



CITY OF RALEIGH

Atlantic Union Bank Convention Center

Atlantic Union Bank Convention Center
500 South Salisbury Street,
Raleigh, NC 27601

INFORMAL CONSTRUCTION BID

FOR

Atlantic Union Bank Convention Center Roof Repair

Date of Issue: September 28, 2026

CITY OF RALEIGH
ADVERTISEMENT FOR BID (INFORMAL CONSTRUCTION BID)

BID NUMBER: *274-2027-RCPAC-02*

PROJECT NAME: *Atlantic Union Bank Convention Center Roof Repair*

PROJECT LOCATION: *Atlantic Union Bank Convention Center
500 South Salisbury Street, Raleigh, NC 27601*

OWNER: *City of Raleigh
Atlantic Union Bank Convention Center*

OWNER ADDRESS: *500 South Salisbury Street, Raleigh, NC 27601*

OWNER PROJECT MANAGER: *Mason Tierney
Mason.Tierney@raleighnc.gov*

OWNER ADDITIONAL CONTACT: *Rachel Rice
Rachel.Rice@raleighnc.gov*

NOTE: Do not refer or use previously published bid documents.

Pursuant to the General Statutes of North Carolina, Section 143-128 et. seq, contractors are invited to submit Sealed Single Prime Construction bids providing labor, material, and ~~equipment~~ needed for entering into a Single Prime Contract.

Pursuant to North Carolina General Statutes §143-131, there will be no public bid opening for this solicitation. Additionally, the City reserves the right to reject any or all bids and waive informalities.

The scope of work associated with this project is the removal and replacement of damaged roofing material, drains, insulation and cold formed steel studs as necessary to repair the roof as indicated in the bid documents. This includes all inspection/permitting fees. All work is to be performed in accordance with current North Carolina code.

1. **Cost Specifications:**

Total cost of this project shall be included within the bid package. All labor, materials, equipment, and permitting fees in relation to the purpose of this project are to be included. Bid proposals shall be for a single lump sum.

2. **Scope/Description of Work:**

Remove existing, damaged roofing material down to substrate for both the roof and wall surfaces damaged by the fire on December 1st, 2025 and replace with in-kind materials as described in the bid documents. The work also includes the replacement of five damaged area drains in the upper roof gutter area. The roof, walls, and gutter area being repaired is roughly 20,000 square feet.

The Contractor shall restore the structural integrity of the affected areas to meet all applicable codes, standards, and design requirements.

The facility will remain operational during construction. The Contractor shall coordinate all work activities to maintain safe access and minimize impact to daily operations and scheduled events.

The selected Contractor shall be responsible for coordinating, securing, and obtaining all necessary permits and approvals for any road closures, lane closures, or traffic control measures required in connection with the Project.

All work shall be performed in accordance with the project drawings, specifications, and applicable City of Raleigh standards.

The following documents are incorporated by reference and shall be considered part of this solicitation:

Exhibit A: IFB Document Drawings

Exhibit B: IFB Document Project Manual

3. **Submitting Bids:**

Bidders are responsible for ensuring delivery of their Bid prior to the deadline stated below.

A paper Bid must be submitted by mail/courier (UPS, Fed-Ex, etc.), or via in person/hand delivery, to the City Project manager stated above, prior to the due date and time below.

Bids must be received by:

Time:	4:00 PM
Date:	October 21, 2026
Mailing/Delivery Address:	Atlantic Union Bank Convention Center, Administration Office Suite Attn: Rachel Rice 500 South Salisbury Street Raleigh, NC 27601
In-Person Drop-Off Times:	9:00 AM – 4:00 PM
In-Person Drop-Off Address:	Atlantic Union Bank Convention Center, Administration Office Suite 500 South Salisbury Street

All information related to this solicitation, including any addenda, will be posted to the North Carolina electronic Vendor Portal (eVP) at <https://evp.nc.gov/>.

No Bid may be withdrawn for Forty-Five (45) days after opening time.

4. **Bidder Requirements:**

Bidders/contractors are responsible for distributing documents to all sub-contractors.

Bidders will be required to show evidence that they are licensed to perform the work in the Bidding

Documents as required by North Carolina General Statute, Chapter 87.

END OF ADVERTISEMENT FOR BID

INSTRUCTIONS TO BIDDERS

1. General

This project consists of roofing replacement including the removal of existing, damaged roofing material down to substrate for both the roof and wall surfaces damaged by the fire on December 1st, 2026 and replace with in-kind materials as described in the bid documents. The work also includes the replacement of five damaged area drains in the upper roof gutter area. The roof, walls, and gutter area being repaired is roughly 20,000 square feet.

2. Project Location

Atlantic Union Bank Convention Center
500 South Salisbury Street, Raleigh, NC 27601

3. Bid Schedule/Timeline

Provided below is a list of the anticipated schedule of events related to this Bid. The City of Raleigh reserves the right to modify and/or adjust the following schedule to meet the needs of the service. All times shown are Eastern Time (EST):

Bid Schedule	Date and Time
Bid Advertisement Date	September 28, 2026
Pre-Bid Meeting Date and Time (Mandatory)	October 1st, 2026, at 10:00 AM Atlantic Union Bank Convention Center Main Lobby
Deadline for Written Questions	October 9 th , 2026, by 5:00 PM
City Response to Questions (anticipated)	October 14, 2026
Bid Submittal Due Date and Time	October 21, 2026, by 4:00 PM
Bid Award Announced (tentative)	October 23, 2026

4. Bid Submissions

The submission of a bid will assume that the Contractor has fully examined the site and knows the existing conditions and has made every provision for operating under the existing conditions, and has included all necessary items, and has read and understands the Bidding Documents. No consideration shall be given to any claim for extra compensation or extension of contract time because of failure to comply with this provision.

Bids must be made in strict accordance with the "Bid Form" provided hereto and all blank spaces for Unit Prices shall be properly filled in. If no price increase, assign "\$0". When requested alternates (if applicable) or Unit Prices have no entry, the bid may be considered incomplete and the bid may be rejected as non-responsive. All bids must be submitted on the BID PROPOSAL FORM included

herein. Prices given shall be both in writing and figures and the complete form shall be without any lineation, alterations, or erasures. In case of conflicting prices, the written prices shall govern. Submit one (1) set of bid forms enclosed.

Bids shall be received in strict accordance with all requirements of the General Statutes of North Carolina.

When submitting a paper bid, the bid must be submitted sealed in an envelope with the bidder/company's name, the City project name, and the City bid/project number written on the exterior of the envelope, and include only one (1) original copy of the bid.

The Contractor shall fill in the Forms of the Bid as follows:

- a) All bids must be signed by an authorized official of the firm.
- b) Each proposal shall include the full name and address, phone number, and e-mail contact of the bidder.
- c) All signatures shall be properly witnessed.
- d) It shall be the specific responsibility of the Bidder to deliver the bid to the proper City location address prior to the date and time specified in the invitation to bidders for opening of the Bids. Bidders are encouraged to be prompt as later delivery of a Bid for any reason, including delivery by the United States Postal Service, shall disqualify the Bid.
- e) Modifications of previously submitted bids will be acceptable only if delivered to the place of the bid by the specified time.

The City of Raleigh shall not be held responsible for late deliveries. Faxed and/or email submissions will not be accepted. Proposals not received by the designated time will not be accepted.

The bidder shall fill in and sign the bid form correctly. Bids that show any omission, alterations or form, additions not called for, conditional bids, or any irregularities of any kind may be rejected.

Except to the extent allowed by statute, bids shall not be withdrawn, and bids shall remain subject to acceptance by the City for a period of Forty-Five (45) days.

It is the City's intention to award a contract for work under this project to the lowest responsive, responsible bidder. The City reserves the right to reject any and all bids, including without limitation, nonconforming, non-responsive, unbalanced, or conditional bids.

The City of Raleigh further reserves the right to not award the bid to any Bidder whom it finds, after reasonable inquiry and evaluation, to be not responsible. The City of Raleigh may also not award the bid of any bidder if the City believes that it would not be in the best interest of the City to not make an award to that bidder. The City of Raleigh also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate terms with the successful bidder.

Upon request, bidders must present satisfactory evidence that they have been regularly engaged in the business of constructing such work, such as company work history and references from similar construction projects. And upon request, bidders must show that they are fully prepared with the necessary capital, equipment, etc., to begin the work promptly, and complete the same in accordance with specifications.

The bidder to whom the award is made shall be required to furnish work crews of adequate number,

size, and experience to properly perform the work. The superintendent responsible for the project is required to be on-site during construction. The interpretation of the number of crews, size, and experience will be determined by the City of Raleigh as to their adequacy.

The Contractor will furnish all materials, labor, equipment, supervision, tools, machinery, etc. for complete construction of projects in accordance with plans and specifications of the City of Raleigh.

The City reserves the right to extend the work in this Contract upon the same terms, provided that such extensions shall not exceed in cost fifty per cent (50%) of the original Contract price of the Contract being extended.

5. **Site Investigation**

All bidders shall examine the site before submitting a proposal in order to determine the extent of work involved, size of work, etc., and the conditions under which the work must be staged and performed.

6. **Permits And Fees**

The Contractor will need to have the permit issued in its name and provide contact information to the Development Services Department as required for permit issuance. The cost for all related permit fees and final issuance of the permit shall be presented for billing against the Owners Allowance. Markups, profit and overhead are not permissible for permit costs.

7. **Non-Collusion in Bidding**

The Bidder specifically agrees to abide by all applicable provisions of Article 3 of Chapter 133 of the North Carolina General Statutes. By submission of this Bid, each Bidder and each person signing on behalf of any Bidder certifies, and in case of a joint Bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:

The prices in this Bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other Bidder or with any competitor.

Unless otherwise required by Law, the prices quoted in the Bid have not been knowingly disclosed by the Bidder and will not knowingly be disclosed by the Bidder prior to opening, directly or indirectly, to any other Bidder or to any competitor; and

No attempt has been made or will be made by the Bidder to induce any other person, partnership, or corporation to submit or not to submit a Bid for the purpose of restricting competition.

8. **Form Of Agreement**

The form of agreement to be entered into shall be the contract included within these specifications.

9. **Contract Security**

If the bid amount is greater than \$300,000, the awarded Contractor is required to furnish a Payment Bond, each equal to one hundred percent (100%) of the Contract Price within 10-days of being notified of award of contract. Bonds given shall meet the requirements of the law of the State of North Carolina including but not limited to G.S. 143-129 and G.S. 44A-26. The surety on each Bond shall be a surety company satisfactory to the City and duly authorized to do business in the State of North Carolina.

The City requires the use of its payment bond forms for this project unless, after consulting with the

City Attorney's office, the project manager finds that different bond forms satisfactorily protect the City.

END OF INSTRUCTIONS TO BIDDERS

BID PROPOSAL FORM

The undersigned bidder has carefully examined the Form of Contract, the Form of Contract Bonds, the General Conditions, the Supplemental Conditions and Specifications, all of which are acknowledged to be part of the proposal and the Proposal Form, and the Bidder has also examined the site of the proposed work. Bidder agrees to perform all the work included in the Contract as indicated and specified in the Contract Documents. It is the City's intention to award a contract for all work under this project to the lowest responsive, responsible bidder. The City reserves the right to reject any or all bids and to waive informalities.

The undersigned further agrees to sign a Contract for the work, if offered within ninety (90) days after receipt of Bids, and to furnish surety as specified. The Bidder further agrees to provide and furnish all necessary materials, equipment, machinery, and labor necessary to complete the demolition of the work in full, in complete accordance with the plans and specifications and the contract documents to the full and entire satisfaction of the City of Raleigh and in accordance with these documents within the time limit specified below.

In addition to all other agreements and assurances, the undersigned Bidder understands and hereby agrees as follows:

1. The Bidder represents and agrees to complete the entire project in the following number of Consecutive Calendar Days: Ninety (90) days from the date on the Notice to Proceed.
2. The Bidder agrees to comply with the City's policy to encourage bidders to use Certified MWBE businesses as specified in Division 00 MWBE Requirements.

Base Bid:

_____ Dollars (\$) (In Words)

_____ Dollars (\$) (In Figures)

Total Bid:

(Including Base bid and Owner's Site Conditions Allowance):

_____ Dollars (\$) (In Words)

_____ Dollars (\$) (In Figures)

Name of General Contractor and GC License Number:

ACKNOWLEDGMENT OF RECEIPT OF ADDENDA

The undersigned Bidder hereby acknowledges receipt of the following Addenda:

Dated

Acknowledge Receipt (initial)

Please check here if no addenda were received: _____

PROPOSAL SIGNATURE PAGE

Respectfully submitted this day of :

By:

(Name of firm or corporation making bid)

WITNESS:

By: _____

Signature

(Proprietorship or Partnership)

Name: _____

Print or type

Title:

(Owner/Partner/Pres./V.Pres)

Address:

ATTEST:

GC License No.: _____

By:

Federal Tax I.D. No.: _____

Title: _____
(Corp. Sec. or Asst.Sec. only)

Email Address:

(CORPORATE SEAL)

Office Phone Number:

END OF CITY OF RALEIGH – BID PROPOSAL FORM

GENERAL CONDITIONS

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1. DEFINITIONS OF TERMS

Wherever used in the Contract Documents, the following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof:

"Addenda" shall mean written or graphic instruments issued prior to the execution of the agreement, which modify or interpret the Contract Documents by additions, deletions, clarifications, or corrections.

"Allowance" shall mean any amount specified and included in an agreed-upon construction scope of work for a certain item of work whose details are not yet determined at the time of agreement between the contractor and the Owner for such scope of work.

"Architectural Supplemental Instructions" shall mean the information that allows an architect to provide additional instructions or make minor changes without having to re-work the entire construction plan.

"Authorization Request" shall mean the final action in approving a cost or change event. It may result in a change in the project's cost of work, general conditions or overheads, contingency, or other item which is included in the contract amount.

"Bad Weather Day" shall mean a day when construction Work cannot be performed and is attributable to unusual weather phenomena as defined herein.

"Bid" shall mean the offer or Proposal of the Bidder submitted on the prescribed form setting forth the price(s) for the Work to be performed.

"Bidder" shall mean any person, firm, or corporation submitting a Bid for the Work.

"Bonds" shall mean Bid, Performance, and Payment Bonds and other instruments of security, furnished by the Contractor and the Contractor's surety in accordance with the Contract Documents.

"Change Order" shall mean the adjustment of the contract of time, or addition or deduction to the overall contract price. A Change Order shall be an amendment to the contract and requires approval by the City of Raleigh through the City Council or City Manager.

"Change Order Directive (COD)" shall mean an instrument used to provide written notice for the Contractor to proceed with the work directed by the Designer or Owner prior to issuance of a formal request for change proposal or change agreement by the Contractor.

"Consultant" shall be defined as the professional services firm employed by the City or Owner.

"Contract Documents" shall consist of Advertisement for Bids, Proposal, Bid Bond, Contract, Contract Performance Bond, Payment Bond, Instructions to Bidders, General Requirements, General Conditions, Supplementary Conditions, Technical Specifications, Certificates of Insurance, and Drawings and any other pertinent documents. The intent of these documents is to include all materials, appliances, tools, labor, and services of every kind necessary for the proper execution of the Work, and the terms and conditions of payment therefore. The Contract Documents shall be considered as one, and whatever is called for by any one of them shall be as binding as if called for by all.

"Contract Price" shall mean the total monies payable to the Contractor under the terms and conditions of the Contract Documents.

"Contract Time" shall mean the number of calendar days stated in the Contract Documents for the completion of the Work.

"Contractor" or "General Contractor" shall mean the individual, firm, or corporation undertaking the execution of the Work as an independent Contractor under the terms of the Contract and acting through its agents or employees.

"Cost or Change Event" shall mean a directive to perform work resulting from a proposed change. There may or may not be costs associated with the work. It is initiated as a proposal from the Contractor and sent to the Designer for review. If approved by the Designer, the Designer forwards it to the Owner as a recommendation from the Designer in the form of an Authorization Request.

"Change Order" means a written order to the Contractor and/or any amendments to the contract that authorize a change in the contract time/schedule or contract amount. **"City"** shall mean City of Raleigh.

"Designer" shall mean the professional architectural and/engineering firm and/or its subconsultants that are responsible for the project design and have placed their professional seals on the construction documents. Can also be noted as "Engineer".

"Drawings" shall mean the part of the Contract Documents, which show largely through graphical presentation the characteristics, design and scope of the Work to be performed and which have been prepared or approved by the City.

"Final Acceptance" shall be defined as concurrence between the Designer and the Owner to accept the project from the contractor. Final acceptance of the project shall not be considered before the final inspection is conducted. Final acceptance does not infer the lack of claims on a project.

"Liquidated Damages" shall mean the amount reasonably estimated in advance to cover the consequential damages associated with the City's economic loss in not having the use of the project for its intended purposes resulting from the Contractor's failure to complete the project by the completion date.

"Modification" shall mean the process of incorporating agreed changes or alterations made to a contract. A contract modification may introduce, revise or cancel specifications, delivery period, price, quantity or terms of an existing contract, while leaving its overall purpose and effect intact.

"Notice of Award" shall mean the written notice to the successful bidder of the acceptance of the bid as approved by the City Council. Notice may be issued in person or via regular mail, certified mail with receipt of delivery, or email with receipt of delivery.

"Notice to Proceed" shall mean written communication issued by the City or its Designer to the Contractor authorizing him to proceed with the Work and establishing the date of commencement of the Work. Notice may be issued in person or via regular mail, certified mail with receipt of delivery, or email with receipt of delivery.

"Owner" shall mean City of Raleigh.

"Owner's Contingency" shall mean the amount of funds included in the contract that represents the Owner's best estimate of funds to provide for allowances and to address unforeseen circumstances or other conditions that may arise during the construction of the project.

"Owner-Requested Change" is a change in, addition to, and/or reduction of the construction Work requested by the Owner necessitating an adjustment to a GMP, the date for Substantial Completion, or both. The document by which the CMAR proposes an adjustment to a GMP, the date for Substantial Completion, or both, in response to an Owner-Requested Change is a Change Order Proposal.

"Project" shall mean the undertaking to be performed as provided in the Contract Documents.

"Project Manager" shall be the individual or individuals assigned to coordinate the project and insure that City procedures are followed, and the quality of Work is up to the standards expected.

"Request for Proposal" shall mean an offer by a contractor, in response to a request issued by the Designer or Owner for the purpose of requesting an equitable adjustment for a proposed change to an existing contract.

"Shall" is mandatory; "may" is permissive.

"Shop Drawings" shall mean all drawings, diagrams, illustrations, brochures, schedules, and other data, which are prepared by the Contractor, Subcontractor, manufacturer, Supplier, or distributor, which illustrate how specific portions of the Work shall be fabricated or installed.

"Specifications" shall mean a part of the Contract Documents consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards, and Workmanship specified for this Project.

"Subcontractor" shall mean an individual, firm, or corporation having a direct contract with the Contractor or with any other Subcontractor for the performance of a part of the Work at the site.

"Substantial Completion" shall mean that date determined by the City when the construction of the Project or an expressly stipulated part thereof is sufficiently completed, in accordance with the Contract Documents, so the Project or stipulated part can be fully utilized for the purposes for which it is intended.

"Supplemental General Conditions" shall mean a part of the Contract Documents consisting of modifications or additions to the General Conditions.

"Superintendent" shall mean the Contractor's authorized on job representative designated in writing by the Contractor prior to commencement of any Work

"Supplier" shall mean any person, supplier, or organization who furnishes materials or equipment for the Work, including that fabricated to a special design, but who does not perform labor at the site.

"Surety" shall mean the bonding or insurance company that represents the Contractor and that assumes responsibility for the completion of the project should the Contractor, for any reason, become unable to complete the project.

"Time Extension" shall mean an increase in the length of time specified in a contract resulting in a revised contract completion date.

"Work" of the Contractor or Subcontractor shall include all labor, material, equipment, transportation, skill, tools, machinery, and other equipment and things useful or necessary in order to complete the Contract.

"Written Notice" shall mean the notification either in handwritten, computer generated, typed, or email form that communicates information or directives.

2. APPLICABLE REQUIREMENTS

The Work shall comply with the Contract Documents and with all applicable codes, laws, and regulations of the City, State, or Federal agencies. In the event of any conflict between the terms of this

Contract and such codes, laws, and regulations, the codes, laws, and regulations shall prevail. If the Contractor performs any Work contrary to such codes, laws, or regulations the Contractor shall assume full responsibility therefore and shall bear any and all costs necessary to correct the Work.

3. CONTRACT BID GUARRANTY AND SECURITY

BID GUARRANTY: Bidders shall furnish a bid guaranty in the form of cash, a certified cashier's check issued by a responsible bank or trust company insured by the Federal Deposit Insurance Corporation, made payable to the City of Raleigh, or a Bid Bond issued by a surety licensed to conduct business in the state where the Project is located. The amount of such guaranty shall be equal to 5% of the bid price. The Bid security of the successful Bidder will be retained until the Contractor has executed the Contract and furnished the required Contract security, whereupon it will be returned; if the Contractor fails to execute and deliver the Contract and furnish the required Contract security within ten (10) calendar days of the Notice of Award, Owner may annul the Notice of Award and the Bid security of the Bidder will be forfeited. The Bid security of any other Bidder who the Owner believes to have a reasonable chance of receiving the Award may be retained by Owner until the earlier of (1) the seventh day after the executed Contract is delivered by the Owner to Contractor and the required Contract security is furnished or (2) the sixty-first day after Bid opening. Bid security of other Bidders will be returned within ten (10) days of the Bid opening.

SECURITY: The Contractor shall furnish a Contract Performance Bond and a Payment Bond, each equal to one hundred percent (100%) of the Contract Price if the base bid price exceeds \$300,000. However, the City may impose this requirement on any contract in excess of \$30,000. This requirement, if exercised, will be specified in the Supplementary General Conditions. Bonds given shall meet the requirements of the law of the State of North Carolina including but not limited to G.S. 143-129 and G.S. 44A-26. The surety on each Bond shall be a surety company satisfactory to the City and duly authorized to do business in the State of North Carolina.

The Contractor shall also furnish other bid security or bonds that may be required by various Federal, State or Local authorities having jurisdiction as a condition of obtaining permits.

4. NOTICE AND SERVICE THEREOF

Any notice to Contractor from the City relative to any part of this Contract shall be in accordance with the City's Form of Contract.

5. INTENT OF DRAWINGS AND SPECIFICATIONS

The intent of the Drawings, Specifications/project manual and all other documents comprising the Contract Documents, is that the Contractor shall be held responsible to provide and pay for all labor, materials, tools, power, water, equipment, transportation, and other facilities necessary for the proper execution of the Work in accordance with the Contract Documents and all incidental Work necessary to complete the Project in an acceptable manner, ready for use, occupancy, or operation by the City.

The Drawings, Specifications/project manual, and all other documents comprising the Contract Documents, shall be supplementary to each other, and any material, Workmanship, and/or service which may be in one, but not called for in the others, shall be as binding as if indicated, called for, or implied by all. In case of discrepancy or disagreement in the contract documents, the order of precedence shall be: Form of Construction Contract, General Conditions, Supplemental General Conditions, Project Special Conditions, CSI Specification Sections, large-scale drawings, and small-scale drawings.

Any discrepancies found between the Drawings and Specifications and site conditions or any inconsistencies or ambiguities in the Drawings or Specifications shall be immediately reported to the Designer for the City, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. Work done by the Contractor after discovery of such discrepancies, inconsistencies, or ambiguities shall be done at the Contractor's risk.

Each section or type of Work is described separately in the Technical Specifications. For convenience of reference and to facilitate the letting of contracts and subcontracts, these Specifications are separated into titled sections. Such separation shall not, however, operate to make the City an arbiter to establish limits to

the contracts between the Contractor and Subcontractors, nor shall such separation be interpreted as superseding normal construction trade jurisdictions. Should any item of material, equipment, Work, or combinations of such be required in one section, and not be described in that section and a similar item described in another section, that description shall apply regardless of the section under which it is described. In case of conflict between the Drawings and Specifications, the Specifications shall govern. Figure dimensions on Drawings shall govern over scale dimensions, and detailed drawings shall govern over general drawings.

Attention is directed to the fact that the detailed Specifications and separate sections may be written in short or abridged form. The Contractor shall, in regard to every section of the Specifications and Drawings of articles, materials, operations, or methods:

- a. Provide each item mentioned and indicated, of quality or subject to qualifications noted.
- b. Perform according to conditions stated, each operation prescribed.
- c. Provide therefore all necessary labor, equipment and incidentals.

Whenever in these Specifications or on the Drawings the words "directed," "required," "permitted," "ordered," or words of like import are used, it shall be understood that the direction, requirement, permission or order of the City is intended, and similar words, "approved," "acceptable," "satisfactory," or words of like import shall mean approved by, acceptable to, or satisfactory to the City.

Notwithstanding the appearance of such language in the various sections of the Specifications as, "The Paving Contractor," "The Grading Contractor," etc., the Contractor is responsible to the City for the entire Contract and the execution of all Work referred to in the Contract Documents.

The Designer for the City may (without changing the scope of the Work) furnish the Contractor additional instructions and detail drawings, as necessary to carry out the Work required by the Contract Documents. The additional drawings and instructions thus supplied will become a part of the Contract Documents. The Contractor shall carry out the Work in accordance with the additional detail drawings and instructions.

6. PRESENT DOCUMENTS GOVERN

The Contractor shall in no case claim a waiver of any specification requirements on the basis of previous approval of material or Workmanship on other jobs of like nature or on the basis of what might be considered "standard" for material or Workmanship in any particular location. The Contract Documents for this job shall govern the Work.

7. CONTRACTOR'S SHOP DRAWINGS

Absent of more detailed Shop Drawing and Submittal Requirement Provisions noted elsewhere in the Contract, Supplementary General Conditions, or Administrative Specification Requirements, the provisions outlined below shall be followed:

Within thirty (30) consecutive days after the issuance of the Notice to Proceed, the Contractor shall submit a schedule for the submission of all shop drawings, product data, samples, and similar submittals to the Designer. The schedule shall indicate the items, relevant specification sections, other related submittal data, and the date when these items will be furnished to the Designer. Pay applications shall not be approved until the submittal schedule has been submitted.

The approved Drawings will be supplemented by such Shop Drawings as are needed to adequately control the Work. It is mutually agreed that all authorized alterations affecting the requirements and information given on the approved Drawings shall be in writing.

Shop Drawings to be furnished by the Contractor for any structure shall consist of such detailed drawings as may be required for the prosecution of the Work.

Shop Drawings must be approved by the Designer before the Work in question is performed. Drawings for false Work, centering, and form work may also be required, and in such cases shall be likewise subjected

to approval unless approval be waived. It is expressly understood, however, that approval of the Contractor's Shop Drawings does not relieve the Contractor of any responsibility for accuracy of dimensions and details. It is mutually agreed that the Contractor shall be responsible for agreement and conformity of the Shop Drawings with the approved Drawings and Specifications.

It is the responsibility of the Contractor to review and approve all Shop Drawings for compliance with the contract documents, with signed evidence of review by the Contractor, before same are submitted to the Designer for approval. Shop Drawings that have not been reviewed and approved by the Contractor will not be approved.

Shop Drawings shall be submitted only by the Contractor who shall indicate by a signed stamp on the drawings that the submittal has been reviewed and approved the Shop Drawings and that the Work shown on them is in accordance with Contract requirements and has been checked for dimensions and relationship with Work of all other trades involved. Under no conditions shall Shop Drawings be accepted from anyone other than the Contractor.

The Contractor shall furnish the Designer at least six (6) hard copies of all Shop Drawings for approval. Shop drawings may also be electronically submitted for approval utilizing construction/project management software. Both the Designer and the Contractor shall be license holders of the software, house the software program on its server, and provide access to the City via a secured password and username. The Designer shall review required submittals promptly, noting desired corrections, if any, and retaining three (3) copies. The remaining copies will be returned to the Contractor by the Designer for the Contractor's use not later than twenty-one (21) days from the date of the receipt for multiple disciplines or fourteen (14) days from the date of receipt for single discipline. The Contractor shall furnish the required submittals with sufficient information and accuracy to obtain required approval of any item with no more than three submittals. Designer will record time beyond the initial three submittals for reviewing subsequent submittals of shop drawings, samples, or other items requiring approval and the Contractor shall reimburse the Owner for the charges for such time accrued by the Designer. The Contractor shall also be responsible for any delays to the project's schedule resulting from additional reviews.

The Contract Price shall include the cost of furnishing all Shop Drawings and the Contractor will be allowed no extra compensation for such drawings.

The approval of such Shop Drawings shall not relieve the Contractor from responsibility for deviations from Drawings or the Specifications unless the Contractor has in writing called attention to such deviations, and the Designer has approved the changes or deviations in writing at the time of submission, nor shall it relieve him from the responsibility for errors of any kind in Shop Drawings. When the Contractor does call such deviations to the attention of the Designer, any deviations involving extra cost shall be submitted in letter form by the Contractor. If the Contractor neglects to provide a letter, it will be assumed that no extra cost is involved for making the change.

8. INSTRUCTIONS, MINOR CHANGES, ETC.

All changes, alterations or instructions regarding any feature of the Work that differ from the Drawings and Specifications must be approved in writing in all cases, and no verbal orders will be regarded as a basis for claims for extra Work.

If the Contractor claims that any instruction by Drawings for a change or otherwise involves extra cost or an extension of time, the Contractor shall notify the Designer in writing within ten (10) days after the receipt of such instruction and, in any event, before proceeding to execute the Work. Thereafter, the procedure shall be the same as that described for changes in the Work. No such claim shall be valid unless made in accordance with the terms of this section.

No claims for extra cost will be considered based on an escalation of material prices throughout the period of the Contract.

No extra Work is to be performed or any change made that involves any extra cost or extension of time unless approved through an Authorization Request.

The Designer shall have authority, however to order minor changes in the Work not necessitating a cost event or change order, and not inconsistent with the intent of the Contract Documents. Such minor changes shall be affected by written order, bulletin drawing, or supplemental architectural instructions and shall be binding to the Owner and the Contractor.

9. EXAMINATION OF WORK BY CONTRACTOR

It is understood and agreed that the Contractor, has by careful examination, is satisfied as to the nature and location of the Work, the conformation of the ground, the character, quality, and quantity of the facilities needed preliminary to and during the prosecution of the Work, the general and local conditions, and all other matters which can in any way affect the Work or the cost thereof under this Contract. No verbal agreement or conversation with any officer, agent, or employee of the City, either before or after the execution of the Contract, shall affect or modify any of the terms or obligations herein contained.

The Contractor shall, in good Workmanlike manner, do and perform all Work and furnish all supplies and materials, machinery, equipment, facilities, and means, except as herein otherwise expressly specified, necessary, or proper to perform and complete all the Work required by this Contract, within the time herein specified, in accordance with the provisions of this Contract and said Specifications and in accordance with the Drawings of the Work covered by this Contract and any and all supplemental drawings of the Work covered by this Contract. The Contractor shall furnish, erect, maintain, and remove such construction, plants, and such temporary Works as may be required. The Contractor alone shall be responsible for the safety, efficiency, and adequacy of plants, appliances, and methods, and for any damage, which may result from their failure or their improper construction, maintenance, or operation. The Contractor shall observe, comply with, and be subject to all terms, conditions, requirements, and limitations of the Contract and Specifications, local ordinances, and State and Federal laws; and shall do, carry on, and complete the entire Work.

The Contractor is and remains fully responsible for its acts or omissions as well as those of any subcontractor or any employee of either. The Contractor agrees that no contractual relationship exists between the subcontractor and the Owner in regard to the Contractor and that the subcontractor acts on this Work as an agent or employee of the Contractor.

10. MATERIALS, SERVICES AND FACILITIES

The Contractor shall at all times employ sufficient labor and equipment for prosecuting the Work to full completion in the manner and time specified. Failure of the Contractor to provide adequate labor and equipment may result in default of the Contract. The labor and equipment to be used in the Work by the Contractor shall be sufficient to meet the requirements of the Work and shall be such as to produce a satisfactory quality of Work, in accordance with accepted industry practices within the time specified in the Contract.

If at any time during the construction and completion of the Work covered by these construction documents, the language, conduct, or attire of any Workman of the various crafts be adjudged a nuisance to the Owner or Designer, or if any Workman be considered detrimental to the Work, the Contractor shall order such parties removed immediately from the ground.

Materials and equipment shall be so stored and handled as to insure the preservation of their quality and fitness for the Work. Stored materials and equipment to be incorporated in the Work shall be located so as to facilitate prompt inspection. No product that has in any way become unfit for the intended purpose shall be incorporated into the Work.

Manufactured articles, materials and equipment shall be applied, installed, connected, erected, cleaned, and conditioned as directed by the manufacturer.

Materials, supplies, and equipment to be incorporated into the Work shall be new and unused unless otherwise specifically stated in the Contract Documents. The source of supply for all such products shall be submitted to the Designer, together with detailed descriptions thereof in the form of samples, Shop Drawings, tests, or other means necessary to adequately describe the items proposed. If, after trial, it is found that sources of supply, even though previously approved by the Designer, have not furnished products meeting the

intent of the Contract Documents, the Contractor shall thereafter furnish products from other approved sources, and shall remove completed Work incorporating products which do not meet Contract requirements.

11. "OR EQUAL" CLAUSE

In accordance with G.S. 133-3, whenever a material or article required is specified or shown on the Drawings and/or Specifications by using the name of the proprietary product or of a particular manufacturer or vendor, the Designer shall denote that the quality standard of the article desired is the intent and the Contractor is not restricted to the specific brand, make, or manufacturer so named. The Designer shall specify three or more examples of items of equal or equivalent design. Any material or article that will perform adequately the duties imposed by the general design may be considered equal and satisfactory providing the material or article so proposed is of equal substance and function. The opinion of the Designer shall be final, and no substitute material or article shall be purchased or installed without such written approval.

Any proposed substitutions of materials, items, or equipment of equal or equivalent design shall be submitted to the Designer for approval or disapproval prior to the opening of bids. Proposed substitutions shall only be submitted by the prime contractors. No requests from subcontractors, manufacturers or suppliers will be accepted.

12. TESTING OF MATERIALS

Unless otherwise specifically provided for, testing of materials and finished articles to be incorporated in the Work at the site shall be made by bureaus, laboratories, or agencies approved by the Designer and Owner. All laboratory tests shall be paid by the Owner unless provided otherwise in the contract documents. The Contractor shall furnish evidence satisfactory to the Designer that the material and finished articles have passed the required tests prior to the incorporation of such materials and finished articles in the Work.

The Contractor shall pay for the laboratory tests to establish design mixes for concrete, asphalt, mortar and other materials proposed for use on the project, and for additional tests to prove compliance with contract documents where materials have tested deficient except where the testing laboratory did not follow the appropriate testing procedures as defined in the Specifications.

13. INSPECTION OF WORK BY OTHER PARTIES

The Contractor shall, at all times, permit and facilitate inspection of the Work by authorized representatives of the City and authorities having jurisdiction in connection with the Work of this Contract. The presence or observations of the Designer or other City representatives at the site of the Work shall not be construed to, in any manner, relieve the Contractor of the responsibility for strict compliance with the provisions of the Contract Documents.

All Work shall be inspected by the Designer or the Owner's or its Consultants prior to being covered by the Contractor. The Contractor shall give a minimum of two weeks' notice unless otherwise agreed to by all parties. Not less than 48 hours prior to inspection or testing, the Contractor shall coordinate said events with the Designer, Owner, and/or respective parties. If the inspection fails after the first re-inspection, all costs associated with additional re-inspections, including travel, per diem, testing, etc. for the Designer or the Designer's authorized representative and the Owner's Consultants, shall be borne by the Contractor.

If the Specifications, City's instructions, laws, ordinances, or an authority having jurisdiction require any Work to be specially tested or approved, the Contractor shall give the Designer timely notice of its readiness for observation or inspection. If the inspection is by another authority, then the Designer shall be advised of the date fixed for such inspection. Required certificates of inspection shall be secured by the Contractor. Contractor having secured all certificates of inspection will deliver same to the Designer upon completion. If any Work should be covered up without approval or consent of the Designer, Project Manager, Special Inspector, it shall, if required by the Designer, be uncovered for examination at the Contractor's expense.

Should any disagreement or difference arise as to the estimate, quantities or classifications or as to the meaning of the Drawings or Specifications, or any point concerning the character, acceptability, and nature of the several kinds of Work, any materials and construction thereof, the decisions of the Designer shall be final and conclusive and binding upon all parties to the Contract.

14. AUTHORITY OF THE DESIGNER/ENGINEER

The Contractor shall perform all of the Work herein specified under the general direction, and to the entire satisfaction, approval, and acceptance of the Designer. The Designer shall decide all questions relating to measurements of quantities; the character of the Work performed and as to whether the rate of progress is such that the Work will be completed within the time limit of the Contract. All questions as to the meaning of these Specifications will be decided by the Designer.

The approval of the Designer of any materials, plants, equipment, Drawings, or of any other items executed, or proposed by the Contractor shall be construed only to constitute an approval of general design. Such approval shall not relieve the Contractor from the performance of the Work in accordance with the Contract Documents, or from any duty, obligations, performance guarantee, or other liability imposed upon him.

Where drawings or specifications are sealed by the Engineer, in lieu of Designer, these same provisions shall apply to the Engineer.

15. PROHIBITED INTERESTS

No official of the City who is authorized in such capacity and on behalf of the City to negotiate, make, accept or approve, or to take part in negotiating, making, accepting, or approving any architectural, engineering, inspection, construction, or material supply contract, or any subcontract in connection with the construction of the Project, shall become directly or indirectly interested personally in this Contract or in any part hereof. No officer, employee, architect, attorney, engineer, or inspector of or for the City who is authorized in such capacity and on behalf of the City to exercise any legislative, executive, supervisory, or other similar functions in connection with the construction of the Project, shall become directly or indirectly interested personally in this Contract or in any part thereof, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the Project.

16. REJECTIONS OF WORK AND MATERIALS, AND OWNER'S RIGHT TO DO WORK

All materials and equipment furnished, and all Work done that is not in accordance with the Drawings or Specifications or that is defective will be rejected. All rejected materials, equipment, or Work shall be removed immediately. If rejected materials, equipment, or Work is not removed within forty-eight hours from the date of letter of notification, the Designer shall have the right and authority to stop the Contractor's Work immediately, and/or shall have the right to arrange for the removal of said rejected materials, equipment, or Work at the cost and expense of the Contractor. All rejected materials, equipment, or Work shall be replaced with other material, equipment, or Work that conforms with the Drawings and Specifications at no additional cost to the City.

Inspection of the Work shall not relieve the Contractor of any obligations to fulfill the Contract and defective Work shall be made good regardless of whether such Work, material, or equipment has been previously inspected by the Designer and accepted or estimated for payment. Neither the final certificate, final payment, occupancy of the premises by the Owner, nor any provision of the contract, nor any other act or instrument of the Owner, nor the Designer shall relieve the Contractor from responsibility for negligence or faulty material or Workmanship or failure to comply with the drawings and Specifications.

If during the progress of the Work or during the period of guarantee, the Contractor fails to prosecute the Work properly or to perform any provision of the contract, the Owner, after seven days' written notice sent in person or via email with delivery confirmation or certified mail, return receipt requested, to the Contractor from the Designer, may perform or have performed that portion of Work. The cost of the Work may be deducted from any amount due or to become due to the Contractor, including retainage, such action and cost of same having been first approved by the Designer. Should the cost of such action of the Owner exceed the amount due or to become due to the Contractor, then the Contractor or the Contractor's the Surety, or both, shall be liable for and shall pay to the Owner the amount of said excess.

17. ROYALTIES AND PATENTS

The Contractor shall hold and save the City and its officers, agents, servants, and employees, harmless from liability of any nature or kind, including cost and expenses for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the Contract, including its use by the City, unless otherwise specifically stipulated in the Contract Documents.

18. CONTRACTOR'S SUPERINTENDENCE AND PERSONNEL

The Contractor will supervise and direct the Work. The Contractor will be solely responsible for the means, methods, techniques, sequences, and procedures of construction. An experienced Superintendent, and the necessary assistants competent to supervise the Work involved, shall be assigned to the Project by the Contractor and shall be present at the site when Work is in progress. The name of the Superintendent shall be submitted with qualifications of same prior to start of the Work and shall be approved by the Designer prior to start of the Work. The Superintendent so named by the Contractor shall be employed by the Contractor and shall have served in a supervisory capacity on at least one Project of like description and size performed by the Contractor during the previous twelve months. Under no circumstances shall an employee of any Subcontractor serve as Project Superintendent. The Superintendent shall represent the Contractor, and all directions given to the Superintendent shall be as binding as if given to the Contractor.

Only persons skilled in the type of Work that they are to perform shall be employed. The Contractor shall maintain discipline and good order among its employees and shall not employ on the Work any unfit person or persons or anyone unskilled in the Work assigned him. The Contractor shall insure that all employees maintain proper respect and courtesy for the any persons/individuals on the project site or in adjacent off-site areas.

19. LINES, GRADES AND MEASUREMENTS

Such stakes and markings as the Designer may set for either its or the Contractor's guidance shall be preserved by the Contractor. Failure to protect such stakes or markings, or gross negligence on the Contractor's part resulting in loss of same, may result in the Contractor being charged for their replacement.

The Contractor must exercise proper care and caution to verify the grades and figures before proceeding with the Work and shall be responsible for any damage or defective Work caused by the Contractor's failure of such care and caution. The Contractor shall promptly notify the Designer of any errors or discrepancies discovered in order that the proper corrections may be made.

20. LAYOUT OF WORK

The Contractor shall lay out its work from established base lines and bench marks indicated on the drawings, and shall perform all construction layout, computations and staking from the baseline information and control points shown on the drawings and shall be responsible for all measurements in connection with the layout. The Contractor shall furnish, at its own expense, all stakes, templates, platforms, equipment, tools, materials, and labor required to lay out any part of the work. The Contractor shall be responsible for executing the work to the lines and grades that may be established or indicated by the Designer/Owner.

Prior to the start of any layout work, the Contractor shall provide the names and license numbers of the professional land surveyors and/or engineers, licensed in the State of North Carolina, who will be in charge of their survey for the project.

During initial site layout and before existing conditions are disturbed, the Contractor shall verify the basic survey data provided on the contract drawings. Verification shall be initiated from the point(s) shown on the contract drawings and shall include, as a minimum, benchmark elevations, horizontal control points, and sufficient spot checks of critical elevations to ensure that the survey data adequately reflects existing conditions.

The Contractor will provide the Designer and Owner with a copy of the initial, intermediate (as necessary to adequately define an area of concern) and final survey information in an electronic PDF file and CAD or .DWG drawing file, and a point data file in electronic CAD or .DWG format which contains the survey control found (or established) in the field by the surveyor. The CAD or .DWG drawing file will be based on the

coordinate system indicated on the contract drawings and will also show street r/w and property corners, easements, and the proposed improvements.

21. PERMITS, LICENSES, AND IMPACT FEES

Permits and licenses of a temporary nature necessary for the prosecution of the Work shall be secured by the Contractor. Costs for permits, licenses, and impact fees may be included in the total contract amount as an allowance. Refer to the bid documents or Supplemental General Conditions.

22. LAWS AND REGULATIONS

The Contractor's attention is directed to the fact that all applicable Federal, State, and City laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the Contract throughout, and they will be deemed to be included in the Contract Documents the same as though herein written out in full. The Contractor is responsible for being fully informed of all laws, ordinances, and regulations of the Federal, State, and City in any manner affecting those engaged or employed in the Work or the materials used in the Work or in any way affecting the conduct of the Work and of all orders and decrees of bodies or tribunals having any jurisdiction or authority over same. If any discrepancy or inconsistency should be discovered in this Contract, or in the Drawings or Specifications herein referred to, in relation to any such law, regulation, ordinance, order, or decree, the Contractor shall herewith report the same, in writing, to the Designer. The Contractor shall always observe and comply with all such laws, ordinances, and regulations, and shall protect and indemnify the City and its agents against any such law, ordinance, regulation, order, or decree, whether by the Contractor including any employees.

23. SUBCONTRACTING

The Contractor understands and agrees that it shall be a breach of this Contract to subcontract any portion of the Work on this Project unless the Work and the Contractor proposed to perform it have been declared in the Proposal to the Contract. In accordance with the City's MWBE Program Policy, within thirty (30) days of award of the contract, the Contractor shall submit to the Designer and Owner the "Contract Subcontractor Identification Form, giving the names and addresses of subcontractors, and equipment and material suppliers proposed to be used together with the scope of their respective parts of the Work. Should any subcontractor be disapproved by the Designer or Owner, the Designer or Owner shall communicate its decision to the Contractor. The Contractor shall present substitutions to the Designer and Owner for approval. If the subcontractor is listed on the MWBE affidavits, another MWBE subcontractor with similar certification/classification shall be substituted.

THE CONTRACTOR FURTHER UNDERSTANDS AND AGREES THAT ANY WORK ON THIS PROJECT WHICH THE CONTRACTOR SECURES IN VIOLATION OF THIS PROVISION SHALL BE DEEMED A GRATUITY FROM THE CONTRACTOR FOR WHICH THE CITY OF RALEIGH SHALL NOT BE OBLIGATED TO PAY. ALSO, THAT ANY WORK DONE BY THE SUBCONTRACTOR AND NOT MEETING THE SPECIFICATIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE AT NO COST TO THE CITY.

Nothing contained in this Contract shall create any contractual relation between any Subcontractor and the City.

24. SUBCONTRACTORS

Within thirty (30) days of award of the contract, the Contractor shall submit to the Designer and Owner the "Contract Subcontractor Identification Form, giving the names and addresses of subcontractors, and equipment and material suppliers proposed to be used together with the scope of their respective parts of the Work.

The Designer may furnish to any subcontractor, upon written request, evidence regarding amounts of money requested to be paid to the Contractor regarding the portion of the subcontractor's work; provided however, that the Contractor has sufficiently broken down the request to allow such determination.

The Owner reserves the right to limit the amount of work, or the percentage of work, to be subcontracted as hereinafter specified.

25. ASSIGNMENTS

The Contractor shall not assign the whole or any part of this Contract or any monies due or to become due hereunder without written consent of the City.

26. INSURANCE REQUIREMENTS

Review the City of Raleigh Form of Contract and Supplemental Conditions for the specific insurance requirements.

27. LAND AND RIGHTS-OF-WAY

Prior to entering on any land or right-of-way, the Contractor shall ascertain the requirements of applicable permits or easements secured by the City or required of the Contractor and shall conduct the Work in accordance with requirements thereof including the giving of notice.

The Contractor shall provide at its own expense and without liability to the City any additional land and access thereto that the Contractor may desire for temporary construction facilities, or for storage of materials.

28. PROTECTION OF WORK, PROPERTY AND PERSONS

The Contractor will be required to protect all Work and materials against damage or injury from the weather. If, in the opinion of the Designer, any Work or materials shall have been damaged or injured by reason of failure to protect such, all such materials or Work shall be removed and replaced at the expense of the Contractor.

The Contractor will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. The Contractor will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to all employees on the Work and other persons who may be affected thereby, all the Work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, lakes, drainage ways, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction. Contractor shall provide continuously sufficient illumination at all barricades and at protective barriers around excavations so that the public is adequately warned of such hazards. The Contractor shall, where necessary, provide and maintain access to and from all adjacent properties as directed by the plans and Specifications, or the Designer, or the Owner's Representative, for street rights of way, along the line of the Contractor's Work. The Contractor shall abide by the Manual on Uniform Traffic Control Devices (MUTCD) for any street closures or traffic control.

The Contractor will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. The Contractor will erect and maintain, as required by the conditions and progress of the Work, all necessary warning safeguards for devices and safety and protection of the Work, the public, and adjoining property. The Contractor shall immediately notify Owners of adjacent utilities when prosecution of the Work may affect them. The Contractor will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the Contractor, any Subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

The Contractor shall, prior to commencing other on-site Work, accurately locate above and below ground utilities and structures, which may be affected by the Work, using whatever means may be appropriate. The Contractor shall mark the location of existing utilities and structures, not otherwise readily visible, with flagging, stakes, barricades, or other suitable means, and shall preserve and protect all utilities and placement during construction. The Contractor shall notify the Designer promptly on discovery of any conflict between the Contract Documents and any existing facility.

In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, or unanticipated conditions where delay would substantially impact the time or cost of Work, the Contractor,

upon notification to the Designer, shall act to prevent threatened damage, injury, or loss. Any claim for compensation or extension of time by the Contractor due to such extra Work shall be submitted to the Designer within ten (10) days of the date of performing such Work or deviations in the manner prescribed for a cost event or change order. The Designer will evaluate and determine if the claims asserted by the Contractor warrant a cost event or change order and will make a recommendation to the Owner.

All existing utilities, both public and private, including sewer, gas, water, electrical, and telephone services, etc., shall be protected and their operation shall be maintained through the course of the Work. Any temporary shutdown of an existing service shall be arranged between the Contractor and the utility responsible and hold the City harmless from the result of any damage that may occur as a result of the Contractor's activities.

See the City's Form of Contract and the Supplementary Conditions for additional safety requirements.

29. PRIOR USE BY CITY

Prior to completion of the Work, the City may take over operation and/or use of the uncompleted Project or portions thereof. The Contractor must agree to the prior use, and it must not prevent the Contractor from completing the Work. Such prior use of facilities by the City shall not be deemed as acceptance of any Work or relieve the Contractor from any of the requirements of the Contract Documents.

Where the City has beneficial occupancy of a usable facility prior to the expiration of the specified Contract Time, but where contract Work items remain outstanding, the City, at its option, may, in lieu of all or a proportion of liquidated damages owed by the Contractor, charge the Contractor for actual cost of administering the Contract for a period subsequent to expiration of the Contract completion date (not to exceed the total amount which could be assessed under liquidated damages).

30. CLEANING UP AND SITE ACCESS

The Contractor shall at all times keep the premises free from accumulation of waste materials or rubbish caused by Contractor's employees or Work. Upon completion of the Work, the Contractor shall remove all equipment, tools, materials, and other articles from the property of the City. Delivery of construction materials and equipment shall be only from locations approved by the City.

31. DISPOSAL OF WASTE MATERIALS FROM ANY CONSTRUCTION

Disposal of all waste material from construction sites shall be made in strict accordance with all State laws and City ordinances pertaining to disposal of construction or hazardous waste. It shall be the responsibility of the Contractor to secure the necessary permits and provide all information required to secure said permits. The Contractor shall designate the disposal site prior to beginning construction and in the event waste material is to be disposed of on private property, a letter from the property Owner shall be furnished to the Owner or its representative granting the Contractor or the Contractor's agent(s) such permission and listing the requirements made by the property Owner on the Contractor, if any.

32. CHANGES IN THE WORK

The City may at any time, as the need arises, order changes within the scope of the Work without invalidating the agreement. If such changes increase or decrease the amount due under the Contract Documents or in the time required for performance of the Work, an adjustment may be authorized by a cost event or change order.

The Contractor must assert any request for an adjustment to the contract price, performance schedule, or both, in writing no later than 10 days from the Contractor's first knowledge of the change, or its right to assert such request for equitable adjustment shall be considered waived. Under no circumstance shall any pending request for adjustment or dispute excuse the Contractor from proceeding with its performance, as changed. The Owner, in its sole discretion, may receive and act upon any request for equitable adjustment at any time before final payment.

The Designer, also, may at any time, make changes in the details of the Work as may also be approved by the Owner. The Contractor shall proceed with the performance of any changes in the Work so ordered by the Designer unless the Contractor believes that such change entitles him to a change in contract price, time, or both, in which event the Contractor shall give the Designer written notice thereof within five (5) days after the receipt of the ordered change, and the Contractor shall not execute such changes pending the receipt of authorization from the Owner or the Designer.

33. MODIFICATION AND PRICE PROPOSALS

The City may issue modification and price proposal requests for changes during the contract. The Contractor shall submit itemized price proposals including those for all subcontractors and sub-tiers for any such requests. The format used by the City for an adjustment in accordance with this term shall be a Request for Proposal (RFP). The Contractor's proposal shall be submitted within 10 days, or as otherwise directed by the Department, of the Contractor's first knowledge of the proposed change or receipt of the RFP. The City or Designer may also issue a Notice to Proceed associated with the request for proposal should it be determined to be in the City's best interest.

The proposal shall include a detailed breakdown of all labor, equipment, materials, supplies, overhead and profit costs for both the contractor and all subcontractors at any tier to allow a review of the proposal. Material, labor, equipment and other direct cost shall be summarized and totaled as construction direct costs in the proposal. Overheads, profit, and bond shall be added as appropriate line items shown as indirect or soft cost in the proposal. Cost estimates or pricing detail backup shall be completely itemized to include direct labor man-hours, individual craft, and hourly wage rate. Include verifiable labor burden (including craft fringes, FUI, SUI, and FICA) as a separate line item.

All subcontractor proposals shall include this same level of breakdown and detail and shall be so noted in the Contractor's proposal. The contractor shall provide copies of any quotations that have been received in regard to the proposal and shall ensure that adequate competition has been obtained such that the proposal is fair and reasonable. Any credit for deleted work shall also be reflected on the proposal.

Such proposal shall also include a detailed justification for any time extension request that is being requested as part of the equitable adjustment. Any time extension request that arise from the proposal shall be clearly noted, shall identify the specific activity or activities involved, and shall depict the changes necessary in the project schedule in order to accomplish the change. The contractor is advised that any request in contract period must demonstrate that there has been an increase in the critical path for completion of the project that is directly attributed to the change. The contractor shall provide a revised project schedule incorporating any time extension resulting as part of the equitable adjustment.

Lump sum cost estimates or price proposals shall be rejected and returned to the Contractor for itemization as described above. Failure of the Contractor to submit properly itemized cost estimates or price proposals shall not constitute an excusable delay. The equitable adjustment shall not include increased costs or time extension for delay resulting from the Contractor's failure to provide notice or to diligently continue performance. No proposal from the Contractor for an equitable adjustment shall be allowed if not asserted within time frames in this clause.

Limits of Claim:	
Insurance:	30%
Profit and Overhead charge for additional Contractor's work:	15%
Profit and Overhead charge for deductive Contractor's work:	10%
Profit and Overhead charge for additional Sub-contractor's work:	5%
Profit and Overhead charge for deductive Sub-contractor's work:	0%

The contractor may submit for approval recent audited financial statements performed in accordance with generally accepted accounting procedures to help establish an overhead rate for this project. Absent of this information, the rates noted above shall apply.

Where the extra Work involved is covered by unit prices quoted in the proposal, or subsequently agreed to by the Contractor, Designer, and the City, the value of the change shall be computed by application of unit prices based on quantities, estimate or actual as agreed of the items involved, see Section 48.

34. TIME FOR COMPLETION, LIQUIDATED DAMAGES AND TIME EXTENSIONS

The time of completion is expressed as the number of calendar days from the Notice to Proceed. It is hereby understood and mutually agreed, by and between the Contractor and the City, that the date of beginning, rate of progress and the time for completion of the Work are essential conditions of this Contract; and it is further mutually understood and agreed that the Work embraced in this Contract shall be commenced on a date to be specified in the Notice to Proceed.

The Contractor agrees that said Work shall be prosecuted regularly, diligently and uninterrupted at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the City, that the time for the completion of the Work described herein is a reasonable time for the completion of the same, taking into consideration the average climate range prevailing in this locality.

The Contractor shall commence work as outlined in the Notice to Proceed and shall fully complete all work hereunder within the time of completion stated. For each day in excess of the contract completion number of days, the Contractor(s) shall pay the Owner the sum stated as liquidated damages reasonably estimated in advance to cover the losses to be incurred by the Owner by reason of failure of said Contractor(s) to complete the work within the time specified, such time being in the essence of this contract and a material consideration thereof. Liquidated Damages are specified in Section 2 of the Supplementary General Conditions.

The Contractor acknowledges that delays will damage the Owner, but also acknowledges that proof of such damages would be difficult and costly for both parties to determine, and that the injury to the Owner which could result from a failure of the Contractor to complete the Project on schedule is uncertain and cannot be computed with exact precision. In order to liquidate in advance the delay damages that the Owner will be entitled to recover from the Contractor in the event of unexcused delays in the FINAL completion of the Project, the Contractor agrees that it will pay, and that the Owner may retain from the funds otherwise to be paid to the Contractor, the following Liquidated Damages and additional Owner Engineering Expenses and Other Fees, which sums are agreed upon as a reasonable and proper measure of damages which the Owner will sustain by failure of the Contractor to complete Work within the time stipulated, and as Owner's sole and exclusive remedy for any such delays. See Supplementary Conditions for Owner's liquidated damages.

It is further agreed that time is of the essence for this Contract and of the Specifications wherein a definite portion and certain length of time is fixed for the performance of any act whatsoever; and where under the Contract an additional time is allowed for the completion of any Work, the new time limit fixed by such extension shall be of the essence for this Contract.

Provided, that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the Work is due to unforeseeable causes beyond the control and without the fault or negligence of the Contractor or that of their subcontractor at any tier, including but not restricted to unavoidable casualties; by acts of God or of the public enemy; by acts of the Government in either its sovereign or contractual capacity; by acts of another Contractor in the performance of a contract with the City; by fires; by floods; by epidemics; by quarantine restrictions; by strikes; by freight embargoes; by unusually severe weather exceeding the average climatic conditions in that area of the Work or by any other causes which the Designer and Owner determine may just the delay, then the contract time may be extended by change order for the time as determined to be reasonable.

