

PROJECT MANUAL
For
Beaufort County School District



Whale Branch Early College High School
Building Envelope Repairs
69 Detour Road
Seabrook, SC 29940

Prepared for
Beaufort County School District

Prepared by



WMBE Project No. 2023-173

Construction Documents

Issued: July 11, 2023

DOCUMENT 001116 - INVITATION TO BID

1.1 PROJECT INFORMATION

- A. Notice to Bidders: Your firm is one of the bidders invited to submit bids for the Project as described in this Document according to the Instructions to Bidders.
- B. Project Identification: Whale Branch Early College High School Building Envelope Repairs
 - 1. Project Location: 69 Detour Road, Seabrook, SC 29940
- C. Owner: Beaufort County School District
 - 1. Owner's Representative: Mr. Alexander Marshall, Facilities Planning and Construction, Project Manager,
- D. Consultant: Joe Baker, WM Building Envelope Consultants, LLC, 226 N. Live Oak Drive, Moncks Corner, SC 29461. Phone: 843-499-2756 or Joe@wmbeconsultants.com

1.2 GENERAL SUMMARY

Base Bid

- 1. Scope of work includes building envelope repairs at Whale Branch Early College High School. This includes repairs of roof system and installation of underlayment system/wall panels on various exterior wall systems above the roof. Associated sheet metal components and accessories are included.

1.3 BID SUBMITTAL AND OPENING

- A. Owner will receive sealed bids until the bid time and date at the location indicated below. Owner will consider bids prepared in compliance with the Instructions to Bidders issued by Owner, and delivered as follows:
 - 1. Bid Date: November 09, 2023
 - 2. Bid Time: 5:00 p.m.
 - 3. Location: Email to Kaylee Yinger (Kaylee.yinger@eaufort.k12.sc.us), Alexander Marshall (Ashton.marshall@beaufort.k12.sc.us) and c.c. Joe Baker (joe@wmbeconsultants.com). Also, upload to the Beaufort County Website.
 - 4. Attention: Whale Branch Early College High School Building Envelope Repairs

1.4 PREBID CONFERENCE

- A. A pre-bid conference for all bidders will be held at **(Whale Branch Early College High School)** 69 Detour Road, Seabrook, SC 29940 on **October 26, 2023 at 10:00 a.m.** **Prospective bidders are requested to attend.**

1.5 DOCUMENTS

- A. Emailed Procurement and Contracting Documents: Documents will be provided to the bidders via email; only complete sets of documents will be issued.

1.6 BIDDER'S QUALIFICATIONS

- A. Bidders must be properly licensed under the laws governing their respective trades and be able to obtain insurance and bonds required for the Work. **A Performance Bond, a separate Labor and Material Payment Bond, and Insurance in a form acceptable to Owner will be required of the successful Bidder.**

END OF DOCUMENT 001116

SECTION 011001 – ABBREVIATED SCOPE OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Allowances
7. Unit Prices
8. Payment Procedures
9. Construction Progress Documentation
10. Submittal Procedures
11. Temporary Facilities and Controls
12. Closeout Procedures

B. Related Requirements:

1. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

1.3 PROJECT INFORMATION

A. Project Identification: Whale Branch Early College High School Building Envelope Repairs

1. Project Location: 69 Detour Road, Seabrook, SC 29940

B. Owner: Beaufort County School District

1. Owner's Representative: Mr. Alexander Marshall, Facilities Planning and Construction, Project Manager,

C. Consultant: Joe Baker, WM Building Envelope Consultants, LLC, 226 N. Live Oak Drive, Moncks Corner, SC 29461. Phone: 843-499-2756 or Joe@wmbeconsultants.com

1.4 GENERAL SUMMARY

Base Bid

1. Scope of work includes building envelope repairs at Whale Branch Early College High School. This includes repairs of roof system and installation of underlayment system/wall panels on various exterior wall systems above the roof. Associated sheet metal components and accessories are included.

1.5 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations. These locations will be determined at the pre-bid conference.
- B. Use of Site: Limit use of project site to areas of work. Do not disturb portions of project site beyond areas in which the Work is indicated.
 1. Limits: Confine construction operations to areas of work.
 2. Driveways, Walkways and Entrances: Keep driveways, loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.
 1. WORK SITE DAMAGES: Any damage to existing utilities, equipment or finished surfaces resulting from the performance of this contract shall be repaired to the District's satisfaction at the contractor's expense. Any damages resulting from performance of this contract must be reported to the Consultant/Owner.

1.6 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy site and adjacent building(s) during entire construction period. 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 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 approval of authorities having jurisdiction.
 2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

1.7 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Monday – Friday (8:00am – 5:00pm). Limit work on the existing building to normal business working hours, Monday through Friday, unless otherwise approved by owner.
 - 1. Weekend Hours: Weekend work must be coordinated and approved by the Owner.
 - 2. Early Morning Hours: Early morning work is not permitted.
 - 3. Work cannot be performed during school testing.
 - 4. Work causing noise and vibration cannot be performed during school hours.
- C. 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 Consultant and Owner not less than 72 hours in advance of proposed utility interruptions.
 - 2. Obtain Owner’s written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
- E. Nonsmoking Building: Smoking is not permitted on the Facility.
 - 1. TOBACCO FREE CAMPUSES: All facilities and grounds within Beaufort County School District are designated as tobacco-free areas. Smoking, E Cigarettes or chewing tobacco at any site within the District, including vehicles located on District property, is prohibited at all times. This policy extends to contractors, vendors, and temporary staff.

1.8 ALLOWANCES

- A. Allowance is an amount specified and included in the Construction Documents for a certain item/items of work whose details are not yet determined.
- B. The determined allowance is to be included in the Base Bid.
- C. Schedule of Allowances
 - 1. General Lump Sum: \$5,000

1.9 UNIT PRICES

- A. Unit price is a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the

scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

- B. The base bid is to include unit price quantities included in the documents.
- C. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- D. The Contractor is required to notify the Consultant, in writing, when approximately 75% of unit price quantities have been used.
- E. Schedule of Unit Prices:
 - 1. Unit Price No. 1: Roof Membrane Repair
 - a. 9 SF

1.10 PAYMENT PROCEDURES

- A. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.

1.11 CONSTRUCTION PROGRES DOCUMENTATION

- A. Time Frame: Extend schedule from date established for date of commencement to date of Substantial Completion and final completion.
- B. Weekly Construction Reports: Prepare a weekly construction report recording the work performed and the work to be performed in the upcoming week. Weekly Construction Report shall be provided by Close Of Business on Friday of each week.

1.12 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Submit electronic submittals via email as PDF electronic files.
 - a. Consultant will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 - 2. Applications for Payment: Provide three original copies that include the signature of an officer or other individual authorized to sign documents on behalf of that entity and shall be notarized.

1.13 TEMPORARY FACILITIES AND CONTROLS

- A. Portable Restrooms: Portable restrooms are to be cleaned and maintained on a regular basis. Location to be selected by the Owner during the pre-construction conference.
 - 1. Toilets: Use of Owner's existing toilet facilities will not be permitted.
- B. Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
 - 1. Prior to commencing work, provide charcoal filters or other Owner recommended filter at all HVAC intakes for the duration of the work.
- C. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner. If additional power is needed other than what is provided by the Owner, Contractor is to provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
 - 1. Connect temporary service to Owner's existing power source, as directed by Owner.
- D. Traffic Controls: Comply with requirements of the Owner.
 - 1. Protect existing site including curbs, pavement, and utilities.
 - 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- E. Parking: Use areas designated by the Owner for parking of construction vehicles.
- F. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.
 - 1. Temporary Signs: Provide signs informing public/individuals seeking entrance to Project facility.
 - a. Provide temporary, directional signs for construction personnel, building occupants and visitors.
 - 2. Maintain and touchup signs so they are legible at all times.
- G. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations.
- H. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
 - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- I. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- J. Contractor's Moisture-Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- K. Maintenance: Maintain facilities in good operating condition until removal.

