusive benefit of any party. Total float and contract float are jointly owned, and are resources available to the District or the Contractor on a first-come-first-served-basis for the benefit of the project. The District Construction Manager shall monitor float to determine if any float erosion is for the benefit of the project
 - 5. Float Manipulation: Utilizing unrealistic or inflated durations, imposed dates, artificial logic and/or lags, preferential logic, date constraints, and others that results in an impact to Float. Do not manipulate float. Instead, add detail within the schedule in order to mitigate the use of Float manipulation. Provide a detailed written explanation in the Baseline Narrative for items seen as potential float manipulation if directed by District Construction Manager. After a review of the Baseline Schedule and the detailed written explanation, any such actions ultimately seen as Float manipulation by the District Construction Manager may result in direction for a Baseline revision and re-submittal.
- K. Lag: An adjustment of time between tied CPM schedule activities.
- L. Near-Critical Activity: A non-critical activity with a Total Float value within 10 workdays of the Critical (Longest) Path.
- M. Percent Complete: The portion of an activity that is complete based on the measurement of work accomplished. Percent completes are ultimately decided by the District Construction Manager.
- N. Relationships: Ties between activities within the CPM schedule.

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O. TIA: Time Impact Analysis.

1.4 INFORMATIONAL SUBMITTALS

A. Submit required submittals per the following:

1. Indication of type of schedule being submitted (Baseline, Monthly Schedule Update, Time Impact Analysis, etc.)
2. PDF electronic file(s).
3. Electronic software file (for all CPM schedule submittals). Provide a unique file name in the schedule software for all CPM Schedules.

B. Reports: As part of every CPM schedule submittal, submit each of the following reports:

1. Detailed Gantt Chart: Individual columns on left shall contain activity number, activity description, original duration, remaining duration, early start date, early finish date, calendar identifier, and total float. Activities shall be grouped in a manner acceptable to the District Construction Manager. All activities shall be depicted, and activities shall be sorted by early start dates, then total float and early finish dates. Gantt Chart shall be on a page of sufficient width required to display entire schedule for Contract Time. Size of paper/sheet is at discretion of District Construction Manager, and sheet size shall range from 8.5" x 11" to 11" x 17". Gantt Chart shall depict relationship lines between activities and shall also clearly show the Critical (Longest) Path.
 - a. Columns on monthly updates shall also include: current month's activity percent complete.
2. Schedule Narrative Report: With every CPM schedule submittal, submit a schedule narrative. The narrative report shall contain the following:
 - a. Baseline Schedule: Explanations of assumptions in baseline schedule development including:
 - 1) General work sequencing, including phasing and interim housing considerations.
 - 2) Justification of Critical (Longest) Path.
 - 3) Long lead equipment or material items.
 - 4) Constraints and challenges to completing the work.
 - 5) Work week schedule, work hours and non-working days, including holidays.
 - 6) Person(s) preparing and providing input towards schedule submittal.
 - b. Monthly Update: Items in this narrative report shall include:
 - 1) Physical progress accomplished during the report period, broken down by each building and site area (for example, parking lot, play field, second floor, etc.).
 - 2) Explanation of Critical (Longest) Path if changed from previous month's update (or accepted Baseline, if first Monthly Schedule Update).
 - 3) Explanation of potential delays and/or problems and their estimated impact on performance, Key and Contractual Milestone dates, and the overall Completion date.
 - 4) All Notices of Delay submitted to the District Construction Manager.

- 5) Alternatives for possible schedule recovery to mitigate delay or potential delay.
 - 6) Known or anticipated problems with delivery of materials or equipment.
 - 7) Approved weather impact dates incurred in previous month, along with affected CPM schedule activity identification numbers and activity descriptions.
3. For each Monthly Schedule Update submittal: A copy of the Monthly Schedule Update markup documentation.
 4. Other variations of the above reports, as directed by the District.
- C. Daily Construction Reports: Submit to District as described herein.

1.5 QUALITY ASSURANCE

- A. Scheduler Qualifications: Retain or employ an experienced specialist in CPM scheduling capable of satisfying the requirements described herein, providing planning, evaluation, reporting and delay analysis using CPM scheduling.
- B. Schedule Software: All CPM schedules shall be prepared with a Windows operating system based CPM scheduling computer software program capable of satisfying all the requirements herein, and is either Microsoft Project 2013 or later, or Primavera P6 Professional Project Management version 16 or later.

1.6 COORDINATION

- A. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal register, progress reports, payment requests, and other required schedules and reports.
 1. Secure time commitments for performing critical elements of the Work from entities involved.
 2. Coordinate each activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, BASELINE

- A. Baseline Schedule: Prepare and submit a baseline CPM schedule that shows the breakdown of all work into activities to the extent required to effectively plan and execute the Project, track and report work progress, effectively analyze time impacts and show all logical relationships (ties) between activities. The District Construction Manager will accept, accept as noted, or direct the Contractor to revise and re-submit, the Baseline Schedule submittal. The District Construction Manager's Baseline Schedule review will be based on the District Construction Manager's evaluation of the Baseline Schedule's reasonableness and compliance with the Contract Documents. The Contract CPM Schedule shall be the basis for monitoring the Contractor's progress against milestone dates and Contract Time, and the evaluation and reconciliation of extensions in Contract Time. The Baseline Schedule shall communicate and constitute the Contractor's detailed intent for planning and executing the work. Construct the

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Baseline Schedule based on the Contract Documents, including any addenda received during the bid phase. Coordinate with all subcontractors when developing the Baseline Schedule.

1. Breakout of Work into multiple Schedules: Even if multiple school sites or DSA numbers are attributed to a Contract, multiple schedules that break out work by school site, DSA number, etc., are not allowed.
2. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.
 - a. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
 - b. Early Completion: If the District Construction Manager accepts an early completion schedule and the District Construction Manager does not revise the Contract completion date, the Baseline must first include a float activity that fills the time between the early completion and the contractual substantial completion date. The Contractor agrees to forego any extended overhead between early completion noted in the Baseline and the contractual substantial completion date.
3. Activities in the Baseline Schedule shall comply with the following:
 - a. Activity Duration: Estimate the amount of time to start and complete each activity. Define field work activities so no activity is longer than 10 workdays, unless specifically allowed by District Construction Manager.
 - b. Units of Time: Workdays shall be the default unit of time for an activity in the schedule. Indicate nonworking days and holidays incorporated into the schedule to correlate with Contract Time.
 - c. Critical (Longest) Path: Critical (Longest) Path is to be easily identifiable. Any part of the Baseline Schedule's Critical (Longest) Path deemed unreasonable by the District Construction Manager may result in direction for a Baseline Schedule revision and re-submittal.
 - d. Procurement Cycle Activities: Procurement cycle activities include, but are not limited to, submittals, shop drawing submittals, submittal reviews and approvals, purchasing, fabrication, and delivery. Unless waived by the District Construction Manager, include detailed procurement cycle activities as separate activities in the Baseline Schedule for each Specification section number. The detailed Procurement Cycle activities shall constitute the Submittal Schedule, and shall align with the Submittal Register. Procurement Cycle activities shall be logically tied in the Baseline Schedule to the associated construction activities. Unless waived by the District Construction Manager, include detailed procurement cycle activities as separate activities in the Baseline Schedule for each Specification Section number, with separate activities for the following:
 - 1) Submittal Preparation.
 - 2) Submittal Review / Approval.
 - 3) Procurement / Fabrication.
 - 4) Delivery.Note: Include the Specification Section number either within the activity's identification number or activity's name/description.
 - e. Submittal Review Time: Include review times indicated in Section 01 33 00 "Submittal Procedures" in Baseline Schedule.
 - f. Relationships and CPM Network: CPM networks shall be closed, whereby every activity shall have, at a minimum, one predecessor and one successor relationship. The exceptions to this closed network rule are the network's start and finish milestones.

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- g. Constraints: Constraints shall be scrutinized and shall only be used to reflect contractually and/or environmentally imposed conditions. Add schedule activities and detail to mitigate the use of Constraints. Constraints ultimately deemed unreasonable by the District Construction Manager may result in direction for a Baseline revision and re-submittal.
- h. Lags: Lags shall be scrutinized. Add schedule activities and detail to mitigate the use of Lags. Lags ultimately deemed unreasonable by the District Construction Manager may result in direction for a Baseline revision and re-submittal.
- i. Schedule Settings: The setting in the CPM scheduling software shall be set so that the logic is retained when calculating the schedule. Critical activities shall be defined as Longest Path. The “progress override” option shall not be utilized, unless directed otherwise by the District Construction Manager. Autocost, Resource, and Schedule calculation rules shall be set to the default settings. Default percent complete to be used is the duration percent complete.
- j. Activity Detail: Field work activities shall not reflect a combining of work located in separate buildings or site areas, work corresponding to different Specifications Sections or Unifomat Sections, work performed by different Subcontractors, or rough and finish work of the same trade. The CPM Schedule shall include activities and appropriate time for temporary items (for example, scaffolding and concrete formwork), curing, testing, items that interface with work performed by others (for example, Owner Furnished Owner Installed items), regulatory agency approvals, permitting, City of San Diego and utility activities, physical checkout, startup, mobilization, operational and maintenance manual preparation, equipment and systems training, cleanup, and contractor’s internal punch list.
- k. Activity Descriptions: Descriptions for schedule activities shall provide adequate detail that defines the activity, scope and location.
- l. Milestones: Include Key Milestones and Contractual Milestones indicated in the Contract Documents in Schedule.
- m. Negative Float: The Baseline Schedule shall not contain negative float.
- n. Weather: The Baseline Schedule shall include, during the period from the start of mobilization (or start of field work activity, whichever starts first) through the date of Substantial Completion, workdays for anticipated weather delays affecting the Critical (Longest) Path.

- 1) This weather allowance shall be incorporated into the Contract Time. Incorporate weather allowance days into their schedule activities per the following table:

Weather Table												
	Month											
Anticipated Weather Days	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	7	5	7	2	1	1	0	0	1	2	3	5

- a) If the Contract Time starts or ends in the middle of a month, the weather allowance shall be prorated. For example, if mobilization starts on February 1 and Substantial Completion is November 20 of the same year, the weather allowance is 21 workdays.
- 2) Unused weather allowance days become jointly owned float.
- 3) If the number of approved weather days in a month exceed the number depicted in the Weather Table, or if the grand total of approved weather

- days exceed the number allotted in the contract, the number of weather days in excess are excusable and non-compensable.
- 4) Weather or the results of weather on non-scheduled workdays will not be considered. Reference documents shall include CPM schedules and Look Ahead schedules to determine scheduled workdays.
 - 5) If the Contractor considers weather or the results of weather as an impact to the Critical (Longest) Path and/or a Contractual Milestone, the Contractor has two (2) workdays from the date in question to provide written justification for the weather day request, describing the Primavera activity/activities impacted, as well as describing how over 50 percent of the Critical (Longest) Path work for the requested day was impacted. Describe work done to mitigate weather impact.
 - 6) The District Construction Manager determines if a weather day has been incurred, and the Critical (Longest) Path and/or Contractual Milestone so affected. If the Contractor does not provide written justification regarding weather impacts, the District Construction Manager can still determine if weather days have been incurred.
 - 7) If weather impacts a Contractual Milestone for a phase that is not on the Critical (Longest) Path, the District Construction Manager will grant excusable and non-compensable relief equal to the number of days impacted by weather.

- B. Work Restrictions: Include any work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Work by District: Include a separate activity for each portion of the Work performed by District, including Owner Furnished Contractor Installed (OFCI) and Owner Furnished Owner Installed (OFOI) items.
 2. District-Furnished Products: Include a separate activity for each product. Delivery dates indicated stipulate the earliest possible delivery date.
 3. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with any existing construction.
 - b. Limitations of continued occupancies.
 - c. Partial occupancy before Substantial Completion.
 4. Use of premises and any site-specific restrictions.
- C. Baseline Schedule: Submittal, Review and Acceptance. Within the timeline specified below (Schedule Table 1), submit the Baseline Schedule to the District Construction Manager for review and acceptance.

Schedule Table 1

Description	Calendar Days for Individual Item	Cumulative Calendar Days
Contract Time Start Date, per Notice to Proceed	0	0
Contractor submits complete Baseline Schedule submittal to District Construction Manager for review	28	28

District Construction Manager provides review comments (and possible acceptance) to Contractor (Meeting may be required, at District Construction Manager's discretion)	7	35
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1. The deduction for Contractor's delayed submission of the complete Baseline Schedule submittal is \$150 per day; this deduction also applies to re-submittals. Such deductions shall occur on the first progress payment after the Baseline Schedule has been accepted. Refer to paragraph 1.4 herein regarding Submittal items.
2. Upon submittal by the Contractor, the District Construction Manager will review the Baseline Schedule and provide comments within the timeframe shown in Schedule Table 1. The District Construction Manager may question any aspect of the Baseline Schedule submittal. If the District Construction Manager raises questions or identifies schedule deficiencies or noncompliance with the Contract Documents, a revision and re-submittal is required. Make appropriate adjustments or corrections and shall deliver to the District Construction Manager the Baseline Schedule re-submittal within 7 days of receipt of the District Construction Manager's comments. Indicate in writing the adjustments or corrections made by the Contractor, including individual responses to every comment made by the District Construction Manager on the previous submittal. The District Construction Manager will review and return written comments on the re-submitted Baseline Schedule within 7 days of receipt of the Contractor's re-submittal. The above process shall be repeated until the District Construction Manager provides written notification to the Contractor that the Baseline Schedule has been accepted.
 - a. If the District Construction Manager conditionally accepts the Baseline Schedule submittal, the Contractor has seven (7) days to provide another Baseline Schedule submittal that addresses the conditional notes, to the satisfaction of the District Construction Manager. The District Construction Manager will review and comment on the re-submittal within five (5) days of receipt. If the Contractor fails to submit a Baseline Schedule submittal that addresses the conditional notes to the District Construction Manager's satisfaction, then the Baseline Schedule status will be revised from "Accepted as Noted" to "Revise and Re-submit".
 - b. As the schedule is a requirement for a proper progress payment, it is incumbent on the Contractor to submit a satisfactory Baseline Schedule submittal within the timeline depicted herein; Look-Ahead Schedules do not satisfy the requirement regarding "Construction Progress Schedule".
 - c. If the Baseline is not accepted after the first fifty (50) days, the District Construction Manager may stop the Work; delays here shall be deemed inexcusable.
3. Upon acceptance of the Baseline Schedule, all activities and their relationships shown on the Baseline Schedule may not be changed, added, or deleted without the consent of the District Construction Manager. The Contractor may not alter activity identification numbers, or rename activities without the District Construction Manager's consent. The Contractor must request written approval from the District Construction Manager to remove activities from the CPM Schedule, and must retain the removed activities within the electronic project schedule files that are submitted to the District Construction Manager. The Contractor may appropriately code the approved removed activities to filter the same out of the reports.
4. The initial accepted Baseline Schedule is a schedule that shall reflect no progress on schedule activities.
5. If a Baseline Schedule is accepted late in a month, the Contractor is still required to submit a Monthly Schedule Update for the previous period (for example, if a Baseline Schedule is accepted on January 26, the Contractor is required to submit Monthly Schedule Update with a January 1 Data Date).

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6. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of District Construction Manager's acceptance of the schedule.

2.2 Schedule of Values

- A. Though the CPM Schedule is not cost-loaded, the Schedule of Values (SOV) spreadsheet must meet the following requirements:
 1. No SOV line item shall combine work from multiple Specification sections.
 2. SOV line items shall be mapped to Unifomat Level 3 (dictionary can be provided, upon request from Contractor), and no SOV line item shall combine work from multiple Unifomat Level 3 sections.
 3. No SOV line item shall have a budgeted cost exceeding \$50,000, unless specifically accepted by the District Construction Manager.
 4. In addition to all construction activities, the following are to be separate and distinct SOV line items: Bonds, Insurance, Demobilization, Close-Out Submittals.
 5. No SOV line items for submittal or procurement activities are permitted, except as accepted or directed by the District Construction Manager.
 6. Mobilization shall be a separate SOV line item, and shall not exceed 1 percent (1%) of the Contract Price. If requested by the District Construction Manager, provide detailed backup documentation, at a level of detail to the satisfaction of the District Construction Manager, to substantiate the Contractor's mobilization dollar amount.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, MONTHLY SCHEDULE UPDATES

- A. Contractor's Construction Schedule Updating: At monthly intervals update the schedule to reflect actual progress and forecast the remainder of the work. Submit the Monthly Schedule Update to the District Construction Manager who will either accept it, accept it with notes, or direct the Contractor to revise and resubmit. On the last workday of each month or other day determined by District Construction Manager, submit a draft schedule update for review. The Data Date shall be the 1st day of the month. For example, if the monthly update is to capture all work accomplished in April the Data Date shall be May 1st. the Draft Monthly Schedule Update shall consist of the following:
 1. A hardcopy print out of the Detailed Gantt Chart distributed to the District Construction Manager. Sheets for this item are to be no larger than 11" x 17".
 2. A markup of the hard copy print out showing percent completes, actual start dates and actual finish dates to indicate work accomplished during the month. Also indicate the expected finish dates or remaining duration for activities that have started but have not yet completed; remaining duration shall be the Contractor's best estimate of the time required to complete activities.
 3. Within three (3) days of the draft Monthly Schedule Update submittal, meet with District Construction Manager to finalize the Monthly Schedule Update, as well as discuss required corrections and proposed revisions to the schedule.
 4. After the meeting, make any needed adjustments to the schedule as directed by the District Construction Manager, make final entries in the schedule software, recalculate the schedule, and submit the final Monthly Schedule Update submittal. The Monthly Schedule Update submittal, including Progress Payment submittal items, is due no later than three (3) days following this meeting. A complete Monthly Schedule Update

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- submittal submitted after the 10th day of the month is subject to a \$100 per day deduction that shall occur no later than the next progress payment.
5. Upon receipt and review of the Monthly Schedule Update submittal, if the Monthly Schedule Update indicates a late completion to a Contractual Milestone and/or Contract Time, a Monthly Schedule Review meeting shall occur to discuss issues related to late completion, possible revisions, and possible Recovery Schedule submittal and/or Time Impact Analysis methodology and deliverables. Such a meeting shall include the District Construction Manager, District Scheduler, and Contractor (Project Manager, Superintendent and Scheduler), and shall occur prior to the following Monthly Schedule Update submittal.
- B. Progress Payments: The District Construction Manager will provide an Application for Progress Payment form for the Contractor to submit with each Monthly Schedule Update
- C. Monthly Schedule Update:
1. Requirements: Unless directed in writing by the District Construction Manager, the Monthly Schedule Update shall not be used to delete activities, add activities, make title changes, or to make logic changes.
 - a. If the Contractor proposes to make activity additions/deletions and/or logic changes and/or duration changes within a Monthly Schedule Update, simultaneously submit two distinct CPM schedules:
 - 1) Monthly Schedule Update, showing progress in just-completed month, without proposed changes.
 - 2) Monthly Schedule Update, showing progress in just-completed month, with proposed changes. Provide detail in the Monthly Schedule Update Narrative why changes were caused and needed.
 2. Distribution: The Contractor must submit the Monthly Schedule Update package to the District Construction Manager before the District will process an Application for Progress Payment for each month.
 3. Other activities in Schedule: The only activities to be added to the Monthly Schedule Updates are the following:
 - a. Approved Time Impact Analysis.
 - b. Approved Weather Dates (one Activity per approved Weather Date).
 - 1) The original duration for the weather allowance activity shall be reduced each month by the number of approved weather days.
 - c. Procurement Cycle re-submittals (i.e., Specification re-submittal after rejection, Specification re-submittal review).
 4. Review: The District Construction Manager will either accept, accept with comments, or direct a revise-and-resubmit of the Monthly Schedule Update submittal. Allow seven (7) days for the District Construction Manager's review of the Monthly Schedule Update submittal.
 - a. Completeness of Submittal: The District may withhold up to 5 percent of the pre-retention progress payment if, in the District Construction Manager's opinion, the Contractor has failed to meet the Monthly Schedule Update submittal requirements.
 - b. Acceptance of the Monthly Schedule Update submittal by the District Construction Manager shall be a condition precedent to the processing of the subsequent Progress Payment.

3.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, SCHEDULE CORRECTION

- A. Each month, address corrections to the schedule that were identified by the District Construction Manager during the review of the last Monthly Schedule Update. These corrections generally include, but are not limited to, correction of inaccurate or missing actual dates, correction of logic for activities being driven by the data date, incorrect percent complete, and out of sequence progress. The District Construction Manager reserves the right to require the Contractor adjust, add to, or clarify any portion of the schedule that may be considered insufficient to monitor the work. No additional compensation shall be provided for such adjustments, additions, or clarifications.
- B. If the Monthly Schedule Update submittal is rejected, the Contractor must individually respond to every correction and review comment received from the District Construction Manager in the re-submittal of the Monthly Schedule Update package.
- C. If the submittal is conditionally accepted with noted exceptions, respond to every correction and review comment via the next Monthly Schedule Update submittal. Failure of the Contractor to specifically respond to each of the District Construction Manager's previous review comments may result in rejection of the following submittal.

3.3 CONTRACTOR'S CONSTRUCTION SCHEDULE, LOOK AHEAD SCHEDULES

- A. Look Ahead Schedule: Prepare and submit a report indicating activities performed in the one week prior and two weeks following the day of week as determined by the District Construction Manager. Due to the District Construction Manager in electronic format no later than 24 hours before the start of each weekly progress meeting, the Look Ahead Schedule shall include the following:
 - 1. Columns on left hand side of report, indicating the following:
 - a. Activity number, corresponding to the same field in the CPM schedule.
 - 1) Potential or approved change orders shall be included as activities with temporary activity identification numbers (for example, RFI or CCD number).
 - b. Activity description, including work performed and location of work (for example, Install Footing Rebar at Building 700).
 - c. Responsibility.
 - 2. Dates on the right-hand section of report, with marks noting the specific dates that activity was performed / will be performed for each of the look ahead activities. Note with "S" on days when an activity starts, "X" for an activity in-progress, and "F" for when an activity finishes.
 - 3. Generated in Microsoft Excel.
 - 4. Details shall include material and equipment deliveries, non-work days such as holidays, and approved weather days.
 - 5. Other information or formatting, at the discretion of the District Construction Manager.
 - 6. If a progress meeting is not held in a week, a Look Ahead Schedule is still due.
 - 7. The first Look Ahead Schedule is due no later than the day of the Preconstruction Conference.
- B. Look Ahead Schedule Corrections: Upon request from the District Construction Manager, submit a revised look ahead schedule if there are significant corrections to the look ahead

schedule noted during the weekly progress meeting. The revised look ahead schedule is due no later than two (2) workdays after the request has been made by the District Construction Manager.

3.4 CONTRACTOR'S DAILY REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events relating to this Contract:
1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Count of personnel and hours worked at Project site by trade.
 4. Visitor(s) to the Project site.
 5. Major Equipment at Project site.
 6. Material and/or equipment deliveries.
 7. Work activities performed at Project site, including CPM schedule activity identification numbers. Include separate line items for any Time & Material, RFI, ASI, CCD, potential Change Order, or approved Change Order work.
 8. High and low temperatures and general weather conditions, including any precipitation totals.
 9. Site Conditions.
 10. Request for weather day, include CPM schedule activity identification number(s) and activity description(s) affected.
 11. Action(s) taken to prepare for anticipated upcoming weather event.
 12. Accidents and near-accidents.
 13. Meetings and significant decisions.
 14. Issues incurred or addressed.
 15. Unusual events.
 16. Stoppages, delays, shortages, and losses.
 17. Meter readings and similar recordings.
 18. Emergency procedures.
 19. Orders and requests of authorities having jurisdiction.
 20. Change Orders received and implemented.
 21. Change Directives, Field Work Orders, or Architect's Supplemental Instructions received and implemented.
 22. Services connected and disconnected.
 23. Equipment or system tests and startups.
 24. Partial completions and occupancies.
 25. Substantial Completions authorized.
- B. Upon receipt, the District Construction Manager will review each Daily Report. If needed, corrections to Daily Reports may be required.
- C. Starting with the first day of construction activity or any activity on site, submit a separate and distinct Daily Report for each day. Daily Reports for the previous week are due no later than Monday of the following week. For example, the Daily Reports for Monday April 1st through Friday April 5th are due to the District Construction Manager no later than Monday April 8th.

3.5 CONTRACTOR'S CONSTRUCTION SCHEDULE, RECOVERY SCHEDULE

- A. If Work progress or the sequencing of the Work activities differs from that indicated in the Baseline Schedule or previous Monthly Update Schedules, the District Construction Manager may direct the Contractor to submit a Recovery Schedule. The Contractor is required to

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prepare and submit a Recovery Schedule if the current monthly schedule update depicts negative float exceeding minimum thresholds set forth herein, or as otherwise deemed appropriate by the District Construction Manager.

1. The Contractor is required to prepare and submit a Recovery Schedule if the current monthly schedule update, during the first third (1/3) of the Contract Time, depicts negative float in excess of thirty (30) days.
2. The Contractor is required to prepare and submit a Recovery Schedule if the current monthly schedule update, during the second third (1/3) of the Contract Time, depicts negative float in excess of twenty (20) days.
3. The Contractor is required to prepare and submit a Recovery Schedule if the current monthly schedule update, during the final third (1/3) of the Contract Time, depicts negative float in excess of ten (10) days.
4. Within fifteen (15) days of the District Construction Manager's direction, prepare and submit a Recovery Schedule to the District Construction Manager demonstrating the Contractor's plan to recover lost time, achieve all contractual milestones, and complete the work within the Contract Time. The District Construction Manager will review the Recovery Schedule and provide documented comments within ten (10) days. Appropriate recovery actions include, but are not limited to, assignments of additional labor or equipment, shift or overtime work, expediting of submittals or deliveries, overlapping of activities, or sequencing changes to increase activity concurrence. The accompanying narrative shall describe the cause of the problems and the actions planned by the Contractor to recover the schedule.
5. If the delay necessitating the Recovery Schedule is caused by the Contractor, all costs for recovery shall be borne by the Contractor.

3.6 CONTRACTOR'S CONSTRUCTION SCHEDULE, TIME IMPACT ANALYSIS (TIA)

- A. Time Impact Analyses shall demonstrate the impacts of the delay to the Critical (Longest) Path, and shall be completed per the following:
 1. If the Contractor experienced what they consider to be an excusable delay to the Critical (Longest) Path and/or contractual milestone, submit a Time Impact Analysis within ten (10) days of the completion of the delay event.
 2. The District Construction Manager may also request a TIA within fourteen (14) days from the Contractor. The District Construction Manager's TIA request may be the result of viewing a monthly schedule update that indicates a late completion to the Critical (Longest) Path and/or contractual milestone, or some other event the District Construction Manager may consider to be a cause for a TIA.
 3. All efforts shall be made to rectify TIAs contemporaneously.
 4. Notes:
 - a. The Time Impact Analysis submittal shall consist of a CPM schedule sub-network (fragnet) derived by adding activities and relationships representing the delay into the first accepted Monthly Schedule Update after the finish of the delay event that impacted the Critical (Longest) Path and/or Contractual Milestone.
 - b. The TIA submittal should address the Critical (Longest) Path depicted in Monthly Schedule Updates. If the TIA is to address a Contractual Milestone that is not on the Critical (Longest) Path, the TIA should address the Critical activities related to the Contractual Milestone.
 - c. If the Contractor does not submit a complete Time Impact Analysis submittal within the timeframes noted herein, a deduction of \$150 per day shall be applied.

- B. Multiple issues are not to be combined into a single Time Impact Analysis submittal, and such TIAs that combine issues in a single TIA submittal shall be returned to the Contractor with a status of revise-and-resubmit.
- C. Include the following items with all Time Impact Analysis Request submittals:
1. A fragnet where impacts to the critical path can be clearly viewed, with separate activities for each component of the Time Impact Analysis, breaking out activities by Responsible party (Contractor, Architect/Engineer, District, etc.), trade (Mechanical contractor, Concrete contractor, etc.), and site area (for example, parking lot, second floor staff restroom, library, etc.).
 2. A written narrative that notes the following:
 - a. The number of days requested.
 - b. A detailed description on the cause and effect of delay.
 - c. A detailed description of the Contractor's daily activities relating to the delay on each day during the delay period, as well as a description of the Contractor's diligence in mitigating the delay; the mere submittal of contractor/subcontractor daily reports does not satisfy this requirement.
 - d. A list of additions, deletions and/or changes to activities, logic, and durations.
 3. All supporting backup documentation (for example, Requests for Information, Field Work Orders, Correspondence, Notice(s) of Delay, etc.).
 4. An electronic copy of the CPM schedule application file(s) used for the TIA.
- D. Allow ten (10) days after receipt of the Time Impact Analysis submittal for the District Construction Manager to accept or reject the request.
- E. Do not incorporate any part of the Time Impact Analysis into the Monthly Schedule Update until the associated Change Order has been approved.
- F. If a Time Impact Analysis submitted by the Contractor is rejected by the District Construction Manager, request a Meet and Confer with the District Construction Management Director within seven (7) days of rejection to discuss and resolve issues related to the request. If agreement is not reached, the Contractor will be allowed thirty (30) days from the receipt of a written decision from the District Construction Management Director following the Meet and Confer meeting to give notice.
- G. Where the District Construction Manager has not rendered formal decision on the Contractor's Time Impact Analysis for adjustment of Contract Time, and the parties are unable to agree as to amount of adjustment to be reflected in the CPM Schedule, reflect that amount of time adjustment in the CPM Schedule as the District Construction Manager may accept as appropriate for the interim. It is understood and agreed that such interim acceptance by the District Construction Manager will not be binding and will be made only for purpose of continuing to schedule work, until such time as a formal decision as to an adjustment, if any, of the Contract Time or any Contractual Milestone dates acceptable to the District Construction Manager has been rendered.
- H. The Contractor is responsible for all costs associated with the preparation of the Time Impact Analysis for inexcusable or concurrent delays. For critical path delays or delays to contractual milestones approved as excusable by the District, the Contractor will be paid up to a maximum fee of \$750.00 per Time Impact Analysis submittal, to be invoiced as a separate Change Order after incorporation into the accepted CPM schedule. A Time Impact Analysis request without merit will not be approved, and hence, not reimbursed.

- I. If a forward-looking TIA that attempts to forecast estimated upcoming impact to the Critical Path and/or Contractual Milestone is required, immediately coordinate with the District Construction Manager to address such an issue.

3.7 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Procedures: In addition to what is specified herein, comply with procedures contained in The Associated General Contractors of America's "Construction Planning & Scheduling Manual".
- B. Timely submissions of the schedules described in this Section are of great importance, and lack of or late receipt diminishes their value to the Project.
- C. Any CPM Schedule submittal item submitted after 3:00PM will be considered received on the following workday.

END OF SECTION 01 32 01

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SECTION 01 32 33
PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs.
- B. Related Requirements:
 - 1. Section 01 33 00 "Submittal Procedures" for submitting photographic documentation.

1.3 INFORMATIONAL SUBMITTALS

- A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Include same information as corresponding photographic documentation.
- B. Digital Photographs: Submit image files within three days of taking photographs.
 - 1. Digital Camera: Minimum sensor resolution of 8 megapixels.
 - 2. Format: Minimum 3200 by 2400 pixels, in unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped, in folder named by date of photograph, accompanied by key plan file.
 - 3. Identification: Provide the following information with each image description in file metadata tag:
 - a. Name of Project.
 - b. Name of Contractor.
 - c. Date photograph was taken.
 - d. Description of location, vantage point, and direction (by compass point), and elevation or story of construction.
 - e. Unique sequential identifier keyed to accompanying key plan.
- C. Video Recording: At the Contractor's option, provide video recording in lieu of photographs specified in paragraph, "Preconstruction Photographs." Submit one copy in digital video disc format acceptable to District.
 - 1. Identification: On each copy, provide an applied label with the following information:
 - a. Name of Project.
 - b. Name of Contractor.

- c. Date videotape was recorded.

1.4 USAGE RIGHTS

- A. If a professional photographer is engaged to take photographs or video recordings, obtain and transfer copyright usage rights from photographer to District for unlimited reproduction of photographic documentation.

1.5 PHOTOGRAPHIC MEDIA

- A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of 8 megapixels, and at an image resolution of not less than 3200 by 2400 pixels.
- B. Digital Video Recordings: Provide high-resolution, digital video disc in format acceptable to District.

1.6 PHOTOGRAPHS

- A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
 - 1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
 - 1. Date and Time: Include date and time in file name for each image.
- C. Preconstruction Photographs: Before starting construction, take photographs that show preconstruction conditions of existing landscape materials; on-site paving; building interior finishes to include ceilings, walls and floors; and interior and exterior equipment that are to remain in place.
 - 1. The photographs will be used to determine responsibility for damage that might appear to have been caused by construction activities. It will be the Contractor's responsibility, through photographs, to show that damage was preexisting.

1.7 VIDEO RECORDINGS

- A. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed. At each change in location, describe vantage point, location, direction (by compass point), and elevation or story of construction.
 - 1. Confirm date and time at beginning and end of recording.
 - 2. Begin each video recording with name of Project, Contractor's name, and Project location.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 32 33

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SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
 - 1. Section 01 32 01 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 2. Section 017700 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
 - 3. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. Document Control Software: The District has implemented a computerized web-accessed document management and control system for the Project referred to herein as "Document Control Software." Use this system for all Project Submittals unless noted otherwise.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include

additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with Contractor's construction schedule.
2. Initial Submittal: Submit concurrently with Baseline Schedule.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Architect's final release or approval.
 - g. Scheduled date of fabrication.
 - h. Scheduled dates for purchasing.
 - i. Scheduled dates for installation.
 - j. Activity or event number.

1.5 SUBMITTAL FORMATS

- A. Architect's Digital Dafta Files: Electronic digital data files of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 4. Coordinate transmittal timing of submittals for related parts of the Work specified in different Sections so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 1. Initial Review: Allow 10 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.