Time extensions under this provision do not entitle the Contractor to compensable damages for delays. Any Contractor claim for compensable damages is limited to delays caused solely by the Owner or its agents. Contractor caused delays shall be accounted for before Owner or Designer caused delays in the case of concurrent delays.

Provided further, that the Contractor shall within ten (10) days from the beginning of such delay, notify the City, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the Contractor within a reasonable time of its decision in the matter.

35. WEATHER DELAY TIME EXTENSIONS

As noted in the Section 34, Time For Completion, Liquidated Damages And Time Extensions, if the contract is delayed at any time in the progress of Work by abnormal weather conditions not reasonably anticipated for the locality where the Work is performed, then the contract time may be extended by change order only for the time which the Designer and Owner may determine is reasonable. The methods to be used for determining the weather delay time extensions are as outlined in this section.

Time extensions will not be granted for rain, wind, snow, or other natural phenomena of normal intensity for the locality where Work is performed. The time for completion includes an allowance for bad weather days based on climatological data and is adjusted to reflect the number of working days per month, which would be affected.

- a. For the purposes of determining the extent of a delay attributable to unusual weather phenomena, please see the table below which notes the maximum number of days by month that can be considered "bad weather" days. For the purposes of this contract, bad weather days to be anticipated are defined as follows:
- b. Days on which precipitation exceeds 0.10 inch of rain equivalent as measured at the beginning of the workday by the precipitation gauge maintained at the Project site.
- c. Days on which the temperature fails to exceed 40 degrees F average (a) measures less than 40 degrees Fahrenheit or below product specifications constraints related to temperature (examples include, but are not limited to, placing concrete, roofing applications, fireproofing application, waterproofing application, exterior envelope installation, and masonry activities) or (b) in excess of 100 degrees Fahrenheit. Note that a day, which qualifies on criteria for both precipitation and temperature, shall be counted as one day.
- d. Days on which prior to building dry-in conditions, Project site conditions such as mud, pooling of water, ice, or standing snow prevent the performance of construction activities such as, but not limited to, mass grading, building pad grading, excavations, and backfill operations.
- e. Days on which wind speeds, as measured by a gauge located at the Project site, exceed those wind speeds that are permissible to use equipment or to perform certain construction tasks safely. Examples may include not being able to safely use crane(s) or other aerial equipment for erection of the building structure.

Bad weather working days to be included in the contractor's schedule are:

Month	Days	Month	Days	Month	Days
January	17	May	7	September	5
February	15	June	4	October	3
March	5	July	5	November	9
April	4	August	5	December	10

The Contractor shall note actual job site weather conditions on the daily report of construction, along with work performed and any effect of weather conditions on the scheduled activities. Tabulations of weather conditions on the job site, and any effects of weather on the critical path activities, shall be totaled on a monthly basis as work progresses. Periods where weather conditions are more favorable than anticipated shall also be accounted in the weather analysis. If the total accumulated number of working days lost to bad weather exceeds the total number tabulated above, the time for completion will be extended by the difference. Time of completion will not be adjusted for actual bad weather days which total less than the number included in the tabulation.

No weather delays shall be considered for building or structure construction after the building or structure has been dried in, unless such other Work claimed to be delayed is on the critical path of the baseline schedule or approved updated schedule. This determination will be made in consultation between the Designer and Owner.

36. PAYMENTS TO CONTRACTOR

Cost Breakdown – The Contractor shall be prepared to submit a cost breakdown/schedule of values immediately after the opening of Bids. Cost breakdown shall be based on values of parts of the Work as divided according to sections of the Specifications and shall be further subdivided into labor and materials. The

Contractor shall use forms similar to the AIA G702 & G703 Forms for cost breakdown and payment requests. Other pay request forms as provided or approved by the Owner may also be used.

Applications for payment shall be submitted to the Designer for review and certification prior to submittal to the Owner for payment. Applications that have not been certified by the Designer shall be rejected by the Owner and returned to the Contractor. Designers will forward certified pay applications to the Project Manager for prompt payment. The pay application shall include the following information:

- a. Total of the contract including change orders or approved authorization requests.
- b. Value of Work completed to date.
- c. Less 5% Retainage (see additional clarification in this section).
- d. Less previous payments.
- e. Current amount due.
- f. The Contractor shall provide a sales tax statement certifying the amount of sales taxes paid for the Work provided under the contract. Manufacturers are not exempt from paying North Carolina sales taxes for providing an item directly to the City of Raleigh. If you have any questions about the sales tax requirements for the state of North Carolina, please contact the North Carolina Department of Revenue at (919) 707-0880 or (877) 252-3052. For more information concerning the applicability of Sales Tax, see Section 21 of the Supplementary General Conditions.
- g. Updated progress schedule reflecting scheduled and actual completion percentages for the overall project as well as activity progress.

As specified in G.S. 143-134.1(b), within seven (7) days of receipt of payment by the Contractor of each periodic or final payment, the Contractor shall pay its subcontractor(s) based on Work completed or service(s) provided. If any periodic or final payment to the subcontractor is delayed by more than seven (7) days after receipt of periodic or final payment by the Contractor, the Contractor shall pay the subcontractor interest, beginning on the eighth day, as a rate of one percent (1%) per month or fraction thereof on the unpaid balance as is due.

In accordance with G.S. 143-134.1(b1), no retainage on periodic or final payments made by the Owner or Contractor shall be allowed on public construction contracts in which the total project costs are less than one hundred thousand dollars (\$100,000). When the project is fifty percent (50%) complete, the Owner, with written consent from the Surety, shall not retain any further retainage from periodic payments due the Contractor, if the Contractor continues to perform satisfactorily and any nonconforming Work identified in writing prior to that time by the designer or Owner has been corrected and accepted by the designer or Owner. If the Owner determines that the Contractor's performance is unsatisfactory, the Owner may reinstate retainage.

Each pay application shall reference the Owner's assigned purchase order number.

Materials and Work Covered by Partial Payments - All materials and Work covered by progress payments shall, upon payment thereof, become the sole property of the Owner, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of materials and Work upon which payments have been made, or the restoration of any damaged Work.

37. STORED MATERIALS

In the preparation of partial estimates, the Owner **may** authorize payment for material delivered to the site and preparatory work done to be taken into consideration subject to the following requirements:

- a. The materials have been submitted and approved for use on the project.
- b. The materials are satisfactorily stored to protect the materials for their intended use.
- c. The Contractor has provided a detailed paid bill of sale or invoice that notes the type and quantity of material included on the invoice, complete with a schedule of unit price values, such that the material inventory can be tracked during installation.

The Contractor shall provide inventory control schedule with each partial payment request that reflects that type of stored material, quantity, unit prices, a schedule noting opening, used that period and ending

inventory of materials and total summary of stored material amount being requested on the partial estimate. A copy of a suitable form that may be used by the Contractor is included as an attachment.

The Contractor acknowledges that it has responsibility to insure and protect such stored materials under the terms of its bond and insurance coverage with the Owner, and to maintain such stored materials in proper condition for installation and to fulfill the contract requirements when installed. Payment for the materials as described shall constitute a transfer of title to the Owner but such transfer does not relieve the Contractor of the responsibility to inspect, safeguard and protect the stored materials until they are incorporated into the permanent work. Payment for the materials does not constitute the start of any warranty, either express or implied, as such action shall not begin until the installation is complete and the work accepted.

The Contractor shall be responsible for the safety and security of subject materials and assume all risk for loss of materials.

Materials delivered to the Contractor at locations other than the project site may also be taken into consideration if, in addition to the above, the Contractor provide evidence the materials are being stored in a secured and protected facility and environment. The location for such storage shall be approved by the Designer/Owner.

38. PAYMENTS WITHHELD

The Designer may recommend to the Owner to withhold payment for any of the following reasons:

- a. Faulty Work not corrected.
- b. The unpaid balance on the contract is insufficient to complete the Work in the judgment of the Designer.
- c. To provide for sufficient contract balance to cover liquidated damages that will be assessed.
- d. Evidence that subcontractors have not been paid.

39. SCHEDULES, REPORTS AND RECORDS

The Contractor shall submit to the Designer such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records, and other data as the Designer may request concerning Work performed or to be performed.

The Contractor shall submit to the Designer within thirty (30) days after the issuance of the Notice to Proceed schedules showing the proposed order of work, including start dates at various parts of the Work, estimated date of completion of each part; and, as applicable, the dates at which special detail drawings will be required, and respective dates for submission of Shop Drawings, the beginning of manufacture, the testing and the installation of materials, supplies and equipment. The basic project schedule shall be presented at the preconstruction meeting and no partial payments shall be made until it has been submitted to the Designer and City. The Designer shall specify acceptable scheduling or project management software programs, type of schedule methodology, either bar chart or critical path, to be utilized by the Contractor in reflecting the construction project's progress. The Contractor shall provide the schedule to the Designer and Owner electronically and in hard copy. See supplemental conditions if there are preferred scheduling software required by the Designer and/or Owner and any specific scheduling requirements.

Where a bar chart schedule is required, it shall be time-scaled in weekly increments, shall indicate the estimated starting and completion dates for each major element of Work by trade and by area, level, or zone, and shall schedule dates for all salient features, including, but not limited to the placing of orders for materials, submission of shop drawings, and other submittals for approval, approval of shop drawings by Designers, the manufacture and delivery of material, the testing and the installation of materials, supplies and equipment and all Work activities to be performed by the Contractor. The Contractor shall allow sufficient time in the schedule for all commissioning, required inspections and completion of the final punch list(s). Each Work activity will be assigned a time estimate by the Contractor. One day shall be the smallest time unit used.

Critical Path Method (CPM) schedule is required for all formal projects. The CPM schedule shall be in time-scaled precedence format. It shall be drawn or plotted with activities grouped or zoned by Work area of subcontract as opposed to random format. The CPM schedule shall be time-scaled on a weekly basis and

shall be drawn or plotted at a level of detail or logic which will schedule all salient features of the Work to be performed by the Contractor. The Contractor shall allow sufficient time in the schedule for all commissioning, required inspections, and completion of final punch list(s). Each Work activity will be assigned a time estimate by the Contractor. One day shall be the smallest time unit used.

The CPM will identify and describe each activity, state the duration of each activity, the calendar dates for the early and late start and the early and late finish of each activity, and clearly highlight all activities on the critical path. "Total float" and "free float" shall be indicated for all activities. Float time shall not be considered for the exclusive use or benefit of either the Owner or the Contractor but must be allocated in the best interest of completing the Work within the contract time. Extensions to the Contract time, when granted, will be granted only when equitable time adjustment exceeds the total float in the activity or path of activities affected by the change.

A cumulative progress-versus-time curve for the activities shall be shown. The vertical scale shall represent cumulative project progress and the horizontal scale shall represent time. Scheduled cumulative progress shall be calculated and plotted on the scale. Actual progress shall be calculated with each payment and plotted as work progresses. This project earnings curve indicating scheduled earnings vs. actual earnings shall generally be plotted and reflected as an earnings "S" curve. The Contractor shall submit this as a schedule of payments that they anticipate they will earn during the course of the Work.

The Contractor shall submit updated schedules at each monthly meeting or at the request of the Designer or Owner. If any activities are behind schedule, the Contractor must indicate in writing what measures will be taken to bring each activity back on schedule and to ensure that the contract completion date is not exceeded. A plan of action and recovery schedule shall be developed and submitted to the Designer when: (1) the Contractor's report indicates delays, that are in the opinion of the Designer or Owner, of sufficient magnitude that the Contractor's ability to complete the Work by the scheduled completion date is brought into question; or (2) the updated construction schedule is thirty (30) days behind the planned or baseline schedule and no legitimate time extensions are in process or have been approved; or (3) the Contractor desires to make changes in the logic (sequencing of Work) or the planned duration of future activities of the CPM schedule which, in the opinion of the Designer or Owner, are of a major nature. The plan of action, when requested by the Designer or Owner, shall be submitted to the Designer and Owner, within five calendar (5) days of the request. The recovery schedule, when required, shall be submitted to the Designer and Owner, within five (5) calendar days of the request.

Failure to provide updated construction schedules, plans of action, or recovery schedules, as requested or required, shall be considered grounds for rejection of pay applications.

40. CITY'S RIGHT TO TERMINATE

See the City of Raleigh Form of Contract concerning the City's right to terminate.

41. FINAL ACCEPTANCE OF WORK AND FINAL PAYMENT

Before issuing final payment, the Contractor shall promptly remove from the premises all materials condemned by the Owner's Representative or Consultant as failing to conform with the Contract, whether incorporated in the work or not, and the Contractor shall promptly replace and re-execute his own work in accordance with the Contract and without expense to the City and shall bear the expense of making good all work of other contractors destroyed or damaged by such removal or replacement.

Final Acceptance shall occur when the Designer and Owner mutually agree to accept the project from the contractor. Final acceptance of the project shall not be considered before the final inspection is conducted. Final acceptance of the project may occur prior to correction of punch list items.

Final Inspection: Upon notice from the Contractor that the Work is completed, the Designer and Owner shall make a final inspection of the Work and shall notify the Contractor of all instances where the Contractor's Work fails to comply with the Drawings and Specifications, as well as any defects discovered. Deficiencies shall be recorded on a "punch list" and the Contractor shall immediately make such alterations as are necessary to make the Work comply with the Drawings and Specifications.

Final Payment: When the Work under this Contract is completed, a final payment request shall be submitted representing the original Contract Price, cost events, and change orders to the Contract. The final payment shall not be due until the Contractor shall have completed all Work necessary and reasonably incidental to the Contract, including final clean up.

The final payment of monies or retained amount due the Contractor for the contract shall not become due until the Contractor has furnished to the Owner, through the Designer, an affidavit signed, sworn and notarized to the effect that all payments for materials, services or subcontracted work in connection with the contract have been satisfied, and that no claims or liens exist against the Contractor in connection with this contract. To the event that the Contractor cannot obtain similar affidavits from sub-contractors to protect the Contractor and the Owner from possible liens or claims against the sub-contractor, the Contractor shall state in the affidavit that no claims or liens exist against any sub-contractor to the best of (the Contractor's) knowledge, and, if any appear afterward, the Contractor shall hold and save the Owner harmless. Retainage for the final as-built drawings in the amount of one (1%) of the construction value, or \$30,000, whichever is the greater, shall be withheld until the final as-built drawing submittal has been approved.

The final payment may not be processed until the Designer has certified that the project has been completed in accordance with the contract Specifications and drawings.

Final acceptance of the Work and the making of final payment shall not constitute a waiver of any claims by the City. Payments otherwise due the Contractor, including Retainage, may be withheld by the City because of defective Work not remedied and unadjusted damage to others by the Contractor or Subcontractors, vendors or laborers.

All requests for final payment must be submitted within 60 days after the Work has been completed and accepted by the City. All requests are subject to final approval and audit by the City of Raleigh.

42. CONSTRUCTION INSPECTION

The Contractor shall maintain an adequate inspection system and perform all inspections to ensure that the work performed under this contract, including that of all subcontractors, is performed per the contract requirements. The Contractor shall maintain complete inspection records and shall make them available to the City. All work shall be conducted under the general direction of the Contractor. As referenced in Section 13, Inspection of Work by Other Parties, all work is subject to City inspection and tests at all places and at all reasonable times before final acceptance to ensure compliance with the terms of this contract. Such inspections by the City are for the benefit of the City and do not relieve the Contractor of its responsibility for providing adequate inspection and control measures for its work and the work of its subcontractors. Such inspections do not constitute any acceptance of the work by the City unless such partial acceptance is done in writing by the City and clearly indicates the scope of work that is being accepted by the City.

As stated in Section 16. Rejection of Work and Materials and Owner's Right to Do Work, the Contractor shall promptly replace or correct work, without charge, that is found to be in non-conformance with contract requirements unless, in the City's interest, the City consents to accept the work with an appropriate adjustment in the contractor price.

The Contractor shall promptly segregate and remove any rejected work or materials from the work area. If the contractor does not promptly remove or correct defective or rejected work, the City may replace or correct the work and charge the cost to the Contractor or terminate the contract for Default.

43. QUALITY CONTROL

The contractor shall develop and implement a quality control system on subject project to ensure the construction is performed per contract requirements. The quality control system shall consist of plans, procedures, and organization necessary to produce an end-product, which complies with the contract requirements. The system shall cover all construction operations, both onsite and offsite, and shall be keyed to the proposed construction sequence. The system shall also include all work performed by its' subcontractors. The Contractor's project superintendent, separate quality control manager or other designated individual will be appointed by the Contractor to be responsible for the quality of work on the job site. The

designated individual shall have the authority to require corrective action for work found to not be in compliance with the contract requirements. Deficiencies and non-conforming work shall be tracked until they have been corrected and found to be in compliance with requirements. Results of quality control inspections shall be documented on the daily report of construction.

44. DAILY REPORT OF CONSTRUCTION

The Contractor's appointed representative shall provide a daily report of construction for each day work is performed on the project. The report is a requirement of the contractor's inspection of construction requirement to ensure all work is performed in compliance with contract requirements. Failure to provide a complete and accurate daily report may result in payment being withheld until the Contractor satisfactorily demonstrates that the work has been inspected. The report, at a minimum, shall include items as noted below to adequately describe the work:

- a. List of Prime and any subcontractors at the site.
- b. Numerical count of personnel at the site by trade/craft or subcontractor.
- c. A list of all construction equipment on site.
- d. High and low temperatures, general weather conditions.
- e. Accidents (provide specific accident information reports).
- f. Meetings and significant decisions.
- g. Work performed by location, description and firm
- h. Quality control inspections, tests and records.
- i. Unusual events.
- j. Stoppages, delays, shortages, losses.
- k. Emergency procedures taken.
- l. Inspection results or requests of governing authorities.
- m. Changes received, implemented.
- n. Services connected, disconnected.
- o. Equipment or system tests and start-ups.
- p. Any partial or substantial completions, occupancies.
- q. Quantity measurements, weight tickets or invoices to document pay items.

The Contractor shall prepare a daily construction report, recording the information concerning events at the site and submit copies to the Designer or Owner, by noon of the following workday (electronic format is acceptable). Each daily report is to be certified/signed by the authorized Contractor representative as to the facts, accuracy and completeness of the information in the daily report.

The Contractor shall document construction on the project with weekly photographs. Photographs shall be digital with resolution equivalent to a 3-inch by 5-inch color photograph. Photos shall be submitted to the Owner digitally. Any information the Contractor wishes to describe regarding the progress photos shall be accompanied with a detailed description and date. As requested by the Owner, progress photos will be provided for each payment request submitted by the Contractor. Progress photos may also be provided with daily reports.

A copy of the Contractor's proposed daily report format is to be provided to the Designer or Owner for approval prior to construction.

45. GUARANTEE AND CORRECTION OF WORK

The Contractor shall guarantee all Work to have been accomplished in conformance with the Contract Documents. Neither the final payment application nor any provision of the Contract Documents, nor partial or entire occupancy or use of the Work by the City, shall constitute an acceptance of any part of the Work not done in accordance with the Contract Documents, or relieve the Contractor of liability for incomplete or faulty materials or workmanship. The Contractor shall promptly remedy any omission or defect in the Work and pay for any damage to other improvements or facilities resulting from such omission or defect which shall appear within a period as defined in the Supplemental Conditions. In the event that the Contractor should fail to make repairs, adjustments or other remedy that may be made necessary by such defects, the City may do so and charge the Contractor the cost thereby incurred.

46. DRAWINGS AND SPECIFICATIONS

At the Notice of Contract Award, the Designer will furnish the Contractor an electronic disk or similar electronic file containing all technical contract documents. This file will include a complete set of drawing files and technical specification files which have all amendments incorporated. The disk will contain drawing files in CAD format and technical specifications in PDF format.

The electronic CAD files and the PDF files are being provided for the Contractor's use in printing hard copies of contract documents. In addition, native CADD files are provided in accordance with "AS-BUILT DOCUMENTS" paragraph for the Contractor's use in developing and maintaining as-built plans.

The Contractor shall:

- a. Check all drawings furnished immediately upon receipt;
- b. Compare all drawings and verify the figures before laying out the work;
- c. Promptly notify the Designer and City of any discrepancies;
- d. Be responsible for any errors which might have been avoided by complying with paragraphs above;
- e. Reproduce and print contract drawings and specifications as needed;
- f. Maintain, in readable condition at the job office, one complete set of permitted working drawings and specifications for the work, including all approved shop drawings, bulletins, architect's supplemental instructions, with such drawings and specifications made available for use by the Designer and City; and,
- g. Maintain at the job office, a day-to-day, "as-built" record of work-in-place that is at variance with the contract documents as required in the As-Built Drawing provision of the specification.

Omissions from the drawings or specifications or the inaccurate description of details of work which are manifestly necessary to carry out the intent of the drawings and specifications, or that are customarily performed, shall not relieve the Contractor from performing such omitted or inaccurate described details of the work. The Contractor shall perform such details as if fully and correctly set forth and described in the drawings and specifications.

47. DIFFERING SITE CONDITIONS

Should the Contractor encounter subsurface or latent conditions, or both, at the site, materially differing from those shown on the drawings or indicated in the specifications or differing materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in this Agreement, the Contractor shall immediately, and in no event later than ten (10) days later, give notice to the Designer/Owner of such conditions before they are disturbed. The Designer and Owner shall thereupon promptly investigate the conditions and if they find that they materially differ from those shown on the drawings or indicated in the specifications, they shall at once make such changes in the drawings and/or specifications as they may find necessary. Any increase or decrease in the Cost of the Work resulting from such changes shall be adjusted in the manner provided herein for adjustments as to extra and/or additional Work and changes. However, neither the Owner nor the Designer shall be liable or responsible for additional Work, costs or changes to the Work that should have been reasonably determined from any geotechnical, soils and other reports, surveys and analyses made available for the Contractor's review or that should have been reasonably discovered by the Contractor through site observations or through the performance of its obligations pursuant to this Agreement.

48. VARIATIONS IN ESTIMATED QUANTITIES

If the quantity of a unit-priced item in this contract is an estimated quantity and the actual quantity of the unit-priced item varies more than fifteen (15) percent above or below the estimated quantity, an equitable adjustment in the contract price for such item shall be made upon demand of either party. The equitable adjustment shall be based upon any increase or decrease in costs due solely to the variation above 115 percent or below 85 percent of the estimated quantity. If the quantity variation is such as to cause an increase in the time necessary for completion, the Contractor may request, in writing, an extension of time, to be received by the Designer/Owner within ten (10) days from the beginning of the delay. Upon the receipt of a written request

for an extension, the Designer/Owner shall ascertain the facts and, if justified, make an adjustment for extending the completion date.

49. WARRANTY OF CONSTRUCTION

The Contractor shall unconditionally warrant materials and workmanship against defects arising from faulty materials, faulty workmanship or negligence for a period of twelve (12) months following the date of final acceptance of the work or date of beneficial occupancy and shall replace such defective materials or workmanship without cost to the Owner.

If the Owner takes possession of any part of the work before final acceptance, this warranty shall continue for a period of one (1) year from the date the Owner takes possession.

The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to owned or controlled real or personal property, when that damage is the result of--

- a. The Contractor's failure to conform to contract requirements; or
- b. Any defect of equipment, material, workmanship, or design furnished.

The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for 1 year from the date of repair or replacement. Refer to CSI specification sections for additional building system warranty requirements.

The Owner shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect, or damage. If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the Owner shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall—

- a. Obtain all warranties that would be given in normal commercial practice;
- b. Require all warranties to be executed, in writing, for the benefit of the Owner,
- c. Enforce all warranties for the benefit of the Owner, if directed by the Owner.

Where items of equipment or material carry a manufacturer's warranty, or an extended warranty required by the specifications, for any period in excess of twelve (12) months, then the manufacturer's warranty or extended warranty shall apply for that piece of equipment or material. The Contractor shall replace such defective equipment or materials, without cost to the Owner, within the manufacturer's warranty period.

Additionally, the Owner may bring an action for latent defects caused by the negligence of the Contractor for defects which are hidden or not readily apparent to the Owner at the time of beneficial occupancy or final acceptance, whichever occurred first, in accordance with applicable law.

50. CONTRACTOR EVALUATION

The Contractor's overall Work performance on this project shall be fairly evaluated by the Owner and the Designer. The Contractor's performance shall be used by the City in the evaluation of the responsible standard of future bids for which the Contractor has submitted. In addition to the final evaluation, interim evaluations may be prepared during the progress of the project. The Owner may also request the Contractor's comments to evaluate the Designer's performance. Copies of all evaluations will be sent to the Contractor's surety.

51. CONTRACT CLOSEOUT ACTIVITIES

Contract closeout activities such as, but not limited to, providing Operation and Maintenance manuals, conducting all Owner training, providing final as-built record drawings, conducting warranty completion requirements, providing equipment warranty completion, final shop drawing submittals, removal of temporary

construction facilities and final cleaning are subsidiary activities of the contract work. Separate payment will not be made for any activity unless otherwise specified. Final contract payment will not be made until completion and approval of all contract closeout activities. The following checklist should be used as a guide in completing contract closeout activities.

SPECIAL SUPPLEMENTARY CONDITIONS

INDEX TO SPECIAL SUPPLEMENTARY CONDITIONS

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19	Final Cleaning	SGC-7
20	Submission of Operations and Maintenance Data	SGC-7
21	Sales Tax	SGC-8

1. PROJECT TIME & DAMAGES

The Contractor shall commence work to be performed under this agreement on a date to be specified in writing from the City and shall fully complete all work hereunder within 120 Consecutive Calendar Days.

2. EMERGENCY CONTACTS

The Contractor shall provide by letter names, telephone numbers and addresses of two responsible company representatives prior to beginning work. These two representatives are to be capable and authorized to respond to emergencies, so which arise during the project, nights, holidays or week-ends. The Contractor, by submitting these person's names, certifies that at least one representative will be available for on call emergency response at all times.

3. OPERATIONS OF OWNER'S FACILITIES

The Contractor agrees that all Work done under the Contract Documents shall be carried on in such a manner so as to ensure the regular and continuous operation of the adjoining or adjacent facilities. The Contractor further agrees that the sequence of operations under the Contract Documents shall be scheduled and carried out so as to ensure said regular and continuous operation. The Contractor shall not close any areas of construction until so authorized by the Owner. The Contractor shall control his operations and those of his Subcontractors and all suppliers, to assure the least inconvenience to the public. Under all circumstances, safety shall be the most important consideration.

- (b) The Owner will occupy the site and existing building during construction except as herein noted. Cooperate with the Owner to minimize conflicts and facilitate owner usage. Perform the work so as not to interfere with the Owner's operations.
- (c) The Owner reserves the right to occupy and place and install equipment in selected construction areas prior to Substantial Completion without accepting the Work in total.

4. PRECONSTRUCTION PHOTOS/VIDEO

The Contractor shall document pre-existing conditions on the project site and submit the photos / video in electronic format. The intent of these photos / video is to document the project conditions such as the pavement and driveways; the condition of the curb & gutter; the condition of the adjoining site boundary; installed improvements and drainage; the condition of the grassing; the condition of any structures and other improvements prior to the start of construction.

The Contractor may also include any pre-existing conditions it wants brought to the attention of the Designer and Owner by including notes and time position on the index sheet. The documentation must be submitted before mobilization to the site.

5. SANITARY FACILITIES

The Contractor shall furnish, install, and maintain ample sanitary facilities for the workers. As the needs arise, a sufficient number of enclosed temporary toilets shall be conveniently placed as required by the sanitary codes of the State and City of Raleigh. Drinking water shall be provided from an approved source, so piped or transported as to keep it safe and fresh and served from single service containers or satisfactory types of sanitary drinking stands or fountains. All such facilities and services shall be furnished in strict accordance with existing and governing health regulations. No separate payment will be made for providing these

6. MATERIAL TICKETS

For all work to be paid based on the basis of a material quantity, the Contractor shall turn in all material tickets from the source of supply for the purpose of payment to the Owner on a daily basis. Such tickets shall be totaled by the Contractor and included on the Contractor's daily report of construction.

7. UTILITY LOCATES

Utilities as shown on the plans are intended to represent general locations only. It shall be the responsibility of the Contractor, prior to construction, to contact appropriate utility companies and utility locates and precisely locate any utilities (both horizontally and vertically) which could be affected by the proposed construction. The Contractor shall be responsible for repair of any damage to the utilities as well as any other damage which may be caused due to the disturbance of the utilities.

If required for construction, the Contractor shall dig sample hand holes to uncover the utility. The digging of sample hand holes shall be coordinated with the Designer and Owner who assist the Contractor to determine the number and location of such holes. There is no line item to pay for such located work, this work is considered incidental to other pay items.

8. NCDOT ENCROACHMENT

On State maintained roads, the NCDOT will issue an encroachment agreement for the project. If encroachment agreement has not been issued at the time of bid opening, the Contractor will be required to incorporate all NCDOT standard encroachment requirements in the base bid for the various items in the contract. No separate payment will be made for work required in accordance with the standard encroachment agreement. Any major deviations from the approved plans and specifications required to comply with the final encroachment agreement will be identified by Addendum before bids are opened, or by change order after contract award, if required.

9. EROSION CONTROL MAINTENANCE AND CONSTRUCTION METHODS

The provisions and requirements of the erosion control permit will be in accordance with City and State standards and specifications for soil erosion and sediment control. Soil erosion control measures shall be installed as described prior to any land disturbing work being done. All erosion control measures must be maintained so that they prevent soil erosion and sediment losses throughout the project, and will remain in place until the denuded areas are stabilized and the permanent seed has germinated. The entrapped sediment from all temporary measures shall be removed before 50% of the original sediment storage capacity has been depleted.

The Contractor shall schedule and conduct construction activities in a manner that will minimize soil erosion and the resulting sedimentation and turbidity of surface waters. The Contractor shall comply with the requirements herein regardless of whether or not a National Pollution Discharge Elimination System (NPDES) permit for the work is required.

Should the Contractor propose to utilize construction methods (such as temporary structures or fill in waters and/or wetlands for haul roads, work platforms, cofferdams, etc.) not specifically identified in the permit (individual, general, or nationwide) authorizing the project it shall be the Contractor's responsibility to coordinate with the Designer to determine what, if any, additional permit action is required. The Contractor shall also be responsible for initiating the request for the authorization of such construction method by the permitting agency. The request shall be submitted through the Designer. The Contractor shall not utilize the construction method until it is approved by the permitting agency.

10. CITY OF RALEIGH STANDARDS

Any work defined to follow the City of Raleigh Standards shall follow the appropriate City of Raleigh Specifications. These are available from the City or Raleigh website.

11. ESTIMATED QUANTITIES

Contract prices submitted by the Contractor in the Proposal shall be full compensation for all labor, materials, equipment, tools, specialties, and incidentals necessary for the Contractor to fully complete the Work as shown on the Drawings and specified in the Contract Documents to be performed under this Contract.

Estimated quantities stipulated in the Proposal or other parts of the Contract Documents are solely for the purpose of comparing the bids received for the Work and determining an initial contract price.

- ☐ The actual quantities of work done and materials furnished can differ from the estimated quantities shown in the Proposal.
- ☐ The final contract price will be based upon the final quantities of pay items incorporated into the Work adjusted by these Contract Documents.

The method of measurement and computations used in determining the quantity of the various pay items incorporated into the work will be those methods generally recognized as accepted engineering practice. Adjustments in unit price or time for variations in quantities are subject to the Contract General Provisions entitled Variations in Estimated Quantity.

Any work required for which an estimated quantity and unit price has not been provided in the Contract Documents shall be considered incidental and separate payment will not be provided.

12. TEMPORARY CONSTRUCTION FACILITIES

The Contractor shall prepare a site plan indicating the proposed location and dimensions of any area to be fenced and used by the Contractor for temporary office area, the number of trailers to be used, avenues of egress to the fenced area and details of the fence installation. Temporary utility services shall also be located on the plan. Any areas which may have to be graveled to prevent the tracking of mud and location of any construction entrances shall also be identified. The Contractor shall also indicate if the use of a supplemental, material storage or other staging area is desired.

The Contractor shall, at its own expense, construct access and haul roads necessary for proper prosecution of the work under this contract. The Contractor shall provide necessary lighting, signs, barricades, and distinctive markings for the safe movement of traffic. The method of dust shall be adequate to ensure safe operation at all times.

The Contractor shall be responsible for the security of its own facilities and equipment. In addition, the contractor shall notify the appropriate law enforcement agency of any requested periodic security checks of the temporary project field office. Areas used by the Contractor for the office area and storage of equipment or material, or other use, shall be restored to the original or better condition.

13. BULLETIN BOARD AND PROJECT SIGN

The Contractor shall install, in a conspicuous location, the project bulletin board immediately upon beginning of work under this contract. The board shall provide a weatherproof glass-covered bulletin board not less than 36 by 48 inches in size, for displaying the equal employment opportunity

poster, any wage decision and wage rates that may be required by the contract, safety and emergency contact information and other information.

If a project sign is required, the Contractor shall furnish, erect, and maintain the project sign in the location approved by the Designer and Owner. Upon completion of work under this contract, the bulletin board and project sign shall be removed from the job site and shall remain the property of the contractor.

14. MOBILIZATION AND DEMOBILIZATION (if used based on project specifications)

The total cost bid for mobilization and de-mobilization, when a unit price is provided for in the bid proposal form, is not to exceed five (5) percent of the total contract bid. All costs for mobilization and de-mobilization shall be included in the contract unit price. There shall be no additional compensation for mobilization and no adjustments to the unit prices based on changes in the scope of work, including, but not limited to, any additions to the work on the contract. The Contractor will be paid in increments based on the status of the actual mobilization effort up to seventy-five (75) percent of the total bid cost. An amount equal to twenty-five (25) percent of the total mobilization cost shall be withheld until the completion of punch-list items and removal of all equipment and temporary construction for project demobilization is complete. the breakdown of this bid item is as follows:

Mobilization – Equal installments to reflect	-	a total of 75%
Demobilization and completion of punch list	-	a total of 25%
Total		100%

Any amount that the contractor has bid in excess of the amount noted above will be retained by the Owner and paid on the final payment estimate.

15. TRAFFIC CONTROL

Work and access may be restricted as noted in the contract. Work hours may vary depending on traffic conditions and constraints. Traffic control plans may be required as required in the contract. Notice may be required to Wake County, City or NCDOT.

It is the Contractor's responsibility to provide all necessary traffic control and signage and provide for maintenance of traffic for the work associated with this project. The cost for this work is to be included in the bid item included in the contract or in the existing unit prices or contract amount if no bid item is included. Traffic control shall be provided in accordance with the current edition of the Manual of Uniform Traffic Control Devices and appropriate City and NCDOT requirements.

16. MAINTENANCE OF AS-BUILT RECORD DRAWINGS

Absent of a more specific contract requirement elsewhere in the Contract Documents, the contractor shall maintain and mark-up a reproducible set of prints at the project site to show as-built conditions. This set of prints shall become the record drawings and shall be kept current and available for review by the Designer and Owner at all times. All changes from the contract drawings which are made in the work, or additional information which might be uncovered during the construction, including uncharted utilities, shall be accurately and neatly recorded as they occur by means of details and notes to the drawings. All changes and/or required additions to the preliminary record drawings shall be clearly identified in a contrasting color and which is compatible with reproduction of the preliminary record drawings.

The record drawings shall be updated by no less frequently than weekly during the construction. Measurements shall be shown for all change of direction points and all surface or underground components such as valves, manholes, drop inlets, cleanouts, meter, etc. The general depth range of

each underground utility line shall be shown or installation detail referenced (i.e., 3 to 4 feet in depth). The description of exterior utilities includes the actual quantity, size, and material of utility lines. Any request for information and / or Designer instructions that depict revisions to the record drawings shall be identified.

The correct grade or alignment of roads, structures or utilities if any changes were made from contract drawings shall be noted. Correct elevations, if changes were made in site grading, shall be noted. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor, including but not limited to fabrication, erection, installation plans and shop drawings shall be noted. The location and dimensions of any changes within the building or structure shall be noted.

As a condition of each payment request, the Contractor and Designer shall verify that as built drawing conditions are being maintained. If the Contractor fails to maintain the as-built drawings as required herein, the Owner may deduct an amount representing the estimated monthly cost of maintaining the as-built drawings from the monthly progress payment.

17. RECORD DRAWINGS FOR SUBSTANTIAL COMPLETION

The Contractor shall provide a marked-up copy of the currently maintained set of record drawings to the Designer for review prior to scheduling the substantial completion inspection. The Designer shall verify that the submitted drawings provide sufficient information for the Owner to adequately operate and maintain the project until the final approved set of as built drawings are provided. If acceptable, at the time of the substantial completion inspection, the Contractor shall deliver a copy of these record drawing for the Owner's use until the final approved as-built record drawings are provided.

18. FINAL CLEANING

Final cleaning of the premises shall be left broom clean. Stains, foreign substances, and temporary labels shall be removed from surfaces. carpet and soft surfaces shall be vacuumed. equipment and fixtures shall be cleaned to a sanitary condition. Filters of operating equipment shall be replaced. Debris shall be removed from roofs, drainage systems, gutters, and downspouts. Paved areas shall be swept and landscaped areas shall be raked clean. The site shall have waste, surplus materials, and rubbish removed. The project area shall have temporary structures, barricades, project signs, and construction facilities removed. A list of any uncompleted clean-up items shall be submitted on the day of final inspection.

19. SUBMISSION OF OPERATIONS AND MAINTENANCE DATA

Absent of a more specific contract requirement elsewhere in the Contract Documents, the contractor shall submit Operation and Maintenance (O&M) Data specifically applicable to this contract. The Contractor shall provide a complete and concise depiction of the provided equipment, product, or system. Organize and present information in sufficient detail to clearly explain O&M requirements at the system, equipment, component, and subassembly level. Include an index preceding each submittal.

The format of the O&M Data shall general follow the following outline and include sufficient information to adequately depict the information:

- a. Safety Precautions of the Equipment
- b. Normal Operation Procedures
- c. Emergency Operations procedures.
- d. Environmental conditions specific for the equipment
- e. Required lubrication data
- f. Preventive maintenance plan and schedule for the equipment

- g. Troubleshooting guides and diagnostic techniques to be used
- h. Wiring diagrams and control diagrams
- i. Maintenance and repair procedures
- j. Removal and replacement instructions
- k. Spare parts and source of supply list
- l. Completed warranty information
- m. Testing equipment and special tools required shall be provided
- n. Installing contractor information.

The Contractor O&M data shall include a list that includes the name, address, and telephone number of the general contractor and each subcontractor who installed the product or equipment, or system. For each item, also provide the name address and telephone number of the manufacturer's representative and service organization most convenient to the project site. Adequate training shall be provided to the Owner to properly operate and maintain the equipment. O&M Data shall be available to the Owner for reference during the training.

20. SALES TAX

North Carolina Sales Tax and Use Tax and Local Option Sales and Use Tax do apply to materials entering into Municipal Work (N.C. Sales and Use Tax Regulations No. 42 & 57, Paragraph A), and such costs shall be included in the bid proposal and contract sum.

The procedures for reporting sales taxes paid by the contractor are as follows:

- a. It shall be the general contractor's responsibility to furnish the owner documentary evidence showing the materials used and sales tax paid by the general contractor and each of his sub-contractors and where paid. Any county sales tax included in the contractor's statements must be shown separately from the state sales tax. If more than one county is shown, each county shall be listed separately.
- b. The documentary evidence shall consist of a certified statement, by the general contractor and each of his subcontractors individually, showing total purchases of materials from each separate vendor and total sales taxes by each county paid each vendor. The certified statement must show the invoice number (s) covered and inclusive dates of such invoices. State sales tax shall be listed separately from county sales tax. If more than one county is shown, each county shall be listed separately.
- c. Materials used from general contractor's or sub-contractor's warehouse stock shall be shown in a certified statement at warehouse stock prices.
- d. The general contractor shall not be required to certify the sub-contractor's statements.
- e. The documentary evidence to be furnished to owners eligible for sales or use tax refunds covers sales and or use taxes paid on building materials used by contractors and sub-contractors in the performance of contract with churches, orphanages, hospitals not operated for profit and other charitable or religious institutions or organizations not operated for profit and, incorporated cities, towns, and counties in this State. The documentary evidence is to be submitted to the above-named institutions, organizations and governmental units to be included in claims for refunds to be prepared and submitted by them to obtain refunds provided by G. S. 105-164.14 (2) and (3) of the 1961 Statute and is to include the purchases of building materials, supplies, fixtures and equipment which become a part of or annex to buildings, or structures being erected, altered or repaired under contract with such institutions, organizations, or governmental units.

- f. The contractor is advised that all requests for payment, partial or final, for work completed under this contract must include a sales tax report submitted in accordance with the procedures outlined above.

PROCEDURE FOR REPORTING NORTH CAROLINA SALES TAX EXPENDITURES ON CITY OF RALEIGH CONTRACTS

1. The following procedure in handling the North Carolina Sales Tax is applicable to this project. Contractors shall comply fully with the requirements outlined hereinafter, in order that the owner may recover the amount of the tax permitted under the law.

2.(a) It shall be the general contractor's responsibility to furnish the owner documentary evidence showing the materials used and sales tax paid by the general contractor and each of his subcontractors. Any county sales tax included in the contractor's statements must be shown separately from the state sales tax. If more than one county is shown, each county shall be listed separately.

(b) The documentary evidence shall consist of a certified statement, by the general contractor and each of his subcontractors individually, showing total purchases of materials from each separate vendor and total sales taxes by each county paid each vendor. The certified statement must show the invoice number (s) covered and inclusive dates of such invoices. State sales tax shall be listed separately from county sales tax. If more than one county is shown, each county shall be listed separately.

(c) Materials used from general contractor's or subcontractor's warehouse stock shall be shown in a certified statement at warehouse stock prices.

(d) The general contractor shall not be required to certify the subcontractor's statements.

(e) The documentary evidence to be furnished to owners eligible for sales or use tax refunds covers sales and/or use taxes paid on building materials used by contractors and subcontractors in the performance of contracts with churches, orphanages, hospitals not for profit, educational institutions not operated for profit and other charitable or religious institutions or organizations not operated for profit and incorporated cities, towns and counties in this State. The documentary evidence is to be submitted to the above-named institutions, organizations and governmental units to be included in claims for refunds to be prepared and submitted by them to obtain refunds provided by G.S. 105-164.14 and is to include the purchase of building materials, supplies, fixtures and equipment which become a part of or annexed to buildings or structures being erected, altered or repaired under contracts with such institutions, organizations or governmental units.

3. The contractor or contractors to whom an award is made on this project will be required to follow the procedure outlined above.

4. The contractor is advised that all requests for payment, partial or final, for work completed under this contract must include a sales tax report submitted in accordance with the procedures outlined above.

North Carolina Sales Tax
(Paid During This Estimate Period)

Project: _____ Project Location: _____ County: _____ Estimate No: _____

Contractor: _____ Period Ending: _____

Date	Vendor	Invoice Number	Invoice Amount	State Tax	County Tax	Transit Tax	Total Tax	County
TOTALS								

I certify that the above listed vendors were paid sales tax upon purchases of building materials during the period covered by the construction estimate, and the property upon which such taxes were paid with or will be used in the performance of this contract. No tax on purchases or rentals of tools and/or equipment is included in the above list. All of the material above became a part of or is annexed to the building or structure being erected, altered or repaired.

_____ County, North Carolina

Signed and sworn to (or affirmed) before this day by:

(name of principal)

(signature of principal)

Date: _____
Notary Public's Signature

(Notary's printed or typed name, Notary Public)

(Official Seal) My commission expires: _____

Exhibit A

Exhibit A IFB Document Drawings for Informal Construction Bid #**274-2027-RCPAC-02**.



Architect of Record

HANBURY

www.hanbury.design
310 S. West Street, Suite 100
Raleigh, NC 27603
+1 919 301 0202

Owner



Consultants

Structural & MEP Engineer

Kimley»Horn

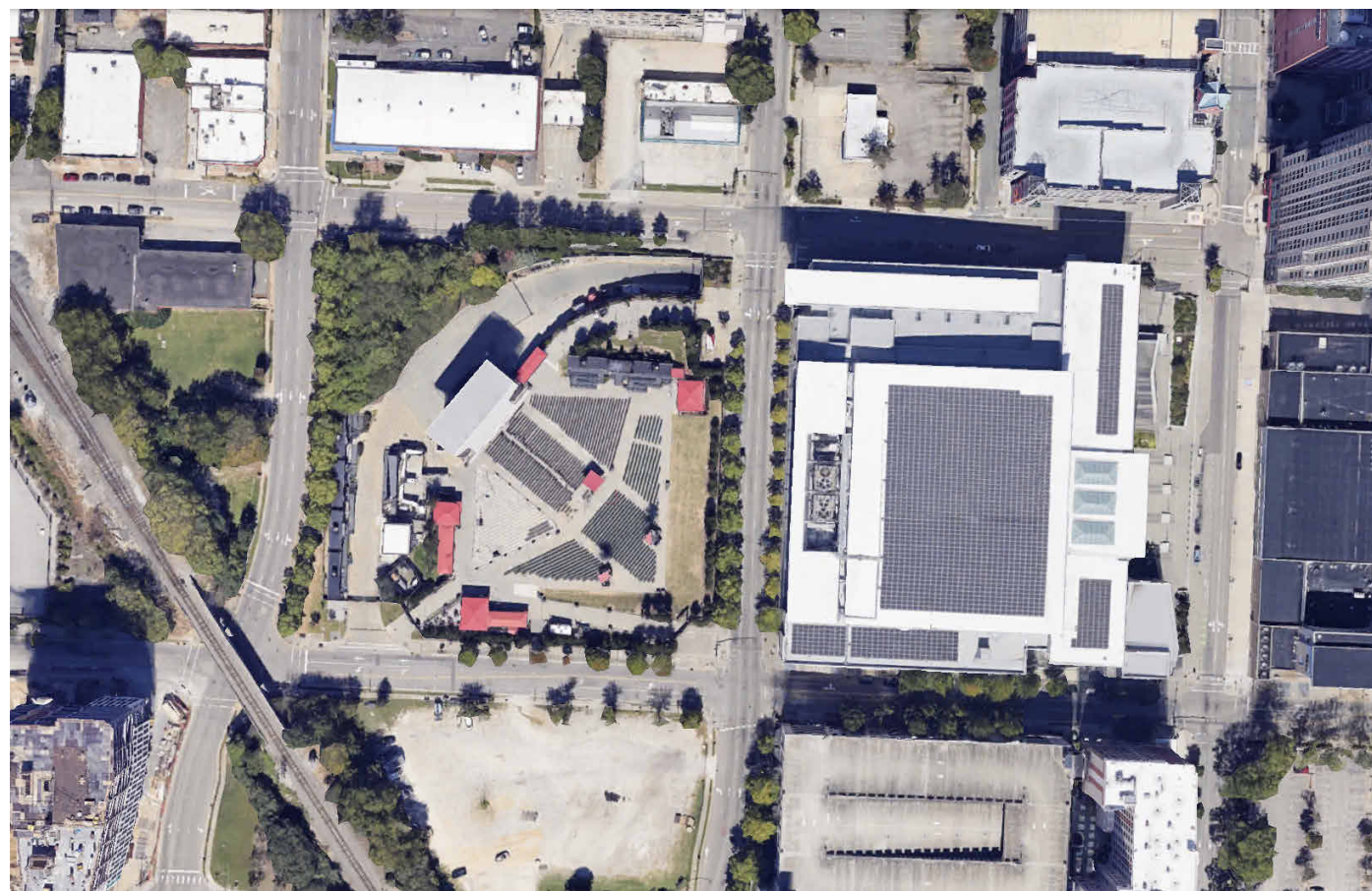
Kimley-Horn CONTACT: Ethan Hill, P.E.
421 Fayetteville St., Suite 600
Raleigh, NC 27601
919.677.2060 www.kimley-horn.com

Building Envelope



CDC, Inc. CONTACT: Jonatan Zaga Viveros
911 Paverstone Drive, #A
Raleigh, NC 27615
919.741.3085 www.cdc-usa.com

Vicinity Map



INDEX OF DRAWINGS

SHEET NUMBER	SHEET NAME
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Architecture	
A102	LEVEL 04 MECHANICAL MEZZANINE - NEW WORK PLAN
A103	ROOF PLAN
A104	ROOF PLAN - SCOPE OF WORK
A105	ROOF LEVEL - PHOTO ORIENTATION PLAN
A201	EXTERIOR ELEVATIONS MECHANICAL MEZZANINE
A202	EXTERIOR ELEVATIONS
A301	BUILDING SECTIONS
A501	MECHANICAL MEZZANINE GUTTER & RELATED PHOTOS
A502	ROOF DETAILS
A503	ROOF DETAILS
A504	ROOF DETAILS
Plumbing	
P000	PLUMBING SYMBOLS, ABBREVIATIONS, AND NOTES
P001	PLUMBING SPECIFICATIONS
P103	ROOF PLAN - PLUMBING
P700	PLUMBING DETAILS

Document

Construction Documents

Issue Date

September 22, 2026

CITY OF RALEIGH -
CONVENTION CENTER
ROOF REPAIRS PHASE 1

RALEIGH, NORTH CAROLINA

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ABBREVIATIONS

ABBREVIATION	WORD / PHRASE
ACC	ACCESSIBLE
ACP	ACOUSTIC CEILING PANEL
ACT	ACOUSTIC CEILING TILE
ADA	AMERICANS WITH DISABILITIES ACT
AFF	ABOVE FINISH FLOOR
ALUM	ALUMINUM
B	BASE
BES	BUILDING EXPANSION JOINT
BLDG	BUILDING
BLKG	BLOCKING
C	C
CAB	CABINET
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
CFOI	CONTRACTOR FURNISHED OWNER INSTALLED
CIP	CAST IN PLACE
CJ	CONTROL JOINT
CL	CENTERLINE
CLG	CEILING
CLR	CLEAR
CMD	CORRUGATED METAL DECK
CMP	COMPOSITE METAL PANEL
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONT	CONTINUOUS
COORD	COORDINATE
CPT	CARPET
CSMU	CALCIUM SILICATE MASONRY UNIT
DBL	DOUBLE
DEMO	DEMOLISH / DEMOLITION
DIA	DIAMETER
DIAG	CORRUGATED METAL DECK
DIM	DIMENSION
DN	DOWN
DP	DECORATIVE PANEL
DR	DOOR
DTL	DETAIL
DWG	DRAWING
EA	EACH
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATION OR ELEVATOR
EPDM	ETHYLENE PROPYLENE DIENE TERPOLYMER
EQ	EQUAL
ERTS	EMERGENCY RESPONSE TELEPHONE SYSTEM
EXT	EXTERIOR
F	FLOOR
FAB	FABRIC
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FLR	FLOOR
FRP	FIBER REINFORCED PANEL
FRT	FIRE RETARDANT TREATED
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GL	GLASS / GLAZING
GWB	GYPSUM WALL BOARD
GYP BD	GYPSUM WALL BOARD
HC	HOLLOW CORE
HEWV	HANBURY, EVANS, WRIGHT, VLATTAS
HIR	HEARING IMPARED ROOM
HORIZ	HORIZONTAL
HPDL	HIGH PRESSURE DECORATIVE LAMINATE
HR	HOURS
HT	HEIGHT

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ABBREVIATIONS

ABBREVIATION	WORD / PHRASE
IMP	INSULATED METAL PANEL
INSUL	INSULATED / INSULATION
INT	INTERIOR
LP	LEATHER PANEL
LVT	LUXURY VINYL TILE
MAX	MAXIMUM
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MIN	MINUTES
MR	MIRROR
MTL	METAL
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
OA	OVERALL
OC	ON CENTER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED
OH	OVERHANG
OPP	OPPOSITE / OPPOSITE HAND
PART	PARTIAL
PJ	PANEL JOINT
PL	PLASTIC LAMINATE
PLY	PLYWOOD
PNT	PAINT
PT	PORCELAIN TILE
PT	PRESSURE TREATED
RBR	RUBBER
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REQD	REQUIRED
RF	RESILIENT FLOORING
RM	ROOM
RO	ROUGH OPENING
SC	SOLID CORE
SCHED	SCHEDULE
SD	SMOKE DETECTOR
SEP	SEPARATION
SIM	SIMILAR
SS	SPECIFICATION
SPK	SPRINKLER
SS	SOLID SURFACE
SSTL	STAINLESS STEEL
ST	STONE
STC	SOUND TRANSMISSION COEFFICIENT
STRUC	STRUCTURE / STRUCTURAL
T	TRIM
T&G	TONGUE & GROOVE
TEL / TELE	TELECOMMUNICATIONS / TELEPHONE
TLT	TOILET
TO	TOP OF
TOC	TOP OF CONCRETE
TOS	TOP OF STEEL
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
VIF	VERIFY IN FIELD
W	WALL
W/	WITH
WC	WALL COVERING
WD	WOOD
WOM	WALK OFF MAT
WT	WINDOW TREATMENT
WV	WOOD VENEER
YALL	YOU ALL

4

SYMBOLS

5A

2B

A141

4C

3D

SHEET WHERE ELEVATION IS LOCATED

5A

2B

A141

4C

3D

EXTERIOR ELEVATION NUMBER

5A

2B

A141

4C

3D

BUILDING SECTION NUMBER

5A

2B

A141

4C

3D

SHEET WHERE SECTION IS LOCATED

5A

2B

A141

4C

3D

WALL SECTION NUMBER

5A

2B

A141

4C

3D

SHEET WHERE SECTION IS LOCATED

5A

2B

A141

4C

3D

CALLOUT NUMBER

5A

2B

A141

4C

3D

SHEET WHERE CALLOUT IS LOCATED

5A

2B

A141

4C

3D

SHEET WHERE ELEVATION IS LOCATED

5A

2B

A141

4C

3D

INTERIOR ELEVATION NUMBER

5A

2B

A141

4C

3D

STAIR SECTION NUMBER

5A

2B

A141

4C

3D

SHEET WHERE SECTION IS LOCATED

5A

2B

A141

4C

3D

CASEWORK ELEVATION NUMBER

5A

2B

A141

4C

3D

SHEET WHERE ELEVATION IS LOCATED

5A

2B

A141

4C

3D

CASEWORK SECTION NUMBER

5A

2B

A141

4C

3D

SHEET WHERE SECTION IS LOCATED

5A

2B

A141

4C

3D

DELTA TRUE NORTH

5A

2B

A141

4C

3D

PROJECT NORTH

5A

2B

A141

4C

3D

ROOM NAME

5A

2B

A141

4C

3D

ROOM NUMBER

5A

2B

A141

4C

3D

CENTERLINE OF SHEAR WALL

5A

2B

A141

4C

3D

WITH LETTER OR NUMBER INDICATES CENTERLINE OF COLUMN

5A

2B

A141

4C

3D

STC RATING (IF APPLICABLE)

5A

2B

A141

4C

3D

PARTITION TYPE

5A

2B

A141

4C

3D

HEIGHT IN INCHES

5A

2B

A141

4C

3D

PARTITION TYPE (PARTIAL HEIGHT)

5A

2B

A141

4C

3D

CEILING TYPE

5A

2B

A141

4C

3D

HEIGHT AFF

5A

2B

A141

4C

3D

DOOR MARK

5A

2B

A141

4C

3D

WINDOW TYPE

5A

2B

A141

4C

3D

KEYNOTE

5A

2B

A141

4C

3D

FURNITURE TYPE

5A

2B

A141

4C

3D

CASEWORK TYPE

5A

2B

A141

4C

3D

ROOM FINISH LOCATION

5A

2B

A141

4C

3D

ROOM FINISH TYPE

5A

2B

A141

4C

3D

TOILET / BATHING ACCESSORY TYPE

5A

2B

A141

4C

3D

FINISH TYPE

3

SHEET NUMBERS

A001

DISCIPLINE

G = GENERAL
B = GEOTECHNICAL / ENVIRONMENTAL
D = DEMOLITION SERIES
C = CIVIL
L = LANDSCAPE
A = ARCHITECTURAL / INTERIORS
I = INTERIORS
S = STRUCTURAL
F = FIRE PROTECTION
P = PLUMBING
M = MECHANICAL / HVAC
E = ELECTRICAL
X = OTHER

VIEW TYPE

0 = GENERAL / SCHEDULES
1 = PLANS
2 = EXTERIOR ELEVATIONS & DETAILS
3 = OVERALL BUILDING & EXTERIOR WALL SECTIONS
4 = ENLARGED PLANS
5 = INTERIOR ELEVATIONS & CASEWORK
6 = DETAILS

SHEET SEQUENCE

VIEW TYPE MODIFIER

0 = DEMOLITION PLANS (OPTIONAL)
1 = FLOOR PLANS
2 = REFLECTED CEILING PLANS
3 = FINISH PLANS
4 = FF&E PLANS

2

GENERAL NOTES

DEFINITION: THE TERM "DESIGN PROFESSIONAL" MEANS "ARCHITECT," "PROFESSIONAL ENGINEER," "INTERIOR DESIGNER" OR OTHER PARTY RESPONSIBLE FOR PROVIDING DESIGN SERVICES AS APPROPRIATE.