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

1.14 CLOSEOUT PROCEDURES

- A. All close-out documents listed below are to be provided upon completion of the project. Documents are to be separated with tab sheets and provided bound with a multi-ring binder with hard covers. All project information is to be listed on the front cover and the spine of the binder.
- B. A complete, combined digital copy is also to be provided with all close-out documents combined with separator sheets identifying each of the following items.
 1. Affidavit of Payment of Debts and Claims.
 2. Affidavit of Payment of Release of Liens.
 3. Consent of Surety to Final Payment.
 4. Certificate of Substantial Completion.
 5. Copy of WMBE Punchlist (Each item initialed as competed).
 6. Certificate of Final Completion.
 7. Contractor's Warranty dated the Substantial Completion date or later.
 8. List of all materials used per specification section.
 9. Copy of all Applications for Payment including Final.
 10. Copy of all change orders with attachments including Final.
 11. Copy of all field observation reports.
 12. Project As-Built Drawings

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

BID FORM

BID SUBMITTED BY: _____

BID SUBMITTED TO: Beaufort County School District

FOR: PROJECT NAME: Whale Branch Early College High School Building Envelope Repairs

PROJECT NUMBER: WMBE 2023-173

OFFER

A. In response to the Invitation for Construction Services and in compliance with the Instructions to Bidders for the subject project, the Bidder agrees, if this Bid is accepted, to enter into a Contract with the Owner on the terms and conditions included in the Bidding Documents, and to perform all Work as specified in the Bidding Documents, for the price and within the time frames indicated in this Bid and in accordance with the other requirements of the Bidding Documents.

B. The Bidder has submitted Bid Security as follows in the amount and form required by the Bidding Documents:

Bid Bond with Power of Attorney

Electronic Bid Bond

Cashier's Check

C. The Bidder acknowledges the receipt of the following Addenda to the Bidding Documents and has incorporated any and all changes included in the Addenda into this Bid:

LIST ALL ADDENDA RECEIVED:

D. Bidder accepts all terms and conditions of the Invitation for Bids, including, without limitation, those dealing with the disposition of Bid Security. Bidder agrees that this Bid, including all Bid Alternates, if any, may not be revoked or withdrawn after the opening of bids, and shall remain open for acceptance for a period of **60** Days following the Bid Date, or for a longer period of time that Bidder may agree to in writing upon request of the Owner.

E. Bidder offers to provide all labor, materials, equipment, tools of trades and labor, accessories, appliances, warranties and guarantees, and to pay all royalties, fees, permits, licenses and applicable taxes necessary to complete the following items of construction work:

F. **BASE BID WORK (Generally described as follows):** Scope of work includes building envelope repairs at Whale Branch Early College High School. This includes repairs of roof system and installation of underlayment system/wall panels on various exterior wall systems above the roof. Associated sheet metal components and accessories are included.

\$ _____, which sum is hereafter called the Base Bid.

(Insert Base Bid Amount)

BID FORM

G. **BID ALTERNATES** as indicated in the Bidding Documents and generally described as follows:

ALTERNATE No. 1 (*Generally described as follows*): NA

ADD or **DEDUCT FROM BASE BID: \$** _____

(*Bidder to Mark appropriate box*)

H. **UNIT PRICES:**

BIDDER offers for the Owner's consideration and use, the following **UNIT PRICES**. The **UNIT PRICES** offered by **BIDDER** indicate the amount to be added or deducted from the **CONTRACT SUM** for each item. **UNIT PRICES** include all costs, including those for materials, labor, equipment, tools of trades and labor, fees, taxes, insurance, bonding, overhead, profit, etc. The Owner reserves the right to include or not to include any of the following **UNIT PRICES** in the Contract and to negotiate the **UNIT PRICES** with **BIDDER**.

No.	Quantity	Item	Unit of Measure	Add/Deduct
1.	<u>9</u>	<u>Roof Membrane Repair</u>	<u>SF</u>	<u>\$</u>

I. **SUBCONTRACTORS**

- a. **Definition of Subcontractor:** A subcontractor is an entity who will perform work or render service to the prime contractor to or about the construction site pursuant to a contract with the prime contractor. Bidder should not identify sub-subcontractors in the spaces provided on the bid form but only those entities with which bidder will contract directly. Likewise, do not identify material suppliers, manufacturers, and fabricators that will not perform physical work at the site of the project but will only supply materials or equipment to the bidder or proposed subcontractor(s).
- b. **Subcontractor Qualifications:** Bidder must only list subcontractors who possess a South Carolina Contractor's license with the license classification and/or subclassification identified in the left column. The subcontractor license must also be within the appropriate license group for the work of the specialty. If Bidder lists a subcontractor who is not qualified to perform the work, the Bidder will be rejected as non-responsible.
- c. **Use of Own forces:** If under the terms of the Bidding Documents, Bidder is qualified to perform the work of a listed specialty and Bidder does not intend to subcontract such work but to use Bidder's own employees to perform such work, the Bidder must insert its own name in the space provided for that specialty.
- d. If bidder is awarded the contract, bidder will not be allowed to substitute another subcontractor in place of a subcontractor listed above unless approved by the Owner.
- e. Bidder's failure to identify a subcontractor or themselves to perform the work of a subcontractor specialty listed in the first column on the left will render the Bid non-responsive.

LISTING OF PROPOSED SUBCONTRACTORS

Bidder shall use the below-listed Subcontractors in the performance of the Subcontractor Classification work listed:

BID FORM

SUBCONTRACTOR CLASSIFICATION By License Classification and/or Subclassification	SUBCONTRACTOR'S PRIME CONTRACTOR'S NAME <i>(To be completed by Bidder)</i>	SUBCONTRACTOR'S PRIME CONTRACTOR'S SC LICENSE NUMBER <i>(To be completed by Bidder)</i>
BASE BID		
"NO SUBCONTRACTOR LISTING REQUIRED"		
ALTERNATE No. 1		
NA		

If a Bid Alternate is accepted, Subcontractors listed for the Bid Alternate shall be used for the work of both the Alternate and the Base Bid work.

J. TIME OF CONTRACT PERFORMANCE AND LIQUIDATED DAMAGES

a) CONTRACT TIME

The Date of Commencement of the Work shall be established in a Notice to Proceed. Substantial completion of the Work shall be within (90) Calendar Days from the Date of Commencement. Substantial completion is subject to changes as provided in the Contract Documents.

K. AGREEMENTS

- a) Bidder agrees that this bid is subject to the requirements of the laws of the State of South Carolina.
- b) Bidder agrees that at any time prior to the issuance of the Notice to Proceed for this Project, this Project may be canceled for the convenience of, and without cost to, the Owner.
- c) The Owner, employees, representatives, consultants, agents, etc. shall not be responsible for any bid preparation costs or charges of any type, if all bids are rejected or the Project is canceled for any reason prior to the issuance of the Notice to Proceed.

BID FORM

CONTRACTOR'S CLASSIFICATIONS AND SUBCLASSIFICATIONS WITH LIMITATION

SC Contractor's License No.: _____

Classification(s) & Limits.: _____

Subclassification(s) & Limits: _____

Bidder's Legal Name: _____

Address: _____

Telephone: _____

Email: _____

Signature: _____ DATE: _____

Print Name: _____

Title: _____

SECTION 075216 - ROOF MEMBRANE REPAIRS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract, including the General and Special Conditions, as well as other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section Includes:

1. Repairs to the existing modified bitumen roofing systems in accordance with the Contract requirements and as required by the roof system manufacturer to maintain the existing roof system warranty.
2. Sheet metal flashings as shown in the contract drawings shall be provided. Sheet metal shall be compatible with the material of that in which it is being applied to. If dissimilar conditions exist, separation is required.
3. Make all repairs noted on Roof Repair Plans.
 - a. Include 50 square feet of insulation and membrane replacement in the Base Bid.
 - b. See 076200 – Sheet Metal Flashing and Trim Specifications Section for applicable products utilized in roof repairs.

