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ADDENDUM

Project Name: **Town of Hillsborough, Utilities Department**
Adron F. Thompson Addition and Renovation
Project No.: 2231.01

ADDENDUM No. 1
Issued January 9, 2026

GENERAL NOTE: The Contract Documents include all Drawings and Specifications, plus all Addenda. The Drawings and the Specifications are complementary and are to be taken together for a complete interpretation of the Work. Contractors shall review a complete set of Contract Documents prior to bidding the work.

Modifications to the original contract documents dated 12/19/2025 for this project shall be made as follows:

The attached documents are either clouded with a revisions date including ADDENDUM No. 1 01.09.2026 or if Specifications are edited, the section or text added is in red to clarify the revision. If full specification sections are added these are not in all red, but the header lists the Addendum number and date that the specification section was issued.

PROJECT MANUAL SPECIFICATIONS:

1. Replace Specification Section **000400 TABLE OF CONTENTS** with the attached of the same number. *The Specification was edited to add the SECTION 133419 - METAL BUILDING SYSTEMS and remove the listed sections under Division 21 as there is no fire suppression scope in the project.*

2. Replace Specification Section **000600 SUPPLEMENTARY GENERAL CONDITIONS** with the attached of the same number. *The Specification was edited to add Liquidated Damages to the contract.*

3. Add the attached 10 page Exhibit A to the **SECTION 000600 SUPPLEMENTARY GENERAL CONDITIONS** into the Project Manual. This document is provided by the Town of Hillsborough and details their insurance requirements for Contractors.

4. Replace Specification Section **012100 - ALLOWANCES** with the attached of the same number. *The Specification was edited to include Allowance 4 for permitting costs, and Allowance 5 for Testing & Inspection Costs.*

5. Replace Specification Section **014000 - QUALITY REQUIREMENTS** with the attached of the same number. *The Specification was edited to clarify the requirements for construction material testing and inspections to be an allowance in the contract that GC selects and arranges testing firms to test and inspect any items requiring inspections or testing in other specification sections.*

6. Replace Specification Section **015000 TEMPORARY FACILITIES AND CONTROLS** with the attached of the same number. *The Specification was edited to remove the requirement for the GC to provide a Field Office which was originally Section 2.2 TEMPORARY FACILITIES, Paragraph B. This is edited to make this optional. Sections B. 1-5 which detailed the minimum requirements for the Field Office are omitted.*

7. Add Specification **SECTION 133419 - METAL BUILDING SYSTEMS**. *The Specification was added to provide guidance on the Vehicle Storage Building requirements.*

8. Replace Specification Section **224000 PLUMBING FIXTURES.** *Specification was edited to align with the Plumbing drawings revisions issued in this Addendum.*

DRAWINGS:

9. Replace plan sheet number **P001 - Plumbing Cover Sheet** with the attached of the same number. *Revised details #2& 4. Edited plumbing fixture schedule. – Revisions are clouded.*

10. Replace plan sheet number **P202 - Sanitary Waste & Vent Plan - Main Level** with the attached of the same number. Added note for dishwasher waste connection. *Revisions are clouded.*

11. Replace plan sheet number **P212 - Domestic Water Plan - Main Level** with the attached of the same number. *Removed supply box for dishwasher and added a note for dishwasher water connection. Revisions are clouded.*

12. Replace plan sheet number **P302 - Plumbing Risers** with the attached of the same number. Revised riser diagram to reflect plan revision. *Revisions are clouded.*

ADDITIONAL INFORMATION:

13. As mentioned in the Pre-Bid Meeting, the Town of Hillsborough requires the General Contractor to complete the attached single page document identified as the **AGREEMENT Contractor Compliance** that acknowledges that work will be done per OSHA standards and that the GC will designate a Safety Representative to perform work on tier property / campus / buildings. This form is not required with the bid, but will be required before starting work on this site.

DESIGN TEAM RESPONSES TO CONTRACTOR QUESTIONS:

14. *Bidder Question: Is a Field Office Required?*
    Response: We removed this requirement and made this optional, and included the amended specification Section 015000 TEMPORARY FACILITIES AND CONTROLS in this Addendum.

15. *Bidder Question: Is a Pollution Liability Policy required for the project by the AHJ or Owner?*
    Response: No.

16. *Bidder Question: Is Material testing by the owner or contractor?*
    Response: We amended the procedure for materials testing and inspections requirements and included the amended specification Section 014000 - QUALITY REQUIREMENTS in this Addendum.

17. *Bidder Question: Is there a bond required for the DOT Driveway permit for this project?*
    Response: The DOT does require a Bond for work in the right of way / encroachment into their right of way. Our information indicates that the bond amount would be $10,000 and that typically the cost of the bond is 1% of the amount of the required bond. General Contractor shall include the amount for this bond in their base bids to add the driveway shown on the Contract Documents. We understand that bond costs are variable related to the contractor's risk so we cannot create an allowance to cover this as it is dependent on your ability to secure the bond.

18. *Bidder Question: Vertical and Horizontal metal panels are called out as VMS and HMS. There is a spec for those panels (074213 Interlocking Metal Wall Panels). These are Zinc wall panels. When I get to pg A310, which is the vehicle storage building, I'm seeing more metal wall panels, but these say 36" wide type. They are called out as MWP. I think the exact same panels are called MWS on pg A311 – can you confirm MWP and MWS are the same panels? In addition to that, are these panels mislabeled zinc panels, or are they some other type of metal panel? I'm not seeing a spec for them, unless they are somehow lumped in with the Roof panels, which I'm not really seeing anything indicating that.*
    Response: The Zinc wall panels (VMS) & (HMS) for the Addition and Renovation of the Adron F Thompson Building are specified in 074213 Interlocking Metal Wall Panels.

    The Vehicle Storage Building (Alternate No 1) is intended to be a Pre-Engineered Metal Building Package for the structural frame and exterior materials with the standard wall and roof panels from the manufacturer. We inadvertently left the Pre-Engineered Metal Building specification out of the Project manual. We have included a Specification Section for the Pre-Engineered Metal Building in this Addendum.

19. *Bidder Question: Hoping you could clarify about the fire suppression system. In the spec book it is showing a fire suppression system, but in the meeting yesterday I thought you said there wasn't going to be a fire suppression system.*
Response: This is an Error in the table of contents. We left these in the TOC but there are no specification sections with the information, nor do the drawings show any scope for adding a fire suppression system. We'll reissue the TOC removing these.

20. *Bidder Question: Looking through the drawings there are (8) 3'-0" x 12'-0" Translucent Panel Skylights. We do not see a specification for them.*
Response: The translucent roof panels will be part of the pre-engineered building package it is not a skylight, it is a standard metal building component. See SECTION 133419 - METAL BUILDING SYSTEMS included with this Addendum for more information on the Translucent Roof Panels.

21. *Bidder Question: Specs are calling for cast iron and copper throughout including underground. Please confirm this is the plumbing materials required?*
Response: We have confirmed that Cast Iron and Copper are the materials preferred by the owner.

22. *Bidder Question: Specs are calling for cast iron and copper throughout including underground. Please confirm this is the plumbing materials required?*
Response: We have confirmed that Cast Iron and Copper are the materials preferred by the owner, please bid materials as specified.

23. *Bidder Question: Plumbing fixture schedule appears to have some discrepancies with items in specifications. Can you clarify the intent?*
Response: Clarifications to the fixture specifications and schedule have been made via drawings revisions in Addendum #1 listed above.

END OF ADDENDUM No. 1

SECTION 000400 - TABLE OF CONTENTS

ITEMS BELOW APPEAR IN VOLUME 1 of 2

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

BID FORMS

DIVISION 01 - GENERAL REQUIREMENTS

DIVISION 02 - EXISTING CONDITIONS

DIVISION 03 - CONCRETE

DIVISION 10 - SPECIALTIES

DIVISION 11 - EQUIPMENT

NOT APPLICABLE

DIVISION 12 - FURNISHINGS

DIVISION 13 - SPECIAL CONSTRUCTION

DIVISION 14 - CONVEYING EQUIPMENT

NOT APPLICABLE

ITEMS BELOW APPEAR IN VOLUME 2 of 2

DIVISION 21 - FIRE SUPPRESSION

NOT APPLICABLE

DIVISION 22 - PLUMBING

DIVISION 23 - HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

DIVISION 25 - INTEGRATED AUTOMATION

NOT APPLICABLE

DIVISION 26 - ELECTRICAL

DIVISION 27 - COMMUNICATIONS

NOT APPLICABLE

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

DIVISION 31 - EARTHWORK

DIVISION 32 - EXTERIOR IMPROVEMENTS

DIVISION 33 - UTILITIES

DIVISION 34 - TRANSPORTATION

NOT APPLICABLE

SECTION 000600 - Supplementary General Conditions.

The Supplementary General Conditions are considered part of the Contract Documents.

The following items reference the articles of the AIA A201 – 2017 General Conditions of the Contract and supplement this document accordingly.

Article 8 TIME shall be amended by adding the section below:

Section 8.4 CONTRACT DURATION

8.4.1 *Duration for the completion of the project from Notice to Proceed to Substantial Completion shall be* ***370 Calendar Days***

Article 15 CLAIMS AND DISPUTES shall be amended by editing sections listed below;

Section 15.2.5 remove reference to Mediation in last sentence. Replace with "All disputes after initial decision maker renders final decision shall be addressed as required in AIA A101 Section 6.2 Binding Dispute Resolution."

15.2.6 remove this entire section as it refers to mediation. Replace with *"All disputes after initial decision maker renders final decision shall be addressed as required in AIA A101 Section 6.2 Binding Dispute Resolution."*

15.2.6.1 remove this entire section as it refers to mediation. Replace with *"All disputes after initial decision maker renders final decision shall be addressed as required in AIA A101 Section 6.2 Binding Dispute Resolution."*

15.3 MEDIATION – Remove entire section.

The following items reference the articles of the AIA A101 – 2017 Standard Form of Agreement Between Owner and Contractor and supplement this document accordingly.

Section 6.2 Binding Dispute Resolution - Omit the phrase *"subject to, but not resolved by, mediation pursuant to Section 15.3 of AIA Document A201-2017,"* and replacing it with the phrase "informal dispute resolution ", and put an "X" in the box to indicate selected / required method of dispute resolution for this contract is; "litigation in a court of competent jurisdiction".

The following items reference the articles of the AIA A101 – 2017 Standard Form of Agreement between the Owner and Contractor and supplement this document accordingly.

Article 4 – CONTRACT SUM

4.5 Liquidated Damages – As part of the Contracting process, the Owner will utilize and the AIA A101-2017 Contract for this project. Section 4.5 of that document will include a total of **$160 per calendar day of Liquidated Damages.** The Owner is leasing office space, parking and storage areas off site to allow the work to be completed on the Adron F. Thompson campus and buildings and therefore every day that the project extends past the contract date the owner incurs actual costs that will be reimbursed by the General Contractor.

B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.

C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or Regulations, and must be issued and signed by a surety named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.

E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.

F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.

G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.

H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.

B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

C. Alternative forms of insurance coverage, including but not limited to self-insurance and "Occupational Accident and Excess Employer's Indemnity Policies," are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.

D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon

request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.

E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.

F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

H. Contractor shall require:

1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and

2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.

I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.

K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.

L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.

M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.

N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 *Contractor's Insurance*

A. *Required Insurance*: Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.

B. *General Provisions*: The policies of insurance required by this Paragraph 6.03 as supplemented must:

1. include at least the specific coverages required;

2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;

3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;

4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and

5. include all necessary endorsements to support the stated requirements.

C. *Additional Insureds*: The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:

1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;

2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;

3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

4. not seek contribution from insurance maintained by the additional insured; and

5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.

B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.

C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.

D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.

E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.

2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.

1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.

C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.

D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants,

and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

6.01 *Insurance—General Provisions*

SC-6.02 Add the following paragraph immediately after Paragraph 6.02.B:

1. Contractor may obtain worker's compensation insurance from an insurance company that has not been rated by A.M. Best, provided that such company (a) is domiciled in the state in which the Project is located, (b) is certified or authorized as a worker's compensation insurance provider by the appropriate state agency, and (c) has been accepted to provide worker's compensation insurance for similar projects by the state within the last 12 months.

6.02 *Contractor's Insurance*

SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

D. *Other Additional Insureds:* As a supplement to the provisions of Paragraph 6.03.C of the General Conditions, the commercial general liability, automobile liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies must include as additional insureds (in addition to Owner and Engineer) the following: **Town of Hillsborough, NC.**

E. *Workers' Compensation and Employer's Liability:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance, including, as applicable, United States Longshoreman and Harbor Workers' Compensation Act, stop-gap employer's liability coverage for monopolistic states, and foreign voluntary workers' compensation (from available sources, notwithstanding the jurisdictional requirement of Paragraph 6.02.B of the General Conditions).

Workers' Compensation and Related Policies	Policy limits of not less than:
Workers' Compensation	
State	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Foreign voluntary workers' compensation (employer's responsibility coverage), if applicable	Statutory

F. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against claims for:

1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees,
2. damages insured by reasonably available personal injury liability coverage, and
3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

G. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage.
   a. Such insurance must be maintained for three years after final payment.

b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.

2. Blanket contractual liability coverage, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.

3. Severability of interests and no insured-versus-insured or cross-liability exclusions.

4. Underground, explosion, and collapse coverage.

5. Personal injury coverage.

6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.

7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

H. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:

1. Any modification of the standard definition of "insured contract" (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).

2. Any exclusion for water intrusion or water damage.

3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.

4. Any exclusion of coverage relating to earth subsidence or movement.

5. Any exclusion for the insured's vicarious liability, strict liability, or statutory liability (other than worker's compensation).

6. Any limitation or exclusion based on the nature of Contractor's work.

7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.

I. *Commercial General Liability—Minimum Policy Limits*

Commercial General Liability	**Policy limits of not less than:**
General Aggregate	$ 2,000,000
Products—Completed Operations Aggregate	$ 1,000,000
Personal and Advertising Injury	$ 1,000,000
Bodily Injury and Property Damage—Each Occurrence	$ 1,000,000

J. *Automobile Liability:* Contractor shall purchase and maintain automobile liability insurance for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	Policy limits of not less than:
Bodily Injury	
Each Person	$ 1,000,000
Each Accident	$ 1,000,000
Property Damage	
Each Accident	$ 1,000,000

K. *Excess or Umbrella Liability:*

1. *General Aggregate* $1,000,000

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.03 *Labor; Working Hours*

SC-7.03 Add the following new subparagraphs immediately after Paragraph 7.03.C:

1. Regular working hours will be 8:00 AM to 5:00 PM.
2. Owner's legal holidays are

New Year's Day

Martin Luther King Jr. Day

Good Friday

Memorial Day

Independence Day

Juneteenth

Labor Day

Veterans Day

Thanksgiving (Thursday and Friday)

Easter (Sunday)

Christmas (two days).

SC-7.03 Add the following new paragraph immediately after Paragraph 7.03.C:

D. Contractor shall be responsible for the cost of any overtime pay or other expense incurred by the Owner for Engineer's services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular

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SECTION 012100 - ALLOWANCES

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 governing allowances.

1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances include the following:

1. Lump-sum allowances.
2. Quantity allowances.
3. Testing and inspecting allowances.

C. Related Requirements:

1. Section 012200 "Unit Prices" for procedures for using unit prices.
2. Section 014000 "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.

1.3 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.

1.4 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.5 INFORMATIONAL SUBMITTALS

A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 COORDINATION

A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.7 LUMP-SUM ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 QUANTITY ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.9 TESTING AND INSPECTING ALLOWANCES

A. Testing and inspecting allowances include the cost of engaging testing agencies, actual tests and inspections, and reporting results.

B. The allowance does not include incidental labor required to assist the testing agency or costs for retesting if previous tests and inspections result in failure. The cost for incidental labor to assist the testing agency shall be included in the Contract Sum.

C. Costs of testing and inspection services not required by the Contract Documents are not included in the allowance.

D. At Project closeout, credit unused amounts remaining in the testing and inspecting allowance to Owner by Change Order.

1.10 ADJUSTMENT OF ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

1. Include installation costs in purchase amount only where indicated as part of the allowance.
2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
3. Submit substantiation of a change in scope of Work, if any, claimed in Change Orders related to unit-cost allowances.
4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. Allowance No. 1: Quantity Allowance: Include 450 cu. yd. of unsatisfactory soil excavation and disposal off-site and replacement with satisfactory soil material from off-site, as specified in Section 312000 "Earth Moving."

1. Coordinate quantity allowance adjustment with unit-price requirements in Section 012200 "Unit Prices."

B. Allowance No. 2: Quantity Allowance: Include 50 cu. yd. of rock removal and replacement with satisfactory soil material, as specified in Section 312000 "Earth Moving."

1. Coordinate quantity allowance adjustment with unit-price requirements in Section 012200 "Unit Prices."

C. Allowance No. 3: Quantity Allowance: Include providing 100 Tons of #57 trench bedding stone as specified in Section 312000 "Earth Moving.

1. Coordinate quantity allowance adjustment with unit-price requirements in Section 012200 "Unit Prices."

D. Allowance No. 4: Monetary Lump Sum Allowance: Include a lump sum of $15,000 (fifteen thousand dollars) to cover the permitting cost through Orange County. Permitting shall be paid by the contactor and receipt and documentation from Orange County shall be retained and submitted to reconcile the amount of permitting and inspections to determine a credit or additional cost amount above and beyond the allowance in a change order.

E. Allowance No. 5: Testing and Inspecting Allowance: Include a $35,000 (thirty-five thousand dollars) allowance for the cost of normal and typical Materials Testing and Inspections required by the contract documents in the separate specification sections. The Contractor will propose and hire the testing firm, arrange for and schedule all tests and inspections, the owner will review and approve or reject the GC's proposed firm.

1. This allowance includes testing and inspection cost, logistics, scheduling, attendance, equipment rental, actual testing, inspection or investigation labor, written report and Contractor overhead and profit.

2. All tests and inspections will be paid from this allowance through the contract. Allowance will be reconciled at end of project with credit due via change order if unused or if additional testing costs are required, the owner will issue a change order to cover the cost of the additional testing that is not the fault of the contractor.