- ALL WORK TO CONFORM TO LOCAL CODES, ORDINANCES, AND REGULATIONS.
- VERIFY ALL EXISTING CONDITIONS WITHIN THE SCOPE OF WORK AREA.
- VERTICAL DIMENSIONS ARE FROM "FLOOR LINE" UNLESS OTHERWISE NOTED. REFER TO ELEVATIONS & SECTIONS FOR "FLOOR LINE" DATUMS.
- EXTERIOR DIMENSIONS ARE TO FACE OF FINISH OR COLUMN CENTERLINE UNLESS NOTED OTHERWISE. HORIZONTAL DIMENSIONS FOR EXISTING CONSTRUCTION ARE FROM FACE OF EXISTING FINISHED SURFACE.
- DO NOT SCALE DRAWINGS. WRITTEN DIMENSIONS GOVERN. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD AND NOTIFY DESIGN PROFESSIONAL OF ALL DISCREPANCIES AND OBTAIN CLARIFICATION BEFORE CONTINUING WITH CONSTRUCTION.
- THE GENERAL CONTRACTOR IS RESPONSIBLE FOR VERIFYING AND COORDINATING WITH ALL TRADES. THE SIZE AND QUANTITY OF ALL OPENINGS FOR MECHANICAL, ELECTRICAL, AND PLUMBING EQUIPMENT, EQUIPMENT CURBS, RAILS OR OTHER SUPPORTING ELEMENTS. COORDINATION DRAWINGS FOR ALL TRADES WORK SHALL BE SUBMITTED BY THE GENERAL CONTRACTOR BEFORE COMMENCING WITH WORK. ALL CONCERNS, SPATIAL LIMITATIONS, OR STRUCTURAL CONFLICTS SHALL BE IMMEDIATELY SUBMITTED TO THE DESIGN PROFESSIONAL FOR RESOLUTION PRIOR TO COMMENCING WITH ANY RELATED WORK.
- ALIGN NEW ROOF FINISHES WITH EXISTING ADJACENT ROOF FINISHES TO THE GREATEST EXTENTS POSSIBLE UNLESS OTHERWISE INDICATED. COORDINATE ALL DEVIATIONS WITH THE ARCHITECT. CONTRACTOR SHALL VERIFY EXISTING SLOPES, INSULATION TAPER MATCHES, AND MEMBRANE TIE-IN TRANSITIONS BETWEEN NEW LOWER WELL TPO AND EXISTING UPPER ROOFING PRIOR TO TIE-IN EXECUTION.
- IT IS UNDERSTOOD AND AGREED THAT DRAWING REFINEMENTS, ADDITIONAL DETAILING AND CLARIFICATIONS WILL BE ISSUED DURING THE CONSTRUCTION SCHEDULE AND NO ADJUSTMENT WILL BE MADE IN THE CONTRACTORS OR SUB-CONTRACTORS PRICE UNLESS SUCH REFINEMENT, DETAILING OR CLARIFICATIONS RESULT IN CHANGES TO THE SCOPE, QUALITY, FUNCTION AND/OR INTENT OF THE DRAWINGS AND THE PROJECT MANUAL NOT REASONABLY INFERRABLE BY A CONTRACTOR OR SUB-CONTRACTOR EXPERIENCED IN THIS TYPE OF WORK.
- ALL CONTRACTORS AND SUB-CONTRACTORS MUST QUOTE ON COMPLETED, FULLY OPERABLE SYSTEMS BASED ON THE DESIGN INTENT OF THE CONTRACT DOCUMENTS, AND ALL MATERIAL AND LABOR IMPLIED THEREFROM.
- UNLESS OTHERWISE REQUIRED BY THE OWNER, CONSTRUCTION ADMINISTRATION SERVICES WILL BE COMPLETED USING NEWFORMA PROJECT CENTER AND PROCORE UNLESS THE OWNER AND DESIGN TEAM ADVISE OTHERWISE. REFERENCE DIVISION 1 OF THE SPECIFICATIONS FOR THE PROCEDURES FOR REQUESTS FOR INFORMATION AND SUBMITTALS.
- ALL WOOD BLOCKING IN EXTERIOR WALLS AND ROOF ASSEMBLIES SHALL BE PRESERVATIVE PRESSURE TREATED IN ACCORDANCE WITH THE SPECIFICATIONS. ALL FASTENERS, ANCHORS, AND METAL FLASHINGS IN DIRECT CONTACT WITH PRESSURE-TREATED WOOD SHALL BE STAINLESS STEEL OR HOT-DIP GALVANIZED TO PREVENT GALVANIC CORROSION. ALL WOOD BLOCKING IN INTERIOR WALLS SHALL BE FIRE RETARDANT TREATED IN ACCORDANCE WITH THE SPECIFICATIONS.
- INSTALL SEALANT AT THE EXTERIOR SIDE OF ALL JOINTS, SEAMS, CONNECTIONS, OR OPENINGS THAT WOULD ALLOW AIR OR WATER INFILTRATION UNLESS NOTED OTHERWISE. SEALANTS MUST BE COMPATIBLE WITH ALL ROOFING SYSTEM ELEMENTS. SUBMIT SAMPLES FOR CLARIFICATION OF ANY COLOR MATCHES.
- THE LOCATIONS OF EXISTING UTILITIES ARE BASED ON DOCUMENTS PROVIDED BY THE OWNER AND MAY NOT REPRESENT THE ACTUAL FIELD CONDITIONS. REVIEW ALL OWNER DOCUMENTS AND FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO COMMENCEMENT OF THE WORK. COORDINATE ALL NEW BUILDING ELEMENTS AND SYSTEMS, LOCATIONS, CONNECTIONS AND PENETRATIONS WITH EXISTING BUILDING ELEMENTS AND SYSTEMS.

1

GENERAL DEMOLITION NOTES

- PRIOR TO PROCEEDING WITH ANY WORK UNDER THIS CONTRACT, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ALL NECESSARY SAFEGUARDS TO MAINTAIN ALL PARTS OF THE EXISTING SITE AND BUILDINGS IN A SAFE CONDITION THROUGHOUT THE ENTIRE CONSTRUCTION PERIOD. THE CONTRACTOR SHALL PROTECT THE BUILDING OCCUPANTS, THE EXISTING BUILDING, ITS CONTENTS AND ALL BUILDING MECHANICAL, ELECTRICAL, FIRE PROTECTION, TELECOMMUNICATIONS AND ALL OTHER MISCELLANEOUS SYSTEMS FROM DAMAGE AT ALL TIMES. ALL DAMAGES RESULTING DIRECTLY OR INDIRECTLY FROM THE CONTRACTORS OPERATIONS SHALL BE REPAIRED TO A "LIKE NEW" CONDITION AT THE CONTRACTORS EXPENSE WITHOUT ANY ADDITIONAL COST TO THE OWNER.
- IF ASBESTOS CONTAINING MATERIAL IS DISCOVERED DURING THE CONSTRUCTION PROJECT, THE CONTRACTOR SHALL IMMEDIATELY SUSPEND OPERATIONS IN THE AFFECTED AREA AND NOTIFY THE OWNERS PROJECT REPRESENTATIVE. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT HIS PERSONNEL, SUBCONTRACTORS AND ALL SITE VISITORS FROM EXPOSURE TO THE ASBESTOS CONTAINING MATERIAL.
- CONFIRM IF EXISTING PAINT HAS BEEN TESTED AND DETERMINED TO CONTAIN LEAD ABOVE THE MINIMUM DETECTION LIMIT. ALL EXISTING MATERIALS SHALL BE ASSUMED TO BE PAINTED UNLESS INDICATED OTHERWISE. PERFORM ALL WORK ON EXISTING PAINTED MATERIALS IN ACCORDANCE WITH CONTRACTORS LEAD PAINT COMPLIANCE PLAN.
- UNLESS LIGHT BALLASTS ARE CLEARLY LABELED "PCB FREE" AND LIGHT FIXTURE BULBS ARE IDENTIFIED AS "LOW MERCURY" AND HAVE DOCUMENTATION INDICATING THAT THE LAMPS PASS "TOXIC CHARACTERISTIC LEACHING PROCEDURE" (TCLP) TESTING, REMOVE ALL EXISTING LIGHT BALLASTS AND LAMPS AS PCB AND MERCURY CONTAMINATED MATERIALS AND DISPOSE OF ACCORDANCE WITH EPA, FEDERAL AND STATE REGULATIONS REGARDING DISPOSAL OF HAZARDOUS MATERIALS.
- DEMOLITION NOTES IN THIS SECTION DO NOT INDICATE LOCATIONS OF HAZARDOUS MATERIALS OR REQUIREMENTS FOR HAZARDOUS MATERIAL REMOVAL. SEE OWNERS INDEPENDENT HAZARDOUS MATERIAL SURVEY FOR TYPES AND LOCATIONS OF SUSPECTED HAZARDOUS MATERIALS.
- MATERIALS AND CONSTRUCTION SHOWN ON THE DRAWINGS REPRESENTS BOTH EXISTING AND NEW MATERIALS. THE DRAWINGS, OTHER THAN THE DEMOLITION PLANS AND PHOTOGRAPHS, SHOW THE DESIRED FINISHED CONSTRUCTION. IN GENERAL, ONLY NEW WORK ITEMS ARE SPECIFICALLY CALLED OUT ON THE DRAWINGS. EXISTING ITEMS THAT ARE INTEGRAL TO THE CONSTRUCTION ARE IDENTIFIED AS "EXISTING" OR "TO REMAIN." NEW MATERIAL MAY BE IMPLIED AND THEREFORE, NOT SPECIFICALLY CALLED OUT ON THE DRAWINGS. THESE ITEMS ARE DISCERNIBLE FROM OTHER DETAILS AND INFORMATION SHOWN ON THE DRAWINGS.
- DRAWINGS HAVE BEEN PREPARED FROM A COMBINATION OF EXISTING DRAWING INFORMATION AND FIELD OBSERVATIONS. DIMENSIONAL DISCREPANCIES WILL BE ENCOUNTERED AND SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT OR ENGINEER OF RECORD. DIMENSIONS ON THE WORK PLANS WITH AN INDICATION OF "+/-" ARE AREAS THAT CAN BE REVISED DIMENSIONALLY TO COMPENSATE FOR DIMENSIONAL DISCREPANCIES BETWEEN THE EXISTING STRUCTURE AND THE WORK PLANS. ALL DIMENSIONAL REVISIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT OR ENGINEER OF RECORD. THE CONTRACTOR SHALL BECOME TOTALLY FAMILIAR WITH AND VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS THAT AFFECT THE CONTRACT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DIMENSIONS, ELEVATIONS, AND SEQUENCES OF WORK NECESSARY FOR THE PROPER CONSTRUCTION AND ALIGNMENT OF PORTIONS OF THE PROJECT THAT INTERFACE WITH EXISTING CONDITIONS TO REMAIN. THE CONTRACTOR SHALL MAKE ALL MEASUREMENTS NECESSARY FOR THE PROPER EXECUTION, FABRICATION AND ERECTION OF ALL WORK ASSOCIATED WITH THIS CONTRACT.
- THE CONTRACTOR SHALL PROTECT THE EXISTING FACILITIES AT ALL TIMES DURING THE COURSE OF CONSTRUCTION. ALL DAMAGES CAUSED AS A RESULT OF HIS ACTIVITIES SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER. IN GENERAL, PATCH, REPAIR, AND RE-ROOFING WORK IS INTENDED TO MATCH, COMPLIMENT AND ALIGN WITH EXISTING CONDITIONS.
- PLAN DIMENSIONS ARE FROM FACE OF EXISTING FINISH TO REMAIN. FACE OF STUD OR COLUMN CENTERLINES AS INDICATED, UNLESS OTHERWISE NOTED.
- COORDINATE LOCATION OF CONTRACTORS LAY DOWN AREA, PROJECT ACCESS POINTS AND LIMITS OF PERIMETER FENCING WITH OWNERS PROJECT REPRESENTATIVE.
- ALL MATERIALS AND EQUIPMENT NOT SPECIFICALLY IDENTIFIED TO REMAIN AND FOR SALVAGE SHALL BE DEMOLISHED AND REMOVED FROM THE SITE. SEE PLUMBING, MECHANICAL AND ELECTRICAL DEMOLITION DRAWINGS FOR ADDITIONAL DEMOLITION REQUIREMENTS.
- PATCH ALL EXISTING ROOF DECK PENETRATIONS FROM REMOVED PIPING, CONDUIT AND OTHER MISCELLANEOUS PENETRATIONS WITH NON-SHRINK GROUT LEVEL WITH ADJACENT DECK SURFACE. PATCH ALL EXISTING METAL ROOF DECK PENETRATIONS WITH METAL DECKING TO MATCH EXISTING BY SISTERING DECKING INTO EXISTING DECK AND TACK WELDING INTO PLACE. CONTRACTOR SHALL ASSUME THAT ALL MECHANICAL UNITS, PLUMBING FIXTURES AND ELECTRICAL DEVICES HAVE ASSOCIATED ROOF DECK PENETRATIONS THAT WILL REQUIRE INFILL. SEE MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS FOR ADDITIONAL DECK PENETRATIONS. ALL EXISTING ABANDONED DECK PENETRATIONS SHALL BE UNFILLED AS INDICATED ABOVE. AT EXISTING FLOOR PENETRATIONS WHERE THE PENETRATING ELEMENT REMAINS, PROVIDE UL APPROVED RATED PENETRATION ASSEMBLY AS APPROPRIATE TO THE ASSEMBLY RATING AND PENETRATION TYPE. ALL NEW PENETRATIONS SHALL BE PROVIDED WITH UL APPROVED RATED PENETRATION ASSEMBLY AS APPROPRIATE TO THE ASSEMBLY TYPE AND PENETRATING ELEMENT.
- PROVIDE DUST AND VIBRATION PROTECTION THROUGHOUT THE CONSTRUCTION PROCESS AS REQUIRED TO MEET THE OWNERS REQUIREMENTS AND FOR THE PROTECTION OF OCCUPANTS AND EXISTING EQUIPMENT.

6

ABBREVIATIONS

ABBREVIATION	WORD / PHRASE
IMP	INSULATED METAL PANEL
INSUL	INSULATED / INSULATION
INT	INTERIOR
LP	LEATHER PANEL
LVT	LUXURY VINYL TILE
MAX	MAXIMUM
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MIN	MINUTES
MR	MIRROR
MTL	METAL
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
OA	OVERALL
OC	ON CENTER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED
OH	OVERHANG
OPP	OPPOSITE / OPPOSITE HAND
PART	PARTIAL
PJ	PANEL JOINT
PL	PLASTIC LAMINATE
PLY	PLYWOOD
PNT	PAINT
PT	PORCELAIN TILE
PT	PRESSURE TREATED
RBR	RUBBER
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REQD	REQUIRED
RF	RESILIENT FLOORING
RM	ROOM
RO	ROUGH OPENING
SC	SOLID CORE
SCHED	SCHEDULE
SD	SMOKE DETECTOR
SEP	SEPARATION
SIM	SIMILAR
SS	SPECIFICATION
SPK	SPRINKLER
SS	SOLID SURFACE
SSTL	STAINLESS STEEL
ST	STONE
STC	SOUND TRANSMISSION COEFFICIENT
STRUC	STRUCTURE / STRUCTURAL
T	TRIM
T&G	TONGUE & GROOVE
TEL / TELE	TELECOMMUNICATIONS / TELEPHONE
TLT	TOILET
TO	TOP OF
TOC	TOP OF CONCRETE
TOS	TOP OF STEEL
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
VIF	VERIFY IN FIELD
W	WALL
W/	WITH
WC	WALL COVERING
WD	WOOD
WOM	WALK OFF MAT
WT	WINDOW TREATMENT
WV	WOOD VENEER
YALL	YOU ALL

5

ABBREVIATIONS

ABBREVIATION	WORD / PHRASE
IMP	INSULATED METAL PANEL
INSUL	INSULATED / INSULATION
INT	INTERIOR
LP	LEATHER PANEL
LVT	LUXURY VINYL TILE
MAX	MAXIMUM
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MIN	MINUTES
MR	MIRROR
MTL	METAL
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
OA	OVERALL
OC	ON CENTER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED
OH	OVERHANG
OPP	OPPOSITE / OPPOSITE HAND
PART	PARTIAL
PJ	PANEL JOINT
PL	PLASTIC LAMINATE
PLY	PLYWOOD
PNT	PAINT
PT	PORCELAIN TILE
PT	PRESSURE TREATED
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RO	ROUGH OPENING
SC	SOLID CORE
SCHED	SCHEDULE
SD	SMOKE DETECTOR
SEP	SEPARATION
SIM	SIMILAR
SS	SPECIFICATION
SPK	SPRINKLER
SS	SOLID SURFACE
SSTL	STAINLESS STEEL
ST	STONE
STC	SOUND TRANSMISSION COEFFICIENT
STRUC	STRUCTURE / STRUCTURAL
T	TRIM
T&G	TONGUE & GROOVE
TEL / TELE	TELECOMMUNICATIONS / TELEPHONE
TLT	TOILET
TO	TOP OF
TOC	TOP OF CONCRETE
TOS	TOP OF STEEL
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
VIF	VERIFY IN FIELD
W	WALL
W/	WITH
WC	WALL COVERING
WD	WOOD
WOM	WALK OFF MAT
WT	WINDOW TREATMENT
WV	WOOD VENEER
YALL	YOU ALL

4

SYMBOLS

5A

2B

A141

4C

3D

SHEET WHERE ELEVATION IS LOCATED

5A

2B

A141

4C

3D

EXTERIOR ELEVATION NUMBER

5A

2B

A141

4C

3D

BUILDING SECTION NUMBER

5A

2B

A141

4C

3D

SHEET WHERE SECTION IS LOCATED

5A

2B

A141

4C

3D

WALL SECTION NUMBER

5A

2B

A141

4C

3D

SHEET WHERE SECTION IS LOCATED

5A

2B

A141

4C

3D

CALLOUT NUMBER

5A

2B

A141

4C

3D

SHEET WHERE CALLOUT IS LOCATED

5A

2B

A141

4C

3D

SHEET WHERE ELEVATION IS LOCATED

5A

2B

A141

4C

3D

INTERIOR ELEVATION NUMBER

5A

2B

A141

4C

3D

STAIR SECTION NUMBER

5A

2B

A141

4C

3D

SHEET WHERE SECTION IS LOCATED

5A

2B

A141

4C

3D

CASEWORK ELEVATION NUMBER

5A

2B

A141

4C

3D

SHEET WHERE ELEVATION IS LOCATED

5A

2B

A141

4C

3D

CASEWORK SECTION NUMBER

5A

2B

A141

4C

3D

SHEET WHERE SECTION IS LOCATED

5A

2B

A141

4C

3D

DELTA TRUE NORTH

5A

2B

A141

4C

3D

PROJECT NORTH

5A

2B

A141

4C

3D

ROOM NAME

5A

2B

A141

4C

3D

ROOM NUMBER

5A

2B

A141

4C

3D

CENTERLINE OF SHEAR WALL

5A

2B

A141

4C

3D

WITH LETTER OR NUMBER INDICATES CENTERLINE OF COLUMN

5A

2B

A141

4C

3D

STC RATING (IF APPLICABLE)

5A

2B

A141

4C

3D

PARTITION TYPE

5A

2B

A141

4C

3D

HEIGHT IN INCHES

5A

2B

A141

4C

3D

PARTITION TYPE (PARTIAL HEIGHT)

5A

2B

A141

4C

3D

CEILING TYPE

5A

2B

A141

4C

3D

HEIGHT AFF

5A

2B

A141

4C

3D

DOOR MARK

5A

2B

A141

4C

3D

WINDOW TYPE

5A

2B

A141

4C

3D

KEYNOTE

5A

2B

A141

4C

3D

FURNITURE TYPE

5A

2B

A141

4C

3D

CASEWORK TYPE

5A

2B

A141

4C

3D

ROOM FINISH LOCATION

5A

2B

A141

4C

3D

ROOM FINISH TYPE

5A

2B

A141

4C

3D

TOILET / BATHING ACCESSORY TYPE

5A

2B

A141

4C

3D

FINISH TYPE

3

SHEET NUMBERS

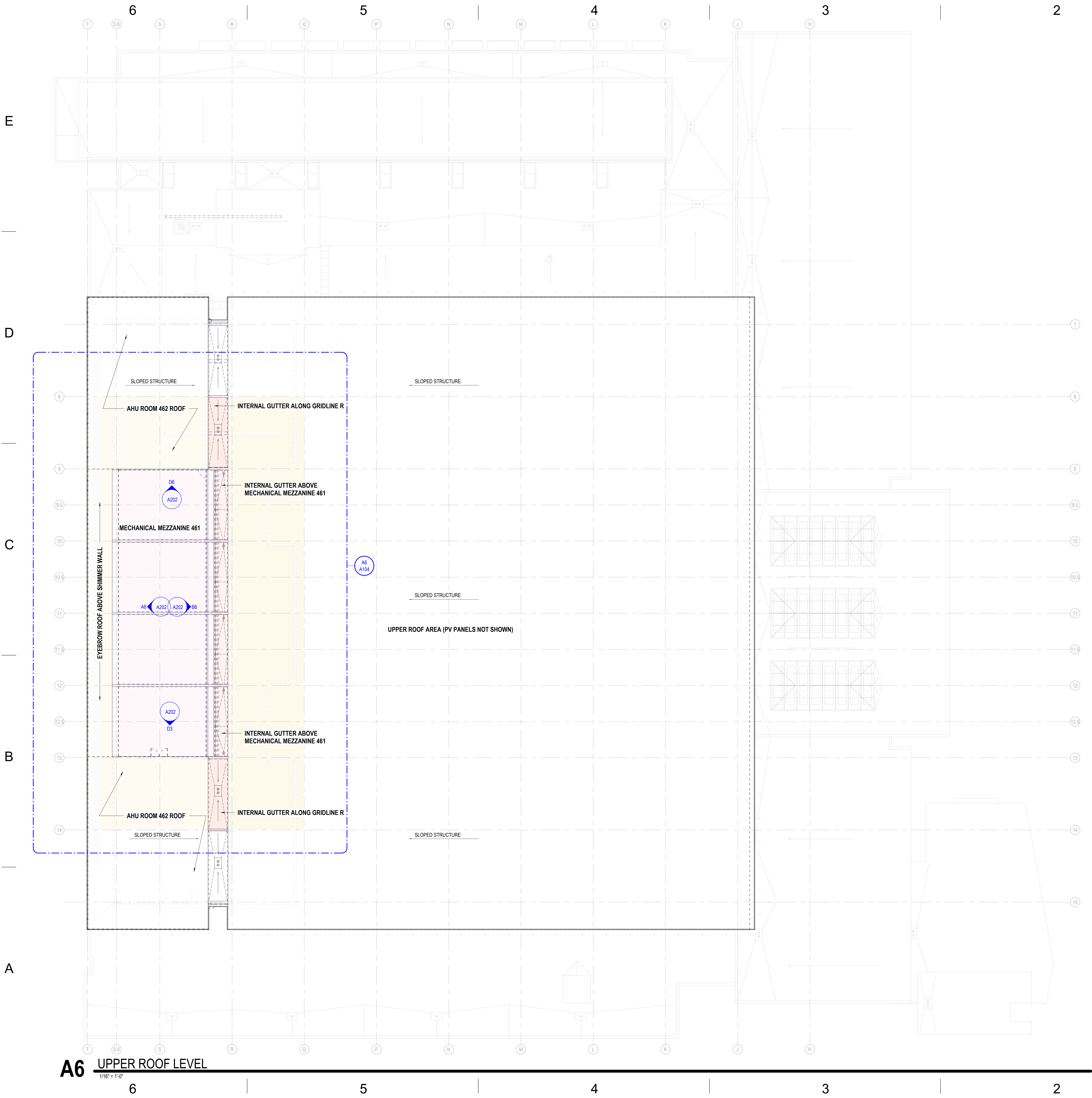
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DISCIPLINE

G = GENERAL
B = GEOTECHNICAL / ENVIRONMENTAL
D = DEMOLITION SERIES
C = CIVIL
L = LANDSCAPE
A = ARCHITECTURAL / INTERIORS
I = INTERIORS
S = STRUCTURAL
F = FIRE PROTECTION
P = PLUMBING
M = ME



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ROOF AREA LEGEND

NOT TO SCALE

- UPPER ROOF AREAS
- MECHANICAL MEZZANINE ROOF
- ROOF GUTTER AREA
- EXTENTS OF UPPER ROOF SYSTEM REPLACEMENT (INCLUDING GUTTER AREA & SIDEWALLS)
- EXTENTS OF PVC MEMBRANE AREA (INCLUDES ADJOINING VERTICAL WALLS & PARAPETS)

HANBURY

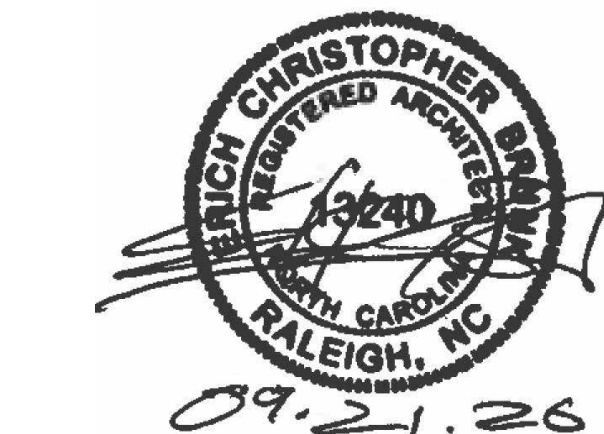
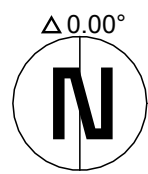
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Keyplan



CITY OF RALEIGH - CONVENTION CENTER ROOF REPAIRS PHASE 1 Raleigh, North Carolina

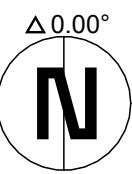
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Sheet Title:

ROOF PLAN

Sheet Number:

A103



GENERAL ROOF REPAIR NOTES

1. THE CONTRACTOR AND ALL RELATED SUBCONTRACTORS SHALL VISIT THE SITE AND FAMILIARIZE THEMSELVES WITH ALL ASPECTS OF THE WORK. THE ROOF REPLACEMENT CONTRACTORS SHALL MAKE EVERY ATTEMPT TO CONFIRM ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO COMMENCING WORK.
2. THE ARCHITECT HAS NOT ATTEMPTED TO IDENTIFY ALL QUANTITIES OF THE VARIOUS ROOF PENETRATIONS OR CONDITIONS WITHIN THESE DOCUMENTS THAT MAY BE ENCOUNTERED BUT HAS PROVIDED TYPICAL DETAILS THAT ARE APPLICABLE TO THE MAJORITY OF THE CONDITIONS FOUND WITHIN THE SCOPE OF WORK. AN INITIAL INVESTIGATION OF THE CONDITIONS WAS CONDUCTED AND MUCH OF THE ROOF AREAS WERE COVERED BY TEMPORARY ROOF SYSTEMS AND TAPPS SO THE FULL EVALUATION OF UNDERLYING CONDITIONS WAS NOT POSSIBLE. NO DESTRUCTIVE DEMOLITION OF ROOF OR WALL SYSTEMS WAS PERFORMED TO ADEQUATELY IDENTIFY ALL OF THE EXISTING CONDITIONS THAT WILL BE ENCOUNTERED. ALL UNFORESEEN CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO WORK COMMENCING.
3. DUE TO THE RESTRICTIONS OF THE INSURANCE CLAIMS IT IS THE INTENT TO PROVIDE NEW ROOF AND WALL ASSEMBLIES TO MATCH THE EXISTING ASSEMBLIES TO THE GREATEST EXTENT POSSIBLE INCLUSIVE OF INSULATION R-VALUES TO BE FOUND WITHIN THE ROOF AND WALL SYSTEMS.
4. THE CONTRACTOR SHALL VERIFY THE INTEGRITY OF THE EXISTING CONCRETE DECK, METAL ROOF DECKING AND METAL WALL STUD ASSEMBLIES AND REPORT ALL DEFICIENCIES TO THE ARCHITECT AND ENGINEER OF RECORD. DEFICIENT ASSEMBLIES SHALL BE REPLACED "LIKE IN KIND" TO THE ORIGINAL MATERIALS TO THE GREATEST EXTENT POSSIBLE UNLESS CURRENT CODES STIPULATE OTHERWISE.
5. THE CONTRACTOR SHALL VERIFY THE INTEGRITY OF THE EXISTING WALL INSULATION AFFECTED BY THE FIRE AND FIRE FIGHTING EFFORTS AND REPLACE ALL DAMAGED, DETERIORATED OR WET MATERIALS. THE CONTRACTOR SHALL VERIFY THE INTEGRITY OF THE EXISTING WALL SHEATHING BUT IT IS ASSUMED ALL SHEATHING & ROOF COVER BAORDS WILL NEED TO BE REPLACED DUE TO THE REMOVAL OF THE FULLY ADHERED ROOF MEMBRANE.
6. IF THE CONTRACTOR IDENTIFIES MOLD IMMEDIATELY NOTIFY THE OWNERS REPRESENTATIVE AND CEASE WORK IN THOSE AREAS UNTIL SUCH CONDITIONS ARE REMEDIATED BY THE APPROPRIATE CONTRACTOR.
7. UPPER ROOF AREAS INCLUDED IN THE SCOPE OF WORK. GIVEN THE LARGE FOOTPRINT OF THE MAIN UPPER ROOF AREAS, A FULL REPLACEMENT OF THE ENTIRE UPPER LEVEL IS NOT PROPOSED. INSTEAD, THE UPPER ROOF SCOPE IS DIVIDED INTO TWO TARGETED ARCHITECTURAL STRATEGIES BASED ON PHYSICAL IMPACT AND PROXIMITY TO THE FIRE ZONE.
 - A. PRIMARY TIE-IN REPLACEMENT AREAS (SCOPE OF WORK ZONE AS IDENTIFIED BY THE 20'-0" DIMENSION FROM THE EDGE OF UPPER ROOF TO THE TIE-IN AREA SURROUNDING THE MECHANICAL WELL AND INTERNAL GUTTER BELOW). COMPLETE REMOVAL AND REPLACEMENT OF THE ENTIRE ROOF ASSEMBLY DOWN TO THE METAL DECK. THIS IMMEDIATE ZONE SUFFERED THE HIGHEST CONCENTRATION OF HEAT EXPOSURE, HEAVY SOOT DEPOSITION, AND INTENSE EMERGENCY FOOT TRAFFIC. COMPLETE REPLACEMENT OF THIS STRIP IS NECESSARY TO ELIMINATE COMPROMISED, ABRASIVE-DAMAGED TPO AND TO ESTABLISH A SOUND, UN-CONTAMINATED SUBSTRATE CAPABLE OF ACHIEVING A FULLY WARRANTED, HEAT-WELDED TIE-IN TO THE NEW LOWER WELL ASSEMBLY.
 - B. SECONDARY FIELD AREA **DIAGNOSTIC CLEANING & INVESTIGATIVE PROTOCOL** - TO BE CONFIRMED WITH THE OWNER PRIOR TO COMMENCEMENT OF THIS WORK - **PROVIDE SEPARATE QUOTE FOR THIS WORK**; THE REMAINING UPPER ROOF AREAS BEYOND THE PRIMARY REPLACEMENT AREA WHERE FULL REPLACEMENT IS NOT FEASIBLE UNDER THE CLAIM, WE RECOMMEND A CONTROLLED, LOW-PRESSURE CLEANING PROTOCOL USING MANUFACTURER-APPROVED SINGLE-FLY CLEANERS. THIS CLEANING IS RECOMMENDED STRICTLY AS AN INVESTIGATIVE AND DIAGNOSTIC PROCEDURE RATHER THAN A FINAL COSMETIC REPAIR. CLEANING THE FIELD SERVES THREE CRITICAL TECHNICAL PURPOSES:
 1. PHYSICAL DAMAGE ASSESSMENT: REMOVING THE SURFACE SOOT LAYER ALLOWS FOR THOROUGH VISUAL INSPECTION OF MECHANICAL ABRASION, GOUGING, AND EXPOSED REINFORCEMENT SCIRM CAUSED BY POST-FIRE FOOT TRAFFIC ACROSS THE FIELD.
 2. WELD-ABILITY TESTING: FOLLOWING CLEANING, MANDATORY HOT-AIR WELD PATCH SAMPLE TESTS (FIELD PEEL TESTS) MUST BE PERFORMED BY A CERTIFIED ROOFING TECHNICIAN TO VERIFY IF THE SOOT-EXPOSED MEMBRANE RETAINS SUFFICIENT POLYMER INTEGRITY TO ACCEPT FUTURE LOCALIZED REPAIR PATCHES OR FLASHING TIE-INS.
 3. WARRANTY & SRI EVALUATION: CLEANING WILL DETERMINE WHETHER DARK COMBUSTION RESIDUES HAVE PERMANENTLY EMBEDDED INTO THE TPO TOP PLY-CAUSING PERMANENT LOSS OF SOLAR REFLECTANCE INDEX (SRI) AND ACCELERATED HEAT AGING-OR IF ORIGINAL MEMBRANE PERFORMANCE CHARACTERISTICS CAN BE RESTORED.

ROOF AREA LEGEND

- NOT TO SCALE
- UPPER ROOF AREAS
 - MECHANICAL MEZZANINE ROOF
 - ROOF GUTTER AREA
 - EXTENTS OF UPPER ROOF SYSTEM REPLACEMENT (INCLUDING GUTTER AREA & SIDEWALLS)
 - EXTENTS OF PVC MEMBRANE AREA (INCLUDES ADJOINING VERTICAL WALLS & PARAPETS)

AREA CALCULATION (APPROX.) - VERIFY IN FIELD	
UPPER ROOF AREA	6448 SF
GUTTER ROOF AREA	1060 SF
MECHANICAL MEZZANINE ROOF AREA	5740 SF
VERTICAL WALLS SURFACE AT MECHANICAL WELL	3664 SF
GUTTER WALLS SURFACE	1388 SF
GUTTER PARAPET	834 SF
GUTTER SOFFIT	755 SF
TOTAL	19,889 SF

MINIMUM CLEARANCE OF ROOFTOP EQUIPMENT

WIDTH OF EQUIPMENT	MIN. CLEARANCE RECOMMENDED ABOVE FINISHED ROOF SURFACE
UP TO 24"	14"
25" - 36"	18"
37" - 48"	24"
49" - 60"	30"
61" AND WIDER	48"

ROOF DEMOLITION & NEW WORK NOTES

1. REMOVE ENTIRE ROOF ASSEMBLY DOWN TO CONCRETE DECK INCLUSIVE OF ALL ROOF MEMBRANES, COVER BOARDS, INSULATION SYSTEMS, AND VAPOR RETARDER. DRY DECK COMPLETELY PRIOR TO NEW ROOF ASSEMBLY INSTALLATION. INSPECT ROOF DECK FOR ANY DEFICIENCIES AND NOTIFY ARCHITECT / ENGINEER OF RECORD - REMOVE ALL ABANDONED ROOF CURBS, PITCH POCKETS, AND ABANDONED CONDUITS OR PIPE PENETRATIONS NO LONGER IN SERVICE.
2. PATCH ALL OPENINGS IN CAST IN PLACE CONCRETE DECK WITH LIKE MATERIAL. AT SMALL OPENING 12" OR LESS SISTER MATCHING METAL DECK TO UNDERSIDE OF AREA AND TACK WELDING IN PLACE. FILL VOID ABOVE DECK WITH NON-SHRINK GROUT OR CONCRETE. REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL DETAILS. AT LARGER THAN 12" DIMENSIONAL OPENINGS REFER TO STRUCTURAL DRAWINGS FOR INFILL DETAILS.
3. AT INTERNAL GUTTER ABOVE MECHANICAL MEZZANINE REMOVE ENTIRE ROOF ASSEMBLY DOWN TO METAL DECK INCLUSIVE OF ALL ROOF MEMBRANES, COVER BOARDS, INSULATION SYSTEM, VAPOR RETARDER AND SUBSTRATE BOARD. DRY METAL DECK COMPLETELY PRIOR TO NEW ROOF ASSEMBLY INSTALLATION. INSPECT METAL DECK FOR ANY DEFICIENCIES AND NOTIFY ARCHITECT / ENGINEER OF RECORD. SEE ROOF PLAN FOR EXTENTS OF WORK.
4. INSPECT ALL EXISTING ROOF DRAINS AND OVERFLOW DRAINS WITHIN THE "SCOPE OF WORK ZONE" CLEAN OUT ALL DEBRIS AND CONFIRM WORKING CONDITION. FOR ALL DRAINS TO BE REPLACED (AT INTERNAL GUTTER AFFECTED BY FIRE) SEE PLUMBING DRAWINGS FOR DETAILS. ALL DRAINS TO BE WRAPPED CONTINUOUSLY WITH R13 THERMAL INSULATION FOR MINIMUM OF 10' LINEAR FEET AS INDICATED ON PLUMBING DRAWINGS. DRAINS EXPOSED TO VIEW AT UNDERSIDE OF GUTTER SOFFIT TO RECEIVE CONTINUOUS WATERTIGHT JACKET FOR ENTIRE LENGTH OF EXPOSED PIPING PER PLUMBING DRAWINGS.
5. ALL EXISTING ROOFTOP MECHANICAL EQUIPMENTS TO REMAIN IN SERVICE DURING ENTIRE RE-ROOFING SEQUENCE UNLESS AUTHORIZED BY THE OWNER. FIELD VERIFY ALL EQUIPMENT SUPPORT AND CURB CONDITIONS PRIOR TO WORK AND REFER TO PHOTOS. VERIFY ALL MECHANICAL NEW WORK IS COMPLETE INCLUSIVE OF POWER SUPPLY CONDUIT RUNS AND CONDENSATE DRAINS RUNS PRIOR TO WORK. COORDINATE ALL WORK SEQUENCES WITH OTHER TRADES. SUPPORT ALL EQUIPMENT FOR DURATION OF WORK. NOTIFY OWNER OF DURATION OF ANY EQUIPMENT SHUT-DOWNS INCLUSIVE OF KITCHEN EXHAUST FANS, MAKE-UP AIR (MUA) UNITS, CHILLERS, EMERGENCY GENERATOR, KITCHEN FREEZER AND WALK-IN COOLER CONDENSERS, AND ALL OTHER ACTIVE EQUIPMENT.
6. REMOVE EXISTING PHOTO-VOLTAIC (PV) CONDUITS & CABLES TO A POINT OUTSIDE THE "SCOPE OF WORK ZONE" TO ALLOW RE-ROOFING WORK. REFER TO ROOF PLAN FOR EXTENTS. COORDINATE WITH OWNER & SOLAR CONSULTANT. PROVIDER AS TO WORK REQUIRED FOR PROTECTION OF SYSTEM CABLEING TO REMAIN. (RELOCATION MAY HAVE OCCURRED PRIOR TO ROOF REPAIRS - MINIMUM CLEARANCE BETWEEN ROOF SURFACE AND CONDUITS TO CONFORM TO ADJACENT TABLE "MINIMUM CLEARANCE OF ROOFTOP EQUIPMENT". VERIFY WIDTH OF CONDUIT CLUSTERS AND REPORT DISCREPANCIES TO OWNER AND ARCHITECT.
7. REMOVE ENTIRE FULLY ADHERED ROOF MEMBRANE AND SHEATHING / COVER BOARD FROM ALL VERTICAL WALL SURFACES WITHIN THE MECHANICAL MEZZANINE AND AT THE INTERNAL GUTTER PARAPET, SIDEWALLS AND SOFFIT TO EXTENTS SHOWN ON THE DRAWINGS. INSPECT AND REMOVE ALL DAMAGED OR DETERIORATED WALL INSULATION & METAL STUDS AND REPLACE WITH NEW TO MATCH EXISTING MATERIALS. TAKE CARE IN REMOVING ROOF MEMBRANE AT EXISTING DOORS, LOUVERS, METAL PANELS, TRIMMER SURFACES OR OTHER FIXTURES MOUNTED TO WALL TO REMAIN. INSTALL NEW ROOF MEMBRANE (OVERLAP WITH MEMBRANE FROM ROOF DECK ABOVE TYPICAL).
8. AT UPPER ROOF AREAS A, B, AND C REMOVE ENTIRE ROOF ASSEMBLY DOWN TO METAL DECK INCLUSIVE OF ALL ROOF MEMBRANES, COVER BOARDS, INSULATION SYSTEM, VAPOR RETARDER AND SUBSTRATE BOARD. INSPECT METAL DECK AND CONFIRM METAL DECK IS UNDAUNAGED AND COMPLETELY DRY PRIOR TO NEW ROOF ASSEMBLY INSTALLATION. NOTIFY ARCHITECT / ENGINEER OF RECORD OF ANY DEFICIENCIES. PROCEED WITH NEW WORK ONLY AFTER ALL DEFICIENCIES HAVE BEEN CORRECTED. PROVIDE NEW ROOF SYSTEM "LIKE IN KIND" TO EXISTING ASSEMBLY MATCHING FINISHED ELEVATION OF ROOF SURFACE. OVERLAP ADJOINING VERTICAL WALL SURFACES AT MECHANICAL MEZZANINE AND GUTTERS WITH MEMBRANE TURNED DOWN WALLS & A MINIMUM 6" TYPICAL.
9. AT FLYING BEAMS INTERSECTING THE OUTER FASCIA WALL ABOVE THE SHIMMER WALL PROVIDE ROOF FLASHING MEMBRANE DETAILING AS PER DETAIL C2/A503.
10. AT FLYING BEAMS INTERSECTING THE EXTERIOR WALL ASSEMBLIES PROVIDE ROOF FLASHING MEMBRANE DETAILING AND INSULATION ENVELOPE THERMAL EXTENSION AS PER DETAIL A4/A501.
11. EXISTING LIGHTNING ARREST SYSTEM TO BE RE-INSTALLED IN ALL AREAS AFFECTED BY THE WORK AND ONLY AFTER RE-ROOFING SCOPE IS COMPLETE. AERIALS AND CABLE ANCHORS SHALL BE ADHERED WITH ADHESIVE APPROVED BY ROOF MANUFACTURER. CABLE LAYOUT AND AERIAL POINTS NOT SHOWN.
12. PVC MEMBRANE AREAS DENOTED WITH STIPLED PATTERN (SEE ROOF AREA LEGEND). PVC MEMBRANE SHALL EXTEND VERTICALLY DOWN ADJOINING SIDE WALLS INCLUSIVE OF HORIZONTAL AND VERTICAL WALL SURFACES OF MECHANICAL MEZZANINE GUTTER, PARAPET & SOFFIT. SEE TYPICAL TIE-IN DETAIL FROM NEW TPO TO NEW PVC MEMBRANES AND NEW MEMBRANES TO EXISTING MEMBRANES.

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30' - 0"

EXISTING MEMBRANE

20' - 0" LIMITS OF UPPER ROOF REPLACEMENT

VERIFY WIDTH

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EXISTING MEMBRANE

20' - 0" LIMITS OF UPPER ROOF REPLACEMENT

VERIFY WIDTH

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EXISTING MEMBRANE

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EXISTING MEMBRANE

20' - 0" LIMITS OF UPPER ROOF REPLACEMENT

VERIFY WIDTH

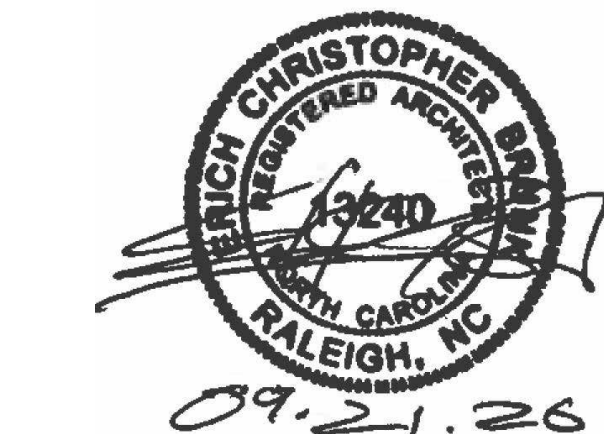
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City of Raleigh,
Raleigh Convention Center
500 S Salisbury St
Raleigh, NC 27601

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Keyplan



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REPAIRS PHASE 1
Raleigh, North
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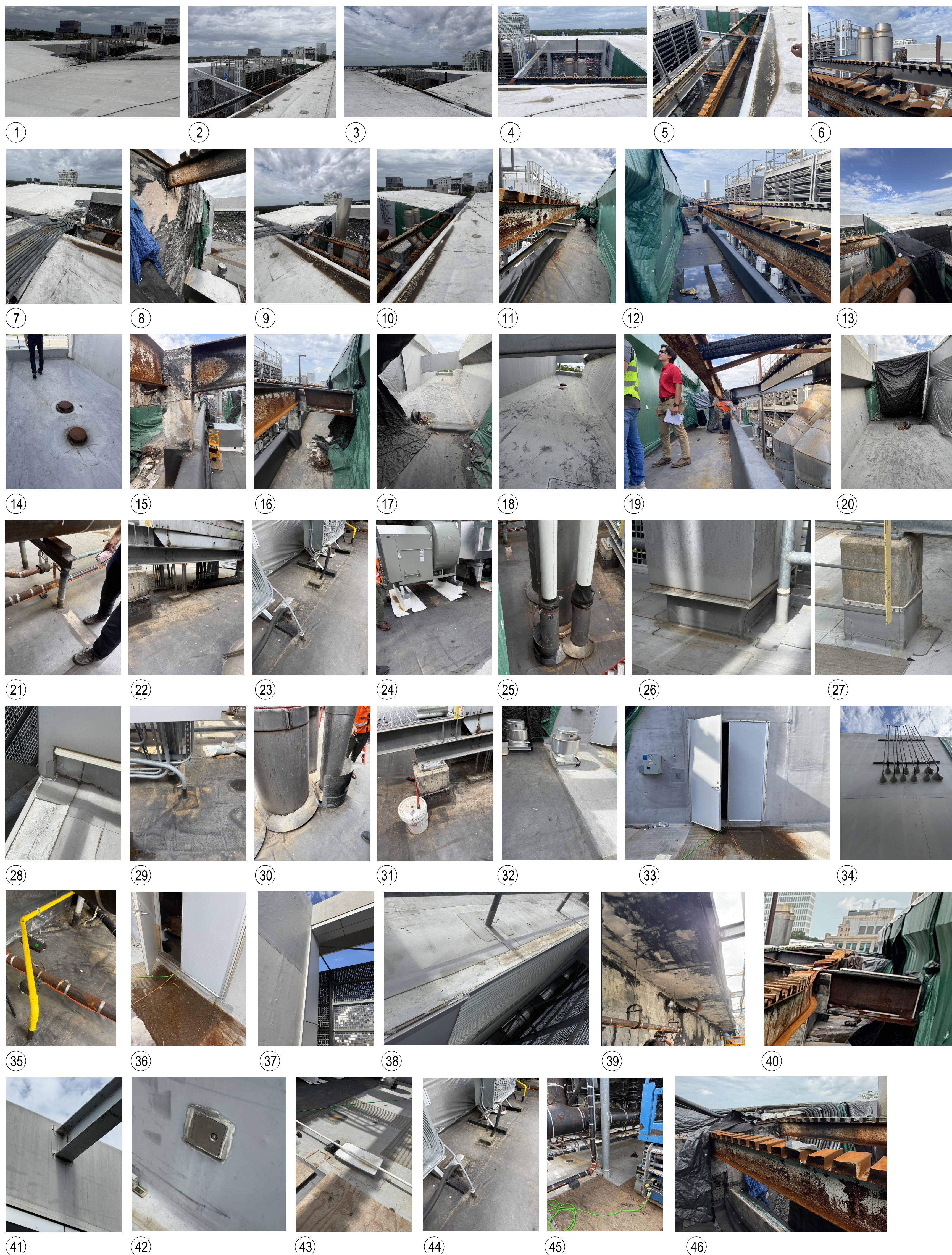
Project Number: R26046.00
Status & Date: September 22, 2026

Sheet Title:

ROOF LEVEL - PHOTO
ORIENTATION PLAN

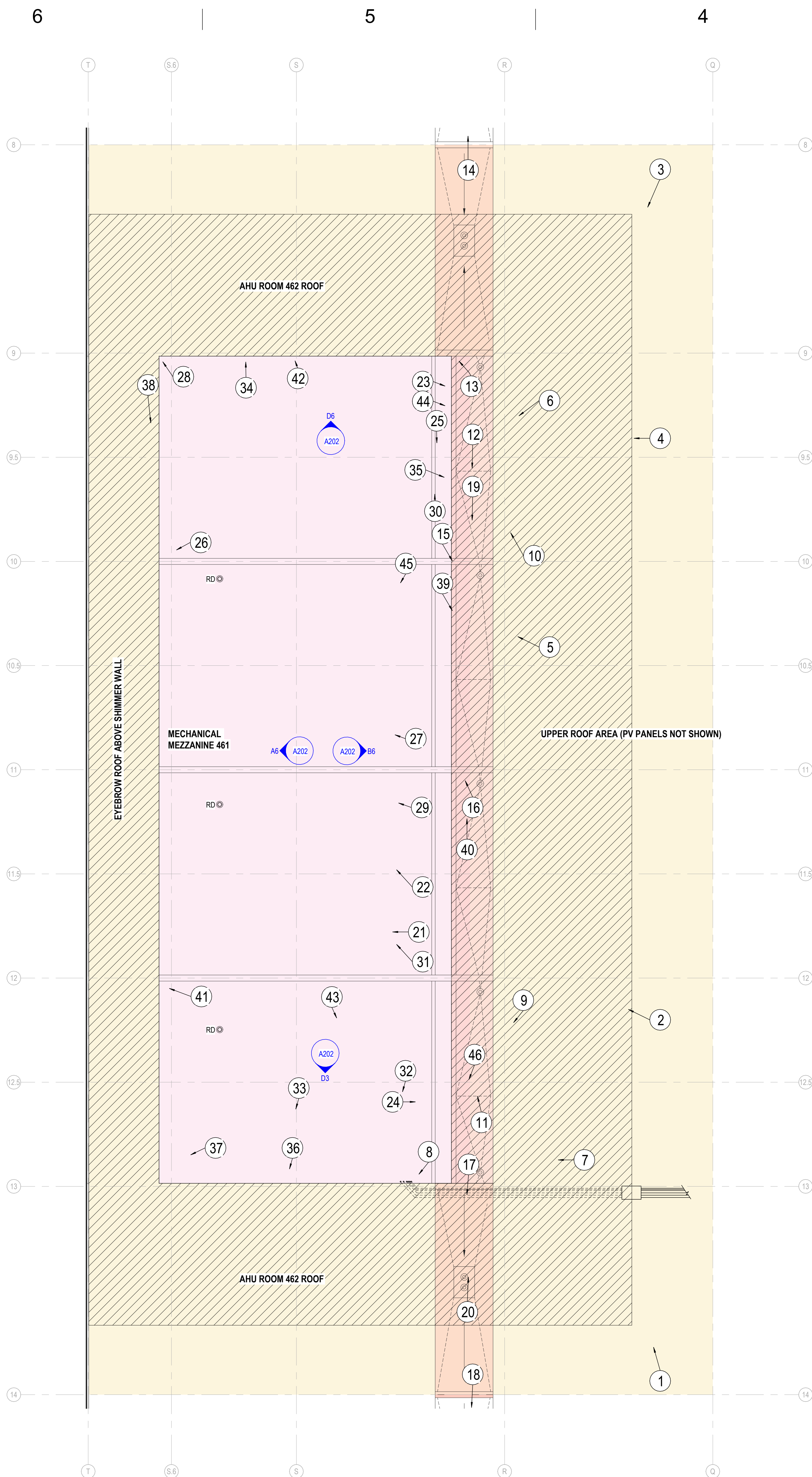
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A105



A3 SITE PHOTOS

1 1/2" = 1'-0"



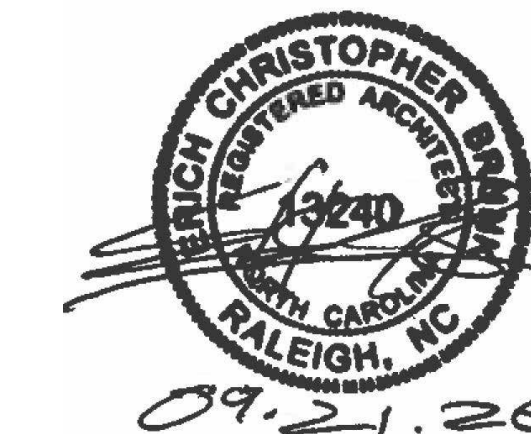
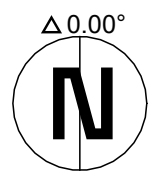
A6 ROOF LEVEL - PHOTO ORIENTATION PLAN

1/8" = 1'-0"

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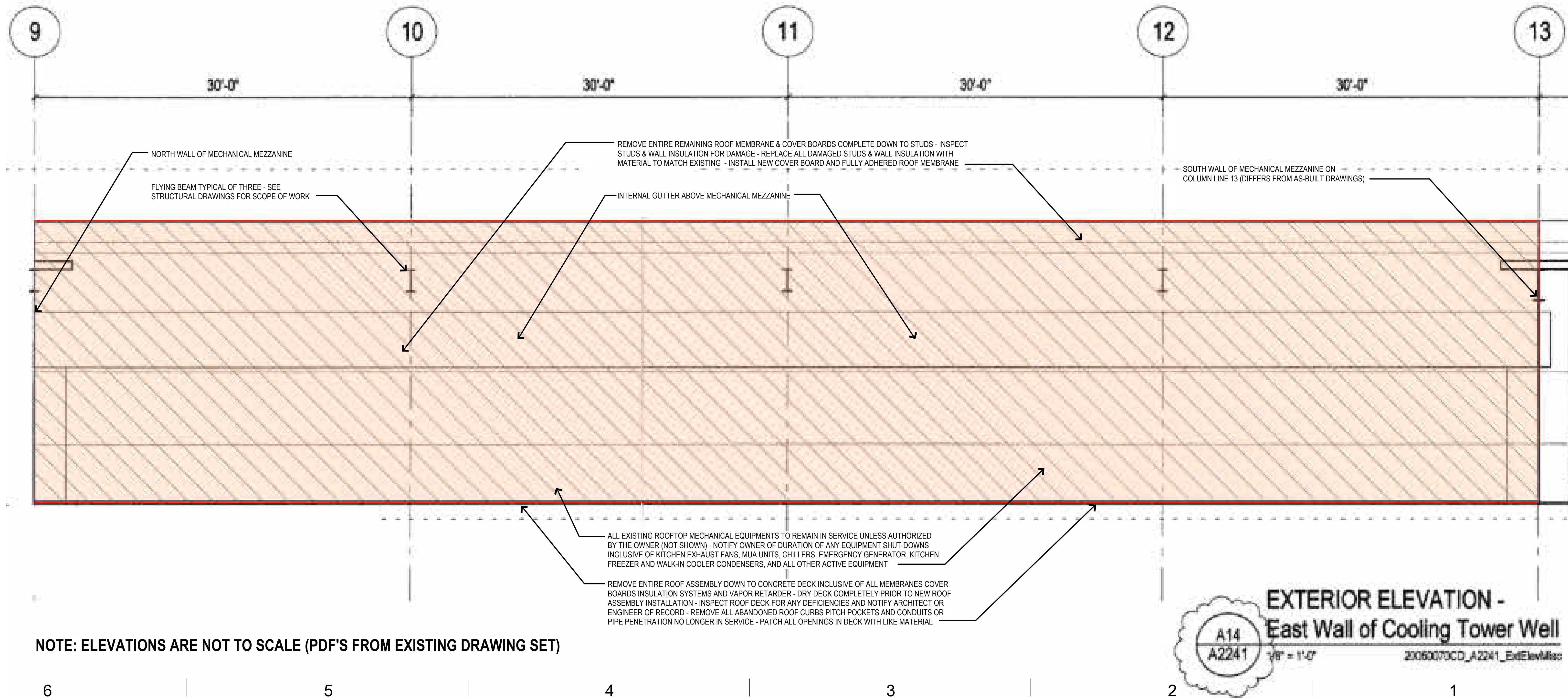
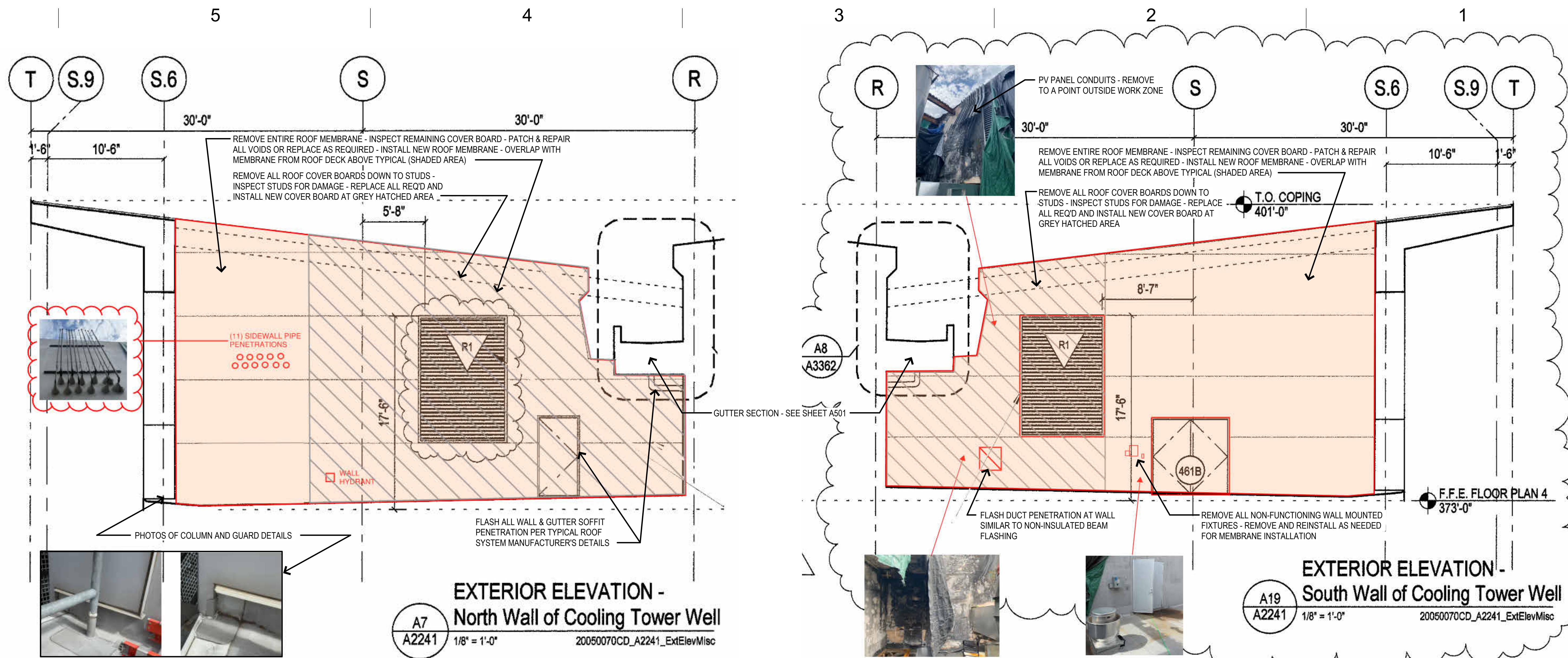
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Status & Date: September 22, 2026