1.3 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

1.4 PREINSTALLATION MEETINGS

- A. Pre-installation Roofing Conference: Conduct conference at Project Site. Mandatory attendance for roofing contractor, material manufacturer's technical representative, all subcontractors, project manager, and project foreman. Manufacturer must have a member at the pre-installation meeting who is trained as a technical advisor (not a sales person).

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Contractor shall submit letter from the roof system manufacturer stating that the work being performed by the Contractor will not void the existing roof system warranty.

- C. Shop Drawings: For roofing system. Include plans, sections, details, and attachments to other work, including:
 - 1. Roof system penetrations

1.6 INFORMATIONAL SUBMITTALS

- A. Research/Evaluation Reports: For components of membrane roofing system, from ICC-ES.
- B. Contractor's Three year workmanship warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.
- B. The Roofing Contractor shall provide written correspondence from the roof system manufacturer on the manufacturer's letterhead stating that the work performed by the Contractor has not voided the existing warranty and that the existing roof system warranty remains intact.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and as required to ensure that the manufacturer's warranty is not voided by the work.
- B. A copy of the latest manufacturer's product data and installation guide shall be kept on the roof at all times during installation.

1.9 MATERIAL STORAGE

- A. All materials shall be properly stored in accordance with industry standards and the manufacturer's guidelines.
 - 1. Use good tarps, free of holes and tears. Secure properly.
 - 2. Store roll goods on end on pallets. Salvage edge shall be up.
 - 3. Cover insulation with tarps. Do NOT rely on the manufacturer's plastic wrapping.
 - 4. Store all materials in a manner to prevent condensation.
 - 5. Do not overload the roof. Limit the amount of materials stored on the roof to the next day's operation at a maximum.

1.10 WARRANTY

- A. The Roofing Contractor shall provide written correspondence from the roof system manufacturer on the manufacturer's letterhead stating that the work performed by the Contractor has not voided the existing warranty and that the existing roof system warranty remains intact.

- B. Contractor's warranty period: Three years from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. All materials provided shall be approved for use by the roof system manufacturer. Obtain components including: roof insulation, cover board, fasteners, base sheet, interply membrane, cap sheet, adhesives, flashing plies, temporary waterproofing membrane, and sealants from the specified manufacturer in order to maintain the existing warranty.

2.2 PERFORMANCE REQUIREMENTS

- A. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
- B. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.
- C. FM Global Listing: Roofing, base flashings, and component materials shall comply with requirements in FM Global 4450 or FM Global 4470 as part of a roofing system, and shall be listed in FM Global's "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.
- D. Exterior Fire-Test Exposure: ASTM E 108 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.
- E. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

2.3 ROOFING SHEET MATERIALS

- A. Roofing Membrane Base Sheet: ASTM D 6163, Grade S, Type I, SBS-modified asphalt sheet (reinforced with glass fibers) smooth surfaced; suitable for application method specified.
 - 1. Modified Base Ply, Stripping Ply, and Flashing Reinforcement Sheet shall meet the following:
 - a. Thickness (avg.): 91 mils with a minimum of 87 mils
 - b. Weight (avg per square): 60 lbs.
 - c. Elastomeric Blend filler content: Less than 35% by weight
 - d. Low temperature flexibility @ 13F: Pass ASTM D 5147
 - e. Breaking Load @ 73F: 30 lbf/inch
 - f. Breaking Load @ 0F: 70 lbf/inch
 - g. Ultimate Elongation @ 73F: 50%
 - h. Dimensional Stability: 0.5%
 - i. Compound Stability: 250F

- j. UL Listed, FM Approved. Products shall bear seals of approval
- B. Granule-Surfaced Roofing Cap Sheet: ASTM D 6162, Grade G, Type I, SBS-modified asphalt sheet; granule surfaced; suitable for application method specified, and as follows:
- 1. Modified Bitumen Finish Ply shall meet the following:
 - a. Thickness (avg.): 150 mils
 - b. Weight (avg per square): 90 lbs.
 - c. Elastomeric Blend filler content: Less than 35% by weight
 - d. Low temperature flexibility @ -13F: Pass ASTM D 5147
 - e. Breaking Load @ 73F: 30 lbf/inch

 - f. Breaking Load @ 0F: 70 lbf/inch
 - g. Ultimate Elongation @ 73F: 55%
 - h. Dimensional Stability: 0.5%
 - i. Compound Stability: 250F
 - j. UL Listed, FM Approved. Products shall bear seals of approval
 - k. Granule embedment: 1.5 grams per sample

2.4 BASE FLASHING SHEET MATERIALS

- A. Same materials as installed in roof system unless Roof Manufacturer’s requirements require differing sheets to be provided for the base flashing (ie. Polyester base flashing cap sheet ply).
 - 1. Installation in strict accordance with the manufacturer’s written installation instructions.

2.5 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.
 - 1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Liquid Applied Flashing: Manufacturer’s recommended liquid applied flashing with reinforcement.
- C. Asphalt Primer: ASTM D 41/D 41M.
- D. Cold-Applied Adhesive: Roofing system manufacturer's standard asphalt-based, one- or two-part, asbestos-free, cold-applied adhesive specially formulated for compatibility and use with roofing membrane and base flashings.
- E. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.
- F. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roofing components to

substrate; tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.

- G. Roofing Granules: Ceramic-coated roofing granules, No. 11 screen size with 100 percent passing No. 8 sieve and 98 percent of mass retained on No. 40 sieve, color to match roofing.

2.6 ROOF INSULATION (If Applicable)

- A. Roof insulation system shall match that of existing in type and thickness.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2 felt or glass-fiber mat facer on both major surfaces.
- C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches at the crickets.
- D. Perlite Board Insulation: ASTM C 728, Type I.
- E. High Density Fiberboard: ASTM C208, Type II, Grade 2.
- F. Gypsum Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/4 inch, factory primed.
- G. If any other conditions exist, adhere to the requirements of the manufacturer.

2.8 INSULATION ACCESSORIES

- A. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer.
- B. Insulation Cant Strips: ASTM C 728, perlite insulation board.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Comply with roofing system manufacturer's written instructions.
- B. If any clarifications are needed, please refer to NRCA Low Slope Roof Repair Manual.
- C. If there is a discrepancy between the specifications and the manufacturer's written instructions, the more stringent guideline shall be followed.
- D. Substrate-Joint Penetrations: Prevent roofing asphalt and adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.2 ROOFING INSTALLATION

- A. Install roofing system according to roofing system manufacturer's written instructions and applicable recommendations in ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing".