3. Costs of failed tests, or rescheduling tests due to contactor availability or the item tested or inspected is not ready will be the responsibility of the contractor and will not be paid using this allowance.

END OF SECTION 012100

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SECTION 014000 - QUALITY REQUIREMENTS

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 quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
4. Specific test and inspection requirements are not specified in this Section.

C. Related Requirements:

1. Section 012100 "Allowances" for testing and inspection allowances.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

C. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.

D. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

E. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

F. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

G. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

H. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

I. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

J. Source Quality-Control Tests: Tests and inspections that are performed at the source; for example, plant, mill, factory, or shop.

K. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

L. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

1.4 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.

1.5 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.6 ACTION SUBMITTALS

A. Delegated-Design Services Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement 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, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.7 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Qualification Data: For Contractor's quality-control personnel.

C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:

1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.
2. Main wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.

D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Entity responsible for performing tests and inspections.
3. Description of test and inspection.
4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

F. Reports: Prepare and submit certified written reports and documents as specified.

G. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.8 CONTRACTOR'S QUALITY-CONTROL PLAN

A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.

B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.

1. Project quality-control manager may also serve as Project superintendent.

C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:

1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
3. Owner-performed tests and inspections indicated in the Contract Documents.

E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to

bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.

F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.9 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, telephone number, and email address of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspection.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

E. All inspections performed by the contractor whether required by the contract or not from any Manufacturer's or Factory Authorized Representatives must be delivered to the owner and designer within 5 working days of the inspection.

F. Any report that details work that must be corrected or does not meet the requirements of the manufacturer to warranty the work or to provide a product that is serviceable for its intended use shall be forwarded to the owner and designer within 24 hours of the inspection.

1.10 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented according to **ASTM E 329**; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:

   a. Provide test specimens representative of proposed products and construction.
   b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
   c. Provide sizes and configurations of test assemblies to adequately demonstrate capability of products to comply with performance requirements.
   d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
   e. When testing is complete, remove test specimens and test assemblies, do not reuse products on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.11 QUALITY CONTROL

A. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

2. Engage a qualified testing agency to perform quality-control services.

    a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.

3. Notify testing agencies at least **24** hours in advance of time when Work that requires testing or inspection will be performed.
4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

B. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

C. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform duties of Contractor.

D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."

E. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's Construction Schedule. Update as the Work progresses.

1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 ACCEPTABLE TESTING AGENCIES

A. Contractor to propose Testing agency for owner review and approval.

3.2 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.3 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

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 temporary utilities, support facilities, and security and protection facilities.

B. Related Requirements:

1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.

B. Sewer Service: Owner will pay sewer-service use charges for usage by all entities for construction operations.

C. Water Service: Owner will pay water-service use charges for water used by all entities for construction operations. Contractor must provide the proper backflow prevention devisces to satisfy cross connection requirements for the Town of Hillsborough. Use of water service for construction activities will require the Cross Connection Control inspection to be made prior to use of water service.

D. Electric Power Service: Pay temporary electric-power-service use charges for electricity used by all Contractor in project site or temporary facilities used to enable the construction operations.

1.4 INFORMATIONAL SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

B. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

C. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.

1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

1.5 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch- thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top rails.

B. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.

C. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches.

D. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Common-Use Field Office: Contractor *may* provide a common use field office *if they elect to locate one for this project. If provided, the field office shall be* of sufficient size to accommodate needs of on site management personnel that directs the daily operations of the work. *The owner will provide* space to host onsite Project meetings specified in other Division 01 Sections.

C. Storage and Fabrication Sheds or Conex Boxes: Provide sheds or Conex boxes sized, furnished, and equipped to accommodate storage of materials and equipment for construction operations.

1. Store combustible materials apart from building.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. HVAC Equipment: Provide temporary HVAC system to condition the project area as required if the permanent system is not operations in time to install finished work that requires temperature and humidity control.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide additional filtration filter with MERV of a minimum of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 017700 "Closeout Procedures".

C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration to prevent dust and odors generated by the work from escaping into finished portions of the building. Provide single switch for emergency shutoff.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

1. Locate facilities to limit site disturbance as specified in Section 011000 "Summary."

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service for temporary mobile units.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

1. Connect temporary mobile unit to on site containment system and have this system serviced and pumped regularly to avoid nuisance odors as directed by authorities having jurisdiction.

C. Water Service: Install water service to mobile unit adequate for use as temporary offices.

D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.

G. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for renovation operations.

1. Connect temporary service to Owner's existing power source, as directed by Owner.

H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for renovation operations, observations and inspections.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

I. Telephone Service: Provide mobile phones for use by all construction personnel.

1. At Mobile field office, post a list of important telephone numbers to all contractors and suppliers, designers and owner’s representatives. List shall also include;

a. Police and fire departments.
b. Ambulance service.
c. Contractor's home office.
d. Contractor's emergency after-hours telephone number.
e. Architect's office.
f. Engineers' offices.

g. Owner's office.
h. Principal subcontractors' field and home offices.

2. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

J. Electronic Communication Service: Provide a desktop or laptop computer in the primary field office adequate for use to access Project electronic documents and maintain electronic communications. Equip computer with not less than the following:

1. Internet Service: Broadband modem, router and ISP to provide a wireless network that is secure but design team and owner have credentials to join while on site, equipped with hardware firewall, providing upload and download speeds sufficient to access project documentation.
2. Internet Security: Integrated software, providing software firewall, virus, spyware, phishing, and spam protection in a combined application.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
2. Maintain support facilities until Architect schedules Final Completion inspection. Remove before Final Completion. Personnel remaining after Final Completion will be permitted to use permanent facilities in this building or the adjacent campus, under conditions acceptable to Owner.

B. Temporary Use of Existing Roads and Paved Areas: Contractor may use the existing driveways parking lots and access roads to the site without protection required.

C. Traffic Controls: Comply with owner’s requirements to facilitate the ingress and egress of staff at the building.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

D. Parking: Provide a designated temporary parking areas for construction personnel that is out of the way of the owner’s site access. Existing owner's parking spaces for vehicles used in the maintenance of the tow’s utility lines shall not be used for construction parking other than areas indicated on drawings as parking, staging or lay-down space.

E. Project Signs: Provide Project signs at Trailer identifying the project and contractor, designers and owner. Unauthorized signs are not permitted.

1. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.

a. Provide temporary, directional signs for construction personnel and visitors.

2. Maintain signs so they are legible at all times.

F. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."

G. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

H. Contractor Stair use: Contractor may use the interior stairs for access to the project site.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 011000 "Summary."

C. Construction Fence: Before construction operations begin, furnish and install enclosure fence for lay down space in a manner that will prevent people and animals from easily entering site except by entrance gates.

1. Extent of Fence: As required to secure and enclose project site and entire lay-down area or portion determined sufficient to accommodate construction operations. Prior to installing, Contractor shall walk the site with the owner to review and approve proposed location pointing out areas where fencing may not encumber.
2. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to Owner.

D. Security Enclosure and Lockup: Provide lockable entrances to project site to prevent unauthorized entrance, theft, and similar violations of security. Lock entrances at end of each work day. Owner shall be given key to this area to access in the case of an emergency.

E. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.

1. Prohibit smoking in construction areas.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.

3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.5 MOISTURE AND MOLD CONTROL

A. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.

3.6 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Final Completion.

D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Final Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. At Final Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

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SECTION 133419 - METAL BUILDING SYSTEMS

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 items below that are to be erected to create the Vehicle Storage Building as identified on the drawings:

1. Structural-steel framing.
2. Metal roof panels.
3. Metal wall panels.
4. Metal Soffit panels
5. Thermal insulation.
6. Personnel doors and frames.
7. Windows.
8. Translucent panels.
9. Accessories.

B. Related Requirements:

1. Section 042113 – “Brick Masonry” for exterior building materials for the pre-engineered metal building
2. Section 083600 "Sectional Overhead Doors" for sectional vehicular doors in metal building systems.
3. Section 084113 – “Aluminum-Framed Entrances and Storefronts” for windows in Vehicle Storage Building

1.3 DEFINITIONS

A. Terminology Standard: See MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in standards referenced by this Section.

1.4 COORDINATION

A. Coordinate sizes and locations of concrete foundations and casting of anchor-rod inserts into foundation walls and footings. Anchor rod installation, concrete, reinforcement, and formwork requirements are specified in Section 033000 "Cast-in-Place Concrete."

B. Coordinate metal panel assemblies with rain drainage work, flashing, trim, and construction of supports and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at **Project site**.

1. Review methods and procedures related to metal building systems including, but not limited to, the following:

    a. Condition of foundations and other preparatory work performed by other trades.
    b. Structural load limitations.
    c. Construction schedule. Verify availability of materials and erector's personnel, equipment, and facilities needed to make progress and avoid delays.
    d. Required tests, inspections, and certifications.
    e. Unfavorable weather and forecasted weather conditions and impact on construction schedule.

2. Review methods and procedures related to metal roof panel assemblies including, but not limited to, the following:

    a. Compliance with requirements for purlin and rafter conditions, including flatness and attachment to structural members.
    b. Structural limitations of purlins and rafters during and after roofing.
    c. Flashings, special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect metal roof panels.
    d. Temporary protection requirements for metal roof panel assembly during and after installation.
    e. Roof observation and repair after metal roof panel installation.

3. Review methods and procedures related to metal wall panel assemblies including, but not limited to, the following:

    a. Compliance with requirements for support conditions, including alignment between and attachment to structural members.
    b. Structural limitations of girts and columns during and after wall panel installation.

c. Flashings, special siding details, wall penetrations, openings, and condition of other construction that will affect metal wall panels.
d. Temporary protection requirements for metal wall panel assembly during and after installation.
e. Wall observation and repair after metal wall panel installation.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of metal building system component.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:

a. Metal roof panels.
b. Metal wall panels.
c. Thermal insulation and vapor-retarder facings.
d. Personnel doors and frames.
e. Windows.
f. Translucent roof panels.
g. Louvers.

B. Shop Drawings: Indicate components by others. Include full building plan, elevations, sections, details and the following:

1. Anchor-Rod Plans: Submit anchor-rod plans and templates before foundation work begins. Include location, diameter, and minimum required projection of anchor rods required to attach metal building to foundation. Indicate column reactions at each location.
2. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing; include provisions for openings. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.

3. Metal Roof and Wall Panel Layout Drawings: Show layouts of panels including methods of support. Include details of edge conditions, joints, panel profiles, corners, anchorages, clip spacing, trim, flashings, closures, and special details. Distinguish between factory- and field-assembled work; show locations of exposed fasteners.

a. Show roof-mounted items including roof hatches, equipment supports, pipe supports and penetrations, lighting fixtures, and items mounted on roof curbs.
b. Show wall-mounted items including personnel doors, vehicular doors, windows, louvers, and lighting fixtures.
c. Show translucent panels.

4. Accessory Drawings: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches (1:8)

    a. Flashing and trim.
    b. Gutters.
    c. Downspouts.

C. Samples for Initial Selection: For units with factory-applied finishes.

D. Samples for Verification: For the following products:

1. Panels: Nominal 12 inches (300 mm) long by actual panel width. Include fasteners, closures, and other exposed panel accessories.
2. Flashing and Trim: Nominal 12 inches (300 mm) long. Include fasteners and other exposed accessories.
3. Vapor-Retarder Facings: Nominal 6-inch- (150-mm-) square Samples.
4. Windows: Storefront windows specified elsewhere,
5. Accessories: Nominal 12-inch- (300-mm-) long Samples for each type of accessory.

E. Door Schedule: For doors and frames. Use same designations indicated on Drawings. Include details of reinforcement.

1. Door Hardware Schedule: See Door hardware Section
2. Keying Schedule: See Door Hardware Section.

F. Delegated-Design Submittal: For metal building systems.

1. Include analysis data indicating compliance with performance requirements and design data signed and sealed by the qualified professional engineer responsible for their preparation.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For erector and manufacturer.

B. Welding certificates.

C. Letter of Design Certification: Signed and sealed by a qualified professional engineer. Include the following:

1. Name and location of Project.
2. Order number.
3. Name of manufacturer.
4. Name of Contractor.
5. Building dimensions including width, length, height, and roof slope.
6. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.

7. Governing building code and year of edition.
8. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
9. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
10. Building-Use Category: Indicate category of building use and its effect on load importance factors.

D. Erector Certificates: For qualified erector, from manufacturer.

E. Material Test Reports: For each of the following products:

1. Structural steel including chemical and physical properties.
2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
3. Tension-control, high-strength, bolt-nut-washer assemblies.
4. Shop primers.
5. Nonshrink grout.

F. Source quality-control reports.

G. Field quality-control reports.

H. Surveys: Show final elevations and locations of major members. Indicate discrepancies between actual installation and the Contract Documents. Have surveyor who performed surveys certify their accuracy.

I. Sample Warranties: For special warranties.

1.8 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panel finishes to include in maintenance manuals.

1.9 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer.

1. Accreditation: Manufacturer's facility accredited according to the International Accreditation Service's AC472, "Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems."
2. Engineering Responsibility: Preparation of comprehensive engineering analysis and Shop Drawings by a professional engineer who is legally qualified to practice in jurisdiction where Project is located.

B. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.

C. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.3, "Structural Welding Code - Sheet Steel."

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Protect foam-plastic insulation as follows:

1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
2. Protect against ignition at all times. Do not deliver foam-plastic insulation materials to Project site before installation time.
3. Complete installation and concealment of foam-plastic materials as rapidly as possible in each area of construction.

1.11 FIELD CONDITIONS

A. Weather Limitations: Proceed with panel installation only when weather conditions permit metal panels to be installed according to manufacturers' written instructions and warranty requirements.

1.12 WARRANTY

A. Special Warranty on Metal Panel Finishes: Manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

B. Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that leak or otherwise fail to remain weathertight within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to the performance and other requirements listed in this specification and the contract documents, provide the pre-engineered metal building as shown on the drawings as the Vehicle Storage Building from one of the manufacturers listed below;

1. American Metal Buildings
2. Butler Manufacturing, a division of BlueScope Buildings North America, Inc.
3. Ceco Building Systems
4. Cornerstone Building Brands
5. Kirby Building Systems
6. Metallic Building Systems
7. Nucor Building Systems
8. Star Building Systems
9. Varco Pruden Buildings

B. Source Limitations: Obtain metal building system components, including primary and secondary framing and metal panel assemblies, from single source from single manufacturer.

2.2 SYSTEM DESCRIPTION

A. Provide a complete, integrated set of mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior.

B. Primary-Frame Type:

1. Rigid Clear Span: Solid-member, structural-framing system without interior columns.

C. End-Wall Framing: Manufacturer's standard, for buildings not required to be expandable, consisting of load-bearing end-wall and corner columns and rafters.

D. Secondary-Frame Type: Manufacturer's standard purlins and joists and exterior-framed (bypass) girts.

E. Eave Height: As indicated by nominal height on Drawings.

F. Bay Spacing: As indicated on Drawings.

G. Roof Slope: 3 inch per 12 inches (1:4) as shown on drawings.

H. Roof System: Manufacturer's standard lap-seam, tapered-rib metal roof panels.

1. Liner Panels: Tapered rib.

I. Exterior Wall System: Manufacturer's standard exposed-fastener, tapered-rib, metal wall panels.

1. Liner Panels: Tapered rib.

2.3 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design metal building system.

B. Structural Performance: Metal building systems shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to procedures in MBMA's "Metal Building Systems Manual."

1. Design Loads: As indicated on Drawings.
2. Deflection and Drift Limits: Design metal building system assemblies to withstand serviceability design loads without exceeding deflections and drift limits recommended in AISC Steel Design Guide No. 3 "Serviceability Design Considerations for Steel Buildings."
3. Deflection and Drift Limits: No greater than the following:

a. Purlins and Rafters: Vertical deflection of 1/240 of the span.
b. Girts: Horizontal deflection of 1/240 of the span.
c. Metal Roof Panels: Vertical deflection of 1/240 of the span.
d. Metal Wall Panels: Horizontal deflection of 1/240 of the span.

e. Design secondary-framing system to accommodate deflection of primary framing and construction tolerances, and to maintain clearances at openings.
f. Lateral Drift: Maximum of 1/400 of the building height.

C. Seismic Performance: Metal building system shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

E. Fire-Resistance Ratings: Where assemblies are indicated to have a fire-resistance rating, provide metal panel assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 or ASTM E 108 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory," FM Global's "Approval Guide," or from the listings of another qualified testing agency.

F. Structural Performance for Metal Roof and Wall Panels: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:

1. Wind Loads: As indicated on Drawings.

G. Air Infiltration for Metal Roof Panels: Air leakage of not more than 0.06 cfm/sq. ft. (0.3 L/s per sq. m) when tested according to ASTM E 1680 or ASTM E 283 at the following test-pressure difference:

1. Test-Pressure Difference: 1.57 lbf/sq. ft. (75 Pa).

H. Air Infiltration for Metal Wall Panels: Air leakage of not more than 0.06 cfm/sq. ft. (0.3 L/s per sq. m) when tested according to ASTM E 283 at the following test-pressure difference:

1. Test-Pressure Difference: 1.57 lbf/sq. ft. (75 Pa).

I. Water Penetration for Metal Roof Panels: No water penetration when tested according to ASTM E 1646 or ASTM E 331 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft. (300 Pa).

J. Water Penetration for Metal Wall Panels: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft. (300 Pa).

K. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.

1. Uplift Rating: UL 30.

L. Thermal Performance for Opaque Elements: Provide the following maximum U-factors and minimum R-values when tested according to ASTM C 1363 or ASTM C 518:

1. Roof:

a. U-Factor: 0.053
b. R-Value: 19

2. Walls:

a. U-Factor: 0.048
b. R-Value: 21

2.4 STRUCTURAL-STEEL FRAMING

A. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings."

B. Bolted Connections: Comply with RCSC's "Specification for Structural Joints Using High-Strength Bolts."

C. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.

D. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafters, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.

1. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly. Provide frame span and spacing indicated.

a. Slight variations in span and spacing may be acceptable if necessary to comply with manufacturer's standard, as approved by Architect.

2. Rigid Clear-Span Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Interior columns are not permitted.

3. Frame Configuration: Single gable.
4. Exterior Column: Tapered.
5. Rafter: Tapered.

E. End-Wall Framing: Manufacturer's standard primary end-wall framing fabricated for field-bolted assembly to comply with the following:

1. End-Wall and Corner Columns: I-shaped sections fabricated from structural-steel shapes; shop-welded, built-up steel plates; or C-shaped, cold-formed, structural-steel sheet.
2. End-Wall Rafters: C-shaped, cold-formed, structural-steel sheet; or I-shaped sections fabricated from shop-welded, built-up steel plates or structural-steel shapes.

F. Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Unless otherwise indicated, fabricate framing from either cold-formed, structural-steel sheet or roll-formed, metallic-coated steel sheet, prepainted with coil coating, to comply with the following:

1. Purlins: C- or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes; minimum 2-1/2-inch- (64-mm-) wide flanges.

    a. Depth: 8” As indicated on Drawings.

2. Purlins: Steel joists of depths indicated on Drawings.
3. Girts: C- or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes. Form ends of Z-sections with stiffening lips angled 40 to 50 degrees from flange, with minimum 2-1/2-inch- (64-mm-) wide flanges.

    a. Depth: 8” As indicated on drawings, and required to comply with system performance requirements.

4. Eave Struts: Unequal-flange, C-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes; to provide adequate backup for metal panels.
5. Flange Bracing: Minimum 2-by-2-by-1/8-inch (51-by-51-by-3-mm) structural-steel angles or 1-inch- (25-mm-) diameter, cold-formed structural tubing to stiffen primary-frame flanges.
6. Sag Bracing: Minimum 1-by-1-by-1/8-inch (25-by-25-by-3-mm) structural-steel angles.
7. Base or Sill Angles: Manufacturer's standard base angle, minimum 3-by-2-inch (76-by-51-mm), fabricated from zinc-coated (galvanized) steel sheet.
8. Purlin and Girt Clips: Manufacturer's standard clips fabricated from steel sheet. Provide galvanized clips where clips are connected to galvanized framing members.

9. Framing for Openings: Channel shapes; fabricated from cold-formed, structural-steel sheet or structural-steel shapes. Frame head and jamb of door openings and head, jamb, and sill of other openings.
10. Miscellaneous Structural Members: Manufacturer's standard sections fabricated from cold-formed, structural-steel sheet; built-up steel plates; or zinc-coated (galvanized) steel sheet; designed to withstand required loads.

G. Bracing: Provide adjustable wind bracing using any method as follows except where portal frames are shown indicated in drawings to accommodate lateral resistance for facades with large door openings:

1. Rods: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 (345); or ASTM A 529/A 529M, Grade 50 (345); minimum 1/2-inch- (13-mm-) diameter steel; threaded full length or threaded a minimum of 6 inches (152 mm) at each end.
2. Cable: ASTM A 475, minimum 1/4-inch- (6-mm-) diameter, extra-high-strength grade, Class B, zinc-coated, seven-strand steel; with threaded end anchors.
3. Angles: Fabricated from structural-steel shapes to match primary framing, of size required to withstand design loads.
4. Rigid Portal Frames: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
5. Fixed-Base Columns: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
6. Diaphragm Action of Metal Panels: Design metal building to resist wind forces through diaphragm action of metal panels.

H. Anchor Rods: Headed anchor rods as indicated in Anchor Rod Plan for attachment of metal building to foundation.

I. Materials:

1. W-Shapes: ASTM A 992/A 992M; ASTM A 572/A 572M, Grade 50 or 55 (345 or 380); or ASTM A 529/A 529M, Grade 50 or 55 (345 or 380).
2. Channels, Angles, M-Shapes, and S-Shapes: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55 (345 or 380); or ASTM A 529/A 529M, Grade 50 or 55 (345 or 380).
3. Plate and Bar: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55 (345 or 380); or ASTM A 529/A 529M, Grade 50 or 55 (345 or 380).
4. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
5. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B or C, structural tubing.
6. Structural-Steel Sheet: Hot-rolled, ASTM A 1011/A 1011M, Structural Steel (SS), Grades 30 through 55 (205 through 380), or High-Strength Low-Alloy Steel (HSLAS) or High-Strength Low-Alloy Steel with Improved Formability (HSLAS-F), Grades 45 through 70 (310 through 480); or cold-rolled, ASTM A 1008/A 1008M,

Structural Steel (SS), Grades 25 through 80 (170 through 550), or HSLAS, Grades 45 through 70 (310 through 480).

7. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, SS, Grades 33 through 80 (230 through 550), or HSLAS or HSLAS-F, Grades 50 through 80 (340 through 550); with G60 (Z180) coating designation; mill phosphatized.
8. Metallic-Coated Steel Sheet Prepainted with Coil Coating: Steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

    a. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, SS, Grades 33 through 80 (230 through 550), or HSLAS or HSLAS-F, Grades 50 through 80 (340 through 550); with G90 (Z275) coating designation.
    b. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, SS, Grade 50 or 80 (340 or 550); with Class AZ50 (AZM150) coating.

9. Joist Girders: Manufactured according to "Standard Specifications for Joist Girders," in SJI's "Standard Specifications and Load Tables for Steel Joists and Joist Girders"; with steel-angle, top- and bottom-chord members, and end- and top-chord arrangements as indicated on Drawings and required for primary framing.
10. Steel Joists: Manufactured according to "Standard Specifications for Open Web Steel Joists, K-Series," in SJI's "Standard Specifications and Load Tables for Steel Joists and Joist Girders"; with steel-angle, top- and bottom-chord members, and end- and top-chord arrangements as indicated on Drawings and required for secondary framing.
11. Non-High-Strength Bolts, Nuts, and Washers: ASTM A 307, Grade A, carbon-steel, hex-head bolts; ASTM A 563 (ASTM A 563M) carbon-steel hex nuts; and ASTM F 844 plain (flat) steel washers.

    a. Finish: Hot-dip zinc coating, ASTM F 2329, Class C.

12. Structural Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers.

    a. Finish: Plain.

13. High-Strength Bolts, Nuts, and Washers: ASTM A 490 (ASTM A 490M), Type 1, heavy-hex steel structural bolts or tension-control, bolt-nut-washer assemblies with spline ends; ASTM A 563 (ASTM A 563M) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers, plain.
14. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex-head steel structural bolts with spline ends.

    a. Finish: Plain.

15. Anchor Rods: ASTM A 307, Grade A.

a. Configuration: Straight.
b. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
c. Plate Washers: ASTM A 36/A 36M carbon steel.
d. Washers: ASTM F 436 (ASTM F 436M) hardened carbon steel.
e. Finish: Hot-dip zinc coating, ASTM F 2329, Class C.

16. Threaded Rods: ASTM A 307, Grade A.

a. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
b. Washers: ASTM F 436 (ASTM F 436M) hardened.
c. Finish: Plain.

J. Finish: Factory primed. Apply specified primer immediately after cleaning and pretreating.

1. Clean and prepare in accordance with SSPC-SP2.
2. Coat with manufacturer's standard primer. Apply primer to primary and secondary framing to a minimum dry film thickness of 1 mil (0.025 mm).

a. Prime secondary framing formed from uncoated steel sheet to a minimum dry film thickness of 0.5 mil (0.013 mm) on each side.

2.5 METAL ROOF PANELS

A. Exposed Fastener, Tapered-Rib, Metal Roof Panels MRP as indicated on drawings Formed with raised, trapezoidal major ribs and pan between major ribs; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.

1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.030-inch (0.76-mm) nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

a. Exterior Finish: Three-coat fluoropolymer.
b. Color: As selected by Architect from manufacturer's full range.

2. Major-Rib Spacing: 12 inches (305 mm) o.c.
3. Panel Coverage: 36 inches (914 mm).
4. Panel Height: .5 inches (38 mm).

B. Finishes:

1. Exposed Coil-Coated Finish:

a. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.013 mm).

2.6 METAL WALL PANELS

A. Exposed-Fastener, Tapered-Rib, Metal Wall Panels MWP as indicated on Drawings: Formed with raised, trapezoidal major ribs and flat pan between major ribs; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.

1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, [0.018-inch (0.46-mm)] [0.024-inch (0.61-mm)] [0.030-inch (0.76-mm)] nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

    a. Exterior Finish: Three-coat fluoropolymer.
    b. Color: As selected by Architect from manufacturer's full range.

2. Major-Rib Spacing: 12 inches (305 mm) o.c.
3. Panel Coverage: 36 inches (914 mm).
4. Panel Height: 1.5 inches (38 mm).

B. Finishes:

1. Exposed Coil-Coated Finish:

    a. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.013 mm).

2.7 METAL SOFFIT PANELS

A. General: Provide factory-formed metal soffit panels designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners and factory-applied sealant in side laps. Include accessories required for weathertight installation.

B. Metal Soffit Panels: Match profile and material of metal roof panels.

1. Finish: Match finish and color of metal wall panels.

C. Exposed-Fastener, Tapered-Rib-Profile, Metal Soffit Panels <Insert drawing designation>: Formed with raised, trapezoidal major ribs and flat pan between major ribs; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.

1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, [0.018-inch (0.46-mm)] [0.024-inch (0.61-mm)] [0.030-inch (0.76-mm)] nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

   a. Exterior Finish: Three-coat fluoropolymer.
   b. Color: As selected by Architect from manufacturer's full range.

2. Major-Rib Spacing: 12 inches (305 mm) o.c.
3. Panel Coverage: 36 inches (914 mm).
4. Panel Height: 1.5 inches (38 mm).

2.8 THERMAL INSULATION

A. Faced Metal Building Insulation: ASTM C 991, Type II, glass-fiber-blanket insulation; 0.5-lb/cu. ft. (8-kg/cu. m) density; 2-inch- (51-mm-) wide, continuous, vapor-tight edge tabs; with a flame-spread index of 25 or less.

B. Retainer Strips: For securing insulation between supports, 0.025-inch (0.64-mm) nominal-thickness, formed, metallic-coated steel or PVC retainer clips colored to match insulation facing.

C. Vapor-Retarder Facing: ASTM C 1136, with permeance not greater than 0.02 perm (1.15 ng/Pa x s x sq. m) when tested according to ASTM E 96/E 96M, Desiccant Method.

1. Composition: White polypropylene film facing and fiberglass-polyester-blend fabric backing.

D. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

2.9 PERSONNEL DOORS AND FRAMES

A. Swinging Personnel Doors and Frames: Metal building system manufacturer's standard doors and frames; prepared and reinforced at strike and at hinges to receive factory- and field-applied hardware according to BHMA A156 Series.

1. Steel Doors: 1-3/4 inches (44.5 mm) thick; fabricated from metallic-coated steel face sheets, 0.036-inch (0.91-mm) nominal uncoated steel thickness, of seamless, hollow-metal construction; with 0.060-inch (1.52-mm) nominal

uncoated steel thickness, inverted metallic-coated steel channels welded to face sheets at top and bottom of door.

a. Design: Flush As indicated on Drawings.
b. Core: Polystyrene foam with U-factor rating of at least 0.16 Btu/sq. ft. x h x deg F (0.91 W/sq. m x K).
c. Glazing Frames: Aluminum frames specified elsewhere.
d. Glazing: As specified in Section 088000 "Glazing."

2. Steel Frames: Fabricate 2-inch- (51-mm-) wide face frames from zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.060-inch (1.52-mm) nominal uncoated steel thickness.

a. Type: Factory welded.

3. Fabricate concealed stiffeners, reinforcement, edge channels, and moldings from either cold- or hot-rolled steel sheet.
4. Hardware:

a. Provide hardware for each door leaf, as follows:

1) Hinges: BHMA A156.1. Three antifriction-bearing, standard-weight, full-mortise, stainless-steel or bronze, template-type hinges; 4-1/2 by 4-1/2 inches (114 by 114 mm), with nonremovable pin.
2) Lockset: BHMA A156.2. Key-in-lever cylindrical type – coordinate with Door Hardware Schedule as exterior doors are access controlled requiring electrified hardware.
3) Threshold: BHMA A156.21. Extruded aluminum.
4) Silencers: Pneumatic rubber; three silencers on strike jambs of single door frames and two silencers on heads of double door frames.
5) Closer: BHMA A156.4. Surface-applied, standard-duty hydraulic type.
6) Weather Stripping: Vinyl applied to head and jambs, with vinyl sweep at sill.

5. Anchors and Accessories: Manufacturer's standard units, galvanized according to ASTM A 123/A 123M.
6. Fabrication: Fabricate doors and frames to be rigid; neat in appearance; and free from defects, warp, or buckle. Provide continuous welds on exposed joints; grind, dress, and make welds smooth, flush, and invisible.

B. Materials:

1. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B, suitable for exposed applications.
2. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, CS, Type B; free of scale, pitting, or surface defects; pickled and oiled.

3. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, CS, Type B; with G60 (Z180) zinc (galvanized) or A60 (ZF180) zinc-iron-alloy (galvannealed) coating designation.

C. Finishes for Personnel Doors and Frames:

1. Prime Finish: Factory-apply manufacturer's standard primer immediately after cleaning and pretreating.

a. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2. Factory-Applied Paint Finish: Manufacturer's standard, complying with SDI A250.3 for performance and acceptance criteria.

a. Color and Gloss: As selected by Architect from manufacturer's full range

2.10 WINDOWS

A. Aluminum Windows: As specified in Section 084113 "Aluminum-Framed Entrances and Storefronts Windows."

1. Fasteners, Anchors, and Clips: Nonmagnetic stainless steel, aluminum, or other noncorrosive material, compatible with aluminum window members, trim, hardware, anchors, and other components of window units. Fasteners shall not be exposed, except for attaching hardware.

a. Reinforcement: Where fasteners screw-anchor into aluminum less than 0.128 inch (3.26 mm) thick, reinforce interior with aluminum or nonmagnetic stainless steel to receive screw threads, or provide standard, noncorrosive, pressed-in, spline grommet nuts.

2. Sliding-Type Weather Stripping: Woven-pile weather stripping of wool, polypropylene, or nylon pile and resin-impregnated backing fabric; complying with AAMA 701/702.

B. Glazing: Comply with requirements specified in Section 088000 "Glazing."

2.11 TRANSLUCENT PANELS

A. Insulated Translucent Panels TRP as indicated on drawings: Fabricate insulating units of two sheets of glass-fiber-reinforced polyester, translucent plastic separated by an air space; complying with ASTM D 3841, Type CC1 (limited flammability), Grade 1

(weather resistant); smooth finish on both sides. Match profile of adjacent metal panels.

1. Exterior Panel Weight: Not less than 6 oz./sq. ft. (1831 g/sq. m).
2. Interior Panel Weight: Not less than 6 oz./sq. ft. (1831 g/sq. m).
3. Light Transmittance: Not less than 42 percent according to ASTM D 1494.
4. Metal Edge: Fabricate full length of each side of panel with metal edge for seaming into standing-seam roof panel joint.
5. Color: White.

B. Mastic for Translucent Panels: Nonstaining, saturated vinyl polymer as recommended by translucent panel manufacturer for sealing laps.

C. Performance:

1. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

   a. Flame-Spread Index: 25 or less.
   b. Smoke-Developed Index: 450 or less.

2.12 ACCESSORIES

A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.

1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.

B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fasciae, corner units, ridge closures, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.

1. Closures: Provide closures at eaves and ridges, fabricated of same material as metal roof panels.
2. Clips: Manufacturer's standard, formed from steel sheet, designed to withstand negative-load requirements.
3. Cleats: Manufacturer's standard, mechanically seamed cleats formed from steel sheet.
4. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.

5. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or premolded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
6. Thermal Spacer Blocks: Where metal panels attach directly to purlins, provide thermal spacer blocks of thickness required to provide 1-inch (25-mm) standoff; fabricated from extruded polystyrene.

C. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels unless otherwise indicated.

1. Closures: Provide closures at eaves and rakes, fabricated of same material as metal wall panels.
2. Backing Plates: Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
3. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or premolded to match metal wall panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

D. Flashing and Trim: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch (0.46-mm) nominal uncoated steel thickness, prepainted with coil coating; finished to match adjacent metal panels.

1. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers.
2. Opening Trim: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.030-inch (0.76-mm) nominal uncoated steel thickness, prepainted with coil coating. Trim head and jamb of door openings, and head, jamb, and sill of other openings.

E. Gutters: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch (0.46-mm) nominal uncoated steel thickness, prepainted with coil coating; finished to match roof fascia and rake trim. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- (2438-mm-) long sections, sized according to SMACNA's "Architectural Sheet Metal Manual."

1. Gutter Supports: Fabricated from same material and finish as gutters.
2. Strainers: Bronze, copper, or aluminum wire ball type at outlets.

F. Downspouts: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch (0.46-mm) nominal uncoated steel thickness, prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum 10-foot- (3-m-) long sections, complete with formed elbows and offsets.

1. Mounting Straps: Fabricated from same material and finish as gutters.

G. Louvers: Size and design indicated on Mechanical Draiwngs; self-framing and self-flashing. Fabricate welded frames from zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.048-inch (1.21-mm) nominal uncoated steel thickness; finished to match metal wall panels. Form blades from zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.036-inch (0.91-mm) nominal uncoated steel thickness; folded or beaded at edges, set at an angle that excludes driving rains, and secured to frames by riveting or welding. Fabricate louvers with equal blade spacing to produce uniform appearance.

1. Blades: Fixed and Adjustable type, with weather-stripped edges.
.
2. Free Area: As required on Mechanical Drawings.
3. Bird Screening: Galvanized steel, 1/2-inch- (13-mm-) square mesh, 0.041-inch (1.04-mm) wire; with rewirable frames, removable and secured with clips; fabricated of same kind and form of metal and with same finish as louvers.

    a. Mounting: Interior face of louvers.

4. Vertical Mullions: Provide mullions at spacings recommended by manufacturer, or 72 inches (1830 mm) o.c., whichever is less.