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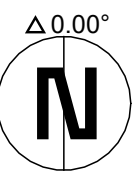
EXTERIOR ELEVATIONS
MECHANICAL MEZZANINE

PRINT IN COLOR
Sheet Number:

A201



NOTE: ELEVATIONS ARE NOT TO SCALE (PDF'S FROM EXISTING DRAWING SET)



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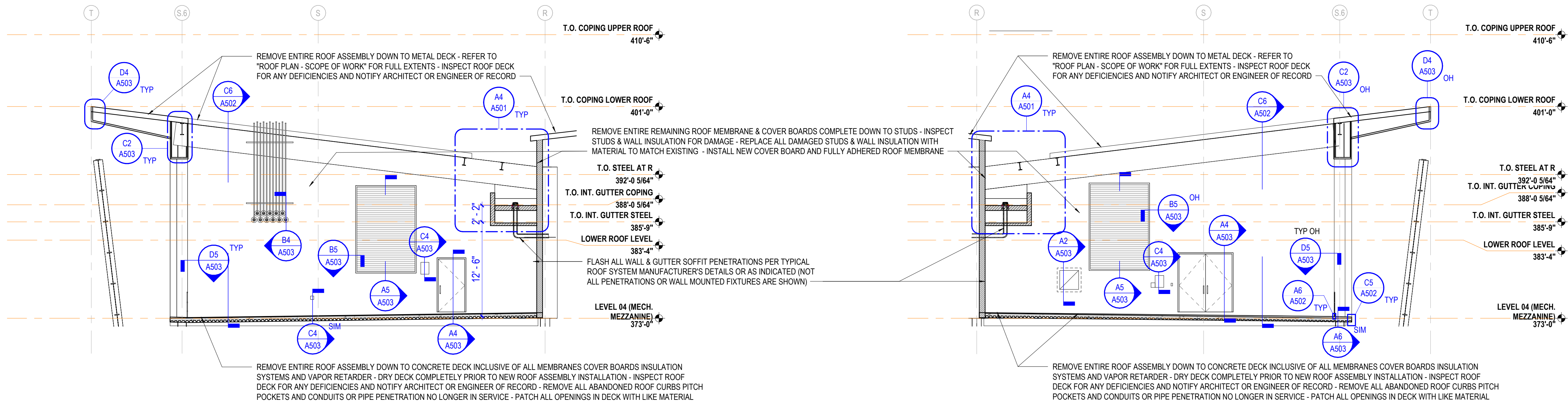
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EXTERIOR ELEVATIONS

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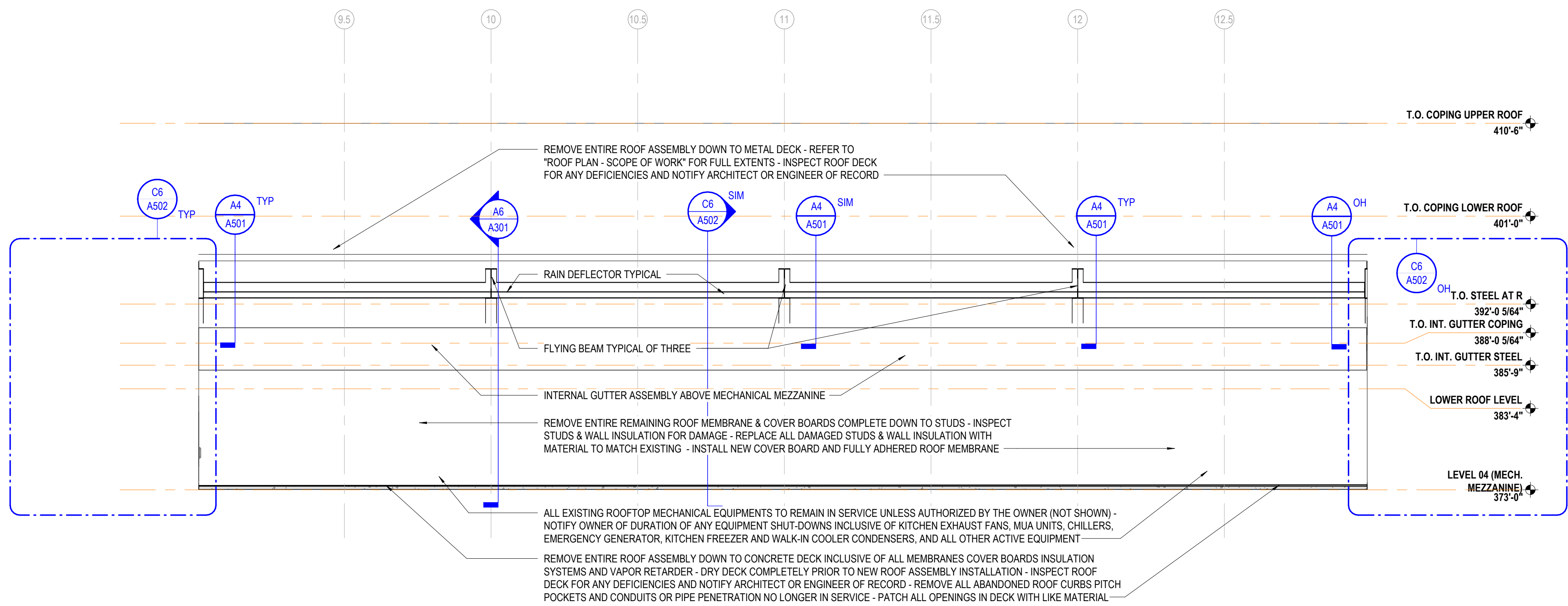
A202

6 | 5 | 4 | 3 | 2 | 1

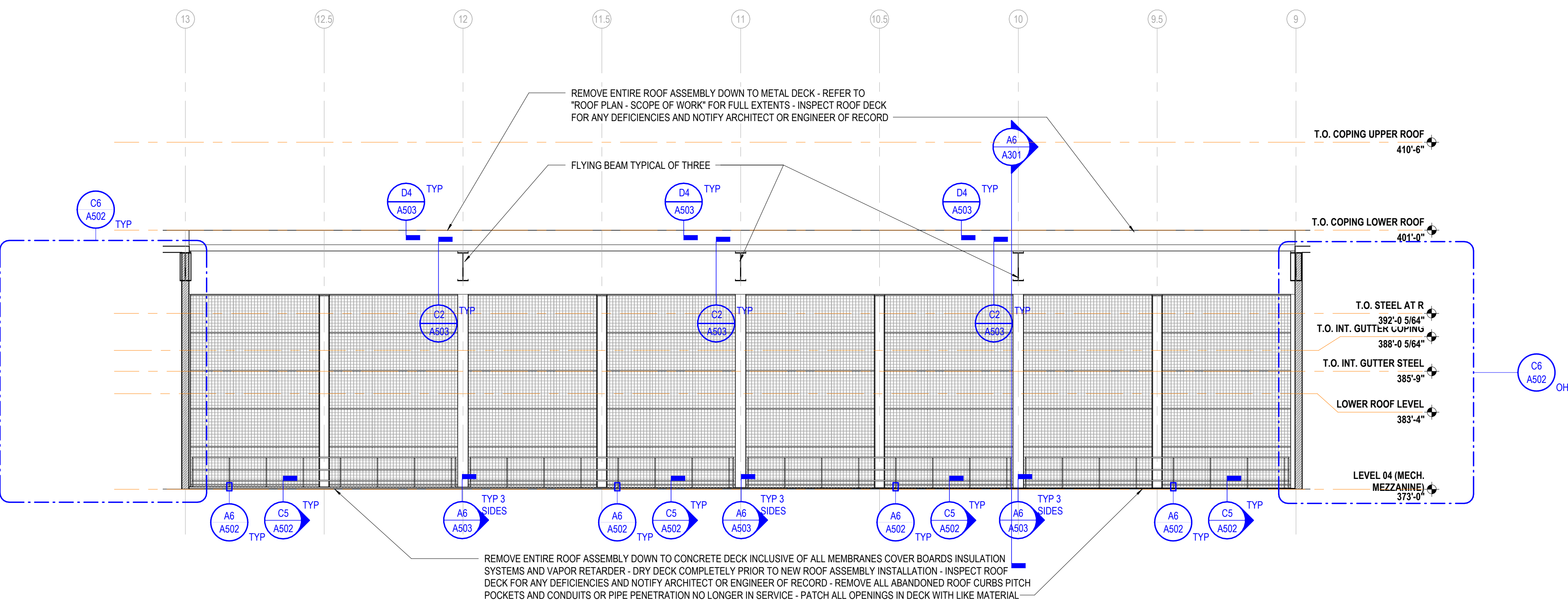


D6 ELEVATION - MECHANICAL MEZZANINE - NORTH
1/8" = 1'-0" DRAWING REF: A3 / A102

D3 ELEVATION - MECHANICAL MEZZANINE - SOUTH
1/8" = 1'-0" DRAWING REF: A3 / A102



B6 ELEVATION - MECHANICAL MEZZANINE - EAST
1/8" = 1'-0" DRAWING REF: A3 / A102



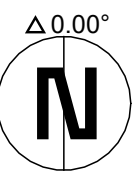
A6 ELEVATION - MECHANICAL MEZZANINE - WEST
1/8" = 1'-0" DRAWING REF: A3 / A102

6 | 5 | 4 | 3 | 2 | 1

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Sheet Title:

BUILDING SECTIONS

PRINT IN COLOR

Sheet Number:

A301

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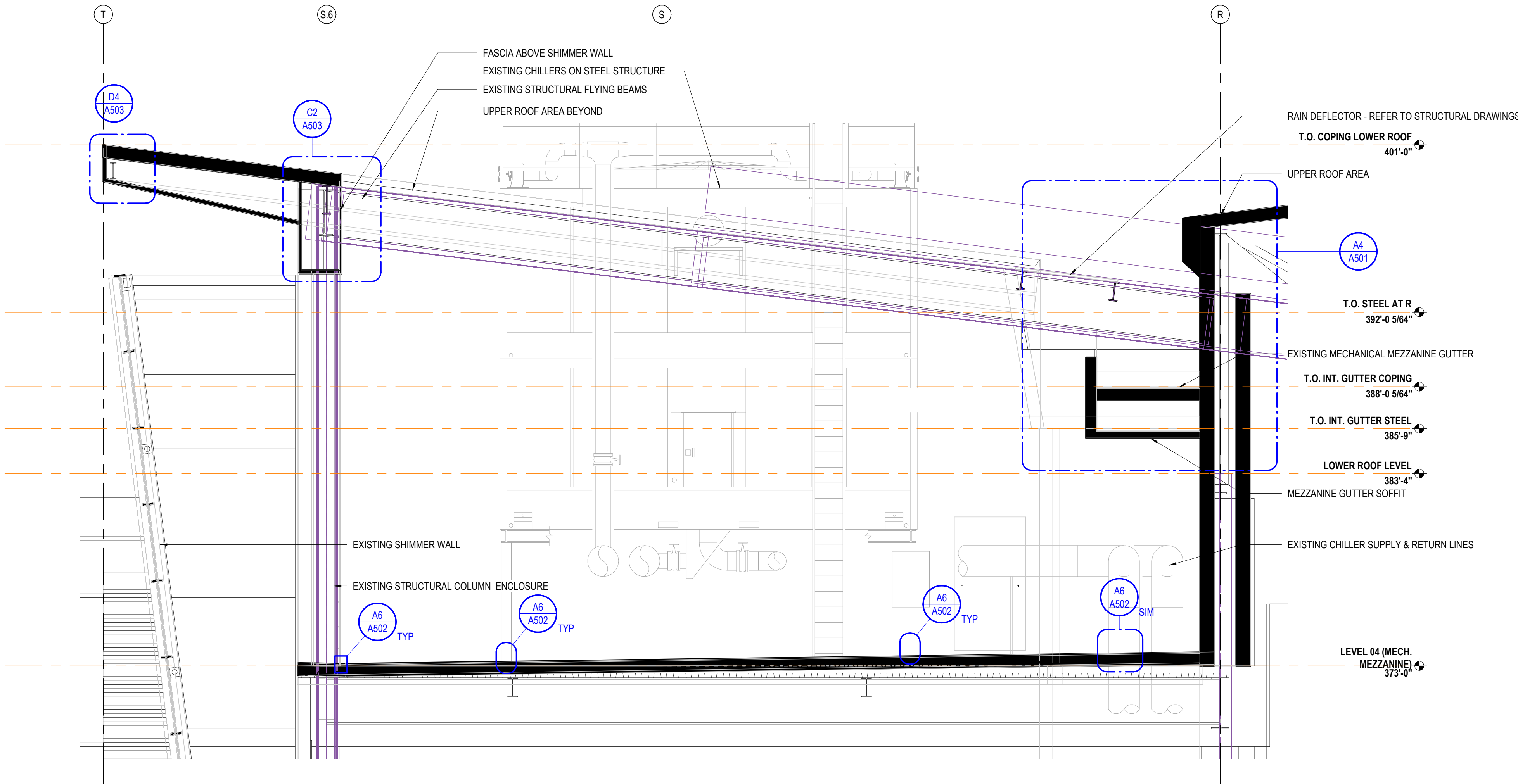
E

D

C

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A



A6 SECTION - MECHANICAL MEZZANINE - LOOKING NORTH
1/4" = 1'-0" DRAWING REF: A3 / A102

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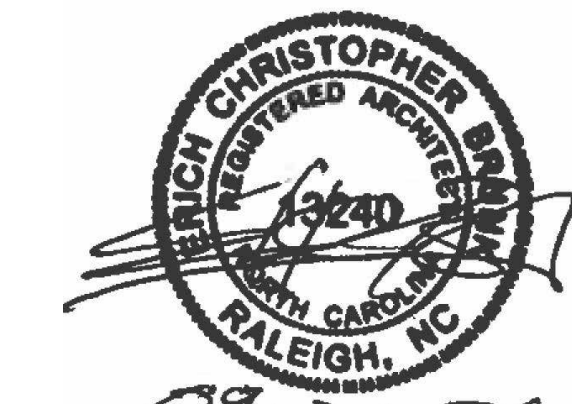
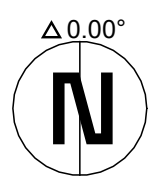
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1

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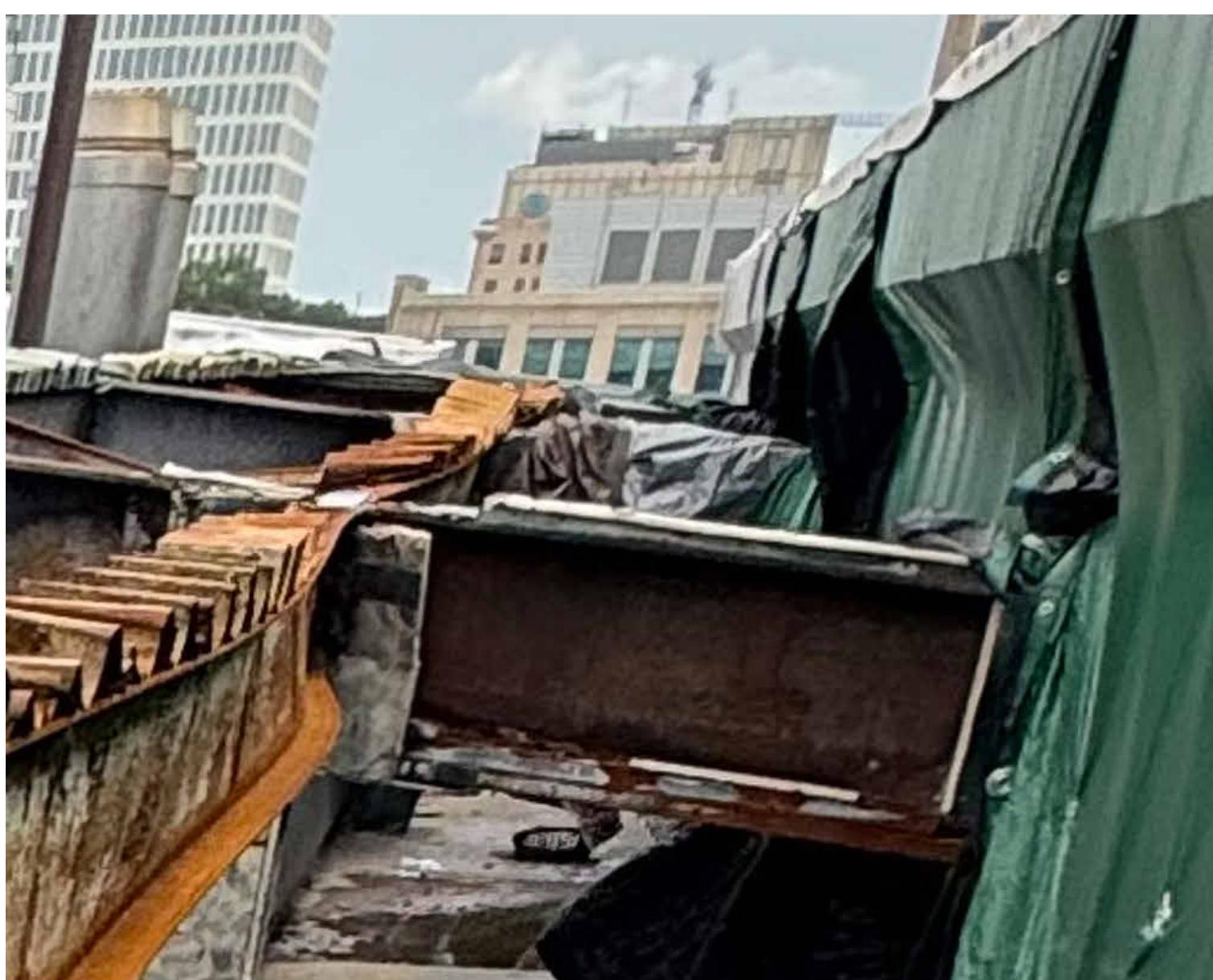


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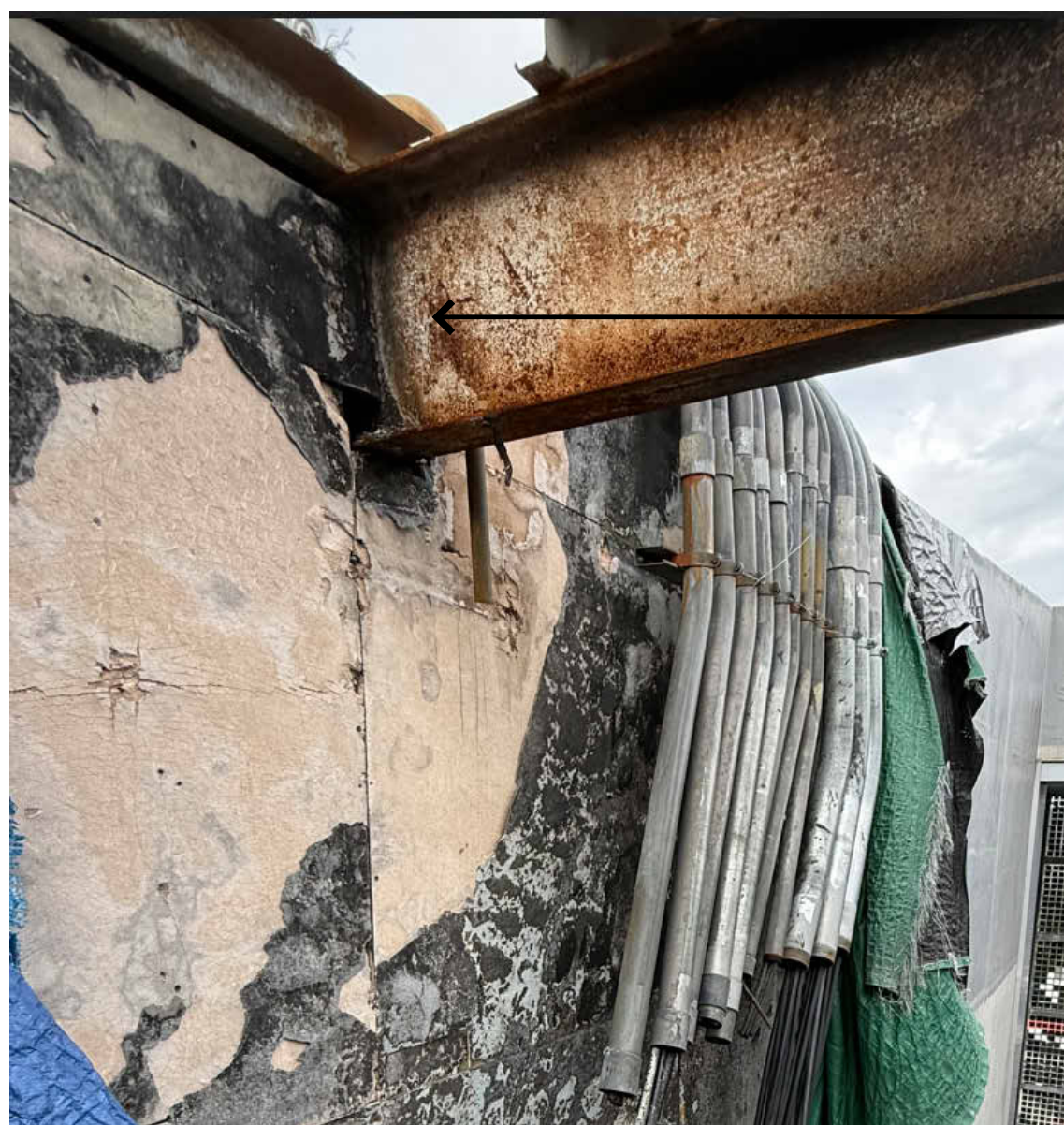
Project Number: R26046.00
Status & Date: September 22, 2026

Sheet Title:
MECHANICAL MEZZANINE
GUTTER & RELATED PHOTOS

PRINT IN COLOR
Sheet Number:
A501



TERMINATION OF FLYING BEAM AT BACK OF HOUSE CORRIDOR



RAIN DEFLECTOR SUPPORT BEAM

REMOVE TEMPORARY ROOF, COVER BOARDS &
METAL STUDS AND PREPARE ALL STUB
COLUMNS FOR NEW ROOF MEMBRANE, COVER
BOARD AND METAL STUD ASSEMBLY TYPICAL



STUB COLUMN AT GUTTER TO FLYING BEAM

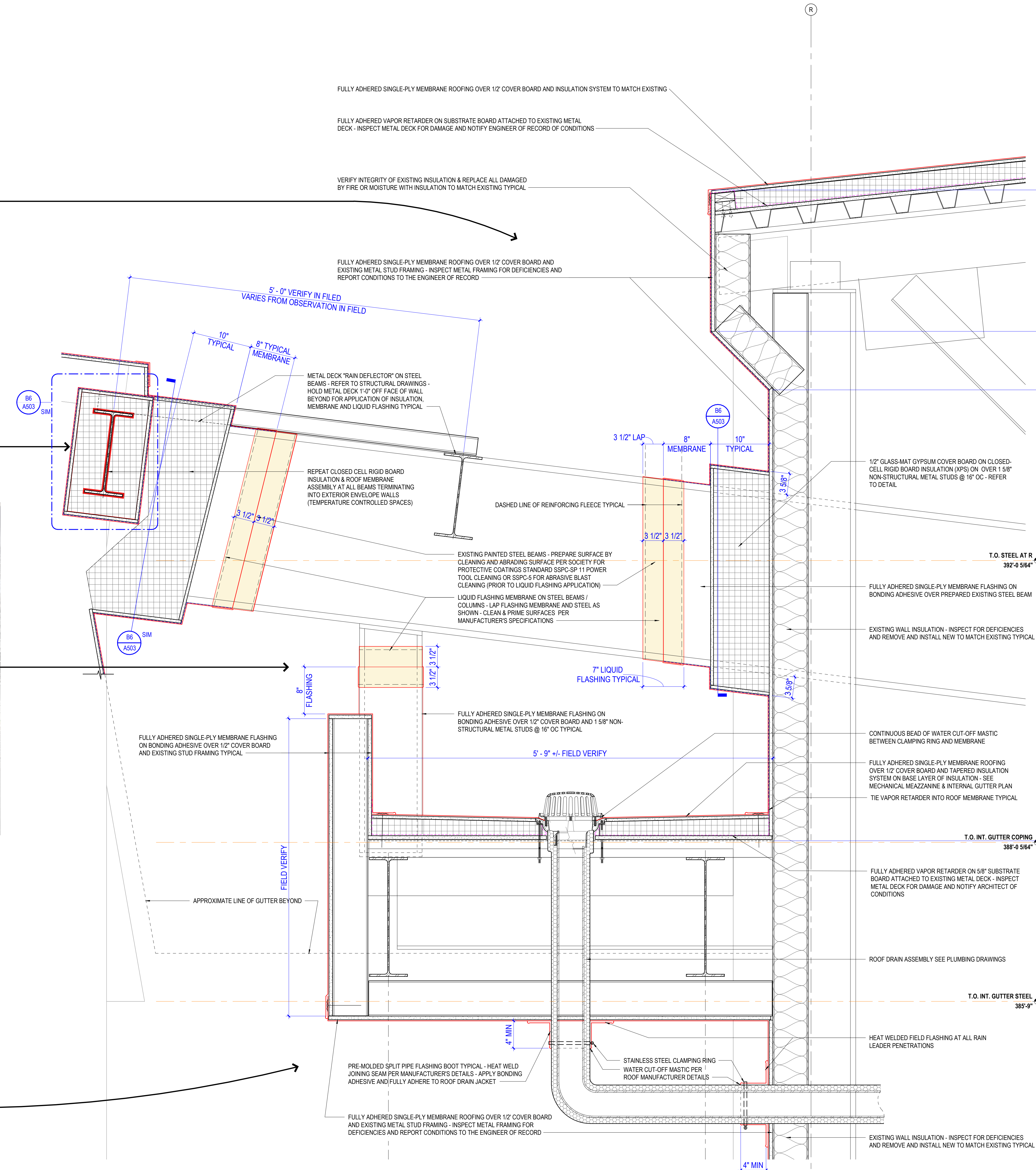


UNDERSIDE OF GUTTER

RAIN LEADER

REMOVE ALL COVER BOARDS COMPLETE AND
INSPECT METAL STUDS FOR DEFICIENCIES -
REPLACE ALL STRUCTURALLY DEFICIENT
STUDS WITH NEW TO MATCH EXISTING

INSPECT EXISTING WALL INSULATION FOR
DEFICIENCIES - REPLACE ALL WATER / FIRE
DAMAGED INSULATION WITH NEW TO MATCH
EXISTING

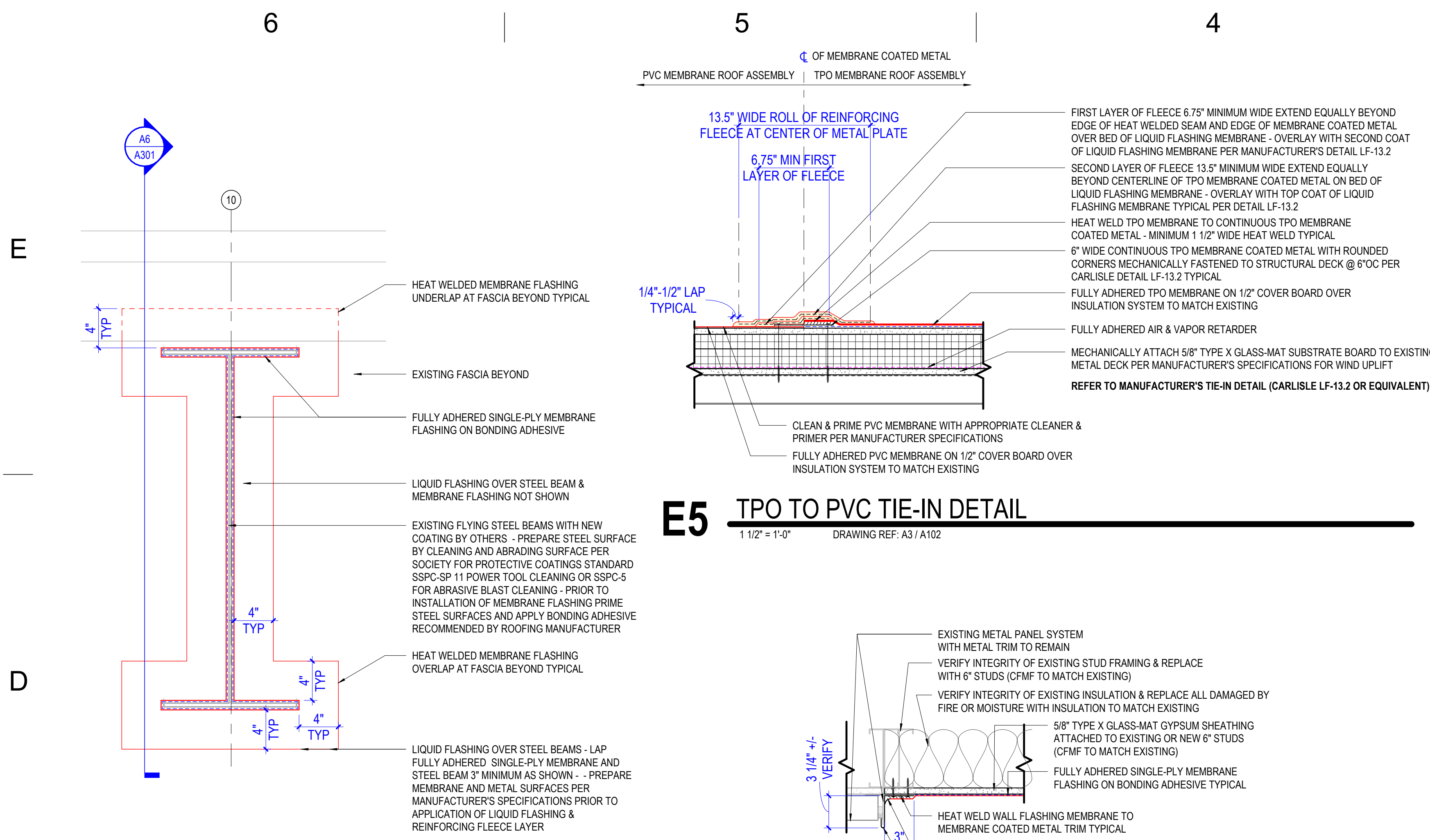


A6 PHOTOS

1 1/2" = 1'-0"

A4 SECTION THROUGH GUTTER SPANNING THE WIDTH OF MECHANICAL MEZZANINE

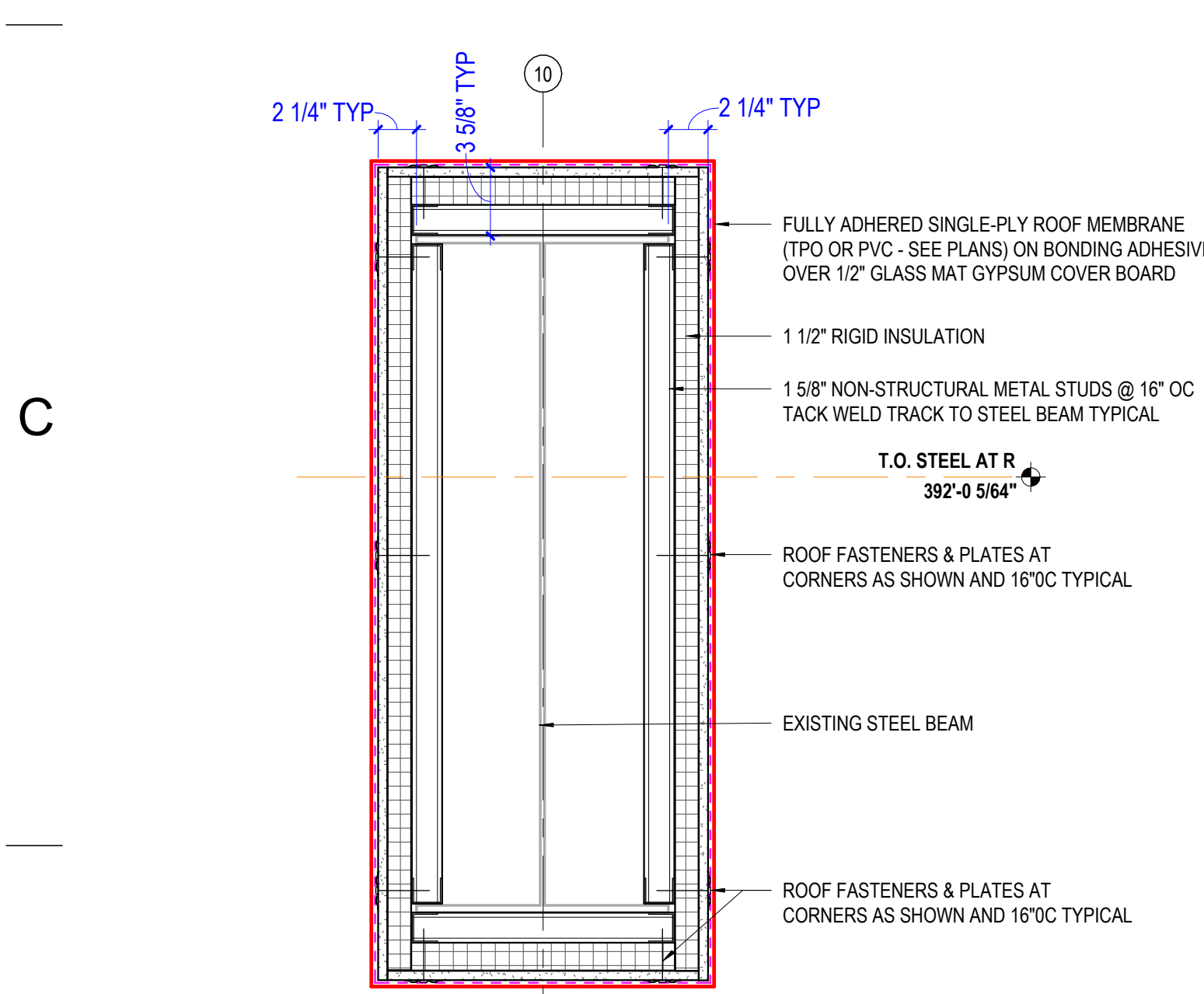
1 1/2" = 1'-0" DRAWING REF: A4 / A102



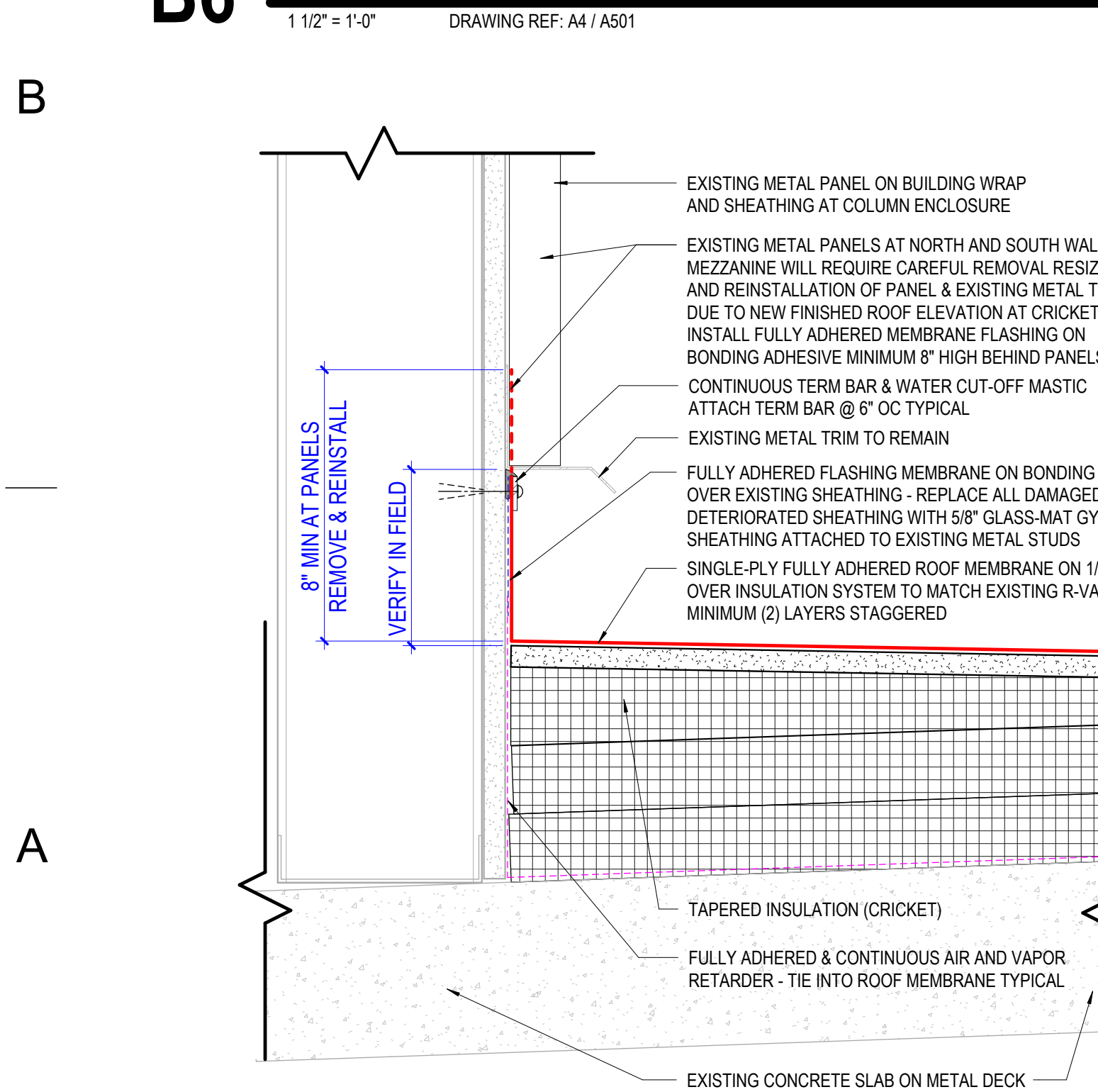
E5 TPO TO PVC TIE-IN DETAIL



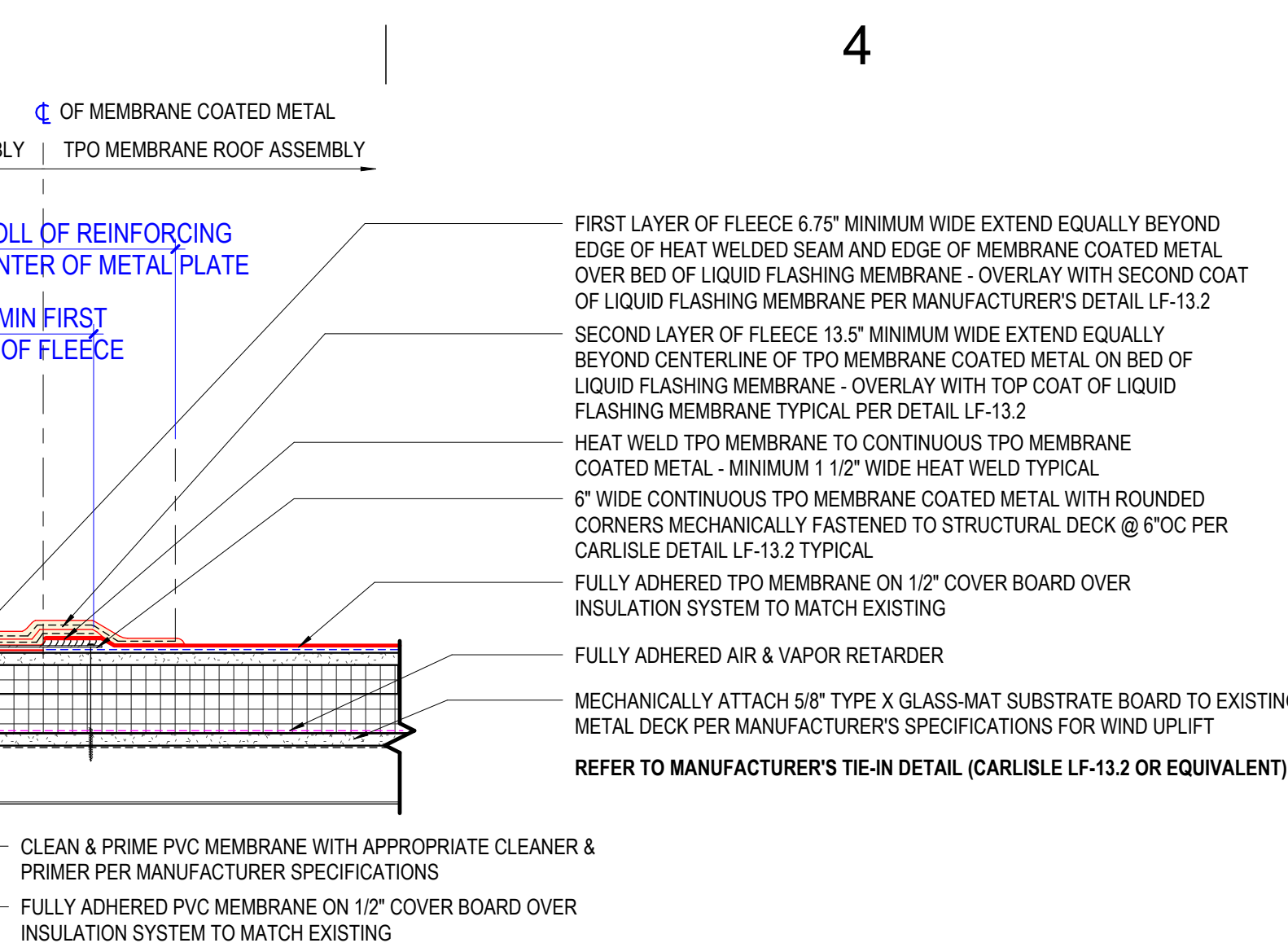
D6 NON-INSULATED WRAP AT FLYING BEAM



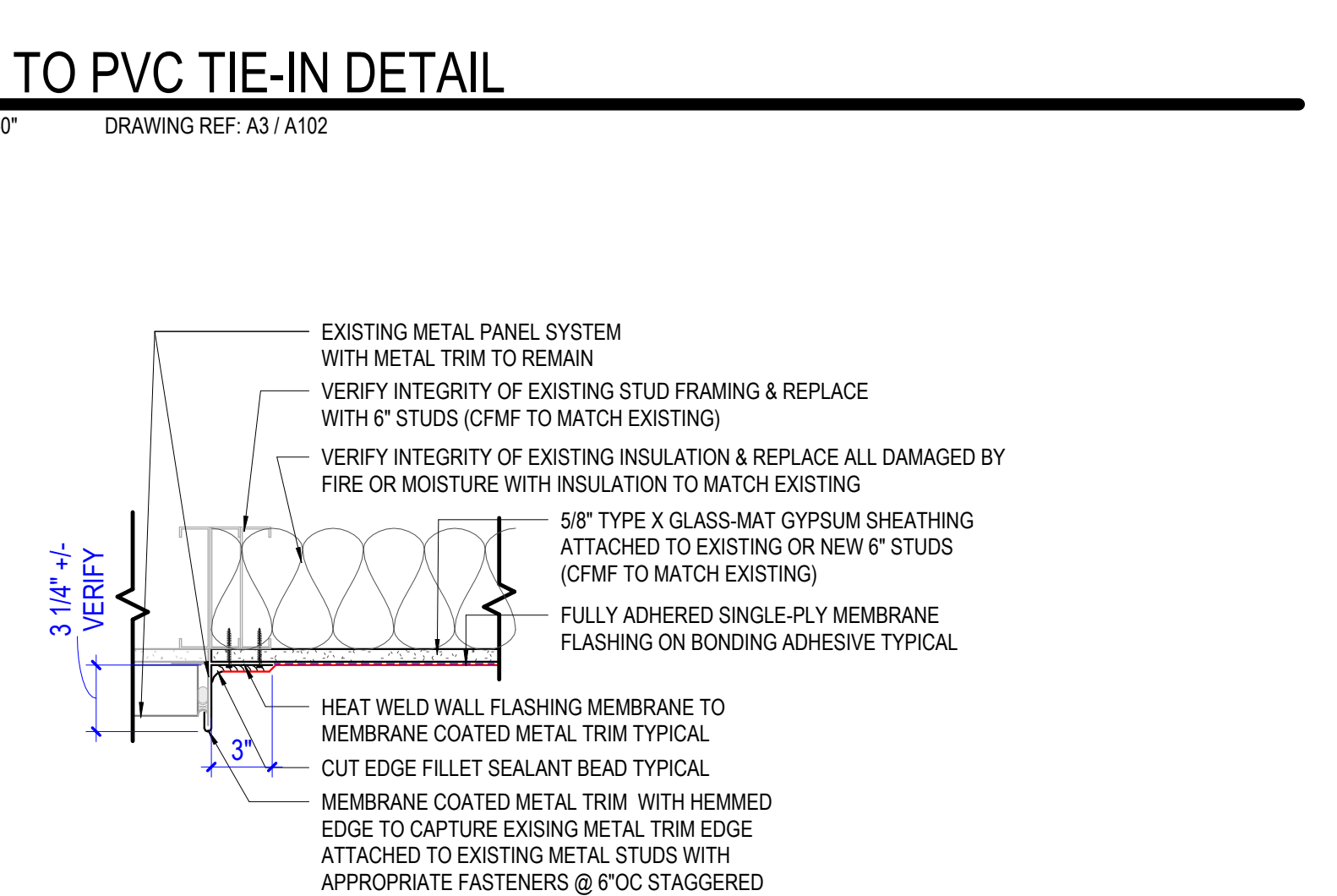
B6 INSULATED WRAP AT FLYING BEAM



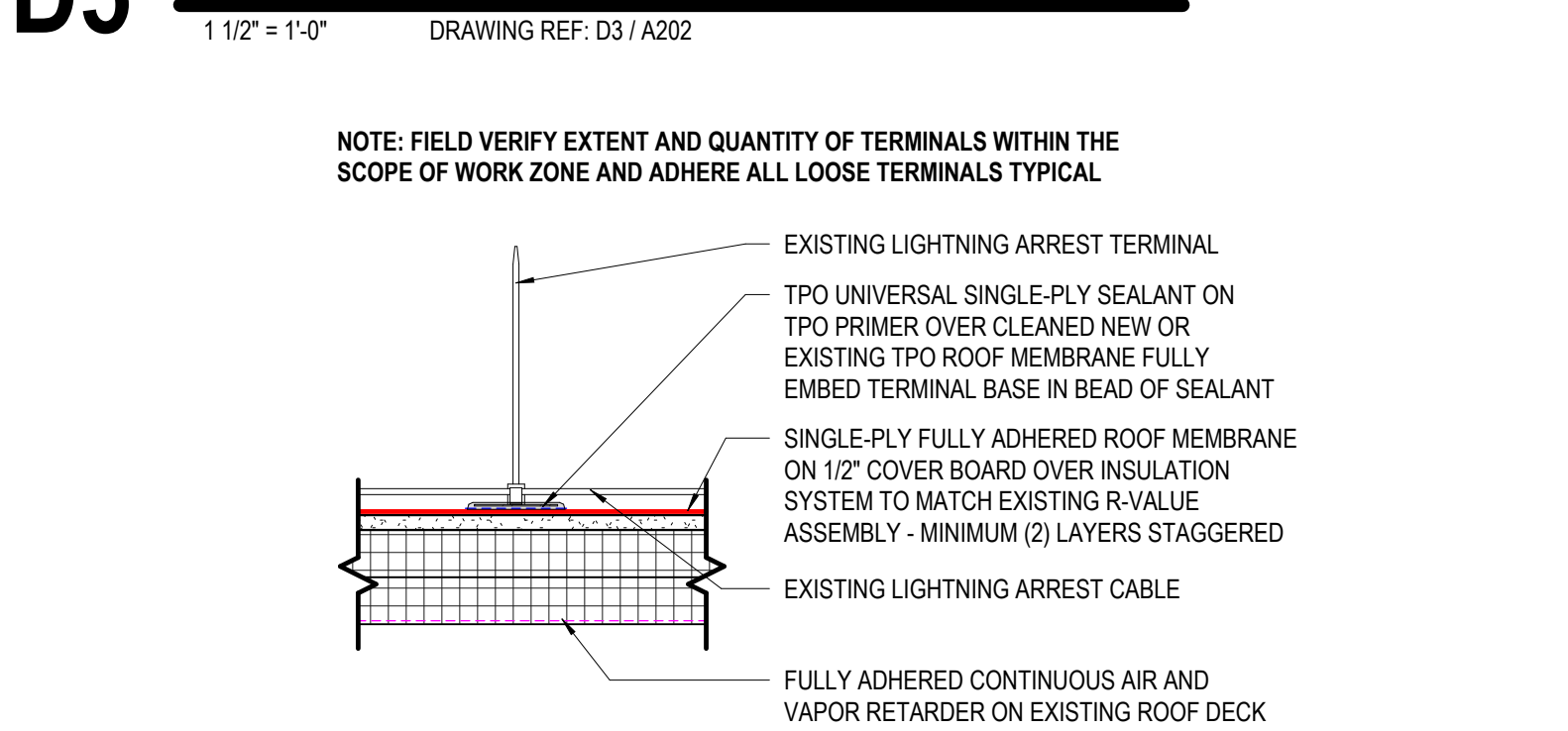
A6 COLUMN BASE DETAIL - PILASTER SIMILAR