3.3 ROOF EDGE REPAIR

- A. Roof Edge Repair:
 1. Cut out flashing materials that are unadhered until reaching adhered material.
 2. Inspect the flashing/roof system for possible moisture infiltration.
 3. If moisture infiltration is suspected, cut open the flashing and inspect the underlying interplies and substrate. Replace any wet or damaged materials. Notify WM immediately if moisture is discovered in any location where not indicated on plans.
 4. To promote thorough adhesion of a patch, it is essential to begin by preparing the surface. Remove debris, contaminants, surfacing from the surface of the membrane flashing to be repaired. The area to be prepared should extend beyond the perimeter of the patch to provide an ample clean work area on which to install the patch.
 5. Clean the surface of the membrane.
 6. Prime the surface of the membrane and edge metal with asphalt primer and allow to dry. Primer contains solvents and is used to enhance adhesion; however, overuse of primer can harm the membrane.
 7. Cut a patch of like material (base sheet and cap sheet) 8 inches larger in all dimension than the location to be prepared. Round the corners of the patch to prevent peeling of square corners. If corners of the base flashing are included, flash the corners in accordance with Manufactures printed instructions.
 8. Install the patch in cold adhesive or by torch extending approximately 8 inches beyond in all directions. When torching, work gradually, applying heat only sufficient to achieve adhesion without damaging the membrane reinforcement or scorching surrounding membrane.
 9. Apply moderate pressure to the patch to assure adhesion to the existing membrane.
 10. Provide liquid applied flashing at the edge of the membrane termination to the edge metal. Provide masking tape on the vertical face of the edge metal and remove upon the completion of the liquid applied flashing setting up.

3.4 ROOF MEMBRANE REPAIR (If Needed)

- A. Opening/Cut/Blister:
 1. Carefully cut back the opening/cut/blistered membrane until good adhesion is reached.
 2. Inspect the membrane for possible moisture infiltration.
 3. If moisture infiltration is suspected, cut open the flashing and inspect the underlying interplies and substrate. Replace any wet or damaged materials. Notify WM immediately if moisture is discovered in any location where not indicated on plans.
 4. To promote thorough adhesion of a patch, it is essential to begin by preparing the surface. Remove debris, contaminants, surfacing from the surface of the membrane flashing to be repaired. The area to be prepared should extend beyond the perimeter of the patch to provide an ample clean work area on which to install the patch.
 5. Clean the surface of the membrane.

6. Prime the surface of the membrane asphalt primer and allow to dry. Primer contains solvents and is used to enhance adhesion; however, overuse of primer can harm the membrane.
7. Cut a patch of like material 8 inches larger in all dimension than the location to be prepared. Round the corners of the patch to prevent peeling of square corners. If corners of the base flashing are included, flash the corners in accordance with Manufactures printed instructions.
8. Install the patch (cap sheet) in cold adhesive or by torch extending approximately 8 inches beyond in all directions. When torching, work gradually, applying heat only sufficient to achieve adhesion without damaging the membrane reinforcement or scorching surrounding membrane.
9. Apply moderate pressure to the patch to assure adhesion to the existing membrane.

3.5 ROOF INSULATION INSTALLATION (If Needed)

- A. Install roof insulation in accordance with manufacturer's guidelines and NRCA details.
- B. Insulation installation:
 1. Mechanically attach the base layer of insulation.
 2. Adhere all layers to the subsequent layers in beads of low rise foam adhesive.
 3. Stagger all joints a minimum of 12" in both directions
 4. Fit insulation neatly but do not jam in place. Insulation should lay free without gaps. Any gaps or openings greater than or equal to 1/4" shall be filled with similar insulation or replaced with new boards. Cut boards tight to curbs and other penetrations.
 5. Take care to ensure that the insulation lays down completely in the adhesive. Walk in and roll as necessary. Follow manufacturer's instructions on cure time.

3.6 ROOF MEMBRANE REPLACEMENT (If Needed)

- A. After the roof insulation has been properly installed, remove any dust and debris from surface.
- B. Install all roof membrane repairs using the materials below in accordance with the NRCA Low Sloped Roof Repair Manual or as recommended by the roof system manufacturer.
- C. Modified Bitumen Base Sheet Installation:
 1. Roll out sheet and allow to relax as per manufacturer's instructions.
 2. Starting at low points and working upward, embed in manufacturer's recommended adhesive at the rate of 1.5 gallons per 100 square feet. Use notched squeegees and ensure a solid bed of adhesive free of lumps and excess.
 3. Roll membrane into adhesive free of voids, fishmouths, mole runs, etc. Ensure solid embedment of membrane.
 4. Run modified bitumen base sheet up and over the top of cant. Seal to penetrations.
 5. Lap side laps a minimum of 3" an end laps a minimum of 6". Stagger end laps at least 24". Install modified bitumen base sheet so that the laps do not line up with joints in insulation.
 6. Seal all laps and verify solid lap adhesion at the end of each working day. Make repairs as necessary to ensure a watertight assembly.
- D. Modified Bitumen Cap Sheet Installation:

1. Clean base sheet of any dust, moisture, and debris.
2. Roll out the modified bitumen cap sheet and allow to relax as per manufacturer's instructions.
3. Starting at low points and working upward, embed modified bitumen cap sheet in manufacturer's recommended adhesive at the rate of 1.5 gallons per 100 square feet. Use notched squeegees and ensure a solid bed of adhesive free of lumps and excess.
4. Roll membrane into adhesive free of voids, fishmouths, mole runs, etc. Ensure solid embedment of membrane.
5. Lap side laps a minimum of 3" an end laps a minimum of 6". Stagger end laps at ½ of roll length where available but no more than 30" together. Install modified bitumen cap sheet so that the laps do not line up with the laps of the modified bitumen base sheet.
6. Stagger laps in drain/valley areas to prevent "backwards" laps.
7. Seal all laps and verify solid lap adhesion at the end of each working day. Make repairs as necessary to ensure a watertight assembly.
8. Check lap integrity each day and repair any loose areas. Embed granules where necessary to dress up finished roof assembly.

3.7 FLASHING REPAIRS (If Needed)

- A. Installation of fluid applied flashing system with reinforcement fabric where indicated and in strict accordance with the manufacturer's written installation instructions.
- B. Extend flashing up walls or parapets a minimum of 8 inches above roofing membrane and 6 inches onto field of roofing membrane.
- C. Mechanically fasten top of flashing system securely at terminations and perimeter of roofing a minimum of 8" on center using appropriate fasteners for substrate material. Use washers where necessary.

3.8 Warranty:

- A. Provide three year contractor's workmanship warranty.

3.9 Closeout:

- A. Clean finished roof of all materials, equipment, debris, markings, etc.

END OF SECTION 075216

SECTION 076200 - SHEET METAL FLASHING AND TRIM

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. Provide sheet metal flashings and trim as indicated in the Contract Drawings.

- B. Related Sections:

- 1. Section 075216 "Roof Membrane Repairs"

1.3 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 leak-proof, secure, and noncorrosive installation.

1.4 ACTION SUBMITTALS

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

- 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

- B. Shop Drawings: For sheet metal flashing and trim.

- 1. Include identification of material, thickness, weight, and finish for each item and location in Project.

- C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.

- D. Samples for Verification: For each type of exposed finish.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.
- B. Product Certificates: For each type of coping and roof edge flashing that is SPRI ES-1 tested.
- C. 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.

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 SPRI ES-1 tested, shop shall 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. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- 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 Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 30 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall 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 shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" 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 roof edge flashings tested according to SPRI ES-1 and capable of resisting the design pressures.
- D. 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.

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Galvalume Sheet: ASTM A792/A792M-97a, 50 ksi steel sheet, 55% Aluminum-Zinc Alloy Coating by the Hot-Dip Process, grade AZ55.
 - 1. Exposed Coil-Coated Finish:
 - a. Two-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 2. Color: As selected by Owner 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.
 - 4. Component Thickness 24 gauge:
 - a. Fascia
 - b. Drip Edge
 - c. Counterflashing Receiver
 - d. Counterflashing
 - e. Wind Clips
 - f. Scupper Face Plate
 - g. Wall Panels
- C. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.