H. Materials:

1. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide fasteners with heads matching color of materials being fastened by means of plastic caps or factory-applied coating.

    a. Fasteners for Metal Roof Panels: Self-drilling or self-tapping, zinc-plated, hex-head carbon-steel screws, with a stainless-steel cap or zinc-aluminum-alloy head and EPDM sealing washer.
    b. Fasteners for Metal Wall Panels: Self-drilling or self-tapping, zinc-plated, hex-head carbon-steel screws**,** with EPDM sealing washers bearing on weather side of metal panels.
    c. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws with hex washer head.
    d. Blind Fasteners: High-strength aluminum or stainless-steel rivets.

2. Corrosion-Resistant Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
3. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.
4. Metal Panel Sealants:

a. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene-compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape of manufacturer's standard size.
b. Joint Sealant: ASTM C 920; one part elastomeric polyurethane or polysulfide; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended by metal building system manufacturer.

2.13 FABRICATION

A. General: Design components and field connections required for erection to permit easy assembly.

1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.

B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.

C. Primary Framing: Shop fabricate framing components to indicated size and section, with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.

1. Make shop connections by welding or by using high-strength bolts.
2. Join flanges to webs of built-up members by a continuous, submerged arc-welding process.
3. Brace compression flange of primary framing with steel angles or cold-formed structural tubing between frame web and purlin web or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
4. Weld clips to frames for attaching secondary framing if applicable, or punch for bolts.
5. Shop Priming: Prepare surfaces for shop priming according to SSPC-SP 2. Shop prime primary framing with specified primer after fabrication.

D. Secondary Framing: Shop fabricate framing components to indicated size and section by roll forming or break forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.

1. Make shop connections by welding or by using non-high-strength bolts.
2. Shop Priming: Prepare uncoated surfaces for shop priming according to SSPC-SP 2. Shop prime uncoated secondary framing with specified primer after fabrication.

E. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.

1. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of metal panel.

2.14 SOURCE QUALITY CONTROL

A. Special Inspection: Owner will engage a qualified special inspector to perform source quality control inspections and to submit reports.

1. Accredited Manufacturers: Special inspections will not be required if fabrication is performed by an IAS AC472-accredited manufacturer approved by authorities having jurisdiction to perform such Work without special inspection.

a. After fabrication, submit copy of certificate of compliance to authorities having jurisdiction, certifying that Work was performed according to Contract requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Before erection proceeds, survey elevations and locations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments to receive structural framing, with erector present, for compliance with requirements and metal building system manufacturer's tolerances.

1. Engage land surveyor to perform surveying.

C. Proceed with erection only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.

B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction

loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural framing, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION OF STRUCTURAL FRAMING

A. Erect metal building system according to manufacturer's written instructions and drawings.

B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.

C. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.

D. Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

E. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure will be completed and in service.

F. Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.

1. Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt type and joint type specified.

a. Joint Type: Snug tightened or pretensioned as required by manufacturer.

G. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.

1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
2. Locate and space wall girts to suit openings such as doors and windows.
3. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.

H. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.

1. Tighten rod and cable bracing to avoid sag.
2. Locate interior end-bay bracing only where indicated.

I. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.

J. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

3.4 METAL PANEL INSTALLATION, GENERAL

A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.

C. Examination: Examine primary and secondary framing to verify that structural-panel support members and anchorages have been installed within alignment tolerances required by manufacturer.

1. Examine roughing-in for components and systems penetrating metal panels, to verify actual locations of penetrations relative to seams before metal panel installation.

D. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Field cut metal panels as required for doors, windows, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.

    a. Field cutting of metal panels by torch is not permitted unless approved in writing by manufacturer.

2. Install metal panels perpendicular to structural supports unless otherwise indicated.
3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Locate metal panel splices over structural supports with end laps in alignment.
6. Lap metal flashing over metal panels to allow moisture to run over and off the material.

E. Lap-Seam Metal Panels: Install screw fasteners using power tools with controlled torque adjusted to compress EPDM washers tightly without damage to washers, screw threads, or metal panels. Install screws in predrilled holes.

1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.

F. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.

G. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants indicated; or, if not indicated, provide types recommended by metal panel manufacturer.

1. Seal metal panel end laps with double beads of tape or sealant the full width of panel. Seal side joints where recommended by metal panel manufacturer.
2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.5 METAL ROOF PANEL INSTALLATION

A. General: Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.

1. Install ridge caps as metal roof panel work proceeds.

2. Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws.

B. Lap-Seam Metal Roof Panels: Fasten metal roof panels to supports with exposed fasteners at each lapped joint, at location and spacing recommended by manufacturer.

1. Provide metal-backed sealing washers under heads of exposed fasteners bearing on weather side of metal roof panels.
2. Provide sealant tape at lapped joints of metal roof panels and between panels and protruding equipment, vents, and accessories.
3. Apply a continuous ribbon of sealant tape to weather-side surface of fastenings on end laps and on side laps of nesting-type metal panels, on side laps of ribbed or fluted metal panels, and elsewhere as needed to make metal panels weatherproof to driving rains.
4. At metal panel splices, nest panels with minimum 6-inch (152-mm) end lap, sealed with butyl-rubber sealant and fastened together by interlocking clamping plates.

C. Metal Fascia Panels: Align bottom of metal panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws. Flash and seal metal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.

D. Metal Roof Panel Installation Tolerances: Shim and align metal roof panels within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.6 METAL WALL PANEL INSTALLATION

A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
2. Shim or otherwise plumb substrates receiving metal wall panels.
3. When two rows of metal panels are required, lap panels 4 inches (102 mm) minimum.
4. When building height requires two rows of metal panels at gable ends, align lap of gable panels over metal wall panels at eave height.
5. Rigidly fasten base end of metal wall panels and allow eave end free movement for thermal expansion and contraction. Predrill panels.
6. Flash and seal metal wall panels with weather closures at eaves and rakes, and at perimeter of all openings. Fasten with self-tapping screws.
7. Install screw fasteners in predrilled holes.
8. Install flashing and trim as metal wall panel work proceeds.

9. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated on Drawings; if not indicated, as necessary for waterproofing.
10. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws.
11. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

B. Metal Wall Panels: Install metal wall panels on exterior side of girts. Attach metal wall panels to supports with fasteners as recommended by manufacturer.

C. Installation Tolerances: Shim and align metal wall panels within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m), noncumulative; level, plumb, and on location lines; and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.7 TRANSLUCENT PANEL INSTALLATION

A. Translucent Panels: Attach translucent panels to structural framing with fasteners according to manufacturer's written instructions. Install panels perpendicular to supports unless otherwise indicated. Anchor translucent panels securely in place, with provisions for thermal and structural movement.

1. Provide end laps of not less than 6 inches (152 mm) and side laps of not less than 1-1/2-inch (38-mm) corrugations for metal roof panels.
2. Align horizontal laps with adjacent metal panels.
3. Seal intermediate end laps and side laps of translucent panels with translucent mastic.

3.8 METAL SOFFIT PANEL INSTALLATION

A. Provide metal soffit panels the full width of soffits. Install panels perpendicular to support framing.

B. Flash and seal metal soffit panels with weather closures where panels meet walls and at perimeter of all openings.

3.9 THERMAL INSULATION INSTALLATION

A. General: Install insulation concurrently with metal panel installation, in thickness indicated to cover entire surface, according to manufacturer's written instructions.

1. Set vapor-retarder-faced units with vapor retarder toward warm side of construction unless otherwise indicated. Do not obstruct ventilation spaces except for firestopping.

2. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to the surrounding construction to ensure airtight installation.
3. Install factory-laminated, vapor-retarder-faced blankets straight and true in one-piece lengths, with both sets of facing tabs sealed, to provide a complete vapor retarder.
4. Install blankets straight and true in one-piece lengths. Install vapor retarder over insulation, with both sets of facing tabs sealed, to provide a complete vapor retarder.

B. Blanket Roof Insulation: Comply with the following installation method:

1. Over-Framing Installation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Hold in place by metal roof panels fastened to secondary framing.
2. Between-Purlin Installation: Extend insulation and vapor retarder between purlins. Carry vapor-retarder-facing tabs up and over purlin, overlapping adjoining facing of next insulation course and maintaining continuity of retarder. Hold in place with bands and crossbands below insulation.
3. Over-Purlin-with-Spacer-Block Installation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Install layer of filler insulation over first layer to fill space formed by metal roof panel standoffs. Hold in place by panels fastened to standoffs.

    a. Thermal Spacer Blocks: Where metal roof panels attach directly to purlins, install thermal spacer blocks.

4. Two-Layers-between-Purlin-with-Spacer-Block Installation: Extend insulation and vapor retarder between purlins. Carry vapor-retarder-facing tabs up and over purlin, overlapping adjoining facing of next insulation course and maintaining continuity of retarder. Install layer of filler insulation over first layer to fill space between purlins formed by thermal spacer blocks. Hold in place with bands and crossbands below insulation.

    a. Thermal Spacer Blocks: Where metal roof panels attach directly to purlins, install thermal spacer blocks.

5. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.

C. Blanket Wall Insulation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Hold in place by metal wall panels fastened to secondary framing.

1. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.
2. Sound-Absorption Insulation: Where sound-absorption requirement is indicated for metal liner panels, cover insulation with polyethylene film and provide inserts of wire mesh to form acoustical spacer grid.

D. Board Wall Insulation: Extend board insulation in thickness indicated to cover entire wall. Hold in place by metal wall panels fastened to secondary framing. Comply with manufacturers' written instructions.

1. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.

3.10 DOOR AND FRAME INSTALLATION

A. General: Install doors and frames plumb, rigid, properly aligned, and securely fastened in place according to manufacturers' written instructions. Coordinate installation with wall flashings and other components. Seal perimeter of each door frame with elastomeric sealant used for metal wall panels.

B. Personnel Doors and Frames: Install doors and frames according to NAAMM-HMMA 840. Fit non-fire-rated doors accurately in their respective frames, with the following clearances:

1. Between Doors and Frames at Jambs and Head: 1/8 inch (3 mm).
2. Between Edges of Pairs of Doors: 1/8 inch (3 mm).
3. At Door Sills with Threshold: 3/8 inch (9.5 mm).
4. At Door Sills without Threshold: 3/4 inch (19.1 mm).
5. At fire-rated openings, install frames according to, and doors with clearances specified in, NFPA 80.

C. Field Glazing: Comply with installation requirements in Section 088000 "Glazing."

D. Door Hardware:

1. Install surface-mounted items after finishes have been completed at heights indicated in DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
3. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
4. Set thresholds for exterior doors in full bed of sealant complying with requirements for concealed mastics specified in Section 079200 "Joint Sealants."

3.11 WINDOW INSTALLATION

A. General: Install windows plumb, rigid, properly aligned, without warp or rack of frames or sash, and securely fasten in place according to manufacturer's written instructions. Coordinate installation with wall flashings and other components. Seal perimeter of each window frame with elastomeric sealant used for metal wall panels.

1. Separate dissimilar materials from sources of corrosion or electrolytic action at points of contact with other materials by complying with requirements specified in AAMA/WDMA/CSA 101/I.S.2/A440.

B. Set sill members in bed of sealant or with gaskets, for weathertight construction.

C. Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.

D. Mount screens directly to frames with tapped screw clips.

3.12 ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal roof panel assembly, including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
2. Install components for a complete metal wall panel assembly, including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
3. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, and set units true to line and level. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

C. Gutters: Join sections with riveted-and-soldered or lapped-and-sealed joints. Attach gutters to eave with gutter hangers spaced as required for gutter size, but not more

than 36 inches (914 mm) o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

D. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1524 mm) o.c. in between.

1. Provide elbows at base of downspouts to direct water away from building.
2. Tie downspouts to underground drainage system indicated.

E. Louvers: Locate and place louver units level, plumb, and at indicated alignment with adjacent work.

1. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
2. Provide perimeter reveals and openings of uniform width for sealants and joint fillers.
3. Protect galvanized- and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of corrosion-resistant paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.
4. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Section 079200 "Joint Sealants" for sealants applied during louver installation.

3.13 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform field quality control special inspections and to submit reports.

B. Product will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

3.14 ADJUSTING

A. Doors: After completing installation, test and adjust doors to operate easily, free of warp, twist, or distortion.

B. Door Hardware: Adjust and check each operating item of door hardware and each door to ensure proper operation and function of every unit. Replace units that cannot be adjusted to operate as intended.

C. Windows: Adjust operating sashes and ventilators, screens, hardware, and accessories for a tight fit at contact points and at weather stripping to ensure smooth operation and weathertight closure. Lubricate hardware and moving parts.

D. Adjustable Louvers: After completing installation, including work by other trades, lubricate, test, and adjust units to operate easily, free of warp, twist, or distortion as needed to provide fully functioning units.

1. Adjust louver blades to be weathertight when in closed position.

3.15 CLEANING AND PROTECTION

A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.

B. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

C. Touchup Painting: After erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing, bearing plates, and accessories.

1. Clean and prepare surfaces by SSPC-SP 2, "Hand Tool Cleaning," or by SSPC-SP 3, "Power Tool Cleaning."
2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

D. Touchup Painting: Cleaning and touchup painting are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

E. Metal Panels: Remove temporary protective coverings and strippable films, if any, as metal panels are installed. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

1. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

F. Doors and Frames: Immediately after installation, sand rusted or damaged areas of prime coat until smooth and apply touchup of compatible air-drying primer.

1. Immediately before final inspection, remove protective wrappings from doors and frames.

G. Windows: Clean metal surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances. Clean factory-glazed glass immediately after installing windows.

H. Louvers: Clean exposed surfaces that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate until final cleaning.

1. Restore louvers damaged during installation and construction period so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

a. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 133419

SECTION 224000 - PLUMBING FIXTURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Faucets
2. Flush valves
3. Fixture supports.
4. Water closets.
5. Urinals.
6. Lavatories.
7. Mop basins.
8. Water coolers

1.2 DEFINITIONS

A. Accessible Fixture: Plumbing fixture that can be approached, entered, and used by people with disabilities.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Operation and maintenance data.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.

C. Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible.

D. Water closet and urinal flush valves shall be of the same manufacturer. Mixing of manufacturers will not be allowed.

PART 2 - PRODUCTS

2.1 FAUCETS

A. Lavatory Faucets:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Sloan Company.

b. Zurn Plumbing Products Group.

c. Symmons.

2.2 FLUSH VALVES

A. Flushometers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Sloan Valve Company.
b. Zurn Plumbing Products Group; Commercial Brass Operation.

2.3 TOILET SEATS

A. Toilet Seats:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Bemis Manufacturing Company.
b. Church Seats.
c. Olsonite Corp.

2.4 PROTECTIVE SHIELDING GUARDS

A. Protective Shielding Pipe Covers:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
a. McGuire Manufacturing Co., Inc.
b. Plumberex Specialty Products Inc.
c. TRUEBRO, Inc.

2. Description: Manufactured plastic wraps for covering plumbing fixture hot- and cold-water supplies and trap and drain piping. Comply with Americans with Disabilities Act (ADA) requirements.

2.5 FIXTURE SUPPORTS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Josam Company.
2. Smith, Jay R. Mfg. Co.
3. Watts Drainage Products Inc.; a div. of Watts Industries, Inc.
4. Zurn Plumbing Products Group; Specification Drainage Operation.

B. Water-Closet Supports:

1. Description: Combination carrier designed for accessible or standard mounting height as indicated of wall-mounting, water-closet-type fixture. Include single or double, vertical or horizontal, hub-and-spigot or hubless waste fitting as required for piping arrangement; faceplates; couplings with gaskets; feet; and fixture bolts and hardware matching fixture. Include additional extension coupling, faceplate, and feet for installation in wide pipe space.

C. Urinal Supports:

1. Description: Type I, urinal carrier with fixture support plates and coupling with seal and fixture bolts and hardware matching fixture for wall-mounting, urinal-type fixture. Include steel uprights with feet.
2. Accessible-Fixture Support: Include rectangular steel uprights.

D. Lavatory Supports:

1. Description: Type II, lavatory carrier with concealed arms and tie rod III or lavatory carrier with hanger plate and tie rod for wall-mounting, lavatory-type fixture. Include steel uprights with feet.
2. Accessible-Fixture Support: Include rectangular steel uprights.

E. Sink Supports:

1. Description: Type II, sink carrier with hanger plate, bearing studs, and tie rod or III, sink carrier with hanger plate and exposed arms for sink-type fixture. Include steel uprights with feet.

2.6 WATER CLOSETS

A. Water Closets:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Kohler
    b. American Standard
    c. Zurn

2.7 URINALS

A. Urinals:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Kohler Co
    b. American Standard
    c. Zurn

2.8 LAVATORIES

A. Lavatories:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Kohler.
    b. Zurn.
    c. American Standard.

2.9 FAUCETS

A. Faucets:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Sloan.
    b. Symmons.
    c. Chicago.

2.10 SHOWERS

A. Showers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Symmons.
b. Leonard.
c. Chicago.
d. Powers.

2.11 MOP SERVICE BASIN

A. Mop Service Basin:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Acorn
b. Fiat
c. Stern-Williams

2.12 HOSE BIBBS AND HYDRANTS

A. Hose Bibbs and Hydrants:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Woodford

b. Zurn

c. J.R. Smith

PART 3 - EXECUTION

3.1 INSTALLATION

A. Assemble plumbing fixtures, trim, fittings, and other components according to manufacturers' written instructions.

B. Install off-floor supports, affixed to building substrate, for wall-mounting fixtures.

1. Use carrier supports with waste fitting and seal for back-outlet fixtures.
2. Use carrier supports without waste fitting for fixtures with tubular waste piping.
3. Use chair-type carrier supports with rectangular steel uprights for accessible fixtures.

C. Install floor-mounting fixtures on closet flanges or other attachments to piping or building substrate.

D. Install wall-mounting fixtures with tubular waste piping attached to supports.

E. Install fixtures level and plumb according to roughing-in drawings.

F. Install water-supply piping with stop on each supply to each fixture to be connected to water distribution piping. Attach supplies to supports or substrate within pipe spaces behind fixtures. Install stops in locations where they can be easily reached for operation.