2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 10 days for review of each resubmittal.
 4. Sequential Review: Where sequential review of submittals by Architect's consultants, District, or other parties is indicated, allow 10 days for initial review of each submittal.
 5. DSA review: Where submittal must be reviewed by DSA, allow 35 days for review of submittal.
- D. Options: Identify options requiring selection by Architect. Retain "Electronic Submittals" Paragraph below for all Projects. Generally, all submittals are to be made electronically using District's Document Control Software.
- E. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations.
- F. Electronic Submittals: Provide submittals via Email. Immediately notify Architect, District Construction Manager, Project Inspector, and Document Control Specialist of all submittals made.
- G. Paper Submittals: Provide paper submittal only where required by individual specification sections. Place a permanent label or title block on each submittal item for identification.
1. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling.
 2. Provide a space approximately 6 by 8 inches on permanent label or beside title block to record Contractor's review and approval markings and action taken by Architect.
 3. Include the following information:
 - a. Project name.
 - b. Date.
 - c. Transmittal Destination (To:).
 - d. Transmittal Source (From:).
 - e. Name of Architect.
 - f. Name of District Construction Manager.
 - g. Name of Contractor.
 - h. Name of firm or entity that prepared the submittal.
 - i. Names of subcontractor, manufacturer, and supplier.
 - j. Unique submittal number, including revision identifier. Include Specification Section number with sequential identifier; and alphanumeric suffix for resubmittals.
 - k. Number and title of appropriate Specification Section.
 - l. Drawing number and detail references, as appropriate.
 - m. Location(s) where product is to be installed, as appropriate.
 - n. Other necessary identification.
 - o. Remarks.
 4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
- H. Resubmittals: Make resubmittals in same manner as initial submittal.
1. Resubmit submittals until they are marked with approval notation from Architect's action stamp.

2. For paper submittals, note date and content of previous submittal.
 3. For paper submittals, note date and content of revision in label or title block and clearly indicate extent of revision.
- I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
 - J. Furnish one copy of each final action submittal marked with approval notation from Architect's action stamp to Project Inspector.
 - K. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

1.6 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 1. Send electronic submittals as PDF electronic files via email to Architect and District
 - a. Architect will post annotated file and notify Contractor of posting.
 2. Action Submittals: For paper submittals, submit four paper copies of each submittal for District use and as many copies as Contractor wants returned for Contractor use.
 3. Informational Submittals: For paper submittals, submit two paper copies of each submittal unless otherwise indicated. Architect will not return copies.
 4. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.

- c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 - 5. Submit Product Data before Shop Drawings, and before or concurrent with Samples.
 - 6. Submit Product Data in the following format:
 - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect's digital data drawing files is otherwise permitted.
- 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 - 2. Paper Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches.
 - 3. Submit Shop Drawings in the following format:
 - a. PDF electronic file.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
- 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 - 2. Identification: Permanently attach label on unexposed side of Samples that includes the following:
 - a. Project name and submittal number. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - e. Specification paragraph number and generic name of each item.
 - 3. Provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
 - 4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.

- b. Samples not incorporated into the Work, or otherwise designated as District's property, are the property of Contractor.
- 5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit two full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return one submittal with options selected.
- 6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 - 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 - 2. Manufacturer and product name, and model number if applicable.
 - 3. Number and name of room or space.
 - 4. Location within room or space.
 - 5. Submit product schedule in the following format:
 - a. PDF electronic file.
- F. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- G. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- H. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

- I. **Manufacturer Certificates:** Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- J. **Product Certificates:** Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- K. **Material Certificates:** Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- L. **Material Test Reports:** Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- M. **Product Test Reports:** Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- N. **Research Reports:** Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - 1. Name of evaluation organization.
 - 2. Date of evaluation.
 - 3. Time period when report is in effect.
 - 4. Product and manufacturers' names.
 - 5. Description of product.
 - 6. Test procedures and results.
 - 7. Limitations of use.
- O. **Preconstruction Test Reports:** Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- P. **Compatibility Test Reports:** Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- Q. **Field Test Reports:** Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- R. **Design Data:** Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of applicable codes and regulations, and calculations, list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.

1.7 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file, and three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

1.8 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
 - 1. Architect will not review submittals that do not have Contractor's review and approval.

1.9 ARCHITECT'S REVIEW

- A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and post review on Document Control Software. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:
 - 1. Approved as Submitted
 - 2. Approved, except as noted on drawing and/or attached sheets. Resubmission not required
 - 3. Approved except as noted on drawing. Refer to attached sheet. Resubmission required
 - 4. Will be returned by separate correspondence
 - 5. Disapproved. See comments on attached sheet
 - 6. Receipt acknowledged

- B. Informational Submittals: Architect will review each submittal and will post submittal review on Document Control Software only if it does not comply with requirements.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals received from sources other than Contractor will be returned by the Architect without action or may be discarded.
- F. Submittals not required by the Contract Documents will be returned by the Architect without action or may be discarded.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 33 00

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**SUBMITTAL PROCEDURES
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SECTION 01 73 00

EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Coordination of District-installed products.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.
9. Correction of the Work.

- B. Related Requirements:

1. Section 01 10 00 "Summary" for limits on use of Project site.
2. Section 01 33 00 "Submittal Procedures" for submitting surveys.
3. Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of District-accepted deviations from indicated lines and levels, and final cleaning.
4. Section 02 41 19 "Selective Demolition" for demolition and removal of selected portions of the building.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

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1.4 PREINSTALLATION MEETINGS

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor.
- B. Qualification Data: For franchise utility project manager.
- C. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
- D. Cutting and Patching Notification: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:
 - 1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
 - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
 - 3. Products: List products to be used for patching and firms or entities that will perform patching work.
 - 4. Dates: Indicate when cutting and patching will be performed.
 - 5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
- E. Landfill Receipts: Submit copies of waste hauler slips indicating the amount of waste hauled in tons and the amount of waste in tons diverted from landfill and recycled, composted or salvaged.
- F. Certified Surveys: Submit two copies signed by land surveyor.
- G. Final Property Survey: Submit 10 copies showing the Work performed and record survey data.

1.6 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in California and who is experienced in providing land-surveying services of the kind indicated.
- B. Franchise Utility Project Manager Qualifications: A qualified franchise utility project manager/coordinator with a minimum of 10 years' experience in project management with utility agencies (SDG&E, SBC Global, Cox Cable, Time Warner, etc.). Duties shall include administering and coordinating all aspects of the administration of the franchise utility work including contractor self-performed work.
- C. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify the District Construction Manager of locations and details of cutting and await directions from the District Construction Manager before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include but are not limited to the following:
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Plumbing piping systems.
 - f. Mechanical systems piping and ducts.
 - g. Control systems.
 - h. Communication systems.
 - i. Fire-detection and -alarm systems.
 - j. Conveying systems.
 - k. Electrical wiring systems.
 - l. Operating systems of special construction.
 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
 - a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Sprayed fire-resistive material.
 - e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.
 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in the District Construction Manager's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- D. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.

- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site to District Construction Manager 10 days prior to start of work.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - 1. Description of the Work.
 - 2. List of detrimental conditions, including substrates.
 - 3. List of unacceptable installation tolerances.
 - 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to District that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

- B. **Field Measurements:** Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. **Space Requirements:** Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. **Review of Contract Documents and Field Conditions:** Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 01 31 00 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. **Verification:** Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify the District Construction Manager promptly.
- B. **General:** Engage a land surveyor to lay out the Work using accepted surveying practices.
 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 2. Establish limits on use of Project site.
 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 4. Inform installers of lines and levels to which they must comply.
 5. Check the location, level and plumb, of every major element as the Work progresses.
 6. Notify the District Construction Manager when deviations from required lines and levels exceed allowable tolerances.
 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. **Site Improvements:** Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. **Building Lines and Levels:** Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. **Record Log:** Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect and project Inspector.

3.4 FIELD ENGINEERING

- A. **Reference Points:** Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of the District Construction Manager. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to the District Construction Manager before proceeding.
 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- C. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.
- D. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
 - a. For utility lines, show, without limitation, elevations of drain/plumbing lines, plugged tees, capped ends, catch basins/drainage structures and the flow line elevations from these points.

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Where possible, select tools or equipment that minimize production of excessive noise levels. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by the District Construction Manager.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 01 10 00 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

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- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 - 4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 74 19 "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.9 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

3.10 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 73 00

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- B. Related Requirements:
 - 1. Section 01 73 00 "Execution" for progress cleaning of Project site.
 - 2. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of cleaning agent.
- B. Contractor's List of Incomplete Items.
- C. Certified List of Incomplete Items: Final submittal at final completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Submittals Prior to Substantial Completion: Complete the following prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Prepare and submit Contractor's List of Incomplete Items (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by District. Label with manufacturer's name and model number where applicable.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain District signature for receipt of submittals.
 5. Submit testing, adjusting, and balancing records.
 6. Submit changeover information related to District's occupancy, use, operation, and maintenance.
- B. Procedures Prior to Substantial Completion: Complete the following prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise District that site is ready for final changeover of permanent locks. District will make final changeover.
 2. Complete startup and testing of systems and equipment.
 3. Perform preventive maintenance on equipment used prior to Substantial Completion.
 4. Advise District of changeover in utility services.
 5. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 6. Complete final cleaning requirements.
 7. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- C. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of seven days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect and Project Inspector will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
 - 1. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 - 2. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 - 3. Submit pest-control final inspection report.
 - 4. Complete commissioning requirements.

- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of seven days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Project Inspector will either proceed with inspection or notify Contractor of unfulfilled requirements.
 - 1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 - 1. Organize list of spaces in sequential order
 - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 - 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Contractor.
 - d. Page number.
 - 4. Submit list of incomplete items in the following format:
 - a. MS Excel electronic file.
 - b. PDF electronic file.
 - c. Three paper copies.

1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.

- B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are not planted, mulched, or paved, to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural

weathering of exterior surfaces. Restore reflective surfaces to their original condition.

- f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
- g. Sweep concrete floors broom clean in unoccupied spaces.
- h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
- i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
- j. Remove labels that are not permanent.
- k. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- l. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- m. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- n. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
- o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
- p. Leave Project clean and ready for occupancy.

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
 - 3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
 - 4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures. Insert additional requirements to suit Project.

END OF SECTION 01 77 00

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**CLOSEOUT PROCEDURES
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SECTION 01 78 39
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 01 77 00 "Closeout Procedures" for general closeout procedures.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Submit one paper copy of marked-up record prints.
- B. Record Specifications: Submit one paper copy of marked-up record specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one paper copy of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

1.4 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued, depicting the current status of the Work.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

- a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
2. Content: Types of items requiring marking include, but are not limited to, the following:
- a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order, Construction Change Directive, or Field Work Order.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 - o. Changes made by responses to Requests for Information (RFI's).
- 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 - 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 - 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 - 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

1.5 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3. Note related Change Orders where applicable.

1.6 RECORD PRODUCT DATA

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes.
- B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Note related Change Orders where applicable.

1.7 RECORDING AND MAINTENANCE

- A. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's, Project Inspector's, and District Construction Manager's reference during normal working hours.
- B. Review Record Documents weekly with Project Inspector. Indicate to Project Inspector the items incorporated in Project Record Documents concurrent with progress of the Work, including modifications, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 78 39

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**PROJECT RECORD DOCUMENTS
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SECTION 26 00 10
SUPPLEMENTAL REQUIREMENTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Supplemental requirements generally applicable to the Work specified in Division 26. This Section is also referenced by related Work specified in other Divisions.

1.2 REFERENCES

A. Abbreviations and Acronyms for Electrical Terms and Units of Measure:

1. 8P8C: An 8-position 8-contact modular jack.
2. A: Ampere, unit of electrical current.
3. AC or ac: Alternating current.
4. AFCI: Arc-fault circuit interrupter.
5. AIC: Ampere interrupting capacity.
6. AL, Al, or ALUM: Aluminum.
7. ASD: Adjustable-speed drive.
8. ATS: Automatic transfer switch.
9. AWG: American wire gauge; see ASTM B258.
10. BAS: Building automation system.
11. BIL: Basic impulse insulation level.
12. BIM: Building information modeling.
13. CAD: Computer-aided design or drafting.
14. CATV: Community antenna television.
15. CB: Circuit breaker.
16. cd: Candela, the SI fundamental unit of luminous intensity.
17. CO/ALR: Copper-aluminum, revised.
18. COPS: Critical operations power system.
19. CU or Cu: Copper.
20. CU-AL or AL-CU: Copper-aluminum.
21. dB: Decibel, a unitless logarithmic ratio of two electrical, acoustical, or optical power values.
22. dB(A-weighted) or dB(A): Decibel acoustical sound pressure level with A-weighting applied in accordance with IEC 61672-1.
23. dB(adjusted) or dBa: Decibel weighted absolute noise power with respect to 3.16 pW (minus 85 dBm).
24. dBm: Decibel absolute power with respect to 1 mW.
25. DC or dc: Direct current.
26. DCOA: Designated critical operations area.
27. DDC: Direct digital control (HVAC).
28. EGC: Equipment grounding conductor.
29. ELV: Extra-low voltage.
30. EMF: Electromotive force.
31. EMI: Electromagnetic interference.
32. EPM: Electrical preventive maintenance.

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33. EPS: Emergency power supply.
34. EPSS: Emergency power supply system.
35. ESS: Energy storage system.
36. EV: Electric vehicle.
37. EVPE: Electric vehicle power export equipment.
38. EVSE: Electric vehicle supply equipment.
39. fc: Footcandle, an internationally recognized unit of illuminance equal to one lumen per square foot or 10.76 lx. The simplified conversion 1 fc = 10 lx in the Specifications is common practice and considered adequate precision for building construction activities. When there are conflicts, lux is the primary unit; footcandle is specified for convenience.
40. FLC: Full-load current.
41. ft: Foot.
42. ft-cd: Foot-candle, the antiquated U.S. Standard unit of illuminance, equal to one international candle measured at a distance of one foot, that was superseded in 1948 by the unit "footcandle" after the SI unit candela (cd) replaced the international candle; see "fc,"
43. GEC: Grounding electrode conductor.
44. GFCI: Ground-fault circuit interrupter.
45. GFPE: Ground-fault protection of equipment.
46. GND: Ground.
47. HACR: Heating, air conditioning, and refrigeration.
48. HDPE: High-density polyethylene.
49. HID: High-intensity discharge.
50. HP or hp: Horsepower.
51. HVAC: Heating, ventilating, and air conditioning.
52. Hz: Hertz.
53. IBT: Intersystem bonding termination.
54. inch: Inch. To avoid confusion, the abbreviation "in." is not used.
55. IP: Ingress protection rating (enclosures); Internet protocol (communications).
56. IR: Infrared.
57. IS: Intrinsically safe.
58. IT&R: Inspecting, testing, and repair.
59. ITE: Information technology equipment.
60. kAIC: Kiloampere interrupting capacity.
61. kcmil or MCM: One thousand circular mils.
62. kV: Kilovolt.
63. kVA: Kilovolt-ampere.
64. kVAr or kVAR: Kilovolt-ampere reactive.
65. kW: Kilowatt.
66. kWh: Kilowatt-hour.
67. LAN: Local area network.
68. lb: Pound (weight).
69. lbf: Pound (force).
70. LCD: Liquid-crystal display.
71. LCDI: Leakage-current detector-interrupter.
72. LED: Light-emitting diode.
73. Li-ion: Lithium-ion.
74. lm: Lumen, the SI derived unit of luminous flux.
75. LNG: Liquefied natural gas.
76. LP-Gas: Liquefied petroleum gas.
77. LRC: Locked-rotor current.
78. LV: Low voltage.
79. lx: Lux, the SI derived unit of illuminance equal to one lumen per square meter.
80. m: Meter.
81. MCC: Motor-control center.

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82. MDC: Modular data center.
83. MG set: Motor-generator set.
84. MIDI: Musical instrument digital interface.
85. MLO: Main lugs only.
86. MV: Medium voltage.
87. MVA: Megavolt-ampere.
88. mW: Milliwatt.
89. MW: Megawatt.
90. MWh: Megawatt-hour.
91. NC: Normally closed.
92. Ni-Cd: Nickel-cadmium.
93. Ni-MH: Nickel-metal hydride.
94. NIU: Network interface unit.
95. NO: Normally open.
96. NPT: National (American) standard pipe taper.
97. OCPD: Overcurrent protective device.
98. ONT: Optical network terminal.
99. PC: Personal computer.
100. PCS: Power conversion system.
101. PCU: Power-conditioning unit.
102. PF or pf: Power factor.
103. PHEV: Plug-in hybrid electric vehicle.
104. PLC: Programmable logic controller.
105. PLFA: Power-limited fire alarm.
106. PoE: Power over Ethernet.
107. PV: Photovoltaic.
108. PVC: Polyvinyl chloride.
109. pW: Picowatt.
110. RFI: (electrical) Radio-frequency interference; (contract) Request for interpretation.
111. RMS or rms: Root-mean-square.
112. RPM or rpm: Revolutions per minute.
113. SCADA: Supervisory control and data acquisition.
114. SCR: Silicon-controlled rectifier.
115. SPD: Surge protective device.
116. sq.: Square.
117. SWD: Switching duty.
118. TCP/IP: Transmission control protocol/Internet protocol.
119. TEFC: Totally enclosed fan-cooled.
120. TR: Tamper resistant.
121. TVSS: Transient voltage surge suppressor.
122. UL: (standards) Underwriters Laboratories, Inc.; (product categories) UL, LLC.
123. UL CCN: UL Category Control Number.
124. UPS: Uninterruptible power supply.
125. USB: Universal serial bus.
126. UV: Ultraviolet.
127. V: Volt, unit of electromotive force.
128. V(ac): Volt, alternating current.
129. V(dc): Volt, direct current.
130. VA: Volt-ampere, unit of complex electrical power.
131. VAR: Volt-ampere reactive, unit of reactive electrical power.
132. VFC: Variable-frequency controller.
133. VOM: Volt-ohm-multimeter.
134. VPN: Virtual private network.
135. VRLA: Valve regulated lead acid; also called "sealed lead acid (SLA)" or "valve regulated sealed lead acid."

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136. W: Watt, unit of real electrical power.
137. Wh: Watt-hour, unit of electrical energy usage.
138. WPT: Wireless power transfer.
139. WPTE: Wireless power transfer equipment.
140. WR: Weather resistant.

B. Abbreviations and Acronyms for Electrical Raceway Types:

1. EMT: Electrical metallic tubing.
2. EMT-A: Aluminum electrical metallic tubing.
3. EMT-S: Steel electrical metallic tubing.
4. EMT-SS: Stainless steel electrical metallic tubing.
5. ENT: Electrical nonmetallic tubing.
6. EPEC: Electrical HDPE underground conduit.
7. EPEC-40: Schedule 40 electrical HDPE underground conduit.
8. EPEC-80: Schedule 80 electrical HDPE underground conduit.
9. EPEC-A: Type A electrical HDPE underground conduit.
10. EPEC-B: Type B electrical HDPE underground conduit.
11. ERMC: Electrical rigid metal conduit.
12. ERMC-A: Aluminum electrical rigid metal conduit.
13. ERMC-S: Steel electrical rigid metal conduit.
14. ERMC-S-G: Galvanized-steel electrical rigid metal conduit.
15. ERMC-S-PVC: PVC-coated-steel electrical rigid metal conduit.
16. ERMC-SS: Stainless steel electrical rigid metal conduit.
17. FMC: Flexible metal conduit.
18. FMC-A: Aluminum flexible metal conduit.
19. FMC-S: Steel flexible metal conduit.
20. FMT: Steel flexible metallic tubing.
21. FNMC: Flexible nonmetallic conduit. See "LFNC."
22. HDPE: See EPEC.
23. IMC: Steel electrical intermediate metal conduit.
24. LFMC: Liquidtight flexible metal conduit.
25. LFMC-A: Aluminum liquidtight flexible metal conduit.
26. LFMC-S: Steel liquidtight flexible metal conduit.
27. LFMC-SS: Stainless steel liquidtight flexible metal conduit.
28. LFNC: Liquidtight flexible nonmetallic conduit.
29. LFNC-A: Layered (Type A) liquidtight flexible nonmetallic conduit.
30. LFNC-B: Integral (Type B) liquidtight flexible nonmetallic conduit.
31. LFNC-C: Corrugated (Type C) liquidtight flexible nonmetallic conduit.
32. PVC: Rigid PVC conduit.
33. PVC-40: Schedule 40 rigid PVC conduit.
34. PVC-80: Schedule 80 rigid PVC Conduit.
35. PVC-A: Type A rigid PVC concrete-encased conduit.
36. PVC-EB: Type EB rigid PVC concrete-encased underground conduit.
37. RGS: See ERMC-S-G.
38. RMC: See ERMC.
39. RTRC: Reinforced thermosetting resin conduit.
40. RTRC-AG: Low-halogen, aboveground reinforced thermosetting resin conduit.
41. RTRC-AG-HW: Heavy wall, low-halogen, aboveground reinforced thermosetting resin conduit.
42. RTRC-AG-SW: Standard wall, low-halogen, aboveground reinforced thermosetting resin conduit.
43. RTRC-AG-XW: Extra heavy wall, low-halogen, aboveground reinforced thermosetting resin conduit.
44. RTRC-BG: Low-halogen, belowground reinforced thermosetting resin conduit.

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C. Abbreviations and Acronyms for Electrical Single-Conductor and Multiple-Conductor Cable Types:

1. AC: Armored cable.
2. CATV: Coaxial general-purpose cable.
3. CATVP: Coaxial plenum cable.
4. CATVR: Coaxial riser cable.
5. CI: Circuit integrity cable.
6. CL2: Class 2 cable.
7. CL2P: Class 2 plenum cable.
8. CL2R: Class 2 riser cable.
9. CL2X: Class 2 cable, limited use.
10. CL3: Class 3 cable.
11. CL3P: Class 3 plenum cable.
12. CL3R: Class 3 riser cable.
13. CL3X: Class 3 cable, limited use.
14. CM: Communications general-purpose cable.
15. CMG: Communications general-purpose cable.
16. CMP: Communications plenum cable.
17. CMR: Communications riser cable.
18. CMUC: Under-carpet communications wire and cable.
19. CMX: Communications cable, limited use.
20. DG: Distributed generation cable.
21. FC: Flat cable.
22. FCC: Flat conductor cable.
23. FPL: Power-limited fire-alarm cable.
24. FPLP: Power-limited fire-alarm plenum cable.
25. FPLR: Power-limited fire-alarm riser cable.
26. IGS: Integrated gas spacer cable.
27. ITC: Instrumentation tray cable.
28. ITC-ER: Instrumentation tray cable, exposed run.
29. MC: Metal-clad cable.
30. MC-HL: Metal-clad cable, hazardous location.
31. MI: Mineral-insulated, metal-sheathed cable.
32. MTW: (machine tool wiring) Moisture-, heat-, and oil-resistant thermoplastic cable.
33. MV: Medium-voltage cable.
34. NM: Nonmetallic sheathed cable.
35. NMC: Nonmetallic sheathed cable with corrosion-resistant nonmetallic jacket.
36. NMS: Nonmetallic sheathed cable with signaling, data, and communications conductors, plus power or control conductors.
37. NPLF: Non-power-limited fire-alarm circuit cable.
38. NPLFP: Non-power-limited fire-alarm circuit cable for environmental air spaces.
39. NPLFR: Non-power-limited fire-alarm circuit riser cable.
40. NUCC: Nonmetallic underground conduit with conductors.
41. OFC: Conductive optical fiber general-purpose cable.
42. OFCG: Conductive optical fiber general-purpose cable.
43. OFCP: Conductive optical fiber plenum cable.
44. OFCR: Conductive optical fiber riser cable.
45. OFN: Nonconductive optical fiber general-purpose cable.
46. OFNG: Nonconductive optical fiber general-purpose cable.
47. OFNP: Nonconductive optical fiber plenum cable.
48. OFNR: Nonconductive optical fiber riser cable.
49. P: Marine shipboard cable.
50. PLTC: Power-limited tray cable.
51. PLTC-ER: Power-limited tray cable, exposed run.

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52. PV: Photovoltaic cable.
53. RHH: (high heat) Thermoset rubber, heat-resistant cable.
54. RHW: Thermoset rubber, moisture-resistant cable.
55. SA: Silicone rubber cable.
56. SE: Service-entrance cable.
57. SER: Service-entrance cable, round.
58. SEU: Service-entrance cable, flat.
59. SIS: Thermoset cable for switchboard and switchgear wiring.
60. TBS: Thermoplastic cable with outer braid.
61. TC: Tray cable.
62. TC-ER: Tray cable, exposed run.
63. TC-ER-HL: Tray cable, exposed run, hazardous location.
64. THW: Thermoplastic, heat- and moisture-resistant cable.
65. THHN: Thermoplastic, heat-resistant cable with nylon jacket outer sheath.
66. THHW: Thermoplastic, heat- and moisture-resistant cable.
67. THWN: Thermoplastic, moisture- and heat-resistant cable with nylon jacket outer sheath.
68. TW: Thermoplastic, moisture-resistant cable.
69. UF: Underground feeder and branch-circuit cable.
70. USE: Underground service-entrance cable.
71. XHH: Cross-linked polyethylene, heat-resistant cable.
72. XHHW: Cross-linked polyethylene, heat- and moisture-resistant cable.

D. Abbreviations and Acronyms for Electrical Flexible Cord Types:

1. SEO: 600 V extra-hard-usage, hard-service cord with thermoplastic elastomer insulation and oil-resistant thermoplastic elastomer outer covering for damp locations.
2. SEOW: 600 V extra-hard-usage, hard-service cord with thermoplastic elastomer insulation and oil-resistant thermoplastic elastomer outer covering for damp or wet locations.
3. SEOO: 600 V extra-hard-usage, hard-service cord with oil-resistant thermoplastic elastomer insulation and oil-resistant thermoplastic elastomer outer covering for damp locations.
4. SEOOW: 600 V extra-hard-usage, hard-service cord with oil-resistant thermoplastic elastomer insulation and oil-resistant thermoplastic elastomer outer covering for damp or wet locations.
5. SJEO: 300 V hard-usage, junior hard-service cord with thermoplastic elastomer insulation and oil-resistant thermoplastic elastomer outer cover for damp locations.
6. SJEOW: 300 V hard-usage, junior hard-service cord with thermoplastic elastomer insulation and oil-resistant thermoplastic elastomer outer cover for damp or wet locations.
7. SJEOO: 300 V hard-usage, junior hard-service cord with oil-resistant thermoplastic elastomer insulation and oil-resistant thermoplastic elastomer outer cover for damp locations.
8. SJEOOW: 300 V hard-usage, junior hard-service cord with oil-resistant thermoplastic elastomer insulation and oil-resistant thermoplastic elastomer outer cover for damp or wet locations.
9. SJO: 300 V hard-usage, junior hard-service cord with thermoset insulation and oil-resistant thermoset outer cover for damp locations.
10. SJOW: 300 V hard-usage, junior hard-service cord with thermoset insulation and oil-resistant thermoset outer cover for damp or wet locations.
11. SJOO: 300 V hard-usage, junior hard-service cord with oil-resistant thermoset insulation and oil-resistant thermoset outer cover for damp locations.
12. SJOOW: 300 V hard-usage, junior hard-service cord with oil-resistant thermoset insulation and oil-resistant thermoset outer cover for damp or wet locations.
13. SJTO: 300 V hard-usage, junior hard-service cord with thermoplastic insulation and oil-resistant thermoplastic outer cover for damp locations.

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14. SJTOW: 300 V hard-usage, junior hard-service cord with thermoplastic insulation and oil-resistant thermoplastic outer cover for damp or wet locations.
15. SJTOO: 300 V hard-usage, junior hard-service cord with oil-resistant thermoplastic insulation and oil-resistant thermoplastic outer cover for damp locations.
16. SJTOOW: 300 V hard-usage, junior hard-service cord with oil-resistant thermoplastic insulation and oil-resistant thermoplastic outer cover for damp or wet locations.
17. SO: 600 V extra-hard-usage, hard-service cord with thermoset insulation and oil-resistant thermoset outer covering for damp locations.
18. SOW: 600 V extra-hard-usage, hard-service cord with thermoset insulation and oil-resistant thermoset outer covering for damp or wet locations.
19. SOO: 600 V extra-hard-usage, hard-service cord with oil-resistant thermoset insulation and oil-resistant thermoset outer covering for damp locations.
20. SOOW: 600 V extra-hard-usage, hard-service cord with oil-resistant thermoset insulation and oil-resistant thermoset outer covering for damp or wet locations.
21. STO: 600 V extra-hard-usage, hard-service cord with thermoplastic insulation and oil-resistant thermoplastic outer covering for damp locations.
22. STOW: 600 V extra-hard-usage, hard-service cord with thermoplastic insulation and oil-resistant thermoplastic outer covering for damp or wet locations.
23. STOO: 600 V extra-hard-usage, hard-service cord with oil-resistant thermoplastic insulation and oil-resistant thermoplastic outer covering for damp locations.
24. STOOO: 600 V extra-hard-usage, hard-service cord with oil-resistant thermoplastic insulation and oil-resistant thermoplastic outer covering for damp or wet locations.

E. Definitions:

1. 8-Position 8-Contact (8P8C) Modular Jack: An unkeyed jack with up to eight contacts commonly used to terminate twisted-pair and multiconductor Ethernet cable. Also called a "TIA-1096 miniature 8-position series jack" (8PSJ), or an "IEC 8877 8-pole jack."
 - a. Be careful when suppliers use "RJ45" generically. Obsolete RJ45 jacks used for analog telephone cables have rejection keys. 8P8C jacks used for digital telephone cables and Ethernet cables do not have rejection keys.
2. Basic Impulse Insulation Level (BIL): Reference insulation level expressed in impulse crest voltage with a standard wave not longer than 1.5 times 50 microseconds and 1.5 times 40 microseconds.
3. Cable: In accordance with NIST NBS Circular 37 and IEEE standards, in the United States for the purpose of interstate commerce, the definition of "cable" is (1) a conductor with insulation, or a stranded conductor with or without insulation (single-conductor cable); or (2) a combination of conductors insulated from one another (multiple-conductor cable).
4. Communications Jack: A fixed connecting device designed for insertion of a communications cable plug.
5. Communications Outlet: One or more communications jacks, or cables and plugs, mounted in a box or ring, with a suitable protective cover.
6. Conductor: In accordance with NIST NBS Circular 37 and IEEE standards, in the United States for the purpose of interstate commerce, the definition of "conductor" is (1) a wire or combination of wires not insulated from one another, suitable for carrying an electric current; (2) (National Electrical Safety Code) a material, usually in the form of wire, cable, or bar, suitable for carrying an electric current; or (3) (general) a substance or body that allows a current of electricity to pass continuously along it.
7. Designated Seismic System: A system component that requires design in accordance with Ch. 13 of ASCE/SEI 7 and for which the Component Importance Factor is greater than 1.0.

8. Direct Buried: Installed underground without encasement in concrete or other protective material.
9. Enclosure: The case or housing of an apparatus, or the fence or wall(s) surrounding an installation, to prevent personnel from accidentally contacting energized parts or to protect the equipment from physical damage. Types of enclosures and enclosure covers include the following:
 - a. Cabinet: An enclosure that is designed for either surface mounting or flush mounting and is provided with a frame, mat, or trim in which a swinging door or doors are or can be hung.
 - b. Concrete Box: A box intended for use in poured concrete.
 - c. Conduit Body: A means for providing access to the interior of a conduit or tubing system through one or more removable covers at a junction or terminal point. In the United States, conduit bodies are listed in accordance with outlet box requirements.
 - d. Conduit Box: A box having threaded openings or knockouts for conduit, EMT, or fittings.
 - e. Cutout Box: An enclosure designed for surface mounting that has swinging doors or covers secured directly to and telescoping with the walls of the enclosure.
 - f. Device Box: A box with provisions for mounting a wiring device directly to the box.
 - g. Extension Ring: A ring intended to extend the sides of an outlet box or device box to increase the box depth, volume, or both.
 - h. Floor Box: A box mounted in the floor intended for use with a floor box cover and other components to complete the floor box enclosure.
 - i. Floor-Mounted Enclosure: A floor box and floor box cover assembly with means to mount in the floor that is sealed against the entrance of scrub water at the floor level.
 - j. Floor Nozzle: An enclosure used on a wiring system, intended primarily as a housing for a receptacle, provided with a means, such as a collar, for surface-mounting on a floor, which may or may not include a stem to support it above the floor level, and is sealed against the entrance of scrub water at the floor level.
 - k. Junction Box: A box with a blank cover that joins different runs of raceway or cable and provides space for connection and branching of the enclosed conductors.
 - l. Outlet Box: A box that provides access to a wiring system having pryout openings, knockouts, threaded entries, or hubs in either the sides or the back, or both, for the entrance of conduit, conduit or cable fittings, or cables, with provisions for mounting an outlet box cover, but without provisions for mounting a wiring device directly to the box.
 - m. Pedestal Floor Box Cover: A floor box cover that, when installed as intended, provides a means for typically vertical or near-vertical mounting of receptacle outlets above the floor's finished surface.
 - n. Pull Box: A box with a blank cover that joins different runs of raceway and provides access for pulling or replacing the enclosed cables or conductors.
 - o. Raised-Floor Box: A floor box intended for use in raised floors.
 - p. Recessed Access Floor Box: A floor box with provisions for mounting wiring devices below the floor surface.
 - q. Recessed Access Floor Box Cover: A floor box cover with provisions for passage of cords to recessed wiring devices mounted within a recessed floor box.
 - r. Ring: A sleeve, which is not necessarily round, used for positioning a recessed wiring device flush with the plaster, concrete, drywall, or other wall surface.
 - s. Ring Cover: A box cover, with raised center portion to accommodate a specific wall or ceiling thickness, for mounting wiring devices or luminaires flush with the surface.