1. Exposed Coil-Coated Finish:
 - a. Two-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 2. Color: As selected by Owner 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.
 4. Component Thickness 0.040 inches:
 - a. Fascia
 - b. Drip Edge
 - c. Counterflashing Receiver
 - d. Counterflashing
 - e. Wind Clips
 - f. Scupper Face Plate
 - g. Wall Panels
- D. Stainless-Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, dead soft, fully annealed; with smooth, flat surface.
1. Component Thickness 24 gauge:
 - a. Scupper Liner/Sleeve

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Underlayment: Minimum 40 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 according to written recommendations of underlayment manufacturer.
1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F or higher.
 2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F or lower.
- B. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. minimum.

2.4 MISCELLANEOUS MATERIALS

- A. General: 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 unless otherwise indicated.
- B. Fasteners: Wood 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.
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: Low profile pancake head with length sufficient to penetrate metal substrates minimum 3 threads or wood substrates minimum 1-1/2".
2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
 3. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
 4. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.
 5. Fasteners for Concrete and Masonry: 1/4" diameter metal based expansion anchor with stainless steel mandrel of length to penetrate substrate a minimum of 1-1/2".
 6. Washers: Shall be stainless steel with neoprene gasket backing. Shall be 9/16" diameter for use with #12 screws and 5/8" diameter for use with 1/4" diameter concrete and masonry anchors.
 7. Rivets: #44 Stainless steel rivets with stainless steel mandrel. Length of rivet to properly fasten particular sheet metal components. Rivets shall be factory painted to match adjacent sheet metal.
- C. 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.
- D. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Silicone Sealant: Shall be a one-component, non-sag, neutral cure, low-modulus, UV resistant, high performance silicone sealant. Shall meet ASTM C 920, Type S, Grade NS, Class 100, Use M, G, A or O. Color to match adjacent materials.
- F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- G. Hat Channel: Hat-Shaped, Rigid Furring Channels; AISI S220, 7/8 inch deep, 20 gauge thickness.

2.5 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
1. Obtain field measurements for accurate fit before shop fabrication.
 2. 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.
 3. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. 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 joints unless otherwise indicated.
- C. Sealant Joints: Where movable, non-expansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- D. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal. Cleats shall be 1 gauge/increment thicker than sheet metal used.
- E. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 2. Install sheet metal flashing and trim to fit substrates resulting in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 3. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 4. Torch cutting of sheet metal flashing and trim is not permitted.
 5. Prime all sheet metal surfaces (top and bottom) to receive bituminous materials. Allow primer to dry thoroughly before application of bituminous materials.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other 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.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 18 inches maximum or 24 inches minimum of corner or intersection.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
- D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/2 inches for nails and not less than 1 inch for wood screws.
- 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.

3.2 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Underlayment: Install self-adhering underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered between courses. Overlap side edges not less than 3-1/2 inches. Roll laps and edges with roller. Cover underlayment within 14 days.
- B. Red Rosin Paper: Provide as slip sheet between sheet metal underlayment and copper.

3.3 ROOF-DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of overflow roof-drainage system.

3.4 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 3 inches over base flashing. Install stainless-steel draw band and tighten.
- C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in receivers and fit tightly to base flashing. Provide 2 inch wide wind clips at 24 inches on center. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints minimum of 4 inches. Trim hemmed edge of counterflashing on underlying section of counterflashing so that sheet metal nests properly.
- D. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with sealant and clamp flashing to pipes that penetrate roof.
- E. Primary Scupper Flashing:
 - 1. Fabricate thru-wall scupper flange, liner, and faceplate as shown in Contract Drawings. Scuppers dimensions shall be as indicated in the Contract Drawings.
 - 2. Clean and solder all seams of the flange and liner.
 - 3. Provide flange which extends a minimum of 4" on top and sides of scupper, and extends a minimum of 4" out onto the horizontal membrane. Set all flanges in a full bead of roof cement.
 - 4. Strip-in flange as indicated in the Contract Drawings.
 - 5. Provide faceplate which extends 4" around the entire scupper. Set faceplate in a bead of sealant.
 - 6. Scupper Liner shall extend 1" beyond the exterior wall face and lock onto faceplate at sides and sill.

7. The face plate shall lock over scupper liner at head to provide a water shedding condition.

3.5 WALL PANEL INSTALLATION

- A. General: Install sheet metal wall panels to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. Provide self-adhering underlayment over existing substrate. Coordinate with counterflashing receiver when applicable.
- C. Provide hat channels at 24 inches on center unless indicated otherwise on the Contract Drawings.
- D. Secure hat channels 12 inches on center staggered to the substrate.
- E. Secure wall panels 12 inches on center to each hat channel unless indicated otherwise on the Contract Drawings.

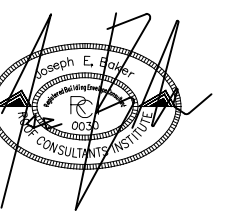
3.6 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. All sheet metal work shall be thoroughly cleaned of all asphalt, flux, scrapes and dust.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturers written installation instructions.

END OF SECTION 076200

BEAUFORT COUNTY SCHOOL DISTRICT WHALE BRANCH EARLY COLLEGE HIGH BUILDING ENVELOPE REPAIRS

WM PROJECT NUMBER: 2023-173



DESIGNED: JB

BEAUFORT COUNTY SCHOOL DISTRICT
WHALE BRANCH EARLY COLLEGE HIGH
BUILDING ENVELOPE REPAIRS

WM PROJECT NO.: 2023-173

169 DETOUR ROAD
SEABROOK, SC 29940

LEGEND

XX	ROOF AREA DESIGNATION		ROOF HATCH
VTR	VENT THROUGH ROOF		VENTILATOR
RD	ROOF DRAIN	UNIT	MECHANICAL UNIT
OF	OVERFLOW DRAIN	OF	OVERFLOW SCUPPER
	HOT STACK	DS/SD	DRAIN SCUPPER TO STORM DRAIN
E	ELECTRICAL PENETRATION		LADDER
	ELEC		MECHANICAL UNIT ON ROOF CURBS
	PITCH PAN AT	DS/SP	DOWNSPOUT TO SPLASH PAN
	HOOD PENETRATION	== EJ ==	EXPANSION JOINT
	EQUIPMENT SUPPORT CURB	== EJ ==	EXPANSION JOINT AT WALL
EQU	EQU	CL	CONDENSATION LINE
	GOOSE NECK		

SITE LOCATION



FORM F3: RE-ROOFING ANALYSIS FORM

PROJECT: WHALE BRANCH EARLY COLLEGE HIGH BUILDING ENVELOPE REPAIRS		DISTRICT: BEAUFORT COUNTY SCHOOL DISTRICT	
SUBMITTAL:	<input type="checkbox"/> SCHEMATIC	<input type="checkbox"/> DESIGN DEVELOPMENT	<input checked="" type="checkbox"/> CONSTRUCTION DOCUMENTS
DATE: 07/11/2023		CODE & EDITION: 2021 IBC, 2009 IECC & 2020 OSF CONSTRUCTION GUIDE	
CODE & EDITION:	SC CODE EDITION	2018	
	ICC CODE EDITION	2018	
	ICC A117.1 EDITION	2017	
	OSF GUIDE EDITION	2020	
	OTHER CODES/STDS & EDITIONS	2009 IECC	
FIRE RESISTANCE RATING OF BUILDING ELEMENTS			
ROOF CONSTRUCTION INCLUDING SUPPORTING BEAMS & JOIST (IBC TABLE 601)	AS REQUIRED, HRS	NO CHANGE	
	AS DESIGNED, HRS	NO CHANGE	
	TESTING AGENCY & DESIGN NO. (UL, FM, ETC.)	UL 790 CLASS A	
	WALL/PARTITION KEY CODE	NO CHANGE	
STRUCTURAL DESIGN INFORMATION, BUILDING			
WIND LOADS	ANALYSIS PROCEDURE (ASCE 7 OR IBC 1609.6)	ASCE 7-16	
	BASIC WIND SPEED, MPH (3 SEC GUST IBC FIG. 1609)	NA	
	EXPOSURE CATEGORY	C	
	RISK CATEGORY	III	
	INTERNAL PRESSURE COEFFICIENT (ASCE 7)	0.55	
	EXTERNAL PRESSURE COEFFICIENT (ASCE 7)	(1)-0.9, (1)-1.7, (2)-2.3, (3)-3.2	
ENERGY INFORMATION			
INSULATION			
ROOF	CAVITY	N/A	
	CONTINUOUS	R - 20	