G. Install flushometer valves for accessible water closets and urinals with handle mounted on wide side of compartment. Install other actuators in locations that are easy for people with disabilities to reach.

H. Install tanks for accessible, tank-type water closets with lever handle mounted on wide side of compartment.

I. Install faucet flow-control fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.

J. Install escutcheons at piping wall and ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding fittings.

K. Seal joints between fixtures and walls, floors, and countertops using sanitary-type, one-part, mildew-resistant silicone sealant. Match sealant color to fixture color.

3.2 CONNECTIONS

A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Connect fixtures with water supplies, stops, and risers, and with traps, soil, waste, and vent piping. Use size fittings required to match fixtures.

3.3 FIELD QUALITY CONTROL

A. Verify that installed plumbing fixtures are categories and types specified for locations where installed.

B. Check that plumbing fixtures are complete with trim, faucets, fittings, and other specified components.

C. Inspect installed plumbing fixtures for damage. Replace damaged fixtures and components.

D. Test installed fixtures after water systems are pressurized for proper operation. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.

E. Install fresh batteries in sensor-operated mechanisms.

3.4 PROTECTION

A. Provide protective covering for installed fixtures and fittings.

B. Do not allow use of plumbing fixtures for temporary facilities unless approved in writing by Owner.

3.5 PLUMBING FIXTURE SCHEDULE

A. Provide protective covering for installed fixtures and fittings.

B. Do not allow use of plumbing fixtures for temporary facilities unless approved in writing by Owner.

C. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified below and in other Part 2 articles.

3.6 WATER CLOSET (P-1)

A. Bowl:

1. Manufacturers:
   a. Kohler Model No. K-43325-0 Kingston.
   b. American Standard Model No. 2257101.020 Afwall Millennium.
   c. Zurn Model No. Z5615-BWL.

2. ANSI/ASME A112.19.2; wall mounted, siphon jet, vitreous china, elongated rim, bolt caps, 1 1/2 inch spud, white, 1.6 gallon flush. Rim 15” inches above floor.

B. Flush Valve:

1. Manufacturers:
   a. Sloan Royal Model No. 111-1.6 ESS TMO. (Basis of Design)
   b. Zurn Model No. ZEMS-6000AV-WS1-YJ-YO-MOB.
   c. Pre-Approved equal.

2. ASME A112.18.1; exposed chrome-plated flush valve, metal oscillation non-hold open handle, I.P.S. screw driver operated combination angle check and stop valve with protective cap, 11 ½” adjustable tailpiece, transformer, vacuum breaker flush connection and spud coupling for top spud, wall and spud flanges.

C. Seat:

1. Manufacturers:
   a. Church Model No.2155SSCT.
   b. Bemis Model No 3155SSCT.
   c. Kohler Model No. K-4670-SA-0 Lustra.

2. Solid white plastic, open front, extended back, self-sustaining hinge with stainless steel posts and pintles, antimicrobial, brass bolts, without cover.

D. Wall Mounted Carrier:

1. Manufacturers:
   a. Zurn Model No. Z-1203 & Z-1204.
   b. J.R. Smith Model No. 0210 & 0230.
   c. Wade Model No. 310 & 330.

3.7 WATER CLOSET (P-2) (ADA)

A. Bowl:

1. Manufacturers:
   a. Kohler Model No. K-4325-0 Kingston.
   b. American Standard Model No. 2257101.020 Afwall Millennium.
   c. Zurn Model No. Z5615-BWL.

2. ANSI/ASME A112.19.2; wall mounted, siphon jet, vitreous china, elongated rim, bolt caps, 1 1/2 inch spud, white, 1.6 gallon flush. Rim 17" above finished floor.

B. Flush Valve:

1. Manufacturers:
   a. Sloan Royal Model No. 111-1.6 ESS TMO. (Basis of Design)
   b. Zurn Model No. ZEMS-6000AV-WS1-YJ-YO-MOB.
   c. Pre-Approved equal.

2. ASME A112.18.1; exposed chrome-plated flush valve, hard-wired, sensor operated, mechanical override button, I.P.S. screw driver operated combination angle check and stop valve with protective cap, adjustable 11 1/2" tailpiece, transformer, vacuum breaker flush connection and spud coupling for top spud, wall and spud flanges.

3. Note: Where required to avoid interference with handrails, the plumbing contractor shall modify the tailpiece by shortening length. Contractor shall verify with the manufacturer of the flush valve the maximum length the tailpiece can be shortened.

C. Seat:

1. Manufacturers:
   a. Church Model No.2155SSCT.
   b. Bemis Model No 3155SSCT.
   c. Kohler Model No. K-4670-SA-0 Lustra.

2. Solid white plastic, open front, extended back, self-sustaining hinge with stainless steel posts and pintles, antimicrobial, brass bolts, without cover.

D. Wall Mounted Carrier:

1. Manufacturers:
   a. Zurn Model No. Z-1203 & Z-1204.
   b. J.R. Smith Model No. 0210 & 0230.
   Wade Model No. 310 & 330.

3.8 URINAL (P-3)(ADA)

A. Urinal:

1. Manufacturers:
   a. Kohler Model No. K-4991-ET Bardon.
   b. American Standard Model No. 6590001.020 Washbrook.
   c. Zurn Model No. Z5755-U.
2. ASME A112.19.2: vitreous china, wall hung siphon jet urinal with shields, integral trap, top spud, wall hanger, stainless steel strainer, 0.5 gal/flush. White. Mount 17 inches to lip.

B. Flush Valve:

1. Manufacturers:
   a. Sloan Model No. Royal Model 186 ESS-0.5-TMO-HW. (Basis of Design)
   b. Zurn Model No. ZEMS6003PL-EWS-YP-YJ.
   c. Pre-Approved equal.
2. ASME A112.18.1: exposed chrome plated, flush valve, hard-wired, sensor operated, transformer, I.P.S. screwdriver operated combination angle check and stop valve with protective cap, adjustable tailpiece, vacuum breaker flush connection, manual override and spud coupling for top spud flanges.
3. Carriers:
   a. Zurn Model No. Z1221.
   b. J.R. Smith Model No. 0614.
   c. Josam Model No. 17550.

3.9 URINAL (P-3A)

A. Urinal:

1. Manufacturers:
   a. Kohler Model No. K-4991-ET Bardon.
   b. American Standard Model No. 6590001.020 Washbrook.
   c. Zurn Model No. Z5755-U.
2. ASME A112.19.2: vitreous china, wall hung siphon jet urinal with shields, integral trap, top spud, wall hanger, stainless steel strainer, 0.5 gal/flush. White. Mount 24 inches to lip.

B. Flush Valve:

1. Manufacturers:
   a. Sloan Model No. Regal Model 186 ESS-0.5-TMO-HW. (Basis of Design)
   b. Zurn Model No. Z6003PL-EWS-YP-YJ.
   c. Pre-Approved equal.
2. ASME A112.18.1: exposed chrome plated, flush valve, hard-wired, sensor operated, transformer, I.P.S. screwdriver operated combination angle check and stop valve with protective cap, adjustable tailpiece, vacuum breaker flush connection, manual override and spud coupling for top spud flanges.
3. Carriers:
   a. Zurn Model No. Z1221.
   b. J.R. Smith Model No. 0614.
   c. Josam Model No. 17550.

3.10 LAVATORY (P-4)

A. Basin:

1. Manufacturers:
   a. Kohler Model No. K-20000-0 Caxton.
   b. American Standard Model No. 0483.000 Estate.
   c. TOTO Model No. LT542G.

2. ANSI/ASME A112.19.1; undermount, rectangular basin, vitreous china, 18" x 13", front overflow, 5-5/16” depth, white. Mount in casework provided by the Architect.

B. Trim:

1. Faucet: ASME A112.18.1; unit shall be plug-in sensor operated faucet, temperature mixing handle, polished chrome plated finish, solid brass finish, vandal resistant, ½ inch IPS, ADA compliant, and 1.5 GPM aerator. Provide necessary accessories (transformers, power supply) for connecting multiple faucets together (daisy chain).
   a. Sloan Model No. EAF-300-PLG-ISM-CP-1.5GPM-AER-IR-IQ-FCT-LT.
   b. Symmons Model No. S6360E-M_USDP4.
   c. Chicago Faucets Model No. H-T11H-45ABCPT with Model No. 240.630.00.1 plug-in transformer.

2. Cast brass grid drain (17 gauge) with 6” x 1¼” tailpiece
   a. McGuire Model No. 155A.
   b. Brasscraft Model No. 0701.
   c. T&S Model No. B-0899.
   d. Zurn Model No. Z-8743.

3. Trap: Cast brass 17 gauge swivel joint 1¼” x 1½” trap with clean out plug and nipple and escutcheon, cast brass slip nuts, polished chrome-plated finish.
   a. McGuire Model No. 8902.
   b. Kohler Model No. K8999.
   c. Brasscraft Model No. 0120.
   d. Zurn Model No. Z-8701-9-B.

4. Supplies: 1/2” I.P.S. brass chrome plated angle supply with chrome plated copper riser, quarter turn ball valve stop and escutcheons.
   a. McGuire Model No. LFBV2165.
   b. Brasscraft Model No. KTCS400A.
   c. Pre-Approved equal.

5. White pre-molded antimicrobial vinyl insulation kit on tailpiece, p-trap and supplies:
   a. Truebro Model No. 102K.
   b. McGuire Prowrap Model No. PW2000.
   c. Plumberex Model No. X4333.

3.11 LAVATORY (P-5)

A. Basin:

1. Manufacturers:

a. Kohler Model No. K-2005 Kingston.
b. American Standard Model No. 0355.034 Lucerne.
c. Zurn Model No. Z5360.

2. ANSI/ASME A112.19.1; wall mount, vitreous china, 21-1/4" x 18-1/8", front overflow, 5” depth, white, and 4” centers. Install on concealed arm wall carrier.

B. Trim:

1. Faucet: ASME A112.18.1; unit shall be single handle operated faucet, temperature mixing handle, polished chrome plated finish, solid brass finish, vandal resistant, ½ inch IPS, ADA compliant, and 0.5 GPM aerator.
   a. T&S Brass Model No. B-2711-VF05.
   b. Zurn Model No. Z82200-XL.
   c. Chicago Faucets Model No. 420-E2805ABCP.

2. Cast brass grid drain (17 gauge) with 6” x 1¼” tailpiece
   a. McGuire Model No. 155A.
   b. Brasscraft Model No. 0701.
   c. T&S Model No. B-0899.
   d. Zurn Model No. Z-8743.

3. Trap: Cast brass 17 gauge swivel joint 1¼” x 1½” trap with clean out plug and nipple and escutcheon, cast brass slip nuts, polished chrome-plated finish.
   a. McGuire Model No. 8902.
   b. Kohler Model No. K8999.
   c. Brasscraft Model No. 0120.
   d. Zurn Model No. Z-8701-9-B.

4. Supplies: 1/2” I.P.S. brass chrome plated angle supply with chrome plated copper riser, quarter turn ball valve stop and escutcheons.
   a. McGuire Model No. LFBV2165.
   b. Brasscraft Model No. KTCS400A.
   c. Pre-Approved equal.

5. White pre-molded antimicrobial vinyl insulation kit on tailpiece, p-trap and supplies:
   a. Truebro Model No. 102K.
   b. McGuire Prowrap Model No. PW2000.
   c. Plumberex Model No. X4333.

6. Wall Carrier; Concealed Arm:
   a. Zurn Model No. Z1231.
   b. Smith Mfg. Model No. 0700.
   c. MIFAB Model No. MC-41.

3.12 LAVATORY (P-6)

A. Basin:

1. Manufacturers:
   a. Kohler Model No. K-2196-4 Pennington.

b. American Standard Model No. 0476.028 Aqualyn.
c. Zurn Model No. Z5114.

2. ANSI/ASME A112.19.1; undermount, vitreous china, 19" x 15", front overflow, 5" depth, white. Mount in casework provided by the Architect.

B. Trim:

1. Faucet: ASME A112.18.1; unit shall be single handle operated faucet, temperature mixing handle, polished chrome plated finish, solid brass finish, vandal resistant, ½ inch IPS, ADA compliant, and 0.5 GPM aerator.
   a. T&S Brass Model No. B-2711-VF05.
   b. Zurn Model No. Z82200-XL.
   c. Chicago Faucets Model No. 420-E2805ABCP.

2. Cast brass grid drain (17 gauge) with 6" x 1¼" tailpiece
   a. McGuire Model No. 155A.
   b. Brasscraft Model No. 0701.
   c. T&S Model No. B-0899.
   d. Zurn Model No. Z-8743.

3. Trap: Cast brass 17 gauge swivel joint 1¼" x 1½" trap with clean out plug and nipple and escutcheon, cast brass slip nuts, polished chrome-plated finish.
   a. McGuire Model No. 8902.
   b. Kohler Model No. K8999.
   c. Brasscraft Model No. 0120.
   d. Zurn Model No. Z-8701-9-B.

4. Supplies: 1/2" I.P.S. brass chrome plated angle supply with chrome plated copper riser, quarter turn ball valve stop and escutcheons.
   a. McGuire Model No. LFBV2165.
   b. Brasscraft Model No. KTCS400A.
   c. Pre-Approved equal.

5. White pre-molded antimicrobial vinyl insulation kit on tailpiece, p-trap and supplies:
   a. Truebro Model No. 102K.
   b. McGuire Prowrap Model No. PW2000.
   c. Plumberex Model No. X4333.

3.13 TWO COMPARTMENT SINK (P-7)

A. Basin:

1. Manufacturers:
   a. Elkay Model No. ELUH3116DBG.
   b. Just Manufacturing Model No. UD1832A-J.
   c. Acorn Model No. DU-3118.

2. ANSI/ASME A112.19.3; undermount, 18 gauge, stainless steel, 31" x 18" x 7-1/2". Mount in casework provided by the Architect.

B. Trim:

1. Faucet: ASME A112.18.1; unit shall be single handle operated faucet, temperature mixing handle, polished chrome plated finish, solid brass finish, vandal resistant, ½ inch IPS, ADA compliant, and 0.5 GPM aerator.
   a. Delta Model No. 101LF-HDF.
   b. Zurn Model No. Z82300-XL-CST.
   c. Chicago Faucets Model No. 2300-ABCP with copper tube supplies.

2. Strainer: Chrome plated stamped brass drain outlet fitting for 3-1/2” opening with 3” perforated grid strainer and 1-1/2” tailpiece, one for each compartment.
   a. Elkay Model No. LK99.
   b. Just Model No. J-35.
   c. Acorn Model No. BST-3.

3. Trap: Cast brass 17 gauge swivel joint 1 1/2” x 1 1/2” trap with clean out plug and nipple and escutcheon, cast brass slip nuts, polished chrome-plated finish.
   a. McGuire Model No. 8912.
   b. Dearnborn Brass Model No. 710BN-1.
   c. Zurn Model No. ZR371-PC-B.

4. Supplies: 1/2” I.P.S. brass chrome plated angle supply with chrome plated copper riser, quarter turn ball valve stop and escutcheons.
   a. McGuire Model No. LFBV2165.
   b. Brasscraft Model No. KTCS400A.
   c. Pre-Approved equal.

5. White pre-molded antimicrobial vinyl insulation kit on tailpiece, p-trap and supplies:
   a. Truebro Model No. 102K.
   b. McGuire Prowrap Model No. PW2000.
   c. Plumberex Model No. X4333.

3.14 MOP BASIN (P-8)

A. Receptor shall be corner type 24" x 24" x 12” type, with 6” drop front Terrazzo base, brass drain, removable stainless steel strainer, stainless steel threshold. Color selection by Architect from standard colors.

   1. Fiat Model No. TSBC1610.

   2. Acorn Model No. TNC-24.

   3. Florestone Model No. 96.

B. Trim:

   1. (Mop Receptor) ASME A112.18.1 exposed wall type supply with cross handles, spout wall brace, vacuum breaker, hose and spout, strainers, eccentric adjustable inlets, integral screwdriver stops with covering caps and adjustable threaded wall flanges; 3 feet of 1/2 inch diameter plain and reinforced rubber hose, hose clamp, (2) 24 inch stainless steel wall guards and mop hanger. Mop hanger shall be mounted above basin, opposite faucet.

C. Faucet

1. Fiat Model No. 830AA.
2. T&S Brass Model No. B-0665-CR-BSTR.
3. Zurn Model No. Z-842M2.

3.15 ANTI-FREEZE HYDRANTS (P-9)

A. Manufacturers:

1. Woodford, Model No. 67.
2. Zurn, Model No. Z-1321.
3. Smith, Model No. 5615.

B. Wall Hydrant: ANSI/ASSE 1019; non-freeze, self-draining type, hose thread spout, lock-shield, and removable key and vacuum breaker.

3.16 SHOWER (P-10)

A. Trim: Concealed pressure-balancing shower valve with stops, single lever (brass) handle shower arm and shower head. Finish to be polished chrome.

1. Symmons Temptrol Model No. 1-100-X-X-CHKS.
2. Leonard Aquatrol Model No. 4501-H15.
3. Chicago Model No. 1907-622LCP.

B. Drain: ANSI A112.21.2, 2” drain, brass body construction, stainless steel strainer, rubber gasket.

1. Elkay Model No. K-22675.
2. Jones Stephens Model No. D40140.
3. Zurn Model No. FD2275-BR2.

C. Shower compartment shall be ceramic tile by General Contractor.

3.17 SHOWER ADA (P-11)

A. Pressure-balancing shower valve, hand spray with 5 feet chrome-plated hose with in-line vacuum breaker, 30” chrome bar with adjustable slide, diverter valve, and fixed shower head with adjustable spray. Symmons, 1-117VT-FS-XB24. Delta, 11T5-0-3.