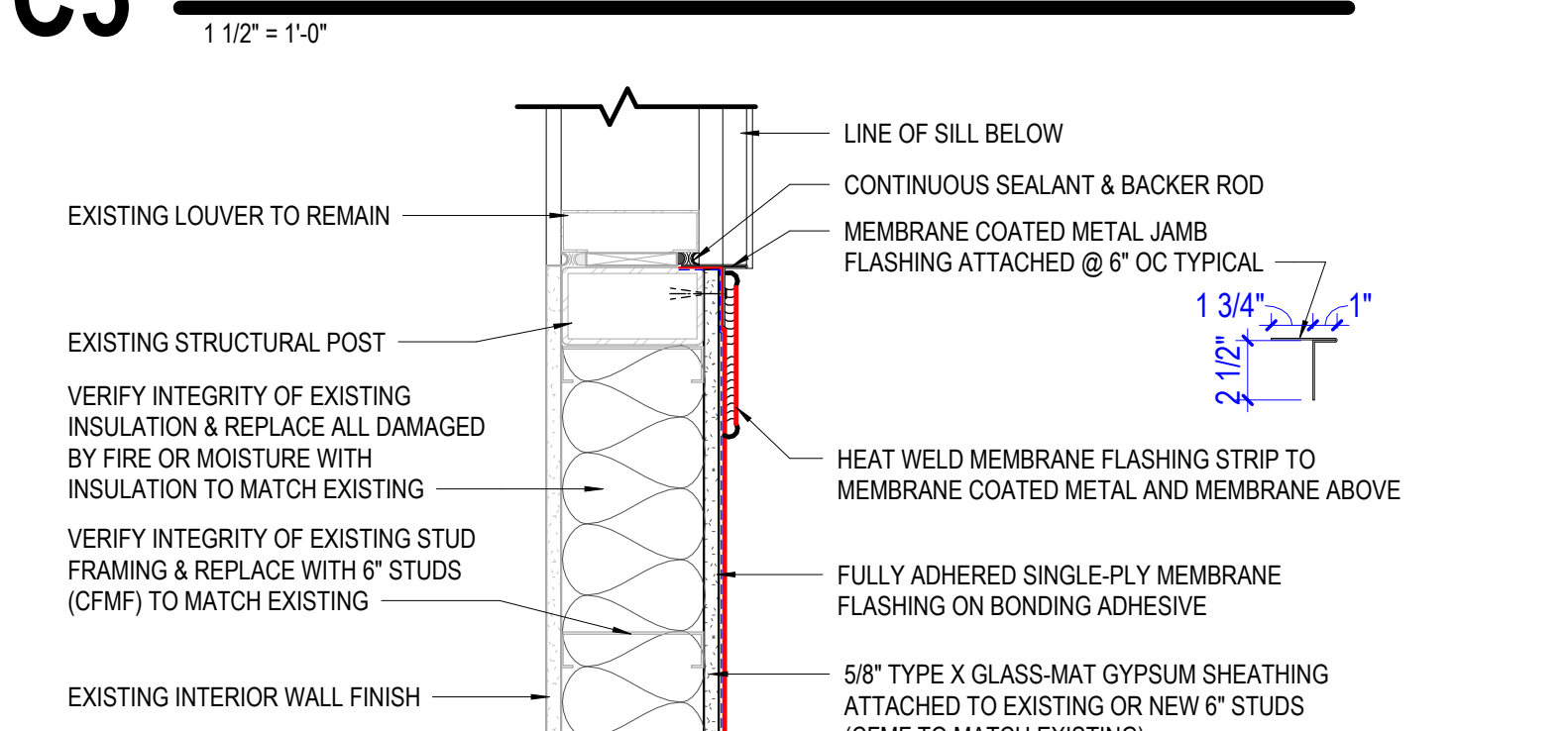
E5 TPO TO PVC TIE-IN DETAIL



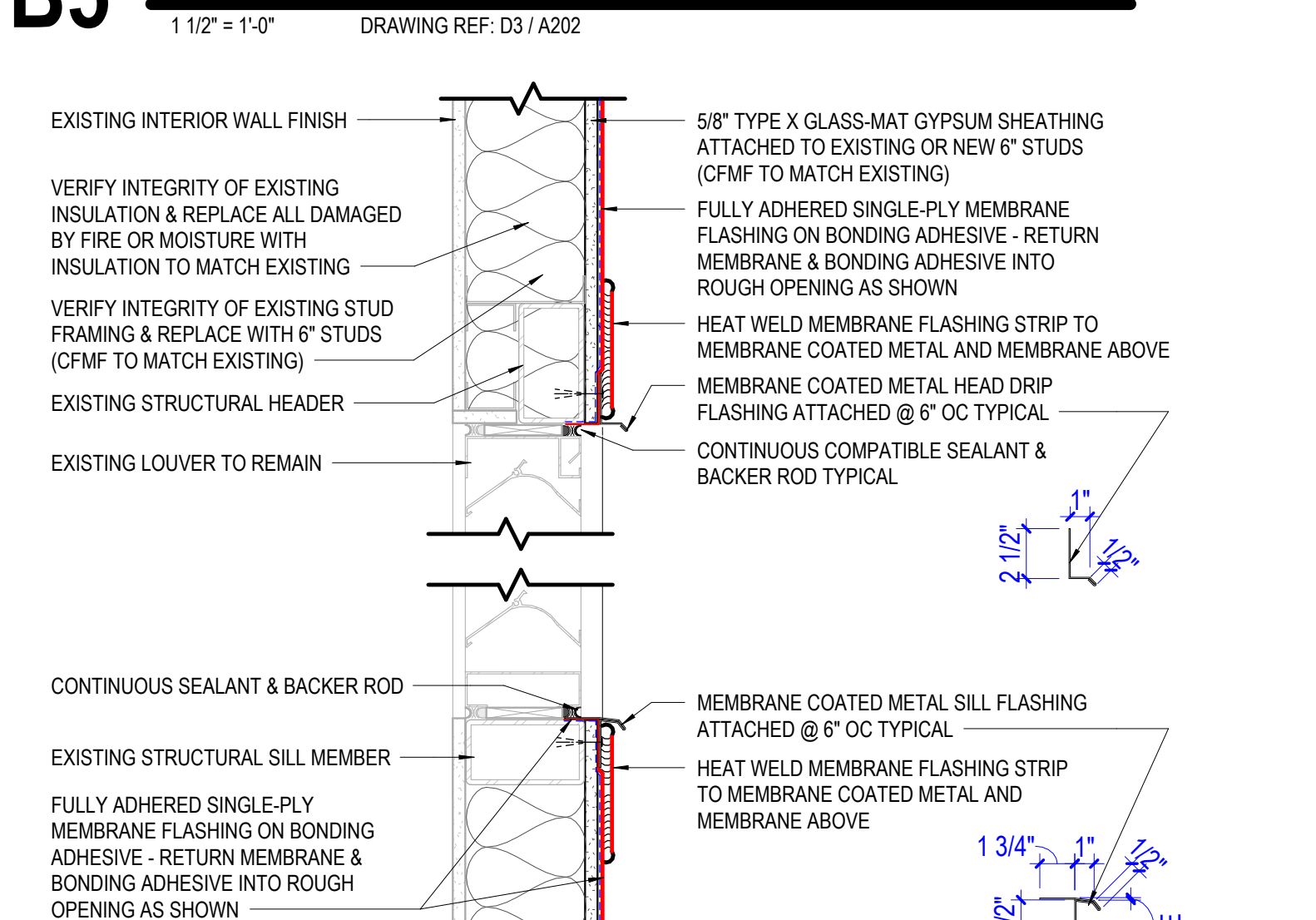
D5 METAL PANEL VERTICAL EDGE TRIM



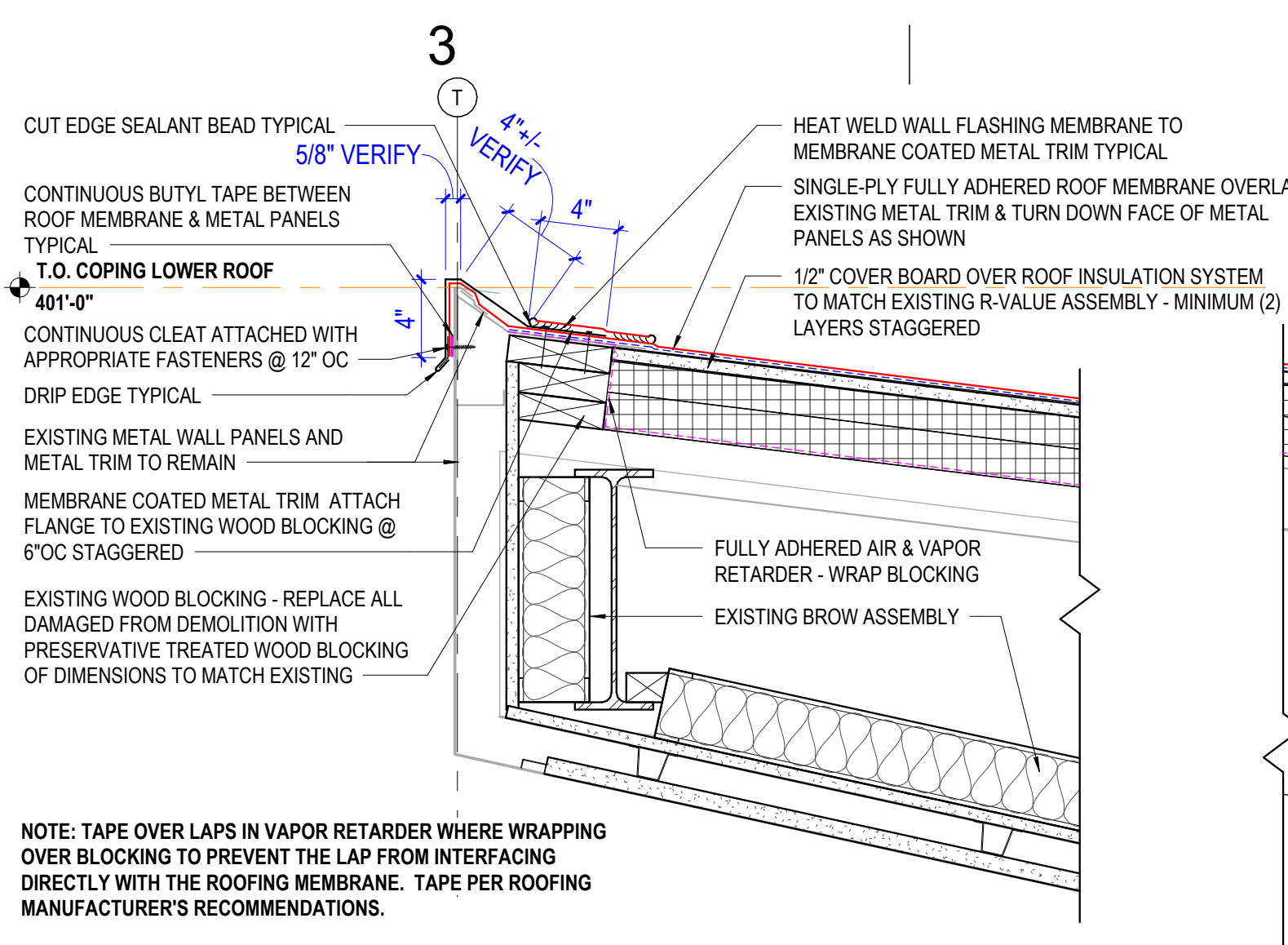
C5 LIGHTNING ARREST TERMINAL



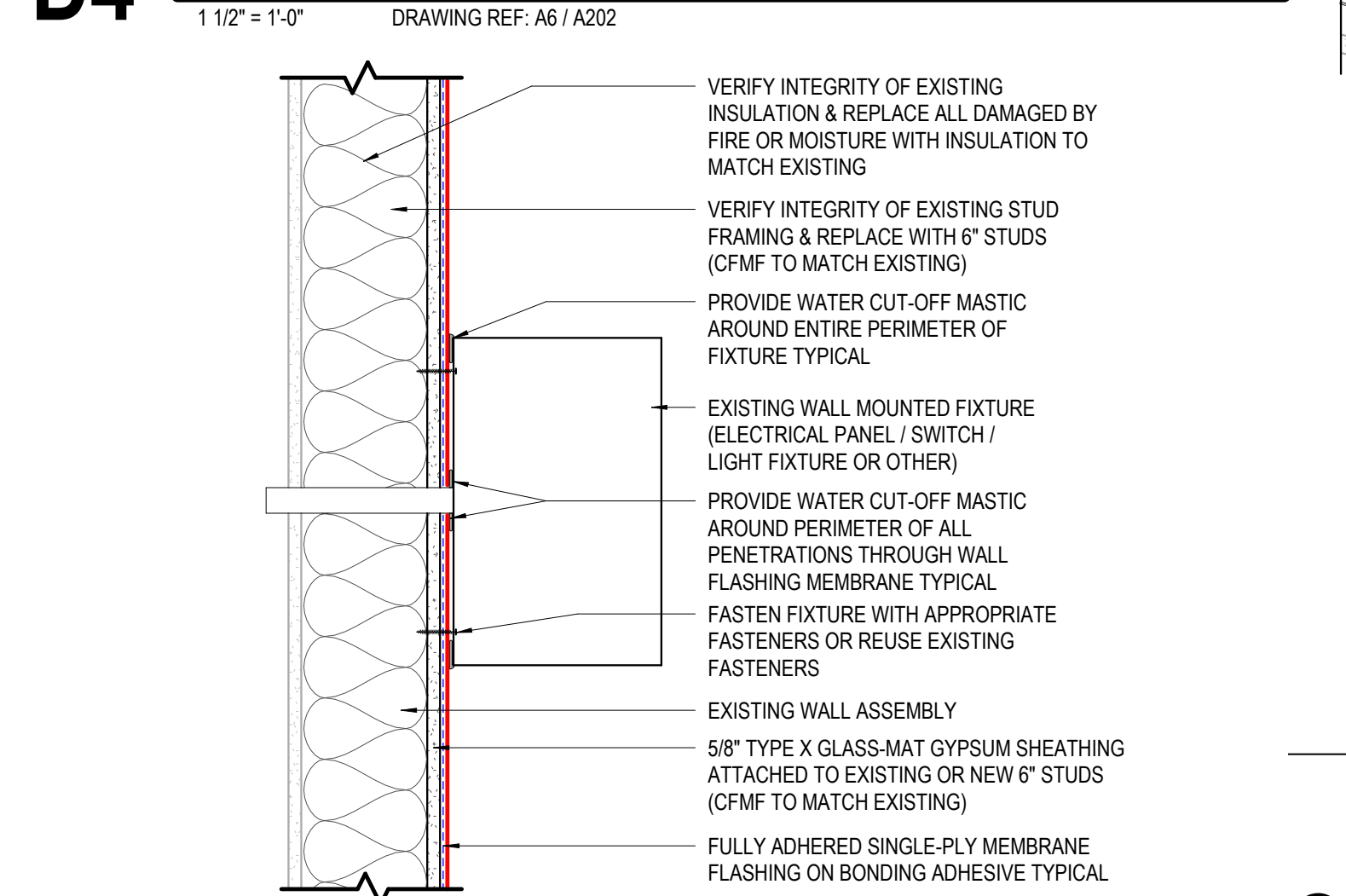
R5 LOUVER JAMB DETAIL



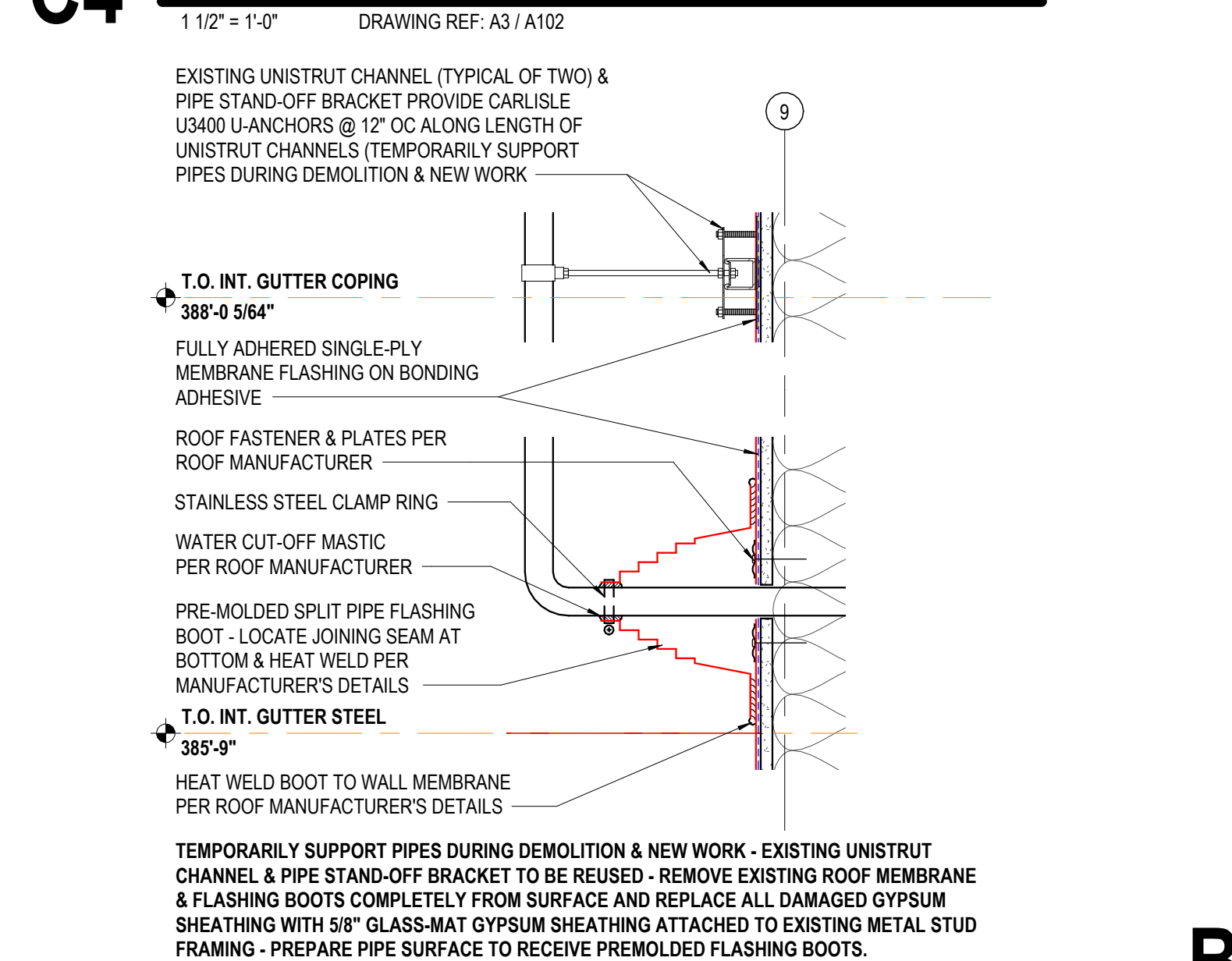
A5 LOUVER HEAD & SILL DETAIL



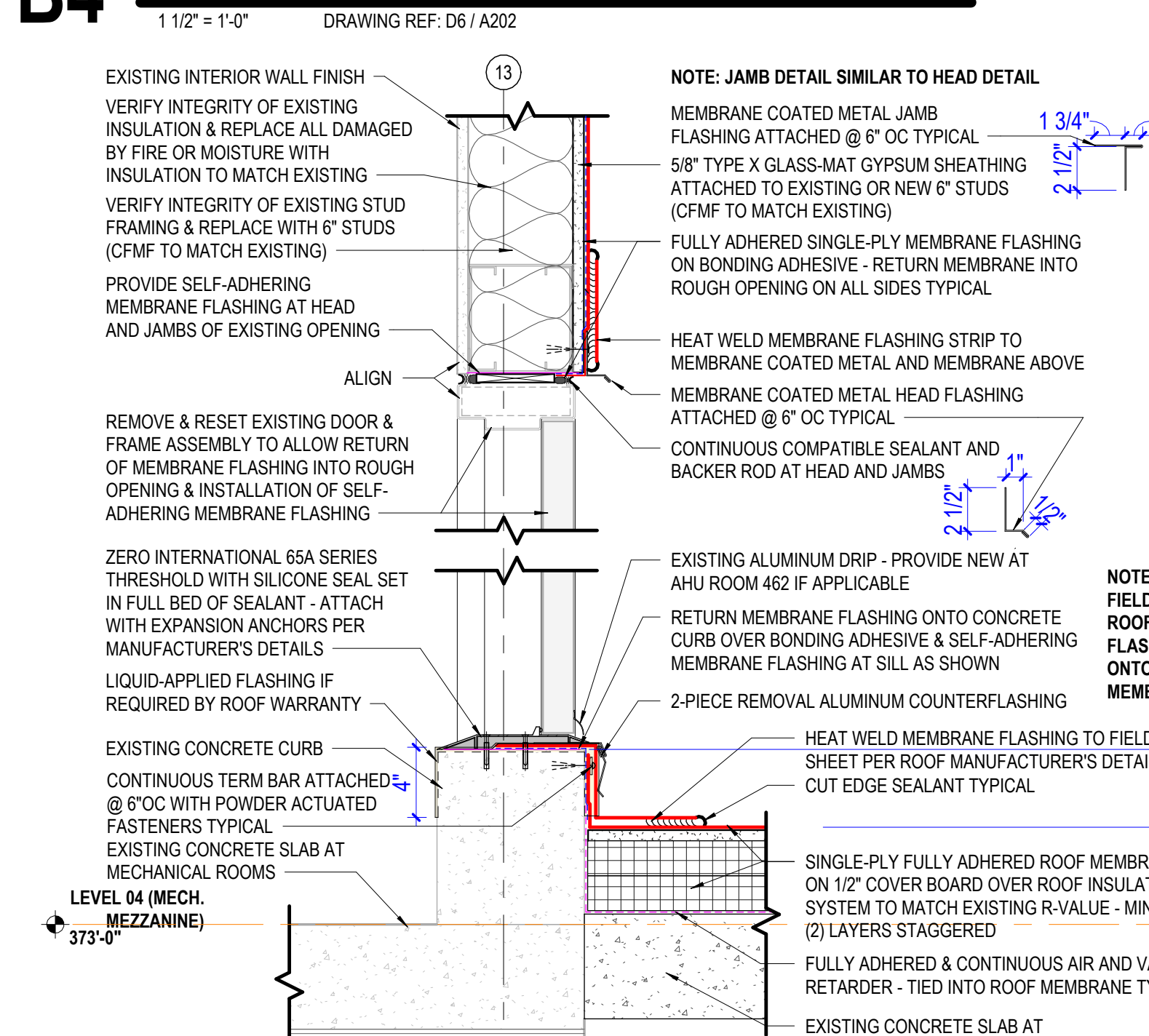
D4 EDGE DETAIL OF SOFFIT AT MECHANICAL WELL



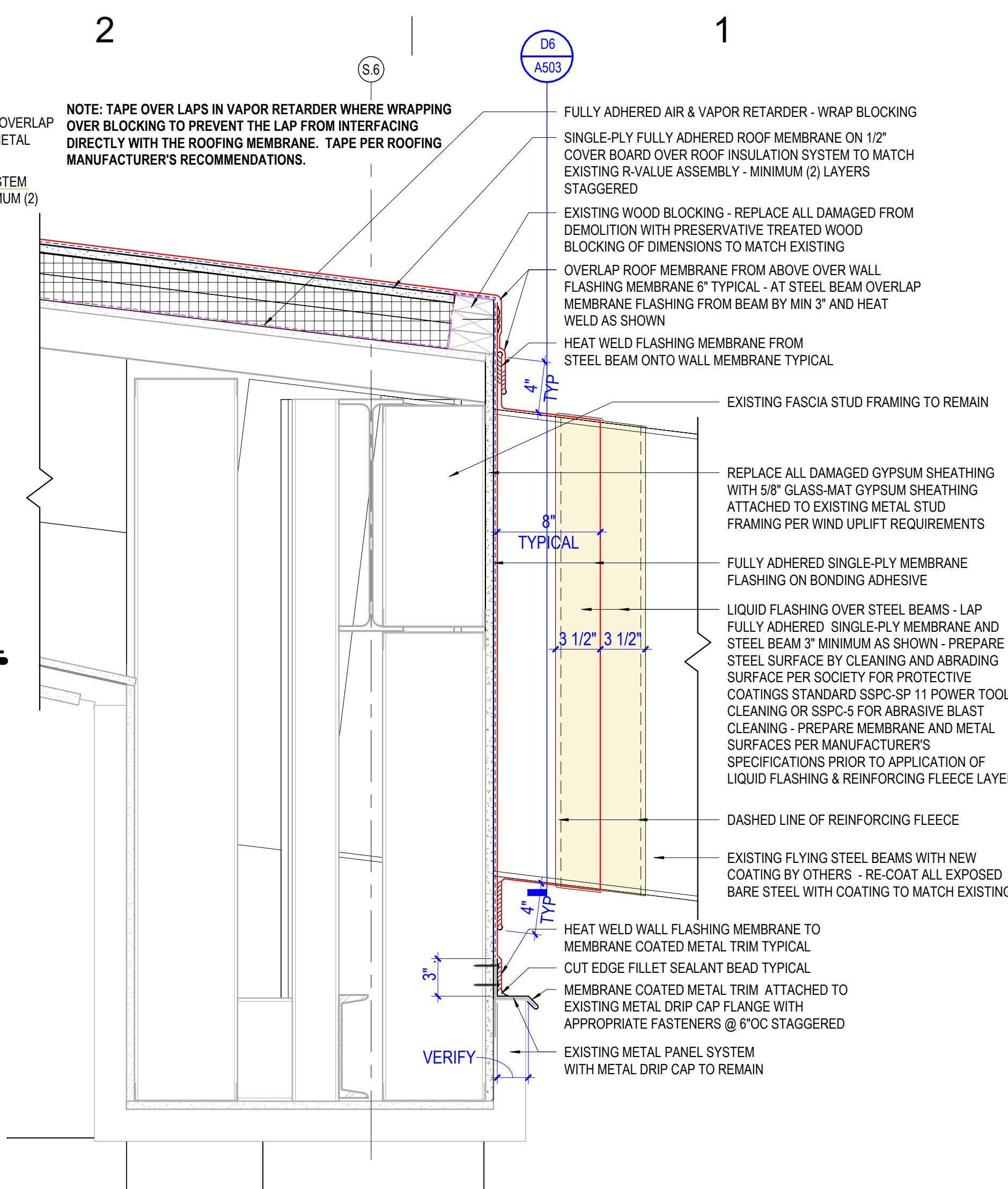
C4 WALL MOUNTED FIXTURES DETAIL



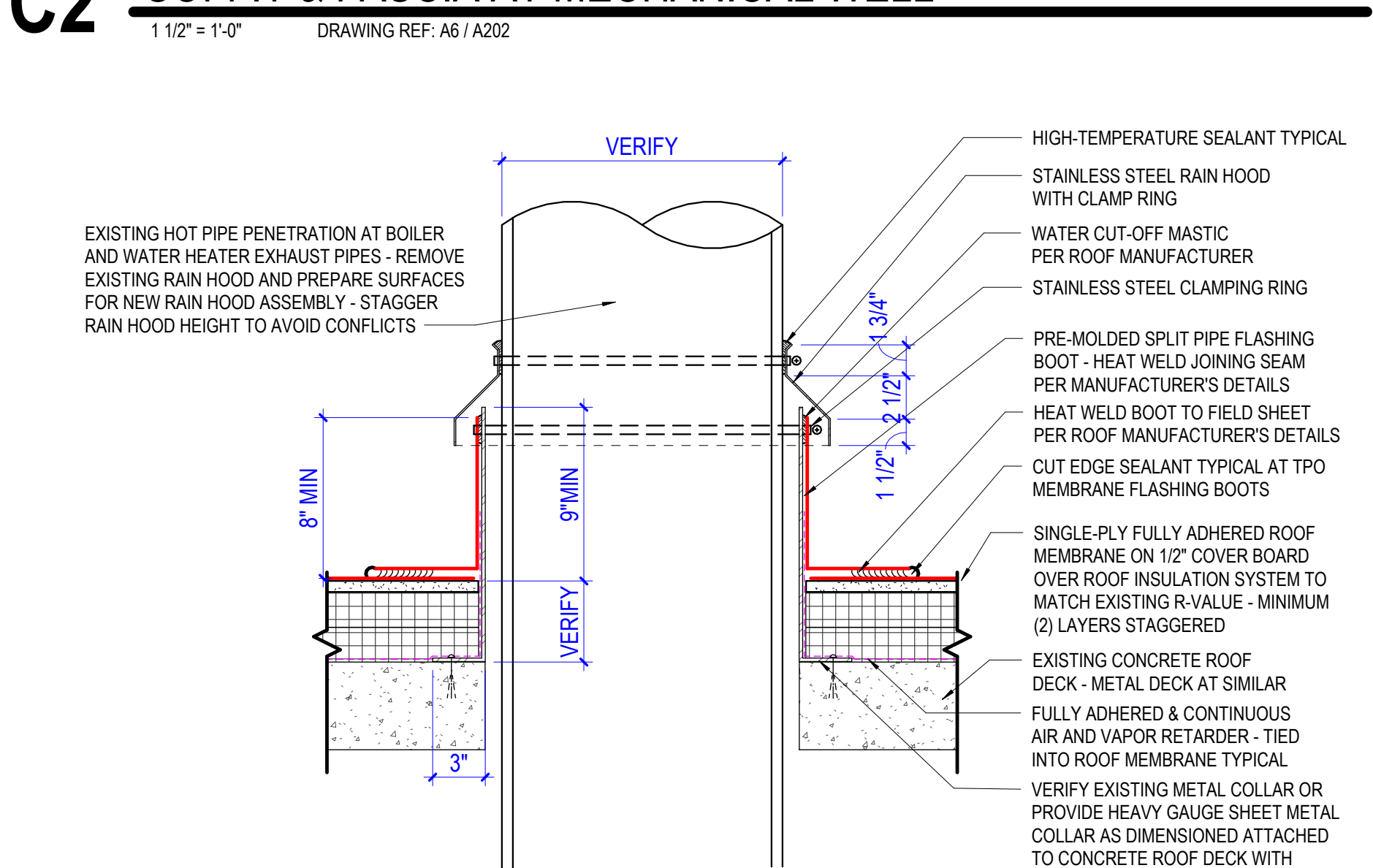
B4 MULTIPLE PIPE CONFIGURATION AT WALL



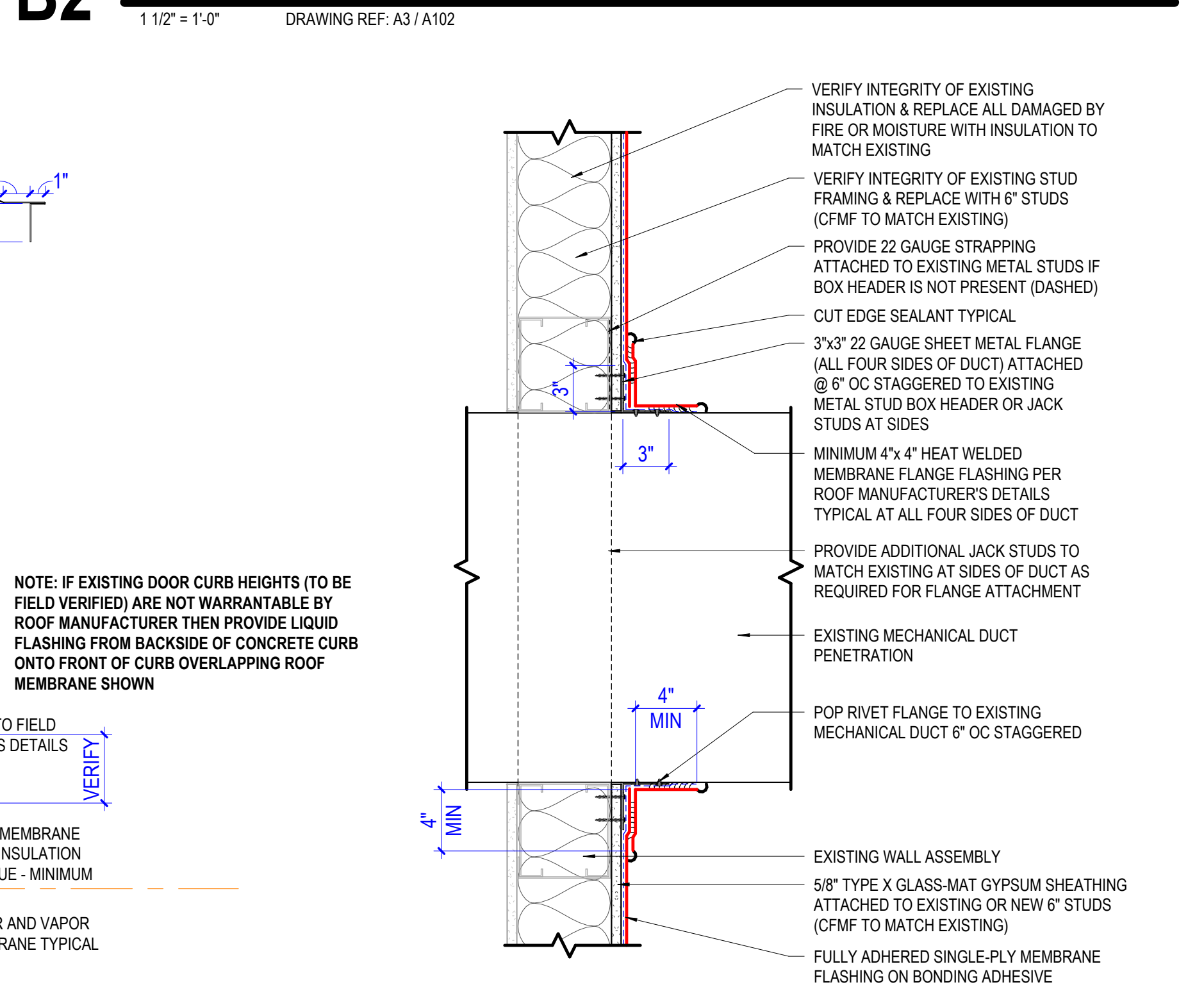
A4 MECHANICAL MEZZANINE DOOR HEAD & SILL DETAIL



C2 SOFFIT & FASCIA AT MECHANICAL WELL



R2 HOT PIPE DETAIL



A2 DUCT SIDE WALL PENETRATION

B

A

D

C

E

6

5

4

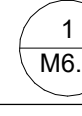
3

2

1

PLUMBING SYMBOLS AND LEGEND		
SYMBOL	ABBREVIATION	DESCRIPTION
	BV	BALL VALVE
	CS	CIRCUIT SETTER OR FLOW CONTROL VALVE
	BFV	BUTTERFLY VALVE
	GV	GATE VALVE
	CHV	CHECK VALVE
	GLV	GLOBE VALVE
	ANV	ANGLE VALVE
	TDV	TRIPLE DUTY VALVE
	HB	HOSE BIB
	HV	3/4" HOSE END DRAIN VALVE
	BP	BACKFLOW PREVENTOR
	GPR	GAS PRESSURE REGULATOR
	STR	STRAINER
	STR	STRAINER WITH 3/4" HOSE END DRAIN VALVE
	PTR	PRESSURE - TEMPERATURE RELIEF VALVE
	RV	PRESSURE RELIEF VALVE
		2-WAY CONTROL VALVE
		3-WAY CONTROL VALVE
		UNION
		REDUCER
	WHA	WATER HAMMER ARRESTOR
	PG	PRESSURE GAGE WITH GAUGE COCK
	TH	THERMOMETER
	FCO/GCO	FLOOR OR GRADE CLEANOUT
	WCO	WALL CLEANOUT
	PD	PIPING TEE DOWN
	PU	PIPING TEE UP
	PU	PIPING ELBOW UP
	PD	PIPING ELBOW DOWN
		BRANCH - TOP CONNECTION
		BRANCH - BOTTOM CONNECTION
	COP	CAP ON END OF PIPE
		ARROW INDICATES DIRECTION OF EACH FLOW
	FLS	FLOOR SINK
	FD	FLOOR DRAIN
	VTR	PLUMBING VENT THRU ROOF

PLUMBING PIPING LEGEND		
SYMBOL	ABBREVIATION	DESCRIPTION
	CW	COLD WATER
	HWS	HOT WATER SUPPLY
	HWR	HOT WATER RETURN
	W	SANITARY WASTE
	W	SANITARY WASTE (ABOVE GRADE)
	GLW	GREASE LADEN WASTE
	V	VENT PIPING
	ST	STORM OR ROOF DRAIN PIPING
	ST	STORM OR ROOF DRAIN PIPING (ABOVE GRADE)
	ODL	OVERFLOW ROOF DRAIN PIPING
	ODL	OVERFLOW ROOF DRAIN PIPING (ABOVE GRADE)
	CD	CONDENSATE DRAIN PIPING
	TW	TEMPERED WATER (105° F)
	TP	TRAP PRIMER WATER PIPING
	G	GAS - LOW PRESSURE (7"-14" WC)
	MPG	GAS - MEDIUM PRESSURE (2-3 PSI)
	HPG	GAS - HIGH PRESSURE (5 PSI AND ABOVE)
	LPG	GAS - LIQUIFIED PETROLEUM
	CA	COMPRESSED AIR PIPING

PLUMBING ANNOTATIONS		
SYMBOL	ABBREVIATION	DESCRIPTION
		MECHANICAL EQUIPMENT - (SEE MECHANICAL SCHEDULE)
		DETAIL REFERENCE CALLOUT, DETAIL NUMBER AND SHEET
		SECTION VIEW CALLOUT, DETAIL NUMBER AND SHEET
	POC	POINT OF CONNECTION - NEW ITEMS TO EXISTING ITEMS
	L-1	PLUMBING FIXTURE SCHEDULE - (SEE SCHEDULE)
		SHEET NOTES
	AP	ACCESS PANEL

CODE COMPLIANCE DATA	
THE FOLLOWING ARE THE PRIMARY CODES UNDER WHICH THIS PROJECT IS DESIGNED AND PERMITTED.	
CODE	APPLICABLE CODE BOOK AND YEAR
BUILDING	2018 NORTH CAROLINA STATE BUILDING CODE - BUILDING
PLUMBING	2018 NORTH CAROLINA STATE BUILDING CODE - PLUMBING
BUILDING	2018 NORTH CAROLINA STATE BUILDING CODE - EXISTING BUILDING

PLUMBING ABBREVIATIONS	
ABBREVIATION	DESCRIPTION
ADA	AMERICANS WITH DISABILITIES ACT
AFF	ABOVE FINISHED FLOOR
AV	ACID VENT
AW	ACID WASTE
BFF	BELOW FINISHED FLOOR
BFG	BELOW FINISHED GRADE
BHP	BRAKE HORSE POWER
BOF	BOTTOM OF PIPE
BTU/H	BRITISH THERMAL UNIT PER HOUR
CO	CLEAN-OUT
CP	CONDENSATE PUMP
CPVC	CHLORINATED POLYVINYL CHLORIDE
CU	COPPER
(D)	DEMOLISHED
DIA	DIAMETER
DFU	DRAINAGE FIXTURE UNIT
DN	DOWN
(E)	EXISTING
EFF	EFFICIENCY
EW	ELECTRIC WATER COOLER
EWI	ENTERING WATER TEMPERATURE
°F	DEGREES FAHRENHEIT
FLA	FULL LOAD AMPS
FTM	FEET PER MINUTE
GA	GAGE OR GAUGE
GAL	GALLONS
GI	GREASE INTERCEPTOR
GPF	GALLONS PER FLUSH
GPM	GALLONS PER MINUTE
HD	HEAD PRESSURE
HP	HORSEPOWER
IBC	INTERNATIONAL BUILDING CODE
IMC	INTERNATIONAL MECHANICAL CODE
IPC	INTERNATIONAL PLUMBING CODE
IE	INVERT ELEVATION BELOW FINISHED FLOOR
KW	KILOWATT
L	LAVATORY
LBS	POUNDS
LWT	LEAVING WATER TEMPERATURE
MAX	MAXIMUM
MBH	ONE THOUSAND BTUH
MCA	MINIMUM CIRCUIT AMPS
MIN	MINIMUM
MOC	MAXIMUM OVER CURRENT PROTECTION
N/A	NOT APPLICABLE
N/C	NORMALLY CLOSED
N/O	NORMALLY OPEN
NEC	NATIONAL ELECTRIC CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIS	NOT IN SCOPE
NTS	NOT TO SCALE
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
PD	PRESSURE DROP
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
RD	ROOF DRAIN
RPM	REVOLUTIONS PER MINUTE
S	SINK
SOI	SAND OIL INTERCEPTOR
SP	SUMP PUMP
SS	STAINLESS STEEL
TDH	TOTAL DYNAMIC HEAD
TFA	TO FLOOR ABOVE
TFB	TO FLOOR BELOW
TYP	TYPICAL
UBC	UNIFORM BUILDING CODE
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORIES, INC.
UMC	UNIFORM MECHANICAL CODE
UNO	UNLESS NOTED OTHERWISE
UPC	UNIFORM PLUMBING CODE
VFD	VARIABLE FREQUENCY DRIVE
WC	WATER COLUMN
WG	WATER GAUGE
WSFU	WATER SUPPLY FIXTURE UNIT
WVS	WASTE VENT STACK

PLUMBING GENERAL NOTES	
1.	PLUMBING WORK SHALL CONFORM WITH THE LATEST ADOPTED LOCAL CODES, ORDINANCES AND DESIGN REQUIREMENTS INCLUDING BUT LIMITED TO THE FOLLOWING: 2018 NORTH CAROLINA STATE BUILDING CODE, 2018 NORTH CAROLINA STATE PLUMBING CODE, 2018 NORTH CAROLINA STATE FIRE CODE, 2018 NORTH CAROLINA STATE MECHANICAL CODE, 2018 NORTH CAROLINA STATE ENERGY CONSERVATION, 2020 NORTH CAROLINA STATE ELECTRIC CODE (NEC), NATIONAL FIRE PROTECTION ASSOCIATION STANDARDS.
2.	(FOR RENOVATIONS OR REMODELS) THE INFORMATION INDICATED WITHIN THE DRAWINGS AS EXISTING WAS TAKEN FROM CLIENT PROVIDED INFORMATION SUCH AS AS-BUILT DRAWINGS, SITE PHOTOS, OR OBSERVED BY THE DESIGN TEAM DURING SITE VISITS. THE ACCURACY OF THE DRAWING IS NOT GUARANTEED BUT ONLY FOR INDICATING, TO THE BEST OF OUR KNOWLEDGE, THE EXISTING SYSTEMS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VISIT THE SITE AND FIELD VERIFY SYSTEMS SHOWN ON THE DRAWINGS. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO MAKE ADJUSTMENTS TO THE DRAWING INFORMATION AS REQUIRED TO MATCH EXISTING FIELD CONDITIONS.
3.	THE CONTRACTOR SHALL INSTALL NEW SYSTEMS AROUND NEW AND EXISTING OBSTACLES SUCH AS BUT NOT LIMITED TO DOMESTIC WATER PIPING, WASTE AND VENT PIPING, FIRE SPRINKLER PIPING, GAS PIPING, ELECTRICAL CONDUIT, DUCTING, AND EXISTING HVAC EQUIPMENT. RELOCATION OF EXISTING SYSTEMS MAY BE REQUIRED IF IN CONFLICT WITH NEW SYSTEMS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE ANY RELOCATIONS WITH THE APPROPRIATE SUBCONTRACTOR.
4.	CONTRACTOR SHALL COORDINATE WITH STRUCTURAL REQUIREMENTS BEFORE DRILLING OR CUTTING ANY CMU WALLS, CEILING JOISTS OR STRUCTURAL ELEMENTS.
5.	PLUMBING DRAWING ARE INHERENTLY DIAGRAMMATIC AND ONLY SERVE TO SHOW INTENT, SYSTEM CONNECTIONS, AND GENERAL ROUTING. THE CONTRACTOR IS RESPONSIBLE FOR ALL FOR ALL COMPONENTS FOR A COMPLETE OPERABLE AND CODE COMPLIANT SYSTEM.
6.	LOCATIONS OF UTILITIES SHOWN ARE FOR INFORMATION/COORDINATION PURPOSES ONLY. DETERMINE EXACT LOCATIONS OF EXISTING UTILITIES IN FIELD. VERIFY INVERTS AND ELEVATIONS PRIOR TO CONSTRUCTION AND INSTALLATION.
7.	CONTRACTOR TO PROVIDE ALL REQUIRED LABOR, MATERIALS, EQUIPMENT, AND INSURANCES TO COMPLETE THE DESIGN PER THE INTENT OF THE DRAWINGS AND SPECIFICATIONS TO THE SATISFACTION OF THE ENGINEER/ARCHITECT.
8.	CONTRACTOR TO PROVIDE ALL REQUIRED PERMITS AND FEES TO COMPLETE THE PROJECT.
9.	CONTRACTOR SHALL GUARANTEE ALL WORK AND MATERIALS FOR ONE YEAR.
10.	THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH DRAWINGS PROVIDED BY OTHER DISCIPLINES. CONSTRUCTION CONFLICTS ARE TO BE BROUGHT TO THE ATTENTION OF THE ENGINEER/ARCHITECT.
11.	DUE TO THE SMALL SCALE OF THE DRAWINGS, IT IS NOT FEASIBLE TO SHOW ALL REQUIRED ROUTING, ELEVATIONS, ETC., IT IS THEREFORE THE CONTRACTORS RESPONSIBILITY TO VERIFY THE REQUIRED ROUTING, ELEVATION, AND PLACEMENT OF EQUIPMENT AND FIXTURES. DEVIATIONS ARE TO BE INSTALLED IN ACCORDANCE WITH CURRENT CODES AND THE SPECIFICATIONS TO MEET THE INTENT OF THE DESIGN.
12.	ALL INFORMATION SHOWN ON SCHEDULES ARE BASED ON AVAILABLE PRODUCT INFORMATION AT THE TIME OF DESIGN.
13.	THE CONTRACTOR SHALL KEEP INSTALLATION INSTRUCTIONS FOR ALL LISTED EQUIPMENT ON THIS PROJECT AT THE JOBSITE AND SHALL HAVE THEM ACCESSIBLE FOR THE FIELD INSPECTOR UPON REQUEST.
14.	PROVIDED DRAWINGS BY THE ENGINEER DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO PROVIDE AN INSTALLATION SUITABLE IN DIMENSION, CONSTRUCTION, FUNCTION AND FINISH FOR THE PURPOSE INTENDED.
15.	ANY DISCREPANCIES DURING BID SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER/ARCHITECT AND RESOLVED PRIOR TO FINALIZATION OF THE CONSTRUCTION CONTRACT.
16.	ALL PRODUCTS SHALL BE INSTALLED CONFORMING TO MANUFACTURERS' REQUIREMENTS AND RECOMMENDATIONS.
17.	THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION WITH ALL OTHER TRADES.
18.	PROVIDE ACCESS PANELS FOR ANY EQUIPMENT THAT REQUIRES REGULAR MAINTENANCE. EXACT LOCATION OF ACCESS PANELS SHALL BE COORDINATED WITH FINAL PLACEMENT OF ALL VALVES, DAMPERS, AND ANY OTHER COMPONENT IDENTIFIED ON THE DRAWINGS.
19.	ALL ABOVE GRADE PIPING SHALL BE SUPPORTED PROPERLY FROM THE STRUCTURE AND SHALL NOT HANG OR REST ON ANY CEILING TILES, DUCTWORK, PIPING ETC.
20.	FLOOR DRAINS SHALL BE INSTALLED FLUSH WITH THE FINISHED FLOOR.
21.	PROVIDE ISOLATION VALVES ON ALL BRANCH PIPING AND ALL EQUIPMENT AND FIXTURE PIPE INLETS. ALL VALVES SHALL BE ACCESSIBLE.
22.	INSTALL VENTS AT POINTS AND DRAIN VALVES AT LOW POINTS IN THE PIPING SYSTEMS.
23.	NO PIPING SHALL BE ROUTED OVER ELECTRICAL PANELS OR EQUIPMENT.
24.	CONTRACTOR SHALL PROVIDE DIELECTRIC FITTINGS FOR DISSIMILAR METAL CONNECTIONS.
25.	ALL VALVES SHALL BE LINE SIZE UNLESS NOTED OTHERWISE.
26.	CONTRACTOR SHALL PERFORM TESTING AND ADJUSTING AS REQUIRED FOR ALL EQUIPMENT AND/OR SYSTEMS WITHIN THIS SCOPE OF WORK PER THE SPECIFICATIONS.
27.	PER THE INTERNATIONAL PLUMBING CODE, CONTRACTOR SHALL FLUSH AND DISINFECT ALL POTABLE WATER LINES AFTER CONSTRUCTION IS COMPLETE BUT PRIOR TO BUILDING OCCUPANCY.

PLUMBING SHEET LIST			
SHEET #	SHEET NAME	85% CD Set	100% CD Set
P000	PLUMBING SYMBOLS, ABBREVIATIONS, AND NOTES	•	•
P001	PLUMBING SPECIFICATIONS	•	•
P103	ROOF PLAN - PLUMBING	•	•
P700	PLUMBING DETAILS	•	•



Keyplan

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CITY OF RALEIGH -
CONVENTION
CENTER ROOF
REPAIRS PHASE 1
Raleigh, North
Carolina

Project Number: R26046.00
Status & Date: September 22, 2026

Sheet Title:

PLUMBING SYMBOLS,
ABBREVIATIONS, AND
NOTES

Sheet Number:

P000

PLUMBING GENERAL NOTES:

- A. THE PLUMBING SCOPE OF WORK IS LIMITED TO THE REPAIR, REPLACEMENT, AND RECONNECTION OF FIRE-DAMAGED ROOF DRAINS, OVERFLOW DRAINS, STORM DRAINAGE PIPING, FITTINGS, HANGERS, SUPPORTS, AND ASSOCIATED ACCESSORIES AS INDICATED ON THE DRAWINGS.
- B. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO COMMENCING WORK. ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND THE CONTRACT DOCUMENTS SHALL BE REPORTED TO THE ENGINEER PRIOR TO PROCEEDING WITH THE AFFECTED WORK.
- C. THE DRAWINGS ARE DIAGMMATIC AND ARE INTENDED TO INDICATE THE GENERAL SCOPE OF REPAIR. CONTRACTOR SHALL DETERMINE THE EXACT ROUTING, ELEVATIONS, OFFSETS, FITTINGS, SUPPORTS, AND INSTALLATION METHODS REQUIRED TO SUIT ACTUAL FIELD CONDITIONS.
- D. REPLACE ALL FIRE-DAMAGED OR COMPROMISED ROOF DRAINS, OVERFLOW DRAINS, STORM PIPING, FITTINGS, INSULATION, HANGERS, AND SUPPORTS AS REQUIRED TO RESTORE THE SYSTEM TO FULL OPERATION.
- E. UNLESS NOTED OTHERWISE, REPLACEMENT MATERIALS SHALL MATCH THE EXISTING PIPE MATERIAL, NOMINAL PIPE SIZE, DRAIN TYPE, AND SYSTEM CONFIGURATION. PROVIDE APPROVED TRANSITION FITTINGS WHERE NEW WORK CONNECTS TO EXISTING SYSTEMS.
- F. CONTRACTOR SHALL REMOVE AND REPLACE ADDITIONAL PIPING, FITTINGS, INSULATION, OR ACCESSORIES DISCOVERED TO BE FIRE-DAMAGED DURING CONSTRUCTION, WHETHER SPECIFICALLY SHOWN OR NOT, AS REQUIRED TO PROVIDE A COMPLETE AND OPERABLE STORM DRAINAGE SYSTEM.
- G. ALL EXISTING STORM DRAINAGE PIPING AND COMPONENTS TO REMAIN SHALL BE PROTECTED FROM DAMAGE DURING CONSTRUCTION.
- H. COORDINATE ALL ROOF DRAIN REPLACEMENTS, FLASHING, WATERPROOFING, AND ROOF PENETRATIONS WITH THE ROOFING CONTRACTOR.
- I. CONTRACTOR SHALL PROVIDE NEW HANGERS, SUPPORTS, ANCHORS, FIRESTOPPING, SLEEVES, ESCUTCHEONS, AND INCIDENTAL MATERIALS REQUIRED FOR A COMPLETE INSTALLATION.
- J. MAINTAIN CONTINUOUS POSITIVE DRAINAGE AND EXISTING OVERFLOW DRAINAGE FUNCTION THROUGHOUT THE PROJECT.
- K. TEST ALL NEW AND MODIFIED STORM DRAINAGE PIPING IN ACCORDANCE WITH APPLICABLE CODES AND AUTHORITIES HAVING JURISDICTION. REPAIR ANY LEAKS OR DEFICIENCIES AND RETEST UNTIL ACCEPTABLE RESULTS ARE OBTAINED.
- L. CONTRACTOR SHALL COORDINATE WORK WITH ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL, AND ROOFING SYSTEMS PRIOR TO INSTALLATION.
- M. THE EXACT EXTENT OF FIRE-DAMAGED PIPING MAY NOT BE FULLY VISIBLE PRIOR TO DEMOLITION. THE CONTRACTOR SHALL INVESTIGATE, IDENTIFY, AND REPLACE ALL FIRE-DAMAGED STORM DRAINAGE COMPONENTS AS REQUIRED TO RESTORE THE SYSTEM TO ITS PRE-LOSS CAPACITY AND FUNCTION.

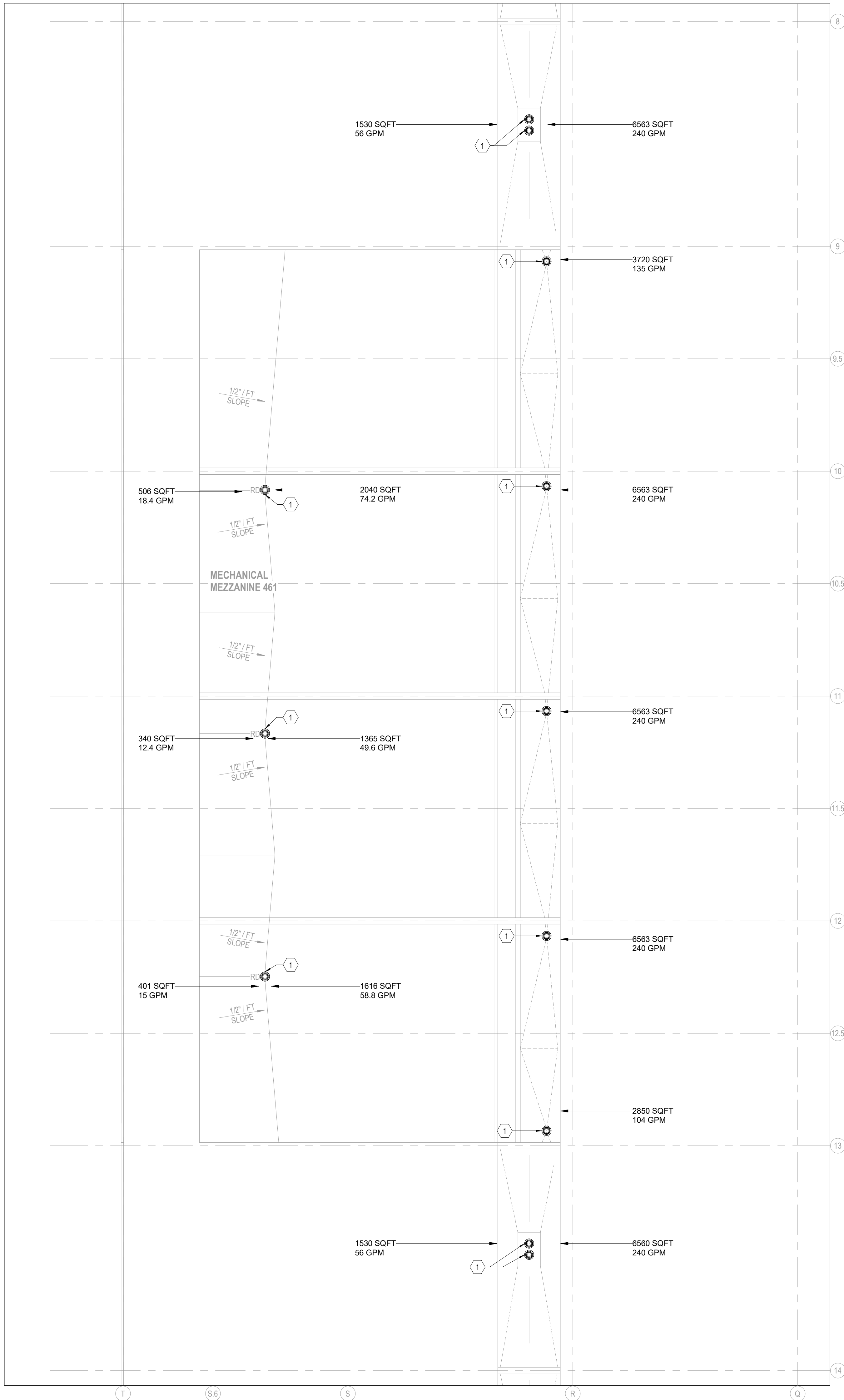
KEYNOTES

- 1 INSPECT ALL EXISTING PRIMARY AND OVERFLOW ROOF DRAINS WITHIN THE SCOPE OF WORK AREA. CLEAN AND VERIFY PROPER OPERATION OF EACH DRAIN. REPLACE ALL DRAINS FOUND TO BE DAMAGED OR DEFECTIVE WITH NEW DRAINS OF EQUIVALENT TYPE, SIZE, AND CAPACITY. WRAP ALL ASSOCIATED DRAIN PIPING WITH CONTINUOUS R-13 THERMAL INSULATION FOR A MINIMUM OF 10 FEET FROM THE DRAIN OUTLET. ALL PIPING EXPOSED TO VIEW AT THE UNDERSIDE OF GUTTER SOFFITS SHALL BE PROVIDED WITH A CONTINUOUS WEATHERPROOF/WATERTIGHT JACKET FOR THE ENTIRE EXPOSED LENGTH. CONTRACTOR TO CONFIRM THAT ALL EXISTING DRAINS ARE OF ADEQUATE SIZE TO HANDLE GPM CALLED OUT ON THESE PLANS.
- 2 BASIS OF DESIGN / LIMITATIONS: THE SIZE, MATERIAL, ROUTING, SLOPE, AND CONDITION OF THE EXISTING STORM DRAINAGE PIPING ARE UNKNOWN AND HAVE NOT BEEN VERIFIED BY THE ENGINEER. NO ANALYSIS OF THE EXISTING CONVEYANCE PIPING HAS BEEN PERFORMED. THE STORM SIZING TABLE IS PROVIDED FOR REFERENCE IN ESTABLISHING ROOF DRAIN AND OVERFLOW DRAIN CAPACITY ONLY AND SHALL NOT BE CONSTRUED AS A DESIGN OR VERIFICATION OF THE EXISTING PIPING SYSTEM. REPLACEMENT PIPING SHALL MATCH EXISTING SIZE AND MATERIAL UNLESS DIRECTED OTHERWISE BY THE ENGINEER.