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- t. Termination Box: An enclosure designed for installation of termination base assemblies consisting of bus bars, terminal strips, or terminal blocks with provision for wire connectors to accommodate incoming or outgoing conductors, or both.
10. Emergency Systems: Those systems legally required and classed as emergency by municipal, state, federal, or other codes, or by any governmental agency having jurisdiction that are designed to ensure continuity of lighting, electrical power, or both, to designated areas and equipment in the event of failure of the normal supply for safety to human life.
 11. Essential Electrical Systems: (healthcare facilities) Those systems designed to ensure continuity of electrical power to designated areas and functions of a healthcare facility during disruption of normal power sources, and also to minimize disruption within the internal wiring system.
 12. Fault Limited: Providing or being served by a source of electrical power that is limited to not more than 100 W when tested in accordance with UL 62368-1.
 - a. The term "fault limited" is intended to encompass most Class 1, 2, and 3 power-limited sources complying with Article 725 of NFPA 70; Class ES1 and ES2 electrical energy sources that are Class PS1 electrical power sources (e.g., USB); and Class ES3 electrical energy sources that are Class PS1 and PS2 electrical power sources (e.g., PoE). See UL 62368-1 for discussion of classes of electrical energy sources and classes of electrical power sources.
 13. High-Performance Building: A building that integrates and optimizes on a life-cycle basis all major high-performance attributes, including energy conservation, environment, safety, security, durability, accessibility, cost-benefit, productivity, sustainability, functionality, and operational considerations.
 14. Jacket: A continuous nonmetallic outer covering for conductors or cables.
 15. Luminaire: A complete lighting unit consisting of a light source such as a lamp, together with the parts designed to position the light source and connect it to the power supply. It may also include parts to protect the light source or the ballast or to distribute the light.
 16. Mode: The terms "Active Mode," "Off Mode," and "Standby Mode" are used as defined in the Energy Independence and Security Act (EISA) of 2007.
 17. Multi-Outlet Assembly: A type of surface, flush, or freestanding raceway designed to hold conductors, receptacles, and switches, assembled in the field or at the factory.
 18. Plenum: A compartment or chamber to which one or more air ducts are connected and that forms part of the air distribution system.
 19. Receptacle: A fixed connecting device arranged for insertion of a power cord plug. Also called a power jack.
 20. Receptacle Outlet: One or more receptacles mounted in a box with a suitable protective cover.
 21. Sheath: A continuous metallic covering for conductors or cables.
 22. UL Category Control Number (CCN): An alphabetic or alphanumeric code used to identify product categories covered by UL's Listing, Classification, and Recognition Services.
 23. Voltage Class: For specified circuits and equipment, voltage classes are defined as follows:
 - a. Control Voltage: Having electromotive force between any two conductors, or between a single conductor and ground, that is supplied from a battery or other Class 2 or Class 3 power-limited source.
 - b. Line Voltage: (1) (controls) Designed to operate using the supplied low-voltage power without transformation. (2) (transmission lines, transformers, SPDs) The line-to-line voltage of the supplying power system.

- c. Extra-Low Voltage (ELV): Not having electromotive force between any two conductors, or between a single conductor and ground, exceeding 30 V(ac rms), 42 V(ac peak), or 60 V(dc).
 - d. Low Voltage (LV): Having electromotive force between any two conductors, or between a single conductor and ground, that is rated above 30 V but not exceeding 1000 V.
 - e. Medium Voltage (MV): Having electromotive force between any two conductors, or between a single conductor and ground, that is rated about 1 kV but not exceeding 69 kV.
 - f. High Voltage: (1) (circuits) Having electromotive force between any two conductors, or between a single conductor and ground, that is rated above 69 kV but not exceeding 230 kV. (2) (safety) Having sufficient electromotive force to inflict bodily harm or injury.
24. Wire: In accordance with NIST NBS Circular 37 and IEEE standards, in the United States for the purpose of interstate commerce, the definition of "wire" is a slender rod or filament of drawn metal. A group of small wires used as a single wire is properly called a "stranded wire." A wire or stranded wire covered with insulation is properly called an "insulated wire" or a "single-conductor cable." Nevertheless, when the context indicates that the wire is insulated, the term "wire" will be understood to include the insulation.

1.3 COORDINATION

- A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions:
 - 1. Notify Architect Construction Manager Owner Tenant no fewer than seven days in advance of proposed interruption of electrical service.
 - 2. Do not proceed with interruption of electrical service without Architect's Construction Manager's Owner's written permission.
 - 3. Coordinate interruption with systems impacted by outage including, but not limited to, the following:
 - a. Exercising generators.
 - b. Emergency lighting.
 - c. Elevators.
 - d. Fire-alarm systems.
- B. Arrange to provide temporary electrical service or power in accordance with requirements specified in Division 01.

1.4 QUALIFICATIONS

- A. Electrical Professional Engineer: Professional engineer possessing active qualifications specified in Section 014000 "Quality Requirements," with expertise in electrical engineering, including electrical power system modeling and analysis of electrical safety in accordance with NFPA 70E.

1.5 FIELD CONDITIONS

- A. Modeling, analysis, product selection, installation, and quality control for Work specified in Division 26 must comply with requirements specified in Section 260011 "Facility Performance Requirements for Electrical."

PART 2 - PRODUCTS

2.1 SUBSTITUTION LIMITATIONS FOR ELECTRICAL EQUIPMENT

- A. Substitution requests for electrical equipment will be entertained under the following conditions:
 - 1. Substitution requests may be submitted for consideration prior to the Electrical Preconstruction Conference if accompanied by value analysis data indicating that substitution will comply with Project performance requirements while significantly increasing value for Owner throughout life of facility.
 - 2. Substitution requests may be submitted for consideration concurrently with submission of power system study reports when those reports indicate that substitution is necessary for safety of maintenance personnel and facility occupants.
 - 3. Contractor is responsible for sequencing and scheduling power system studies and electrical equipment procurement. After the Electrical Preconstruction Conference, insufficient lead time for electrical equipment delivery will not be considered a valid reason for substitution.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protection of In-Place Conditions:

3.2 INSTALLATION OF ELECTRICAL WORK

- A. Unless more stringent requirements are specified in the Contract Documents or manufacturers' written instructions, comply with NFPA 70 and NECA NEIS 1 for installation of Work specified in Division 26. Consult Architect for resolution of conflicting requirements.

END OF SECTION 26 00 10

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SECTION 26 05 19
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Copper building wire.
2. Fire-alarm wire and cable.
3. Connectors and splices.

B. Related Requirements:

1. Section 26 00 10 "Supplemental Requirements for Electrical" for additional abbreviations, definitions, submittals, qualifications, testing agencies, and other Project requirements applicable to Work specified in this Section.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Product Schedule: Indicate type, use, location, and termination locations.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

C. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 for stranded conductors.

D. Conductor Insulation:

1. Type THHN and Type THWN-2: Comply with UL 83.
2. UL 83.

2.2 FIRE-ALARM WIRE AND CABLE

- A. General Wire and Cable Requirements: NRTL listed and labeled as complying with NFPA 70, Article 760.
- B. Signaling Line Circuits: Twisted, shielded pair, size as recommended by system manufacturer.
 - 1. Circuit Integrity Cable: Twisted shielded pair, NFPA 70, Article 760, Classification CI, for power-limited fire-alarm signal service Type FPL. NRTL listed and labeled as complying with UL 1424 and UL 2196 for a two-hour rating.
- C. Non-Power-Limited Circuits: Solid-copper conductors with 600 V rated, 75 deg C, color-coded insulation, and complying with requirements in UL 2196 for a two-hour rating.
 - 1. Low-Voltage Circuits: No. 16 AWG, minimum, in pathway.
 - 2. Line-Voltage Circuits: No. 12 AWG, minimum, in pathway.

2.3 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- B. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.
 - 1. Material: Copper.
 - 2. Type: One hole with standard barrels.
 - 3. Termination: Compression.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders:
 - 1. Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
 - 2. Copper for feeders smaller than No. 4 AWG; copper for feeders No. 4 AWG and larger. Conductors must be solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits:
 - 1. Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
 - 2. Copper. Solid for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.

3.3 INSTALLATION, GENERAL

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

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- B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members and follow surface contours where possible.
- F. Support cables according to Section 26 05 29 "Hangers and Supports for Electrical Systems."

3.4 INSTALLATION OF FIRE-ALARM WIRE AND CABLE

- A. Comply with NFPA 72.
- B. Wiring Method: Install wiring in metal pathway according to Section 270528.29 "Hangers and Supports for Communications Systems."
 - 1. Install plenum cable in environmental airspaces, including plenum ceilings.
 - 2. Fire-alarm circuits and equipment control wiring associated with fire-alarm system must be installed in a dedicated pathway system.
 - a. Cables and pathways used for fire-alarm circuits, and equipment control wiring associated with fire-alarm system, may not contain any other wire or cable.
 - 3. Fire-Rated Cables: Use of two-hour, fire-rated fire-alarm cables, NFPA 70, Types MI and CI, is permitted.
- C. Wiring within Enclosures: Separate power-limited and non-power-limited conductors as recommended by manufacturer. Install conductors parallel with or at right angles to sides and back of the enclosure. Bundle, lace, and train conductors to terminal points with no excess. Connect conductors that are terminated, spliced, or interrupted in any enclosure associated with fire-alarm system to terminal blocks. Mark each terminal according to system's wiring diagrams. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plug connectors.
- D. Cable Taps: Use numbered terminal strips in junction, pull, and outlet boxes; cabinets; or equipment enclosures where circuit connections are made.
- E. Color-Coding: Color-code fire-alarm conductors differently from the normal building power wiring. Use one color-code for alarm circuit wiring and another for supervisory circuits. Color-code audible alarm-indicating circuits differently from alarm-initiating circuits. Use different colors for visible alarm-indicating devices. Paint fire-alarm system junction boxes and covers red.

3.5 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

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- B. Make splices, terminations, and taps that are compatible with conductor material.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inch of slack.

3.6 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.7 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
2. After installing conductors and cables and before electrical circuitry has been energized, test conductors feeding the following critical equipment and services for compliance with requirements:
3. Perform each of the following visual and electrical tests:
 - a. Inspect exposed sections of conductor and cable for physical damage and correct connection according to the single-line diagram.
 - b. Test bolted connections for high resistance using one of the following:
 - 1) A low-resistance ohmmeter.
 - 2) Calibrated torque wrench.
 - c. Inspect compression-applied connectors for correct cable match and indentation.
 - d. Inspect for correct identification.
 - e. Inspect cable jacket and condition.
 - f. Insulation-resistance test on each conductor for ground and adjacent conductors. Apply a potential of 500 V(dc) for 300 V rated cable and 1000 V(dc) for 600 V rated cable for a one-minute duration.
 - g. Continuity test on each conductor and cable.
 - h. Uniform resistance of parallel conductors.

B. Cables will be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports to record the following:

1. Procedures used.
2. Results that comply with requirements.
3. Results that do not comply with requirements, and corrective action taken to achieve compliance with requirements.

END OF SECTION 26 05 19

SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Grounding and bonding conductors.
2. Grounding and bonding clamps.
3. Grounding and bonding bushings.
4. Grounding and bonding hubs.
5. Grounding and bonding connectors.
6. Grounding (earthing) electrodes.

B. Related Requirements:

1. Section 26 00 10 "Supplemental Requirements for Electrical" for additional abbreviations, definitions, submittals, qualifications, testing agencies, and other Project requirements applicable to Work specified in this Section.

1.2 ACTION SUBMITTALS

A. Product Data:

1. For each type of product indicated.

B. Shop Drawings: Plans showing dimensioned locations of grounding features described in "Field Quality Control" Article, including the following:

1. Rod electrodes.

C. Field Quality-Control Submittals:

1. Field quality-control reports.

1.3 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data:

1. In addition to items specified in Section 260010 "Supplemental Requirements for Electrical," include the following:
 - a. Plans showing locations of grounding features described in "Field Quality Control" Article, including the following:
 - 1) Rod electrodes.

PART 2 - PRODUCTS

2.1 GROUNDING AND BONDING CONDUCTORS

A. Equipment Grounding Conductor:

1. General Characteristics: 600 V, THHN/THWN-2 or THWN-2, copper wire or cable, green color, in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

B. ASTM - Bare Copper Grounding and Bonding Conductor:

1. Referenced Standards: Complying with one or more of the following:
 - a. Soft or Annealed Copper Wire: ASTM B3

2.2 GROUNDING AND BONDING CLAMPS

A. Description: Clamps suitable for attachment of grounding and bonding conductors to grounding electrodes, pipes, tubing, and rebar.

B. Source Limitations: Obtain products from single manufacturer.

C. Performance Criteria:

1. Regulatory Requirements:
 - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended location and application.
2. Listing Criteria:
 - a. Grounding and Bonding Equipment: UL CCN KDER; including UL 467.
 - b. Grounding and Bonding Equipment for Communications: UL CCN KDSH; including UL 467.

2.3 GROUNDING AND BONDING BUSHINGS

A. Description: Bonding bushings connect conduit fittings, tubing fittings, threaded metal conduit, and unthreaded metal conduit to metal boxes and equipment enclosures and have one or more bonding screws intended to provide electrical continuity between bushing and enclosure. Grounding bushings have provision for connection of bonding or grounding conductor and may or may not also have bonding screws.

B. Source Limitations: Obtain products from single manufacturer.

C. Performance Criteria:

1. Regulatory Requirements:
 - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended location and application.
2. Listing Criteria:

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- a. Grounding and Bonding Equipment: UL CCN KDER; including UL 467.

2.4 GROUNDING AND BONDING HUBS

- A. Description: Hubs with certified grounding or bonding locknut.
- B. Source Limitations: Obtain products from single manufacturer.
- C. Performance Criteria:
 - 1. Regulatory Requirements:
 - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended location and application.

2.5 GROUNDING AND BONDING CONNECTORS

- A. Source Limitations: Obtain products from single manufacturer.
- B. Performance Criteria:
 - 1. Regulatory Requirements:
 - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended location and application.
 - 2. Listing Criteria:
 - a. Grounding and Bonding Equipment: UL CCN KDER; including UL 467.
 - b. Grounding and Bonding Equipment for Communications: UL CCN KDSH;
- C. UL KDER - Lay-In Lug Mechanical-Type Grounding and Bonding Busbar Terminal
 - 1. General Characteristics: Mechanical-type, copper rated for direct burial terminal with set screw.
- D. UL KDER - Crimped Pressure-Type Grounding and Bonding Cable Connector:
 - 1. General Characteristics: Crimp-and-compress connectors that bond to conductor when connector is compressed around conductor.
 - a. Copper, C and H shaped.
- E. UL KDER - Split-Bolt Pressure-Type Grounding and Bonding Cable Connector:
 - 1. General Characteristics: Bolts that surround cable and bond to cable under compression when nut is tightened.
 - a. Copper.

2.6 GROUNDING (EARTHING) ELECTRODES

- A. Description: Grounding electrodes include rod electrodes, ring electrodes, metal underground water pipes, metal building frames, concrete-encased electrodes, and pipe and plate electrodes.
- B. Source Limitations: Obtain products from single manufacturer.
- C. Performance Criteria:
 - 1. Regulatory Requirements:
 - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended location and application.
 - 2. Listing Criteria:
 - a. Grounding and Bonding Equipment: UL CCN KDER; including UL 467.
- D. UL KDER - Rod Electrode
 - 1. General Characteristics: Copper-clad 3/4 inch by 10 ft (19 mm by 3 m).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine facility's grounding electrode system and equipment grounding for compliance with requirements for maximum ground-resistance level and other conditions affecting performance of grounding and bonding of electrical system.
- B. Inspect test results of grounding system measured at point of electrical service equipment connection.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with connection of electrical service equipment only after unsatisfactory conditions have been corrected.

3.2 SELECTION OF GROUNDING AND BONDING CONDUCTORS

- A. Conductors: Install solid conductor for 8 AWG and smaller, and stranded conductors for 6 AWG and larger unless otherwise indicated.
- B. Custom-Length Insulated Equipment Bonding Jumpers: 6 AWG, 19-strand, Type THHN.
- C. Bonding Cable: 28 kcmil, 14 strands of 17 AWG conductor, 1/4 inch (6 mm) in diameter.
- D. Bonding Conductor: 4 AWG or 6 AWG, stranded conductor.
- E. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inch (41 mm) wide and 1/16 inch (1.6 mm) thick.

- F. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inch (41 mm) wide and 1/16 inch (1.6 mm) thick.

3.3 SELECTION OF CONNECTORS

A. Conductor Terminations and Connections:

- 1. Underground Connections: Welded connectors except at test wells and as otherwise indicated.

3.4 INSTALLATION

A. Comply with manufacturer's published instructions.

B. Reference Standards:

- 1. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.
- 2. Consult Architect for resolution of conflicting requirements.

C. Special Techniques:

1. Conductors:

- a. Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

2. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.

- a. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.
- b. Make connections with clean, bare metal at points of contact.

3. Electrodes:

- a. Ground Rods: Drive rods until tops are 2 inch (50 mm) below finished floor or final grade unless otherwise indicated.

- 1) Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.

4. Grounding Underground Distribution System Components:

- a. Grounding Manholes and Handholes: Install driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4 inch (100 mm) will extend above finished floor. If necessary, install ground rod before manhole is placed and provide 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through waterproof sleeve in manhole wall. Protect ground rods passing through

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concrete floor with double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inch (50 mm) above to 6 inch (150 mm) below concrete. Seal floor opening with waterproof, nonshrink grout.

5. Equipment Grounding:
 - a. Install insulated equipment grounding conductors with feeders and branch circuits.
 - b. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
 - 1) Feeders and branch circuits.
 - 2) Lighting circuits.
 - 3) Receptacle circuits.
 - 4) Single-phase motor and appliance branch circuits.
 - 5) Three-phase motor and appliance branch circuits.
 - c. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.5 FIELD QUALITY CONTROL

- A. Field tests and inspections must be witnessed by Tenant.
- B. Tests and Inspections:
 1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
 2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with calibrated torque wrench in accordance with manufacturer's published instructions.
 3. Test completed grounding system at each location where maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal at individual ground rods. Make tests at ground rods before conductors are connected.
 - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method in accordance with IEEE Std 81.
 - c. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.
 4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to record of tests and observations. Include number of rods driven and their depth at each location and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
- C. Nonconforming Work:
 1. Grounding system will be considered defective if it does not pass tests and inspections.
 2. Remove and replace defective components and retest.
- D. Collect, assemble, and submit test and inspection reports.

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1. Report measured ground resistances that exceed the following values:
 - a. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 Ω .
 - b. Manhole Grounds: 10 Ω .

3.6 PROTECTION

- A. After installation, protect grounding and bonding cables and equipment from construction activities. Remove and replace items that are contaminated, defaced, damaged, or otherwise caused to be unfit for use prior to acceptance by Owner.

END OF SECTION 26 05 26

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SECTION 26 05 29
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Support, anchorage, and attachment components.
2. Fabricated metal equipment support assemblies.

B. Related Requirements:

1. Section 26 00 10 "Supplemental Requirements for Electrical" for additional abbreviations, definitions, submittals, qualifications, testing agencies, and other Project requirements applicable to Work specified in this Section.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
 - a. Slotted support systems, hardware, and accessories.
 - b. Clamps.
 - c. Hangers.
 - d. Sockets.
 - e. Eye nuts.
 - f. Fasteners.
 - g. Anchors.
 - h. Saddles.
 - i. Brackets.
2. Include rated capacities and furnished specialties and accessories.

B. Shop Drawings: For fabrication and installation details for electrical hangers and support systems.

1. Hangers. Include product data for components.
2. Slotted support systems.
3. Equipment supports.

C. Delegated Design Submittal: For hangers and supports for electrical systems.

1. Include design calculations and details of hangers.
2. Include design calculations for seismic restraints.

1.3 INFORMATIONAL SUBMITTALS

A. Welding certificates.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified structural professional engineer to design hanger and support system.

2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32 inch (10 mm) diameter holes at a maximum of 8 inch (200 mm) on center in at least one surface.
 - 1. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
 - 2. Material for Channel, Fittings, and Accessories: Galvanized steel.
 - 3. Channel Width: 1-5/8 inch (41.25 mm), 1-1/4 inch (31.75 mm), 13/16 inch (20.64 mm).
 - 4. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 - 5. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs must have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body must be made of malleable iron.
- D. Structural Steel for Fabricated Supports and Restraints: ASTM A36/A36M steel plates, shapes, and bars; black and galvanized.
- E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 - 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - 2. Mechanical-Expansion Anchors: Insert-wedge-type, stainless steel, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - 3. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
 - 4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
 - 5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM F3125/F3125M, Grade A325 (Grade A325M).
 - 6. Hanger Rods: Threaded steel.

2.3 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

PART 3 - EXECUTION

3.1 SELECTION

- A. Comply with the following standards for selection and installation of hangers and supports, except where requirements on Drawings or in this Section are stricter:
 - 1. NECA NEIS 101
 - 2. NECA NEIS 102.
 - 3. NECA NEIS 105.
 - 4. NECA NEIS 111.
- B. Comply with requirements for raceways and boxes specified in Section 260533 "Raceway and Boxes for Electrical Systems."
- C. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2 inch (38 mm) and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.

3.2 INSTALLATION OF SUPPORTS

- A. Comply with NECA NEIS 101 for installation requirements except as specified in this article.
- B. Raceway Support Methods: In addition to methods described in NECA NEIS 1, EMT may be supported by openings through structure members, in accordance with NFPA 70.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination must be weight of supported components plus 200 lb (90 kg).
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To Wood: Fasten with lag screws or through bolts.
 - 2. To New Concrete: Bolt to concrete inserts.
 - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - 4. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inch (100 mm) thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inch (100 mm) thick.
 - 5. To Light Steel: Sheet metal screws.
- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

3.4 PAINTING

A. Touchup:

1. Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - a. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).

- #### B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A780.

END OF SECTION 26 05 29

SECTION 26 05 33
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Type EMT-S raceways and elbows.
2. Type EPEC raceways and fittings.
3. Type ERMCS raceways, elbows, couplings, and nipples.
4. Type FMC-S and Type FMC-A raceways.
5. Type LFMC raceways.
6. Type PVC raceways and fittings.
7. Fittings for conduit, tubing, and cable.
8. Solvent cements.
9. Surface metal raceways and fittings.
10. Strut-type channel raceways and fittings.
11. Metallic outlet boxes, device boxes, rings, and covers.
12. Nonmetallic outlet boxes, device boxes, rings, and covers.
13. Hoods for outlet boxes.

B. Related Requirements:

1. Section 26 00 10 "Supplemental Requirements for Electrical" for additional abbreviations, definitions, submittals, qualifications, testing agencies, and other Project requirements applicable to Work specified in this Section.
2. Section 260519 "Low-Voltage for Electrical Power Conductors and Cables" for nonmetallic underground conduit with conductors (Type NUCC).
3. Section 260543 "Underground Ducts and Raceways for Electrical Systems" for exterior duct banks, manholes, and underground utility construction.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:

1. Wireways and auxiliary gutters.
2. Surface metal raceways.
3. Surface nonmetallic raceways.
4. Floor boxes.
5. Cabinets, cutout boxes, and miscellaneous enclosures.

- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details. Show that floor boxes are located to avoid interferences and are structurally allowable. Indicate floor thickness at location where boxes are embedded in concrete floors and underfloor clearances where boxes are installed in raised floors.

1.3 INFORMATIONAL SUBMITTALS

A. Manufacturers' Instructions:

1. For Type ERMCS-PVC.

PART 2 - PRODUCTS

2.1 TYPE EMT-S RACEWAYS AND ELBOWS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
2. General Characteristics: UL 797 and UL Category Control Number FJMX.

B. Steel Electrical Metal Tubing (EMT-S) and Elbows:

1. Material: Steel.
2. Options:
 - a. Exterior Coating: Zinc.
 - b. Interior Coating: Zinc with organic top coating.
 - c. Minimum Trade Size: Metric designator 21 (trade size 3/4).
 - d. Colors: As indicated on Drawings.

2.2 TYPE EPEC RACEWAYS AND FITTINGS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
2. General Characteristics: UL 651A and UL Category Control Number EAZX.

B. Schedule 40 Electrical HDPE Underground Conduit (EPEC-40):

1. Dimensional Specifications: Schedule 40.
2. Options:
 - a. Minimum Trade Size: (trade size 1").

C. Schedule 80 Electrical HDPE Underground Conduit (EPEC-80):

1. Dimensional Specifications: Schedule 80.
2. Options:
 - a. Minimum Trade Size: (trade size 1").

2.3 TYPE ERMCS RACEWAYS, ELBOWS, COUPLINGS, AND NIPPLES

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
2. General Characteristics: UL 6 and UL Category Control Number DYIX.

B. Galvanized-Steel Electrical Rigid Metal Conduit (ERMCS-G), Elbows, Couplings, and Nipples:

1. Exterior Coating: Zinc.
2. Options:
 - a. Interior Coating: Zinc.

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- b. Minimum Trade Size: Metric designator 21 (trade size 3/4).
- c. Colors: As indicated on Drawings.

2.4 TYPE FMC-S AND TYPE FMC-A RACEWAYS

A. Performance Criteria:

- 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
- 2. General Characteristics: UL 1 and UL Category Control Number DXUZ.

B. Steel Flexible Metal Conduit (FMC-S):

- 1. Material: Steel.
- 2. Options:
 - a. Minimum Trade Size: Metric designator 21 (trade size 3/4).

2.5 TYPE LFMC RACEWAYS

A. Performance Criteria:

- 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
- 2. General Characteristics: UL 360 and UL Category Control Number DXHR.

B. Steel Liquidtight Flexible Metal Conduit (LFMC-S):

- 1. Material: Steel.
- 2. Options:
 - a. Minimum Trade Size: Metric designator 21 (trade size 3/4).

2.6 TYPE PVC RACEWAYS AND FITTINGS

A. Performance Criteria:

- 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
- 2. General Characteristics: UL 651 and UL Category Control Number DZYR.

B. Schedule 40 Rigid PVC Conduit (PVC-40) and Fittings:

- 1. Dimensional Specifications: Schedule 40.
- 2. Options:
 - a. Minimum Trade Size: (trade size 1").

C. Schedule 80 Rigid PVC Conduit (PVC-80) and Fittings:

- 1. Dimensional Specifications: Schedule 80.
- 2. Options:
 - a. Minimum Trade Size: (trade size 1").

2.7 FITTINGS FOR CONDUIT, TUBING, AND CABLE

- A. Performance Criteria:
 - 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
- B. Fittings for Type ERM, , Type PVC, Type EPEC, and Raceways:
 - 1. General Characteristics: UL 514B and UL Category Control Number DWTT.
 - 2. Options:
 - a. Material: Steel.
 - b. Coupling Method: Compression coupling.
 - c. Conduit Fittings for Hazardous (Classified) Locations: UL 1203.
 - d. Expansion and Deflection Fittings: UL 651 with flexible external bonding jumper.
- C. Fittings for Type EMT Raceways:
 - 1. General Characteristics: UL 514B and UL Category Control Number FKAV.
 - 2. Options:
 - a. Material: Steel.
 - b. Coupling Method: Compression coupling
 - c. Expansion and Deflection Fittings: UL 651 with flexible external bonding jumper.
- D. Fittings for Type FMC Raceways:
 - 1. General Characteristics: UL 514B and UL Category Control Number ILNR.
- E. Fittings for Type LFMC and Type LFNC Raceways:
 - 1. General Characteristics: UL 514B and UL Category Control Number DXAS.

2.8 SOLVENT CEMENTS

- A. Performance Criteria:
 - 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
 - 2. General Characteristics: As recommended by conduit manufacturer in accordance with UL 514B and UL Category Control Number DWTT.
 - 3. Sustainability Characteristics:
- B. Solvent Cements for Type PVC Raceways and Fittings:

2.9 SURFACE METAL RACEWAYS AND FITTINGS

- A. Performance Criteria:
 - 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
 - 2. General Characteristics: UL 5 and UL Category Control Number RJBT.
- B. Surface Metal Raceways and Fittings with Metal Covers:
 - 1. Options:

- a. Galvanized steel base with snap-on covers.
 - b. Manufacturer's standard enamel finish in color.
 - C. Surface Metal Raceways and Fittings with Nonmetallic Covers:
 - 1. Additional Characteristics: UL 94, V-0 requirements for self-extinguishing characteristics.
 - 2. Options:
 - a. Galvanized steel base with snap-on covers.
 - b. Provide texture and color selected by Architect from manufacturer's standard colors.
- 2.10 STRUT-TYPE CHANNEL RACEWAYS AND FITTINGS
- A. Performance Criteria:
 - 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
 - 2. General Characteristics: UL 5B and UL Category Control Number RIUU.
 - B. Strut-Type Channel Raceways and Fittings with Metallic Covers:
 - 1. Options:
 - a. Manufacturer's standard enamel finish in color.
- 2.11 METALLIC OUTLET BOXES, DEVICE BOXES, RINGS, AND COVERS
- A. Performance Criteria:
 - 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
 - 2. General Characteristics: UL 514A and UL Category Control Number QCIT.
 - B. Metallic Outlet Boxes:
 - 1. Description: Box having pryout openings, knockouts, threaded entries, or hubs in either the sides of the back, or both, for entrance of conduit, conduit or cable fittings, or cables, with provisions for mounting outlet box cover, but without provisions for mounting wiring device directly to box.
 - 2. Options:
 - a. Material: Sheet steel.
 - b. Sheet Metal Depth: Minimum 2 inch (50 mm).
 - c. Cast-Metal Depth: Minimum 1.8 inch (44.5 mm).
 - C. Metallic Conduit Bodies:
 - 1. Description: Means for providing access to interior of conduit or tubing system through one or more removable covers at junction or terminal point. In the United States, conduit bodies are listed in accordance with outlet box requirements.
 - D. Metallic Device Boxes:
 - 1. Description: Box with provisions for mounting wiring device directly to box.

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2. Options:

- a. Material: Sheet steel.
- b. Sheet Metal Depth: minimum 1.5 inch (38 mm).
- c. Cast-Metal Depth: minimum 1.8 inch (44.5 mm).

2.12 NONMETALLIC OUTLET BOXES, DEVICE BOXES, RINGS, AND COVERS

A. Performance Criteria:

- 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
- 2. General Characteristics: UL 514C and UL Category Control Number QCMZ.

B. Nonmetallic Outlet Boxes:

- 1. Description: Box having pryout openings, knockouts, threaded entries, or hubs in either the sides or the back, or both, for entrance of conduit, conduit or cable fittings, or cables, with provisions for mounting outlet box cover, but without provisions for mounting wiring device directly to box.

C. Nonmetallic Device Boxes:

- 1. Description: Box with provisions for mounting wiring device directly to box.

2.13 HOODS FOR OUTLET BOXES

A. Performance Criteria:

- 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
- 2. General Characteristics:

a. Reference Standards:

- 1) UL 514D and UL Category Control Numbers QCIT and QCMZ.
- 2) Receptacle, hood, cover plate, gaskets, and seals comply with UL 498 Supplement SA when mated with box or enclosure complying with UL 514A, UL 514C, or UL 50E.

- b. Mounts to box using fasteners different from wiring device.

B. Retractable or Reattachable Hoods for Outlet Boxes:

1. Options:

- a. Provides, weatherproof, "while-in-use" cover.

C. Extra-Duty, While-in-Use Hoods for Outlet Boxes:

- 1. Additional Characteristics: Marked "Extra-Duty" in accordance with UL 514D.
- 2. Options:

- a. Provides, weatherproof, "while-in-use" cover.
- b. Manufacturer may combine nonmetallic device box with hood as extra-duty rated assembly.

PART 3 - EXECUTION

3.1 SELECTION OF RACEWAYS

- A. Unless more stringent requirements are specified in Contract Documents or manufacturers' written instructions, comply with NFPA 70 for selection of raceways. Consult Architect for resolution of conflicting requirements.
- B. Outdoors:
 - 1. Exposed and Subject to Severe Physical Damage: ERM C.
 - 2. Exposed and Subject to Physical Damage: ERM C.
 - a. Locations less than 2.5 m (8 ft) above finished floor.
 - 3. Direct Buried: PVC-80, PVC-40.
 - 4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
- C. Indoors:
 - 1. Exposed and Subject to Physical Damage: EMT. Subject to physical damage includes the following locations:
 - a. Locations less than 2.5 m (8 ft) above finished floor.
 - b. Stub-ups to above suspended ceilings.
 - 2. Exposed and Not Subject to Physical Damage: EMT.
 - 3. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 - 4. Damp or Wet Locations: ERM C.
 - 5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
- D. Raceway Fittings: Select fittings in accordance with NEMA FB 2.10 guidelines.
 - 1. ERM C: Provide threaded type fittings unless otherwise indicated.

3.2 SELECTION OF BOXES AND ENCLOSURES

- A. Unless more stringent requirements are specified in Contract Documents or manufacturers' written instructions, comply with NFPA 70 for selection of boxes and enclosures. Consult Architect for resolution of conflicting requirements.
- B. Degree of Protection:
 - 1. Outdoors:
 - a. Type 3R unless otherwise indicated.
 - 2. Indoors:
 - a. Type 1 unless otherwise indicated.
 - b. Damp or Dusty Locations: Type 12
 - c. Surface Mounted in Kitchens and Other Locations Exposed to Oil or Coolants: Type 12.
 - d. Flush Mounted in Kitchens and Other Locations Exposed to Oil or Coolants: Type 12.

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3.3 INSTALLATION OF RACEWAYS

A. Installation Standards:

1. Unless more stringent requirements are specified in Contract Documents or manufacturers' written instructions, comply with NFPA 70 for installation of raceways. Consult Architect for resolution of conflicting requirements.
2. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
3. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.
4. Comply with NECA NEIS 101 for installation of steel raceways.
5. Comply with NECA NEIS 102 for installation of aluminum raceways.
6. Comply with NECA NEIS 111 for installation of nonmetallic raceways.
7. Install raceways square to the enclosure and terminate at enclosures without hubs with locknuts on both sides of enclosure wall. Install locknuts hand tight, plus one-quarter turn more.
8. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to metric designator 35 (trade size 1-1/4) and insulated throat metal bushings on metric designator 41 (trade size 1-1/2) and larger conduits terminated with locknuts.
9. Raceway Terminations at Locations Subject to Moisture or Vibration:
 - a. Provide insulating bushings to protect conductors, including conductors smaller than No. 4 AWG. Install insulated throat metal grounding bushings on service conduits.