1. Symmons Temptrol Model No. 96-500-B30-V-X-1.5.
2. Leonard Aquatrol Model No. 4505-515P(G)-30.
3. Powers.

B. Drain: ANSI A112.21.2, 2" drain, brass body construction, stainless steel strainer, rubber gasket.

1. Elkay Model No. K-22675.

2. Jones Stephens Model No. D40140.

3. Zurn Model No. FD2275-BR2.

C. Shower compartment shall be ceramic tile by General Contractor.

3.18 HOSE BIBBS (P-12)

A. Manufacturers:

1. Woodford., Model No. 26 with MB26 box.

2. J.R. Smith Model No. 5572.

3. Prier Model No. C-155 with C-155BX.

B. B. Interior: Bronze or brass with integral mounting flange, replaceable hexagonal disc, hose thread spout, chrome plated where exposed, with removable loose key handle and integral vacuum breaker in conformance with ANSI/ASST 1011, lockable recessed box.

3.19 HOSE BIBBS (P-13)

A. Manufacturers:

1. Woodford., Model No. 26.

2. J.R. Smith Model No. 5573.

3. Prier Model No. C-155..

B. B. Interior: Bronze or brass with integral mounting flange, replaceable hexagonal disc, hose thread spout, chrome plated where exposed, with removable loose key handle and integral vacuum breaker in conformance with ANSI/ASST 1011, mechanical rooms.

3.20 WASHING MACHINE BOX (P-14)

A. Recessed outlet box, 20 gauge box and faceplate, white powdered coated box, center drain, quarter turn valves with arrestors.

1. Guy Gray Model No. T200TPPVCHA.

2. Oatey Model No. 38995.

3. Preapproved equal.

3.21 ICE MAKER BOX (P-15)

B. Recessed outlet box, 20 gauge metal white powdered coated box, quarter turn valve with arrestor.

1. Guy Gray Model No. MIB1HAAB.

2. Oatey Model No. 39140 with 38686 metal faceplate.

3. Preapproved equal.

3.22 ELECTRIC WATER COOLER (P-17)

A. Fountain:

1. Manufacturers:
   a. Elkay Model No. EZSTL8WSSK.
   b. Halsey-Taylor Model No. HTHB-HAC8BLSS-NF.
   c. Oasis Model No. PG8EBFSL.

2. ANSI/ARI 1010; handicapped/accessible bi-level electric water cooler with stainless steel finish, steel body, bottle filling station, elevated anti-squirt flexi-guard bubbler with stream guard, automatic stream regulator, mounting bracket, refrigerated with integral air cooled condenser. Unit shall deliver 8.0 GPH of 50 degrees F. water at 90 degrees F. ambient and 80 degrees F. inlet water. Unit shall be equipped with self-closing front and side push bars. Color shall be stainless steel. Mount 34 inches above finished floor. Provide trap, cast brass swivel joint 1-1/4" x 1-1/4" trap with cleanout plug and nipple and escutcheon, McGuire 8872, Brasscraft 0210, Kohler K8998. Supplies, 3/8" I.P.S. brass chrome plated angle supply with chrome plated copper riser, ball valve stop and escutcheon – McGuire LFBV07, Brasscraft KTR19X C.

3.23 EXISTING TWO COMPARTMENT SINK (P-18)

A. Basin: Existing two compartment sink to be relocated.

B. Trim:

1. Faucet: ASME A112.18.1; unit shall be single handle operated faucet, temperature mixing handle, polished chrome plated finish, solid brass finish, vandal resistant, ½ inch IPS, ADA compliant, and 0.5 GPM aerator.
   a. Delta Model No. 101LF-HDF.
   b. Zurn Model No. Z82300-XL-CST.
   c. Chicago Faucets Model No. 2300-ABCP with copper tube supplies.

2. Strainer: Chrome plated stamped brass drain outlet fitting for 3-1/2" opening with 3" perforated grid strainer and 1-1/2" tailpiece, one for each compartment.
   a. Elkay Model No. LK99.
   b. Just Model No. J-35.
   c. Acorn Model No. BST-3.

3. Trap: Cast brass 17 gauge swivel joint 1 1/2" x 1 1/2" trap with clean out plug and nipple and escutcheon, cast brass slip nuts, polished chrome-plated finish.
   a. McGuire Model No. 8912.
   b. Dearnborn Brass Model No. 710BN-1.
   c. Zurn Model No. ZR371-PC-B.

4. Supplies: 1/2" I.P.S. brass chrome plated angle supply with chrome plated copper riser, quarter turn ball valve stop and escutcheons.
   a. McGuire Model No. LFBV2165.
   b. Brasscraft Model No. KTCS400A.
   c. Pre-Approved equal.

5. White pre-molded antimicrobial vinyl insulation kit on tailpiece, p-trap and supplies:
   a. Truebro Model No. 102K.
   b. McGuire Prowrap Model No. PW2000.
   c. Plumberex Model No. X4333.

END OF SECTION 224000

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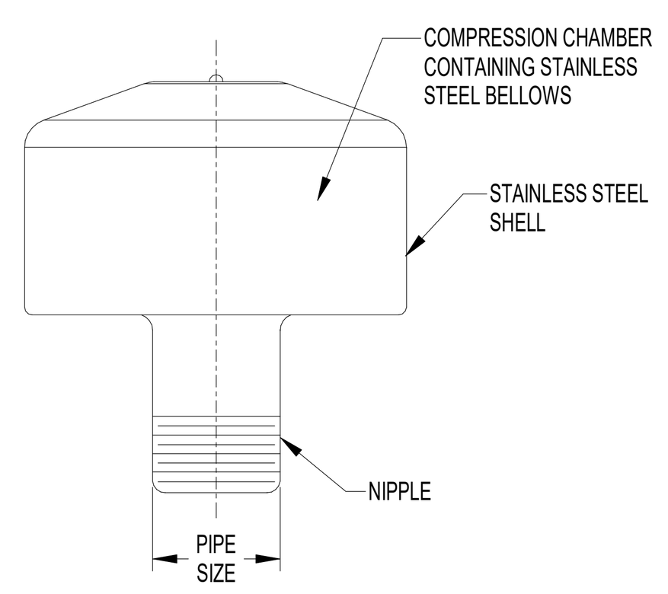
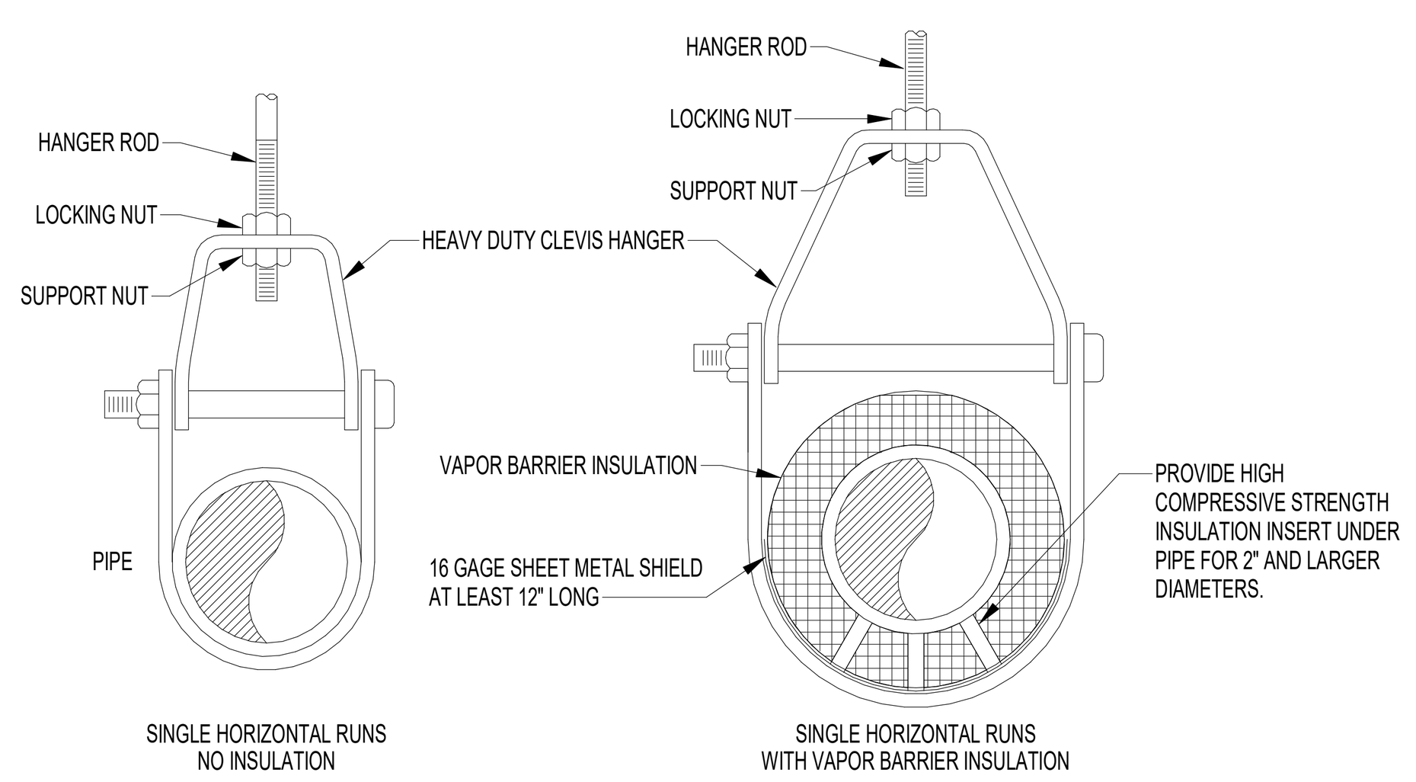


SHOCK ARRESTOR SCHEDULE

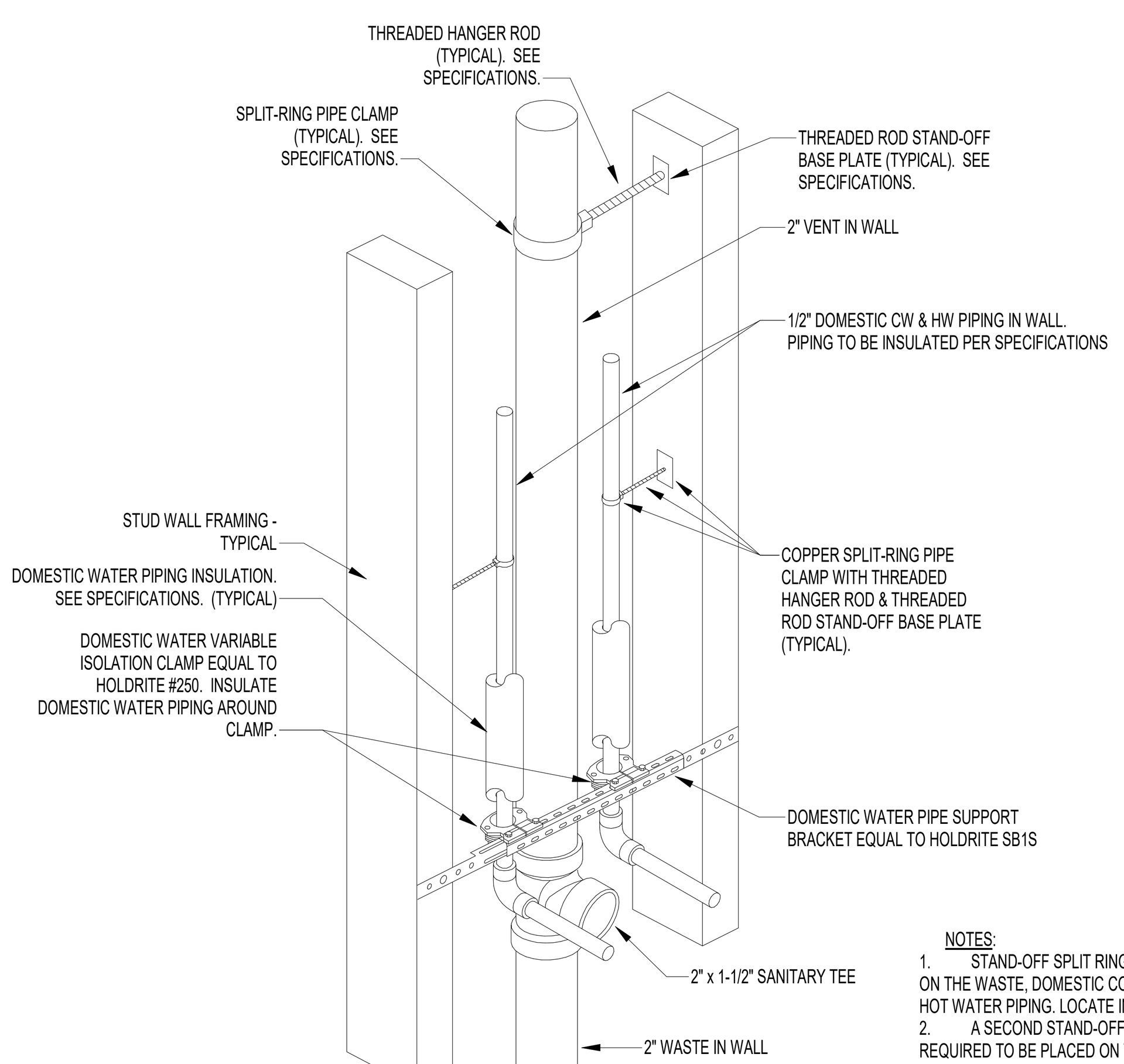
MANUFACTURER	P.D.I. SYMBOL	FIXTURE UNITS	PIPE SIZE	ARRESTOR LENGTH
JAY R. SMITH MFG. SERIES 5000 "HYDROTROL"	A	1-11	3/4"	3-1/4"
JAY R. SMITH MFG. SERIES 5000 "HYDROTROL"	B	12-32	1"	4-1/16"
JAY R. SMITH MFG. SERIES 5000 "HYDROTROL"	C	33-60	1"	4-3/8"
JAY R. SMITH MFG. SERIES 5000 "HYDROTROL"	D	61-113	1"	5-1/4"
JAY R. SMITH MFG. SERIES 5000 "HYDROTROL"	E	114-154	1"	7-1/32"
JAY R. SMITH MFG. SERIES 5000 "HYDROTROL"	F	155-330	1"	7-1/32"

NOTE:
1. ALWAYS INSTALL IN VERTICAL POSITION.
2. MANUFACTURER EQUALS: ZURN Z1700, PPP SBHA-500A - SBHA-2000F.
3. ARRESTOR SHALL BE ALL STAINLESS STEEL CONSTRUCTION WITH STAINLESS STEEL BELLOWS.

1 Shock Arrestor Schedule
P001 SCALE: NONE

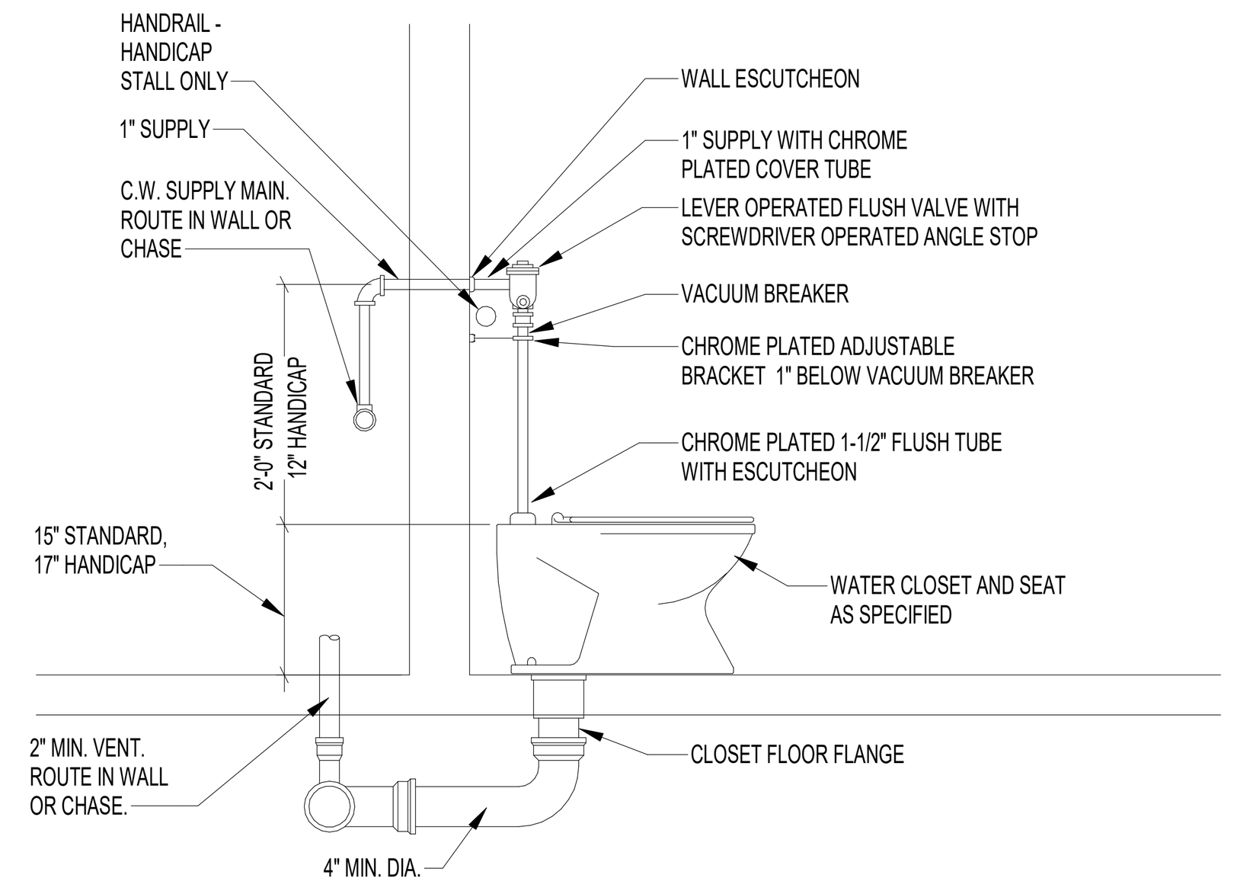


2 Clevis Hanger Detail
P001 SCALE: NONE



NOTES:
1. STAND-OFF SPLIT RING CLAMPS SHALL BE LOCATED ON THE WASTE, DOMESTIC COLD WATER, AND DOMESTIC HOT WATER PIPING. LOCATE IN WALL AT PIPE MIDPOINT.
2. A SECOND STAND-OFF SPLIT RING CLAMP IS REQUIRED TO BE PLACED ON THE WASTE PIPING 18" AFF MAX. LOCATE THE CLAMP ON THE CAST IRON PIPE PRIOR TO TRANSITIONING TO PVC BELOW SLAB.
3. PROVIDE POLYETHYLENE TUBE ISOLATORS WHEN PASSING THROUGH STUD WALLS. ISOLATOR TO EQUAL HOLDRITE MODEL #104
4. METAL STRAPPING IS NOT MERMITTING TO BE USED FOR PIPE SUPPORT.
5. CONTACT ENGINEERS OFFICE FOR REVIEW OF PIPE ROUGH-INS WITH WATER TEST ON.
6. CONTACT ENGINEERS OFFICE FOR REVIEW OF COMPLETED INSULATION PRIOR TO WALL BOARD INSTALLATION