REFERENCE CODE	IPC
STATE	North Carolina
CLOSEST CITY	Raleigh
RAINFALL RATE (INCHES PER HOUR)	4.0

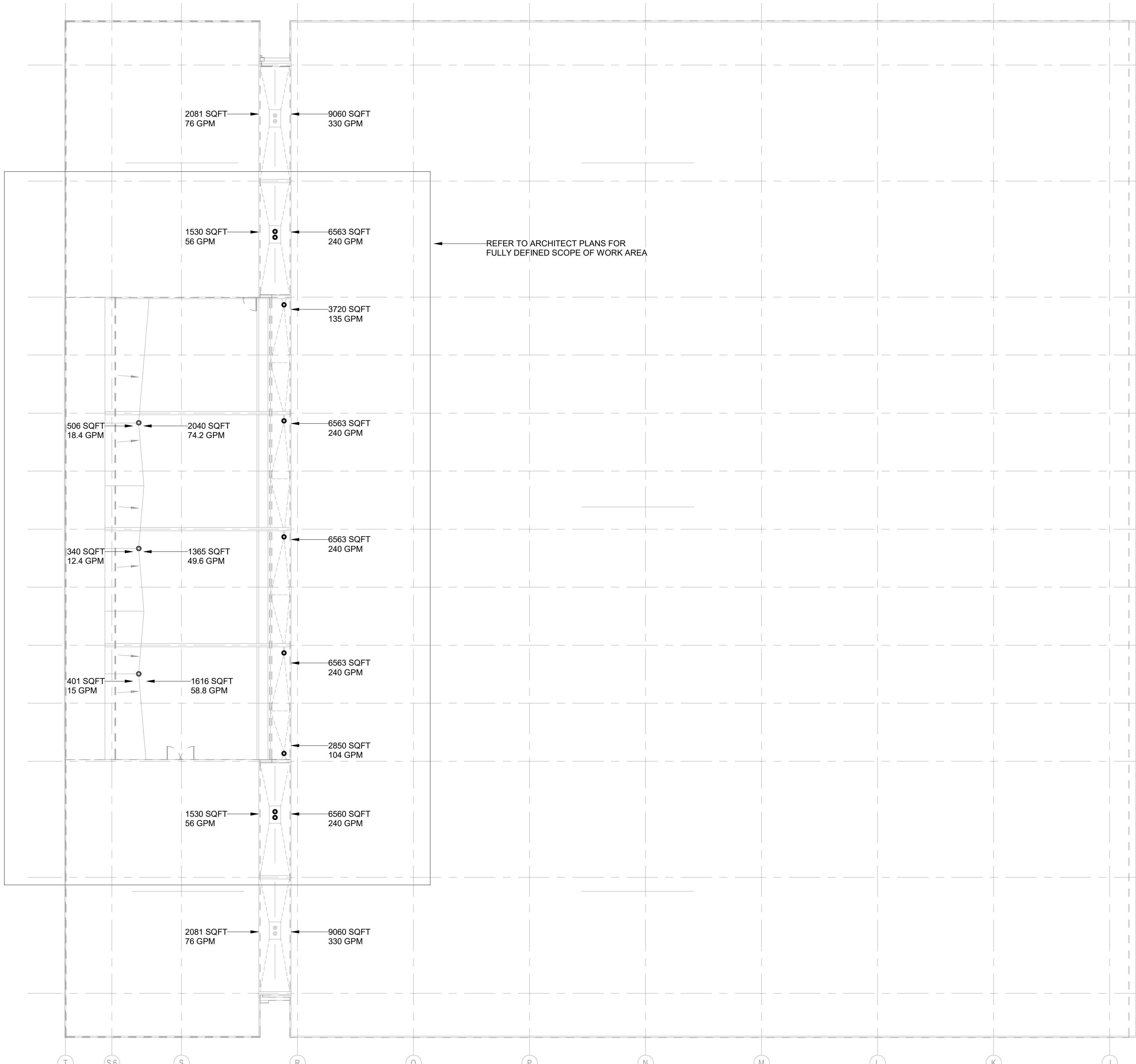
STORM SIZING (GPM & AREA)	
TOTAL AREA SERVED (SQFT)	TOTAL FLOW (GPM)
9060.0	376.5
6560.0	272.6
2850.0	116.4
6563.0	272.7
6563.0	272.7
3720.0	154.6
6563.0	272.7
2081.0	86.5
1530.0	63.6
401.0	16.7
340.0	14.1
506.0	21.0
1530.0	63.6
2040.0	84.8
GPM FROM PUMPS	
GRAND TOTAL	2573.6

MAIN SIZING FOR REFERENCE ONLY	SIZE (INCHES)	MAX GPM
VERTICAL MAIN	12"	3272.0
MAIN AT 1/16" SLOPE	#REF!	#REF!
MAIN AT 1/8" SLOPE	15"	3546.0
MAIN AT 1/4" SLOPE	12"	2960.0
MAIN AT 1/2" SLOPE	10"	2623.0
IF ANY OF THESE SAY #REF!, THAT MEANS THE FLOW IS TOO HIGH FOR THE CORRESPONDING SLOPE		



1 ROOF LEVEL - SOW PLAN - PLUMBING

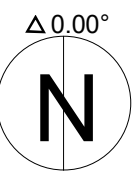
1/8" = 1'-0"



2 ROOF LEVEL - OVERALL

1/16" = 1'-0"

Keyplan



26.09.22	100% CD Set
26.09.01	95% CD Set



CITY OF RALEIGH -
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Raleigh, North
Carolina

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Sheet Title:
ROOF PLAN - PLUMBING

Sheet Number:

P103

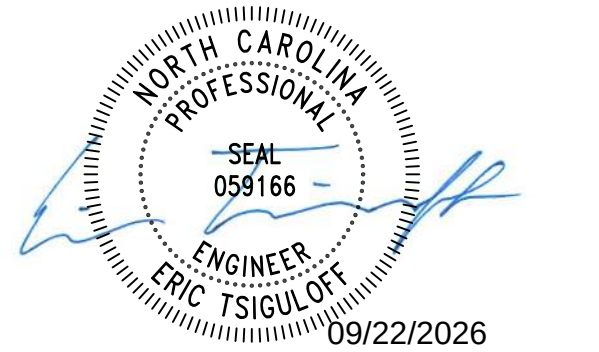
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Keyplan



26.09.22	100% CD Set
26.09.01	95% CD Set



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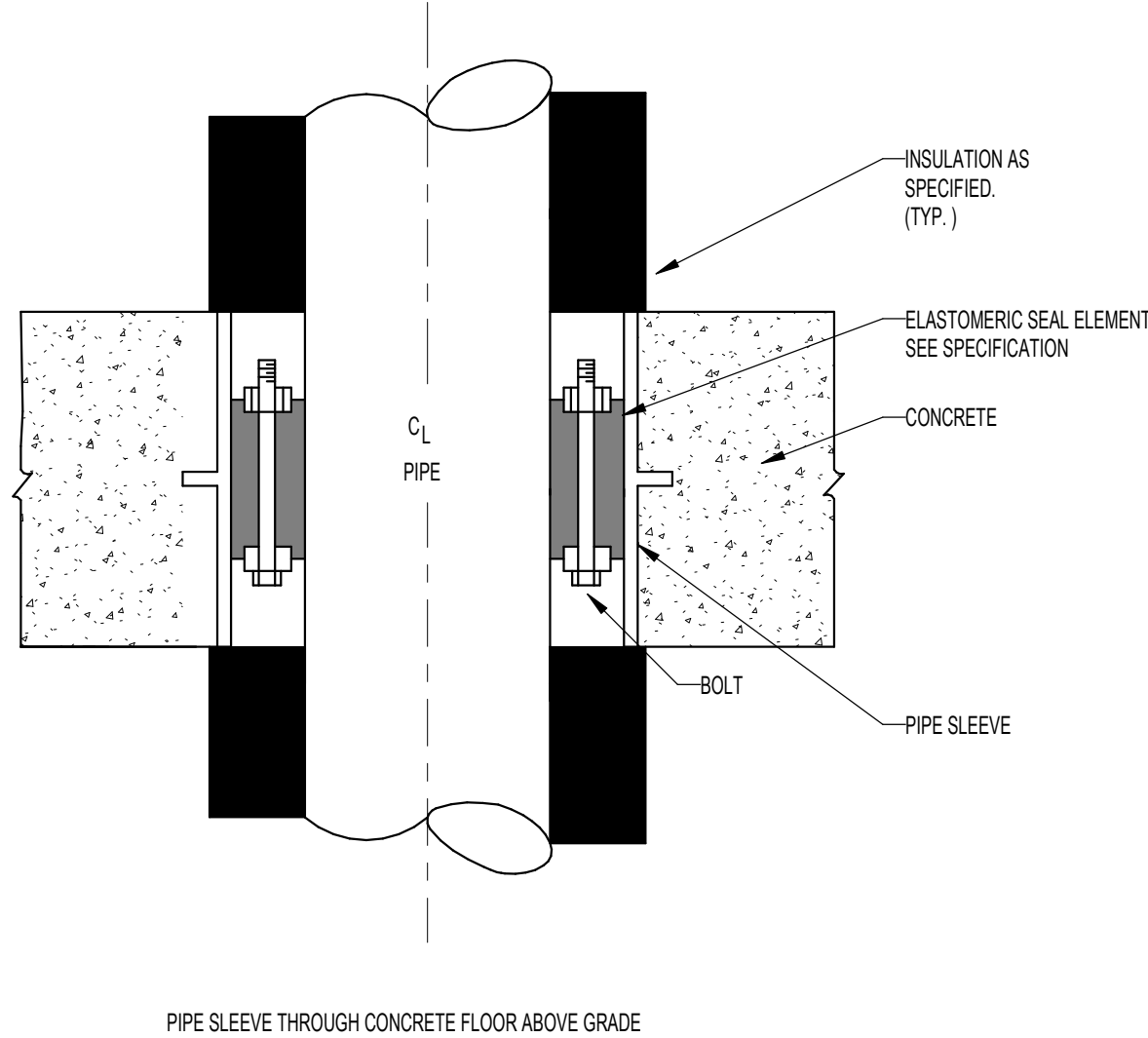
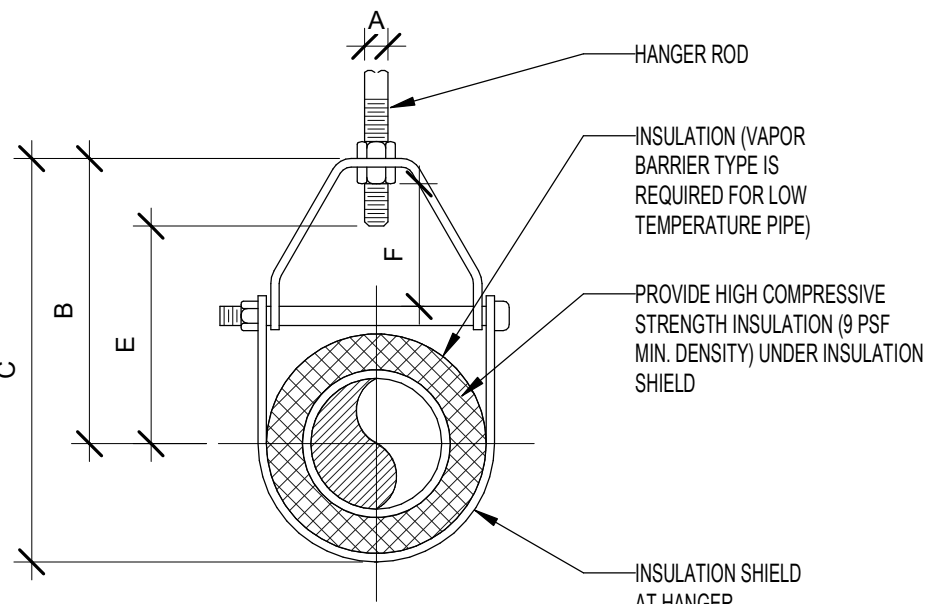
Sheet Title:
PLUMBING DETAILS

Sheet Number:
P700

DESIGNER'S NOTE:
1. SHOW ON THE DRAWINGS OTHER SPECIFIED AND SPECIAL PIPE SUPPORTS WHERE REQUIRED.

MSS SP-58 TYPE 1									
PIPE SIZE	A	B	C	E	F	BOLT	WEIGHT EACH LB	MAX. REQ. LOAD LB	
1/2"	3/8	3-13/16	4-1/4	3	7/16	1/4	0.30	730	
3/4"	3/8	3-3/4	4-3/16	2-15/16	7/16	1/4	0.33	730	
1"	3/8	4-1/8	4-3/4	3-9/16	9/8	1/4	0.34	730	
1-1/4"	3/8	4-7/16	5-1/4	3-5/8	7/8	1/4	0.39	730	
1-1/2"	3/8	4-3/4	5-3/4	3-15/16	1-1/16	1/4	0.47	730	
2"	3/8	7-1/4	8-7/16	6-7/16	1-1/4	1/4	0.65	730	
2-1/2"	1/2	8-13/16	10-3/16	7-3/4	1-15/16	5/16	1.24	1130	
3"	1/2	9	10-3/4	7-15/16	1-3/4	5/16	1.34	1130	
4"	5/8	10-1/8	12-3/8	8-13/16	2-1/8	3/8	1.92	1430	
5"	5/8	9-7/8	12-9/16	8-7/16	1-7/16	1/2	2.58	1430	
6"	3/4	10-7/8	14-1/8	9-1/4	1-3/4	1/2	3.35	1940	
8"	3/4	12-1/4	16-9/16	10-7/16	1-7/8	5/8	5.08	2000	
10"	7/8	14-1/2	19-7/8	12-1/2	2-1/4	3/4	9.08	3600	
12"	7/8	15-7/8	22-1/4	13-7/8	2-13/16	3/4	11.54	3800	

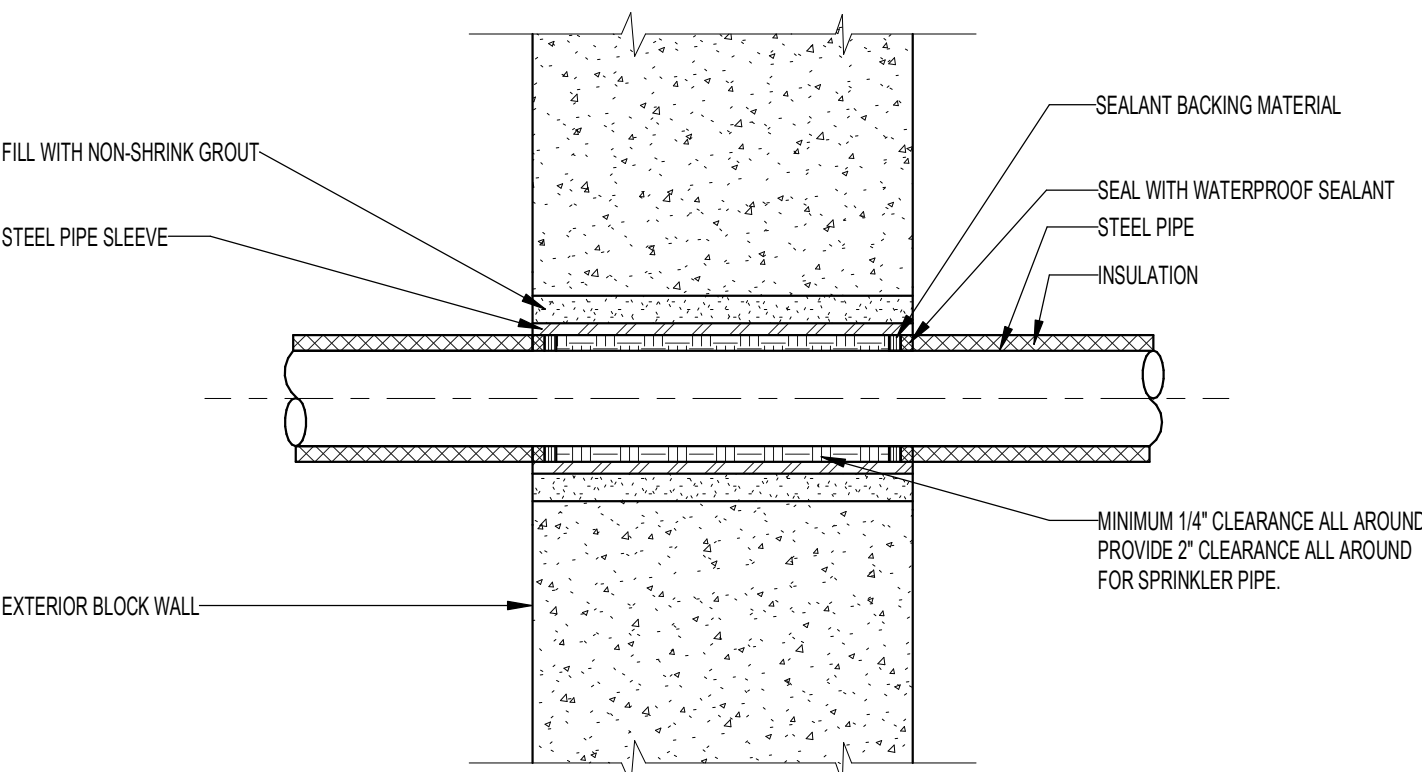
NOTE:
1. SEE SPECIFICATION FOR DETAILED HANGER REQUIREMENTS



PIPE SLEEVE THROUGH CONCRETE FLOOR ABOVE GRADE

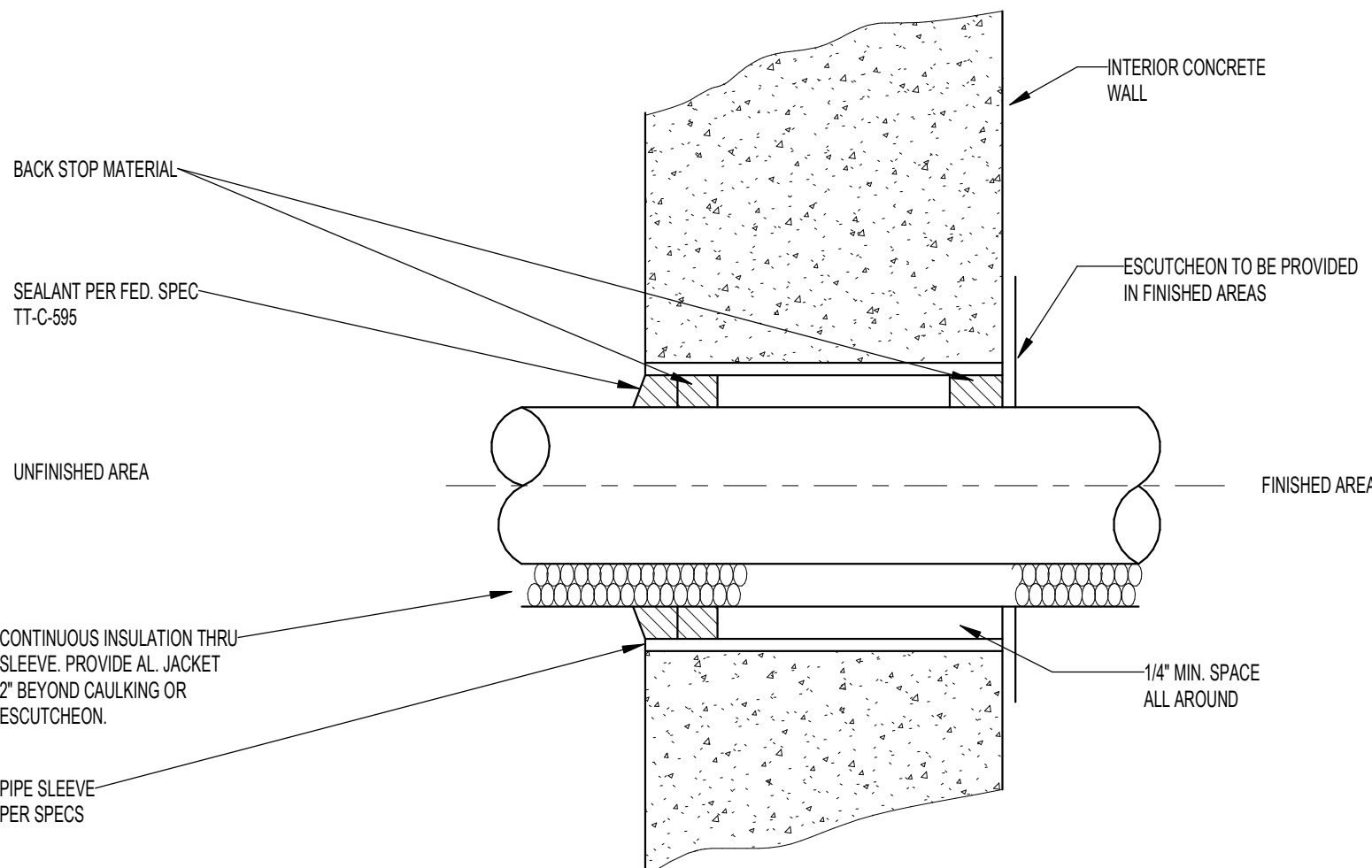
1 PIPING HANGERS DETAIL

NOT TO SCALE



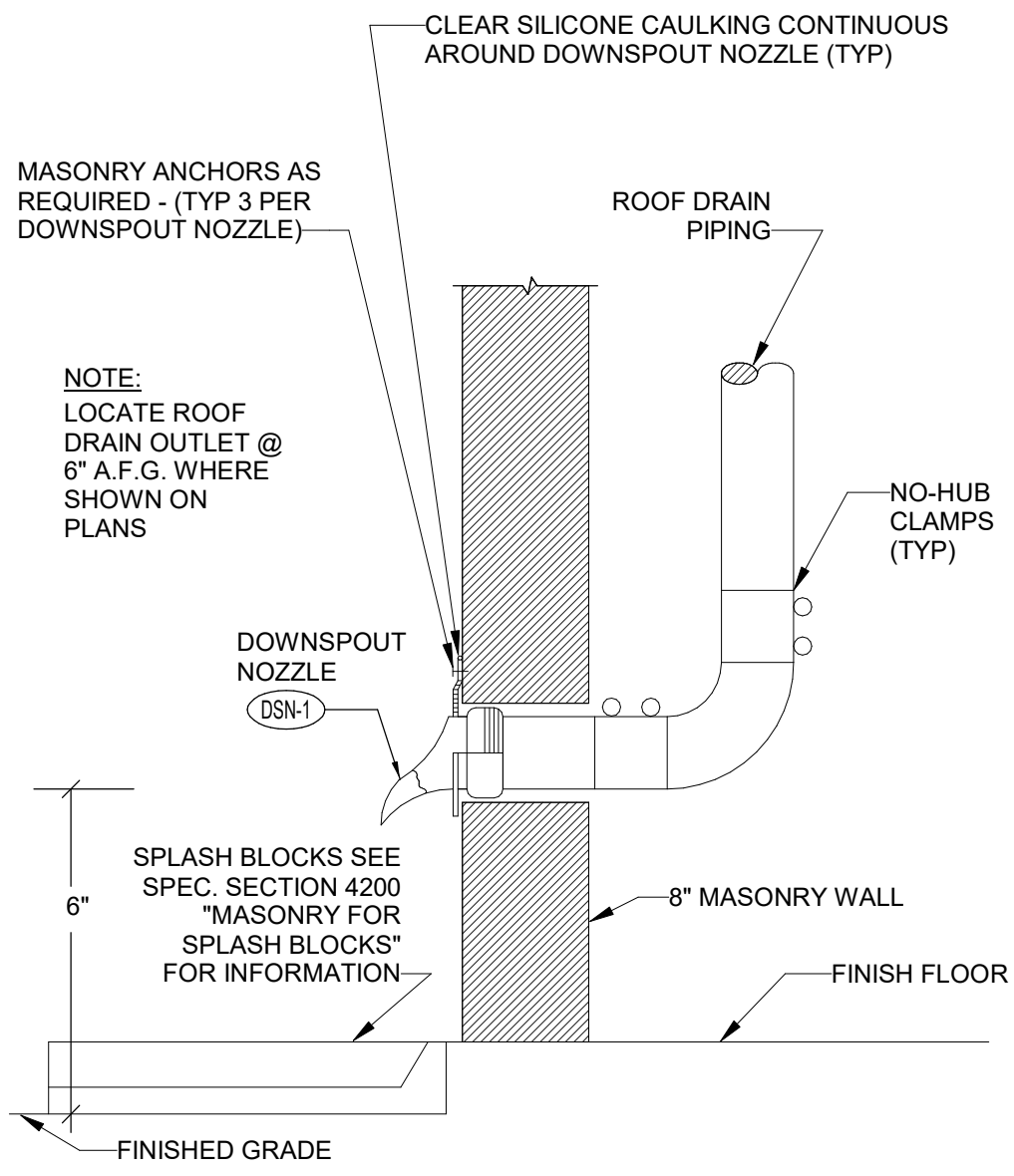
2 PIPE SLEEVE THRU EXTERIOR WALL

NOT TO SCALE



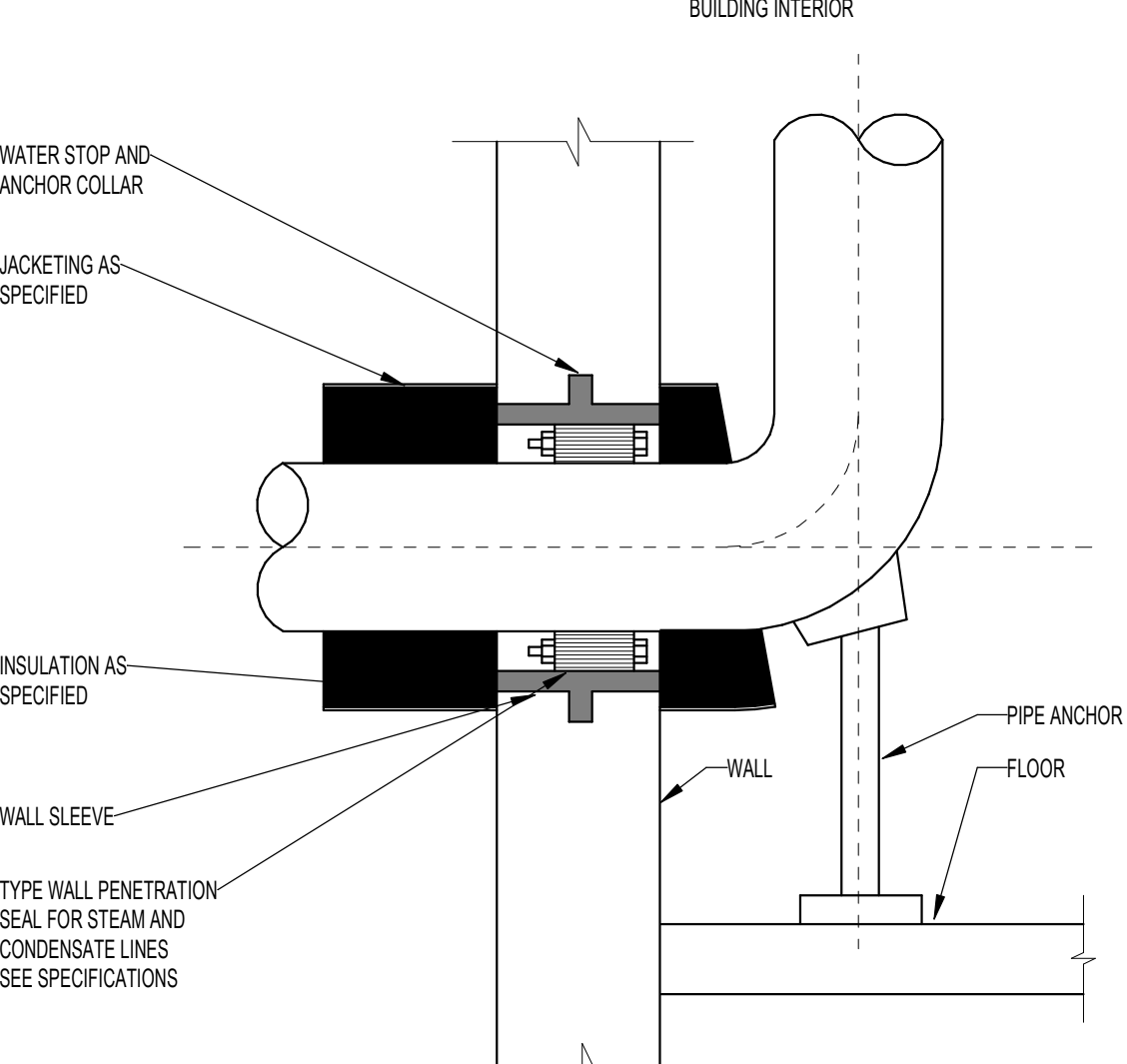
3 PIPE SLEEVE - WALL

NOT TO SCALE



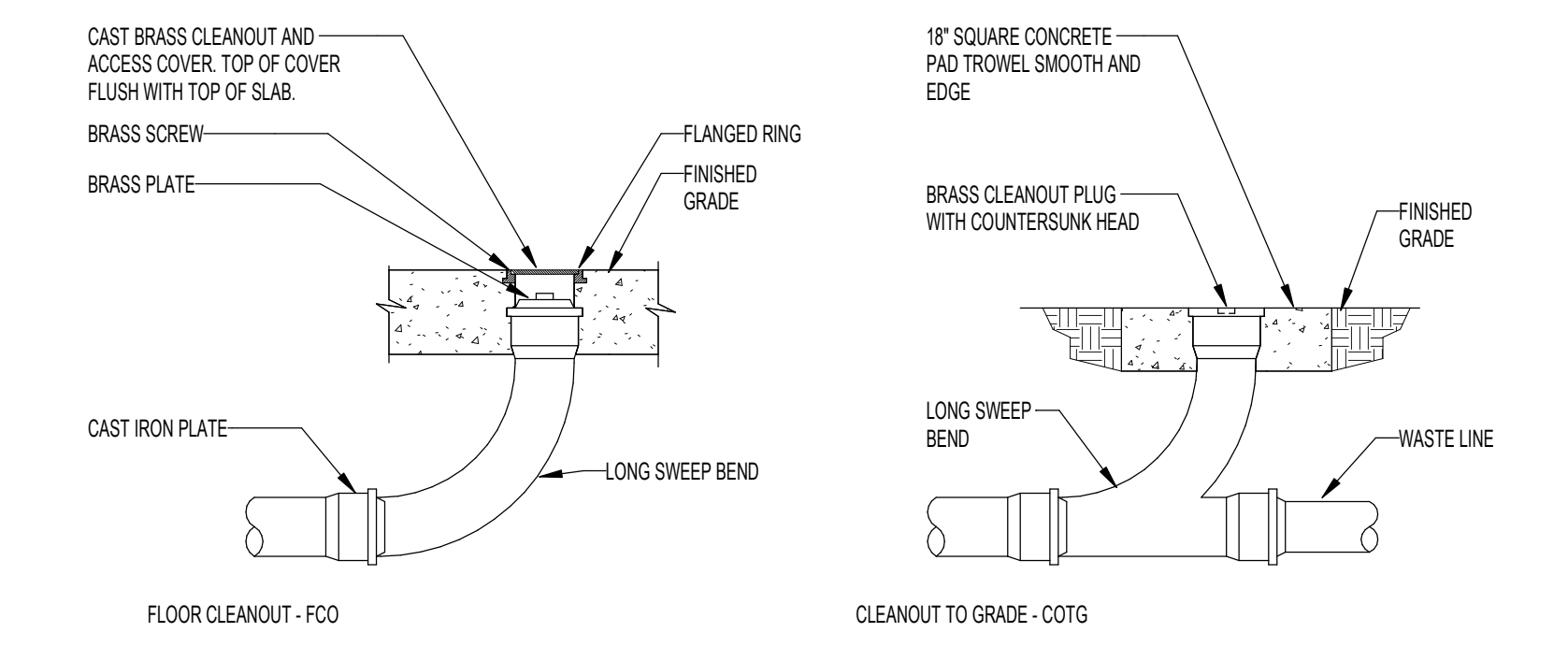
5 DOWNSPOUT NOZZLE DETAIL

NOT TO SCALE



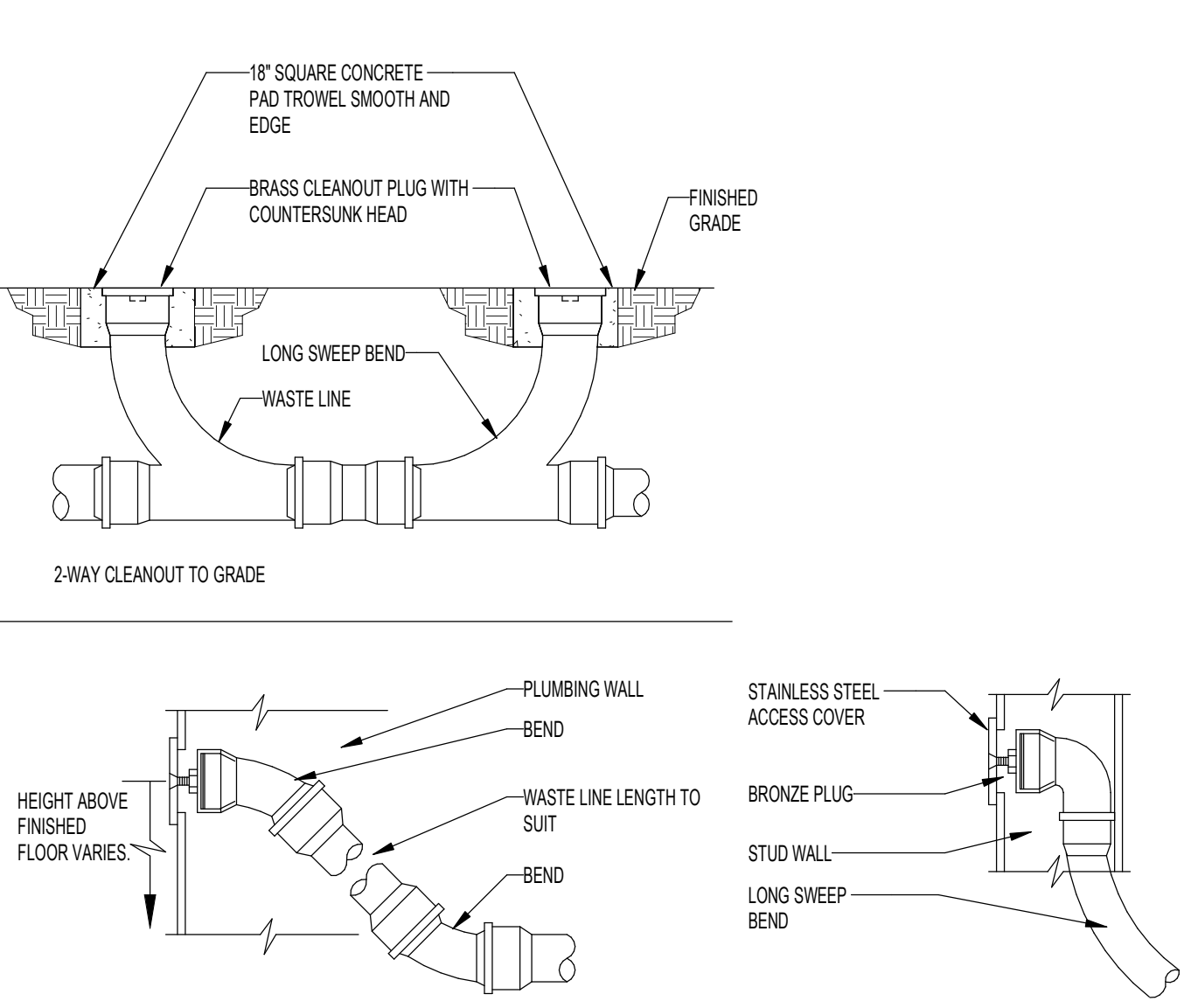
6 INSULATED PIPE WALL PENETRATION

NOT TO SCALE



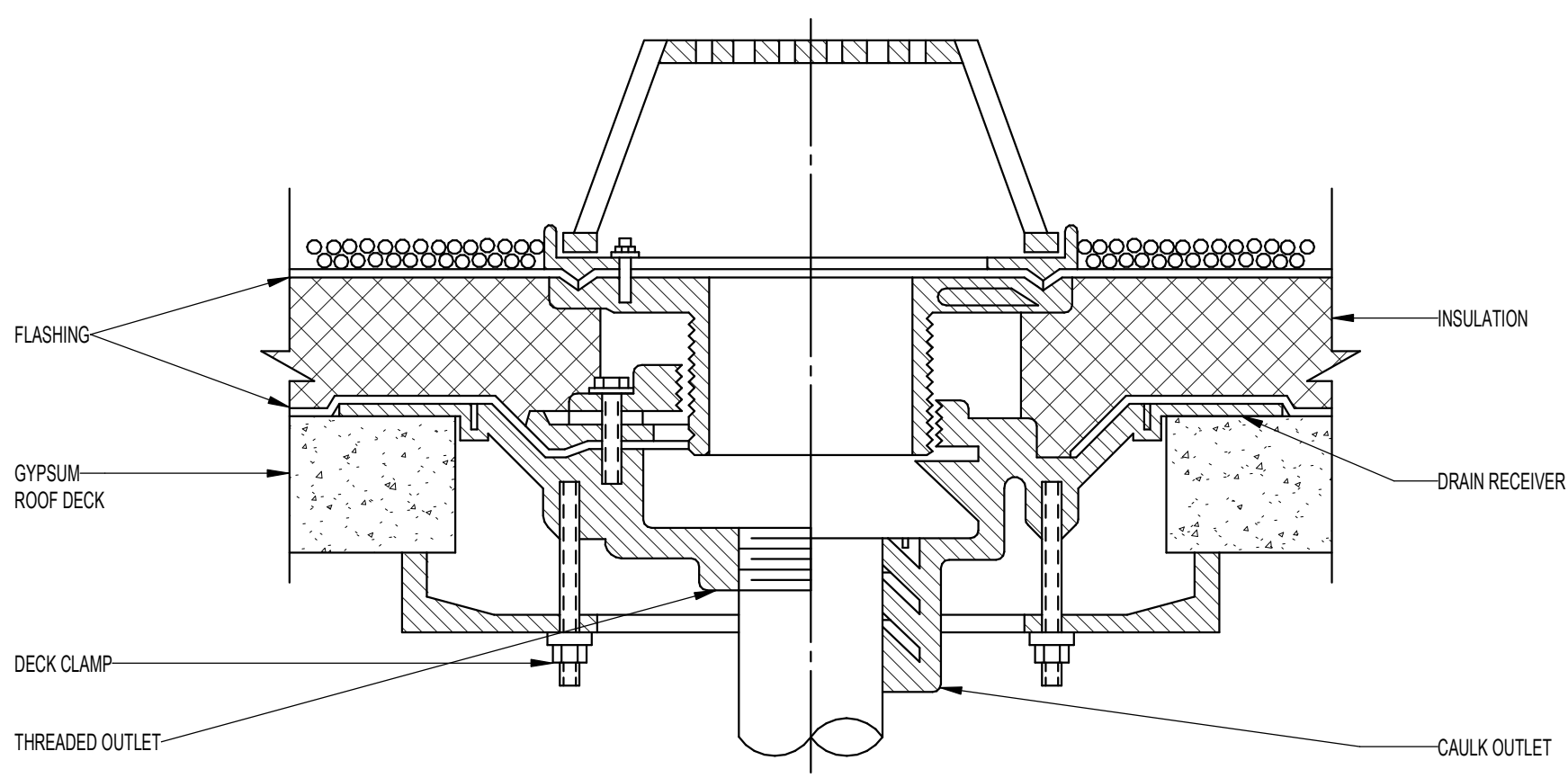
8 CLEAN OUT (FLOOR, WALL, AND COTG)

NOT TO SCALE



7 LARGE SUMP ROOF DRAIN

NOT TO SCALE



Project Manual

CITY OF RALEIGH

CONVENTION CENTER ROOF REPAIRS

Phase 1



Owner: City of Raleigh

Convention Center

Raleigh, NC

September 22, 2026

Issue For Bid

Prepared by:

Kimley»Horn

HANBURY



CITY OF RALEIGH
CONVENTION CENTER ROOF REPAIR
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KIMLEY-HORN
PROJECT # 011063183
9/22/2026

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SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
1. Project information.
 2. Work covered by Contract Documents.
 3. Preconstruction Conference
 4. Access to site.
 5. Coordination with occupants.
 6. Work restrictions.

1.3 PROJECT INFORMATION

- A. Project Identification: Raleigh Convention Center Post Fire Structural Repairs
1. Project Location:
 - a. Raleigh Convention Center – 500 South Salisbury Street, Raleigh, NC 27602
- B. Owner: City of Raleigh
1. Owner's Representative: Mason Tierney
 - a. Phone: (919) 996-8523
 - b. Email: mason.tierney@raleighnc.gov
- C. Engineer: Kimley-Horn and Associates, Inc.
1. Engineer of Record: Ethan Hill, P.E.
 - a. Phone: (919) 677-2060
 - b. Email: ethan.hill@kimley-horn.com
 - c. Address: 421 Fayetteville St, Suite 600, Raleigh, NC, 27601
- D. The repairs described in these documents are based Kimley-Horn's review of existing conditions resulting from the localized fire at the lower roof section of the roof on December 1, 2025. Immediately following an initial assessment of the fire damage, Kimley-Horn prepared a temporary reinforcement detail for the damaged beams supporting the shimmer wall. These temporary reinforcement measures were previously constructed by others. The repairs described

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herein, are the permanent repairs to the fire-damaged structural members of the upper roof mechanical area.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work consists of furnishing all the labor, materials, equipment, services, and permits necessary to complete the repairs and rehabilitation defined within the Contract Documents and as identified during a Pre-Construction conference by the Engineer, City Inspector, and Contractor and as summarized herein.
- B. Work incidental to the repairs, including, but not limited to, repainting finish materials to match existing, use of temporary shoring devices, use of temporary traffic control measures, and protection of persons and property is also included in this project.
- C. Contractor is responsible for completion of a visual survey of the site to clearly mark repair locations. Repair locations must be marked prior to the pre-construction conference. Contractor is responsible for determining actual extent and locations of repair areas in accordance with the bid documents and in coordination with the Owner and Engineer. Some areas shown on the plans only represent typical types and approximate locations of repairs or deterioration.
- D. Work shall be substantially complete and ready for occupancy within the date set forth in the Instructions to Bidders. Substantial completion will be provided for the project as a whole, not by repair type or installation dates.

The Work of Project is defined by the Contract Documents and generally consists of structural repairs to eight damaged steel beams and metal roof deck located in the immediate vicinity of the fire.

E. Type of Contract:

- 1. Project will be constructed under a single prime contract between Owner and Contractor.

1.5 PRECONSTRUCTION AND PREINSTALLATION CONFERENCE

- A. The Contractor will attend a required pre-construction conference as conducted by the Owner. Based on the phasing plan prepared by the Contractor, in conjunction with the Traffic and Pedestrian Management Plan prepared by Kimley-Horn, there may be more than one pre-installation conference.
- B. The Contractor shall conduct all required Pre-Installation meetings.
- C. Following the Contractor's completion of a visual survey to identify and mark repair locations, a Pre-Installation Conference will be held on site. At this conference, the extent, types, locations, and quantities of repairs will be confirmed. Using removable paint/chalk/etc., mark the spall, delamination, and crack locations on the locations proposed to repair. Use orange for locations of materials within the assumed limits specified in the construction documents. Use yellow for locations of materials that may exceed the quantity limits specified in the construction documents. The intent is to determine

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if changes to scope will be required. At the end of the Pre-Installation Conference, the Engineer, and Owner will review the marks and determine if more or less locations should be repaired.

- D. The Owner, Engineer, the Contractor's Project Manager, and Superintendent will participate in this on-site meeting. This meeting will be scheduled by the Contractor and coordinated with the Owner and Engineer. The conference will coincide with any pre-installation conferences that are required for specified repair products.
- E. At a minimum, the Contractor should discuss the following items:
 - 1. Construction schedule
 - 2. Phasing Plan
 - 3. Critical work sequencing and long-lead items.
 - 4. Designation of key personnel and their duties.
 - 5. Extent, types, locations, and quantities of repairs.
 - 6. Lines of communications.
 - 7. Procedures for processing field decisions and Change Orders.
 - 8. Procedures for RFIs.
 - 9. Procedures for testing and inspecting.
 - 10. Procedures for preparing and submitting daily Contractor reports.
 - 11. Procedures for processing Applications for Payment.
 - 12. Submittal procedures.
 - 13. Preparation of record documents.
 - 14. Use of the premises.
 - 15. Work restrictions.
 - 16. Working hours.
 - 17. Owner's occupancy requirements.
 - 18. Construction waste management and recycling.
 - 19. Parking availability.
 - 20. Office, work, and storage areas.
 - 21. Equipment deliveries and priorities.
 - 22. First aid.
 - 23. Progress cleaning.

1.6 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- B. Use of Site: Limit use of Project site to work in areas specifically coordinated with and approved by the Owner. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Streets, Driveways, Walkways and Entrances: Keep streets, drive aisles and entrances serving premises clear and available to Owner, Owner's employees, tenants, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

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- a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
 - c. Materials are not allowed to be stored or kept within the right-of-way when construction personnel are not on site.
 - d. Notify Owner not less than 2-weeks in advance of proposed deliveries or activities which require closures of driveways, walkways, and/or entrances.
2. Contractor to coordinate with Engineer to develop pedestrian phasing and traffic control plans.
- C. Condition of Existing Buildings: The Contractor shall protect from damage the existing structure, adjacent structures, walls, curbs to remain, elevator lobby, storefronts, vehicles, storm drain lines, equipment, stairs, etc. during construction activities. Repair of damage caused by construction operations is Contractors responsibility and should be repaired to a condition equal to or superior than the existing condition.
 - D. The Contractor shall provide for their own parking and shall minimize the occupation of parking spaces in areas that are otherwise open to the public for parking during the construction. The Contractor shall provide for their own storage, containment, and protection and shall coordination locations of storage space with the Owner.

1.7 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner and Owner's tenants will occupy site and existing building(s) during entire construction period. Therefore, Contractor shall provide adequate protection to ensure public safety. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing vehicular and pedestrian exits unless otherwise indicated.
 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
 2. Sidewalk and street lane closures permits must be obtained from authorities having jurisdiction.
 3. Provide not less than 2-week notice to Owner of activities that will affect Owner's operations.
 4. Contractor shall provide adequate protection to ensure public safety.
- B. The Contractor should take adequate measures to catch any falling debris from reaching the ground or floor and the protection may be temporarily affixed to the beams / girders overhead, or to columns. Temporary supports may not extend down into the drive aisle space. This debris protection, if required, should stay in place during the duration of work.

1.8 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.

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1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction. Use of existing loading/parking zones should be coordinated with and approved by the Owner for approval and may require additional permits.
- B. On-Site Work Hours: Contractor shall coordinate permitted working hours with Owner. Normal business working hours are indicated below. **Contractor shall utilize, when possible, normal business hours for the completion of work as much as possible. Nights and weekends are optional as authorized by the Owner. It is anticipated that work requiring lane closures to McDowell Street may be required during nights and weekends only.**
1. Normal business hours – Monday-Friday: 6am to 9pm
 2. After hours work (night) – Monday-Sunday: 9pm to 6am
 3. Weekend work hours –9pm Friday through 7am Monday
 4. Conduct operations requiring high noise levels during normal business hours.
- C. **Special Events: Contractor shall coordinate schedule such that work is not performed during special events in the downtown area. The current calendar list of events may be obtained at this web address: <https://www.raleighconvention.com/event-calendar>.** It is the Contractor's responsibility to confirm all dates shown and to confirm the required work phasing due to the special events. Additional events may also be subject to complete work closure as required by the Owner:
- D. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
1. Notify Owner not less than 2 weeks in advance of proposed utility interruptions.
 2. Obtain Owner's written permission before proceeding with utility interruptions.
- E. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner. Contractor shall develop dust and noise control measures, such as erecting and maintaining dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise, and submit to Owner and Engineer for approval.
1. Notify Owner not less than 1 week in advance of proposed disruptive operations.
 2. Obtain Owner's written permission before proceeding with disruptive operations.
 3. Contractor shall avoid any high noise operations, such as drilling, hammering, chipping etc., directly above any tenant space during the hours of operation of that tenant. Coordinate hours of such operation with the Owner.
 4. City of Raleigh noise ordinance: The bidders should reference City of Raleigh Ordinance 12-5007 regarding noise control. The contractor should consider these work hours when establishing their construction schedule and phasing plan. The contractor may request alternate work hours although there is no guarantee alternate hours will be accepted by the City.
- F. Nonsmoking Building: Smoking is not permitted within any building or within 25 feet of any building.

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- G. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.
- H. Employee Identification: Provide identification tags, shirts, etc. for Contractor personnel working on Project site. Require personnel to use identification at all times.
- I. Contractor shall minimize the disturbance to the traffic flow, sidewalks, and adjacent facilities use during repair process.
- J. Contractor shall install and maintain traffic and pedestrian barricades to separate and protect public from construction activities throughout the site. See the Traffic and Pedestrian Management Plan prepared by Kimley-Horn.
 - 1. Contractor shall purchase and install temporary signs to direct traffic and pedestrians safely around construction activities.
 - 2. Traffic flagger, as required to maintain traffic flow, is Contractor's responsibility.
 - 3. Follow the approved pedestrian phasing and traffic control plans.
- K. **Contractor shall submit detailed construction phasing plans to the Engineer and Owner for review and approval prior to beginning work.** For each phase of work, the plan shall include construction activity, any parking spaces impacted by construction related activities, locations of temporary barricades, pedestrian routes, signage, and traffic routes for vehicular access around the site. At a minimum, the following should be maintained:
 - 1. On-street parking spaces may be closed to public use due to repairs by the Contractor during normal weekday business hours in accordance with the approved phasing plan and the approved pedestrian and traffic control plan.
 - 2. No more than 5 parking spaces cumulative may be closed to public use in a location coordinated with the Owner, for material storage and Contractor's vehicles.
 - 3. Contractor should not begin construction activities in a new work phase until "Work Phase Completion Procedures" per Section 017700 "Closeout" are completed.
- L. The Contractor shall be aware that the City or other Contractor(s) may be working at the project site concurrent to the execution of the scope of this work. Contractor shall cooperate fully with separate contractors so work on those contracts may be carried out smoothly without interfering with or delaying work under this contract.
- M. The Contractor shall provide adequate measures to prevent site discharges from entering the storm drainage system including, but not limited to, containing, capturing, and properly disposing of the wastewater generated. Measures should be in compliance with the City of Raleigh stormwater requirements. Contact the Stormwater Utility Division for additional questions.

END OF SECTION 011000

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SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings 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. Quantity allowances.
- C. Related Requirements:
 - 1. Division 01 Section "Unit Prices" for procedures for using unit prices.
 - 2. Division 01 Section "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.
 - 3. Divisions 02 through 22 Sections for items of Work covered by allowances.

1.3 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Engineer 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 Engineer'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 Engineer 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.

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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 UNIT-COST ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Engineer 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 Engineer 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 Engineer, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 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.

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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: Contractor to include an allowance for up to 15 (fifteen), 16 – 20' length cold formed steel studs of like existing dimensions in case corroded or damaged studs are uncovered during selective demolition.
 1. This allowance includes material cost, receiving, handling, and installation, and Contractor overhead and profit.
 2. Unit of Measure: Work will be paid for as a percentage of the total allowance quantity.
- B. Allowance No. 2: Quantity Allowance: Contractor to include an allowance for replacement of up to 1,500 SF (one-thousand, five-hundred square feet) of damaged/deteriorated batt insulation that is uncovered during selective demolition at the existing exterior walls in the Scope of Work area. New insulation to be as specified in Spec Section 072100 – Thermal Insulation. New insulation to match existing insulation in like and kind.

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1. This allowance includes material cost, receiving, handling, and installation, and Contractor overhead and profit.
 2. Unit of Measure: Work will be paid for as a percentage of the total allowance quantity.
- C. Allowance No. 3: Quantity Allowance: Contractor to include an allowance for replacement of up to 700 SF (seven hundred square feet) of damaged metal deck that is uncovered during selection demolition in the Scope of Work area. New deck material to match existing deck material in like and kind.
1. This allowance includes material cost, receiving, handling, and installation, and Contractor overhead and profit.
 2. Unit of Measure: Work will be paid for as a percentage of the total allowance quantity.
- D. Allowance No. 4: Quantity Allowance: Contractor to include an allowance for replacement of up to 25 SF (twenty-five square feet) of metal deck at locations of abandoned curbs and abandoned penetrations that are uncovered during selective demolition. The new deck material is to match existing deck material in like and kind.
1. This allowance includes material cost, receiving, handling, and installation, and Contractor overhead and profit.
 2. Unit of Measure: Work will be paid for as a percentage of the total allowance quantity.
- E. Allowance No. 5: Quantity Allowance: Contractor to include an allowance for replacement of up to 25 SF (twenty-five square feet) of damaged concrete deck at locations that are uncovered during selective demolition. The new deck material is to match existing deck material.
1. This allowance includes material cost, receiving, handling, and installation, and Contractor overhead and profit.
 2. Unit of Measure: Work will be paid for as a percentage of the total allowance quantity.
- F. Allowance No. 6: Quantity Allowance: Contractor to include an allowance for replacement of up to 50 LF (fifty linear feet) of damaged Mechanical/Plumbing piping that is uncovered during selective demolition. The new piping material is to match existing piping material in like and kind.
1. This allowance includes material cost, receiving, handling, and installation, and Contractor overhead and profit.
 2. Unit of Measure: Work will be paid for as a percentage of the total allowance quantity.
- G. Allowance No. 7: Quantity Allowance: Contractor to include an allowance for replacement of up to 100 LF (one hundred linear feet) of damaged electrical conduit that is uncovered during selective demolition. The new conduit material is to match existing material in like and kind.
1. This allowance includes material cost, receiving, handling, and installation, and Contractor overhead and profit.
 2. Unit of Measure: Work will be paid for as a percentage of the total allowance quantity.

END OF SECTION 012100

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SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for products selected under an allowance.
 - 2. Section 012300 "Alternates" for products selected under an alternate.
 - 3. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use CSI Form 13.1A.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.

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- b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
 - i. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
 - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

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1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.7 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

- 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

- a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
- b. Substitution request is fully documented and properly submitted.
- c. Requested substitution will not adversely affect Contractor's construction schedule.
- d. Requested substitution has received necessary approvals of authorities having jurisdiction.
- e. Requested substitution is compatible with other portions of the Work.
- f. Requested substitution has been coordinated with other portions of the Work.
- g. Requested substitution provides specified warranty.
- h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

- B. Substitutions for Convenience: Engineer will consider requests for substitution if received within 30 days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of Engineer.

- 1. Conditions: Engineer will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

- a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
- b. Requested substitution does not require extensive revisions to the Contract Documents.
- c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
- d. Substitution request is fully documented and properly submitted.
- e. Requested substitution will not adversely affect Contractor's construction schedule.

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- f. Requested substitution has received necessary approvals of authorities having jurisdiction.
- g. Requested substitution is compatible with other portions of the Work.
- h. Requested substitution has been coordinated with other portions of the Work.
- i. Requested substitution provides specified warranty.
- j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

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SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.
 - 2. Section 013100 "Project Management and Coordination" for requirements for forms for contract modifications provided as part of web-based Project management software.

1.3 MINOR CHANGES IN THE WORK

- A. Engineer will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on **web-based Project management software**.

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: **Engineer** will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by **Engineer** are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within **20 days, when not otherwise specified**, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.

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- d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to **Engineer**.
 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Include costs of labor and supervision directly attributable to the change.
 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
 7. Proposal Request Form: Use **form provided by Owner upon request**.

1.5 ADMINISTRATIVE CHANGE ORDERS

- A. Allowance Adjustment: See Section 012100 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.
- B. Unit-Price Adjustment: See Section 012200 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: **Engineer** may issue a Construction Change Directive on a **City issued form**. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

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1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.7 WORK CHANGE DIRECTIVE

- A. Work Change Directive: **Engineer** may issue a Work Change Directive on **EJCDC Document C-940**. Work Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. Work Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Work Change Directive.
 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

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SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for procedural requirements governing the handling and processing of allowances.
 - 2. Section 012200 "Unit Prices" for administrative requirements governing the use of unit prices.
 - 3. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule, including the following:
 - a. Application for Payment forms with continuation sheets.
 - b. Submittal schedule.
 - c. Items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Owner at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.

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3. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values coordinated with each element.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Repair Type.
1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Owner and Engineer.
 - c. Engineer's Project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 2. Arrange schedule of values consistent with format of AIA Document G703.
 3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
 4. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site.
 5. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
 6. Overhead Costs: Include total cost and proportionate share of general overhead and profit for each line item.
 7. Overhead Costs: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
 8. Closeout Costs. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling **[five]** <Insert number> percent of the Contract Sum and subcontract amount.
 9. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Engineer and paid for by Owner.
- B. Payment Application Times: The period covered by each Application for Payment is per the General Conditions of the Contract.

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- C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Engineer will return incomplete applications without action.
 - 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 - 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 - 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 - 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
 - 1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment for stored materials.
 - 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 - 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- F. Transmittal: Submit [**three**] <**Insert number**> signed and notarized original copies of each Application for Payment to Owner by a method ensuring receipt. One copy shall include waivers of lien and similar attachments if required.
 - 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from **entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.**
 - 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 - 2. When an application shows completion of an item, submit conditional final or full waivers.

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3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of values.
 3. Contractor's construction schedule (preliminary if not final).
 4. Schedule of unit prices.
 5. Submittal schedule (preliminary if not final).
 6. List of Contractor's staff assignments.
 7. List of Contractor's principal consultants.
 8. Copies of building permits.
 9. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 10. Initial progress report.
 11. Report of preconstruction conference.
 12. Certificates of insurance and insurance policies.
 13. Performance and payment bonds.
 14. Data needed to acquire Owner's insurance.
- I. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. AIA Document G706.
 5. AIA Document G706A.
 6. AIA Document G707.
 7. Evidence that claims have been settled.
 8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
 9. Final liquidated damages settlement statement.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

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SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General project coordination procedures.
 - 2. Administrative and supervisory personnel.
 - 3. Requests for Information (RFIs).
 - 4. Project meetings.
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
 - 1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. RFI: Request for Information. Request from Owner, Engineer, or Contractor seeking information from each other during construction.

1.4 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.

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2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
1. Preparation of Contractor's construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Preinstallation conferences.
 6. Project closeout activities.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.5 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - b. Coordinate the addition of trade-specific information to coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.

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- c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
- d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
- e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
- f. Indicate required installation sequences.
- g. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:

- 1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
- 2. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
- 3. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
- 4. Review: Engineer will review coordination drawings to confirm that in general the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Engineer determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.
- 5. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 013300 "Submittal Procedures."

1.6 KEY PERSONNEL

- A. Key Personnel Names: Within 10 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and email addresses. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
 - 1. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.7 REQUEST FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

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1. Engineer will return without response those RFIs submitted to Engineer by other entities controlled by Contractor.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Engineer.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Engineer.
1. Attachments shall be electronic files in PDF format.
- D. Engineer's Action: Engineer will review each RFI, determine action required, and respond. Allow seven working days for Engineer's response for each RFI. RFIs received by Engineer after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Engineer's actions on submittals.
 - f. Incomplete RFIs or inaccurately prepared RFIs.
 2. Engineer's action may include a request for additional information, in which case Engineer's time for response will date from time of receipt of additional information.

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3. Engineer's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to the General Conditions of the Contract.
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Engineer in writing within 10 days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log monthly at time of pay application submittal. Software log with not less than the following:
 1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Engineer.
 4. RFI number including RFIs that were dropped and not submitted.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Engineer's response was received.
 8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.
- F. On receipt of Engineer's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Engineer within seven days if Contractor disagrees with response.

1.8 PROJECT MEETINGS

- A. General: Contractor will schedule and conduct meetings and conferences at Project site unless otherwise indicated.
 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Engineer of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Engineer, within three days of the meeting.
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Engineer, but no later than 15 days after execution of the Agreement.
 1. Conduct the conference to review responsibilities and personnel assignments.
 2. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned

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parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Discuss items of significance that could affect progress, including the following:

- a. Tentative construction schedule.
- b. Phasing.
- c. Critical work sequencing and long lead items.
- d. Designation of key personnel and their duties.
- e. Lines of communications.
- f. Procedures for processing field decisions and Change Orders.
- g. Procedures for RFIs.
- h. Procedures for testing and inspecting.
- i. Procedures for processing Applications for Payment.
- j. Distribution of the Contract Documents.
- k. Submittal procedures.
- l. Preparation of Record Documents.
- m. Use of the premises.
- n. Work restrictions.
- o. Working hours.
- p. Owner's occupancy requirements.
- q. Responsibility for temporary facilities and controls.
- r. Procedures for disruptions and shutdowns.
- s. Construction waste management and recycling.
- t. Parking availability.
- u. Office, work, and storage areas.
- v. Equipment deliveries and priorities.
- w. First aid.
- x. Security.
- y. Progress cleaning.

4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required for coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Engineer of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

- a. Contract Documents.
- b. Options.
- c. Related RFIs.
- d. Related Change Orders.
- e. Purchases.
- f. Deliveries.
- g. Submittals.

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- h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility requirements.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written instructions.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
- 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 - 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 - 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Engineer, but no later than 30 days prior to the scheduled date of Substantial Completion.
- 1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 - 2. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of Record Documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties.
 - d. Requirements for preparing operations and maintenance data.
 - e. Requirements for demonstration and training.
 - f. Preparation of Contractor's punch list.
 - g. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - h. Submittal procedures.

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- i. Coordination of separate contracts.
 - j. Owner's partial occupancy requirements.
 - k. Installation of Owner's furniture, fixtures, and equipment.
 - l. Responsibility for removing temporary facilities and controls.
 - 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- E. Progress Meetings: Engineer will schedule and conduct progress meetings at regular intervals or as directed by the Owner, but no less than monthly.
 - 1. Coordinate dates of meetings with preparation of payment requests.
 - 2. Attendees: In addition to representatives of Owner and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site use.
 - 8) Temporary facilities and controls.
 - 9) Progress cleaning.
 - 10) Quality and work standards.
 - 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of Proposal Requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) Documentation of information for payment requests.