ABBREVIATIONS

MIN	MINIMUM
MAX	MAXIMUM
NRCA	NATIONAL ROOFING CONTRACTORS ASSOCIATION
O.C.	ON CENTER
SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION

WHALE BRANCH EARLY COLLEGE HIGH

169 STATE HWY S 7,549
SEABROOK, SC 29940



COLUMBIA AREA OFFICE

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CHARLESTON AREA OFFICE

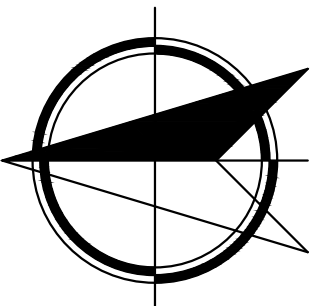
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PROJECT NUMBER: 2023-173

CONSTRUCTION DOCUMENTS

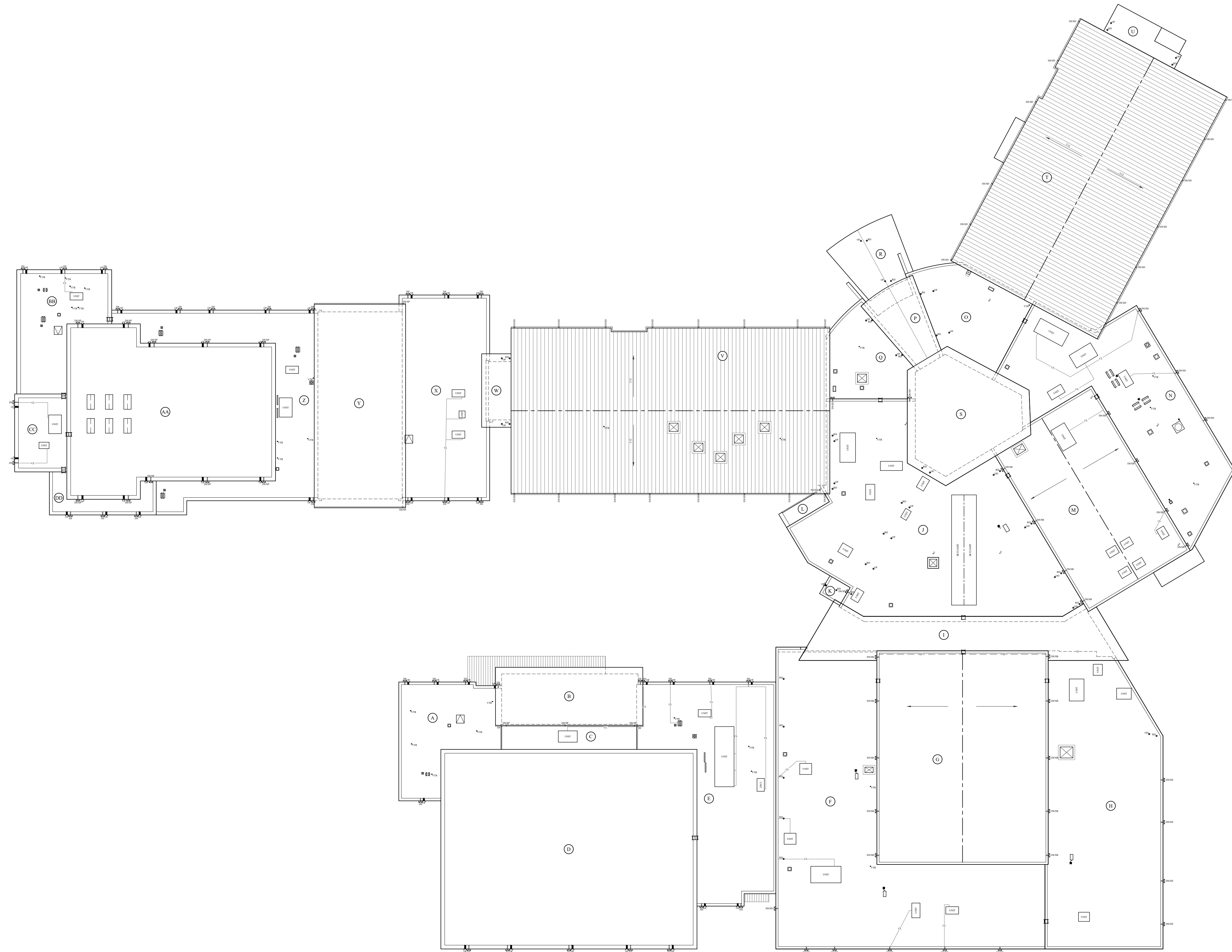
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COVER SHEET

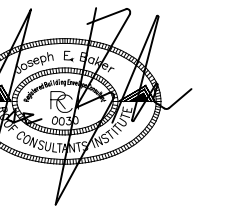
R-1.0

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R-1.2	ROOF REPAIR PLAN
R-1.3	ROOF REPAIR PLAN
R-1.4	ROOF REPAIR PLAN
R-1.5	ROOF REPAIR PLAN
R-1.6	ROOF REPAIR PLAN
R-2.1	DETAILS



1 OVERALL ROOF PLAN
R-1.1 1" = 30'



DESIGNED: JB

BEAUFORT COUNTY SCHOOL DISTRICT
WHALE BRANCH EARLY COLLEGE HIGH
BUILDING ENVELOPE REPAIRS

WM PROJECT NO.: 2023-173

169 DETOUR ROAD
SEABROOK, SC 29940



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CHARLESTON AREA OFFICE

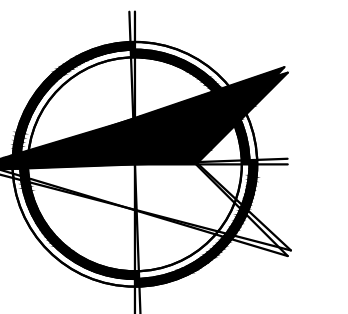
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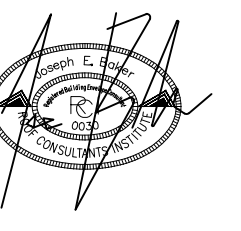
PROJECT NUMBER: 2023-173