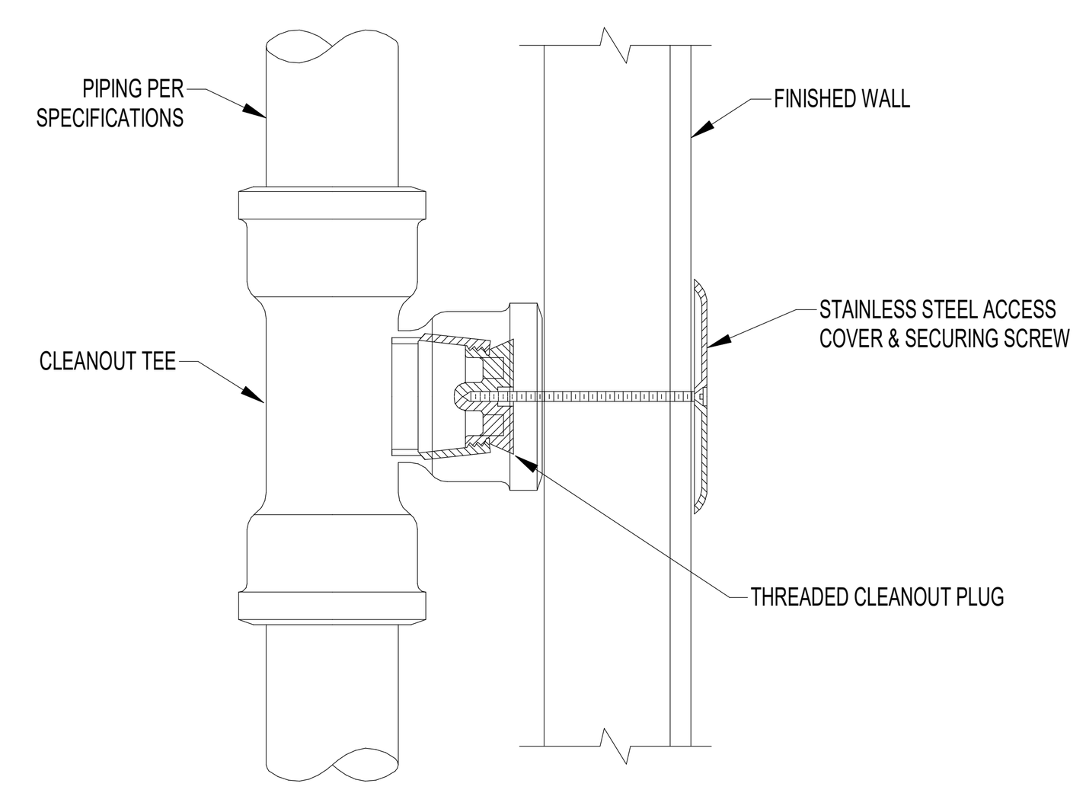
3 Fixture Connection Pipe Support Detail
P001 SCALE: NONE



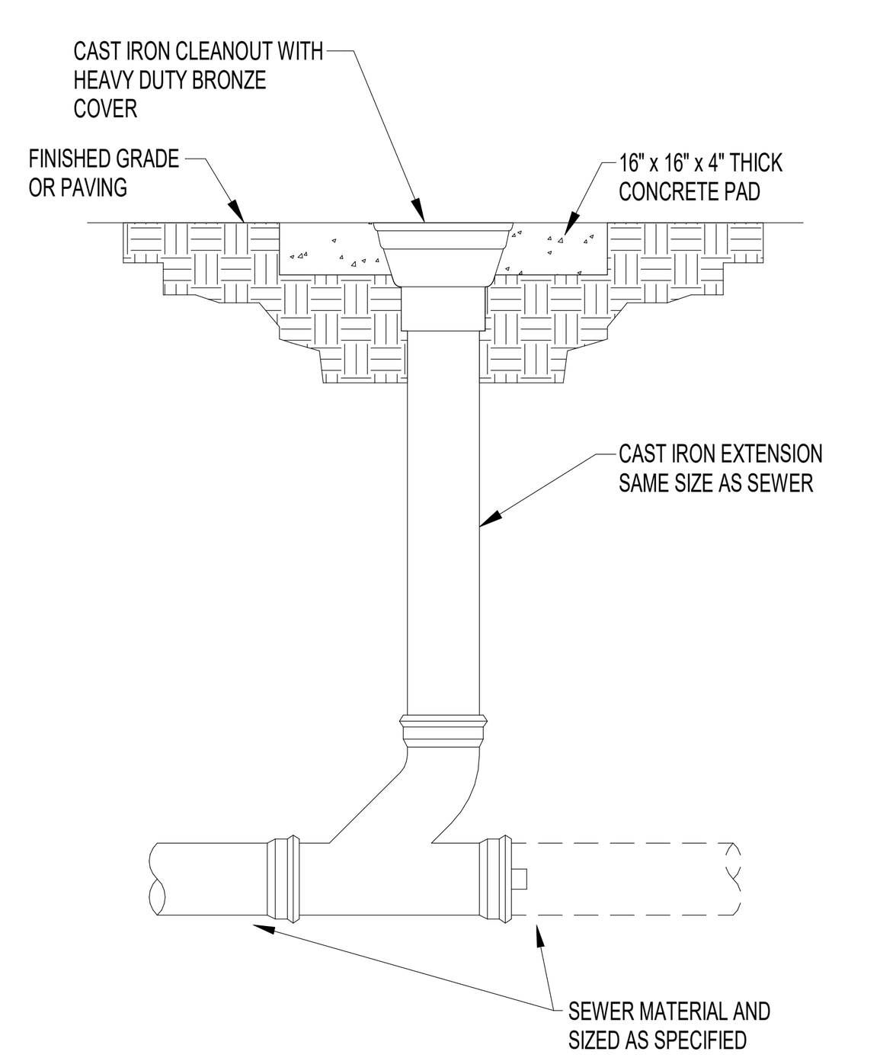
NOTE:
1. PLUMBING CONTRACTOR SHALL INSTALL SHOCK ARRESTORS TO FIXTURES PER PLANS AND RISER DIAGRAMS.
2. ALL PRE-KINDERGARTEN AND KINDERGARTEN TOILETS SHALL BE LOCATED A MAX. OF 12" OFF OF PARALLEL WALL WITH TOILET.

4 Floor-Mounted Water Closet Detail
P001 SCALE: NONE

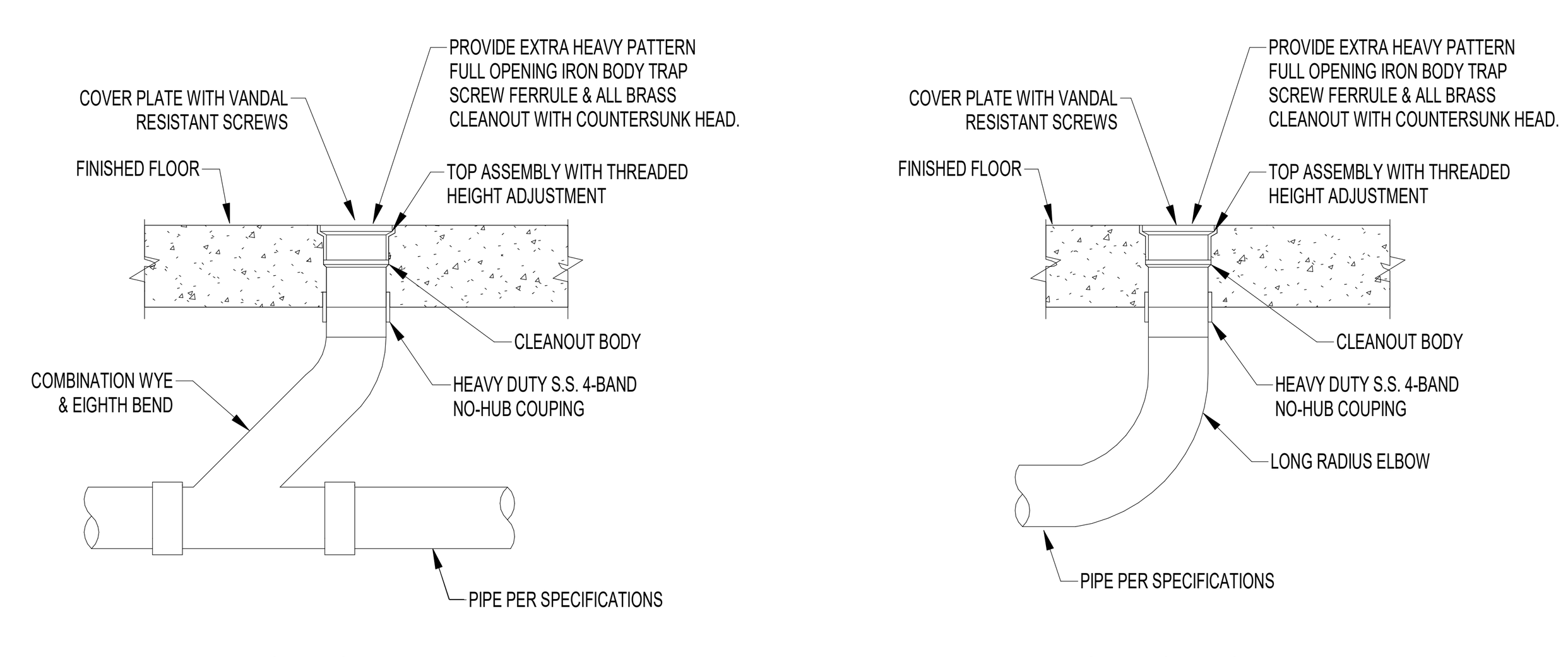
1



5 Wall Cleanout Detail
P001 SCALE: NONE



6 Exterior Cleanout Detail
P001 SCALE: NONE



7 Interior Floor Cleanout Detail
P001 SCALE: NONE

FLOOR DRAIN SCHEDULE

NUMBER	MODEL NUMBER
FD-A	ZURN ZN-415, DURA COATED CAST IRON BODY ADJUSTABLE 6" B-TYPE NICKLE BRONZE STRAINER
FS-1	ZURN Z1752, STAINLESS STEEL, NON-TILT LOOSE SET HALF GRATE WITH 12" SQUARE OPENINGS AND ANTI-SPLASH STAINLESS SHTEEL INTERIOR DOME STRAINER.

OR PRE-APPROVED EQUAL PRODUCTS BY THE FOLLOWING:
1. SMITH
2. JOSAM

PLUMBING LEGEND

SYMBOL	DESCRIPTION
	SANITARY SEWER PIPING
	VENT PIPING
	COLD WATER PIPING
	HOT WATER PIPING
	HOT WATER RETURN PIPING
RDL	ROOF DRAIN LEADER PIPING
G	GAS PIPING
GW	GREASE WASTE PIPING
	FLOOR/GRADE CLEANOUT
	FLOOR DRAIN
	GATE VALVE
	BALL VALVE
	POINT OF CONNECTION
	POINT OF DEMOLITION
SA-?	SHOCK ARRESTOR TYPE PER P.D.I.
	PIPE TURN DOWN
	PIPE RISE UP
	FLOW DIRECTIONAL ARROW
	CHECK VALVE
	END OF LINE CLEANOUT OR WALL CLEANOUT
	HOSE BIBB OR WALL HYDRANT
	PIPE CAP
P-	PLUMBING FIXTURE NUMBER
	PIPE UNION
	RECIRCULATION PUMP
	BALANCING VALVE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
BFF	BELOW FINISHED FLOOR
BFG	BELOW FINISHED GRADE
CO	CLEAN OUT
CW	COLD WATER
DN	DOWN
FD	FLOOR DRAIN
HW	HOT WATER
HWR	HOT WATER RECIRC
RD	ROOF DRAIN
RDL	ROOF DRAIN LEADER
V	VENT
VTR	VENT THROUGH THE ROOF
W	WASTE PIPE

FIXTURE SCHEDULE

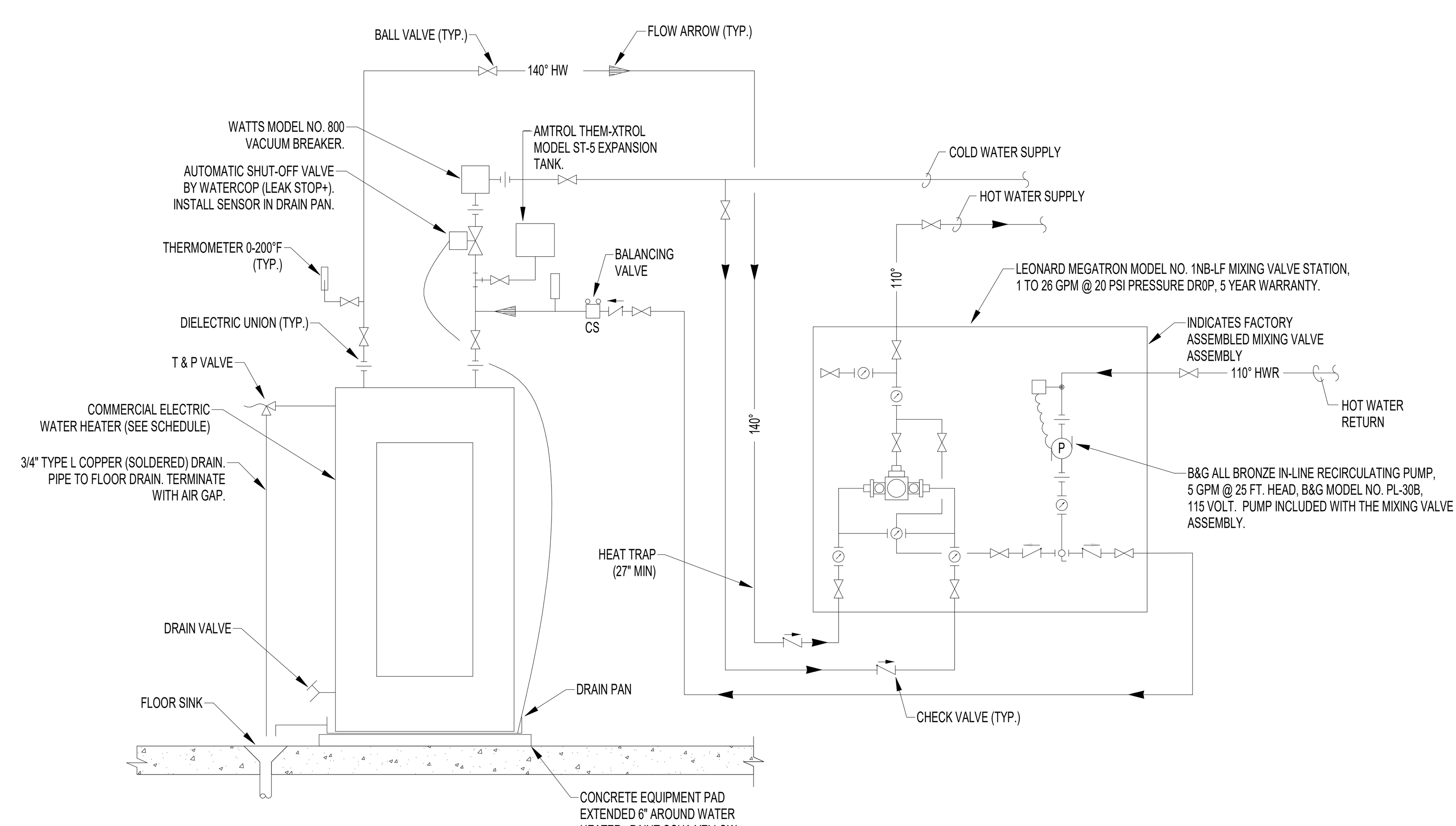
DESIG	FIXTURE	WASTE	CW	HW	REMARKS
P-1	WATER CLOSET	4"	1"	-	FLOOR MOUNTED, FLUSH VALVE, 1.6 GPF, 15" AFF
P-2	WATER CLOSET (ADA)	4"	1"	-	FLOOR MOUNTED, FLUSH VALVE, 1.6 GPF, ADA, 17" AFF
P-3	URINAL	2"	3/4"	-	0.5 GPF, 24" AFF TO RIM
P-3A	URINAL	2"	3/4"	-	0.5 GPF, 17" AFF TO RIM
P-4	LAVATORY	1-1/4"	1/2"	1/2"	UNDER MOUNT, ADA, SENSOR FAUCET, 0.5 GPM, 34" AFF TO RIM
P-5	LAVATORY	1-1/4"	1/2"	1/2"	WALL MOUNT, ADA, SINGLE HANDLE FAUCET, 0.5 GPM, 34" AFF TO RIM
P-6	LAVATORY	1-1/4"	1/2"	1/2"	DROP-IN, ADA, SINGLE HANDLE FAUCET, 0.5 GPM. 34" AFF TO RIM
P-7	TWO COMPARTMENT SINK	1-1/2"	1/2"	1/2"	UNDERMOUNT, SINGLE HANDLE HANDLE FAUCET, 1.5 GPM
P-8	MOP SINK	3"	1/2"	1/2"	MOP HANGER, HOSE, (2) STAINLESS STEEL WALL GUARDS
P-9	ANTI-FREEZE HYDRANT	3" (AT BOOT WASH ONLY)	1/2"		18" AFF OR AFG
P-10	SHOWER	2"	1/2"	1/2"	SHOWER BASE AND SURROUND BY ARCHITECT, 1.5 GPM SHOWER HEAD
P-11	SHOWER (ADA)	2"	1/2"	1/2"	SHOWER BASE AND SURROUND BY ARCHITECT, ADA TRANSFER, 1.5 GPM SHOWER HEAD
P-12	HOSE BIB	-	1/2"	-	INSTALLED IN TOILET ROOMS, 18" AFF, CAST BRASS WALL BOX
P-13	HOSE BIB	-	1/2"	-	INSTALLED IN MECHANICAL ROOMS, 18" AFF
P-14	WASHING MACHINE BOX	2"	1/2"	1/2"	METAL WASHER BOX W/SHOCK ARRESTORS AND QUARTER TURN VALVES, 42" AFF
P-15	ICE MAKER BOX	-	1/2"	-	METAL ICE MAKER BOX W/SHOCK ARRESTOR AND QUARTER TURN VALVE, 18" AFF
P-16	NOT USED	-	-	-	-
P-17	WATER COOLER BI-LEVEL	1-1/2"	1/2"	1/2"	BI-LEVEL WATER COOLER. MOUNT LOWER LEVEL UNIT 34" AFF
P-18	EXISTING DOUBLE BOWL SINK	2"	1/2"	1/2"	REINSTALL EXISTING DOUBLE BOWL SINK AND WELDED STAND, PROVIDE NEW ROUGH-INS AND SINGLE HANDLE FAUCET, 1.5 GPM