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4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- F. Coordination Meetings: Conduct Project coordination meetings at site as needed for specific coordination items. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
 1. Attendees: In addition to representatives of Owner and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
 - c. Review present and future needs of each contractor present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site use.
 - 8) Temporary facilities and controls.
 - 9) Work hours.
 - 10) Hazards and risks.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Status of RFIs.
 - 14) Change Orders.
 3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

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PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

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SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Startup construction schedule.
 - 2. Contractor's Construction Schedule.
 - 3. Construction schedule updating reports.
 - 4. Daily construction reports.
 - 5. Material location reports.
 - 6. Site condition reports.
 - 7. Special reports.
- B. Related Requirements:
 - 1. Section 014000 "Quality Requirements" for schedule of tests and inspections.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

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1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. Working electronic copy of schedule file, where indicated.
 - 2. PDF file.
- B. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
- C. Construction Schedule Updating Reports: Submit with Applications for Payment.
- D. Daily Construction Reports: Submit at weekly] intervals.
- E. Material Location Reports: Submit at monthly intervals.
- F. Site Condition Reports: Submit at time of discovery of differing conditions.
- G. Special Reports: Submit at time of unusual event.

1.5 QUALITY ASSURANCE

- A. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's Construction Schedule, including, but not limited to, the following:
 - 1. Discuss constraints, including phasing, work stages, area separations, interim milestones, and partial Owner occupancy.
 - 2. Review delivery dates for Owner-furnished products.
 - 3. Review submittal requirements and procedures.
 - 4. Review time required for review of submittals and resubmittals.
 - 5. Review requirements for tests and inspections by independent testing and inspecting agencies.
 - 6. Review time required for Project closeout and Owner startup procedures.
 - 7. Review and finalize list of construction activities to be included in schedule.
 - 8. Review procedures for updating schedule.

1.6 COORDINATION

- A. Coordinate Contractor's Construction Schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

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1.7 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.
- B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of final completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- C. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Engineer.
 - 2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 - 3. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
 - 4. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Engineer's administrative procedures necessary for certification of Substantial Completion.
 - 5. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.
- D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
 - 1. Phasing: Arrange list of activities on schedule by phase.
 - 2. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 - 3. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Uninterruptible services.
 - c. Partial occupancy before Substantial Completion.
 - d. Use-of-premises restrictions.
 - e. Provisions for future construction.
 - f. Seasonal variations.
 - g. Environmental control.
 - 4. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:

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- a. Submittals.
 - b. Purchases.
 - c. Mockups.
 - d. Fabrication.
 - e. Sample testing.
 - f. Deliveries.
 - g. Installation.
 - h. Tests and inspections.
 - i. Adjusting.
 - j. Curing.
 - k. Startup and placement into final use and operation.
5. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
- a. Temporary enclosure and space conditioning.
 - b. Substantial Completion.
- E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.
- F. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate final completion percentage for each activity.
- G. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.
- H. Distribution: Distribute copies of approved schedule to Engineer, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

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1.8 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. Equipment at Project site.
 5. Material deliveries.
 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 7. Testing and inspection.
 8. Accidents.
 9. Meetings and significant decisions.
 10. Unusual events.
 11. Stoppages, delays, shortages, and losses.
 12. Meter readings and similar recordings.
 13. Emergency procedures.
 14. Orders and requests of authorities having jurisdiction.
 15. Change Orders received and implemented.
 16. Change Directives received and implemented.
 17. Services connected and disconnected.
 18. Equipment or system tests and startups.
 19. Partial completions and occupancies.
 20. Substantial Completions authorized.
 21. **Quantities completed that day and to date per bid item.**
- B. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.
- C. Unusual Event Reports: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, responses by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.
1. Submit unusual event reports directly to Owner and Engineer within two day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013200

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SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Submittal schedule requirements.
2. Administrative and procedural requirements for submittals.

B. Related Requirements:

1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
2. Section 013100 "Project Management and Coordination" for submitting coordination drawings and subcontract list and for requirements for web-based Project software.
3. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
4. Section 014000 "Quality Requirements" for submitting test and inspection reports, and schedule of tests and inspections.
5. Section 017700 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
6. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

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1.4 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Engineer and additional time for handling and reviewing submittals required by those corrections.
1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 30 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
 3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
 - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
 4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal Category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Project Coordinator's final release or approval.
 - g. Scheduled dates for purchasing.
 - h. Scheduled date of fabrication.
 - i. Scheduled dates for installation.
 - j. Activity or event number.

1.5 SUBMITTAL FORMATS

- A. Submittal Information: Include the following information in each submittal:
1. Project name.
 2. Date.
 3. Name of Architect.
 4. Name of Construction Manager.
 5. Name of Contractor.
 6. Name of firm or entity that prepared submittal.
 7. Names of subcontractor, manufacturer, and supplier.
 8. Unique submittal number, including revision identifier. Include Specification Section number with sequential alphanumeric identifier; and alphanumeric suffix for resubmittals.
 9. Category and type of submittal.
 10. Submittal purpose and description.

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11. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
12. Drawing number and detail references, as appropriate.
13. Indication of full or partial submittal.
14. Location(s) where product is to be installed, as appropriate.
15. Other necessary identification.
16. Remarks.
17. Signature of transmitter.

B. Options: Identify options requiring selection by Engineer.

C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Engineer or Owner on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

D. Paper Submittals:

1. Place a permanent label or title block on each submittal item for identification; include name of firm or entity that prepared submittal.
2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Engineer.
3. Action Submittals: Submit two paper copies of each submittal unless otherwise indicated. Engineer will return two copies.
4. Informational Submittals: Submit two paper copies of each submittal unless otherwise indicated. Engineer will not return copies.
5. Additional Copies: Unless additional copies are required for final submittal, and unless Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
6. Transmittal for Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using AIA Document G810 transmittal form.

E. PDF Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

F. Submittals for Web-Based Project Software: Prepare submittals as PDF files, or other format indicated by Project software website.

1.6 SUBMITTAL PROCEDURES

A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Email: Prepare submittals as PDF package, and transmit to Engineer by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Engineer.

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- a. Engineer will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.
- B.
- C. Processing Time: Allow time for submittal review, including time for resubmittals. Time for review shall commence on Engineers receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
- D. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 - 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked with approval notation from Engineer's action stamp.

1.7 SUBMITTAL REQUIREMENTS

- A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 - 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams that show factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 - 5. Submit Product Data before Shop Drawings, and before or concurrent with Samples.
- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

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1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Paper Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 42 inches (750 by 1067 mm).
- C. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other materials and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - e. Specification paragraph number and generic name of each item.
 3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics, and identification information for record.
 4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit two full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Owner or Engineer will return submittal with options selected.
 6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and

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physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

- a. Number of Samples: Submit two sets of Samples. Engineer or Owner will retain one Sample set; remainder will be returned
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
- E. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- F. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual Specification Sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.
- G. Certificates:
 1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
 2. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
 3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
 4. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

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5. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

H. Test and Research Reports:

1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - a. Name of evaluation organization.
 - b. Date of evaluation.
 - c. Time period when report is in effect.
 - d. Product and manufacturers' names.
 - e. Description of product.
 - f. Test procedures and results.
 - g. Limitations of use.

1.8 CONTRACTOR'S REVIEW

- A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.
- B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement

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certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

1.9 PROJECT COORDINATOR'S REVIEW

- A. Action Submittals: Engineer will review each submittal, indicate corrections or revisions required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Informational Submittals: Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Engineer.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents will be returned by Architect without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013300

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SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including 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 inspection 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 quality-control requirements for individual construction activities are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and quality-control services required by Engineer, 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. Divisions 02 through 33 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

- A. Field Quality-Control Tests: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- B. 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.
- C. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

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- D. 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.
- E. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect[**or Construction Manager**].

1.4 CONFLICTING REQUIREMENTS

- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements are specified and the standards or requirements 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 Engineer for direction 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 Engineer for a decision before proceeding.

1.5 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.

1.6 INFORMATIONAL SUBMITTALS

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

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1.7 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 Engineer. 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. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- C. 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..
- D. 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.
- E. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Engineer 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.

1.8 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Contractor 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.
 - 1. Bidder shall have a minimum of five (5) years of experience in services of similar scope and magnitude within the last ten (10) years.
 - 2. Bidder shall provide resumes of the Project Manager and Site Superintendent demonstrating experience in services of similar scope and magnitude within the last five (5) years. Two (2) references must be included on each resume.
 - 3. Bidder shall provide a concise description of their work experiences as related to the scope of work outlined herein. Said description should include, but not be limited to, the number of years the Bidder has been providing these types of services, the number and types of customers the Bidder presently services, types of systems provided, references, and other documentation to verify the Bidder's experience.

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4. Bidder shall provide a minimum, five (5) references. The name, address, and phone number should be provided for each reference along with a contact person for that reference. Two (2) references shall be of client's that purchased and utilized similar repairs as proposed.
 5. For all repair products outlined in the scope of work which require factory trained and certified installers, the Bidder must have this certification from the Manufacturer prior to installation of that product on this project.
 6. All work indicated to be performed under these contract documents shall be performed by a Contractor with the proper class of license for each portion of the work to be completed.
- C. 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.
- D. 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.
- E. Testing Agency Qualifications: Contractor will engage an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
- F. 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.

1.9 QUALITY CONTROL

- A. Contractor Responsibilities: Tests and inspections are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.
1. 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.
 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
 3. Submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

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- 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 Engineer, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 1. Notify Engineer 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. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
 - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, 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

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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

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SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including 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, Engineer, testing agencies, and authorities having jurisdiction.
- B. Water Service: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- C. Electric Power Service: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.
- B. Dust Control Plan: Submit coordination drawing and narrative that indicates the dust control measures proposed for use, proposed locations, and proposed time frame for their operation. Include the following:
 - 1. Locations of dust-control partitions at each phase of work.
 - 2. Waste-handling procedures.
 - 3. Other dust-control measures.

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PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide concrete bases for supporting posts.
- B. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil (0.25-mm) minimum thickness, with flame-spread rating of 15 or less per ASTM E84 and passing NFPA 701 Test Method 2.

2.2 EQUIPMENT

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

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.
- C. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
 - 1. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
 - 2. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- D. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- E. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

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- F. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
- G. Traffic Controls: Comply with requirements of authorities having jurisdiction and with the approved pedestrian and traffic control plans.
 - 1. Protect existing site improvements to remain including curbs, pavement, and utilities.
 - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- H. Parking: Use designated areas of Owner's existing parking areas for construction personnel.
- I. Project Signs: Provide Project signs as indicated. 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 and touchup signs so they are legible at all times.
- J. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. An on-site dumpster should be provided by the Contractor and use of any Owner's dumpsters is not allowed. Coordinate the location to place dumpster with the Owner. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Division 01 Section "Execution."
- K. Material Storage: Coordinate with the Owner on a material storage area within the garage that may be used during the project.
 - 1. Material storage areas shall not impede the existing traffic aisles.
 - 2. Owner is not responsible for any materials or equipment stored within the designated material storage area. Contractor must take all necessary precautions to secure and protect materials and equipment.
 - 3. Material storage weight may not exceed 40 PSF or a 3,000 lb point load
- L. Temporary Elevator Use: Use of elevators is not permitted.
- M. Existing Stair Usage: Use of Owner's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore stairs to condition existing before initial use.
 - 1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.

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3.2 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.
 - 1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.
- B. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.
 - 1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.
 - 2. Maintain security by limiting number of keys and restricting distribution to authorized personnel.
- C. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- D. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
- E. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner and tenants from fumes and noise.
 - 1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side.

3.3 OPERATION, TERMINATION, AND REMOVAL

- A. 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 Substantial 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 Substantial 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 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Divisions 2 through 33 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved by Architect through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Project Documents and proposed by Contractor.
- C. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual

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characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.

- D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
- E. Special Warranty: Written warranty required by or incorporated into the Project Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

1.4 ACTION SUBMITTALS

- A. General:
 - 1. Engineer shall have 21 days for initial review of each submittal.
 - 2. Place a permanent label or title block on each submittal for identification.
 - 3. Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.
- B. Product List: Submit a list, in tabular form, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.
 - 1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
 - 2. Completed List: Within 7 days after date of commencement of the Work, submit 3 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
 - 3. Engineer's Action: Engineer will respond in writing to Contractor within 7 days of receipt of completed product list. Engineer's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Engineer's response, or lack of response, does not constitute a waiver of requirement that products comply with the Project Documents.
- C. Comparable Product Request Submittal: Submit request for consideration of each comparable product. Identify basis-of-design product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 - 2. Engineer's Action: If necessary, Engineer will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Engineer will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later. Use product specified if Engineer does not issue a decision on use of comparable product request within time allocated.

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1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
 - 1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
 - 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Engineer will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
 - 1. Store products to allow for inspection and measurement of quantity or counting of units.
 - 2. Store materials in a manner that will not endanger Project structure.
 - 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 - 4. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 - 5. Protect stored products from damage and liquids from freezing.
 - 6. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.
 - a. Maximum weight of all equipment and materials shall not exceed 40-psf.

1.7 PRODUCT WARRANTIES

- A. **The Contractor shall act as a single source point of contact for all defects and necessary repairs during the specified warranty periods for all products and associated labor. As such, the Owner will only contact the Contractor in the event of problems associated with**

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repairs made per this scope of work. It shall be the Contractor's sole responsibility to coordinate with manufacturers as needed and provide labor as required to conduct any and all warranty repairs.

- B. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 - 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 - 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- C. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. See Divisions 02 through 33 Sections for specific content requirements and particular requirements for submitting special warranties.
- D. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
 - 4. Where products are accompanied by the term "as selected," Engineer will make selection.
 - 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 - 6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures:

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1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience may be considered, unless otherwise indicated.
 2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience may be considered, unless otherwise indicated.
 3. Products: Where Specification paragraphs or subparagraphs titled "Products" introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
 - a. Comparable products or substitutions for Contractor's convenience will be considered.
 4. Available Products: Where Specification paragraphs or subparagraphs titled "Available Products" introduce a list of names of both products and manufacturers, provide one of the products listed or another product that complies with requirements. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
 5. Available Manufacturers: Where Specification paragraphs or subparagraphs titled "Available Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed or another manufacturer that complies with requirements. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
 6. Product Options: Where Specification paragraphs titled "Product Options" indicate that size, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide either the specific product or system indicated or a comparable product or system by another manufacturer. Comply with provisions in "Product Substitutions" Article.
 7. Basis-of-Design Product: Where Specification paragraphs or subparagraphs titled "Basis-of-Design Product[s]" are included and also introduce or refer to a list of manufacturers' names, provide either the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article to obtain approval for use of unnamed product.
- C. Visual Matching Specification: Where Specifications require "match Engineer's sample," provide a product that complies with requirements and matches Engineer's sample. Engineer's decision will be final on whether a proposed product matches.
1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.

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- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Engineer from manufacturer's full range" or similar phrase, select a product that complies with requirements. Engineer will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRODUCT SUBSTITUTIONS

- A. Timing: Engineer will consider requests for substitution if received within 7 days after commencement of the Work. Requests received after that time may be considered or rejected at discretion of Engineer.
- B. Conditions: Engineer will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Engineer will return requests without action, except to record noncompliance with these requirements:
1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Engineer for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 2. Requested substitution does not require extensive revisions to the Project Documents.
 3. Requested substitution is consistent with the Project Documents and will produce indicated results.
 4. Substitution request is fully documented and properly submitted.
 5. Requested substitution will not adversely affect Contractor's Construction Schedule.
 6. Requested substitution has received necessary approvals of authorities having jurisdiction.
 7. Requested substitution is compatible with other portions of the Work.
 8. Requested substitution has been coordinated with other portions of the Work.
 9. Requested substitution provides specified warranty.
 10. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved

2.3 COMPARABLE PRODUCTS

- A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Engineer may return requests without action, except to record noncompliance with these requirements:
1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant product qualities include attributes such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
 3. Evidence that proposed product provides specified warranty.

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4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

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SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Installation of the Work.
 - 2. Cutting and patching.
 - 3. Progress cleaning.
 - 4. Protection of installed construction.
 - 5. Correction of Work
- B. Related Requirements:
 - 1. Section 011000 "Summary" for limits on use of Project site.
 - 2. Section 013300 "Submittal Procedures" for submitting surveys.
 - 3. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
 - 4. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

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- B. Review of Project Documents and Field Conditions: Immediately on discovery of the need for clarification of the Project Documents, submit a request for information to Engineer. Include a detailed description of problem encountered, together with recommendations for changing the Project Documents.

- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
 - 1. Description of the Work.
 - 2. List of detrimental conditions, including substrates.
 - 3. List of unacceptable installation tolerances.
 - 4. Recommended corrections.

- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to the following requirements:
 - 1. Notify Owner not less than one week in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Owner's written permissions.

- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Engineer. Include a detailed description of the problem encountered, together with recommendations for changing the Project Documents.

3.3 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.

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2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Attachment: Provide anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work.
 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 2. Allow for building movement, including thermal expansion and contraction.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.4 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

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- E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.5 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).

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3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 - b. Lead Paint: Contractor should assume that all paint in the deck contains lead. During lead paint removal, abatement, and disposal, Contractor shall follow all applicable state and/or federal requirements.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Contractor to take all necessary precautions above and beyond that indicated in this Section to limit lead paint dust exposure to workers and the general public, and to prevent any lead dust particles from escaping into the environment. Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

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3.6 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section "Cutting and Patching."
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 017300

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SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- B. Related Requirements:
 - 1. Section 017839 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 2. Divisions 02 through 33 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of cleaning agent.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at final completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.

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1.5 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 1. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
 2. Submit closeout submittals specified in individual Divisions 02 through 33 Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 3. Submit maintenance material submittals specified in individual Divisions 02 through 33 Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Construction Manager. Label with manufacturer's name and model number.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of **10** days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 1. Advise Owner of pending insurance changeover requirements.
 2. Complete startup and testing of systems and equipment.
 3. Perform preventive maintenance on equipment used prior to Substantial Completion.
 4. Advise Owner of changeover in utility services.
 5. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 6. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 7. Complete final cleaning requirements.
 8. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Engineer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
 1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for final completion.

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1.6 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
 - 1. Submit a final Application for Payment.
 - 2. Certified List of Incomplete Items: Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 - 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
 - 1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.7 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 - 1. Organize list of spaces in sequential order, proceeding from lowest floor to highest floor.
 - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 - 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Engineer and Owner.
 - d. Name of Contractor.
 - e. Page number.

1.8 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Engineer for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.

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- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- D. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - d. Remove snow and ice to provide safe access to building.
 - e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

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- g. Sweep concrete floors broom clean in unoccupied spaces.
 - h. Remove labels that are not permanent.
 - i. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls.

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair, or remove and replace, defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 - 1. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
 - 2. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.

END OF SECTION 017700

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SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
 - 5. Daily Construction Report Submittal
 - 6. Construction Photographs
- B. Related Requirements:
 - 1. Section 017700 "Closeout Procedures" for general closeout procedures.
 - 2. Divisions 02 through 33 Sections for specific requirements for project record documents if the Work in those Sections.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit copies of record Drawings as follows:
 - a. Final Submittal:
 - 1) Submit one paper-copy of marked-up record prints.
 - 2) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one paper copy of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one paper copy of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

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- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit one paper copy of each submittal.
- A. Daily Construction Reports: Submit one paper copy of all Daily Construction Reports.
- B. Construction Photographs: Submit an electronic copy of all construction photographs to a web-based FTP site as provided by the Engineer.
- C. Cost Change Proposals: Submit an electronic copy of all approved Cost Change Proposals and Change Orders.

1.4 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding photographic documentation.
 - 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Changes made by Change Order or Change Directive.
 - d. Changes made following Engineer' written orders.
 - e. Details not on the original Contract Drawings.
 - f. Field records for variable and concealed conditions.
 - g. Record information on the Work that is shown only schematically.
 - 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 - 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 - 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 - 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

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- B. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Engineer determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
 - 1. New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
 - 2. Consult Engineer for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting
- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 - 1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 - 2. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Engineer and Owner.
 - e. Name of Contractor.

1.5 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 - 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 - 5. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as paper copy.

1.6 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

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2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, record Specifications, and record Drawings where applicable.

B. Format: Submit record Product Data as paper copy.

1. Include record Product Data directory organized by Specification Section number and title

C. Submit a tabular list showing specific products used in the Work. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.

1.7 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as paper copy.

1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

1.8 DAILY CONSTRUCTION REPORT SUBMITTAL

A. Prepare a daily construction report recording the following information concerning events at the Project site. The Contractor shall submit daily reports to the Owner and Engineer on a weekly basis. The Engineer will provide a form document to use as an Appendix to the technical specifications.

1. List of contractors at Project site.
2. Approximate count of personnel at Project site.
3. High and lower temperatures and general weather conditions.
4. Meetings and significant decisions occurring during the day.
5. Stoppages, delays, shortages, and losses.
6. Substantial completions authorized.
7. **Daily log of repair quantities**

1.9 CONSTRUCTION PHOTOGRAPHS

A. Preconstruction Photographs: Before starting construction, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points.

1. Flag construction limits before taking construction photographs.

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2. Take photographs to show existing conditions adjacent to property before starting the Work.
 3. Take photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
 4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.
- B. Periodic Construction Photographs: Take photographs monthly, coinciding with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.
- C. Photographic Media:
1. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of 8 megapixels, and at an image resolution of not less than 3200 by 2400 pixels.

1.10 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Engineer's reference during normal working hours.
- C. All of the documents required at the Project site under this article shall be available for use by the Engineer or his representative at all times.
- D. Upon completion of this project, the documents required under this article shall be turned over to the Engineer in good order.

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION 017839

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SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected portions of building or structure.
 - 2. Demolition excluding removal of hazardous materials and toxic substances.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
 - 2. Section 015639 "Temporary Tree and Plant Protection" for temporary protection of existing trees and plants that are affected by selective demolition.
 - 3. Section 017300 "Execution" for cutting and patching procedures.
 - 4. Section 013516 "Alteration Project Procedures" for general protection and work procedures for alteration projects.

1.3 DEFINITIONS

- A. Remove: Detach or dismantle items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- C. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

1.4 REFERENCE STANDARDS

- A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.
- B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

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1.5 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.6 INFORMATIONAL SUBMITTALS

- A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.
- B. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations.
- C. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.
- D. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.7 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.
- B. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.8 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Engineer of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. If suspected hazardous materials are encountered, do not disturb; immediately notify Engineer and Owner. Hazardous materials will be removed by Owner under a separate contract.
 - 2. Lead paint removal, abatement, and disposal shall follow all applicable state and/or federal requirements.

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- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.9 COORDINATION

- A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Survey of Existing Conditions: Survey existing conditions and correlate with requirements indicated to determine extend of demolition required.
- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Engineer.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
 - 1. Comply with requirements for existing services/systems interruptions specified in Division 01 Section "Summary."
- B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.
 - 1. Provide at least one week notice to Owner if shutdown of service is required

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3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Comply with requirements for access and protection specified in Division 01 Section "Summary" and Division 01 Section "Temporary Facilities and Controls."
 2. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
 3. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
 4. Protect existing site improvements, appurtenances, and landscaping to remain.
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Division 01 Section "Summary" and Division 01 Section "Temporary Facilities and Controls."
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
1. Strengthen or add new supports when required during progress of selective demolition.
- D. Remove temporary barricades and protections where hazards no longer exist.

3.4 POLLUTION CONTROLS

- A. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.
- B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

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1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.5 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 4. Maintain adequate ventilation when using cutting torches.
 5. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 6. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 7. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 8. Dispose of demolished items and materials promptly.
- B. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.

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3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 1/2 inch (13 mm) at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
- C. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight. See Section 075400 – Thermoplastic Membrane Roofing for new roofing requirements.
 - 1. Remove existing roof membrane, flashings, copings, and roof accessories.
 - 2. Remove existing roofing system down to substrate.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Burning: Do not burn demolished materials.
- C. Burning: Do not burn demolished materials.
- D. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.8 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

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SECTION 030130 - MAINTENANCE OF CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Removal of deteriorated concrete and subsequent replacement and patching.
 - 2. Repairs to reinforcing steel.
 - 3. Rout and seal cracks and construction joints.
 - 4. Epoxy crack injection.

1.3 UNIT PRICES

- A. Work of this Section is affected by unit prices specified in Section 012200 "Unit Prices."
- B. General: Unit prices include the cost of preparing existing construction to receive the work indicated and costs of field quality control required for units of work completed.
- C. Shallow Depth Concrete Removal and Replacement or Patching: Work will be paid for by the square foot computed on the basis of rectangular solid shapes approximating the actual shape of concrete removed and replaced with average widths and lengths, measured to the nearest inch. Unit price also includes welded wire fabric in the repair area, joint sealant around the perimeter of the patch and any restriping necessary to match the existing concrete surface. Depth of repair = 1/2" to 2".
- D. Deep Concrete Removal and Replacement: Work will be paid for by the square foot computed on the basis of rectangular solid shapes approximating the actual shape of concrete removed and replaced with average depths, widths, and lengths, measured to the nearest inch. Unit price also includes joint sealant around the perimeter of the patch and any restriping necessary to match the existing concrete surface. Depth of repair = 2" to 4".
- E. Overhead / Vertical Concrete Removal and Replacement: Work will be paid for by the square foot computed on the basis of rectangular solid shapes approximating the actual shape of concrete removed and replaced with average widths and lengths, measured to the nearest inch. Unit price also includes any paint necessary to match the existing concrete surface. Depth of repair = 1/2" to 4"

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- F. Exposed Rebar: Work will be paid for by the square foot computed on the basis of rectangular solid shapes approximating the actual shape of concrete removed and replaced with average widths and lengths, measured to the nearest inch. Concrete depth = 1/2" to 2".
- G. Epoxy Crack Injection: Work includes surface preparation, will be paid for by the linear foot of crack injected.
- H. Rout and Seal Crack: Work, which includes surface preparation, will be paid for by the linear foot of crack repaired.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Engineer and Owner of scheduled meeting dates.
 - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. The Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility problems.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written recommendations.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
 - 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 - 4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.

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5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 1. Include construction details, material descriptions, chemical composition, physical properties, test data, and mixing, preparation, and application instructions.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For installers and manufacturers.
- B. Material Certificates: For each type of material supplied for mixing or adding to products at Project site.
- C. Product Test Reports: For each product, for tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Field quality-control reports.
- E. Quality-Control Program: Submit before work begins.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Each manufacturer shall employ factory-trained technical representatives who are available for consultation and Project-site inspection and assistance at no additional cost.
- B. Installer Qualifications: Installer that employs workers trained and approved by manufacturer to apply products.

1.8 cDELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in manufacturer's original and unopened containers, labeled with type and name of products and manufacturers.
- B. Comply with manufacturer's written instructions for minimum and maximum temperature requirements and other conditions for storage.
- C. Store cementitious materials off the ground, under cover, and in a dry location.
- D. Store aggregates covered and in a dry location; maintain grading and other required characteristics and prevent contamination.

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1.9 FIELD CONDITIONS

- A. Environmental Limitations for Epoxies: Do not apply when air and substrate temperatures are outside limits permitted by manufacturer. During hot weather, cool epoxy components before mixing, store mixed products in shade, and cool unused mixed products to retard setting. Do not apply to wet substrates unless approved by manufacturer.
 - 1. Use only Class A epoxies when substrate temperatures are below or are expected to go below 40 deg F (5 deg C) within eight hours.
 - 2. Use only Class A or B epoxies when substrate temperatures are below or are expected to go below 60 deg F (16 deg C) within eight hours.
 - 3. Use only Class C epoxies when substrate temperatures are above and are expected to stay above 60 deg F (16 deg C) for eight hours.
- B. Cold-Weather Requirements for Cementitious Materials: Do not apply unless concrete-surface and air temperatures are above 40 deg F (5 deg C) and will remain so for at least 48 hours after completion of Work.
- C. Hot-Weather Requirements for Cementitious Materials: Protect repair work when temperature and humidity conditions produce excessive evaporation of water from patching materials. Provide artificial shade and wind breaks, and use cooled materials as required. Do not apply to substrates with temperatures of 90 deg F (32 deg C) and above.
- D. Mask off adjoining surfaces to prevent damage to any surface outside work area.
- E. Protect repaired surfaces from traffic, damage, and contamination during curing time period. Refer to product manufacturer product specifications for required curing time.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: For repair products, obtain each color, grade, finish, type, and variety of product from single source and from single manufacturer with resources to provide products of consistent quality in appearance and physical properties.
- B. VOC Content: Provide materials that comply with VOC limits of authorities having jurisdiction.

2.2 BONDING AGENTS

- A. Epoxy-Modified, Cementitious Bonding and Anticorrosion Agent: Manufactured product that consists of water-insensitive epoxy adhesive, portland cement, and water-based solution of corrosion-inhibiting chemicals that forms a protective film on steel reinforcement.
 - a. Planibond 3C; MAPEI
 - b. MasterEmaco P 124; Master Builders Solutions
 - c. Euclid Chemical Company (The), an RPM company; Duralprep AC.

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- d. Sika Corporation, Construction Product Division; Armatec 110 EpoCem.
 - e. Sto Corp., Concrete Restoration Division; Sto Bonding and Anti-Corrosion Agent.
 - f. Any manufacturer approved by the Engineer as a provider of an equal product and equal or better service.
- B. Mortar Scrub Coat: Mix consisting of 1 part portland cement and 1 part fine aggregate complying with ASTM C144 except 100 percent passing a No. 16 (1.18-mm) sieve.

2.3 PATCHING MORTAR

A. Patching Mortar Requirements:

- 1. Only use patching mortars that are recommended by manufacturer for each applicable horizontal, vertical, or overhead use orientation.
 - 2. Color and Aggregate Texture: Provide patching mortar and aggregates of colors and sizes necessary to produce patching mortar that matches existing, adjacent, exposed concrete. Blend several aggregates if necessary to achieve suitable matches.
 - 3. Coarse Aggregate for Patching Mortar: ASTM C33/C33M, washed aggregate, Size No. 8, Class 5S. Add to patching-mortar mix only as permitted by patching-mortar manufacturer.
- B. Polymer-Modified, Cementitious Patching Mortar: Packaged, dry mix for repair of concrete and that contains a non-redispersible latex additive as either a dry powder or a separate liquid that is added during mixing. Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following
- 1. Compressive Strength: Not less than 5500 psi at 28 days when tested according to ASTM C928.
 - 2. Overhead/Vertical Application for repair depths ½ inch to 4 inches:
 - a. MAPEI; Planitop XS
 - b. Master Builders Solutions; MasterEmaco S 488 CI
 - c. Sika Corporation; SikaTop 123 Plus
 - d. Sto Corp.; Sto Overhead Mortar.
 - e. Euclid Chemical Company; Euclid Verticoat Supreme
 - f. Any manufacturer approved by the Owner as a provider of an equal product and equal or better service.
 - 3. Horizontal Application for repair depths ½ inch to 2 inches:
 - a. MAPEI; Mapecem 102
 - b. Master Builders Solutions; MasterEmaco S 466 CI
 - c. Sika Corporation; SikaTop 122 Plus
 - d. Sto Corp; Sto Full Depth Repair Mortar with CI
 - e. Euclid Chemical Company; Verticoat Supreme, Concrete Top Supreme
 - f. Any manufacturer approved by the Owner as a provider of an equal product and equal or better service.
 - 4. Horizontal application for repair depths 2 inches to 4 inches:
 - a. MAPEI; Planitop 11 SCC

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- b. Master Builders Solutions; MasterEmaco S 466 CI extended with 3/8-inch pea gravel meeting ASTM C 33
 - c. Sika Corporation; Sikacrete 111 Plus; Sikacrete 211 SCC Plus
 - d. Sto Corp; Sto Full Depth Repair Mortar with CI
 - e. Euclid Chemical Company; Verticoat Supreme extended with 3/8-inch pea gravel meeting ASTM C 33, Concrete Top Supreme extended with 3/8-inch pea gravel meeting ASTM C 33
 - f. Any manufacturer approved by the Owner as a provider of an equal product and equal or better service.
5. Full Depth application for repair depths 4 inches to 8 inches (if required):
- a. MAPEI; Planitop 11 SCC
 - b. Master Builders Solutions; MasterEmaco S 466 CI extended with 3/8-inch pea gravel meeting ASTM C 33
 - c. Sika Corporation; Sikacrete 211 SCC Plus
 - d. Euclid Chemical Company; Eucocrete Supreme extended with 3/8-inch pea gravel meeting ASTM C 33
 - e. Sto Corp; Sto Extended Full-Depth Repair Mortar with CI.
 - f. Any manufacturer approved by the Owner as a provider of an equal product and equal or better service.
6. For repair depths greater than 8 inches place concrete mix as approved by the Engineer.

C. Grout Fluidifier for Grout: ASTM C937.

D. Pozzolans for Grout: ASTM C618.

2.4 EPOXY CRACK-INJECTION MATERIALS

A. Epoxy Crack-Injection Adhesive: ASTM C881/C881M, bonding system Type I free of VOCs.

- 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
 - a. MAPEI; Epojet; Planibond AE as cap seal
 - b. Sika Corporation; Sikadur 35 Hi-Mod LV, Sikadur 35 Hi-Mod LV LPL, Sikadur 52, or Sikadur Injection Gel.
 - c. Tamms Industries, Inc.; Duralcrete LV.
 - d. Sto Corp., Concrete Restoration Division; Sto Epoxy Binder
- 2. Any manufacturer approved by the Engineer as a provider of an equal product and equal or better service
- 3. Capping Adhesive: Product manufactured for use with crack-injection adhesive by same manufacturer.
- 4. Color: Provide epoxy crack-injection adhesive and capping adhesive that blend with existing, adjacent concrete and do not stain concrete surface.

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2.5 MISCELLANEOUS MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type I, II, or III unless otherwise indicated.
- B. Water: Potable.
- C. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from as-drawn steel wire into flat sheets.

2.6 MIXES

- A. General: Mix products, in clean containers, according to manufacturer's written instructions.
 - 1. Do not add water, thinners, or additives unless recommended by manufacturer.
 - 2. Add clean silica sand and coarse aggregates only as recommended by manufacturer.
 - 3. When practical, use manufacturer's premeasured packages to ensure that materials are mixed in proper proportions. When premeasured packages are not used, measure ingredients using graduated measuring containers; do not estimate quantities or use shovel or trowel as unit of measure.
 - 4. Do not mix more materials than can be used within time limits recommended by manufacturer. Discard materials that have begun to set.
- B. Mortar Scrub Coat: Mix dry ingredients with enough water to provide consistency of thick cream.
- C. Dry-Pack Mortar: Mix required type(s) of patching-mortar dry ingredients with just enough liquid to form damp cohesive mixture that can be squeezed by hand into a ball but is not plastic.
- D. Concrete:
 - 1. Minimum Compressive Strength: 5000 psi at 28 days.
 - 2. Maximum W/C Ratio: 0.40.
 - 3. Slump Limit:
 - 4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for $\frac{3}{4}$ " nominal maximum aggregate size.

PART 3 - EXECUTION

3.1 CONCRETE MAINTENANCE

- A. Have concrete-maintenance work performed only by qualified concrete-maintenance specialist.
- B. Comply with manufacturers' written instructions for surface preparation and product application.

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3.2 EXAMINATION

- A. Standard Specifications and Repair Methods:
 - 1. ICRI 03731 – Guide for Selecting Application Methods for the Repair of Concrete Surfaces
 - 2. ACI 503.4 – Standard Specification for Repairing Concrete with Epoxy Mortars
 - 3. ACI 503R – Use of Epoxy Compounds with Concrete
 - 4. ACI 546 – Concrete Repair Guide
- B. Notify Engineer three days in advance of dates when areas of deteriorated or delaminated concrete and deteriorated reinforcing bars will be located.
- C. Locate areas of deteriorated or delaminated concrete using hammer or chain-drag sounding and mark boundaries. Mark areas for removal by simplifying and squaring off boundaries as directed by Engineer. At columns and walls make boundaries level and plumb unless otherwise indicated.
- D. Pachometer Testing: Locate at least three reinforcing bars using a pachometer, and drill test holes to determine depth of cover. Calibrate pachometer using depth of cover measurements, and verify depth of cover in removal areas using pachometer.

3.3 PREPARATION

- A. Ensure that supervisory personnel are on-site and on duty when concrete maintenance work begins and during its progress.
- B. Protect persons, motor vehicles, surrounding surfaces of building being repaired, building site, plants, and surrounding buildings from harm resulting from concrete maintenance work.
 - 1. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.
 - 2. Use only proven protection methods appropriate to each area and surface being protected.
 - 3. Provide temporary barricades, barriers, and directional signage to exclude public from areas where concrete maintenance work is being performed.
 - 4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of concrete maintenance work.
 - 5. Contain dust and debris generated by concrete maintenance work and prevent it from reaching the public or adjacent surfaces.
 - 6. Use water-mist sprinkling and other wet methods to control dust only with adequate, approved procedures and equipment that ensure that such water will not create a hazard or adversely affect other building areas or materials.
 - 7. Protect floors and other surfaces along haul routes from damage, wear, and staining.
 - 8. Protect adjacent surfaces and equipment by covering them with heavy polyethylene film and waterproof masking tape or a liquid strippable masking agent. If practical, remove items, store, and reinstall after potentially damaging operations are complete.
 - 9. Neutralize and collect alkaline and acid wastes for disposal off Owner's property.

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10. Dispose of debris and runoff from operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.
- C. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Engineer immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is in working order.
1. Prevent solids such as aggregate or mortar residue from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from concrete maintenance work.
 2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.
- D. Preparation for Concrete Removal: Examine construction to be repaired to determine best methods to safely and effectively perform concrete maintenance work. Examine adjacent work to determine what protective measures will be necessary. Make explorations, probes, and inquiries as necessary to determine condition of construction to be removed in the course of repair.
1. Verify that affected utilities have been disconnected and capped.
 2. Inventory and record the condition of items to be removed for reinstallation or salvage.
 3. Provide and maintain shoring, bracing, and temporary structural supports as required to preserve stability and prevent unexpected or uncontrolled movement, settlement, or collapse of construction being demolished and construction and finishes to remain. Strengthen or add new supports when required during progress of removal work.
 4. Saw-cut perimeter of areas indicated for removal to a depth of at least 1/2 inch (12.7 mm). Make cuts perpendicular to concrete surfaces and no deeper than cover on reinforcement. Care shall be taken not to damage existing reinforcing steel or sheathing.
 5. Remove deteriorated and delaminated concrete by breaking up and dislodging from reinforcement.
 6. Where half or more of the perimeter of reinforcing bar is exposed, bond between reinforcing bar and surrounding concrete is broken, or reinforcing bar is corroded, remove concrete from entire perimeter of bar and to provide at least a 3/4-inch clearance around bar.
 7. Test areas where concrete has been removed by tapping with hammer, and remove additional concrete until unsound and disbonded concrete is completely removed.
 8. Provide surfaces with a fractured profile of at least 1/8 inch that are approximately perpendicular or parallel to original concrete surfaces. At columns and walls, make top and bottom surfaces level unless otherwise directed.
 9. Detail the edge of the patch to a 90 degree angle to eliminate feather edging.
 10. Thoroughly clean removal areas of loose concrete, dust, and debris.
- E. Reinforcing-Bar Preparation: Remove loose and flaking rust from exposed reinforcing bars by high-pressure water cleaning, abrasive blast cleaning, needle scaling, or wire brushing until only tightly adhered light rust remains. All exposed surfaces of reinforcing steel shall be coated within 30 minutes after cleaning. An epoxy-based and anti-corrosion agent shall be used in accordance with the manufacturer recommendations.

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1. Where section loss of reinforcing bar is more than 25 percent, or 20 percent in two or more adjacent bars, cut bars and remove and replace as indicated only as directed by Engineer.
 2. Remove additional concrete as necessary to provide at least 3/4-inch (19-mm) clearance at existing and replacement bars.
 3. Splice replacement bars to existing bars according to ACI 318 (ACI 318M) by lapping, welding, or using mechanical couplings.
- F. Preparation of Floor Joints for Repair: Saw-cut joints full width to edges and depth of spalls, but not less than [3/4 inch (19 mm)] **[1 inch (25 mm)] [2 inches (50 mm)]** <Insert dimension> deep. Clean out debris and loose concrete; vacuum or blow clear with compressed air.

3.4 REMOVAL OF CONCRETE

- A. Do not overload structural elements with debris.
- B. Saw-cut perimeter of areas indicated for removal to a depth of at least 1/2 inch (13 mm). Make cuts perpendicular to concrete surfaces and no deeper than cover on reinforcement.
- C. Remove deteriorated and delaminated concrete by breaking up and dislodging from reinforcement.
- D. Remove additional concrete if necessary to provide a depth of removal of at least 1/2 inch (13 mm) over entire removal area.
- E. Where half or more of the perimeter of reinforcing bar is exposed, bond between reinforcing bar and surrounding concrete is broken, or reinforcing bar is corroded, remove concrete from entire perimeter of bar and to provide at least 3/4-inch (19-mm) clearance around bar.
- F. Test areas where concrete has been removed by tapping with hammer, and remove additional concrete until unsound and disbonded concrete is completely removed.
- G. Provide surfaces with a fractured profile of at least 1/8 inch (3 mm) that are approximately perpendicular or parallel to original concrete surfaces. At columns and walls, make top and bottom surfaces level unless otherwise directed.
- H. Thoroughly clean removal areas of loose concrete, dust, and debris.

3.5 APPLICATION OF BONDING AGENT

- A. General: Comply with manufacturer's written instructions and recommendations for application of products, including surface preparation.
- B. Epoxy-Modified, Cementitious Bonding and Anticorrosion Agent: Apply to reinforcing bars and concrete by stiff brush or hopper spray according to manufacturer's written instructions. Apply to reinforcing bars in two coats, allowing first coat to dry two to three hours before applying second coat. Allow to dry before placing patching mortar or concrete.

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- C. Mortar Scrub Coat for Job-Mixed Patching Mortar and Concrete: Dampen repair area and surrounding concrete 6 inches (150 mm) beyond repair area. Remove standing water and apply scrub coat with a brush, scrubbing it into surface and thoroughly coating repair area. If scrub coat dries, recoat before placing patching mortar or concrete.
- D. Slurry Coat for Cementitious Patching Mortar: Wet substrate thoroughly and then remove standing water. Scrub a slurry of neat patching mortar mixed with latex bonding agent into substrate, filling pores and voids.

3.6 INSTALLATION OF PATCHING MORTAR

- A. Place patching mortar as specified in this article unless otherwise recommended in writing by manufacturer.
 - 1. Provide forms where necessary to confine patch to required shape.
 - 2. Wet substrate and forms thoroughly and then remove standing water.
- B. Pretreatment: Apply specified bonding agent.
- C. General Placement: Place patching mortar by troweling toward edges of patch to force intimate contact with edge surfaces. For large patches, fill edges first and then work toward center, always troweling toward edges of patch. At fully exposed reinforcing bars, force patching mortar to fill space behind bars by compacting with trowel from sides of bars.
- D. 5. Control Joints: Large or abnormally shaped patch areas may require control joints – consult Engineer of Record for patches with an aspect ratio greater than 2:1 or an area larger than 25 square feet.
- E. Reinforcing Steel: Unless otherwise noted, place welded wire fabric at mid depth of the patch.
- F. Vertical Patching: Place material in lifts of not more than 1-1/2 inches (38 mm) or less than 1/4 inch (6 mm). Do not feather edge.
- G. Overhead Patching: Place material in lifts of not more than 1-1/2 inches (38 mm) or less than 1/4 inch (6 mm). Do not feather edge.
- H. Consolidation: After each lift is placed, consolidate material and screed surface.
- I. Multiple Lifts: Where multiple lifts are used, score surface of lifts to provide a rough surface for placing subsequent lifts. Allow each lift to reach final set before placing subsequent lifts.
- J. Finishing: Allow surfaces of lifts that are to remain exposed to become firm and then finish to a surface matching adjacent concrete, with not more than 1/8 inch difference in height to adjacent surfaces. Edges are to have a maximum slope of 1/4 inch rise to 1 foot of run. Finish with a medium broom surface finish.

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- K. Curing: Wet-cure cementitious patching materials, including polymer-modified cementitious patching materials, for not less than seven days by water-fog spray or water-saturated absorptive cover.

3.7 INSTALLATION OF DRY-PACK-MORTAR

- A. Use dry-pack mortar for deep cavities. Place as specified in this article unless otherwise recommended in writing by manufacturer.
 - 1. Provide forms where necessary to confine patch to required shape.
 - 2. Wet substrate and forms thoroughly and then remove standing water.
- B. Pretreatment: Apply specified bonding agent.
- C. Place dry-pack mortar into cavity by hand, and compact tightly into place. Do not place more material at a time than can be properly compacted. Continue placing and compacting until patch is approximately level with surrounding surface.
- D. After cavity is filled and patch is compacted, trowel surface to match profile and finish of surrounding concrete. A thin coat of patching mortar may be troweled into the surface of patch to help obtain required finish.
- E. Wet-cure patch for not less than seven days by water-fog spray or water-saturated absorptive cover.

3.8 CONCRETE PLACEMENT

- A. Place concrete according to Section 033000 "Cast-in-Place Concrete" and as specified in this article.
- B. Pretreatment: Apply epoxy bonding agent to reinforcement and concrete substrate.
- C. Standard Placement: Place concrete by form-and-pump method unless otherwise indicated.
 - 1. Use vibrators to consolidate concrete as it is placed.
 - 2. At unformed surfaces, screed concrete to produce a surface that when finished with patching mortar will match required profile and surrounding concrete.
- D. Form-and-Pump Placement: Place concrete by form-and-pump method where indicated.
 - 1. Design and construct forms to resist pumping pressure in addition to weight of wet concrete. Seal joints and seams in forms and where forms abut existing concrete.
 - 2. Pump concrete into place from bottom to top, releasing air from forms as concrete is introduced. When formed space is full, close air vents and pressurize to 14 psi (96 kPa).
- E. Wet-cure concrete for not less than seven days by leaving forms in place or keeping surfaces continuously wet by water-fog spray or water-saturated absorptive cover.

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- F. Fill placement cavities with dry-pack mortar and repair voids with patching mortar. Finish to match surrounding concrete.

3.9 GROUTING PREPLACED AGGREGATE CONCRETE

- A. Use grouted preplaced aggregate concrete for column and wall repairs. Place as specified in this article.
- B. Design and construct forms to resist pumping pressure in addition to weight of wet grout. Seal joints and seams in forms and where forms abut existing concrete.
- C. Apply epoxy bonding agent to reinforcement and concrete substrate.
- D. Place aggregate in forms, consolidating aggregate in lifts as it is placed. Pack aggregate into upper areas of forms to achieve intimate contact with concrete surfaces.
- E. Fill forms with water to thoroughly dampen aggregate and substrates. Drain water from forms before placing grout.
- F. Pump grout into place at bottom of preplaced aggregate, forcing grout upward. Release air from forms at top as grout is introduced. When formed space is full and grout flows from air vents, close vents and pressurize to 14 psi (96 kPa).
- G. Wet-cure concrete for not less than seven days by leaving forms in place or keeping surfaces continuously wet by water-fog spray or water-saturated absorptive cover.
- H. Repair voids with patching mortar and finish to match surrounding concrete.

3.10 EPOXY CRACK INJECTION

- A. Clean cracks with oil-free compressed air or low-pressure water to remove loose particles.
- B. Clean areas to receive capping adhesive of oil, dirt, and other substances that would interfere with bond
- C. Place injection ports as recommended by epoxy manufacturer, spacing no farther apart than thickness of member being injected. Seal injection ports in place with capping adhesive.
- D. Seal cracks at exposed surfaces with a ribbon of capping adhesive at least 1/4 inch (6 mm) thick by 1 inch (25 mm) wider than crack.
- E. Inject cracks wider than 0.003 inch (0.075 mm) to a depth of 8 inches (200 mm).
- F. Inject epoxy adhesive, beginning at widest part of crack and working toward narrower parts. Inject adhesive into ports to refusal, capping adjacent ports when they extrude epoxy. Cap injected ports and inject through adjacent ports until crack is filled.
- G. After epoxy adhesive has set, remove injection ports and grind surfaces smooth.

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3.11 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor shall engage a qualified testing agency to perform tests and inspections.
- B. Perform the following tests and inspections:
 - 1. Packaged, Cementitious Patching Mortar: 5 randomly selected sets of samples for each type of mortar required, tested according to ASTM C928/C928M.
 - 2. Job-Mixed Patching Mortar: 5 randomly selected sets of samples for each type of mortar required, tested for compressive strength according to ASTM C109/C109M.
 - 3. Concrete: As specified in Section 033000 "Cast-in-Place Concrete."
 - 4. Grout for Preplaced Aggregate: Tested for compressive strength according to ASTM C942.
 - a. Testing Frequency: One sample for each 25 cu. yd. (19 cu. m) of grout or fraction thereof, but not less than one sample for each day's work.
 - 5. Epoxy Crack Injection: Core-drilled samples to verify proper installation.
 - a. Testing Frequency: One sample for each 100 feet (30 m) of crack injected.
 - b. Where samples are taken, refill holes with epoxy mortar.
- C. Product will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

END OF SECTION 030130

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PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cold-formed steel framing.
2. Load-bearing wall framing.
3. Exterior non-load-bearing wall framing.
4. Vertical deflection clips, exterior.
5. Interior non-load-bearing wall framing.
6. Vertical deflection clips, interior.
7. Joist framing.
8. Roof rafter framing.
9. Soffit framing.
10. Sill sealer/termite barrier.

B. Related Requirements:

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings:

1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
3. Signed and sealed by the qualified professional engineer responsible for their preparation.

- C. Delegated Design Submittal: For cold-formed steel framing, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.

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- B. Welding certificates.
- C. Product Certificates: For each type of code-compliance certification for studs and track.
- D. Product Test Reports: For each listed product, for tests performed by a qualified testing agency.
 - 1. Steel sheet.
 - 2. Expansion anchors.
 - 3. Power-actuated anchors.
 - 4. Mechanical fasteners.
 - 5. Vertical deflection clips.
 - 6. Horizontal drift deflection clips
 - 7. Miscellaneous structural clips and accessories.
- E. Research Reports:
 - 1. For nonstandard cold-formed steel framing post-installed anchors and power-actuated fasteners, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.
 - 2. For sill sealer gasket/termite barrier, showing compliance with ICC-ES AC308.
- F. Delegated Design Engineer Qualifications: For cold-formed steel framing.

1.5 QUALITY ASSURANCE

- A. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment, indicating steel sheet complies with requirements, including base-steel thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.
- B. Code-Compliance Certification of Studs and Track: Provide documentation that framing members are certified in accordance with the product-certification program of the Steel Framing Industry Association.
- C. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."
- D. Delegated Design Engineer Qualifications: A professional engineer who is legally qualified to practice in North Carolina where Project is located and who is experienced in providing engineering services of the type indicated.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect and store cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling as required in AISI S202.

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PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide cold-formed steel framing capable of withstanding design loads within limits and under conditions indicated.
 - 1. Design Loads: Provided if necessary for the project.
 - 2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
 - a. Exterior Non-Load-Bearing Framing: Horizontal deflection of 1/240 of the wall height.
 - 3. Design framing systems to provide for movement of framing members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F (67 deg C).
 - 4. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.
- B. Cold-Formed Steel Framing Standards: Unless more stringent requirements are indicated, framing complies with AISI S100 and ASTM C955.
- C. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Indicate design designations from UL's "Product iQ" or from the listings of another qualified testing agency acceptable to authorities having jurisdiction.
- D. Sound-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated, in accordance with ASTM E90 and classified according to ASTM E413 by an independent testing agency.

2.2 COLD-FORMED STEEL FRAMING

- A. Framing Members, General: Comply with ASTM C955 for conditions indicated.
- B. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, of grade and coating designation as follows:
 - 1. Grade: ST33H (ST230H).
 - 2. Coating: G60 (Z180), A60 (ZF180), AZ50 (AZM150), or GF30 (ZGF90)

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2.3 EXTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
 - 1. Minimum Base-Steel Thickness: Match Existing.
 - 2. Flange Width: Match Existing.
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
 - 1. Minimum Base-Steel Thickness: Match Existing
 - 2. Flange Width: Match Existing
- C. Vertical Deflection Clips, Exterior: Manufacturer's standard bypass or head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web.
- D. Single Deflection Track: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:
 - 1. Minimum Base-Steel Thickness: Match Existing
 - 2. Flange Width: Match Existing.

2.4 SOFFIT FRAMING

- A. Exterior Soffit Framing: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:
 - 1. Minimum Base-Metal Thickness: Match Existing
 - 2. Flange Width: Match Existing.

2.5 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from ASTM A1003/A1003M, Structural Grade, Type H, metallic-coated steel sheet, of same grade and coating designation used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
 - 1. Supplementary framing.
 - 2. Bracing, bridging, and solid blocking.
 - 3. Web stiffeners.
 - 4. Anchor clips.
 - 5. End clips.
 - 6. Foundation clips.

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7. Gusset plates.
8. Stud kickers and knee braces.
9. Joist hangers and end closures.
10. Hole-reinforcing plates.
11. Backer plates.

2.6 FABRICATION

- A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, in accordance with AISI S240 and standards, manufacturer's written instructions, and requirements in this Section.
 1. Fabricate framing assemblies using jigs or templates.
 2. Cut framing members by sawing or shearing; do not torch cut.
 3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners and install in accordance with Shop Drawings, with screws penetrating joined members by no fewer than three exposed screw threads.
 4. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, in accordance with Shop Drawings.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies by means that prevent damage or permanent distortion.
- C. Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable variation of **1/8 inch in 10 ft. (1:960)** and as follows:
 1. Spacing: Space individual framing members no more than plus or minus **1/8 inch (3 mm)** from plan location. Cumulative errors are not to exceed minimum fastening requirements of sheathing or other finishing materials.
 2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of **1/8 inch (3 mm)**.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, conditions, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

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3.2 PREPARATION

- A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or track to structural members indicated to receive sprayed fire-resistive materials.
- B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that are required to obtain fire-resistance ratings indicated. Protect remaining fire-resistive materials from damage.
- C. Install load-bearing shims or grout between the underside of load-bearing wall bottom track and the top of foundation wall or slab at locations with a gap larger than **1/4 inch (6 mm)** to ensure a uniform bearing surface on supporting concrete or masonry construction.
- D. Install sill sealer gasket at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.
- E. Install sill sealer gasket/termite barrier in accordance with manufacturer's written instructions at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION OF COLD-FORMED STEEL FRAMING

- A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed steel framing in accordance with ASTM C1007, AISI S202, and manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
 - 1. Cut framing members by sawing or shearing; do not torch cut.
 - 2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
 - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 - b. Locate mechanical fasteners, install in accordance with Shop Drawings, and comply with requirements for spacing, edge distances, and screw penetration.
- D. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- E. Install temporary bracing and supports to secure framing and support loads equal to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

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- F. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
- G. Install insulation, specified in **Section 072100 "Thermal Insulation,"** in framing-assembly members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- H. Fasten hole-reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.

3.4 INSTALLATION OF EXTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Install continuous track sized to match studs. Align track accurately and securely anchor to supporting structure.
- B. Fasten both flanges of studs to top and bottom track unless otherwise indicated. Space studs as follows:
 - 1. Stud Spacing: Match Existing spacing and location as directed by the Engineer.
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
 - 1. Connect vertical deflection clips to infill studs and anchor to building structure.
 - 2. Connect drift clips to cold-formed steel framing and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced vertically in rows indicated on Shop Drawings but not more than **48 inches (1220 mm)** apart. Fasten at each stud intersection.
 - 1. Channel Bridging: Cold-rolled steel U-channel, welded or mechanically fastened to webs of punched studs.
 - 2. Strap Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
 - 3. Bar Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

3.5 INSTALLATION TOLERANCES

- A. Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of **1/8 inch in 10 ft. (1:960)** and as follows:

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1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error are not to exceed minimum fastening requirements of sheathing or other finishing materials.

3.6 REPAIR

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint in accordance with ASTM A780/A780M and manufacturer's written instructions.

3.7 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Cold-formed steel framing will be considered defective if it does not pass tests and inspections.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.8 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 054000

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SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Sheathing.

1.2 REFERENCE STANDARDS

- A. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2024.
- B. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

1.3 SUBMITTALS

- A. See Section 013300 Submittal Procedures for submittal procedures.
- B. Product Data: Provide technical data on sheathing and application instructions.
- C. Specimen Warranty.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store products above ground in dry ventilated space to protect against moisture. Support stacked products to prevent deformation and allow air circulation.
- B. Protect materials from soiling and damage.
- C. Deliver materials to site promptly without undue exposure to weather.

1.5 FIELD CONDITIONS

- A. Do not apply finishes over cementitious reinforced panel when wet, frozen, or containing frost.
- B. Prior to application of finishes, cementitious reinforced panel must be conditioned at same temperature as required for finished flooring for at least 48 hours.

1.6 WARRANTY

- A. See Section 017700 – Closeout Procedures for additional warranty requirements.

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- B. Manufacturer Warranty: Provide warranty for material defects and fabrication as noted in manufacturer's documentation. Complete forms in Owner's name and register with manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design Manufacturer: USG Corporation: www.usg.com.
- B. Substitutions: See Section 012500 Substitution Procedures.
- C. Source Limitations: Furnish products produced by single manufacturer and obtained from single supplier.