CONSTRUCTION DOCUMENTS

DATE: 07/11/2023

OVERALL ROOF PLAN

R-1.1



DESIGNED: JB

BEAUFORT COUNTY SCHOOL DISTRICT
WHALE BRANCH EARLY COLLEGE HIGH
BUILDING ENVELOPE REPAIRS

WM PROJECT NO.: 2023-173
169 DETOUR ROAD
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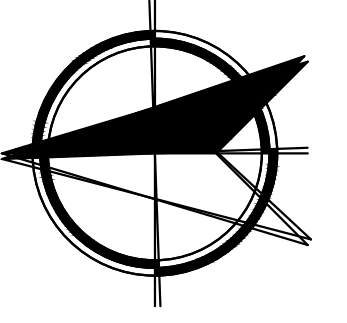
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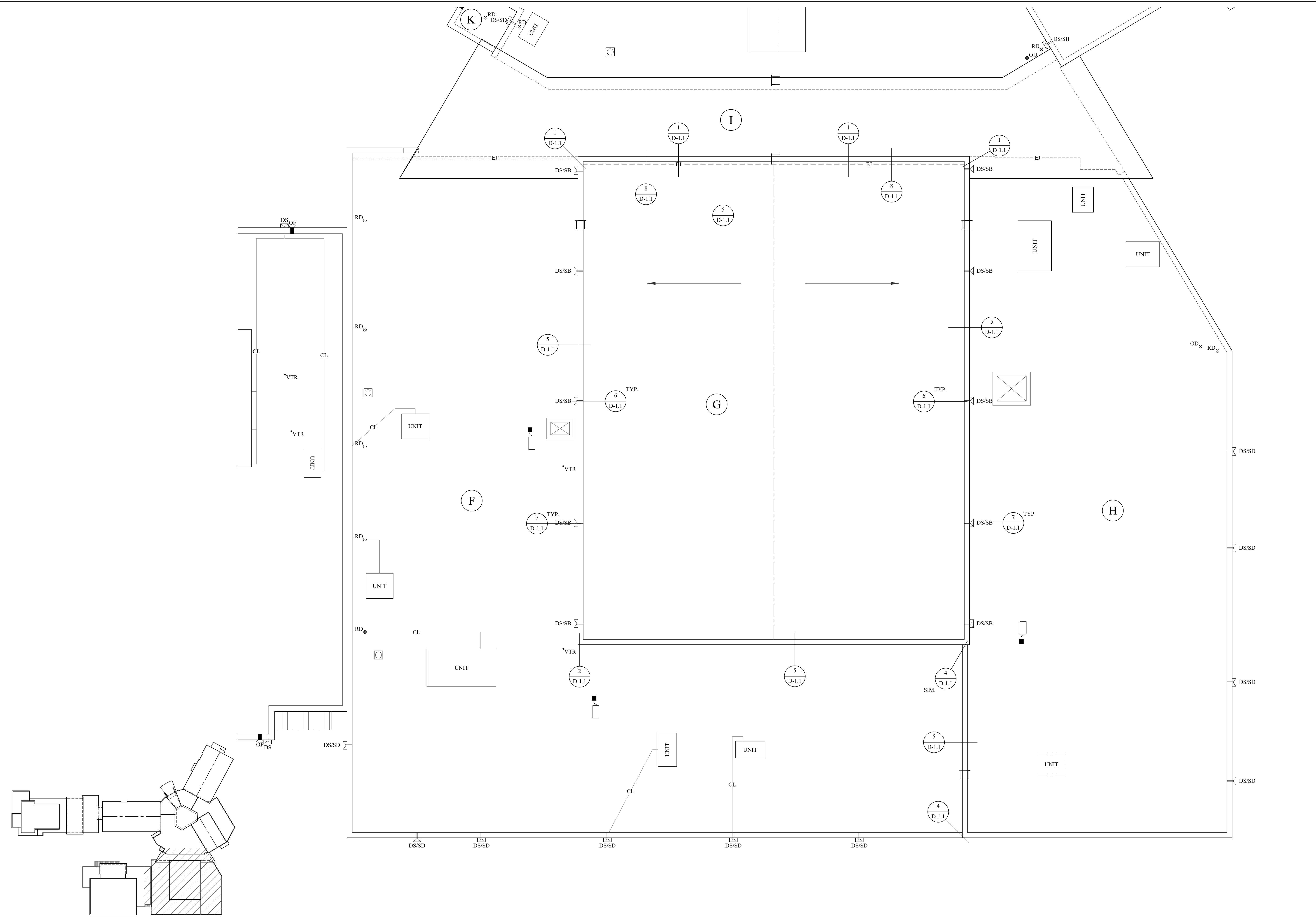
PROJECT NUMBER: 2023-173

CONSTRUCTION DOCUMENTS

DATE: 07/11/2023

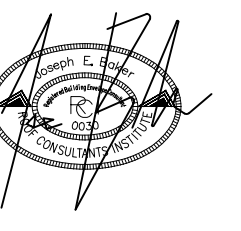
ROOF REPAIR PLAN

R-1.2



KEY PLAN

2 ROOF REPAIR PLAN
R-1.2 1" = 10'



DESIGNED: JB

BEAUFORT COUNTY SCHOOL DISTRICT
WHALE BRANCH EARLY COLLEGE HIGH
BUILDING ENVELOPE REPAIRS

WM PROJECT NO.: 2023-173
169 DETOUR ROAD
SEABROOK, SC 29940



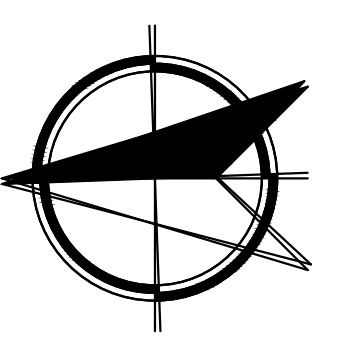
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CHAPIN, SOUTH CAROLINA
EMAIL: CHRIS@WMBECONSULTANTS.COM
EMAIL: DANIEL@WMBECONSULTANTS.COM