B. General Requirements for Installation of Raceways:

1. Complete raceway installation before starting conductor installation.
2. Provide stub-ups through floors with coupling threaded inside for plugs, set flush with finished floor. Plug coupling until conduit is extended above floor to final destination or a minimum of 2 ft (0.6 m) above finished floor.
3. Install no more than equivalent of three 90-degree bends in conduit run except for control wiring conduits, for which no more than equivalent of two 90-degree fewer bends are permitted. Support within 12 inch (300 mm) of changes in direction.
4. Make bends in raceway using large-radius preformed ells except for parallel bends. Field bending must be in accordance with NFPA 70 minimum radii requirements. Provide only equipment specifically designed for material and size involved.
5. Conceal conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
6. Support conduit within 12 inch (300 mm) of enclosures to which attached.
7. Install raceway sealing fittings at accessible locations in accordance with NFPA 70 and fill them with listed sealing compound. For concealed raceways, install fitting in flush steel box with blank cover plate having finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings in accordance with NFPA 70.
8. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal interior of raceways at the following points:
 - a. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - b. Where an underground service raceway enters a building or structure.
 - c. Conduit extending from interior to exterior of building.
 - d. Conduit extending into pressurized duct and equipment.
 - e. Conduit extending into pressurized zones that are automatically controlled to maintain different pressure set points.

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- f. Where otherwise required by NFPA 70.
 - 9. Do not install conduits within 2 inch (50 mm) of the bottom side of a metal deck roof.
 - 10. Keep raceways at least 6 inch (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
 - 11. Cut conduit perpendicular to the length. For conduits metric designator 53 (trade size 2) and larger, use roll cutter or a guide to make cut straight and perpendicular to the length. Ream inside of conduit to remove burrs.
 - 12. Install pull wires in empty raceways. Provide polypropylene or monofilament plastic line with not less than 200 lb (90 kg) tensile strength. Leave at least 12 inch (300 mm) of slack at both ends of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- C. Requirements for Installation of Specific Raceway Types:
- 1. Types ERM and IMC:
 - a. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound that maintains electrical conductivity to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
 - 2. Type ERM-S-PVC:
 - a. Follow manufacturer's installation instructions for clamping, cutting, threading, bending, and assembly.
 - b. Provide PVC-coated sealing locknut for exposed male threads transitioning into female NPT threads that do not have sealing sleeves, including transitions from PVC couplings/female adapters to Type ERM-S-PVC elbows in direct-burial applications. PVC-coated sealing locknuts must not be used in place of conduit hub. PVC-coated sealing locknut must cover exposed threads on Type ERM-S-PVC raceway.
 - c. Coat field-cut threads on PVC-coated raceway with manufacturer-approved corrosion-preventing conductive compound prior to assembly.
 - 3. Types FMC, LFMC, and LFNC:
 - a. Comply with NEMA RV 3. Provide a maximum of 72 inch (1830 mm) of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
 - 4. Types PVC and EPEC:
 - a. Do not install Type PVC or Type EPEC conduit where ambient temperature exceeds 122 deg F (50 deg C). Conductor ratings must be limited to 75 deg C except where installed in a trench outside buildings with concrete encasement, where 90 deg C conductors are permitted.
 - b. Comply with manufacturer's written instructions for solvent welding and fittings.
- D. Raceway Fittings: Install fittings in accordance with NEMA FB 2.10 guidelines.
- 1. ERM-S-PVC: Provide only fittings listed for use with this type of conduit. Patch and seal joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Provide sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
 - 2. EMT: Provide compression, steel fittings. Comply with NEMA FB 2.10.

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3. Flexible Conduit: Provide only fittings listed for use with flexible conduit type. Comply with NEMA FB 2.20.

E. Expansion-Joint Fittings:

1. Install in runs of aboveground PVC that are located where environmental temperature change may exceed 30 deg F (17 deg C) and that have straight-run length that exceeds 25 ft (7.6 m). Install in runs of aboveground ERMC and EMT conduit that are located where environmental temperature change may exceed 100 deg F (55 deg C) and that have straight-run length that exceeds 100 ft (30 m).
2. Install type and quantity of fittings that accommodate temperature change listed for the following locations:
 - a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F (70 deg C) temperature change.
 - b. Outdoor Locations Exposed to Direct Sunlight: [155 deg F (86 deg C) temperature change.
 - c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F (70 deg C) temperature change.
3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F (0.06 mm per meter of length of straight run per deg C) of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F (0.0115 mm per meter of length of straight run per deg C) of temperature change for metal conduits.
4. Install expansion fittings at locations where conduits cross building or structure expansion joints.
5. Install expansion-joint fitting with position, mounting, and piston setting selected in accordance with manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

F. Raceways Penetrating Rooms or Walls with Acoustical Requirements:

1. Seal raceway openings on both sides of rooms or walls with acoustically rated putty.

3.4 INSTALLATION OF SURFACE RACEWAYS

- A. Install surface raceways only where indicated on Drawings.
- B. Install surface raceway with a minimum 2 inch (50 mm) radius control at bend points.
- C. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inch (1200 mm) and with no less than two supports per straight raceway section. Support surface raceway in accordance with manufacturer's written instructions. Tape and glue are unacceptable support methods.

3.5 INSTALLATION OF BOXES AND ENCLOSURES

- A. Provide boxes in wiring and raceway systems wherever required for pulling of wires, making connections, and mounting of devices or fixtures.
- B. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

- C. Locate boxes so that cover or plate will not span different building finishes.
 - D. Support boxes in recessed ceilings independent of ceiling tiles and ceiling grid.
 - E. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for purpose.
 - F. Fasten junction and pull boxes to, or support from, building structure. Do not support boxes by conduits.
 - G. Set metal floor boxes level and flush with finished floor surface.
 - H. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.
 - I. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to ensure a continuous ground path.
 - J. Boxes and Enclosures in Areas or Walls with Acoustical Requirements:
 - 1. Seal openings and knockouts in back and sides of boxes and enclosures with acoustically rated putty.
 - 2. Provide gaskets for wallplates and covers.
- 3.6 PROTECTION
- A. Protect coatings, finishes, and cabinets from damage and deterioration.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.
- 3.7 CLEANING
- A. Boxes: Remove construction dust and debris from device boxes, outlet boxes, and floor-mounted enclosures before installing wallplates, covers, and hoods.

END OF SECTION 26 05 33

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**SECTION 26 05 43
UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS**

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Type EPEC raceways and fittings.
2. Type PVC raceways and fittings.
3. Fittings for conduit, tubing, and cable.
4. Threaded metal joint compound.
5. Solvent cements.
6. Duct accessories.
7. Handholes and boxes for exterior underground wiring.
8. Manholes for exterior underground wiring.
9. Utility structure accessories.
10. Duct sealing.

B. Related Requirements:

1. Section 26 00 10 "Supplemental Requirements for Electrical" for additional abbreviations, definitions, submittals, qualifications, testing agencies, and other Project requirements applicable to Work specified in this Section.
2. Section 26 05 19 "Low-Voltage for Electrical Power Conductors and Cables" for nonmetallic underground conduit with conductors (Type NUCC).

1.2 DEFINITIONS

- A. Duct: A single raceway or multiple raceways, installed singly or as components of a duct bank.
- B. Duct Bank: Two or more ducts installed in parallel, direct buried or with additional casing materials such as concrete.
- C. Handhole: An underground chamber containing electrical cables, sized such that personnel are not required to enter in order to access the cables.
- D. Manhole: An underground chamber containing electrical cables and equipment, sized to provide access with working space clearances.
- E. Trafficways: Locations where vehicular or pedestrian traffic is a normal course of events.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
- B. Preinstallation Coordination Meeting(s): For underground ducts and raceways. Conduct meeting(s) as videoconference or at Project site.
1. Attendees: Installers, fabricators, representatives of manufacturers, and administrators for field tests and inspections. Notify Architect, and Construction Manager of scheduled meeting dates.

1.4 ACTION SUBMITTALS

A. Product Data:

1. Duct-bank materials, including spacers and miscellaneous components.
2. Ducts, conduits, and their accessories, including elbows, end bells, bends, fittings, and solvent cement.
3. Accessories for manholes, handholes, boxes.
4. Underground-line warning tape.
5. Warning planks.

B. Shop Drawings:

1. Electric Utility Duct Banks and Structures:

- a. Include plans, elevations, sections, and details, including attachments to other Work.
- b. Indicate locations of private property boundaries and utility easements.
- c. Include information required for approval by electric utility and for obtaining public space utility work permits.

2. Factory-Fabricated Handholes and Boxes Other Than Precast Concrete:

- a. Include dimensioned plans, sections, and elevations, and fabrication and installation details.
- b. Include duct entry provisions, including locations and duct sizes, and methods and materials for waterproofing duct entry locations.
- c. Include cover design.
- d. Include grounding details.
- e. Include dimensioned locations of cable rack inserts, pulling-in and lifting irons, and other accessories.

C. Field Quality-Control Submittals:

1. Field quality-control reports.

1.5 INFORMATIONAL SUBMITTALS

A. Certificates:

1. For concrete and steel used in precast concrete handholes, as required by ASTM C858.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Spare Parts: Furnish to Owner spare parts necessary for repairing or adding more cables to manholes or handholes that are packaged with protective covering for storage and identified with labels describing contents.

1. Cable-Support Stanchions, Arms, and Associated Fasteners: Five percent of quantity of each item installed.

1.7 REGULATORY AGENCY APPROVALS

- A. Shop Drawing submittals for electric utility duct banks and structures must be signed and sealed by qualified electrical professional engineer responsible for their preparation.

PART 2 - PRODUCTS

2.1 TYPE EPEC RACEWAYS AND FITTINGS

- A. Performance Criteria:
 - 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
 - 2. General Characteristics: UL 651A and UL CCN EAZX.
- B. Schedule 40 Electrical HDPE Underground Conduit (EPEC-40):
 - 1. Dimensional Specifications: Schedule 40.
 - 2. Options:
 - a. Minimum Trade Size: Metric designator 27 (trade size 1).

2.2 TYPE PVC RACEWAYS AND FITTINGS

- A. Performance Criteria:
 - 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
 - 2. General Characteristics: UL 651 and UL CCN DZYR.
- B. Schedule 40 Rigid PVC Conduit (PVC-40) and Fittings:
 - 1. Dimensional Specifications: Schedule 40.
 - 2. Options:
 - a. Minimum Trade Size: Metric designator 27 (trade size 1).

2.3 FITTINGS FOR CONDUIT, TUBING, AND CABLE

- A. Performance Criteria:
 - 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.

2.4 SOLVENT CEMENTS

- A. Performance Criteria:
 - 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
 - 2. General Characteristics: As recommended by conduit manufacturer in accordance with UL 514B and UL CCN DWTT.
 - 3. Sustainability Characteristics:
- B. Solvent Cements for Type PVC Raceways and Fittings:

2.5 DUCT ACCESSORIES

- A. Duct Spacers: Factory-fabricated, rigid, PVC interlocking spacers; sized for type and size of duct with which used, and selected to provide minimum duct spacing indicated while supporting duct during concreting or backfilling.
- B. Underground-Line Warning Tape: In accordance with Section 260553 "Identification for Electrical Systems."

2.6 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

- A. Performance Criteria:
 - 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
 - 2. General Characteristics:
 - a. ASTM C858 for design and manufacturing processes.
 - b. SCTE 77.
- B. Precast Concrete Handholes and Boxes
 - 1. Description: Factory-fabricated, reinforced-concrete, monolithically poured walls and bottom unless open-bottom enclosures are indicated. Frame and cover must form top of enclosure and must have load rating consistent with that of handhole or box.
 - 2. Configuration: Units must be designed for flush burial and have open bottom unless otherwise indicated.
 - 3. Frame and Cover:
 - a. Weatherproof steel frame, with steel cover with recessed cover hook eyes and tamper-resistant, captive, cover-securing bolts.
 - 4. Extensions and Slabs: Designed to mate with bottom of enclosure. Same material as enclosure.
 - a. Extension must provide increased depth of 12 inch (300 mm).
 - b. Slab: Same dimensions as bottom of enclosure, and arranged to provide closure.
 - 5. Joint Sealant: Asphaltic-butyl material with adhesion, cohesion, flexibility, and durability properties necessary to withstand maximum hydrostatic pressures at installation location with ground-water level at grade.
 - 6. Knockout Panels: Precast openings in walls, arranged to match dimensions and elevations of approaching duct, plus additional 12 inch (300 mm) vertically and horizontally to accommodate alignment variations.
 - a. Splayed or Center window location.
 - b. Knockout panels must be located no less than 6 inch (150 mm) from interior surfaces of walls, floors, or frames and covers of handholes, but close enough to corners to facilitate racking of cables on walls.
 - c. Knockout panel opening must have cast-in-place, welded-wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct.
 - d. Knockout panels must be framed with at least two additional No. 3 steel reinforcing bars in concrete around each opening.
 - e. Knockout panels must be 1-1/2 to 2 inch (38 to 50 mm) thick.

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7. Duct Entrances in Handhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.
 - a. Type and size: Match fittings to duct to be terminated.
 - b. Fittings must align with elevations of approaching duct and be located near interior corners of handholes to facilitate racking of cable.
 - c. Provide minimum of one cast end-bell or duct-terminating fitting of each size provided in each wall.
8. Handholes 12 inch wide by 24 inch long (300 mm wide by 600 mm long) and larger must have inserts for cable racks and pulling-in irons installed before concrete is poured.

2.7 DUCT SEALING

- A. Duct-Sealing Compound: Nonhardening, safe for contact with human skin, not deleterious to cable insulation, and workable at temperatures as low as 35 deg F (2 deg C). Compound must be capable of withstanding temperature of 300 deg F (150 deg C) without slump and adhering to clean surfaces of plastic ducts, metallic conduit, conduit and duct coatings, concrete, masonry, lead, cable sheaths, cable jackets, insulation materials, and common metals. Duct sealing compound must be removable without damaging ducts or cables.
- B. Inflatable Duct-Sealing System: Wraparound inflatable bladder that seals ducts that are empty or containing conductors against air and water infiltration. System is suitable for use in steel, plastic, or concrete ducts and penetrations.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate layout and installation of duct, duct bank, handholes, and boxes with final arrangement of other utilities, site grading, and surface features as determined in field. Notify Architect if there is conflict between areas of excavation and existing structures or archaeological sites to remain.
- B. Coordinate elevations of duct and duct-bank entrances into, handholes, and boxes with final locations and profiles of duct and duct banks, as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations as required to suit field conditions and to ensure that duct and duct bank will drain to manholes and handholes, and as approved by Architect.

3.2 SELECTION OF UNDERGROUND DUCTS

- A. Duct for Electrical Feeders 600 V and Less: PVC-40, direct buried unless otherwise indicated.
- B. Duct for Electrical Branch Circuits: PVC-40, direct buried unless otherwise indicated.

3.3 SELECTION OF UNDERGROUND ENCLOSURES

- A. Handholes and Boxes:
 1. Units in Driveway, Parking Lot, and Off-Roadway Locations, Subject to Occasional, Nondeliberate Loading by Heavy Vehicles: Precast concrete, AASHTO HB 17, H-10 structural load rating.
 2. Units in Sidewalk and Similar Applications with Safety Factor for Nondeliberate Loading by Vehicles: Precast concrete, AASHTO HB 17, H-10 structural load rating.

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3. Cover design load must not exceed load rating of handhole or box.

3.4 EARTHWORK

- A. Excavation and Backfill: Do not use heavy-duty, hydraulic-operated, compaction equipment.

3.5 INSTALLATION OF DUCTS AND DUCT BANKS

- A. Reference Standards:

1. Unless more stringent requirements are specified in Contract Documents or manufacturers' published instructions, comply with NEMA TCB 2 for installation of underground ducts and duct banks.
2. Consult Architect for resolution of conflicting requirements.

- B. Special Techniques:

1. Curves and Bends:

- a. Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends with minimum radius of 48 inch (1200 mm), 12.5 ft (4 m), 25 ft (7.5 m), both horizontally and vertically, at other locations unless otherwise indicated.
- b. Field bending must be in accordance with NFPA 70 minimum radii requirements, except bends over 45 degrees must be made with minimum radius of 48 inch (1200 mm), 12.5 ft (4 m), 25 ft (7.5 m). Use only equipment specifically designed for material and size involved. Use PVC heating bender for bending PVC conduit.
- c. Duct must have maximum of 180 degrees of bends between pull points.

2. End Bell Entrances to Manholes and Concrete and Polymer Concrete Handholes: Use end bells, spaced approximately 10 inch (250 mm) o.c. for 5 inch (125 mm) duct, and vary proportionately for other duct sizes.

- a. Begin change from regular spacing to end-bell spacing 10 ft (3 m) from end bell, without reducing duct slope and without forming trap in line.
- b. Grout end bells into structure walls from both sides to provide watertight entrances.

3. Pulling Cord: Install 200 lbf (1000 N) test nylon cord in empty ducts.

4. Direct-Buried Duct and Duct Bank:

- a. Excavate trench bottom to provide firm and uniform support for duct.
- b. Width: Excavate trench 3 inch (75 mm) wider than duct on each side.
- c. Depth: Install top of duct at least 24 inch (610 mm) below finished grade unless otherwise indicated.
- d. Set elevation of top of duct bank below frost line.
- e. Place minimum 6 inch (153) of sand as bed for duct.
- f. Support ducts on duct spacers coordinated with duct size, duct spacing, and outdoor temperature.
- g. Spacer Installation: Place spacers close enough to prevent sagging and deforming of duct, with not less than four spacers per 20 ft (6 m) of duct. Place spacers within 24 inch (600 mm) of duct ends. Stagger spacers approximately 6 inch (150 mm) between tiers. Secure spacers to earth and to ducts to prevent floating during concreting. Tie entire assembly together using fabric straps; do not use tie wires or

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reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.

- h. Install manufactured duct elbows for stub-ups, at building entrances, and at changes of direction in duct direction unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
 - i. After installing first tier of duct, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat procedure after placing each tier. After placing last tier, hand place backfill to 4 inch (100 mm) over duct and hand tamp. Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction.
5. Underground-Line Warning Tape: Bury conducting underground line specified in Section 260553 "Identification for Electrical Systems" above duct banks and approximately 12 inch (300 mm) below grade. Align tape parallel to and within 3 inch (75 mm) of centerline of duct bank. Provide additional warning tape for each 12 inch (300 mm) increment of duct-bank width over nominal 18 inch (450 mm). Space additional tapes 12 inch (300 mm) apart, horizontally across width of ducts.

C. Interfaces with Other Work:

- 1. Coordinate installation of new products for with existing conditions.

3.6 INSTALLATION OF CONCRETE, HANDHOLES, AND BOXES

A. Reference Standards:

- 1. Precast Concrete Handholes: Comply with ASTM C891 unless otherwise indicated.
- 2. Consult Architect for resolution of conflicting requirements.

B. Special Techniques:

1. Cast-in-Place Manholes:

- a. Finish interior surfaces with smooth-troweled finish.
- b. Knockouts for Future Duct Connections: Form and pour concrete knockout panels 1-1/2 to 2 inch (38 to 50 mm) thick, arranged as indicated.

2. Precast Concrete Handholes:

- a. Install units level and plumb and with orientation and depth coordinated with connecting duct to minimize bends and deflections required for proper entrances.
- b. Unless otherwise indicated, support units on level bed of crushed stone or gravel graded from 1 inch (25 mm) sieve to No. 4 (4.75 mm) sieve and compacted to same density as adjacent undisturbed earth.
- c. Field-cut openings for conduits in accordance with enclosure manufacturer's published instructions. Cut wall of enclosure with tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3. Elevations:

- a. Install handholes with bottom below frost line, below grade.
 - b. Handhole Covers: In paved areas and trafficways, set surface flush with finished grade. Set covers of other handholes 1 inch (25 mm) above finished grade.
 - c. Where indicated, cast handhole cover frame integrally with handhole structure.
4. Field-Installed Bolting Anchors in Manholes and Concrete Handholes: Do not drill deeper than 3-7/8 inch (97 mm) for manholes and 2 inch (50 mm) for handholes, for anchor bolts installed in field. Use minimum of two anchors for each cable stanchion.
 5. Ground manholes, handholes, and boxes in accordance with Section 260526 "Grounding and Bonding for Electrical Systems."

3.7 FIELD QUALITY CONTROL

- A. Field tests and inspections must be witnessed by Architect, Tenant.
- B. Tests and Inspections:
 1. Demonstrate capability and compliance with requirements on completion of installation of underground duct, duct bank, and utility structures.
 2. Pull solid aluminum or wood test mandrel through duct to prove joint integrity and adequate bend radii, and test for out-of-round duct. Provide minimum 12 inch (300 mm) long mandrel equal to duct size minus 1/4 inch (6 mm). If obstructions are indicated, remove obstructions and retest.
 3. Test and handhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Section 260526 "Grounding and Bonding for Electrical Systems."
- C. Nonconforming Work:
 1. Underground ducts, raceways, and structures will be considered defective if they do not pass tests and inspections.
 2. Correct deficiencies and retest as specified above to demonstrate compliance.
- D. Assemble and submit test and inspection reports.

3.8 CLEANING

- A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of duct until duct cleaner indicates that duct is clear of dirt and debris. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.
- B. Clean internal surfaces of manholes, including sump, and building interiors affected by Work.
 1. Sweep floor, removing dirt and debris.
 2. Remove foreign material.

END OF SECTION 26 05 43

SECTION 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Labels.
2. Bands and tubes.
3. Tapes and stencils.
4. Tags.
5. Signs.
6. Cable ties.
7. Miscellaneous identification products.

B. Related Requirements:

1. Section 26 00 10 "Supplemental Requirements for Electrical" for additional abbreviations, definitions, submittals, qualifications, testing agencies, and other Project requirements applicable to Work specified in this Section.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for electrical identification products.

B. Identification Schedule: For each piece of electrical equipment and electrical system components to be index of nomenclature for electrical equipment and system components used in identification signs and labels. Use same designations indicated on Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with ASME A13.1.

B. Comply with 29 CFR 1910.144 for color identification of hazards; 29 CFR 1910.145 for danger, caution, warning, and safety instruction signs and tags; and the following:

1. Fire-protection and fire-alarm equipment, including raceways, must be finished, painted, or suitably marked safety red.
2. Ceiling-mounted hangers, supports, and raceways must be finished, painted, or suitably marked safety yellow where less than 7.7 ft (2.3 m) above finished floor.

C. Signs, labels, and tags required for personnel safety must comply with the following standards:

1. Safety Colors: NEMA Z535.1.
2. Facility Safety Signs: NEMA Z535.2.
3. Safety Symbols: NEMA Z535.3.

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4. Product Safety Signs and Labels: NEMA Z535.4.
5. Safety Tags and Barricade Tapes for Temporary Hazards: NEMA Z535.5.

D. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, must comply with UL 969.

2.2 COLOR AND LEGEND REQUIREMENTS

A. Raceways and Cables Carrying Circuits at 1000 V or Less:

1. Black letters on orange field.
2. Legend: Indicate voltage.

B. Color-Coding for Phase- Identification, 1000 V or Less: Use colors listed below for ungrounded feeder and branch-circuit conductors.

1. Color must be factory applied.
2. Colors for 208Y/120 V Circuits:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.
3. Color for Neutral: White.
4. Color for Equipment Grounds: Green.

C. Warning Label Colors:

1. Identify system voltage with black letters on orange background.

D. Warning labels and signs must include, but are not limited to, the following legends:

1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 3 FEET MINIMUM."

E. Equipment Identification Labels:

1. Black letters on white field.

2.3 LABELS

A. Vinyl Wraparound Labels: Preprinted, flexible labels laminated with clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.

B. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameters sized to suit diameters and that stay in place by gripping action.

C. Self-Adhesive Wraparound Labels: Preprinted, 3 mil (0.08 mm) thick, polyester, vinyl flexible label with acrylic pressure-sensitive adhesive.

1. Self-Lamination: Clear; UV-, weather- and chemical-resistant; self-laminating, protective shield over legend. Labels sized such that clear shield overlaps entire printed legend.

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2. Marker for Labels:
 - a. Machine-printed, permanent, waterproof, black ink recommended by printer manufacturer.
- D. Self-Adhesive Labels: Polyester, Vinyl, thermal, transfer-printed, 3 mil (0.08 mm) thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.
 1. Minimum Nominal Size:
 - a. 1-1/2 by 6 inch (37 by 150 mm) for raceway and conductors.
 - b. 3-1/2 by 5 inch (76 by 127 mm) for equipment.
 - c. As required by authorities having jurisdiction.

2.4 BANDS AND TUBES

- A. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inch (50 mm) long, with diameters sized to suit diameters and that stay in place by gripping action.
- B. Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tubes with machine-printed identification labels, sized to suit diameter and shrunk to fit firmly. Full shrink recovery occurs at maximum of 200 deg F (93 deg C). Comply with UL 224.

2.5 TAPES AND STENCILS

- A. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
- B. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mil (0.08 mm) thick by 1 to 2 inch (25 to 50 mm) wide; compounded for outdoor use.
- C. Tape and Stencil: 4 inch (100 mm) wide black stripes on 10 inch (250 mm) centers placed diagonally over orange background and are 12 inch (300 mm) wide. Stop stripes at legends.
- D. Underground-Line Warning Tape:
 1. Tape:
 - a. Recommended by manufacturer for method of installation and suitable to identify and locate underground electrical and communications utility lines.
 - b. Printing on tape must be permanent and may not be damaged by burial operations.
 - c. Tape material and ink must be chemically inert and not be subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.
 2. Color and Printing:
 - a. Comply with APWA Uniform Color Code using NEMA Z535.1 safety colors.
 - b. Inscriptions for Red Tapes: "CAUTION BURIED ELECTRIC LINE BELOW".
 - c. Inscriptions for Orange Tapes: "CAUTION BURIED FIBER OPTIC LINE BELOW".

3. Tape Type ID

- a. Detectable three-layer laminate, consisting of printed pigmented polyolefin film, solid aluminum-foil core, and clear protective film that allows inspection of continuity of conductive core; bright colored, [continuous-printed on one side with inscription of utility,] compounded for direct-burial service.
- b. Width: 3 inch (75 mm).
- c. Overall Thickness: 5 mil (0.125 mm).
- d. Foil Core Thickness: 0.35 mil (8.9 μ m).
- e. Weight: 28 lb/1000 sq. ft (13.7 kg/100 sq. m).
- f. Tensile in accordance with ASTM D882: 70 lbf (311.3 N) and 4600 psi (31.7 MPa).

2.6 SIGNS

A. Baked-Enamel Signs:

1. Preprinted aluminum signs punched or drilled for fasteners, with colors, legend, and size required for application.
2. 1/4 inch (6.4 mm) grommets in corners for mounting.
3. Nominal Size: 7 by 10 inch (180 by 250 mm).

B. Metal-Backed Butyrate Signs:

1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs, with 0.0396 inch (1 mm) galvanized-steel backing, punched and drilled for fasteners, and with colors, legend, and size required for application.
2. 1/4 inch (6.4 mm) grommets in corners for mounting.
3. Nominal Size: 10 by 14 inch (250 by 360 mm).

C. Laminated Acrylic or Melamine Plastic Signs:

1. Engraved legend.
2. Thickness:
 - a. For signs up to 20 sq. inch (129 sq. cm), minimum 1/16 inch (1.6 mm) thick.
 - b. For signs larger than 20 sq. inch (129 sq. cm), 1/8 inch (3.2 mm) thick.
 - c. Engraved legend with black letters on white face.
 - d. Punched or drilled for mechanical fasteners with 1/4 inch (6.4 mm) grommets in corners for mounting.
 - e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.7 CABLE TIES

A. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.

1. Minimum Width: 3/16 inch (5 mm).
2. Tensile Strength at 73 deg F (23 deg C) in accordance with ASTM D638: 12,000 psi (82.7 MPa).
3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
4. Color: Black, except where used for color-coding.

B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.

1. Minimum Width: 3/16 inch (5 mm).

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2. Tensile Strength at 73 deg F (23 deg C) in accordance with ASTM D638: 12,000 psi (82.7 MPa).
3. Temperature Range: Minus 40 to plus 185 deg F (Minus 40 to plus 85 deg C).
4. Color: Black.

C. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, and self-locking.

1. Minimum Width: 3/16 inch (5 mm).
2. Tensile Strength at 73 deg F (23 deg C) in accordance with ASTM D638: 7000 psi (48.2 MPa).
3. UL 94 Flame Rating: 94V-0.
4. Temperature Range: Minus 50 to plus 284 deg F (Minus 46 to plus 140 deg C).
5. Color: Black.

2.8 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless steel screws or stainless steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.2 INSTALLATION

- A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.
- B. Install identifying devices before installing acoustical ceilings and similar concealment.
- C. Verify identity of item before installing identification products.
- D. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.
- E. Apply identification devices to surfaces that require finish after completing finish work.
- F. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.
- G. System Identification for Raceways and Cables under 1000 V: Identification must completely encircle cable or conduit. Place identification of two-color markings in contact, side by side.
 1. Secure tight to surface of conductor, cable, or raceway.

- H. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
- I. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from floor.
- J. Vinyl Wraparound Labels:
 - 1. Secure tight to surface of raceway or cable at location with high visibility and accessibility.
 - 2. Attach labels that are not self-adhesive type with clear vinyl tape, with adhesive appropriate to location and substrate.
- K. Snap-Around Labels: Secure tight to surface at location with high visibility and accessibility.
- L. Self-Adhesive Wraparound Labels: Secure tight to surface at location with high visibility and accessibility.
- M. Self-Adhesive Labels:
 - 1. Install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual.
 - 2. Unless otherwise indicated, provide single line of text with 1/2 inch (13 mm) high letters on 1-1/2 inch (38 mm) high label; where two lines of text are required, use labels 2 inch (50 mm) high.
- N. Snap-Around Color-Coding Bands: Secure tight to surface at location with high visibility and accessibility.
- O. Heat-Shrink, Preprinted Tubes: Secure tight to surface at location with high visibility and accessibility.
- P. Marker Tapes: Secure tight to surface at location with high visibility and accessibility.
- Q. Self-Adhesive Vinyl Tape: Secure tight to surface at location with high visibility and accessibility.
 - 1. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for minimum distance of 6 inch (150 mm) where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding.
- R. Tape and Stencil: Comply with requirements in painting Sections for surface preparation and paint application.
- S. Underground Line Warning Tape:
 - 1. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 12 inch (305 mm) below finished grade. Use multiple tapes where width of multiple lines installed in common trench exceeds 16 inch (400 mm) overall.
 - 2. Install underground-line warning tape for direct-buried cables and cables in raceways.
- T. Nonmetallic Preprinted Tags:
 - 1. Place in location with high visibility and accessibility.
 - 2. Secure using general-purpose cable ties.

- U. Write-on Tags:
 - 1. Place in location with high visibility and accessibility.
 - 2. Secure using general-purpose cable ties.
- V. Baked-Enamel Signs:
 - 1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to location and substrate.
 - 2. Unless otherwise indicated, provide single line of text with 1/2 inch (13 mm) high letters on minimum 1-1/2 inch (38 mm) high sign; where two lines of text are required, use signs minimum 2 inch (50 mm) high.
- W. Metal-Backed Butyrate Signs:
 - 1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to location and substrate.
 - 2. Unless otherwise indicated, provide single line of text with 1/2 inch (13 mm) high letters on 1-1/2 inch (38 mm) high sign; where two lines of text are required, use labels 2 inch (50 mm) high.
- X. Laminated Acrylic or Melamine Plastic Signs:
 - 1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to location and substrate.
 - 2. Unless otherwise indicated, provide single line of text with 1/2 inch (13 mm) high letters on 1-1/2 inch (38 mm) high sign; where two lines of text are required, use labels 2 inch (50 mm) high.
- Y. Cable Ties: General purpose, for attaching tags, except as listed below:
 - 1. Outdoors: UV-stabilized nylon.
 - 2. In Spaces Handling Environmental Air: Plenum rated.

3.3 IDENTIFICATION SCHEDULE

- A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.
- B. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.
- C. Accessible Raceways and Metal-Clad Cables, 1000 V or Less, for Service, Feeder, and Branch Circuits, More Than 30 A and 120 V to Ground: Identify with self-adhesive raceway labels, vinyl tape applied in bands.
 - 1. Locate identification at changes in direction, at penetrations of walls and floors, at 50 ft (15 m) maximum intervals in straight runs, and at 25 ft (7.6 m) maximum intervals in congested areas.
- D. Power-Circuit Conductor Identification, 1000 V or Less: For conductors in vaults, pull and junction boxes, and handholes, use vinyl wraparound labels, self-adhesive wraparound labels, snap-around labels, snap-around color-coding bands, self-adhesive vinyl tape to identify phase.