2.2 SHEATHING

- A. Glass-mat-faced gypsum wall sheathing, Type X, comply with ASTM C1177/C1177M.
 - 1. Thickness: 5/8 - inch (16 mm).
 - 2. Edges: Square.
 - 3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - 4. Products:
 - a. USG Corporation; Securock Brand UltraLight Glass-Mat Sheathing Firecode X.
 - b. Substitutions: See Section 012500 Substitution Procedures.

2.3 ACCESSORIES

- A. Fasteners and Anchors:
 - 1. General: Refer to manufacturer product information for fastener types and requirements.
 - 2. Anchors: Bolt or ballistic fastener for anchorage to steel.
- B. Panel Treatment: Use manufacturer-recommended sealant, transition trips, flashing sheets, termination bars, patching materials, and adhesive tapes at control joints, panel connections, and penetrations.
- C. Sealants:
 - 1. Medium-modulus, low-VOC, polyurethane for use in joints, penetrations, and transition areas.

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a. USG Corporation; Dymonic 100.

D. Transition Membrane: Silicone extrusion for expansion joints between panels.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and adjoining construction.
- B. Replace damaged framing before installation of cementitious panels. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Select material sizes to minimize waste.
- B. Reuse and clearly separate scrap for use on-site as accessory components, including shims, bracing, and blocking.
- C. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using screws.

END OF SECTION 061600

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SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Extruded polystyrene foam-plastic board insulation.
2. Glass-fiber blanket insulation.
3. Mineral-wool blanket insulation.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Extruded polystyrene foam-plastic board insulation.
2. Glass-fiber blanket insulation.
3. Mineral-wool blanket insulation.

1.3 INFORMATIONAL SUBMITTALS

- A. Installer's Certification: Listing type, manufacturer, and R-value of insulation installed in each element of the building thermal envelope.
- B. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- C. Research Reports: For foam-plastic insulation, from ICC-ES.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Maximum flame-spread and smoke-developed indexes less than 25 and 450 when tested in accordance with ASTM E84.
- B. Fire-Resistance Ratings: Comply with ASTM E119 or UL 263; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

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1. Indicate design designations from UL's "Fire Resistance Directory" or from listings of another qualified testing agency.
- C. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
- D. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.
- E. Thermal-Resistance Value (R-Value): R-value as indicated on Drawings.

2.2 EXTRUDED POLYSTYRENE FOAM-PLASTIC BOARD INSULATION

- A. Extruded Polystyrene Board Insulation, Type X ASTM C578, Type X, 15-psi minimum compressive strength; unfaced.

2.3 GLASS-FIBER BLANKET INSULATION

- A. Glass-Fiber Blanket Insulation, Unfaced: ASTM C665, Type I; passing ASTM E136 for combustion characteristics.

2.4 MINERAL-WOOL BLANKET INSULATION

- A. Mineral-Wool Blanket Insulation, Unfaced: ASTM C665, Type I (blankets without membrane facing); consisting of fibers; passing ASTM E136 for combustion characteristics.

1. Nominal Density: 4 lb/cu. ft.

2.5 ACCESSORIES

- A. Insulation for Miscellaneous Voids:
1. Spray Polyurethane Foam Insulation: ASTM C1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E84.

2.6 PREPARATION

- A. Clean substrates of substances that are harmful to insulation, including removing projections capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

2.7 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

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- C. Install insulation with manufacturer's R-value label exposed after insulation is installed.
- D. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- E. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

2.8 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
 - a. Exterior Walls: Set units with facing placed toward exterior of construction.
- B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
 - 1. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.
 - 2. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked.
 - 3. After insulation is applied, make flush with face of studs by using method recommended by insulation manufacturer.

2.9 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes.
- B. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 072100

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SECTION 075400 – THERMOPLASTIC MEMBRANE ROOFING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Adhered Thermoplastic-Polyolefin (TPO) roofing system. Polyvinyl Chloride (PVC) roofing system at the designated PVC roof area.
- B. Insulation, flat and tapered.
- C. Cover board
- D. Air and vapor retarder.
- E. Substrate board.
- F. Wood products for blocking.
- G. Accessory roofing materials, flashing boots and walkway pads.

1.2 RELATED REQUIREMENTS

- A. Section 076200 "Sheet Metal Flashing and Trim" for metal roof flashings and counterflashings.
- B. Section 079200 "Joint Sealants" for joint sealants, joint fillers, and joint preparation.
- C. Division 22 Sections for storm drainage piping specialties for roof drains.

1.3 REFERENCE STANDARDS

- A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- B. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2025.
- C. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2024.
- D. ASTM D4434/D4434M - Standard Specification for Poly Vinyl Chloride (PVC) Sheet Roofing; 2021.
- E. ASTM D6878/D6878M - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing; most recent edition.
- F. FM DS 1-28 - Wind Design; 2015, with Editorial Revision (2026).
- G. FM DS 1-29 - Roof Deck Securement and Above-Deck Roof Components; 2016, with Editorial Revision (2022).
- H. NRCA (RM) - The NRCA Roofing Manual; 2026.

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- I. UL 790 - Standard for Standard Test Methods for Fire Tests of Roof Coverings; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.
 - 1. Review preparation and installation procedures and coordinating and scheduling required with related work.
 - a. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment (Photovoltaic system).
 - b. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 - c. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - d. Review deck substrate requirements for conditions and finishes, including flatness and fastening.
 - e. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
 - f. Review governing regulations and requirements for insurance and certificates if applicable.
 - g. Review temporary protection requirements for roofing system during and after installation.
 - h. Review roof observation and repair procedures after roofing installation.
 - i. For insulation and roof system component fasteners, include copy of FM Approvals' RoofNav listing.

1.5 SUBMITTALS

- A. See Section 012200 - Submittal Procedures for submittal procedures.
- B. Product Data: Provide manufacturer's written information listed below.
 - 1. Product data:
 - a. Roof Membrane indicating membrane materials.
 - b. Flashing, flashing materials.
 - c. Liquid Flashing material.
 - d. Insulation – board and tapered system.
 - e. Air and Vapor retarder.
 - f. Fasteners, surfacing, and Miscellaneous products.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements.
 - 4. Installation instructions.
- C. Shop Drawings: Include roof plans, sections, details, and attachments to other work, including the following:

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1. Layout and thickness of insulation.
2. Base flashings and membrane terminations.
3. Flashing details – penetrations & wall tie-ins.
4. Tapered insulation thickness and slopes.
5. Roof plan showing orientation of roof membrane, fastening spacings, and patterns for mechanically fastened roofing system.
6. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
7. Tie-in with air and vapor retarder.

D. Samples for Verification and Selection:

1. Roof membrane and flashing, of color required, for each membrane type.
2. TPO coated metal samples.
3. PVC coated metal samples.
4. Insulation and fasteners.
5. Walkway pads or rolls, of color required.
6. Air and vapor retarder.

E. Wind Uplift Resistance Submittal: For roofing system, indicating compliance with wind uplift performance requirements.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and testing agency.
- B. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- C. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.
- D. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.
- E. Warranty:
 1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
 2. Submit installer's certification that installation complies with all warranty conditions for the waterproof membrane.
- F. Manufacturer's qualification statement.
- G. Installer's qualification statement.
- H. Notice of Award: Submit copy of manufacturer's Notice of Award, or equivalent documentation, confirming that the manufacturer is aware of the project, has reviewed the roofing system to be installed, and that it is acceptable to the manufacturer.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.

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- B. Certified statement from existing roof membrane manufacturer stating that existing roof warranty has not been affected by Work performed under this Section.

1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum twenty (20) years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section:
 - 1. With minimum five (5) years documented experience.
 - 2. Approved by membrane manufacturer.
- C. Manufacturer's Field Services: Manufacturer shall send a qualified technical representative to the project site to advise the Installer of procedures and precautions for use of roofing materials.
 - 1. Technical representative shall be present during the initial start of roofing application and remain onsite a minimum of 4 hours, and shall perform not less than weekly inspections during the course of the roofing application.
 - 2. Provide manufacturer's inspection reports within two days of each inspection. Reports shall be distributed to Installer, Architect, and Owner's representative.
- D. Deviations: There shall be no deviations made from the Project Specifications, Plans, or the approved shop drawings without prior written approval by the Architect.
- E. Pitch Pockets: The installation of pitch pockets should be limited to the fullest extent possible. Whenever possible, a premanufactured flashing shall be installed over penetrations before connections are made.

1.9 MOCK-UPS

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Provide mock-up for evaluation of surface preparation, installation methods, and workmanship.
- C. Provide mock-ups as follows:
 - 1. Mock-up the tie-in of PVC membrane to existing TPO membrane.
 - 2. Mock-up the tie-in of PVC membrane to new TPO membrane.
 - 3. Mock-up the tie-in of TPO membrane to existing TPO membrane.
- D. Mock-up may remain as part of the Work if approved.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.
- B. Protect products in weather protected environment, clear of ground and moisture.
- C. Protect foam insulation from direct exposure to sunlight.

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- D. Provide Safety Data Sheets (SDS) at the project site at all times during transportation, storage, and installation of materials.
- E. Comply with requirements from Owner to prevent overloading or disturbance of the structure when loading materials onto the roof.

1.11 FIELD CONDITIONS

- A. Do not apply roofing membrane during unsuitable weather.
- B. Do not apply roofing membrane when ambient temperature is above or below manufacturer's recommendations.
- C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

1.12 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Material Warranty: Provide membrane manufacturer's warranty agreeing to replace material that shows manufacturing defects within 20 years after installation.
- C. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
 - 1. Warranty Term: 20 years.
 - 2. For repair and replacement include costs of both material and labor in warranty.
 - 3. Exceptions NOT Permitted.
 - 4. Wind Speed Warranty: Manufacturer's system warranty shall include coverage for wind speeds not less than those required to achieve the Fire/Windstorm Classification specified in Part 2 Performance Requirements.
- D. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section, including all components of roofing system such as roof membrane, base flashing, roof insulation, fasteners, cover boards, for the following warranty period:
 - 1. Warranty Period: Two years from date of substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing system and flashings to withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roof system and flashings to remain watertight.

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1. Accelerated Weathering: Roof to withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
 2. Impact Resistance: Roof membrane to resist impact damage when tested according to ASTM D3746, ASTM D4272, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.
- B. Material Compatibility: Roofing materials to be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.
- C. Wind Uplift Resistance: Design roofing system to resist the wind uplift pressures indicated on the structural drawings when tested according to FM Approvals 4474, UL 580, or UL 1897:
- D. FM Approvals' RoofNav Listing: Roof membrane, base flashings, and component materials comply with requirements in FM Approvals 4450 or FM Approvals 4470 as part of a roofing system and are listed in FM Approvals' RoofNav for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals Certification markings.
1. Fire/Windstorm Classification: Minimum Class 1A-90 but not less than as required to meet wind uplift requirements on Structural drawings.
 2. Hail-Resistance Rating: FM Global Property Loss Prevention Data Sheet 1-34 MH.
- E. Solar Reflectance Index (SRI): Three-year-aged SRI not less than 64 or initial SRI not less than 82 when calculated according to ASTM E1980, based on testing identical products by a qualified testing agency.
- F. ENERGY STAR Listing: Roofing system to be listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.
- G. Energy Performance: Roofing system to have an initial solar reflectance of not less than 0.70 and an emissivity of not less than 0.75 when tested in accordance with ANSI/CRRC S100.
- H. Exterior Fire-Test Exposure: ASTM E108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- I. Coping and Edge Metal: All coping and/or edge metal that is designed to be part of the roofing system shall be ANSI/SPRI ES-1 (or RAS 111, where applicable) compliant and shall be included in the specified manufacturer's roofing system warranty.

2.2 MANUFACTURERS

- A. Basis of Design (Base Bid Roofing System): Carlisle SynTec Systems: www.carlislesyntec.com.
- B. Other Acceptable Manufacturers:
 1. Firestone/Elevate
 2. GAF
- C. Substitutions: See Section 12500 - Substitution Procedures.

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2.3 ROOFING APPLICATIONS

- A. Thermoplastic-Polyolefin (TPO) Sheet: Internally fabric- or scrim-reinforced, fully adhered, over cover board & insulation system.
- B. Roofing Assembly Performance Requirements and Design Criteria:
 - 1. Roof Covering External Fire Resistance Classification: Class A when tested per UL 790.
 - 2. Wind Uplift:
 - a. Designed to withstand wind uplift forces calculated with ASCE 7.
 - b. Design Wind Speed: In accordance with local building code and authorities having jurisdiction (AHJ).
 - 3. Factory Mutual Classification: Class I and windstorm resistance of I-90, in accordance with FM DS 1-28.
 - 4. Insulation Thermal Resistance (R-Value): Provide R-Value over entire roof deck in accordance with local building code requirements.

2.4 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

- A. Single Source Responsibility: Provide and install products from single source.
- B. TPO Membrane:
 - 1. Material: Thermoplastic-Polyolefin (TPO) sheet complying with ASTM D6878/D6878M.
 - 2. Reinforcing: Internal fabric.
 - 3. Thickness: 60 mil, 0.060 inch (1.5 mm), minimum.
 - 4. Sheet Width: Factory fabricated into largest sheets possible.
 - 5. Products: Basis of Design: Carlisle SynTec Systems; SureWeld TPO.
 - 6. Backing: Non-fleeced back assumed. Backing of existing membrane to be confirmed during demo. If existing membrane is fleeced back, provide manufacturer's equivalent fleeced back membrane for new membrane.
- C. PVC Membrane:
 - 1. Material: Polyvinyl Chloride (PVC) sheet complying with ASTM D4434/D4434M.
 - 2. Reinforcing: Internal fabric.
 - 3. Thickness: 60 mil, 0.060 inch (1.5 mm), minimum.
 - 4. Sheet Width: Factory fabricated into largest sheets possible.
 - 5. Products: Basis of Design: Carlisle SynTec Systems; SureFlex PVC.
- D. Seaming Materials: As recommended by membrane manufacturer.
- E. Flexible Flashing Material: Same material as membrane.
- F. Base Flashing: Provide waterproof, fully adhered base flashing system at all penetrations, plane transitions, and terminations.

2.5 SUBSTRATE BOARD AND COVER BOARDS

- A. Substrate board: Gypsum sheathing, ASTM C1177, Type X Non-combustible in accordance with ASTM E84 & E136 special fire-resistant type, gypsum fiber, 5/8 inch (16 mm) thick.
 - 1. Product: USG Securock, Ultralight coated Glass-mat roof board.

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2.6 Air and vapor barrier

- A. Self-adhering air and vapor barrier: ASTM D1970/D1970M, 40 mil Composite consisting of 35 mils self-adhering rubberized asphalt laminated to 5 mil woven polypropylene film with a one-piece silicone poly release liner.
 - 1. Product: VapAir Seal 725 TR; Air and Vapor Barrier & Temporary Roof, distributed by Carlisle SynTec Systems.

2.7 INSULATION

- A. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces. Where water-based bonding adhesives are scheduled for use or where recommended by membrane manufacturer for roofing application scheduled Type II, Class 2, Grade may be used.
- B. Alternately Composite Polyisocyanurate (ISO) Board Insulation: Composite insulation panel comprised of 1/2 inch (12.7 mm) thick high-density ISO cover board laminated to ISO base insulation, complying with ASTM C1289.
- C. Compressive Strength: Minimum 20 psi. Increase psi where required to meet "Performance Requirements" or "Warranty" requirements indicated.
- D. Size: 48 by 48 inches.
- E. Thickness:
 - 1. Base Layer: As indicated but not less than 1 1/2 inches.
 - 2. Upper Layer: Thickness as required to match existing assembly.
- F. Tapered Insulation: Provide factory-tapered insulation boards.
 - 1. Material: Match roof insulation.
 - 2. Minimum Thickness: 1/4 inch.
 - 3. Slope: Saddles & Crickets; 1/2 inch per foot unless otherwise indicated.

2.8 COVER BOARD

- A. Cover Board: Cover Board: 1/2 inch thick polyiso cover board laminated to a coated Glass fiber-Mat facer. R-Value: 2.5, compressive strength 109psi max.
 - 1. Product: Carlisle SecurShield HD Composite.

2.9 Walkways

- A. Flexible Walkway Rolls (At TPO): Factory-formed, heat-weldable, diamond plate tread, 80 mils thick, gray membrane.
 - 1. Product: Carlisle Sure-Weld TPO Walkway.
- B. Flexible Walkways (At PVC Roof Area): Factory-formed, nonporous, heavy-duty, slip-resisting, open grid, loose laid PVC walkway rolls, two-layer construction.
 - 1. Product: Carlisle Sure-Flex PVC Crossgrip Walkway.

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2.10 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 15 percent for 2 inch nominal thickness or less, unless otherwise indicated.
- C. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
- D. Allowable design stresses, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- E. Fasteners: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
 - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.
 - 2. Nails, Brads, and Staples: ASTM F1667.
- F. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- G. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 or ICC-ES AC193 as appropriate for the substrate.
 - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B633, Class Fe/Zn 5.
 - 2. Material: Stainless steel with bolts and nuts complying with ASTM F593 and ASTM F594, Alloy Group 1 or 2 (ASTM F738M and ASTM F836M, Grade A1 or A4).

2.11 WOOD-PRESERVATIVE TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWWA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
- B. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
- C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- D. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

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2.12 FIRE-RETARDANT TREATED WOOD MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
 - 1. Treatment shall not promote corrosion of metal fasteners.
 - 2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201/D3201M at 92 percent relative humidity. Use where exterior type is not indicated.
 - 3. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D5664 and design value adjustment factors shall be calculated according to ASTM D6841.
- C. Kiln-dry lumber after treatment to maximum moisture content of 19 percent. Kiln-dry plywood after treatment to maximum moisture content of 15 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

2.13 ACCESSORIES

- A. Prefabricated Flashing Accessories:
 - 1. Corners and Seams: Same material as membrane, in manufacturer's standard thicknesses.
 - 2. Penetrations: Same material as membrane, with manufacturer's standard cut-outs, rigid inserts, Pre-molded split pipe flashings, clamping rings, and flanges.
 - 3. Pre-molded Sealant Pocket, same material as membrane, sized to fit existing multiple pipe penetrations.
 - 4. Preformed inside and outside corner sheet flashing, T-joint covers, termination reglets and other accessories.
 - 5. Miscellaneous Flashing: Non-reinforced TPO membrane; 80 mils (0.080 inch) (2 mm) thick, in manufacturer's standard lengths and widths.
- B. Water Cut-off Mastic: Single-component, low-viscosity, butyl-blend. (Review material Safety Data Sheet).
- C. Insulation Adhesive: Two component polyurethane, expanding foam.
 - 1. Products: Flexible FAST adhesive.
- D. Insulation Joint Tape: Glass fiber reinforced type as recommended by insulation manufacturer, compatible with roofing materials; 6 inches (150 mm) wide; self-adhering.
- E. Insulation Fasteners: Factory-coated steel fasteners Appropriate for purpose intended and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470,

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designed for fastening approved by roofing components to substrate, and acceptable to roofing system manufacturer.

- F. Membrane Adhesive: As recommended by membrane manufacturer.
 - 1. Products:
 - a. Sure-Weld TPO Bonding Adhesive (TPO).
 - b. 1168 Low-VOC Bonding Adhesive (TPO).
 - c. CAV-GRIP PVC (PVC).
 - d. HydroBond (PVC)
 - e. Sure-Flex PVC Low-VOC (PVC).
- G. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.
- H. Sealants: As recommended by membrane manufacturer.
 - a. Product: Carlisle Sure-Weld TPO Cut Edge Sealant
 - b. Product: Carlisle Sure-Flex PVC Cut Edge Sealant.
- I. Pourable Sealers: single-component, moisture curing, elastomeric polyether sealant.
 - 1. Product: Carlisle White One-Part Pourable Sealer.
- J. Liquid applied flashings: Two-component liquid flashing resin & reinforcing fleece.
 - 1. Product: Carlisle LIQUISEAL Liquid Flashing.
- K. Cleaner: Manufacturer's standard, clear, solvent-based cleaner.
 - 1. Product:
 - a. Carlisle Low-VOC Membrane Cleaner.
 - b. Carlisle Low-VOC UN-TACK Adhesive Remover and Cleaner.
- L. Primer: Manufacturer's recommended product.
 - 1. Sure-Weld TPO Primer.
 - 2. Sure-Flex PVC Step 2 Primer.
- M. Edgings and Terminations: Manufacturer's standard edge and termination accessories.
 - 1. Drip Edge:
 - a. Carlisle SecurEdge TPO coated drip edge.
 - b. Carlisle SecurEdge PVC coated drip edge.
 - 2. TPO Coated Sheet Metal.
 - 3. PVC Coated Sheet Metal.
 - 4. Termination Bar.
- N. Rooftop Pipe & Conduit Supports:
 - 1. Miro M-Hex; composite plastic conduit & pipe support.
 - 2. Dura-Blok; recycled rubber with galvanized sleeper strut or plate.
 - 3. Rooftop Equipment Anchors: Patented, non-penetrating rooftop attachment system for securing HVAC units, ductwork, vent stacks, antennas, flagpoles, snow retention systems, and other rooftop-mounted components directly to the roof deck without compromising the roof membrane's watertight integrity.
 - a. Basis of Design: Carlisle SynTec Systems (Anchor Products); U3400 U-Anchors, TPO/PVC-KEE HP compatible.
 - 4. Other products as approved through submittal review process.

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PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Metal Decks:
 - 1. Verify metal deck is fully supported and secure.
 - 2. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
 - 3. Verify metal deck surfaces are dry and free of snow or ice
- C. Concrete Decks:
 - 1. Verify that concrete substrate is visibly dry and free of moisture, and that minimum concrete internal relative humidity is not more than 75 percent, or as recommended by roofing system manufacturer, when tested according to ASTM F2170.
 - a. Test Frequency: One test probe per each 1000 sq. ft., or portion thereof, of roof deck, with no fewer than three test probes.
 - b. Submit test reports within 24 hours of performing tests.
- D. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.2 PREPARATION, GENERAL

- A. Clean substrate thoroughly prior to roof application.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction not within the Scope of Work Zone. Remove roof-drain plugs when no work is taking place or when rain is forecast
- C. Do not begin work until other work that requires foot or equipment traffic on roof is complete.

3.3 METAL DECK PREPARATION

- A. Install Substrate board on metal deck:
 - 1. Lay with long side at right angle to flutes; stagger end joints; Locate end joints over crests of steel roof deck or provide support at ends.
 - 2. Cut sheathing cleanly and accurately at roof breaks and protrusions to provide smooth surface.
 - 3. Tightly butt substrate boards together.
 - 4. Fasten substrate board to top flanges of steel deck according to recommendations in FM Approvals' RoofNav listed roof assembly requirements for specified Windstorm Resistance Classification and FM Global Property Loss Prevention Data Sheet 1-29.
 - a. Fasten substrate board to top flanges of steel deck to resist uplift pressure at corners, perimeter, and field of roof according to roofing system manufacturers' written instructions.

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3.4 INSTALLATION - GENERAL

- A. Perform work in accordance with manufacturer's instructions, FM Approvals' RoofNav listed roof assembly requirements and NRCA (RM) applicable requirements.
- B. Do not apply roofing membrane during unsuitable weather.
- C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.
- D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
- F. Coordinate the work with installation of associated counterflashings installed by other sections as the work of this section proceeds.
- G. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.
- H. Install roof membrane and auxiliary materials to tie in to existing roofing to maintain weathertightness of transition and to not void warranty for existing roofing system

3.5 INSTALLATION OF AIR AND VAPOR RETARDER

- A. Self-Adhering Air and Vapor Retarder: Prime existing cleaned and prepared concrete structural deck with primer recommended by manufacturer. Prime new substrate board at metal deck applications with primer recommended by manufacturer.
- B. Install self-adhering-sheet vapor retarder over area to receive vapor retarder, side and end lapping each sheet a minimum of 3-1/2 and 6 inches (90 and 150 mm), respectively.
 - 1. Extend vertically up parapet walls and other projections as indicated to tie into roof membrane.
 - 2. Seal laps by rolling with hand roller.
 - 3. Completely seal air and vapor retarder at terminations, obstructions, and penetrations to prevent air movement into roofing system and create a watertight, temporary roofing system.

3.6 INSULATION INSTALLATION

- A. Adhesive Ribbon Spacing: Where insulation and cover board are set in adhesive, apply insulation/cover board adhesive in ribbons not exceeding the following maximum spacing, as required by roofing manufacturer to obtain the specified tested assembly:
 - 1. Field of Roof: Not greater than 12 inches (300 mm) o.c.
 - 2. Perimeter Zone: Not greater than 8 inches (200 mm) o.c.
 - 3. Corner Zone: Not greater than 6 inches (150 mm) o.c.
- B. Installation Over Concrete Decks (Structural deck is sloped – verify slope in field):

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1. Install base layer of insulation with joints staggered not less than 24 inches (610 mm) in adjacent rows and end joints staggered not less than 12 inches (305 mm) in adjacent rows.
 - a. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting walls.
 - b. Make joints between adjacent insulation boards not more than 1/4 inch (6 mm) in width.
 - c. At internal roof drains, slope insulation to create a square drain sump with each side equal to the diameter of the drain bowl plus 24 inches (610 mm).
 - 1) Trim insulation so that water flow is unrestricted.
 - d. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
 - e. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
 - f. Adhere base layer of insulation to roof deck according to FM Approvals' RoofNav listed roof assembly requirements for specified Windstorm Resistance Classification and FM Global Property Loss Prevention Data Sheet 1-29, as follows:
 - 1) Set insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.
 2. Embed second layer of insulation into full bed of adhesive with joints of each layer offset not less than 12 inches (305 mm) from previous layer of roofing and insulation.
 - a. Staggered end joints within each layer not less than 24 inches (305 mm) in adjacent rows.
 - b. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - c. Make joints between adjacent insulation boards not more than 1/4 inch (6 mm) in width.
 - d. At internal roof drains, slope insulation to create a square drain sump with each side equal to the diameter of the drain bowl plus 24 inches (610 mm).
 - 1) Trim insulation so that water flow is unrestricted.
 - e. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
 - f. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
 - g. Adhere each layer of insulation to previous insulation layer using adhesive according to FM Approvals' RoofNav listed roof assembly requirements for specified Windstorm Resistance Classification and FM Global Property Loss Prevention Data Sheet 1-29, as follows:
 - 1) Set each layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.
- C. Installation Over Metal Decking:
1. Install base layer of insulation with joints staggered not less than 24 inches (610 mm) in adjacent rows and end joints staggered not less than 12 inches (305 mm) in adjacent rows.
 - a. Locate end joints over crests of decking.
 - b. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting walls.
 - c. Make joints between adjacent insulation boards not more than 1/4 inch (6 mm) in width.

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- d. At internal roof drains, slope insulation to create a square drain sump with each side equal to the diameter of the drain bowl plus 24 inches.
 - 1) Trim insulation so that water flow is unrestricted.
- e. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
- f. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
- g. Adhere each layer of insulation to previous insulation layer using adhesive according to FM Approvals' RoofNav listed roof assembly requirements for specified Windstorm Resistance Classification and FM Global Property Loss Prevention Data Sheet 1-29, as follows:
 - 1) Set each layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.
- D. Do not install wet, damaged, or warped insulation boards.
- E. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.
- F. Tape joints of insulation in accordance with roofing and insulation manufacturers' instructions.
- G. At roof drains, use factory-tapered boards to slope down to roof drains over a distance of 18 inches (450 mm).
- H. Do not apply more insulation than can be completely waterproofed in the same day.

3.7 INSTALLATION OF COVER BOARDS

- A. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction.
 - 1. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - 2. At internal roof drains, conform to slope of drain sump.
 - a. Trim cover board so that water flow is unrestricted.
 - 3. Cut and fit cover board tight to nailers, projections, and penetrations.
 - 4. Adhere cover board to substrate using adhesive according to FM Approvals' RoofNav listed roof assembly requirements for specified Windstorm Resistance Classification and FM Global Property Loss Prevention Data Sheet 1-29, as follows:
 - a. Set cover board in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

3.8 INSTALLATION OF ADHERED ROOF MEMBRANE

- A. Adhere roof membrane over area to receive roofing according to roofing system manufacturer's written instructions
- B. Unroll roof membrane and allow to relax before installing. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

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- C. Accurately align roof membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Bonding Adhesive: Apply to all substrates and underside of roof membrane at rate required by manufacturer, and allow to partially dry before installing roof membrane. Do not apply to splice area of roof membrane.
- E. Shingle joints on sloped substrate in direction of drainage.
- F. Fully Adhered Application: Apply bonding adhesive in accordance with the manufacturer's published instructions, to the exposed underside of the membrane and the corresponding substrate area.
- G. Do not apply to splice area of roof membrane.
- H. In addition to adhering, mechanically fasten roof membrane securely at terminations, penetrations, and perimeter of roofing per roofing manufacturer's recommendations and as needed to meet uplift requirements.
- I. Seam Welding:
 - 1. Seam Welding: Clean seam areas, Overlap edges and ends and seal seams by hot-air / heat welding, minimum as recommended by the manufacturer to ensure a watertight seam insulation.
 - 2. Probe all seams once welds have thoroughly cooled. Test lap edges with probe to verify seam weld continuity in accordance with manufacturer's technical bulletins.
 - 3. Repair all deficient seams within the same day.
 - 4. Seal cut edges of reinforced membrane after seam probe is complete.
- J. Flash penetrations with pre-formed flashings to the greatest extent possible. Provide field-formed flashings at larger penetrations and inside and outside corners with cured or uncured sheet flashing.
- K. Terminate and seal top of flashings and mechanically anchor to substrate through termination bars or with stainless steel drawbands as indicated.
- L. At intersections with vertical surfaces terminate and seal top of sheet flashings with termination bars secured to nailing strips or structural backing or in conformance with roofing manufacturer's approved details.:
 - 1. Lap subsequent vertical flashing membrane layers per manufacture's recommendations and heat weld lap as indicated.
- M. At gravel stops, extend membrane under gravel stop and to the outside face of the wall. Install strip flashing over metal drip edge flange as indicated on drawings or as recommended by gravel stop manufacturer.
- N. Install prefabricated joint components in accordance with manufacturer's instructions.
- O. Coordinate installation of roof drains and sumps and related flashings.
- P. Install walkway pads. Space pad joints to permit drainage.

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- Q. Daily Seal: Install daily seal per manufacturer's instructions at the end of each work day. Prevent infiltration of water at incomplete flashings, terminations, and at unfinished membrane edges.

3.9 INSTALLATION OF BASE FLASHING

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars or stainless steel drawbands as indicated. Apply continuous sealant bead to top of termination bars and stainless steel drawbands as indicated.

3.10 INSTALLATION OF MISCELLANEOUS FLASHINGS

- A. Provide overlapping course of liquid applied flashing and reinforcing fleece where indicated on drawings. Apply liquid applied flashings per manufacturer's recommendations and as follows:
 - 1. Prepare all substrates by removing any irregularities, loose or foreign materials such as dirt, water, grease, oil, lacquers, or release agents. Ensure that all metal surfaces are ground down to expose bare metal. Prepare membrane by sanding with 60-grit sandpaper.
 - 2. Apply two-component liquid flashing with reinforcing fleece strictly following written application and sequence directions.
- B. Coordinate installation of roof drains and sumps and related flashings with respective trades. Terminate membranes according to manufacturer's approved details. Spread water cut-off mastic bed over deck-drain flange at roof drains, and securely seal roof membrane in place with clamping ring.

3.11 INSTALLATION OF WALKWAYS

- A. Unroll walkway rolls and allow to relax before final installation.
- B. Loosely lay over walkways at locations indicated on the drawings.
- C. Allow 6" between adjoining sections.
- D. Heat weld TPO walkways where applicable.
- E. Do not secure Sure-Flex PVC Crossgrip to PVC membrane, loose lay per manufacturer's recommendations.

3.12 INSTALLATION OF WOOD BLOCKING AND NAILERS

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- A. Comply with AWP A M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.
- B. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code ICC (IBC).
 - 2. ICC-ES evaluation report for fastener.
- C. Attach wood roofing nailers securely to substrate to resist the designed outward and upward wind loads indicated on Drawings and in accordance with ANSI/SPRI ED-1, Tables A6 and A7.
- D. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- E. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

3.13 FIELD QUALITY CONTROL

- A. Testing Agency: Owner may engage a qualified testing agency to perform tests and to inspect substrate conditions, surface preparation, roof membrane application, sheet flashings, protection, and drainage components, and to furnish reports to Architect.
- B. Roof Testing:
 - 1. Flood Testing: Flood test each roof area for leaks, according to recommendations in ASTM D5957, after completing roofing and flashing but before overlying construction is placed. Install temporary containment assemblies, plug or dam drains, and flood with potable water.
 - a. Perform tests before overlying construction is placed.
 - b. Flood to an average depth of 2-1/2 inches with a minimum depth of 1 inch and not exceeding a depth of 4 inches. Maintain 2 inches of clearance from top of base flashing.
 - c. Flood each area for 24 hours.
 - d. After flood testing, repair leaks, repeat flood tests, and make further repairs until roofing and flashing installations are watertight.
 - 1) Cost of retesting is Contractor's responsibility.
 - e. Testing agency to prepare survey report indicating locations of initial leaks, if any, and final survey report.
 - 2. Infrared Thermography: Testing agency surveys entire roof area using infrared color thermography according to ASTM C1153.
 - a. Perform tests before overlying construction is placed.
 - b. After infrared scan, locate specific areas of leaks by electrical capacitance/impedance testing or nuclear hydrogen detection tests.
 - c. After testing, repair leaks, repeat tests, and make further repairs until roofing and flashing installations are watertight.
 - 1) Cost of retesting is Contractor's responsibility.

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- d. Testing agency to prepare survey report of initial scan indicating locations of entrapped moisture, if any.
- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion, in presence of Architect, and to prepare inspection report.
- D. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.
- F. Fastener Pullout Testing: Conduct fastener pullout tests in accordance with the current SPRI/ANSI Fastener Pullout Standard to verify condition of the deck/substrate and to confirm expected pullout values prior to proceeding with insulation and membrane installation.
- G. Test and Repair Patch Limits: At a maximum, no more than three 4-inch by 4-inch patches will be accepted within any 100 sq. ft. area for repair of test cuts or membrane deficiencies. Larger patches, or areas with a greater density of patches, shall be reviewed by Architect/Owner on a case-by-case basis and may require installation of a full-width sheet of new membrane.

3.14 PROTECTION AND CLEANING

- A. See Section 017300 - Execution and 017700 - Closeout Procedures for additional requirements.
- B. Protect roofing system from damage and wear during remainder of work. When remaining work does not affect or endanger roofing system, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- C. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- D. Remove wrappings, empty containers, paper, and other debris from the roof daily. Dispose of debris in compliance with local, State, and Federal regulations.
- E. Remove bituminous markings from finished surfaces.
- F. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.
- G. Repair or replace defaced or damaged finishes caused by work of this section.

3.15 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS _____ of _____, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
 - 1. Owner: <<Insert name of Owner>>.
 - 2. Owner Address: <<Insert address>>.
 - 3. Building Name/Type: <<Insert information>>.
 - 4. Building Address: <<Insert address>>.

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5. Area of Work: <<Insert information>>.
 6. Acceptance Date: _____.
 7. Warranty Period: <<Insert time>>.
 8. Expiration Date: _____.
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period Roofing Installer will, at Roofing Installer's own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
 - a. lightning;
 - b. peak gust wind speed exceeding <<insert design wind speed>>;
 - c. fire;
 - d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
 - e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
 - f. vapor condensation on bottom of roofing; and
 - g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
 2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
 3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
 4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
 5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.

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6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this _____ day of

_____, _____.

1. Authorized Signature: _____.

2. Name: _____.

F. Title: _____.

END OF SECTION 075400

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SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Low-slope roof sheet metal fabrications.
2. Miscellaneous sheet metal fabrications.

B. Related Sections:

1. Section 07 54 00 "Thermoplastic Membrane Roofing" – for roofing membrane, coping/edge metal, and TPO/PVC coated sheet metal furnished under that Section.

1.2 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
3. Review requirements for insurance and certificates if applicable.
4. Review sheet metal flashing observation and repair procedures after flashing installation.
5. Attendees: Meet with Owner, Architect, Engineer, Owner's insurer if applicable, Installer, and installers whose work interfaces with or affects sheet metal flashing and trim, including installers of roofing materials and roof-mounted equipment.
6. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 ACTION SUBMITTALS

A. Product Data:

1. Low-slope roof sheet metal fabrications.
2. Miscellaneous sheet metal fabrications.

B. Product Data Submittals:

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1. Underlayment materials.
2. Elastomeric sealant.
3. Butyl sealant.
4. Epoxy seam sealer.

C. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled Work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.
5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
6. Include details of termination points and assemblies.
7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
8. Include details of roof-penetration flashing.
9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, flashings, and counterflashings.
10. Include details of special conditions.
11. Include details of connections to adjoining work.
12. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches.

D. Samples: For each exposed product and for each color and texture specified, 12 inches long by actual width.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.
- B. Product Certificates: For each type of coping and roof edge flashing that is ANSI/SPRI/FM 4435/ES-1 tested and FM Approvals approved.
- C. Product Test Reports: For each product, for tests performed by a qualified testing agency.
- D. Evaluation Reports: For copings and roof edge flashing, from an agency acceptable to authority having jurisdiction ICC-ES showing compliance with ANSI/SPRI/FM 4435/ES-1.
- E. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

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1.7 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
 - 1. For copings and roof edge flashings that are ANSI/SPRI/FM 4435/ES-1 tested and FM Approvals approved, shop is to be listed as able to fabricate required details as tested and approved.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.
 - 1. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
 - 2. Protect stored sheet metal flashing and trim from contact with water.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.9 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows 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 Delta E units when tested in accordance with ASTM D2244.
 - b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
 - 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. General Warranty: Warranty sheet metal flashing and trim work to be free of defects in materials and workmanship for a period of two years from date of Substantial Completion. Flashings integral to roofing or waterproofing systems shall be combined with, and subject to, the warranties for those systems.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, are to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim are not to rattle, leak, or loosen, and are to remain watertight.

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- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual: Architectural Metal Flashing, Condensation and Air Leakage Control, and Reroofing" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. SPRI Wind Design Standard: Manufacture and install copings roof edge flashings tested in accordance with ANSI/SPRI/FM 4435/ES-1 and capable of resisting the following design pressure:
 - 1. Design Pressure: As indicated on Drawings.
- D. FM Approvals RoofNav Listing: Manufacture and install copings roof edge flashings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-90. Identify materials with name of fabricator and design approved by FM Approvals. To ensure FM compliance for roofing systems, refer to RoofNav for the exact products that are part of the FM Approved Roofing assembly. Properly installed FM Approved products contribute to a roofing systems overall performance and safety. Final products installed as part of the FM Approved Roofing assembly must be approved and signed off by the Owner's Insurance Agent, AXA XL.
- E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent 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, ambient; 180 deg F, material surfaces.
- F. Sustainable Performance Requirements
 - 1. Refer to Sections 018113.14 and 018113.22 for Sustainable Design Requirements.

2.2 SHEET METALS

- A. Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Aluminum Sheet: ASTM B209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface. Minimum gauge .050".
 - 1. Exposed Coil-Coated Finish:
 - a. Three-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (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. Color: As selected by Architect from manufacturer's full range.
 - 3. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil.
- C. Stainless Steel Sheet: ASTM A240/A240M, Type 304, dead soft, fully annealed; with smooth, flat surface.

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1. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than percent.
 2. Finish: ASTM A480/A480M, No. 4 (polished directional satin) minimum 22 gauge.
 - a. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
 - b. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
 - 1) Run grain of directional finishes with long dimension of each piece.
 - 2) When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
- D. TPO/PVC-Coated Sheet Metal: 24 gauge, galvanized steel sheet with a factory-laminated, non-reinforced TPO or PVC membrane coating matching the adjacent roofing membrane; for use where sheet metal flashing and trim (including drip edges, roof edge metal, and copings) is required to be heat-welded to the roofing membrane specified in Section 07 54 00 "Thermoplastic Membrane Roofing."
1. TPO Coated Sheet Metal: Basis of Design: Carlisle SynTec Systems; Sure-Weld TPO Coated Metal.
 2. PVC Coated Sheet Metal: Basis of Design: Carlisle SynTec Systems; Sure-Flex PVC Coated Metal.

2.3 FLASHING MEMBRANE

- A. High-Temperature, Self-Adhering Flashing Membrane: Minimum 30 mils thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer in accordance with underlayment manufacturer's written instructions. Use as primary underlayment where roofing membrane is not carried under copings, at parapets, and at other locations where sheet metal flashing and trim is installed directly on the substrate; install in concert with the air and water barrier system.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. ATAS International, Inc.
 - b. Carlisle WIP Products; a brand of Carlisle Construction Materials.
 - c. GCP Applied Technologies Inc.
 - d. Henry Company; a Carlisle company.
 - e. Owens Corning.
 2. Source Limitations: Obtain underlayment from single source from single manufacturer.
 3. Low-Temperature Flexibility: ASTM D1970/D1970M; passes after testing at minus 20 deg F or lower.

2.4 MISCELLANEOUS MATERIALS

- A. Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

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- B. Fasteners: Metal screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
 2. Fasteners for Copper, Zinc-Tin Alloy-Coated Copper, or Copper-Clad Stainless-Steel Sheet: Copper, hardware bronze or passivated Series 300 stainless steel.
 3. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
 4. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.
 5. Fasteners for Zinc-Coated (Galvanized) or Aluminum-Zinc Alloy-Coated Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel in accordance with ASTM A153/A153M or ASTM F2329/F2329M.
 6. Fasteners for Zinc Sheet: Series 300 stainless steel or hot-dip galvanized steel in accordance with ASTM A153/A153M or ASTM F2329/F2329M.
- C. Solder:
1. For Copper or Copper-Clad Stainless Steel: ASTM B32, Grade Sn50, 50 percent tin and 50 percent lead with maximum lead content of 0.2 percent.
 2. For Stainless Steel: ASTM B32, Grade Sn60, with acid flux of type recommended by stainless steel sheet manufacturer.
 3. For Zinc-Tin Alloy-Coated Copper: ASTM B32, 100 percent tin, with maximum lead content of 0.2 percent, as recommended by sheet metal manufacturer.
 4. For Zinc-Coated (Galvanized) Steel: ASTM B32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead with maximum lead content of 0.2 percent.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
- E. Elastomeric Sealant: ASTM C920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- G. Bituminous Coating: Cold-applied asphalt emulsion in accordance with ASTM D1187/D1187M.
- H. Reglets: Units of type, material, and profile required, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated.

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1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cheney Flashing Company.
 - b. Fry Reglet Corporation.
 - c. Heckmann Building Products, Inc.
 - d. Hohmann & Barnard, Inc.
 - e. Keystone Flashing Company, Inc.
 - f. Metal-Era, Inc.
 - g. OMG Roofing Products; a Division of OMG, Inc.
2. Source Limitations: Obtain reglets from single source from single manufacturer.
3. Material: Stainless steel, 0.0188 inch thick.
4. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
5. Accessories:
 - a. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
 - b. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing's lower edge.
6. Finish: With manufacturer's standard color coating.

2.5 FABRICATION, GENERAL

- A. Custom fabricate sheet metal flashing and trim to comply with details indicated and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required.
 1. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 2. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 3. Verify shapes and dimensions of surfaces to be covered and obtain field measurements for accurate fit before shop fabrication.
 4. Form sheet metal flashing and trim to fit substrates without excessive oil-canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 5. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances:
 1. Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
 2. Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified.
- C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.

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- D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal in accordance with cited sheet metal standard to provide for proper installation of elastomeric sealant.
- E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.
- G. Seams:
 - 1. Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
 - 2. Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.
 - 3. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer.
- H. Do not use graphite pencils to mark metal surfaces.

2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Base Flashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:
 - 1. Aluminum: 0.040 inch thick.
 - 2. Stainless Steel: 0.0188 inch thick.
 - 3. Aluminum-Zinc Alloy-Coated Steel: 0.028 inch thick.
- B. Counterflashing: Shop fabricate interior and exterior corners. Fabricate with length sufficient to lap base flashing fasteners 2 inches minimum. Fabricate from the following materials:
 - 1. Aluminum: 0.032 inch thick.
 - 2. Stainless Steel: 0.0188 inch thick.
 - 3. Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.
- C. Flashing Receivers: Fabricate in minimum 96-inch-long, but not exceeding 10-foot-long, sections; lap, rivet, and solder joints; turn up back edge of reglet-mounted receivers 1/2 inch; turn up end dams 4 inches; and form receiver for counterflashing along front edge. Fabricate from the following materials:
 - 1. Aluminum: 0.032 inch thick.
 - 2. Stainless Steel: 0.0156 inch thick.
 - 3. Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.

2.7 MISCELLANEOUS SHEET METAL FABRICATIONS

- A. Equipment Support Flashing: Fabricate from the following materials:
 - 1. Stainless Steel: 0.0188 inch thick.
 - 2. Zinc-Tin Alloy-Coated Copper: 16 oz./sq. ft..

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3. Galvanized Steel: 0.028 inch thick.
4. Aluminum-Zinc Alloy-Coated Steel: 0.028 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
 1. Verify compliance with requirements for installation tolerances of substrates.
 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF UNDERLAYMENT

- A. Self-Adhering, High-Temperature Sheet Underlayment:
 1. Install self-adhering, high-temperature sheet underlayment; wrinkle free.
 2. Prime substrate if recommended by underlayment manufacturer.
 3. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures.
 4. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses.
 5. Overlap side edges not less than 3-1/2 inches. Roll laps and edges with roller.
 6. Roll laps and edges with roller.
 7. Cover underlayment within 14 days.

3.3 INSTALLATION, GENERAL

- A. Install sheet metal flashing and trim to comply with details indicated and recommendations of cited sheet metal standard that apply to installation characteristics required unless otherwise indicated on Drawings.
 1. Install fasteners, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
 2. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of sealant.
 3. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.
 4. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.
 5. Install continuous cleats with fasteners spaced not more than 12 inches o.c.
 6. Space individual cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 7. Install exposed sheet metal flashing and trim with limited oil-canning, and free of buckling and tool marks.

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8. Do not field cut sheet metal flashing and trim by torch.
 9. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
1. Coat concealed side of stainless steel sheet metal flashing and trim with bituminous coating where flashing and trim contact ferrous metal, or cementitious construction.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.
1. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
 2. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
 3. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated.
 - a. Embed hooked flanges of joint members not less than 1 inch into sealant.
 - b. Form joints to completely conceal sealant.
 - c. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way.
 - d. Adjust setting proportionately for installation at higher ambient temperatures.
 - 1) Do not install sealant-type joints at temperatures below 40 deg F.
 2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter.
1. Pre-tin edges of sheets with solder to width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work.
 2. Do not solder metallic-coated steel and sheet.
 3. Do not use torches for soldering.
 4. Heat surfaces to receive solder, and flow solder into joint.
 - a. Fill joint completely.
 - b. Completely remove flux and spatter from exposed surfaces.
 5. Stainless Steel Soldering:
 - a. Tin edges of uncoated sheets, using solder for stainless steel and acid flux.
 - b. Promptly remove acid-flux residue from metal after tinning and soldering.

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- c. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

3.4 INSTALLATION OF RECEIVERS AND COUNTERFLASHING

- A. General: Install sheet metal roof flashing and trim to comply with performance requirements and the cited sheet metal standard. Provide concealed fasteners unless otherwise indicated, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight.
- B. Counter Extensions: Fasten counterflashing extensions to, receivers, and integral equipment caps/counterflashings with stainless steel screws with neoprene washers, 24 inches o.c., minimum 3 per side of curb. Lap joints minimum 4 inches and bed with butyl sealant.

3.5 INSTALLATION OF MISCELLANEOUS FLASHING

- A. Equipment Support Flashing:
 - 1. Coordinate installation of equipment support flashing with installation of roofing and equipment.
 - 2. Weld or seal flashing with elastomeric sealant to equipment support member.

3.6 INSTALLATION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.7 CLEANING

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.

3.8 PROTECTION

- A. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.
- B. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended in writing by sheet metal flashing and trim manufacturer.
- C. Maintain sheet metal flashing and trim in clean condition during construction.
- D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures, as determined by Architect.

END OF SECTION 076200

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SECTION 078443 - JOINT FIRESTOPPING

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:
 - 1. Joints in or between fire-resistance-rated constructions.

1.3 PREINSTALLATION MEETINGS

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

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Sustainable Design Submittals:
 - 1. Product Data: For sealants, indicating VOC content.
 - 2. Laboratory Test Reports: For sealants, indicating compliance with requirements for low-emitting materials.
- C. Product Schedule: For each joint firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing agency.
 - 1. Engineering Judgments: Where Project conditions require modification to a qualified testing agency's illustration for a particular joint firestopping system condition, submit illustration, with modifications marked, approved by joint firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each joint firestopping system, for tests performed by a qualified testing agency.

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1.6 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating that joint firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FM Approvals according to FM Approvals 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with UL's "Qualified Firestop Contractor Program Requirements."

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install joint firestopping systems when ambient or substrate temperatures are outside limits permitted by joint firestopping system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Install and cure joint firestopping systems per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

1.9 COORDINATION

- A. Coordinate construction of joints to ensure that joint firestopping systems can be installed according to specified firestopping system design.
- B. Coordinate sizing of joints to accommodate joint firestopping systems.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
 - 1. Perform joint firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Test per testing standards referenced in "Joint Firestopping Systems" Article. Provide rated systems complying with the following requirements:
 - a. Joint firestopping systems shall bear classification marking of a qualified testing agency.
 - 1) UL in its "Fire Resistance Directory."

2.2 JOINT FIRESTOPPING SYSTEMS

- A. Joint Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which joint firestopping

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systems are installed. Joint firestopping systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.

- B. Joints in or between Fire-Resistance-Rated Construction: Provide joint firestopping systems with ratings determined per ASTM E1966 or UL 2079.
 - 1. Subject to compliance with requirements, provide products by the following:
 - a. Hilti, Inc.
 - b. 3M Fire Protection products.
 - 2. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of the wall, floor, or roof in or between which it is installed.
- C. Exposed Joint Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E84.
 - 1. Sealant shall have a VOC content of 250 g/L or less.
 - 2. Sealant shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- D. Accessories: Provide components of joint firestopping systems, including primers and forming materials, that are needed to install elastomeric fill materials and to maintain ratings required. Use only components specified by joint firestopping system manufacturer and approved by the qualified testing agency for conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Before installing joint firestopping systems, clean joints immediately to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:
 - 1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of elastomeric fill materials or compromise fire-resistive rating.
 - 2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with elastomeric fill materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.

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- B. Prime substrates where recommended in writing by joint firestopping system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

3.3 INSTALLATION

- A. General: Install joint firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support elastomeric fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing elastomeric fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.
- C. Install elastomeric fill materials for joint firestopping systems by proven techniques to produce the following results:
 - 1. Elastomeric fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
 - 2. Apply elastomeric fill materials so they contact and adhere to substrates formed by joints.
 - 3. For elastomeric fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

- A. Joint Identification: Identify joint firestopping systems with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of joint edge so labels are visible to anyone seeking to remove or joint firestopping system. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
 - 1. The words "Warning - Joint Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
 - 2. Contractor's name, address, and phone number.
 - 3. Designation of applicable testing agency.
 - 4. Date of installation.
 - 5. Manufacturer's name.
 - 6. Installer's name.

3.5 FIELD QUALITY CONTROL

- A. Inspecting Agency: Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E2393.
- B. Where deficiencies are found or joint firestopping systems are damaged or removed due to testing, repair or replace joint firestopping systems so they comply with requirements.

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- C. Proceed with enclosing joint firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

- A. Clean off excess elastomeric fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by joint firestopping system manufacturers and that do not damage materials in which joints occur.
- B. Provide final protection and maintain conditions during and after installation that ensure joint firestopping systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated joint firestopping systems immediately and install new materials to produce joint firestopping systems complying with specified requirements.

3.7 JOINT FIRESTOPPING SYSTEM SCHEDULE

- A. Where UL-classified systems are indicated, they refer to system numbers in UL's "Fire Resistance Directory" under product Category XHBN or Category XHDG.
- B. Floor-to-Floor, Joint Firestopping Systems:
 - 1. UL-Classified Systems: FF-D-0009 (up to 2 hours) and FF-D-0010 (for more than 2 hours).
 - 2. Assembly Rating: 2 hours or 3 hours to match floor construction fire-resistive rating.
 - 3. Nominal Joint Width: As indicated.
 - 4. Movement Capabilities: Class II - 25 percent compression, extension, or horizontal shear.
- C. Wall-to-Wall, Joint Firestopping Systems:
 - 1. UL-Classified Systems: WW-D-0009 (up to 2 hours) and WW-D-0010 (for more than 2 hours).
- D. Floor-to-Wall, Joint Firestopping Systems:
 - 1. UL-Classified Systems: FW-D-0005 (up to 2 hours) and FW-D-0001 (for more than 2 hours).
 - 2. Assembly Rating: 2 hours.
 - 3. Nominal Joint Width: As indicated.
 - 4. Movement Capabilities: Class II - 25 percent compression, extension, or horizontal shear.
- E. Head-of-Wall, Fire-Resistive Joint Firestopping Systems:
 - 1. UL-Classified Systems: HW-D-0076 for stud walls and HW-D-0081 for masonry walls.
 - 2. Assembly Rating: 1 hour or 2 hours as indicated.
 - 3. Nominal Joint Width: 3/4-inch.
 - 4. Movement Capabilities: Class II - 17 percent for stud walls and 33 percent for masonry walls compression or extension.
- F. Bottom-of-Wall, Joint Firestopping Systems:

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1. UL-Classified Systems: BW-S-0001 (up to 2 hours), BW-S-0002 (up to 2 hours) and BW-S-0023 (shaft wall up to 2 hours).
2. Assembly Rating: 1 hour or 2 hours.
3. Nominal Joint Width: 3/4-inch.
4. Movement Capabilities: Class I - 17 percent compression or extension.

END OF SECTION 078443

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SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Silicone joint sealants.
2. Urethane joint sealants.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Joint sealants.

B. Samples for Initial Selection: Manufacturer's standard color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.3 INFORMATIONAL SUBMITTALS

A. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

A. Manufacturers' special warranties.

B. Installer's special warranties.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Authorized representative who is trained and approved by manufacturer.

1.6 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

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1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain joint sealants from single manufacturer for each sealant type.

2.2 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 SILICONE JOINT SEALANTS

- A. Silicone, S, NS, 100/50, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Use NT.

2.4 URETHANE JOINT SEALANTS

- A. Urethane, M, P, 25, T, NT: Multicomponent, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type M, Grade P, Class 25, Uses T and NT.

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PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
 - 5. At the existing limestone coping stones, decorative balustrade and decorative cornice assemblies of the 1924 East Wing remove completely all existing sealant joints and backer rod(s) at all joints. Prepare existing joints for new backer rod and urethane sealant.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

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3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide flush joint profile at in accordance with Figure 8B in ASTM C1193.

3.4 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or

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deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 079200

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SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following exterior substrates:
 - 1. Steel and iron.
 - 2. Galvanized metal.
- B. Related Requirements:
 - 1. Section 051200 "Structural Steel Framing" for shop priming of metal substrates.

1.3 DEFINITIONS

- A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D523.
- B. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523.
- C. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D523.
- D. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D523.
- E. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D523.
- F. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D523.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
 - 2. Indicate VOC content.

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- B. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.7 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in the Exterior Painting Schedule for the paint category indicated.
- B. Manufacturers: Subject to compliance with requirements, available manufacturers that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Benjamin Moore & Co.
 - 2. Sherwin-Williams Co.
 - 3. PPG Paints
 - 4. Rust-Oleum
 - 5. Columbia Paint

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2.2 PAINT, GENERAL

- A. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- B. Material Compatibility:
 - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- C. Colors: Closely match existing color, contact engineer if color is unidentifiable due to wear.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- C. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.

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- D. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
- E. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's written instructions.
- F. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
 - 1. SSPC-SP 2.
 - 2. SSPC-SP 3.
 - 3. SSPC-SP 7/NACE No. 4.
 - 4. SSPC-SP 11.
- G. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- H. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
 - 3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
 - 4. Paint entire exposed surface of window frames and sashes.
 - 5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 - 6. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

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- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
 - 1. Contractor shall touch up and restore painted surfaces damaged by testing.
 - 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove gar, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

- A. Steel and Iron Substrates:
 - 1. Water-Based Light Industrial Coating System MPI EXT 5.1B:
 - a. Prime Coat: Primer, zinc rich, inorganic, MPI #19.
 - b. Topcoat: Light industrial coating, exterior, water based (MPI Gloss Level 3), MPI #161.
 - 2. Quick-Dry Enamel System MPI EXT 5.1A:
 - a. Prime Coat: Primer, alkyd, quick dry, for metal, MPI #76.
 - b. Topcoat: Alkyd, quick dry, semi-gloss (MPI Gloss Level 5), MPI #81.
- B. Galvanized-Metal Substrates:
 - 1. Latex System MPI EXT 5.3A:

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- a. Prime Coat: Primer, galvanized, water based, MPI #134.
- b. Topcoat: Latex, exterior, flat (MPI Gloss Level 1), MPI #10.

END OF SECTION 099113