1

WATER HEATER SCHEDULE

DESIG.	MANUF	MODEL	TYPE	ENERGY SOURCE	VOLTS	PHASE (ϕ)	AMPERAGE	DEMAND (KW)	ELEMENT QUANTITY	SIMULTANEOUS ELEMENT OPERATION	RECOVERY CAPACITY (GPH)	REMARKS
WH-1	STATE	CSB-120	FLOOR MOUNT	ELEC	208V	3ϕ	41.6A	15KW	3	N/A	61	SEE ALL BELOW

REMARKS
1. WATER HEATER IS INDOOR, COMMERCIAL TYPE.
2. PROVIDE WITH MIXING STATION (SEE DETAIL).
3. BASED ON 100°F TEMPERATURE DIFFERENTIAL.
4. SET WATER HEATER DISCHARGE TEMPERATURE TO 140°F.
5. REFER TO ELECTRICAL DRAWINGS FOR ELECTRICAL EQUIPMENT CHARACTERISTICS.
6. PROVIDE WITH THERMOSTATIC MIXING VALVE (SEE DETAIL).
7. SET THERMOSTATIC MIXING VALVE DISCHARGE TEMPERATURE TO 110°F.
8. SHALL HAVE 120 GALLONS OF STORAGE CAPACITY.
9. SHALL MEET NAECA 16 ENERGY STANDARD REQUIREMENTS.



8 Water Heater Installation Detail
P001 SCALE: NONE

RND architects
RND Architects, PA
3608 University Drive
Suite 204
Durham, NC 27707

(919) 490 - 1266
www.RNDarchitects.com

IN ASSOCIATION WITH:

EDMONDSON ENGINEERS
1920 Hwy. 54, Suite 700, Durham, NC 27713
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PROFESSIONAL SEALS:

PROJECT INFORMATION:

Town of Hillsborough
Adron F. Thompson
Addition & Renovation

715 Dimmocks Mill Road, Hillsborough, NC

KEY PLAN:

Plan North   Not to Scale

REVISIONS

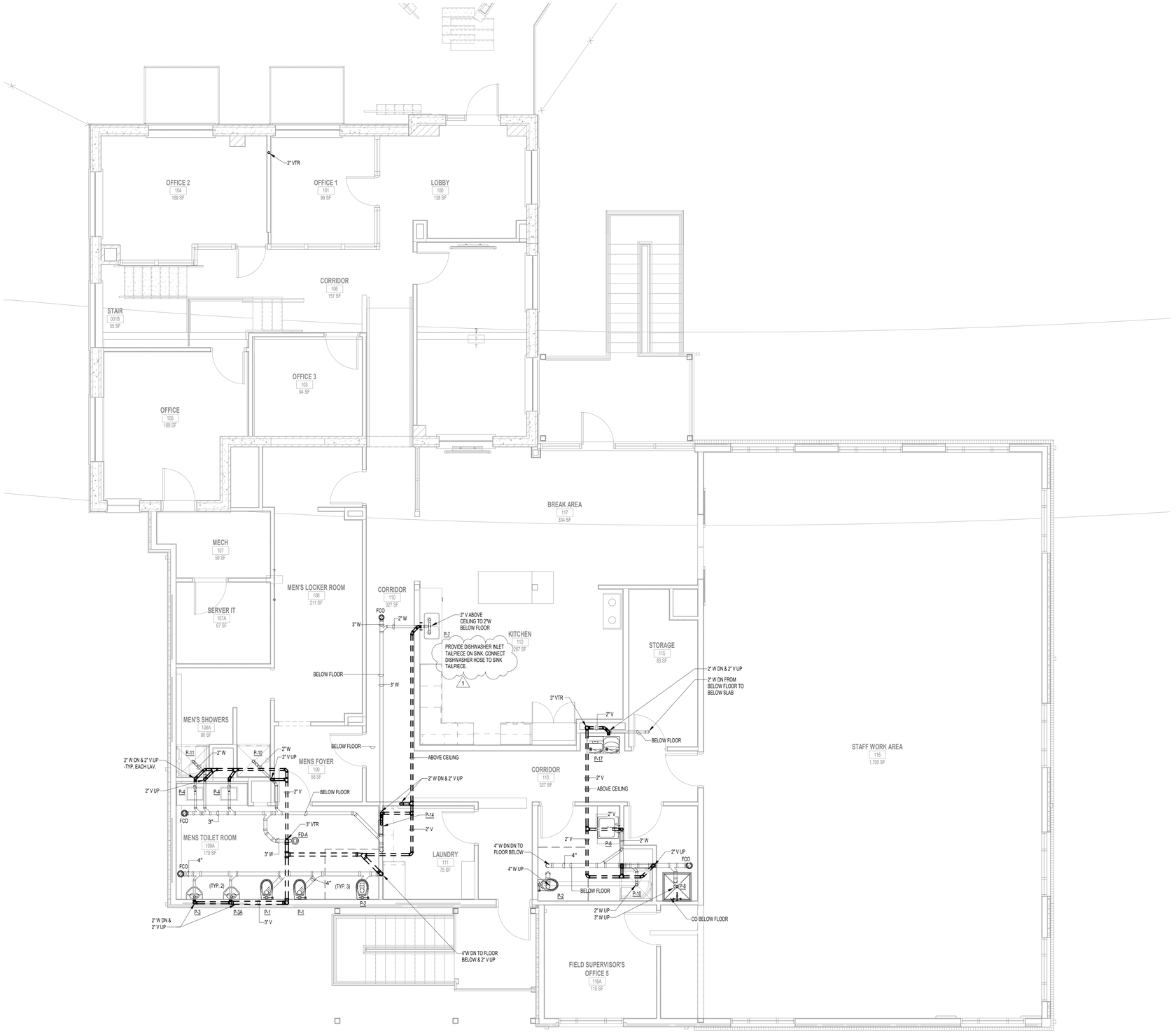
No.	Date	Description
1	2026.01.09	Addendum 1

PROJECT#:	DRAWN:	CHECKED:	DATE:
2231.01	BLN	OGM	2025.12.19

SHEET NAME:

Plumbing Cover Sheet

P001



1 / P202 Sanitary Waste & Vent Plan - Main Level

SCALE: 1/4" = 1'-0"

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PROFESSIONAL SEALS:

NORTH CAROLINA 33945 REGISTERED ARCHITECT DAVID TUCKER 2-19-25

PROJECT INFORMATION:

Town of Hillsborough Adron F. Thompson Addition & Renovation

715 Dimmocks Mill Road, Hillsborough, NC

KEY PLAN:

Plan North

Not to Scale

REVISIONS

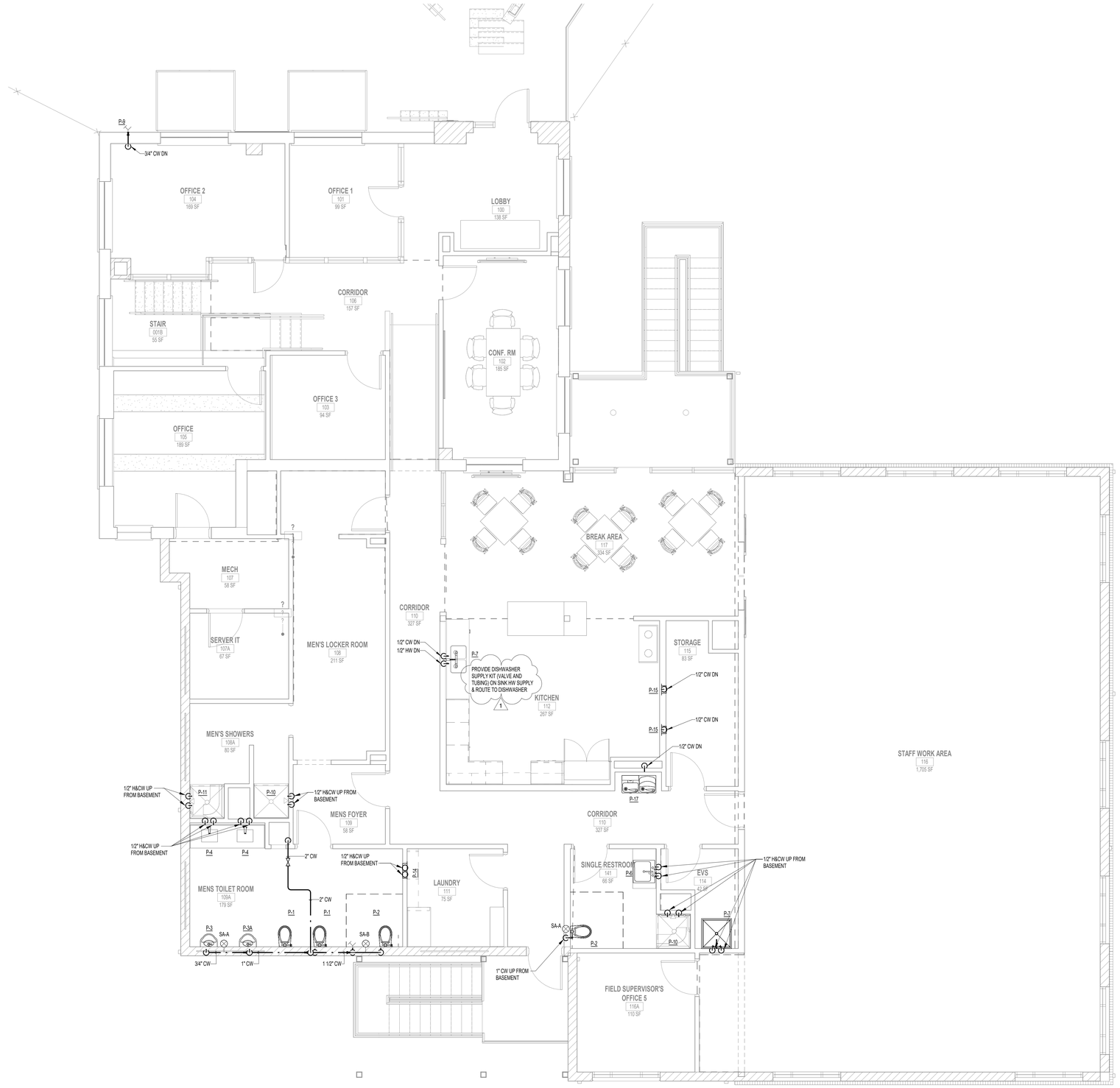
No.	Date	Description
1	2026.01.09	Addendum 1

PROJECT#:	DRAWN:	CHECKED:	DATE:
2231.01	BLN	OGM	2025.12.19

SHEET NAME:

Sanitary Waste & Vent Plan - Main Level

P202



1 P212 Domestic Water Plan - Main Level

SCALE: 1/4" = 1'-0"

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PROFESSIONAL SEALS:

NORTH CAROLINA 13946 REGISTERED LANDSCAPE ARCHITECT DAVID TUCKER 2-19-25

PROJECT INFORMATION:

Town of Hillsborough Adron F. Thompson Addition & Renovation

715 Dimmocks Mill Road, Hillsborough, NC

KEY PLAN:

Plan North

Not to Scale

REVISIONS

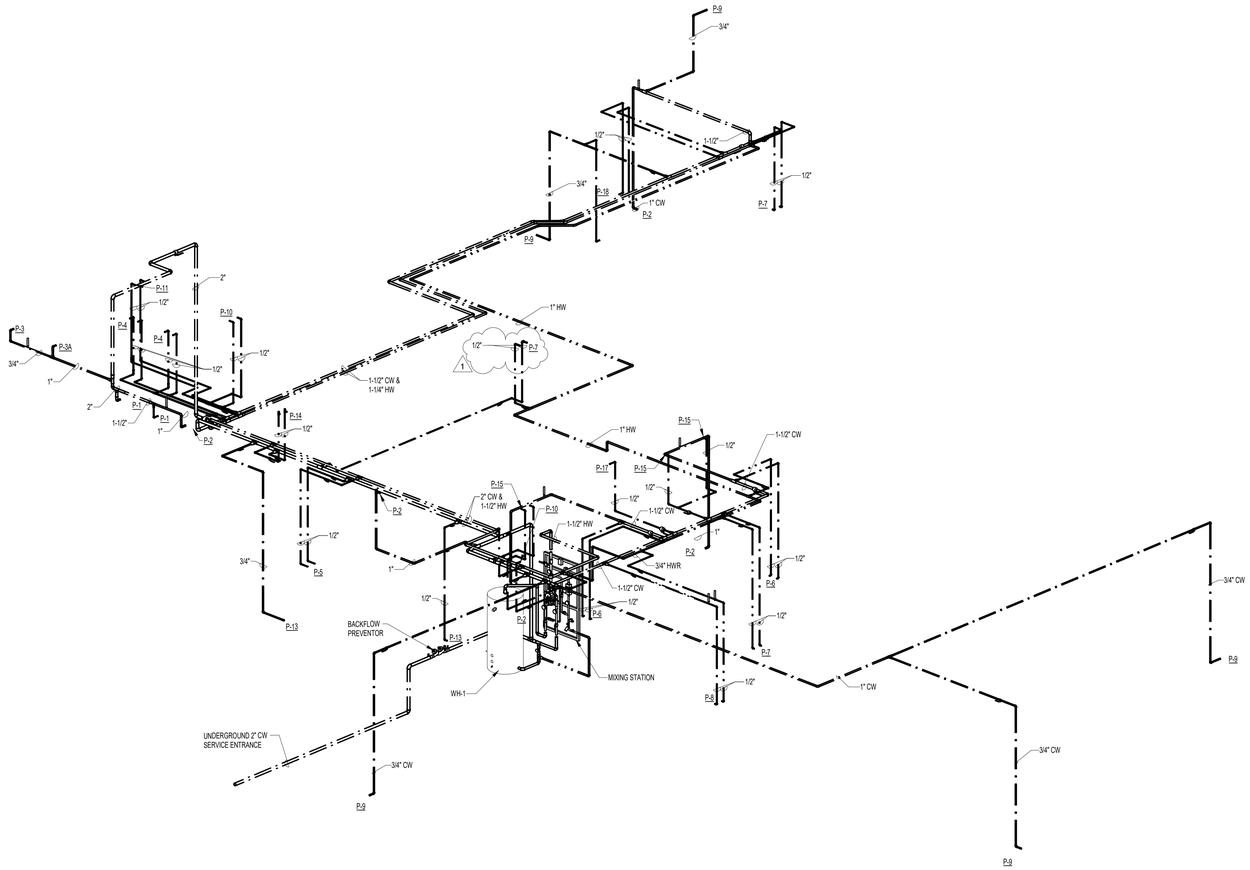
No.	Date	Description
1	2026.01.09	Addendum 1

PROJECT#:	DRAWN:	CHECKED:	DATE:
2231.01	BLN	OGM	2025.12.19

SHEET NAME:

Domestic Water Plan - Main Level

P212



1 P302 DOMESTIC WATER RISER

SCALE: NONE

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PROFESSIONAL SEALS:

NORTH CAROLINA 33945 REGISTERED PROFESSIONAL ENGINEER DAVID TUCKER 2-19-25

PROJECT INFORMATION:

Town of Hillsborough
Adron F. Thompson
Addition & Renovation

715 Dimmocks Mill Road, Hillsborough, NC

KEY PLAN:

Plan North

Not to Scale

REVISIONS

No.	Date	Description
1	2026.01.09	Addendum 1

PROJECT#:	DRAWN:	CHECKED:	DATE:
2231.01	BLN	OGM	2025.12.19

SHEET NAME:

Plumbing Risers

P302

AGREEMENT

Contractor Compliance

Safety and Risk Management Office
890 N.C. 86 N., PO Box 429, Hillsborough, NC 27278
919-296-4615 | Fax: 919-241-4623
www.hillsboroughnc.gov

1. Occupational Safety and Health Act

All work performed by contractors and contractors' employees for the Town of Hillsborough shall comply fully with applicable provisions of federal and applicable state occupational safety and health acts, standards and regulations.

The contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the work. The contractor shall take all necessary safety precautions and provide the necessary protection to prevent damage, injury and losses.

The contractor hereby certifies that all such materials and work performed will conform to and comply with such standards and regulations.

2. Safety Representative

A contractor shall designate a qualified and experienced safety representative at the site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

3. Safety Agreement Acknowledgement

The safety agreement has been read, and its conditions are hereby accepted by the undersigned on behalf of the contractor and its employees, agents, subcontractors and subcontractor employees and agents.

Contractor's Signature: _____
Print: _____
Title: _____
Date: _____

Town Representative's Signature: _____
Print: _____
Title: _____
Date: _____