1. Locate identification at changes in direction, at penetrations of walls and floors, at 50 ft (15 m) maximum intervals in straight runs, and at 25 ft (7.6 m) maximum intervals in congested areas.
- E. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use self-adhesive labels with conductor or cable designation, origin, and destination.
- F. Control-Circuit Conductor Termination Identification: For identification at terminations, provide self-adhesive labels with conductor designation.
- G. Auxiliary Electrical Systems Conductor Identification: Self-adhesive vinyl tape that is uniform and consistent with system used by manufacturer for factory-installed connections.
1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
- H. Locations of Underground Lines: Underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.
- I. Instructional Signs: Self-adhesive labels, including color code for grounded and ungrounded conductors.
- J. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive labels, Baked-enamel warning signs, Metal-backed, butyrate warning signs.
1. Apply to exterior of door, cover, or other access.
 2. For equipment with multiple power or control sources, apply to door or cover of equipment, including, but not limited to, the following:
 - a. Power-transfer switches.
 - b. Controls with external control power connections.
- K. Arc Flash Warning Labeling: Self-adhesive labels.
- L. Operating Instruction Signs: Self-adhesive labels, Baked-enamel warning signs, Metal-backed, butyrate warning signs, Laminated acrylic or melamine plastic signs.
- M. Emergency Operating Instruction Signs: Self-adhesive labels, Baked-enamel warning signs, Metal-backed, butyrate warning signs, Laminated acrylic or melamine plastic signs with white legend on red background with minimum 3/8 inch (10 mm) high letters for emergency instructions at equipment used for [power transfer] [load shedding] <Insert emergency operations
- N. Equipment Identification Labels:
1. Indoor Equipment: Self-adhesive label, Baked-enamel signs, Metal-backed butyrate signs, Laminated acrylic or melamine plastic sign.
 2. Outdoor Equipment: Laminated acrylic or melamine sign, Stenciled legend 4 inch (100 mm) high.
 3. Equipment to Be Labeled:
 - a. Panelboards: Typewritten directory of circuits in location provided by panelboard manufacturer. Panelboard identification must be in form of [self-adhesive, engraved,] [engraved,] laminated acrylic or melamine label.

IDENTIFICATION FOR ELECTRICAL SYSTEMS

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- b. Enclosures and electrical cabinets.
- c. Switchboards.
- d. Enclosed switches.
- e. Remote-controlled switches, dimmer modules, and control devices.

END OF SECTION 26 05 53

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SECTION 26 24 13
SWITCHBOARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Switchboards.
- 2.
3. Disconnecting and overcurrent protective devices.
4. Accessory components and features.

B. Related Requirements

1. Section 26 00 10 "Supplemental Requirements for Electrical" for additional abbreviations, definitions, submittals, qualifications, testing agencies, and other Project requirements applicable to Work specified in this Section.

1.2 COORDINATION

A. Coordinate layout and installation of switchboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

B. Coordinate sizes and locations of concrete bases with actual equipment provided.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Switchboards.
2. Overcurrent protective devices.
3. Accessories.
4. Other components.
5. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.

B. Shop Drawings: For each switchboard and related equipment.

1. Include dimensioned plans, elevations, sections, and details, including required clearances and service space around equipment. Show tabulations of installed devices, equipment features, and ratings.
2. Detail enclosure types for types other than UL 50E, Type 1.
3. Detail bus configuration, current, and voltage ratings.
4. Detail short-circuit current rating of switchboards and overcurrent protective devices.
5. Include descriptive documentation of optional barriers specified for electrical insulation and isolation.
6. Detail utility company's metering provisions with indication of approval by utility company.
7. Include evidence of listing, by qualified electrical testing laboratory recognized by authorities having jurisdiction, for series rating of installed devices.

8. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
9. Include time-current coordination curves for each type and rating of overcurrent protective device included in switchboards. Submit on translucent log-log graph paper; include selectable ranges for each type of overcurrent protective device.
10. Include diagram and details of proposed mimic bus.
11. Include schematic and wiring diagrams for power, signal, and control wiring.

C. Field Quality-Control Submittals:

1. Field Quality-Control Reports:

- a. Test procedures used.
- b. Test results that comply with requirements.
- c. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

1.4 INFORMATIONAL SUBMITTALS

A. Manufacturers' Published Instructions: Record copy of official installation[and testing] instructions issued to Installer by manufacturer for the following:

1. Handling, storing, and providing temporary heat.
2. Mounting accessories and anchoring devices.
3. Testing and adjusting overcurrent protective devices.

B. Sample warranties.

1.5 CLOSEOUT SUBMITTALS

A. Warranty documentation.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Special Tools: Furnish to Owner proprietary equipment, keys, and software required to operate, maintain, repair, adjust, or implement future changes to switchboards, that are packaged with protective covering for storage on-site and identified with labels describing contents. Include the following:

1. Accessory Set: Include tools and miscellaneous items required for overcurrent protective device test, inspection, maintenance, and operation.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver switchboards in sections or lengths that can be moved past obstructions in delivery path.

B. Remove loose packing and flammable materials from inside switchboards and to prevent condensation.

C. Handle and prepare switchboards for installation in accordance with NECA 400 NEMA PB 2.1.

1.8 WARRANTY

- A. Special Installer Extended Warranty: Installer warrants that fabricated and installed switchboard perform in accordance with specified requirements and agrees to repair or replace components that fail to perform as specified within extended-warranty period.
 - 1. Extended-Warranty Period: Two years from date of Substantial Completion; full coverage for labor, materials, and equipment.
- B. Special Manufacturer Extended Warranty: Manufacturer warrants that switchboard performs in accordance with specified requirements and agrees to provide repair or replacement of components that fail to perform as specified within extended-warranty period.
 - 1. Initial Extended-Warranty Period: Three years from date of Substantial Completion; full coverage for labor, materials, and equipment.
 - 2. Follow-On Extended-Warranty Period: Five years from date of Substantial Completion; full coverage for materials that failed because of transient voltage surges only, free on board origin, freight prepaid.

PART 2 - PRODUCTS

2.1 SWITCHBOARDS

- A. Source Limitations: Obtain switchboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.
- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for switchboards including clearances between switchboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- C. Electrical Components, Devices, and Accessories: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended location and application.
- D. Comply with NEMA PB 2.
- E. Comply with NFPA 70.
- F. Comply with UL 891.
- G. Front-Connected, Front-Accessible Switchboards:
 - 1. Main Devices: Fixed, individually mounted.
 - 2. Branch Devices: Panel mounted.
 - 3. Sections front and rear aligned.
- H. Nominal System Voltage: 208Y/120 V.
- I. Main-Bus Continuous: 800 A.
- J. Outdoor Enclosures: Type 3R.
 - 1. Finish: Factory-applied finish in manufacturer's standard color; undersurfaces treated with corrosion-resistant undercoating.
 - 2. Enclosure: Flat roof; bolt-on rear covers for each section, with provisions for padlocking.

SWITCHBOARDS

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- a. Ventilating openings.
- K. Barriers: Between adjacent switchboard sections.
 - L. Insulation and isolation for main and vertical buses of feeder sections.
 - M. Service Entrance Rating: Switchboards intended for use as service entrance equipment may contain from one to six service disconnecting means with overcurrent protection, neutral bus with disconnecting link, grounding electrode conductor terminal, and main bonding jumper.
 - N. Utility Metering Compartment: Barrier compartment and section complying with utility company's requirements; hinged sealable door; buses provisioned for mounting utility company's current transformers and potential transformers, or potential taps as required by utility company. If separate vertical section is required for utility metering, match and align with basic switchboard. Provide service entrance label and necessary applicable service entrance features.
 - O. Customer Metering Compartment: Separate customer metering compartment and section with front hinged door, for indicated metering, and current transformers for each meter. Current transformer secondary wiring must be terminated on shorting-type terminal blocks.
 - P. Bus Transition and Incoming Pull Sections: Matched and aligned with basic switchboard.
 - Q. Hinged Front Panels: Allow access to circuit breaker, metering, accessory, and blank compartments.
 - R. Buses and Connections: Three phase, four wire unless otherwise indicated.
 - 1. Provide phase bus arrangement A, B, C from front to back, top to bottom, and left to right when viewed from front of switchboard.
 - 2. Phase- and Neutral-Bus Material:
 - a. Hard-drawn copper of 98 percent conductivity.
 - 3. Copper feeder circuit-breaker line connections.
 - 4. Load Terminals: Insulated, rigidly braced, runback bus extensions, of same material as through buses, equipped with mechanical connectors for outgoing circuit conductors. Provide load terminals for future circuit-breaker positions at full-ampere rating of circuit-breaker position.
 - 5. Ground Bus: Minimum-size required by UL 891, hard-drawn copper of 98 percent conductivity, equipped with mechanical connectors for feeder and branch-circuit ground conductors.
 - 6. Main-Phase Buses and Equipment-Ground Buses: Uniform capacity for entire length of switchboard's main and distribution sections. Provide for future extensions from both ends.
 - 7. Disconnect Links:
 - a. Isolate neutral bus from incoming neutral conductors.
 - b. Bond neutral bus to equipment-ground bus for switchboards utilized as service equipment or separately derived systems.
 - 8. Neutral Buses: 100percent of ampacity of phase buses unless otherwise indicated, equipped with mechanical connectors for outgoing circuit neutral cables. Brace bus extensions for busway feeder neutral bus.
 - 9. Isolation Barrier Access Provisions: Permit checking of bus-bolt tightness.

- S. Future Devices: Equip compartments with mounting brackets, supports, bus connections, and appurtenances at full rating of circuit-breaker compartment.
- T. Bus-Bar Insulation: Factory-applied, flame-retardant, tape wrapping of individual bus bars or flame-retardant, spray-applied insulation. Minimum insulation temperature rating of 105 deg C.
- U. Fungus Proofing: Permanent fungicidal treatment for overcurrent protective devices and other components including instruments and instrument transformers.

2.2 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.
 - 1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
 - 2. Adjustable Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.
 - a. Instantaneous trip.
 - b. Long- and short-time pickup levels.
 - c. Long and short time adjustments.
 - d. Ground-fault pickup level, time delay, and I squared t response.
 - e. MCCB Features and Accessories: Standard frame sizes, trip ratings, and number of poles.
 - f. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor material.
 - g. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge (HID) lighting circuits.
 - 3. Service-Rated Switches: Labeled for use as service equipment.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Receive, inspect, handle, and store switchboards in accordance with NECA 400 NEMA PB 2.1.
 - 1. Lift or move panelboards with spreader bars and manufacturer-supplied lifting straps following manufacturer's published instructions.
 - 2. Use rollers, slings, or other manufacturer-approved methods if lifting straps are not furnished.
 - 3. Protect from moisture, dust, dirt, and debris during storage and installation.
 - 4. Install temporary heating during storage in accordance with manufacturer's published instructions.
- B. Examine switchboards before installation. Reject switchboards that are moisture damaged or physically damaged.
- C. Examine elements and surfaces to receive switchboards for compliance with installation tolerances and other conditions affecting performance of the Work or that affect performance of equipment.

- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Installation Pathway: Remove and replace access fencing, doors, lift-out panels, and structures to provide pathway for moving switchboards into place.

3.3 INSTALLATION

- A. Comply with manufacturer's published instructions.

- B. Reference Standards:

1. Switchboards and Accessories: Unless more stringent requirements are specified in Contract Documents or manufacturers' published instructions, comply with NECA 400 NEMA PB 2.1.
2. Consult Architect for resolution of conflicting requirements.

- C. Special Techniques:

1. Equipment Mounting: Install switchboards on concrete base, 4 inch (100 mm) nominal thickness. Comply with requirements for concrete base specified in Section 260529 "Hangers and Supports for Electrical Systems."
 - a. Install conduits entering underneath switchboard, entering under vertical section where conductors will terminate. Install with couplings flush with concrete base. Extend 2 inch (50 mm) above concrete base after switchboard is anchored in place.
 - b. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.
 - c. Place and secure anchorage devices. Use setting drawings, templates, diagrams, published instructions, and directions furnished with items to be embedded.
 - d. Install anchor bolts to elevations required for proper attachment to switchboards.
 - e. Anchor switchboard to building structure at top of switchboard if required or recommended by manufacturer.
2. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, straps and brackets, and temporary blocking of moving parts from switchboard units and components.
3. Operating Instructions: Frame and mount printed basic operating instructions for switchboards, including control and key interlocking sequences and emergency procedures. Fabricate frame of finished wood or metal and cover instructions with clear acrylic plastic. Mount on front of switchboards.
4. Install filler plates in unused spaces of panel-mounted sections.
5. Install overcurrent protective devices, surge protection devices, and instrumentation.
 - a. Set field-adjustable switches and circuit-breaker trip ranges.

3.4 CONNECTIONS

- A. Bond conduits entering underneath switchboard to equipment ground bus with bonding conductor sized in accordance with NFPA 70.
- B. Support and secure conductors within switchboard in accordance with NFPA 70.

- C. Extend insulated equipment grounding cable to busway ground connection and support cable at intervals in vertical run.

3.5 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- B. Switchboard Nameplates: Label each switchboard compartment with nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- C. Device Nameplates: Label each disconnecting and overcurrent protective device and each meter and control device mounted in compartment doors with nameplate complying with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."

3.6 FIELD QUALITY CONTROL

- A. Acceptance Testing Preparation:
 - 1. <Insert requirements>.
- B. Field tests and inspections must be witnessed by authorities having jurisdiction.
- C. Tests and Inspections:
 - 1. Acceptance Testing:
 - a. Test insulation resistance for each switchboard bus, component, connecting supply, feeder, and control circuit. Open control and metering circuits within switchboard and remove neutral connection to surge protection and other electronic devices prior to insulation test. Reconnect after test.
 - b. Test continuity of each circuit.
 - 2. Test ground-fault protection of equipment for service equipment in accordance with NFPA 70.
 - 3. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 4. Correct malfunctioning units on-site where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
 - 5. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Nonconforming Work:
 - 1. Switchboard will be considered defective if it does not pass tests and inspections.
 - 2. Remove and replace defective units and retest.
- E. Collect, assemble, and submit test and inspection reports, including certified report that identifies switchboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.
- F. Manufacturer Services:

1. Engage factory-authorized service representative to support field tests and inspections.

3.7 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by manufacturer.
- B. Set field-adjustable circuit-breaker trip ranges as indicated.

3.8 PROTECTION

- A. Temporary Heating: Apply temporary heat, to maintain temperature in accordance with manufacturer's published instructions, until switchboard is ready to be energized and placed into service.

END OF SECTION 26 24 13

SECTION 26 24 16
PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Power panelboards.
2. Lighting and appliance branch-circuit panelboards.
3. Disconnecting and overcurrent protective devices.

B. Related Requirements:

1. Section 26 00 10 "Supplemental Requirements for Electrical" for additional abbreviations, definitions, submittals, qualifications, testing agencies, and other Project requirements applicable to Work specified in this Section.

1.2 DEFINITIONS

A. GFEP: Ground-fault equipment protection.

B. MCCB: Molded-case circuit breaker.

C. VPR: Voltage protection rating.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Power panelboards.
2. Lighting and appliance branch-circuit panelboards.
3. Disconnecting and overcurrent protective devices.
4. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each panelboard and related equipment.

1. Include dimensioned plans, elevations, sections, and details.
2. Show tabulations of installed devices with nameplates, conductor termination sizes, equipment features, and ratings.
3. Detail enclosure types including mounting and anchorage, environmental protection, knockouts, corner treatments, covers and doors, gaskets, hinges, and locks.
4. Detail bus configuration, current, and voltage ratings.
5. Short-circuit current rating of panelboards and overcurrent protective devices.
6. Include evidence of listing, by qualified electrical testing laboratory recognized by authorities having jurisdiction, for series rating of installed devices.
7. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
8. Include wiring diagrams for power, signal, and control wiring.

9. Include time-current coordination curves for each type and rating of overcurrent protective device included in panelboards. Submit on translucent log-log graph paper; include selectable ranges for each type of overcurrent protective device. Include Internet link for electronic access to downloadable PDF of coordination curves.

C. Field Quality-Control Submittals:

1. Field quality-control reports.

1.4 INFORMATIONAL SUBMITTALS

A. Panelboard Schedules: For installation in panelboards.

B. Manufacturers' Published Instructions: Record copy of official installation instructions issued to Installer by manufacturer for the following:

1. Recommended procedures for installing panelboards.
2. Recommended torque settings for bolted connections on panelboards.
3. Recommended temperature range for energizing panelboards.

1.5 CLOSEOUT SUBMITTALS

A. Warranty documentation.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Spare Parts: Furnish to Owner spare parts, for repairing panelboards, that are packaged with protective covering for storage on-site and identified with labels describing contents. Include the following:

1. Keys: 2 spares for each type of panelboard cabinet lock.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Remove loose packing and flammable materials from inside panelboards.

B. Handle and prepare panelboards for installation in accordance with NECA 407 NEMA PB 1.

1.8 WARRANTY

A. Special Installer Extended Warranty: Installer warrants that fabricated and installed panelboards perform in accordance with specified requirements and agrees to repair or replace components or products that fail to perform as specified within extended-warranty period.

1. Extended-Warranty Period: Two years from date of Substantial Completion; full coverage for labor, materials, and equipment.

B. Special Manufacturer Extended Warranty: Manufacturer warrants that panelboard perform in accordance with specified requirements and agrees to provide repair or replacement of components or products that fail to perform as specified within extended-warranty period.

1. Initial Extended-Warranty Period: Three years from date of Substantial Completion; full coverage for labor, materials, and equipment.
2. Follow-On Extended-Warranty Period: [Five] years from date of Substantial Completion; full coverage for materials only, free on board origin, freight prepaid.

PART 2 - PRODUCTS

2.1 PANELBOARDS AND LOAD CENTERS COMMON REQUIREMENTS

- A. Fabricate and test panelboards in accordance with IEEE 344 to withstand seismic forces.
- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for panelboards including clearances between panelboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- C. Electrical Components, Devices, and Accessories: Listed and labeled in accordance with NFPA 70, by qualified electrical testing agency recognized by authorities having jurisdiction and marked for intended location and application.
- D. Comply with NEMA PB 1.
- E. Comply with NFPA 70.
- F. Enclosures: Flush and Surface-mounted, dead-front cabinets.
 - 1. Rated for environmental conditions at installed location.
 - a. Indoor Dry and Clean Locations: UL 50E, Type 1.
 - b. Outdoor Locations: UL 50E, Type 3R.
 - c. Kitchen Areas: UL 50E, Type 4X.
 - d. Other Wet or Damp Indoor Locations: UL 50E, Type 4.
 - e. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: UL 50E, [Type 5] [Type 12].
 - 2. Height: 7 ft (2.13 m) maximum.
 - 3. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box. Trims must cover live parts and may have no exposed hardware.
 - 4. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover. Trims must cover live parts and may have no exposed hardware.
 - 5. Skirt for Surface-Mounted Panelboards: Same gage and finish as panelboard front with flanges for attachment to panelboard, wall, and ceiling or floor.
 - 6. Finishes:
 - a. Panels and Trim: Steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
- G. Incoming Mains:
 - 1. Location: Convertible between top and bottom.
 - 2. Main Breaker: Main lug interiors up to 400 A must be field convertible to main breaker.
- H. Phase, Neutral, and Ground Buses:
 - 1. Material: Hard-drawn copper, 98 percent conductivity.
 - a. Plating must run entire length of bus.
 - b. Bus must be fully rated for entire length.

2. Interiors must be factory assembled into unit. Replacing switching and protective devices may not disturb adjacent units or require removing main bus connectors.
 3. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.
 4. Do not mount neutral bus in gutter.
- I. Conductor Connectors: Suitable for use with conductor material and sizes.
1. Material: Hard-drawn copper, 98 percent conductivity.
 2. Terminations must allow use of 75 deg C rated conductors without derating.
 3. Size: Lugs suitable for indicated conductor sizes, with additional gutter space, if required, for larger conductors.
 4. Main and Neutral Lugs: Mechanical type, with lug on neutral bar for each pole in panelboard.
 5. Ground Lugs and Bus-Configured Terminators: Mechanical type, with lug on bar for each pole in panelboard.
 6. Feed-Through Lugs: Mechanical type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
- J. Quality-Control Label: Panelboards or load centers must be labeled, by qualified electrical testing laboratory recognized by authorities having jurisdiction, for use as service equipment with one or more main service disconnecting and overcurrent protective devices. Panelboards or load centers must have meter enclosures, wiring, connections, and other provisions for utility metering. Coordinate with utility company for exact requirements.
- K. Future Devices: Panelboards or load centers must have mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.
1. Percentage of Future Space Capacity: 20 percent.
- L. Panelboard Short-Circuit Current Rating:
1. Fully rated to interrupt symmetrical short-circuit current available at terminals. Assembly listed, by qualified electrical testing laboratory recognized by authorities having jurisdiction, for 100 percent interrupting capacity.
 - a. Panelboards and overcurrent protective devices rated 240 V or less must have short-circuit ratings as shown on Drawings, but not less than 10 000 A(rms) symmetrical.
- 2.2 POWER PANELBOARDS
- A. Listing Criteria: NEMA PB 1, distribution type.
- B. Doors: Secured with vault-type latch with tumbler lock; keyed alike.
1. For doors more than 36 inch (914 mm) high, provide two latches, keyed alike.
- C. Mains: Circuit breaker.
- D. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers.
- E. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers.

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Listing Criteria: NEMA PB 1, lighting and appliance branch-circuit type.
- B. Mains: Circuit breaker.
- C. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- D. Doors: Door-in-door construction with concealed hinges; secured with flush or multipoint latch with tumbler lock; keyed alike. Outer door must permit full access to panel interior. Inner door must permit access to breaker operating handles and labeling, but current carrying terminals and bus must remain concealed.

2.4 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. MCCB: Comply with UL 489, with interrupting capacity to meet available fault currents.
 - 1. Thermal-Magnetic Circuit Breakers:
 - a. Inverse time-current element for low-level overloads.
 - b. Instantaneous magnetic trip element for short circuits.
 - c. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
 - 2. MCCB Features and Accessories:
 - a. Standard frame sizes, trip ratings, and number of poles.
 - b. Breaker handle indicates tripped status.
 - c. UL listed for reverse connection without restrictive line or load ratings.
 - d. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.
 - e. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and HID lighting circuits.
 - f. Handle Padlocking Device: Fixed attachment, for locking circuit-breaker handle in on or off position.
 - g. Handle Clamp: Loose attachment, for holding circuit-breaker handle in on position.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify actual conditions with field measurements prior to ordering panelboards to verify that equipment fits in allocated space in, and comply with, minimum required clearances specified in NFPA 70.
- B. Receive, inspect, handle, and store panelboards in accordance with NECA 407, NEMA PB 1.1.
- C. Examine panelboards before installation. Reject panelboards that are damaged, rusted, or have been subjected to water saturation.
- D. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's published instructions.
- B. Reference Standards:
 - 1. Panelboards: Unless more stringent requirements are specified in Contract Documents or manufacturers' published instructions, comply with NECA 407, NEMA PB 1.1.
 - 2. Consult Architect for resolution of conflicting requirements.
- C. Special Techniques:
 - 1. Equipment Mounting:
 - a. Install panelboards on cast-in-place concrete equipment base(s).
 - b. Attach panelboard to vertical finished or structural surface behind panelboard.
 - c. Mount surface-mounted panelboards to steel slotted supports 5/8 inch (16 mm) 1-1/4 inch (32 mm) in depth. Orient steel slotted supports vertically.
 - 2. Mount panelboard cabinet plumb and rigid without distortion of box.
 - 3. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.
 - 4. Install overcurrent protective devices and controllers not already factory installed.
 - a. Set field-adjustable, circuit-breaker trip ranges.
 - b. Tighten bolted connections and circuit breaker connections using calibrated torque wrench or torque screwdriver in accordance with manufacturer's published instructions.
 - 5. Make grounding connections and bond neutral for services and separately derived systems to ground. Make connections to grounding electrodes, separate grounds for isolated ground bars, and connections to separate ground bars.
 - 6. Install filler plates in unused spaces.
- D. Interfaces with Other Work:
 - 1. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

3.3 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; install warning signs complying with requirements in Section 260553 "Identification for Electrical Systems."
- B. Panelboard Nameplates: Label each panelboard with nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- C. Device Nameplates: Label each branch circuit device in power panelboards with nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

- D. Install warning signs complying with requirements in Section 26 05 53 "Identification for Electrical Systems" identifying source of remote circuit.
- E. Panelboard Label: Manufacturer's name and trademark, voltage, amperage, number of phases, and number of poles must be located on interior of panelboard door.
- F. Breaker Labels: Faceplate must list current rating, UL and IEC certification standards, and AIC rating.
- G. Circuit Directory:
 - 1. Provide directory card inside panelboard door, mounted in transparent card holder.
 - a. Circuit directory must identify specific purpose with detail sufficient to distinguish it from other circuits.
 - 2. Provide computer-generated circuit directory mounted inside panelboard door with transparent plastic protective cover.
 - a. Circuit directory must identify specific purpose with detail sufficient to distinguish it from other circuits.

3.4 FIELD QUALITY CONTROL

- A. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.
- B. Field tests and inspections must be witnessed by Tenant.
- C. Tests and Inspections:
 - 1. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- D. Nonconforming Work:
 - 1. Panelboards will be considered defective if they do not pass tests and inspections.
 - 2. Remove and replace defective units and retest.
- E. Collect, assemble, and submit test and inspection reports, including certified report that identifies panelboards included and that describes scanning results, with comparisons of two scans. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.
- F. Manufacturer Services:
 - 1. Engage factory-authorized service representative to support field tests and inspections.

3.5 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by manufacturer.

3.6 PROTECTION

- A. Temporary Heating: Prior to energizing panelboards, apply temporary heat to maintain temperature in accordance with manufacturer's published instructions.

END OF SECTION 26 24 16

SECTION 26 28 13

FUSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract.

1.2 SUMMARY

- A. Section Includes:

1. Cartridge fuses rated 600 V ac and less for use in the following:
 - a. Enclosed switches.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles. Include the following for each fuse type indicated:

1. Ambient Temperature Adjustment Information: If ratings of fuses have been adjusted to accommodate ambient temperatures, provide list of fuses with adjusted ratings.
 - a. For each fuse having adjusted ratings, include location of fuse, original fuse rating, local ambient temperature, and adjusted fuse rating.
 - b. Provide manufacturer's technical data on which ambient temperature adjustment calculations are based.
2. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.
3. Current-limitation curves for fuses with current-limiting characteristics.
4. Time-current coordination curves (average melt) and current-limitation curves (instantaneous peak let-through current) for each type and rating of fuse. Submit in PDF format.
5. Coordination charts and tables and related data.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fuses to include in emergency, operation, and maintenance manuals. include the following:

1. Ambient temperature adjustment information.
2. Current-limitation curves for fuses with current-limiting characteristics.
3. Time-current coordination curves (average melt) and current-limitation curves (instantaneous peak let-through current) for each type and rating of fuse used on the Project. Submit in PDF format.
4. Coordination charts and tables and related data.

FUSES

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1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Fuses: Equal to 10percent of quantity installed for each size and type, but no fewer than three of each size and type.

1.6 FIELD CONDITIONS

- A. Where ambient temperature to which fuses are directly exposed is less than 40 deg F (5 deg C) or more than 100 deg F (38 deg C), apply manufacturer's ambient temperature adjustment factors to fuse ratings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain fuses, for use within a specific product or circuit, from single source from single manufacturer.

2.2 CARTRIDGE FUSES

- A. Characteristics: NEMA FU 1, current-limiting, nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages.
 - 1. Type RK-5: 250-V, zero- to 600-A rating, 200 kAIC time delay.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with NEMA FU 1 for cartridge fuses.
- D. Comply with NFPA 70.
- E. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size and with system short-circuit current levels.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fuses before installation. Reject fuses that are moisture damaged or physically damaged.
- B. Examine holders to receive fuses for compliance with installation tolerances and other conditions affecting performance, such as rejection features.
- C. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.
- D. Evaluate ambient temperatures to determine if fuse rating adjustment factors must be applied to fuse ratings.

- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FUSE APPLICATIONS

A. Cartridge Fuses:

1. Feeders: Class RK5, time delay.
2. Motor Branch Circuits: Class RK5, time delay.
3. Other Branch Circuits: Class RK5, time delay.
4. Provide open-fuse indicator fuses or fuse covers with open fuse indication.

3.3 INSTALLATION

- A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.

3.4 IDENTIFICATION

- A. Install labels complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems" and indicating fuse replacement information inside of door of each fused switch and adjacent to each fuse block, socket, and holder.

END OF SECTION 26 28 13

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SECTION 26 28 16
ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fusible switches.
2. Enclosures.

B. Related Requirements:

1. Section 26 00 10 "Supplemental Requirements for Electrical" for additional abbreviations, definitions, submittals, qualifications, testing agencies, and other Project requirements applicable to Work specified in this Section.

1.2 DEFINITIONS

A. GFEP: Ground-fault circuit-interrupter for equipment protection.

B. GFLS: Ground-fault circuit-interrupter for life safety.

C. SPDT: Single pole, double throw.

1.3 ACTION SUBMITTALS

A. Product Data:

1. For each type of enclosed switch, accessory, and component indicated. Include nameplate ratings, dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
2. Enclosure types and details for types other than UL 50E, Type 1.
3. Current and voltage ratings.
4. Short-circuit current ratings (interrupting and withstand, as appropriate).
5. Include evidence of qualified electrical testing laboratory listing for series rating of installed devices.
6. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.
7. Include time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device. Provide in PDF electronic format.

B. Shop Drawings: For enclosed switches.

1. Include plans, elevations, sections, details, and attachments to other work.
2. Include wiring diagrams for power, signal, and control wiring.

C. Field Quality-Control Submittals:

1. Field quality-control reports.

1.4 INFORMATIONAL SUBMITTALS

- A. Sample warranties.

1.5 CLOSEOUT SUBMITTALS

- A. Warranty documentation.

1.6 WARRANTY

- A. Special Installer Extended Warranty: Installer warrants that fabricated and installed enclosed switches and circuit breakers perform in accordance with specified requirements and agrees to repair or replace components or products that fail to perform as specified within extended-warranty period.
 - 1. Extended-Warranty Period: Two years from date of Substantial Completion; full coverage for labor, materials, and equipment.
- B. Special Manufacturer Extended Warranty: Manufacturer warrants that enclosed switches and circuit breakers perform in accordance with specified requirements and agrees to provide repair or replacement of components or products that fail to perform as specified within extended-warranty period.
 - 1. Extended-Warranty Period: Three years from date of Substantial Completion; full coverage for labor, materials, and equipment.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Source Limitations: Obtain products from single manufacturer.
- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- C. Electrical Components, Devices, and Accessories: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended location and application.

2.2 FUSIBLE SWITCHES

- A. Type HD, Heavy Duty:
 - 1. Singlethrow.
 - 2. Threepole.
 - 3. 240 V(ac).
 - 4. 200 A and smaller.
 - 5. UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate fuses.
 - 6. Lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- B. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
3. Lugs: mechanical type, suitable for number, size, and conductor material.

2.3 ENCLOSURES

- A. Enclosed Switches and Circuit Breakers: UL 489, NEMA KS 1, UL 50E, and UL 50, to comply with environmental conditions at installed location.
- B. Enclosure Finish: Enclosure must be finished with gray baked enamel paint, electrodeposited on cleaned, phosphatized steel (NEMA 250 Type 1) gray baked enamel paint, electrodeposited on cleaned, phosphatized galvanized steel (NEMA 250 Types 3R, 12).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 1. Commencement of work will indicate Installer's acceptance of areas and conditions as satisfactory.

3.2 SELECTION OF ENCLOSURES

- A. Indoor, Dry and Clean Locations: UL 50E, Type 1.
- B. Outdoor Locations: UL 50E, Type 3R.
- C. Kitchen Areas: UL 50E, Type 4X.
- D. Other Wet or Damp, Indoor Locations: UL 50E, Type 4.
- E. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: UL 50E, Type 12.

3.3 INSTALLATION

- A. Comply with manufacturer's published instructions.

3.4 IDENTIFICATION

- A. Comply with requirements in Section 26 05 53 "Identification for Electrical Systems."
 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
 2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.5 FIELD QUALITY CONTROL

- A. Acceptance Testing Preparation:

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

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- B. Field tests and inspections must be witnessed by Tenant.
- C. Tests and Inspections for Switches:
 - 1. Visual and Mechanical Inspection:
 - a. Inspect physical and mechanical condition.
 - b. Inspect anchorage, alignment, grounding, and clearances.
 - c. Verify that unit is clean.
 - d. Verify blade alignment, blade penetration, travel stops, and mechanical operation.
 - e. Verify that fuse sizes and types match the Specifications and Drawings.
 - f. Verify that each fuse has adequate mechanical support and contact integrity.
 - g. Inspect bolted electrical connections for high resistance using one of the following methods:
 - 1) Use low-resistance ohmmeter.
 - a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of lowest value.
 - 2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.
 - a) Bolt-torque levels must be in accordance with manufacturer's published data. In absence of manufacturer's published data, use NETA ATS Table 100.12.
 - h. Verify that operation and sequencing of interlocking systems is as described in the Specifications and shown on Drawings.
 - i. Verify correct phase barrier installation.
 - j. Verify lubrication of moving current-carrying parts and moving and sliding surfaces.
 - 2. Electrical Tests:
 - a. Perform resistance measurements through bolted connections with low-resistance ohmmeter. Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of lowest value.
 - b. Measure contact resistance across each switchblade fuseholder. Drop values may not exceed high level of manufacturer's published data. If manufacturer's published data are not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of lowest value.
 - c. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with switch closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In absence of manufacturer's published data, use Table 100.1 from NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.
 - d. Measure fuse resistance. Investigate fuse-resistance values that deviate from each other by more than 15 percent.
 - e. Perform ground fault test in accordance with NETA ATS Section 7.14 "Ground Fault Protection Systems, Low-Voltage."

- D. Tests and Inspections for Molded-Case Circuit Breakers:
1. Visual and Mechanical Inspection:
 - a. Verify that equipment nameplate data are as described in the Specifications and shown on Drawings.
 - b. Inspect physical and mechanical condition.
 - c. Inspect anchorage, alignment, grounding, and clearances.
 - d. Verify that unit is clean.
 - e. Operate circuit breaker to ensure smooth operation.
 - f. Inspect bolted electrical connections for high resistance using one of the following methods:
 - 1) Use low-resistance ohmmeter.
 - a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of lowest value.
 - 2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.
 - a) Bolt-torque levels must be in accordance with manufacturer's published data. In absence of manufacturer's published data, use NETA ATS Table 100.12.
 - g. Inspect operating mechanism, contacts, and chutes in unsealed units.
 - h. Perform adjustments for final protective device settings in accordance with coordination study.
 2. Electrical Tests:
 - a. Perform resistance measurements through bolted connections with low-resistance ohmmeter. Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of lowest value.
 - b. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with circuit breaker closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In absence of manufacturer's published data, use Table 100.1 from NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.
 - c. Perform insulation resistance tests on control wiring with respect to ground. Applied potential must be 500 V(dc) for 300 V rated cable and 1000 V(dc) for 600 V rated cable. Test duration must be one minute. For units with solid state components, follow manufacturer's recommendation. Insulation resistance values may be no less than 2 M Ω .
 3. Test and adjust controls, remote monitoring, and safeties.
- E. Nonconforming Work:
1. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

2. Remove and replace defective units and retest.

F. Collect, assemble, and submit test and inspection reports.

1. Test procedures used.
2. Include identification of each enclosed switch and circuit breaker tested and describe test results.
3. List deficiencies detected, remedial action taken, and observations after remedial action.

G. Manufacturer Services:

1. Engage factory-authorized service representative to support field tests and inspections.

3.6 ADJUSTING

A. Adjust moving parts and operable components to function smoothly and lubricate as recommended by manufacturer.

END OF SECTION 26 28 16

SECTION 32 84 00

IRRIGATION SYSTEM

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Furnish all labor, materials, and equipment necessary to complete the irrigation system work as indicated on the Drawings and specified herein.
- B. Test the entire irrigation system to assure proper operation.
- C. Repair damaged irrigation components that will remain adjacent to or directly involved in the work limits.

1.2 QUALITY ASSURANCE AND REQUIREMENTS

- A. Manufacturer's Directions: Manufacturer's directions and detailed Drawings shall be followed in all cases where the manufacturers of articles used in this Contract furnish directions covering points not shown in the Drawings and Specifications.
- B. Ordinances and Regulations
 - 1. All local, municipal and state laws, and rules and regulations governing or relating to any portion of this work are hereby incorporated into and made a part of these Specifications and their provisions shall be carried out by the Contractor. Anything contained in these Specifications shall not be construed to conflict with any of the above rules and regulations or requirements of the same. However, when these Specifications and Drawings call for or describe materials, workmanship, or construction of a better quality, higher standard, or larger size than is required by the above rules and regulations, the provisions of the Specifications and Drawings shall take precedence.
 - 2. Conform to all applicable sections of the local code.
 - 3. The materials and work of this section shall conform to all applicable provisions of the latest editions of the Uniform Plumbing Code, the California Electrical Code, and all codes properly governing the materials and work at the project site.
 - 4. All electrical materials and work shall conform with California Administrative Code, Title 23, Part 3, Basic Electrical Regulations, Article 18 E 110-16.

C. Explanation of Drawings

- 1. All offsets, fittings, sleeves; etc., which may be required are not indicated. Carefully investigate the structural and finish conditions affecting all of the work and plan the work accordingly furnishing such fittings; etc., as may be required to meet such conditions. Drawings are generally diagrammatic and indicative of the work to be installed. Due to the scale of the Drawings, it is not possible to indicate all offsets, fittings, sleeves, etc., which may be required to complete the irrigation system.
- 2. Before proceeding with any work, the Contractor shall check and verify all dimensions and quantities and shall immediately inform the Project Inspector of any discrepancy between the Drawing and/or the Specifications and actual conditions. No work shall be done in any area where there is such a discrepancy until written approval for the same has been given by the Project Inspector. The Contractor shall assume full responsibility for work installed without approval.
- 3. Materials and work shall be installed to avoid conflicts between irrigation system and planting, existing or proposed utilities, and all other construction features.

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4. Contractor shall verify prior to and during construction, that his contract documents reflect the latest revisions, change orders, and plan checks. Contractor shall be able to produce such documents at the request of the Project Inspector at any time during construction.
5. Pipe sizes indicated on the Drawings are minimum allowable.

1.3 EXISTING CONDITIONS

- A. Contractor shall verify locations of all existing utilities, whether shown on plans or not. The Contractor shall notify members of U.S.A. two (2) working days in advance of performing any excavation work by calling the toll-free number 1-800-642-2444.
- B. Information on the Drawings relative to existing conditions is approximate only. Deviations found necessary during construction to conform to actual conditions, as approved by the Project Inspector, shall be made without additional cost.
- C. Exercise extreme care in excavating and working near existing utilities. Contractor shall be responsible for damages to existing utilities which are caused by his operation or neglect and shall pay all costs to repair or replace utilities damaged by his work.
- D. Contractor shall schedule site meeting with Project Inspector and Owner's Representation to review existing utilities and water stubs within the limits of the project.

1.4 SUBMITTALS

- A. Material List
 1. Contractor shall furnish the articles, equipment, materials, or processes specified by name in the Drawings and Specifications.
 2. Complete material list shall be submitted prior to performing any work. Material list shall include the manufacturer, model number and description of all materials and equipment to be used.
 3. Equipment or materials installed or furnished without prior approval of the owner shall be rejected and the Contractor required to remove such materials from the site at his own expense.
 4. Approval of any item, alternate or substitute indicates only that the product or products apparently meet the requirements of the Drawings and Specifications on the basis of the information or samples submitted. The Contractor shall assume full responsibility (in written form) for the performance of any substitutions. The owners decision for approval or rejection of any substitution is final.
- B. As-Built/Record Drawings
 1. The Contractor shall dimension from two (2) permanent points of reference, building corners, sidewalk, or road intersections, etc., the location of the following items:
 - a. Connection to existing water lines.
 - b. Connection to existing electrical power.
 - c. Routing of irrigation pressure lines (dimension maximum 100' along routing).
 - d. Sleeves
 - e. Irrigation control valves.
 - f. Quick couplers.
 - g. Gate valves.
 - h. Routing for control wiring.
 - i. Other related equipment as directed by the Project Inspector.

2. On or before the date of the final observation, the Contractor shall deliver the corrected and completed set of drawings on electronic (PDF) format to the owner. Delivery of the documents shall not relieve the Contractor of the responsibility of furnishing required information that may be omitted from the prints.

C. Controller Charts

1. Record Drawings shall be approved by the owner before controller charts are prepared.
2. Provide one (1) controller chart for each controller supplied.
3. The chart shall show by using a different color, the area controlled by each remote control valve. Chart shall be sized to the maximum dimensions that will fit within the controller door.
4. The chart shall be a reduced drawing of the actual record drawing system. In the event the controller sequence is not legible which the drawing is reduced, it shall be enlarged to a size that is readable.
5. When completed and approved, the chart shall be hermetically sealed between two (2) pieces of plastic, each piece being a minimum ten (10) mils thick.
6. These charts shall be completed and approved prior to final observation of the irrigation system.

D. Operation and Maintenance Manuals

1. Prepare and deliver two (2) operation manuals as specified and as follows:
 - a. Catalog and parts sheets on every material and equipment installed under this contract. Include name, location and phone numbers of each product manufacturer and local representative.
 - b. Guarantee statement.
 - c. Complete operating and maintenance instructions on all major equipment.
2. In addition to the above mentioned operation and maintenance manuals, provide evidence in writing to the owner at the conclusion of the project that the above services have been rendered.

E. Equipment to be Furnished

1. Supply as a part of this Contract the following tools:
 - a. Two (2) sets of special tools required for removing, disassembling and adjusting each type of sprinkler and valve supplied on this project.
2. The above mentioned equipment shall be turned over to the Owner at the conclusion of the project, before final observation can occur.

1.5 Product Delivery, Storage And Handling

Handling of PVC Pipe and Fittings: The Contractor is cautioned to exercise care in handling, loading, unloading, and storing of PVC pipe and fittings. All PVC pipe shall be transported in a vehicle which allows the length of pipe to lie flat so as not to subject it to undue bending or concentrated external load at any point. Any section of pipe that has been dented or damaged will be discarded and if installed replaced with new.

1.6 Guarantee

- A. The guarantee for the irrigation system shall be one year from the date of final acceptance of the project.
- B. Form of Guarantee: Guarantee shall be submitted on Contractors own letterhead as follows:

GUARANTEE FOR IRRIGATION SYSTEM

PROJECT:

LOCATION:

We hereby guarantee the irrigation system we have furnished and installed against defects in materials and workmanship, ordinary wear and tear and unusual abuse, or neglect accepted, and that the work has been completed in accordance with the plans and specifications. We agree to repair or replace any or all of the work, together with any other adjacent work which may be displaced by so doing, that may prove to be defective in its workmanship or materials within a period of one (1) year after the date the written notice of completion for the project, at no additional cost to the owner. We shall make such repairs or replacements within 14 calendar days following written notification by the owner. When the immediate repair or replacement of the work is necessary to ensure the public safety and welfare, which would be endangered by continued usage of the facility, such circumstance will be deemed an operational emergency. In the event of such an emergency, after the owner contacts our firm and after authorizing 24 hours to initiate repairs, if we fail to initiate and diligently complete such repairs in a timely manner, the owner may direct local forces to perform such functions as the owner may deem necessary to correct the work and immediately place the facility back in operational condition. If such procedure is implemented, we shall bear all expenses incurred by owner. In all cases, the judgment of the owner shall be final in determining whether an operational emergency exists. In the event of our failure to make such repairs or replacements within the time specified after receipt of written notice from owner (other than an operational emergency), we authorize the owner to proceed to have said repairs or replacements made at our expense and we will pay the costs and charges therefore upon demand.

PRINTED NAME & TITLE: _____

SIGNATURE: _____

ADDRESS: _____

PHONE: () _____

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Use only new materials of brands and types noted on the Drawings specified herein or approved equals.
- B. Backfill Material
 - 1. Screened existing site material, as approved by the Project Inspector, shall be used for backfill material. Backfill material shall be free from organic materials, large clods of earth or rocks larger than one (1) inch diameter, trash, debris, rubbish, broken cement, asphalt material or other objectionable substances.
 - 2. Imported backfill material, if required, shall be clean soil consisting of earth, sand, sandy clay, loam or other approved materials, with no large clods of earth or rocks larger than one-half (1/2) inch in size.

3. Sand bedding material shall be a fine granular sand material containing no foreign matter larger than one-half (1/2) inch in size.
- C. Drainage Fill Material
1. Drainage fill material shall be three-quarter (3/4) inch washed, hard and durable, fragments of screened or broken stone or gravel.
- D. Irrigation Pipe Sleeving
1. PVC Schedule 40 pipe as required.
- E. PVC Pressure Main Line Pipe and Fittings.
1. Pressure main line piping for sizes one-and one-half (1-1/2) inch and smaller shall be PVC Schedule 40 with solvent-welded joints.
 - a. Pipe shall be made from NSF approved Type I, Grade I, PVC compound conforming to ASTM resin specification D1785. All pipe shall meet requirements set forth in Federal Specification PS-21-70. (Solvent-weld Pipe).
 2. Pressure main line piping for sizes two (2) inches and four (4) inches shall be PVC Class 315 with solvent weld joints.
 - a. Pipe shall be made from an NSF (National Sanitation Foundation) approved Type I, Grade I, PVC compound conforming to ASTM resin specification D1784. All pipe shall meet requirements as set forth in Federal Specification PS-22-70, with an appropriate standard dimension ratio (S.D.R./ Solvent-weld Pipe).
 3. PVC solvent-weld fittings for 2" or larger mainline, Class 315 mainline and Class 200 laterals shall be Schedule 40; all other solvent-weld fittings shall be Schedule 40, 1-2, II-I NSF approved conforming to ASTM D2466.
 4. Solvent cement and primer for PVC solvent-weld pipe and fittings shall be of the type and installation methods specified by the manufacturers for each type of pipe.
 5. All PVC pipe shall be marked continuously and permanently with the following information: Manufacturer's name, nominal pipe size, schedule or class of pipe, pressure rating in P.S.I. extrusion, NSF approval and date of extrusion.
 6. All fittings shall bear the manufacturer's name or trademark, material designation, size, applicable I.P.S. schedule and NSF seal of approval.
 7. Trace wire shall be placed on top of pressure main line.
- F. PVC Non-Pressure Lateral Line Piping
1. Non-pressure buried lateral line piping shall be PVC Class 200 with solvent-weld joints.
 - a. Pipe shall be made from NSF approved, Type I, Grade II, PVC compound conforming to ASTM resin specification D1784. All pipe shall meet requirements set forth in Federal Specification PS-22-70, with an appropriate standard dimension ratio.
 2. Except as noted, all requirements for non-pressure lateral line pipe and fittings shall be the same as for solvent-weld pressure main line pipe and fittings as set forth in Section 2.01E of these Specifications.
 3. All offsets shall be a minimum three-quarter (3/4) inch unless contractor receives written approval from the owner.

G. PVC Threaded Nipples: PVC Schedule 80

H. Control Wiring

1. Connections between the automatic controllers and the electric control valves shall be made with direct burial copper wire AWG-U.F. 600-volt. Pilot wires shall be a different color wire for each automatic controller. Common wires shall be white with a different color stripe for each automatic controller. Install in accordance with valve manufacturer's specifications and wire chart. In no case shall wire size be less than #14.
2. All splices shall be made with 3M, DBY/DBR direct bury splice kit or Rainbird snap-tie wire connector, or approved equal. All connections shall be water tight.

I. Control Wire Conduit

1. Gray PVC schedule 40 electrical conduit, ASTM F-512, size as required.

J. Electric Remote Control Valve Assembly

1. All electric remote control valve and ball valve shall be of the same type, manufacturer and sizes as indicated on the Drawings and/or as specified herein or approved equal.
2. All remote control valves shall have a manual flow adjustment.

K. Electric Remote Control Valve Assembly Boxes

1. Control valve boxes shall be Carson-Brooks, rectangular Model H1419 with bolt down green cover, or approved equal. Install extension Model H1419 6IN, if required.
2. Control valve and ball valve shall be placed in individual boxes.

L. Irrigation Heads and Drip

1. Shall be of the same manufacturer, type, size and deliver the same rate of precipitation with the same pressure, and discharge as indicated on Drawings and/or specified herein, or approved equal.
2. Sprinkler bodies shall be Hunter brand with factory installed check valves.
3. Nozzles shall be Hunter brand as specified on the drawings.

M. Controller Station Number Identification Tag:

1. Standard yellow I.D. tags by:
Christy Enterprises
1207 W. Struck Avenue
Orange, California 92667
(717) 771-4142
(800) BLU-GLUE

N. Gate Valves

1. Gate valves 3" and smaller shall be bronze with threaded ends and be 200 WOG and equipped with a bronze hand wheel, screw-in Bonnet non-rising stem and solid wedge disc, Nibco or approved equal.
2. Gate valves 3" and larger in size shall be Class 125 iron body with bronze trim and flanged ends. Non-rising stem shall have a square operating unit. Mueller NRS, Nibco or approved equal.

O. Gate valve box

1. Gate valve box shall be Carson-Brooks Model 1100 with bolt down cover or approved equal. Install extension if required.

P. Quick Coupling Valves

1. Quick coupling valves shall have a brass two-piece body designed for working pressure of 150 P.S.I. operable with quick coupler. Key size and type shall be as shown on the Drawings.

Q. Quick Coupling Valve Box

1. Quick coupling valve box shall be Carson-Brooks Model 1100 with bolt down cover or approved equal. Install extension if required.

R. Backflow Preventer

1. Backflow preventer shall be as noted on the plans.
2. Install in weather blanket with cable lock.

S. Master Valve and Flow Sensor

1. Master valve and flow sensor shall be make and model(s) noted on the plans. Install per manufacturers specifications.

PART 3 - EXECUTION

3.1 OBSERVATION OF SITE

A. Site Conditions

1. All scaled dimensions are approximate. The contractor shall check and verify all site dimensions and notify the Project Inspector if site conditions have changed.
2. The Contractor shall carefully check all grades to satisfy himself that he may safely proceed before starting work on the irrigation system.
3. Contractor responsible for review of existing sprinkler/emitter layout and adjustments necessary to provide head-to-head coverage for all new configurations.

3.2 PREPARATION

A. Physical Layout

1. Prior to installation, the Contractor shall stake out all pressure supply lines, routing and location of sprinkler heads.
2. All layout shall be approved by the Project Inspector prior to installation. If equipment is incorrectly located without said approval, it is the Contractor's responsibility to relocate it as per the Project Inspector's directions without additional cost.
3. Irrigation layout shall be installed to conform to new configuration of hardscape modified adjacent to work limits.

3.3 WATER AND ELECTRICAL SERVICES

A. Water Supply

1. Irrigation system shall be connected to the water supply point of connection as indicated on the Drawings. Field verify connection point. Contractor is responsible for any

changes caused by actual site conditions. Notify Project Inspector in writing of any discrepancies prior to beginning construction.

2. Attach trace wire to mainline.
3. Contractor shall verify available flow and pressure. Notify Project Inspector if actual flow and pressure differ from what is shown on the Drawings.

B. Electrical Supply

1. Contractor shall provide all materials and connections to supply electrical power for irrigation controllers.
2. Connection shall be made at approximate location(s) where irrigation controllers are shown on the drawings. The Contractor is responsible for minor changes caused by actual site conditions and for the coordination of all electrical service connections to the controllers with other trades.
3. All electrical work and materials shall conform to local codes, ordinances and governing authorities having jurisdiction.
4. 120-Volt power connection to the automatic controller shall be provided by the Contractor. The Contractor shall provide all materials and connections to supply power to the controllers.

3.4 INSTALLATION

A. Trenching

1. Dig trenches straight and support pipe continuously on bottom of trench. Lay pipe to an even grade. Trenching excavation shall follow layout indicated on the Drawings and as noted.
2. Provide for a minimum of eighteen (18) inches cover for all pressure lines.
3. Provide for a minimum of twelve (12) inches cover for all non-pressure lines.
4. Provide for a minimum of eighteen (18) inches cover for all control wiring.

B. Backfilling

1. The trenches shall not be backfilled until all required tests are performed. Trenches shall be carefully backfilled with the excavated materials approved for backfilling. Backfill shall be mechanically compacted in landscaped areas to a dry density equal to adjacent undisturbed soil in planting areas. Backfill shall conform to adjacent grades without dips, sunken areas, humps or other surface irregularities.
2. Where excavated native soil contains greater than 50% rock or other material one (1) inch diameter or larger, import clean backfill or sand bedding shall be placed three (3) inches in depth around all pipes.
3. If settlement occurs and subsequent adjustments in pipe, valves, drip or planting, or other construction are necessary, the Contractor will make all the required adjustments without cost to the Owner.

C. Trenching and Backfilling Under Paving

1. Trenches located under areas where paving, asphaltic concrete or concrete shall be installed, shall be backfilled with sand (a layer six (6) inches below the pipe and three (3) inches above the pipe and compacted in layers to 90% compaction, using manual or mechanical tamping devices). All trenches shall be left flush with the adjoining grade. The Contractor shall set in place, cap and pressure test all piping under paving prior to the paving work.
2. Generally piping under existing walks is done by jacking, boring or hydraulic driving, but where any cutting or breaking of sidewalks and/or concrete is necessary, it shall be done

and replaced by the Contractor as part of the Contract cost. Permission to cut or break sidewalks and/or concrete shall be obtained from the Owner. No hydraulic driving shall be permitted under concrete paving.

D. Sleeving

1. Install all irrigation and/or electrical sleeving as indicated on the Drawings. Contractor shall coordinate the installation of sleeving with the work of other trades.
2. All pipe that is installed below hardscape shall be installed within sleeving whether shown on the plans or not.
3. Minimum pipe size for sleeves shall be 2x the size of the pipe to be sleeved.
4. Contractor shall coordinate the installation of sleeving with the work of other trades.

E. PVC Pipe

1. Routing of irrigation pipe as indicated on the Drawings is diagrammatic. Install lines and various assemblies to conform with the details shown on the Drawings.
2. PVC pipe and fittings shall be thoroughly cleaned of dirt, dust and moisture before installation. Installation and solvent welding methods shall be as recommended by the pipe and fitting manufacturer.
3. PVC pipe shall be installed so that there will be a small amount of excess length in the pipe to compensate for contraction and expansion of the pipe. This shall be accomplished by "snaking" the pipe in the trench during installation.

F. Line Clearance

1. All lines shall have a minimum clearance of three (3) inches from each other and twelve (12) inches from lines of other trades. Parallel lines shall not be installed directly over one another.

G. Automatic Controller

1. Controller shall be the make and model as specified on the plans.
2. Install as per the irrigation details and manufacturer's specifications.
3. Controller shall be securely mounted in the location as indicated on the Drawings or approved by the owner in such a manner that all normal operations can be conveniently made by the operator.
2. Connect station valves, common and master valve wires to appropriate terminals per manufacturer's specification.
3. The Contractor shall take all control wires to the controller and make all required connections for their installation.
4. All electrical and control wires installed above ground shall be placed in metal conduit or other approved materials and securely mounted. Paint conduit to match building or wall color.

H. Control Wiring

1. Wiring shall occupy the same trench and shall be installed along the same route as pressure supply or lateral lines wherever possible.
2. Where more than one (1) wire is placed in a trench, the wiring shall be taped together at intervals of ten (10) feet.
3. An expansion curl shall be provided within three (3) feet of each wire connection. Expansion curl shall be of 18 inches in length at each splice connection and at each electric control, so that in case of repair, the valve bonnet may be brought to the surface

without disconnection of the control wires. Control wires shall be laid loosely in trench without stress or stretching of control wire conductors.

4. All control wire spliced shall be completely waterproof. Use one splice per connector sealing pack.
5. Size of wire shall not exceed manufacturer's length of run charts.

I. Electric Remote Control Valves

1. Install as per the irrigation details and manufacturer's specifications.
2. Install where shown on Drawings. Locate valve boxes 12 inches from walk, curb, headerboard, etc., for easy access.
3. Install one (1) remote control valves per valve box. Provide extension units as required. Install valve boxes in shrub planting areas whenever possible.
4. Provide eighteen (18) inch expansion loop at all electrical connections within control valve boxes.

J. Gate Valves

1. Install as per the irrigation details and manufacturer's specifications.
2. Install where shown on Drawings. Locate, in valve boxes, 12 inches from walk, curb, headerboard, etc., for easy access.
3. Install one gate valve per valve box. Provide extension units as required. Install valve boxes in shrub planting areas whenever possible.

K. Quick Coupling Valves

1. Install as per the irrigation details and manufacturer's specification.
2. Install where shown on Drawings. Locate, in valve boxes, 12 inches from walk, curb, headerboard in shrub planting areas whenever possible.
3. Install one quick coupling valve per valve box. Provide extension units as required. Install valve boxes in shrub planting areas whenever possible.

L. Flushing of System

1. After all new irrigation pipe lines and risers are in place and connected, all necessary diversion work is complete, and prior to installation of irrigation heads, the control valves shall be opened and a full head of water shall be used to flush out the system.

M. Irrigation Drip

1. Install the irrigation drip as detailed on the Drawings. Irrigation drip to be installed in this work shall be as per plan.
2. Flush pipe for each hydrozone prior to installation of drip emitters.
3. All irrigation drip shall be installed per manufacturers specifications.

N. Pressure Relief Valve

1. Install as per details and manufacturer's specifications.

O. Controller Station Number Identification Tags: fasten securely to each control valve.

P. Sprinklers

1. Install per manufacturers specifications.
2. Flush the pipe for each hydrozone prior to installation of nozzles.

3. Adjust radius and degree pattern to provide head-to-head coverage and to minimize overspray onto adjacent areas.

Q. Backflow Preventer

1. Install backflow prevention assemblies as detailed on the drawings and as per manufacturers specifications.
2. Assemblies shall be installed in a fenced enclosure, as indicated on the drawings and as directed by the project inspector.
3. Do not use PVC piping in backflow prevention assemblies.
4. Install "Weather Guard Blanket" to each unit per manufacturer's specifications.

R. Master Valve

1. Install as per details and manufacturer's specifications.
2. Install separate control and common wires from master valve to controller.

S. Flow Sensor and Communication Cable

1. Install as per details and manufacturer's specifications.
2. Connect flow sensors communication cables to separate terminals.

T. Valve Boxes

1. Install as per details and manufacturer's specifications.
2. Brand top of valve box with station number. lettering shall be 2" minimum height with .18 relief depth.

3.5 FIELD QUALITY CONTROL

A. Adjustment Of The System

1. The Contractor shall adjust all pressure regulating devices on the remote control valves.
2. The Contractor shall flush and adjust all irrigation for optimum performance and to prevent run-off onto walks, hardscape, roadways, and buildings.
3. If it is determined that adjustments in the irrigation equipment shall provide proper and more adequate coverage, the Contractor shall make such adjustments after written approval by the Project Inspector. Adjustments shall include changes and additions of drip lines, emitters, etc. as required without additional contract costs.
4. If it is determined that any irrigation equipment is improperly installed, then adjustments shall be made to conform to construction documents without additional contract costs.

B. Testing of Irrigation System

1. The Contractor shall request the presence of the Project Inspector at least 48 hours in advance of testing.
2. Test all pressure lines under hydrostatic pressure of 125 pounds per square inch prior to installation of remote control valves.
3. Sustain pressure in lines for not less than two (2) hours. If leaks develop, replace joints and repeat test until entire system is proven watertight. At the end of the test the system shall be drained in the presence of the owner.
5. All hydrostatic tests shall be made only in the presence of the Project Inspector. Center load pipe in trench exposing all joints for pressure test. No pipe shall be backfilled until it has been observed, tested and approved in writing by the Project Inspector. Should any work be covered up before such observation and tests are completed, the Contractor

shall, at his own expense, uncover the work; and after it has been observed, tested and approved, he then shall make all repairs with such materials as required to restore all work disturbed to original and proper condition.

6. Furnish necessary force pump and all other test equipment. All equipment shall be present during the test.
7. Provide testing to assure that the work be performed allowed for remaining irrigation connected to or affected by new work remains operational.

3.6 MAINTENANCE

- A. Provide maintenance as per SECTION 329900 - LANDSCAPE MAINTENANCE.

3.7 Clean-Up and Observation Prior To Final Acceptance

- A. Clean-up shall be made as each portion of work progresses. Trash, debris and excess dirt shall be removed from site. All walks and paving shall be broomed or washed down, and any damage sustained to the work of others shall be repaired to original conditions acceptable to the Owner.
- B. The Contractor shall operate each system in its entirety for the owner at time of final observation. Any items deemed not acceptable shall be reworked at no additional contract cost, to the complete satisfaction of the owner.

END OF SECTION 32 84 00

SECTION 32 93 00

PLANTING INSTALLATION

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Furnish all labor, material, equipment and services necessary to provide all landscape work, complete in place, as indicated on Drawings and specified herein.
- B. Work specified in this Section, but is not limited to the following:
 - 1. Soil preparation
 - 2. Planting
 - 3. Clean-up

1.2 QUALITY CONTROL

- A. Source Quality Control
 - 1. Submit documentation to the Project Inspector at least thirty (30) days prior to start of planting that all plant material has been ordered. Arrange procedure for observation of plant material with the Project Inspector at time of submission.
 - 2. Plants shall be subject to observation and approval of the Project Inspector upon delivery for conformity to specifications. Such approval shall not impair the right of observation and rejection during progress of the work.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery

- 1. The Contractor, upon request by the Project Inspector, shall provide receipts, delivery tickets, load tickets, etc. of all items delivered to the job site to verify products and total quantities.
- 2. Deliver fertilizer to site in original unopened containers bearing manufacturer's guaranteed chemical analysis, name trademark, and conformance to State Law.
- 3. Deliver plants with legible identification labels.
 - a. Label trees, evergreens, bundles of containers of like shrubs, or ground cover plants.
 - b. State correct plant name and size indicated on plant list.
 - c. Use durable waterproof labels with water-resistant ink which will remain legible for at least sixty (60) days.
- 4. Protect plant material during delivery to prevent damage to rootball or desiccation of leaves.
- 5. The Contractor shall notify the Project Inspector seventy-two (72) hours in advance of delivery of all plant materials for observation.

B. Storage

- 1. Store plant material in shade and protect from weather.
- 2. Maintain and protect plant material.

C. Handling

1. Do not drop plant materials.
2. Do not pick up container plant material by stems or trunks.

1.4 JOB CONDITIONS

- A. Planting: Perform actual planting only when weather and soil conditions are suitable in accordance with locally accepted practice.
- B. Scheduling: Install trees, shrubs, and ground cover plant material areas after irrigation system is operable.
- C. Protect work and materials from damage due to construction operations by other trades and vandalism. Maintain protection during construction and maintenance period.

1.5 SAMPLES AND TESTS

The Project Inspector reserves the right to take and analyze samples of materials for conformity to specifications at any time; the Contractor shall furnish samples upon request by Project Inspector. Rejected materials shall be immediately removed from the site at the Contractor's expense. Cost of testing of materials not meeting specifications shall be paid by the Contractor.

1.6 GUARANTEE AND REPLACEMENT

- A. All plant material and other materials installed under the Contract shall be guaranteed against any and all poor, inadequate or inferior materials and/or workmanship during installation and the maintenance period. Any plant found to be dead or not in a satisfactory or healthy condition due to faulty materials, workmanship, or improper maintenance as determined by the Project Inspector, shall be replaced by the Contractor at his expense. Trees shall be guaranteed for a period of one year.
- B. Any materials found to be dead, missing or not in a satisfactory or healthy condition during the maintenance period shall be replaced immediately. The Project Inspector shall be the sole judge as to the condition of material. Material to be replaced within the guarantee period shall be replaced by the Contractor within fifteen (15) days of written notification by the Owner. All replacement materials and installation shall comply to the Drawings and the Specifications.

1.7 SUBMITTALS

- A. The Contractor shall submit to the Owner's representative two (2) representative samples of bark mulch, soils report and the specified soil amendments (per soils report) with current (within the last 60 days) analytical data for approval by Owner's representative prior to any delivery of any of the above mentioned materials to the project site.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All materials shall be of standard, approved and first-grade quality and shall be in prime condition when installed and accepted. Any commercially processed or packaged material shall be delivered to the site in the original unopened container bearing the manufacturer's guaranteed analysis. The Contractor shall supply the Project Inspector with a sample of all supplied materials accompanied by analytical data from an approved laboratory source illustrating compliance of bearing the manufacturer's guaranteed analysis.

2.2 PRODUCTS

A. Soil Conditioner (for bidding purposes only).

1. Gro-Power Plus or approved equal: Humus (bacteria included based fertilizer and soil conditioner with soil penetrant shall consist of the following percents by weight:
 - 5 % nitrogen
 - 3 % phosphoric acid
 - 1 % potash
 - 50 % humus
 - 15 % humic acids
2. Actual product shall conform to soils test and recommendations of the analysis.

B. Soil Amendment (for bidding purposes only).

1. Base Bid soil amendment shall be:
2.
 - a. Nitrogen Stabilized Recycled Compost "Super Humus": 0.56 to 0.84% N based on dry weight, treated with relative form of nitrogen (NH₃).
 - 1) Particle Size: 95% - 100% passing 6.35 mm standard sieve.
80% - 100% passing 2.33 mm standard sieve.
 - 2) Salinity: The saturation extract conductivity shall not exceed 3.5 millimhos/centimeter at 25 degrees (25°) centigrade as determined by saturation extract method.
 - 3) Iron Content: Minimum 0.08% dilute acid soluble Fe on dry weight basis.
 - 4) Ash: 0 - 6.0% (dry weight)
 - 5) Acidity range (pH) shall be between 5.5 and 7.5.
 - 6) Actual organic content shall be a minimum 280 pound (lbs.) per cubic yard.
 - 7)
2. Actual product shall conform to soils test and recommendations of the analysis.

C. Fertilizer (for bidding purposes only)

1. Planting Pit Fertilizer: Shall be Gro-Power Plus (bacteria included) with soil penetrant and shall consist of the following percents by weight:
 - 5% nitrogen
 - 3% phosphoric acid
 - 1% potash
 - 50% humus
 - 15% humic acid
2. Turf Starter Fertilizer: Shall consist of the following percents by weight:
 - 12% nitrogen
 - 20% phosphoric acid
 - 0% potash
3. Planting Tablets: Slow-release 21 gram tablets as manufactured by Agriform, containing the following percentages of nutrients by weight:
 - 20% nitrogen
 - 10% phosphoric acid
 - 5% potash
4. Soil Amendment NPK Fertilizer: Shall consist of the following percents by weight:
 - 6% nitrogen
 - 20% phosphoric acid
 - 20% potash
5. Actual products shall conform to soils test and recommendations of the analysis.

D. Plant Material

1. The plant material indicated on the Drawings by the listed names shall conform to "Standard Plant Names", second edition, except for names not covered therein, the established customs of the nursery trade is followed. All plants shall be true to name, above one of each bundle or lot shall be tagged with the name and size of the plant, in accordance with the standards of practice recommended by the American Association of Nurserymen. All plant materials shall meet the specifications of Federal, State and County laws, requiring observation for plant diseases and insect infestations. Plants shall be symmetrical, typical for variety and species, sound, healthy, vigorous, free from plant diseases, insect pests or other eggs, and shall have healthy, normal root systems, while filling their containers, but not to the point of being root bound. Use only plant materials that are first class representative of the species and cultivars specifies and that conform to all State and local laws governing the sale, transportation and observation of plant materials. Plants shall have straight, single trunks, unless otherwise specified on the plans. Those specified to be multi-trunk shall have at least three (3) main leaders from the base. Any and all plants that have any encircling roots (not root bound) shall have root balls lightly slashed on a minimum of three (3) sides to stop encircling root growth. The height and spread of all plant materials shall be measured with branches in their normal position. Sizes of plants shall be as stated on the plant list, five and fifteen (5 & 15) gallon can container stock shall have been grown in that container not less than six (6) months, but shall not have been overgrown in the containers so as to have become root bound.
2. The size of the plants will correspond with that normally expected for species and variety of commercially available nursery stock or as specified in the Special Conditions or Drawings. The minimum acceptable size of all plants, measured before pruning with the branches in normal position, shall conform with the measurements, if any, specified on the Drawings in the list of plants to be furnished. Plants larger in size than specified may be larger plants is approved, the ball of earth or spread of roots for each plant will be increased proportionally. Plant material shall conform to the following Specifications for container stock:

SHRUBS

<u>SIZE</u>	<u>TYPE</u>	<u>EXAMPLE</u>	<u>HEIGHT</u>	<u>SPREAD</u>	<u>CALIPER</u>
1 Gal.	low growing	Pitt. tobira - etc.	8-10"	6-8"	
1 Gal.	tall growing	Pitt. eugen. - etc.	10-12"	6-8"	
5 Gal.	low growing	Pitt. tobira - etc.	15-18"	15-18"	
5 Gal.	tall growing	Pitt. eugen. - etc.,	24-30"	15-18"	

TREES

5 Gal.	slow growing	Quercus - etc.	5-6'	12-18"	1/4 - 1/2"
5 Gal.	fast growing	Euc. - Prunus - etc.	6-7'	12-18"	1/2 - 3/4"
15 Gal.	slow growing	Quercus - Pyrus - etc.	7-8'	24-30"	3/4 - 1"
15 Gal.	fast growing	Euc. - Prunus - etc.	8-10'	30-36"	1- 1 1/4"
24" Box	slow growing	Quercus - Pyrus - etc.	8-10'	3-4'	1 1/2-1 3/4"
24" Box	fast growing	Euc. - Prunus - etc.	10-12'	4-5'	1 3/4-2 1/2"

3. All plants not conforming to the requirements herein specified, shall be considered defective and such plants, whether in place or not, shall be marked as rejected and immediately removed from the site of the work and replaced with new plants at the Contractor's expense. The plants shall be of the species, variety, size and condition specified herein or as shown on the Drawings. Under no conditions will there be any

substitution of plants or sizes listed on the plans, except with the expressed written approval of the Project Inspector.

4. At no time shall trees or plant materials be pruned, trimmed or topped prior to delivery and any alteration of their shape shall be conducted only with the approval and when in the presence of the Project Inspector and/or as noted on the Planting Specifications.
5. Nursery Grown and Collected Stock
 - a. Plant materials shall conform with the latest edition of ANSI Z60.1-1986 American Standard for Nursery Stock.
 - b. Grown under climatic conditions similar to those in locality of project.
 - c. Container-grown stock in vigorous, healthy condition, not root bound or with root system hardened off.
 - d. Use only linear stock plant material which is well established in removable containers or formed homogeneous soil sections.

E. Tree Staking Material

1. Stakes for Tree Support

- a. Wood Tree Stakes-Lodge pole pine stakes full-length. Minimum nominal size: two (2) inches in diameter x ten feet (2" x 10') long and pointed at one (1) end (adjust length to fit tree). Stakes shall be free from knots, checks, splits, or disfigurements.

2. Ties

- a. 24" length Cinch Tie as manufactured by V.I.T. Company.

F. Sod

1. Sod variety shall be as specified on Drawings. Sod shall be healthy, weed free and obtained from a certified sod growing nursery or farm.
2. All sod shall be cut within twenty-four (24) hours prior to installation.

G. Miscellaneous Materials

1. Sand: Wash river sand or equal.

H. Bark Mulch

1. Bark mulch shall be landscape grade shredded cedar from Redi-Gro Corporation.

I. Pre-Emergent

1. Pre-emergent to prevent annual weed development in hydromulch applications.

PART 3 - EXECUTION

3.1 OBSERVATION

- A. Verify that final grades have been established prior to beginning planting operations. Inspect trees, shrubs and liner stock plant material for injury, insect infestation and trees and shrubs for improper pruning. Do not begin planting of trees until deficiencies are corrected or plants replaced.

3.2 PREPARATION

- A. Stake or mark with line locations for plants and outline of planting beds on ground. Do not begin excavation until plant locations and plant beds are acceptable to the Project Inspector. The irrigation system shall be operational and approved prior to planting.
- B. All planting areas shall be weed free at the time of plant material installation.

3.3 INSTALLATION

A. Preparation of Planting Area

- 1. After approximate finished grades have been established, soil amendments shall be added per the recommendations of the soils report as noted on the plans. Amendments shall be uniformly spread and cultivated thoroughly by means of mechanical tiller into the top six (6) inches of soil.
- 2. Application Rates (for bidding purposes only):
 - a. One hundred fifty (150) lbs. of soil conditioner per 1,000 square feet.
 - b. Three (3) cubic yards of soil amendment per 1,000 square feet.
 - c. One hundred thirty (130) pounds of limestone per 1,000 square feet.
 - d. Soil Amendment NPK Fertilizer at a rate of 15 lbs. per 1,000 square feet.

Note: Actual rates shall conform to soils test and recommendations of the analysis.

- 3. All soil areas shall be compacted and settled by application of irrigation to a minimum depth of eight (8) inches.
- 4. At time of planting, the top six (6) inches of all areas to be planted shall be free of stones, stumps, or other deleterious matter one (1) inch in diameter or larger, and shall be free from all debris, or similar objects that would be a hindrance to planting and maintenance.
- 5. Soil Tests: A soils report shall be prepared as noted on the plans. Actual soil amendments shall be provided per the recommendations of the soil test and report.

B. Final Grades

- 1. Finished grading shall insure proper drainage of the site.
- 2. Finish grades shall be as noted on the civil plans.
- 3. Surface drainage shall be away from all building foundations.
- 4. Do not allow water to collect or pond within low spots of planter areas. Finish grades shall allow water to flow away from plantings.
- 5. Dispose of excess or unacceptable soil from the site.

3.4 PLANT INSTALLATION

A. General

- 1. Actual planting shall be performed during those periods when weather and soil conditions are suitable and in accordance with locally accepted practice, as approved by the Project Inspector.
- 2. Only as many plants as can be planted and watered on that same day shall be distributed in a planting area.
- 3. Container shall be opened and plants shall be removed in such a manner that the ball of earth surrounding the roots is not broken and they shall be planted and watered as herein specified immediately after removal from the containers. Containers shall not be opened prior to placing the plants in the planting area.

B. Layout of Major Plantings

1. Locations for plants and outlines of areas to be planted shall be marked on the ground by the Contractor before any plant pits are dug. All such locations shall be approved by the Project Inspector. If an underground construction or utility line is discovered prior to work, other locations for planting may be selected by the Project Inspector.

C. Planting of Trees and Shrubs

1. Excavation for planting shall include the stripping and stocking of all acceptable topsoil encountered within the areas to be excavated for trenches, tree holes, plant pits and planting beds.
2. Excess soil generated from the planting holes and not used as backfill or in establishing the final grades shall be removed from the site.
3. Excavating for Planting
 - a. Shape
 - 1) Vertical sides and flat bottom.
 - 2) Plant pits to be square for box material, circular for canned material.
 - 3) Scarify sides and bottom of each pit.
 - b. Size: All trees shall have planting pits dug twice the diameter of the rootball. Shrubs shall have planting pits dug two (2) times the diameter of the rootball. Backfill around the rootball with prepared backfill mix.
 - c. Protect all areas from excessive compaction when trucking plants or other materials to planting site.
 - d. Can Removal
 - 1) Cut cans on two (2) sides with an acceptable can cutter.
 - 2) Do not injure the rootball.
 - 3) Do not cut cans with spade or ax.
 - 4) Carefully remove plants without injury or damage to rootball.
 - 5) After removing plant, superficially cut edgeroots with knife on three (3) sides.
 - e. Box Removal
 - 1) Remove bottom of plant boxes before planting.
 - 2) Remove sides of box without damage to rootball after positioning plant and partially backfilling.
 - f. Center plant in pit.
 - g. Face plants with fullest growth into prevailing wind.
 - h. Set plant plumb and hold rigidly in position until soil has been tamped firmly around ball roots.
 - i. Remainder of planting pit shall be backfilled with:
 - 1) Three (3) parts rock-free native soil.
 - 2) One (1) part nitrogen stabilized shavings.
 - 3) Two and one half (2-1/2) pounds 6-20-20 fertilizer per cubic yard of mix.
 - 4) Specified type and quantity of planting tablets.
 - j. All plants which settle shall be raised to the correct level. After the plant has been placed, additional backfill shall be added to the hole to cover approximately one-half (1/2) of the height of the rootball. Water shall be added to the top of the partly filled hole to thoroughly saturate the rootball and adjacent soil.

- k. After the water has completely drained, planting tablets shall be placed adjacent to but not in contact with rootball per the recommendations of the soils analysis.
- l. The remainder of the hole shall be backfilled.
- m. After backfilling, an earthen basin shall be constructed around each plant. Each basin shall be of a depth sufficient to hold at least three (3) inches of water. Basin shall be of a size suitable for the individual plant. In no case shall the basin for fifteen (15) gallon plant be less than four (4) feet in diameter; a five (5) gallon plant less than three (3) feet in diameter. The basins shall be constructed of amended backfill materials, and shall not be constructed for trees in turf areas.
- n. Pruning shall be limited to the minimum necessary to remove injured twigs and branches and to compensate for loss of roots during transplanting, but never to exceed one-third (1/3) of the branching structure. Upon approval of the Project Inspector, pruning may be done before delivery of plant, but not before plants have been observed and approved. Cuts over three-quarter (3/4) inch in diameter shall be painted with tree wound paint.
- o. Staking
 - 1) Staking of all trees shall conform to tree staking and tree planting details.
 - 2) One (1) tree of each size shall be staked and approved by the Project Inspector prior to continued staking.

D. Sod Planting

- 1. Prep soil per paragraph 3.03 A.
- 2. Carefully smooth all surfaces to be sodded. Roll area to expose soil depressions or surface irregularities. Regrade as required.
- 3. Spread turf starter fertilizer onto the soil evenly at the rate noted on the soils test.
- 4. Lay first strip of sod along a straight line (use a string in irregular areas). Butt joints tightly, but do not overlap edges. On second strip, stagger joints. Use a sharp knife to cut sod to fit curves, edges and irrigation heads.
- 5. Do not lay whole lawn before watering. When a conveniently large area has been sodded, water lightly to prevent drying. Continue to lay sod and to water until installation is complete.
- 6. After laying all sod, roll lightly to eliminate irregularities and to form good contact between sod and soil. Avoid a very heavy roller or excessive initial watering which may cause roller marks.
- 7. Water the completed lawn surface thoroughly. Soil should be moistened at least eight (8) inches deep. Repeat irrigation at regular intervals to keep sod moist at all times until rooted. After sod is established, decrease frequency and increase amount of water per application as necessary.
- 8. Replace all dead or dying sod with equal material as directed by the Landscape Architect.

E. Weed Control

- 1. Apply weed control to all planter areas after completion of all planting and one (1) complete watering (to "set" plants). Apply as per manufacturer's specifications.

F. Mulch Cover

- 1. All planting areas shall be dressed with a three (3) inch layer of mulch per plans.

3.5 CLEAN UP

- A. After all planting operations have been completed, remove all trash, excess soil, empty plant containers or rubbish from the property. All scars, ruts or other marks in the ground caused by this work shall be repaired and the ground left in a neat and orderly condition throughout

the site. Contractor shall pick up all trash resulting from this work no less frequently than each Friday before leaving the site, once a week, and/or the last working day of each week. All trash shall be removed completely from the site. The Contractor shall leave the site area broom-clean and shall wash down all paved areas within the Contract area, leaving the premises in a clean condition acceptable to Owner and Project Inspector.

3.6 OBSERVATION SCHEDULE

- A. The Contractor shall be responsible for notifying the Project Inspector in advance for the following observations according to the time indicated:
1. Plant layout review - 72 hours.
 2. Soil preparation and planting operations. One (1) tree with each type of specified staking shall be approved prior to planting of trees - 72 hours.

3.7 LANDSCAPE MAINTENANCE

Provide Landscape Maintenance as per SECTION 329900 - LANDSCAPE MAINTENANCE.

END OF SECTION 32 93 00

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**LANDSCAPE PLANTING
32 93 00 - 10
Palo Verde College
Child Development Center Blythe**

SECTION 32 99 00

LANDSCAPE MAINTENANCE

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Furnish all labor, material, equipment and services required to maintain landscape in a healthy growing condition and in a neat and attractive appearance throughout the maintenance period.

1.2 Quality Assurance

- A. The Maintenance Contractor shall be experienced in horticulture and landscape maintenance, practices and techniques, and shall provide sufficient number of workers with adequate equipment to perform the work during the maintenance period.

1.3 MAINTENANCE PERIOD

- A. Continuously maintain the entire project area during the progress of the work and during the Sixty (60) working days, maintenance period or until final acceptance of the project by the Owner.
- B. Maintenance period shall not start until all elements of construction, planting and irrigation for the entire project are in accordance with Plans and Specifications. Prime requirements is that all landscape areas shall be planted for a minimum of one week, all planter areas shall be covered with mulch, nursery stakes shall be removed from all tree plantings and lawn areas be mowed twice. If such criteria is met to the satisfaction of the project inspector, a written notification shall be issued to establish the effective beginning date of maintenance period.
- C. Any day of improper maintenance, as determined by the project inspector, shall not be credited as an acceptable maintenance period day. The maintenance period shall be extended on a daily basis if the work is not in accordance to the plans and specifications.
- D. Maintenance shall continue beyond the sixty (60) working days maintenance period, as required, until final acceptance is given by the owner.
- E. Contractor shall provide protection to the project site during the maintenance period.

1.4 GUARENTEE AND REPLACEMENT

- A. All plant material and other materials installed under the Contract shall be guaranteed for the duration of the landscape maintenance period against any and all poor, inadequate or inferior materials and/or workmanship or improper maintenance, as determined by the project inspector, shall be replaced by the Contractor at his expense. Trees shall be guaranteed for a period of one year.
- B. Any materials found to be dead, missing, or not in a satisfactory or healthy condition during the maintenance period shall be replaced immediately. The project inspector shall be sole judge as to the condition of material. Material to be replaced within the guarantee period shall be replaced by the Contractor within five (5) days of written notification by the Owner. All replacement materials and installations shall comply to the Plans and Specifications. Any

plant missing due to suspected theft shall be replaced by the Contractor. If the Contractor suspects that theft may be a problem, the Contractor shall provide written documentation to the Owner that security on this site needs to be intensified. The Contractor may relieve himself of theft responsibility if after the security notice, with no result, a written notice to the Owner shall be given that plant material will not be replaced for theft or vandalism due to lack of site security being maintained. This procedure may take place only during the Landscape Maintenance Period.

1.5 FINAL ACCEPTANCE OF THE PROJECT

- A. Upon completion of all project work, including maintenance period, the Project Inspector will, upon proper request, make an observation to determine final project acceptability.
- B. Where observed work does not comply with the Plans and Specifications, replace rejected work and continue specified maintenance period until reinspected by the Project Inspector and determined to be acceptable. All replacement materials and installations shall be in accordance with the Plans and Specifications. Remove rejected work and materials immediately from project. Prior to the date of final observation, Contractor shall provide the Owner with all Record Drawings and written Guarantee Statement in accordance with the Plans and Specifications.

PART 2 - PRODUCTS

2.1 Materials

- A. All materials used shall be typical for landscape maintenance practice.
- B. Maintenance fertilizer shall be per the recommendations of the soils report.

PART 3 - EXECUTION

3.1 MAINTENANCE

- A. Maintenance shall be according to the following standards. All areas shall be weeded and cultivated at intervals of not more than seven (7) days. Watering, trash and debris removal, mowing, rolling, edging, trimming, fertilization, spraying and pest control, as required, shall be included in the maintenance period. Street gutters and sidewalks shall be included. The Contractor shall be responsible for maintaining adequate protection of the area. Damaged areas shall be repaired at the Contractor's expense. Between the 15th day and the 20th day of the maintenance period, the Contractor shall re-plant shrubs and/or trees that appear to be in distress or where proficient growth is not evident.
- B. During course of maintenance, excess and waste materials shall be continuously and promptly removed at end of each workday.
- C. Water in such manner and as frequently as is deemed necessary by Owner to assure continued growth of healthy grass. Water areas of site in such a manner as to prevent erosion due to excessive quantities applied over small areas and to avoid damage to finished surface due to watering equipment.

3.2 TREE AND SHRUB CARE

- A. Watering

1. Maintain a large enough water basin around plants so that enough water can be applied to establish moisture through the major root zone. When hand watering use a water wand.

B. Pruning

1. Shrubs:
 - a. Minimize pruning of shrubs. Under no circumstances shall shrubs be clipped into balled or boxed forms.
 - b. All pruning cuts shall be made to lateral branches or buds or flush with the trunk. "Stubbing" will not be permitted.
2. Trees:
 - a. Pruning of trees, if required, shall be performed by a certified arborist.

C. Tree Staking

1. Remove nursery stakes prior to the start of the maintenance period.
2. Stakes shall remain in place through acceptance and are to be inspected to prevent girdling of trunks or branches and to prevent rubbing that causes bark wounds.

D. Weed Control

1. Keep area between plants free of weeds. Use recommended, legally approved herbicides. Avoid frequent soil cultivation that destroys shallow roots. Use mulches to help prevent weed germination.

E. Fertilization

1. Fertilize all planting areas per the recommendations of the soil test.
2. Avoid applying fertilizer to the root ball and base of main stem; rather, spread evenly under plant to drip line. Rates will vary from about a cup of nitrate fertilizer (depending on nitrogen percentage) around a newly installed small plant to about one-half (1/2) lb. of actual nitrogen per inch of trunk diameter measured four feet from the ground for mature trees.

G. Replacement of Plants

1. Replace dead, dying and missing plants with plants of a size, condition and variety to match plans acceptable to Owner at Contractor's expense under the conditions stated in the Guarantee and Replacement section of these specifications.

3.3 GROUND COVER CARE

A. Weed Control

1. Maintain all areas free from weeds and undesirable grasses. Control weeds, preferably with pre-emergent herbicides, but also with selective systemic herbicides. Hoe weeds as little as possible since this may result in plant damage.

B. Watering

1. Water enough that moisture penetrates throughout root zone and only as frequently as necessary to maintain healthy growth.
- C. Trash
1. Remove trash and debris weekly. Dispose in a legal manner.
- D. Edging and Trimming
1. Edge ground cover to keep in bounds and trim growth as necessary to achieve an overall even appearance.
- E. Replacement
1. Replace dead and/or missing plants at Contractor's expense per the conditions stated in the Guarantee and Replacement section of these Specifications.
- F. Bark Mulch
1. Apply bark mulch to all planter areas as necessary to continuously maintain the minimum depths noted on the plans throughout the entirety of the maintenance period until final acceptance is provided by the owner.
- 3.4 TURF CARE
- A. Mowing and Edging
1. Mowing of turf will commence when the grass has reached a height of two inches. The height of cut will be 1 to 1-1/2". Mowing will be at least weekly after the first cut. Turf must be well-established and free of bare spots and weeds to the satisfaction of the Landscape Architect prior to final acceptance.
 2. Grass clippings shall be picked up and removed from the site and premises in a legal manner.
 3. Edges shall be trimmed at least twice monthly or as needed for neat appearance. Clippings shall be removed from paved areas and planting areas and removed from the site.
- B. Watering
1. Lawns shall be watered at such frequency as weather conditions require to replenish soil moisture below root zone and to establish healthy stands of turf.
- C. Weed Control
1. Control broad leaf weeds with selective herbicides. In areas where crabgrass has infested the lawn, apply pre-emergent herbicides such as Dacthal, Balan, or Betasan for control prior to crabgrass germination.
- D. Fertilization
1. During maintenance period an application of general fertility maintenance fertilizer, as specified, shall be made at thirty (30) days and again at sixty (60) days from the date of lawn installation at a rate of five (5) pounds per 1,000 square feet. At the end of the maintenance period apply slow release fertilizer at a rate of ten (10) pounds per 1,000 square feet or as per manufacturer's recommendations.

E. Replacement

1. At conclusion of maintenance period a final observation of turf areas shall be made. Remove diseased areas and unhealthy stands of grass from the site; do not bury into the soil. Replant areas with materials and in a manner as specified on the Plans and Specifications at no additional cost to the Owner.

3.5 Irrigation System

A. System Observation

1. The Contractor shall check all systems for proper operation. Lateral lines shall be flushed out by removing the last sprinkler head at each end of the lateral. All heads are to be adjusted as necessary for unimpeded, head to head coverage.

B. Controllers

1. Set and program automatic controllers for seasonal water requirements. Give the Owner's representative instructions on how to turn off system in case of emergency.

C. Repairs

1. Repair all damages to irrigation system at the Contractor's expense. Repairs shall be made within twenty-four (24) hours.

END OF SECTION 32 99 00

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DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS, 2019 CBC

Application Number: 04-120944	School Name: Palo Verde College Child Development Center Blythe	School District: Palo Verde Community College District
DSA File Number:	Increment Number: 1	Date Created: 2022-08-22 10:29:31

2019 CBC

IMPORTANT: This form is only a summary list of structural tests and some of the special inspections required for the project. Generally, the structural tests and special inspections noted on this form are those that will be performed by the Geotechnical Engineer of Record, Laboratory of Record, or Special Inspector. The actual complete test and inspection program must be performed as detailed on the DSA approved documents. The appendix at the bottom of this form identifies work NOT subject to DSA requirements for special inspection or structural testing. The project inspector is responsible for providing inspection of all facets of construction, including but not limited to, special inspections not listed on this form such as structural wood framing, high-load wood diaphragms, cold-formed steel framing, anchorage of non-structural components, etc., per Title 24, Part 2, Chapter 17A (2019 CBC).

****NOTE:** Undefined section and table references found in this document are from the CBC, or California Building Code.

KEY TO COLUMNS

1. TYPE	2. PERFORMED BY
Continuous – Indicates that a continuous special inspection is required	GE – Indicates that the special inspection shall be performed by a registered geotechnical engineer or his or her authorized representative.
Periodic – Indicates that a periodic special inspection is required	LOR – Indicates that the test or special inspection shall be performed by a testing laboratory accepted in the DSA Laboratory Evaluation and Acceptance (LEA) Program. See CAC Section 4-335.
Test – Indicates that a test is required	PI – Indicates that the special inspection may be performed by a project inspector when specifically approved by DSA.
	SI – Indicates that the special inspection shall be performed by an appropriately qualified/approved special inspector.

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2019 CBC

Application Number: 04-120944	School Name: Palo Verde College Child Development Center Blythe	School District: Palo Verde Community College District
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Geotechnical Reports: Project has a geotechnical report, or CDs indicate soils special inspection is required by GE

1. GENERAL:		Table 1705A.6		
Test or Special Inspection	Type	Performed By	Code References and Notes	
<input checked="" type="checkbox"/> <p>a. Verify that:</p> <ul style="list-style-type: none"> • Site has been prepared properly prior to placement of controlled fill and/or excavations for foundations. • Foundation excavations are extended to proper depth and have reached proper material. • Materials below footings are adequate to achieve the design bearing capacity. 	Periodic	GE*	* By geotechnical engineer or his or her qualified representative. (See Appendix for exemptions.)	

2. SOIL COMPACTION AND FILL:		Table 1705A.6		
Test or Special Inspection	Type	Performed By	Code References and Notes	
<input type="checkbox"/> <p>a. Perform classification and testing of fill materials.</p>	Test	LOR*	* Under the supervision of the geotechnical engineer.	
<input checked="" type="checkbox"/> <p>b. Verify use of proper materials, densities and inspect lift thicknesses, placement and compaction during placement of fill.</p>	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. (Refer to specific items identified in the Appendix for exemptions where soils SI and testing may be conducted under the supervision of a geotechnical engineer or LOR's engineering manager. In such cases, the LOR's form DSA 291 shall satisfy the soil SI and test reporting requirements for the exempt items.)	

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2019 CBC

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<input checked="" type="checkbox"/>	c. Compaction testing.	Test	LOR*	* Under the supervision of the geotechnical engineer. (Refer to specific items identified in the Appendix for exemptions where soils testing may be conducted under the supervision of a geotechnical engineer or LOR's engineering manager. In such cases, the LOR's form DSA 291 shall satisfy the soil test reporting requirements for the exempt items.)
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3. DRIVEN DEEP FOUNDATIONS (PILES):		Table 1705A.7		
Test or Special Inspection	Type	Performed By	Code References and Notes	
<input type="checkbox"/> a. Verify pile materials, sizes and lengths comply with the requirements.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.	
<input type="checkbox"/> b. Determine capacities of test piles and conduct additional load tests as required.	Test	LOR*	* Under the supervision of the geotechnical engineer.	
<input type="checkbox"/> c. Inspect driving operations and maintain complete and accurate records for each pile.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.	
<input type="checkbox"/> d. Verify locations of piles and their plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and record any pile damage.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.	
<input type="checkbox"/> e. Steel piles.	Provide tests and inspections per STEEL section below.			
<input type="checkbox"/> f. Concrete piles and concrete filled piles.	Provide tests and inspections per CONCRETE section below.			

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (SOILS), 2019 CBC

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<input type="checkbox"/>	g. For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.	*	*	* As defined on drawings or specifications.
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4. CAST-IN-PLACE DEEP FOUNDATIONS (PIERS):		Table 1705A.8		
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect drilling operations and maintain complete and accurate records for each pier.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. (See Appendix for exemptions.)
<input type="checkbox"/>	b. Verify pier locations, diameters, plumbness, bell diameters (if applicable), lengths and embedment into bedrock (if applicable); record concrete or grout volumes.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. (See Appendix for exemptions.)
<input type="checkbox"/>	c. Confirm adequate end strata bearing capacity.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. (See Appendix for exemptions.)
<input type="checkbox"/>	d. Concrete piers.	Provide tests and inspections per CONCRETE section below.		

5. RETAINING WALLS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Placement, compaction and inspection of backfill.	Continuous	GE*	1705A.6.1. * By geotechnical engineer or his or her qualified representative. (See Section 2 above).

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<input type="checkbox"/>	b. Placement of soil reinforcement and/or drainage devices.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c. Segmental retaining walls; inspect placement of units, dowels, connectors, etc.	Continuous	GE*	* By geotechnical engineer or his or her qualified representative. See DSA IR 16-3.
<input type="checkbox"/>	d. Concrete retaining walls.	Provide tests and inspections per CONCRETE section below.		
<input type="checkbox"/>	e. Masonry retaining walls.	Provide tests and inspections per MASONRY section below.		

6. OTHER SOILS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Soil Improvements	Test	GE*	Submit a comprehensive report documenting final soil improvements constructed, construction observation and the results of the confirmation testing and analysis to CGS for final acceptance. * By geotechnical engineer or his or her qualified representative.
<input checked="" type="checkbox"/>	b. Inspection of Soil Improvements	Continuous	GE*	* By geotechnical engineer or his or her qualified representative.
<input type="checkbox"/>	c.			

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (Concrete), 2019 CBC

Table 1705A.3; ACI 318-14 Sections 26.12 & 26.13

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7. CAST-IN-PLACE CONCRETE				
Test or Special Inspection		Type	Performed By	Code References and Notes
Material Verification and Testing:				
<input checked="" type="checkbox"/>	a. Verify use of required design mix.	Periodic	SI	Table 1705A.3 Item 5, 1910A.1.
<input checked="" type="checkbox"/>	b. Identify, sample, and test reinforcing steel.	Test	LOR	1910A.2; ACI 318-14 Section 26.6.1.2; DSA IR 17-10. (See Appendix for exemptions.)
<input checked="" type="checkbox"/>	c. During concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	Test	LOR	Table 1705A.3 Item 6; ACI 318-14 Sections 26.5 & 26.12.
<input checked="" type="checkbox"/>	d. Test concrete (f'_c).	Test	LOR	1905A.1.15; ACI 318-14 Section 26.12.
Inspection:				
<input checked="" type="checkbox"/>	e. Batch plant inspection: Continuous	See Notes	SI	Default of 'Continuous' per 1705A.3.3. If approved by DSA, batch plant inspection may be reduced to 'Periodic' subject to requirements in Section 1705A.3.3.1, or eliminated per 1705A.3.3.2. (See Appendix for exemptions.)
<input type="checkbox"/>	f. Welding of reinforcing steel.	Provide special inspection per STEEL, Category 19.1(d) & (e) and/or 19.2(g) & (h) below.		

8. PRESTRESSED / POST-TENSIONED CONCRETE (in addition to Cast-in-Place Concrete tests and inspections):
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DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (Concrete), 2019 CBC

Table 1705A.3; ACI 318-14 Sections 26.12 & 26.13

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	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Sample and test prestressing tendons and anchorages.	Test	LOR	1705A.3.4, 1910A.3
<input type="checkbox"/>	b. Inspect placement of prestressing tendons.	Periodic	SI	1705A.3.4, Table 1705A.3 Items 1 & 9.
<input type="checkbox"/>	c. Verify in-situ concrete strength prior to stressing of post-tensioning tendons.	Periodic	SI	Table 1705A.3 Item 11. Special inspector to verify specified concrete strength test prior to stressing.
<input type="checkbox"/>	d. Inspect application of post-tensioning or prestressing forces and grouting of bonded prestressing tendons.	Continuous	SI	1705A.3.4, Table 1705A.3 Item 9; ACI 318-14 Section 26.13

9. PRECAST CONCRETE (in addition to Cast-in-Place Concrete tests and inspections):				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Inspect fabrication of precast concrete members.	Continuous	SI	ACI 318-14 Section 26.13.
<input type="checkbox"/>	b. Inspect erection of precast concrete members.	Periodic	SI*	Table 1705A.3 Item 10. * May be performed by PI when specifically approved by DSA.

10. SHOTCRETE (in addition to Cast-in-Place Concrete tests and inspections):				
	Test or Special Inspection	Type	Performed By	Code References and Notes

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (Concrete), 2019 CBC

Table 1705A.3; ACI 318-14 Sections 26.12 & 26.13

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<input type="checkbox"/>	a. Inspect shotcrete placement for proper application techniques.	Continuous	SI	1705A.19, Table 1705A.3 Item 7, 1908A.6, 1908A.7, 1908A.8, 1908A.9, 1908A.11, 1908A.12. See ACI 506.2-13 Section 3.4, ACI 506R-16.
<input type="checkbox"/>	b. Sample and test shotcrete (f'_c).	Test	LOR	1908A.5, 1908A.10.

11. POST-INSTALLED ANCHORS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect installation of post-installed anchors	See Notes	SI*	1617A.1.19, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic), 1705A.3.8 (See Appendix for exemptions). ACI 318-14 Sections 17.8 & 26.13. * May be performed by the project inspector when specifically approved by DSA.
<input checked="" type="checkbox"/>	b. Test post-installed anchors.	Test	LOR	1910A.5. (See Appendix for exemptions.)

12. OTHER CONCRETE:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (Masonry), 2019 CBC

1705A.4; TMS 602-16, Tables 3 and 4.

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13. STRUCTURAL MASONRY: 2500 psi				
Test or Special Inspection	Type	Performed By	Code References and Notes	
Material Verification and Testing: (See Appendix for exemptions.)				
<input checked="" type="checkbox"/> a. Mill certificate indicates compliance with requirements for reinforcement, anchors, ties, fasteners and metal accessories. See item 7b for identification, sampling and testing of reinforcing steel.	Periodic	SI*	2103A.4; TMS 602-13 Article 1.5B.2 & 2.4. * To be performed by qualified LOR representative. Applicable testing by LOR. See IR 17-10.16 for unidentified reinforcing steel.	
<input checked="" type="checkbox"/> b. Producer's certificate of compliance for masonry units, mortar and grout materials.	Test	LOR	1705A.4, 2103A.2.1, 2103A.3, 2103A.5; TMS 602-16 Articles 2.1, 2.2, 2.6A and 2.6B, and Table 6 footnote 3.	
<input checked="" type="checkbox"/> c. Test masonry (f_m).	Test	LOR	1705A.4. For Unit Strength: 2105A.3 (2114.6.1+); TMS 602-16 Articles 1.4B.2, 1.5B.1 & 1.5B.2. For Prism (required when $f_m > 2000$ psi): 2105A.2; TMS 602-16 Articles 1.4B.3, 1.4B.4, 1.5B.1 & 1.5B.2.	
<input checked="" type="checkbox"/> d. Verify proportions of site prepared, premixed or preblended mortar and grout.	Periodic	SI	TMS 602-16 Table 3 Item 5, Table 4 Item 1a & 2d.	
<input checked="" type="checkbox"/> e. Test core-drilled samples.	Test	LOR	2105A.4. (See Appendix for exemptions.)	
Inspection: (See Appendix for exemptions.)				
<input type="checkbox"/> f. Inspect preparation of prisms.	Continuous	SI	TMS 602-16 Articles 1.4.B.3 & 1.4.B.4 & Table 4 Item 4.	
<input checked="" type="checkbox"/> g. Verify size, location and condition of all dowels, construction supporting masonry, etc.	Periodic	SI		

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1705A.4; TMS 602-16, Tables 3 and 4.

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<input checked="" type="checkbox"/>	h. Verify size, grade and type of reinforcement and anchor bolts.	Periodic	SI	TMS 602-16 Table 4 Item 1c.
<input type="checkbox"/>	i. Welding of reinforcing steel.	TMS 602-16 Table 4 Item 3e. Provide special inspection per STEEL, Category 19.1(d) & (e) and/or 19.2(g) & (h) below.		
<input checked="" type="checkbox"/>	j. Inspect placement of reinforcement and connectors.	Continuous	SI	TMS 602-16 Table 4 Item 2c.
<input checked="" type="checkbox"/>	k. Inspect placement of masonry units and construction of mortar joints.	Periodic	SI	TMS 602-16 Table 4 Item 3b.
<input checked="" type="checkbox"/>	l. Verify preparation, construction and protection of masonry during cold weather (temperature below 40° F) or hot weather (temperature above 90° F).	Periodic	SI*	TMS 602-16 Table 4 Item 3f. * May be performed by the project inspector when specifically approved by DSA.
<input checked="" type="checkbox"/>	m. Inspect type, size and location of anchors and all other items to embedded in masonry including other details of anchorage of masonry to structural members, frames and other construction.	Continuous	SI	TMS 602-16 Table 4 Item 3d.
<input checked="" type="checkbox"/>	n. Inspect grout space prior to placement of grout.	Continuous	SI	TMS 602-16 Table 4 Item 2a.

14. VENEER OR GLASS BLOCK PARTITIONS: 1705A.4.1; TMS 602-16 Tables 3 and 4.				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify proportions of siteprepared mortar and grout and/or verify certification of premixed mortar.	Periodic	SI	TMS 602-16 Table 3 Item 5 and Table 4 Items 1a & 2d.

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1705A.4; TMS 602-16, Tables 3 and 4.

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<input type="checkbox"/>	b. Inspect placement of units and construction of mortar joints.	Periodic	SI	TMS 602-16 Table 4 Item 3b.
<input type="checkbox"/>	c. Inspect placement of reinforcement, connectors and anchors.	Periodic	SI	TMS 602-16 Table 4 Item 2c.
<input type="checkbox"/>	d. Inspect type, size and location of anchors and all other items to be embedded in masonry including details of anchorage of masonry to structural members, frames and other construction.	Periodic	SI	TMS 602-16 Table 4 Item 3d.
<input type="checkbox"/>	e. Verify preparation, construction and protection of masonry during cold weather (temperature below 40 ^o F) or hot weather (above 90 ^o F).	Periodic	SI*	TMS 602-16 Table 4 Item 3f. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	f. Test veneer bond strength	Test	LOR	1410.2.1; TMS 402 Article 12.3.2.4. (Field constructed mock-up laboratory tested in accordance with ASTM C482).

15. POST-INSTALLED ANCHORS IN MASONRY:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Inspect installation of postinstalled anchors	See Notes	SI*	1617A.1.19, 1705A.4, Table 1705A.3 Item 4a (Continuous) & 4b (Periodic); ACI 318-14 Sections 17.8 & 26.13. * May be performed by the project inspector when specifically approved by DSA. (See Appendix for exemptions.)
<input checked="" type="checkbox"/>	b. Test post-installed anchors.	Test	LOR	1705A.4, 1910A.5. (See Appendix for exemptions.)

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1705A.4; TMS 602-16, Tables 3 and 4.

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16. OTHER MASONRY:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (Steel and Aluminum), 2019 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16

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17. STRUCTURAL STEEL, COLD-FORMED STEEL AND ALUMINUM USED FOR STRUCTURAL PURPOSES				
Material Verification and Testing:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification of all materials and: • Mill certificates indicate material properties that comply with requirements. • Material sizes, types and grades comply with requirements.	Periodic	*	Table 1705A.2.1 Item 3a 3c. 2202A.1; AISI S100-16 Section A3.1 & A3.2, AISI S240-15 Section A3 & A5, AISI S220-15 Sections A4 & A6. * By special inspector or qualified technician when performed off-site.
<input checked="" type="checkbox"/>	b. Test unidentified materials	Test	LOR	2202A.1.
<input checked="" type="checkbox"/>	c. Examine seam welds of HSS shapes	Periodic	SI	DSA IR 17-3.
Inspection:				
<input checked="" type="checkbox"/>	d. Verify and document steel fabrication per DSA-approved construction documents.	Periodic	SI	Not applicable to cold-formed steel light-frame construction, except for trusses (1705A.2.4).

18. HIGH-STRENGTH BOLTS: RCSC 2014				
Material Verification and Testing of High-Strength Bolts, Nuts and Washers:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify identification markings and manufacturer's certificates of compliance conform to ASTM standards specified in the DSA-approved documents.	Periodic	SI	Table 1705A.2.1 Items 1a & 1b, 2202A.1; AISC 360-16 Section A3.3, J3.1, and N3.2; RCSC 2014 Section 1.5 & 2.1; DSA IR 17-8 & DSA IR 17-9.

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1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16

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<input checked="" type="checkbox"/>	b. Test high-strength bolts, nuts and washers.	Test	LOR	Table 1705A.2.1 Item 1c, 2213A.1; RCSC 2014 Section 7.2; DSA IR 17-8.
Inspection of High-Strength Bolt Installation:				
<input checked="" type="checkbox"/>	c. Bearing-type ("snug tight") connections.	Periodic	SI	Table 1705A.2.1 Item 2a, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Section 9.1; DSA IR 17-9.
<input checked="" type="checkbox"/>	d. Pretensioned and slip-critical connections.	*	SI	Table 1705A.2.1 Items 2b & 2c, 1705A.2.6, 2204A.2; AISC 360-16 J3.1, J3.2, M2.5 & N5.6; RCSC 2014 Sections 9.2 & 9.3; DSA IR 17-9. * "Continuous" or "Periodic" depends on the tightening method used.

19. WELDING:	1705A.2.5, Table 1705A.2.1 Items 4 & 5; AWS D1.1 and AWS D1.8 for structural steel; AWS D1.2 for Aluminum; AWS D1.3 for cold-formed steel; AWS D1.4 for reinforcing steel; DSA IR 17-3 (See Appendix for exemptions.)
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Verification of Materials, Equipment, Welders, etc.:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Verify weld filler material identification markings per AWS designation listed on the DSA-approved documents and the WPS.	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	b. Verify weld filler material manufacturer's certificate of compliance.	Periodic	SI	DSA IR 17-3.
<input checked="" type="checkbox"/>	c. Verify WPS, welder qualifications and equipment.	Periodic	SI	DSA IR 17-3.

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1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16

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19.1 SHOP WELDING:				
Test or Special Inspection	Type	Performed By	Code References and Notes	
<input checked="" type="checkbox"/> a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.	
<input checked="" type="checkbox"/> b. Inspect single-pass fillet welds ≤ 5/16", floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Items 5a.5 & 5a.6; AISC 360-16 (and AISC 341-16 as applicable); DSA IR 17-3.	
<input type="checkbox"/> c. Inspect welding of stairs and railing systems.	Periodic	SI	1705A.2.1; AISC 360-16 (and AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3.	
<input type="checkbox"/> d. Verification of reinforcing steel weldability other than ASTM A706.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.	
<input checked="" type="checkbox"/> e. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.	

19.2 FIELD WELDING:				
Test or Special Inspection	Type	Performed By	Code References and Notes	
<input checked="" type="checkbox"/> a. Inspect groove welds, multi-pass fillet welds, single pass fillet welds > 5/16", plug and slot welds.	Continuous	SI	Table 1705A.2.1 Items 5a.1 4; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.	
<input checked="" type="checkbox"/> b. Inspect single-pass fillet welds ≤ 5/16".	Periodic	SI	Table 1705A.2.1 Item 5a.5; AISC 360-16 (AISC 341-16 as applicable); DSA IR 17-3.	

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1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16

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<input checked="" type="checkbox"/>	c. Inspect end-welded studs (ASTM A-108) installation (including bend test).	Periodic	SI	2213A.2; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1; DSA IR 17-3.
<input type="checkbox"/>	d. Inspect floor and roof deck welds.	Periodic	SI	1705A.2.2, Table 1705A.2.1 Item 5a.6; AISC 360-16 (AISC 341-16 as applicable); AWS D1.3; DSA IR 17-3.
<input type="checkbox"/>	e. Inspect welding of structural cold-formed steel.	Periodic	SI*	1705A.2.5; AWS D1.3; DSA IR 17-3. The quality control provisions of AISI S240-15 Chapter D shall also apply. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	f. Inspect welding of stairs and railing systems.	Periodic	SI*	1705A.2.1; AISC 360-16 (AISC 341-16 as applicable); AWS D1.1 & D1.3; DSA IR 17-3. * May be performed by the project inspector when specifically approved by DSA.
<input type="checkbox"/>	g. Verification of reinforcing steel weldability.	Periodic	SI	1705A.3.1; AWS D1.4; DSA IR 17-3. Verify carbon equivalent reported on mill certificates.
<input type="checkbox"/>	h. Inspect welding of reinforcing steel.	Continuous	SI	Table 1705A.2.1 Item 5b, 1705A.3.1, Table 1705A.3 Item 2, 1903A.8; AWS D1.4; DSA IR 17-3.

20. NONDESTRUCTIVE TESTING: 1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input checked="" type="checkbox"/>	a. Ultrasonic	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; ANSI/ASNT CP-189, SNT-TC-1A; AWS D1.1, AWS D1.8; DSA IR 17-2.

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1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16

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<input checked="" type="checkbox"/>	b. Magnetic Particle	Test	LOR	1705A.2.1, 1705A.2.5; AISC 341-16 J6.2, AISC 360-16 N5.5; ANSI/ASNT CP-189, SNT-TC-1A; AWS D1.1, AWS D1.8; DSA IR 17-2.
<input type="checkbox"/>	c.	Test	LOR	

21. STEEL JOISTS AND TRUSSES: 1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Verify size, type and grade for all chord and web members as well as connectors and weld filler material; verify joist profile, dimensions and camber (if applicable); verify all weld locations, lengths and profiles; mark or tag each joist.	Continuous	SI	1705A.2.3, Table 1705A.2.3; AWS D1.1; DSA IR 22-3 for steel joists only. 1705A.2.4; AWS D1.3 for cold-formed steel trusses.

22. SPRAY APPLIED FIRE-PROOFING: 1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Examine structural steel surface conditions, inspect application, take samples, measure thickness and verify compliance of all aspects of application with DSA-approved documents.	Periodic	SI	1705A.14.
<input type="checkbox"/>	b. Test bond strength.	Test	LOR	1705A.14.6.

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS (Steel and Aluminum), 2019 CBC

1705A.2.1, Table 1705A.2.1; AISC 303-16, AISC 341-16, AISC 358-16, AISC 360-16; AISI S100-16

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<input type="checkbox"/>	c. Test density.	Test	LOR	1705A.14.5.
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23. ANCHOR BOLTS AND ANCHOR RODS:				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a. Anchor Bolts and Anchor Rods	Test	LOR	Sample and test anchor bolts and anchor rods not readily identifiable per procedures noted in DSA IR 17-11.
<input type="checkbox"/>	b. Threaded rod not used for foundation anchorage.	Test	LOR	Sample and test threaded rods not readily identifiable per procedures noted in DSA IR 17-11.

Other Steel				
	Test or Special Inspection	Type	Performed By	Code References and Notes
<input type="checkbox"/>	a.			

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

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Exempt items given in DSA IR A-22 or the 2019 CBC (including DSA amendments) and those items identified below with a check mark by the design professional are NOT subject to DSA requirements for the structural tests / special inspections noted. **Items marked as exempt shall be identified on the approved construction documents.** The project inspector shall verify all construction complies with the approved construction documents.

SOILS:	
<input type="checkbox"/>	1. Deep foundations acting as a cantilever footing designed based on minimum allowable pressures per CBC Table 1806A.2 and having no geotechnical report for the following cases: A) free standing sign or scoreboard, B) cell or antenna towers and poles less than 35'-0" tall (e.g., lighting poles, flag poles, poles supporting open mesh fences, etc.), C) single-story structure with dead load less than 5 psf (e.g., open fabric shade structure), or D) covered walkway structure with an apex height less than 10'-0" above adjacent grade.
<input type="checkbox"/>	2. Shallow foundations, etc. are exempt from special inspections and testing by a Geotechnical Engineer for the following cases: A) buildings without a geotechnical report and meeting the exception item #1 criteria in CBC Section 1803A.2 supported by native soil (any excavation depth) or fill soil (not exceeding 12" depth per CBC Section 1804A.6), B) soil scarification/recompaction not exceeding 12" depth, C) native or fill soil supporting exterior non-structural flatwork (e.g., sidewalks, site concrete ramps, site stairs, parking lots, driveways, etc.), D) unpaved landscaping and playground areas, or E) utility trench backfill.

CONCRETE/MASONRY:	
<input type="checkbox"/>	1. Post-installed anchors for the following: A) exempt non-structural components (e.g., mechanical, electrical, plumbing equipment - see item 7 for "Welding") given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) or B) interior nonstructural wall partitions meeting criteria listed in exempt item 3 for "Welding."
<input type="checkbox"/>	2. Concrete batch plant inspection is not required for items given in CBC Section 1705A.3.3.2 subject to the requirements and limitations in that section.

Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

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<input type="checkbox"/>	3. Non-bearing non-shear masonry walls may be exempt from certain DSA masonry testing and special inspection items as allowed per DSA IR 21-1.16. Refer to construction documents for specific exemptions accordingly for each applicable wall condition.
<input type="checkbox"/>	4. Epoxy shear dowels in site flatwork and/or other non-structural concrete.
<input type="checkbox"/>	5. Testing of reinforcing bars is not required for items given in CBC Section 1910A.2 subject to the requirements and limitations in that section.

	Welding:
<input type="checkbox"/>	1. Solid-clad and open-mesh gates with maximum leaf span or rolling section for rolling gates of 10' and apex height less than 8'-0" above lowest adjacent grade. When located above circulation or occupied space below, these gates are not located within 1.5x gate/fence height (max 8'-0") to the edge of floor or roof.
<input type="checkbox"/>	2. Handrails, guardrails, and modular or relocatable ramps associated with walking surfaces less than 30" above adjacent grade (excluding post base connections per the 'Exception' language in Section 1705A.2.1); fillet welds shall not be ground flush.
<input type="checkbox"/>	3. Non-structural interior cold-formed steel framing spanning less than 15'-0", such as in interior partitions, interior soffits, etc. supporting only self weight and light-weight finishes or adhered tile, masonry, stone, or terra cotta veneer no more than 5/8" thickness and apex less than 20'-0" in height and not over an exit way. Maximum tributary load to a member shall not exceed the equivalent of that occurring from a 10'x10' opening in a 15' tall wall for a header or king stud.
<input type="checkbox"/>	4. Manufactured support frames and curbs using hot rolled or cold-formed steel (i.e., light gauge) for mechanical, electrical, or plumbing equipment weighing less than 2000# (equipment only) (connections of such frames to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections 19, 19.1 and/or 19.2 of listing above).
<input type="checkbox"/>	5. Manufactured components (e.g., Tolco, B-Line, Afcon, etc.) for mechanical, electrical, or plumbing hanger support and bracing (connections of such components to superstructure elements using welding will require special inspection as noted in selected item(s) for Sections 19, 19.1 and/or 19.2 of listing above).

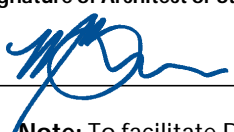
Appendix: Work Exempt from DSA Requirements for Structural Tests / Special Inspections

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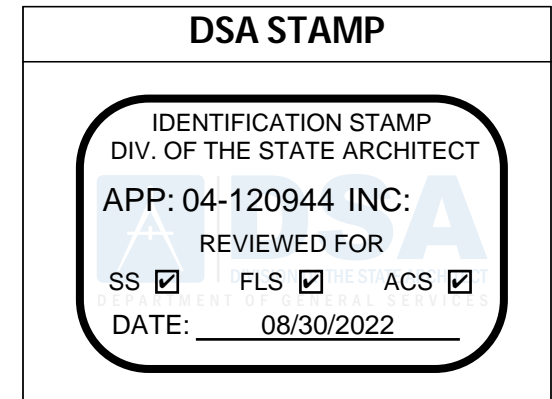
<input type="checkbox"/>	6. TV Brackets, projector mounts with a valid listing (see DSA IR A-5) and recreational equipment (e.g., playground structures, basketball backstops, etc.) (connections of such elements to superstructure elements using welding will require special inspection as noted in selected item(s) for section 19, 19.1 and/or 19.2 located in the Steel/Aluminum category).
<input type="checkbox"/>	7. Any support for exempt non-structural components given in CBC Section 1617A.1.18 (which replaces ASCE 7-16, Section 13.1.4) meeting the following: A) when supported on a floor/roof, <400# and resulting composite center of mass (including component's center of mass) $\leq 4'$ above supporting floor/roof, B) when hung from a wall or roof/floor, <20# for discrete units or <5 plf for distributed systems.

DSA 103-19: LISTING OF STRUCTURAL TESTS & SPECIAL INSPECTIONS(SIGNATURE), 2019 CBC

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Name of Architect or Engineer in general responsible charge: Mark Baker	
Name of Structural Engineer (When structural design has been delegated):	
Signature of Architect or Structural Engineer: 	Date: 08/19/2022

Note: To facilitate DSA electronic mark-ups and identification stamp application, DSA recommends against using secured electronic or digital signatures.



DSA 103-19: LIST OF REQUIRED VERIFIED REPORTS, CBC 2019

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1. Soils Testing and Inspection: Geotechnical Verified Report Form DSA 293

2. Structural Testing and Inspection: Laboratory Verified Report Form DSA 291

3. Concrete Batch Plant Inspection: Laboratory Verified Report Form DSA 291

4. Post-installed Anchors: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

5. Masonry Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

6. Shop Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

7. Field Welding Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292

8. High-Strength Bolt Installation Inspection: Laboratory Verified Report Form DSA 291, or, for independently contracting SI, Special Inspection Verified Report Form DSA 292



Palo Verde College
 Child Development Center

RESPONSIBILITY MATRIX
 25-Jul-22

ACTIVITY DESCRIPTION	PRIME CONTRACTOR	MODULAR CONTRACTOR	DISTRICT/ OTHERS	COMMENTS
DIVISION 01 - GENERAL REQUIREMENTS				
Temporary facilities/toilets	X			
Temporary site fencing / Dumpsters	X			
Fencing, fencing footings & columns	X			Temporary/permanent fencing, fencing footings, columns and all associated work by Prime Contractor.
Temporary field office trailers	X			
Temporary electrical power	X			
All city permits, fees, water, electrical etc.	X		X	
Temporary phone & internet	X			
Staging area for modules on site	X			Provide perimeter fencing for modulars.
Site security	X			Site security during modular building staging - including delivered/stages modules.
DIVISION 02 - EXISTING CONDITIONS				
Subsurface investigation			X	If Applicable.
Demolition & removals	X			
DIVISION 03 - CONCRETE				
Mow strips	X			Forming, placing, installing mow strips and all associated materials.
Site flatwork & accessories	X			Forming, placing, installing all flatwork and all associated materials.
Curb & gutter	X			
Concrete forming and reinforcing	X			
CIP concrete	X			
Precast concrete	X			
Concrete cutting	X			
Modular building foundations	X			Concrete foundation design only by Modular Contractor - per AMS pre-approved PC/basis of design and soils report provided.
Non-modular site foundations	X			
Foundation staking	X			Prime Contractor must maintain stakes
Mechanical & utility foundations	X			If applicable
Soils remediation	X			If required
Haul-off of all foundation/form spoils from site	X			If spoils cannot be utilized with site earthwork. To include modular building foundations
Modular foundation - dig footings	X			Any special footings, caissons, piles or other foundation requirements above PC foundation also in Prime Contractor SOW.



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ACTIVITY DESCRIPTION	PRIME CONTRACTOR	MODULAR CONTRACTOR	DISTRICT/ OTHERS	COMMENTS
All modular building footings & stem walls	X			Per PC foundation/basis of design
Crawl space slurry	X			
Supply metal grates and frames material	X			
Install foundation vents and grates	X			Formed and poured after buildings craned and set and structurally connected.
Provide modular foundation embeds, material only		X		Tailgate delivery to site by Modular Contractor to be coordinated by Prime Contractor. Equipment to offload delivery to be provided by Prime Contractor.
Install foundation embeds for modular building	X			Set \pm 1/8" plane, plumb and level (horizontal, vertical and square, diagonal) over the overall length and width of the foundation footprint
Provide/install light weight concrete subfloors within building		X		
DIVISION 04 - MASONRY - Not Applicable				
Masonry	X			
Grout & Mortar	X			
Precast Caps	X			
DIVISION 05 - METALS				
Building foundation flashings and weep screed		X		
Building foundation & access vent grates	X			Verify T.O. grate is at finish floor height
Embed plates		X		Tailgate delivery to site by Modular Contractor to be coordinated by Prime Contractor. Equipment to offload delivery to be provided by Prime Contractor.
Metal overhangs w/sunshade louvers at MPR		X		Per AMS drawings - galvanized and painted
Custom/circle wave canopy	X			Including close-up to building (if required). If a close-up is added that requires a penetration through exterior wall finish, AMS warranty for water tightness will be void.
Metal mechanical screens				Not applicable
ADA building guardrails				Not applicable
ADA site handrails	X			If applicable
ADA site guardrails	X			If applicable
ADA Drinking Fountain Handrails	X			If applicable
Provide RWL heads on modular building		X		



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ACTIVITY DESCRIPTION	PRIME CONTRACTOR	MODULAR CONTRACTOR	DISTRICT/ OTHERS	COMMENTS
Drainage grates	X			
DIVISION 07 - THERMAL & MOISTURE PROTECTION				
Building dampproofing & waterproofing		X		Modular building only. Above grade conditions only.
Weather barriers		X		
Roofing - PVC roofing system		X		
DIVISION 08 - OPENINGS				
Doors & frames		X		
Windows & frames		X		
Door hardware		X		Master keying by Prime Contractor (Does not Include Electronic Door Hardware)
Glazing		X		
Louvers & vents		X		If applicable
Skylights				Not applicable
DIVISION 09 - FINISHES				
Plaster & gypsum board		X		Conventional stucco exterior applied on site.
Tackable wall panels		X		Per AMS drawings.
FRP Wall Panels		X		Per AMS drawings.
Ceramic tile				Not applicable
Ceilings		X		
Floorings & base		X		Per AMS drawings.
Wall finishes		X		Per AMS drawings.
Painting & coatings		X		
Door frames & doors		X		
Exterior caulking		X		Modular buildings only
Interior window sills		X		
Paintings & coatings		X		Modular buildings only
DIVISION 10 - SPECIALTIES				
Building & site ADA signage	X			All required signage
DIVISION 11 - EQUIPMENT				
Security equipment	X		X	If applicable - owner furnished, Prime Contractor installed.
Educational equipment (smart TVs, WAPs, smartboards, etc.)	X		X	Modular Contractor providing blocking only as/where required. Owner supplying equipment - Prime Contractor installing.
Air curtain	X			If applicable



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ACTIVITY DESCRIPTION	PRIME CONTRACTOR	MODULAR CONTRACTOR	DISTRICT/ OTHERS	COMMENTS
Kitchen equipment	X		X	All kitchen equipment to be provided by Prime Contractor and/or Owner. Modular Contractor to provide blocking and rough-in plumbing only.
DIVISION 12 - FURNISHINGS				
Casework, cabinets, & countertops		X		Modular Contractor to provide countertops and lower/upper cabinets in classrooms per drawings
All furniture			X	
Appliances	X		X	
DIVISION 13 - Special Construction				
Engineering & DSA approval		X		In collaboration with project architect. Kitchen design and health department review and approval not included in Modular Contractor SOW.
Manufacture building		X		
Transport cost to site		X		Special fees, permits, CHP escort, traffic control/coordination fees, if required, are not included
DSA fees			X	
Inplant inspection fees			X	
DIVISION 14 - CONVEYING EQUIPMENT - Not Applicable				
DIVISION 21 - FIRE SUPPRESSION				
Fire water service - stubbed into new buildings AFF w/flange 6"	X			Bring FS line to point of connection Terminate 12" above FF w/ flange after building is crane set
Fire water service within new building		X		
Fire lines underground & hydrants	X			
Fire sprinklers including calculations, building backflows, signage, etc. per DSA approval.		X		
Fire sprinkler riser		X		
Fire sprinkler riser connection	X			
Connect bell & flow switch to fire alarm system and provide power	X			
Ansul system	X			
DIVISION 22 - PLUMBING				
Building Foundation and Site Drywells	X			
Site/under building foundation area drains	X			Installed prior to foundation completion
All Cleanouts below finished Floor and at POC	X			
Pressure testing of all UG lines	X			
Storm drain lines & catch basins	X			



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ACTIVITY DESCRIPTION	PRIME CONTRACTOR	MODULAR CONTRACTOR	DISTRICT/ OTHERS	COMMENTS
Provide & install building scuppers and downspouts		X		Downspouts cleanouts and connection to storm drain by Prime Contractor.
Site sewer line - within 2' of new building	X			Connect to modular building per POC drawing
Gas service - within 2' of new building				Not applicable
Site water service - within 2' of new building	X			Connect to modular building per POC drawing
Crawlspace waste manifold		X		Stub 2' past foundation stem wall. Waste manifold to be cast iron.
Site gas meters & fees - if applicable	X		X	
Gas service line through buildings & mechanical units				Not applicable
Building shut off valves (water, gas, FW, etc.)	X			At or below grade conditions. Gas not applicable.
Site shut off valves (water, gas, FW, etc.)	X			As applicable.
Shut off valves & pressure reducing valves in building & HVAC units		X		Prime Contractor to connect and provide shut off valve.
Building water service in building		X		
Plumbing fixtures		X		Sinks in Kitchen are excluded. Modular Contractor providing rough-in plumbing only.
Chlorination - all lines	X			Including modular buildings
Downspout cleanouts	X			
Connect Downspouts to storm drain	X			Prime Contractor to terminate downspouts and connect to storm drain.
Connect condensate drain to waste	X			
Irrigation	X			
Planting	X			
Site accessories & planters	X			
<i>DIVISION 23 - MECHANICAL</i>				
HVAC piping & pumps within the building		X		Including mini-split system for IDF room.
HVAC supply & return ducts & grills		X		
Run condensate drains to waste per POC		X		
Condensate drain below floor piping and drywells	X			Prime Contractor to connect to modular building per POC drawing.
Exhaust fans		X		Excluding Kitchen
HVAC air cleaning devices		X		Air filter provided at start-up
Thermostats		X		



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ACTIVITY DESCRIPTION	PRIME CONTRACTOR	MODULAR CONTRACTOR	DISTRICT/ OTHERS	COMMENTS
EMS System	X			If applicable; Including thermostats/sensors/controls/ conductors
EMS wiring, testing, labeling, devices, etc. to ensure EMS is compatible with new HVAC units	X			If applicable
Power for EMS		X		If applicable
Backboxes/J-boxes within wall cavity		X		Stubbed 6" above T-bar only
EMS sensors/thermostats conductors	X			Connect to HVAC units, if applicable
Compressed air	X			Not applicable
Make-up Air and Exhaust System	X			Make-up air requirements (hood/equipment) by Prime Contractor. Make-up air calculations by AOR/consultants. Make-up air design, supply and installation is excluded from Modular Contractor SOW. Curb for Make-up air unit Design, supply, and installation is also excluded from Modular Contractor SOW. NOTE: Curb to be installed prior to roofing installation to facilitate proper water tightness. Roof framing/Blocking to support make-up air is included in Modular Contractor SOW (Per AOR's design) Power to AOR directed roof penetration location for make-up air is included in Modular Contractor SOW. (Connection/Termination to MUA by others).
DIVISION 26 - ELECTRICAL				
Site electrical service - to new building	X			Prime Contractor to connect to modular building per POC drawing, including energizing modular subpanels
Interior (with occupancy sensors) & exterior building LED light fixtures		X		Per AMS drawings.
Site light fixtures & foundations	X			
Site UG trenching, backfill, & compaction	X			
Main switchboards	X			Prime Contractor to provide conductors, ground draw, and connections for main distribution panel grounding.
Conductors to meters	X			



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ACTIVITY DESCRIPTION	PRIME CONTRACTOR	MODULAR CONTRACTOR	DISTRICT/ OTHERS	COMMENTS
Transformers & installation of transformers	X			
Conduit pathway and conductors to transformers and from transformers to MSB	X			
Distribution switchboards	X			Prime Contractor to provide conductors, ground draw, and connections for main distribution panel grounding.
Energizing of new building & all site/building electrical components	X			
Building electrical subpanels		X		Per AMS drawings - to be energized by Prime Contractor.
Ground rods, testing, & reports	X			
Power for low voltage components		X		Per layout provided by project AOR.
Conductors from main switchboard to modular subpanels	X			Per POC drawings. Prime Contractor to provide and install conductors, and terminate at both ends.
Electrical conduit from MSB to crawl space subpanel stub out	X			Per POC drawings
Circuit monitoring	X			
Panel ID/circuit ID labeling		X		Within AMS modular building only.
Site lighting / bollard lights	X			
All building exterior lighting to EMS location	X	X		AMS to provide conduit and backboxes as directed by AOR, per DSA approved drawings, stubbed above ceiling. Prime Contractor to connect and supply to EMS/lighting control panel - if applicable.
EMS controls panel	X			If applicable
Interior light programming		X		AMS systems only - excludes programming/integration to campus network, if required.
Exterior light programing	X			
Conduits connectiong building wings	X			If applicable
2x4 Interior dimmable LED lights		X		
Exterior LED lights		X		
Interior occupancy sensors/photo sensors		X		For LED lights
Electrical within new building		X		Per layout provided by project AOR. See subsequent items in Division 21, 23, 26 and 27 for scope limitations.
DIVISION 27 - LOW VOLTAGE				
All necessary conduit sleeves between classroom to classroom		X		As necessary for low voltage system(s) per POC drawings



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ACTIVITY DESCRIPTION	PRIME CONTRACTOR	MODULAR CONTRACTOR	DISTRICT/ OTHERS	COMMENTS
All new to existing low voltage tie-ins (to be coordinated through the school)	X			
Testing of all low voltage lines	X			
Training of district employees for all new devices & equipment	X		X	
Dedicated phone line & testing at Elevator	X			
Telephone system & devices at new building	X			
Network infrastructure	X			
Fiber optic network system	X			If applicable
Audio-video systems	X			If applicable
PA & phone system - install, equipment, cabling, testing, labeling, etc.	X			
Structured cabling	X			
Data communications	X			
Security devices	X			
Cable trays (if applicable)	X			
Data/EMS system - install, equipment, cabling, testing, labeling, etc.	X			
All fire alarm communications & panels	X			Power by AMS per locations provided by project AOR.
Fire alarm system - install, equipment, cabling, testing, labeling, etc.	X			
Site fire alarm systems to complete flow & tamper switches - to include all backflows, DCDA, risers, PIV, fire hydrants, etc.	X			
Low voltage backboxes/ J-boxes within wall cavity only		X		Stubbed 6" above T-bar ceiling only
Fire alarm backboxes/J-boxes within wall cavity only		X		Stubbed 6" above T-bar ceiling only
Conduit pathway to IDF room	X			
Conduit pathway/tie in to all low voltage panels/devices (FA, EMS, IDF, lighting contrls, etc.)	X			
IDF cabinets or racks	X			Power by Modular Contractor.
Signal termination cabinets	X			
DIVISION 28 - ELECTRONIC SAFETY & SECURITY				
New building security system	X			
All new to existing security tie-ins (to be coordinated through the school)	X			
Testing of all security lines	X			



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ACTIVITY DESCRIPTION	PRIME CONTRACTOR	MODULAR CONTRACTOR	DISTRICT/ OTHERS	COMMENTS
Training of district employees for all new devices & equipment	X		X	
DIVISION 31 - EARTHWORK				
Site & building excavation, backfill, compaction, import, export, etc.	X			Backfill along building perimeter within 3 weeks after building crane set
Import/export fill to include engineered fill if applicable per soils report	X			
Rough grading (including building perimeter)	X			
Finish grading, including slopes to drain to drain within building pad area	X			
Surveying, staking (site & building footprint), etc.	X			Prime Contractor must maintain building stakes/corner locations
Finish grade, including slopes to drain (if applicable) within the building pad area, & re-grading after all removed form work.	X			
Excavate modular building foundation pads to +/- .1' for 18" crawl space height.	X			Excavate 5' minimum horizontally beyond building perimeter. Crawl space grade to be set at 2'-5 1/2" minimum from finish grade to finish floor per drawings
Excavate building/foundation footings	X			
Crawl space drainage	X			
DIVISION 32 - ASPHALT CONCRETE PAVING				
Asphalt concrete paving & slurry seal (power wash prior to seal)	X			
Driveways, parking stalls & accessories, wheel stops, speed bumps, etc.	X			
Walkways	X			
Striping	X			
Protection bollards	X			
Gates & fencing - including footings, soil export, etc.	X			
Landscape planting	X			
Landscape irrigation systems	X			
MISCELLANEOUS				
Marquee sign - if applicable	X			
Restroom accessories	X	X		Modular Contractor to provide mirrors, grab bars and ADA TP dispenser accessories only



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ACTIVITY DESCRIPTION	PRIME CONTRACTOR	MODULAR CONTRACTOR	DISTRICT/ OTHERS	COMMENTS
Solid Plastic Restroom Partitions		X		
Classroom accessories (soap/towel dispenser)	X			If applicable
Site SWPPP & monitoring	X		X	
Temporary construction keys & cores		X		
Permanent building master keys & cores	X			
Provide unobstructed truck/crane routes & access to building foundation pads	X			District, school, & contractors to ensure no material, equipment, stockpiles, etc. is in the way.
Establish building corners & surveying	X			All Prime & Modular Contractors to Protect.
Projection screens - if applicable			X	
Modular building mounted exterior hose bibbs		X		
Building mounted exterior power outlets		X		
VCT waxing & sealant	X			Install flooring and sealant per manufacturers instructions
Walk-off floor mats		X		Per AMS drawings
Exterior shade structure	X			
Site security	X		X	Mandatory Site Security During Modular Building Staging On Site.
Dust control	X			
Utility POC coordination	X	X		Per AMS POC Drawings
HVAC condensate lines plumbed to rear of building		X		
Access panels		X		
Water heaters		X		Electric, per AMS drawings
Modular building delivery, craning, rigging, & erecting		X		
Low voltage cable trays	X			If applicable
Kitchen lockers / desk	X		X	Modular contractor to provide blocking only.
Dry storage shelving	X			
Mobile drying racks, mobile work tables, mobile counter, mobile transport cart	X		X	
Roof Hatch w/Ladder		X		
Storage racks / mop racks	X			If applicable
Visual displays	X			
A/V systems	X		X	
Playground equipment	X		X	



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ACTIVITY DESCRIPTION	PRIME CONTRACTOR	MODULAR CONTRACTOR	DISTRICT/ OTHERS	COMMENTS
Trash enclosure, sandbox, storage shed	X		X	
Final cleaning	X		X	