CHARLESTON AREA OFFICE
226 N. LIVE OAK DRIVE
MONCK'S CORNER, SOUTH CAROLINA
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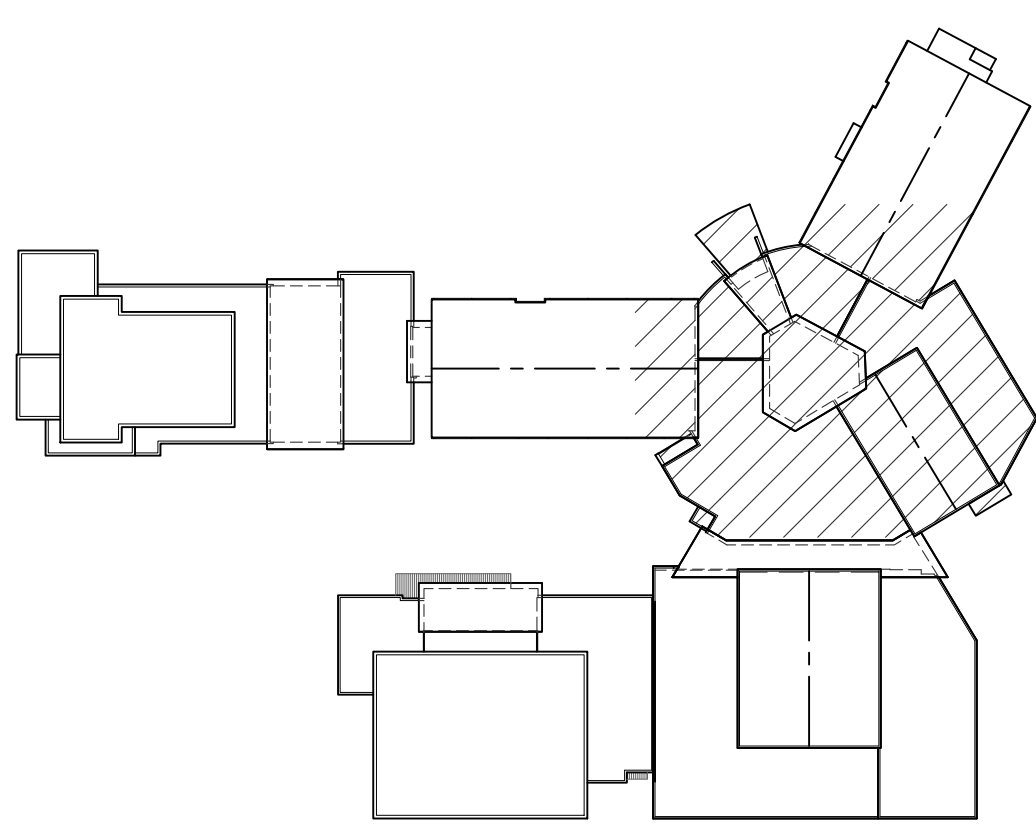
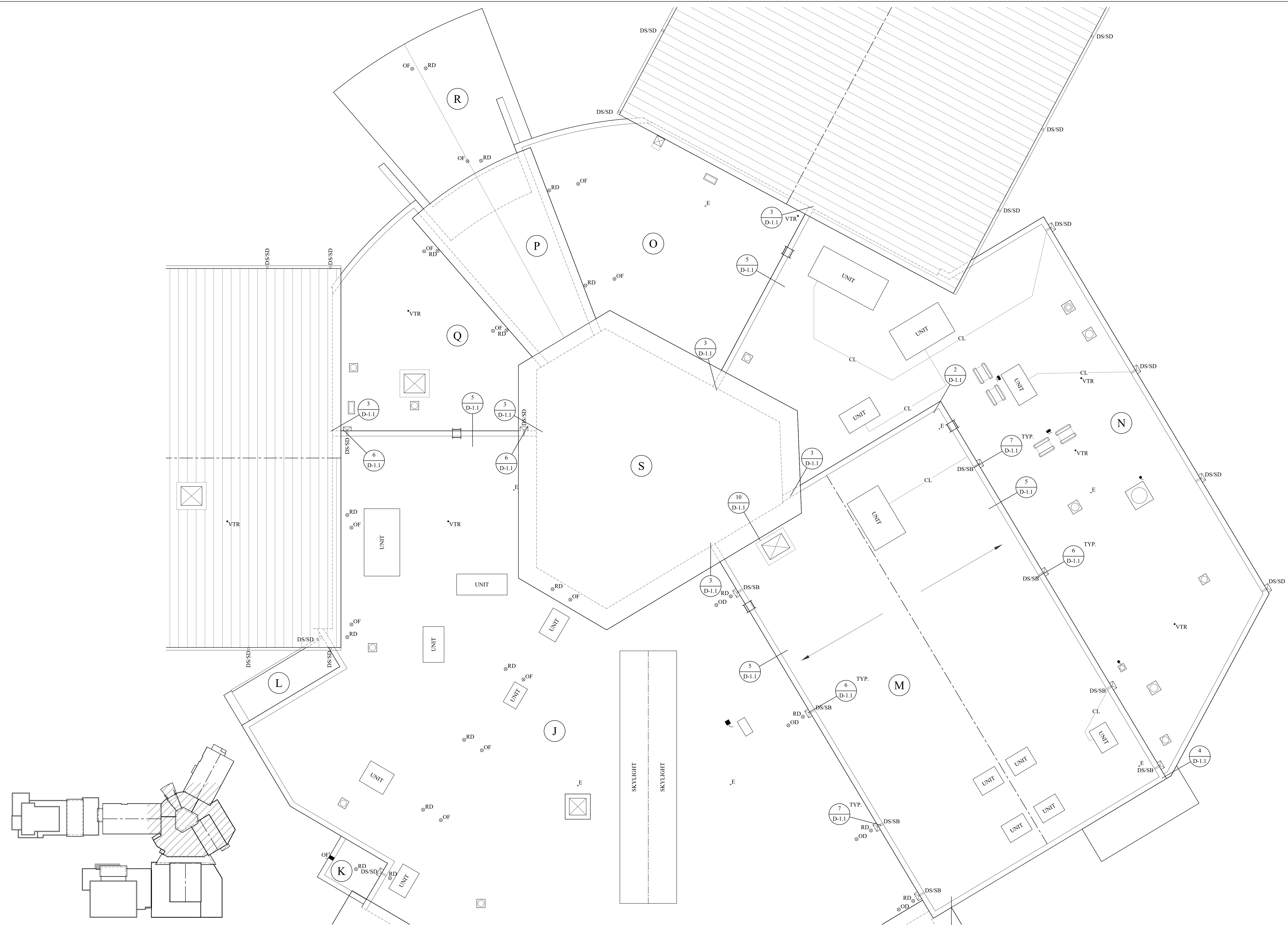
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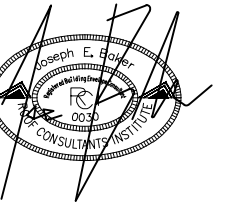
ROOF REPAIR PLAN

R-1.3



KEY PLAN

3 ROOF REPAIR PLAN
R-1.3 1" = 10'



DESIGNED: JB

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WM PROJECT NO.: 2023-173

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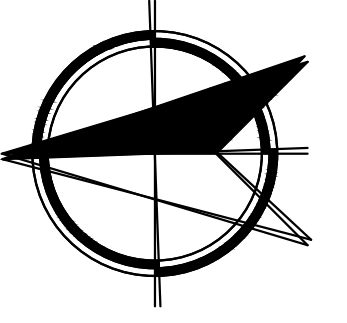
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EMAIL: DANIEL@WMBECONSULTANTS.COM

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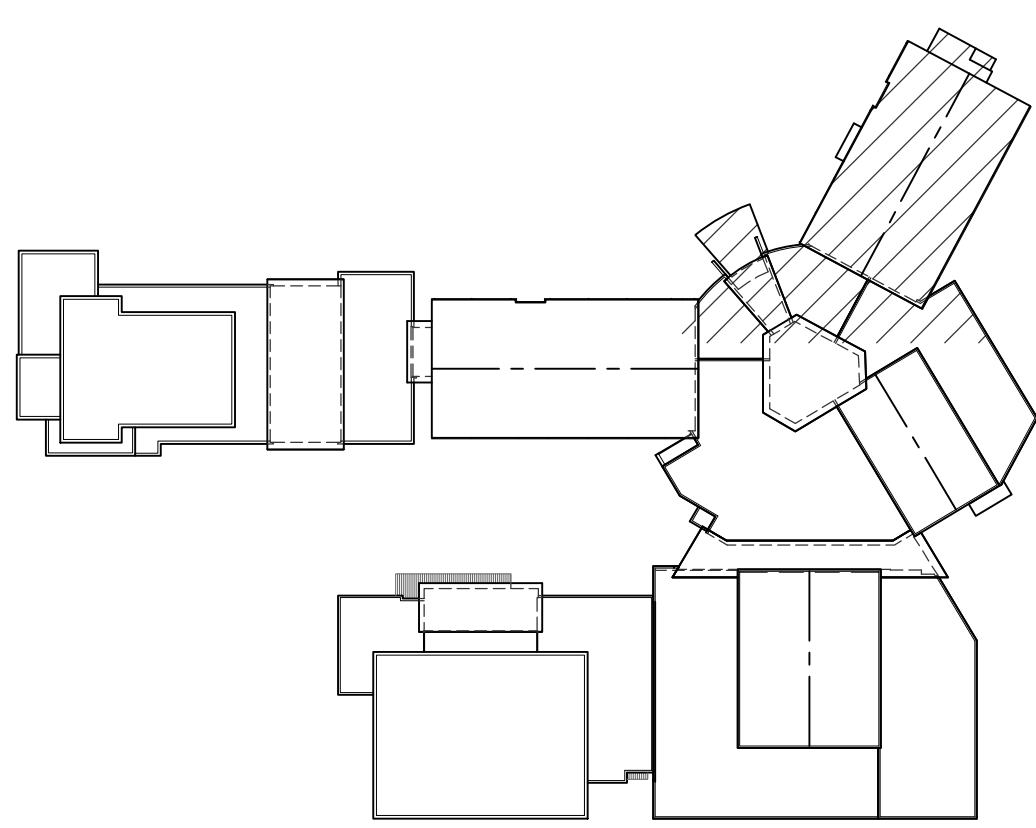
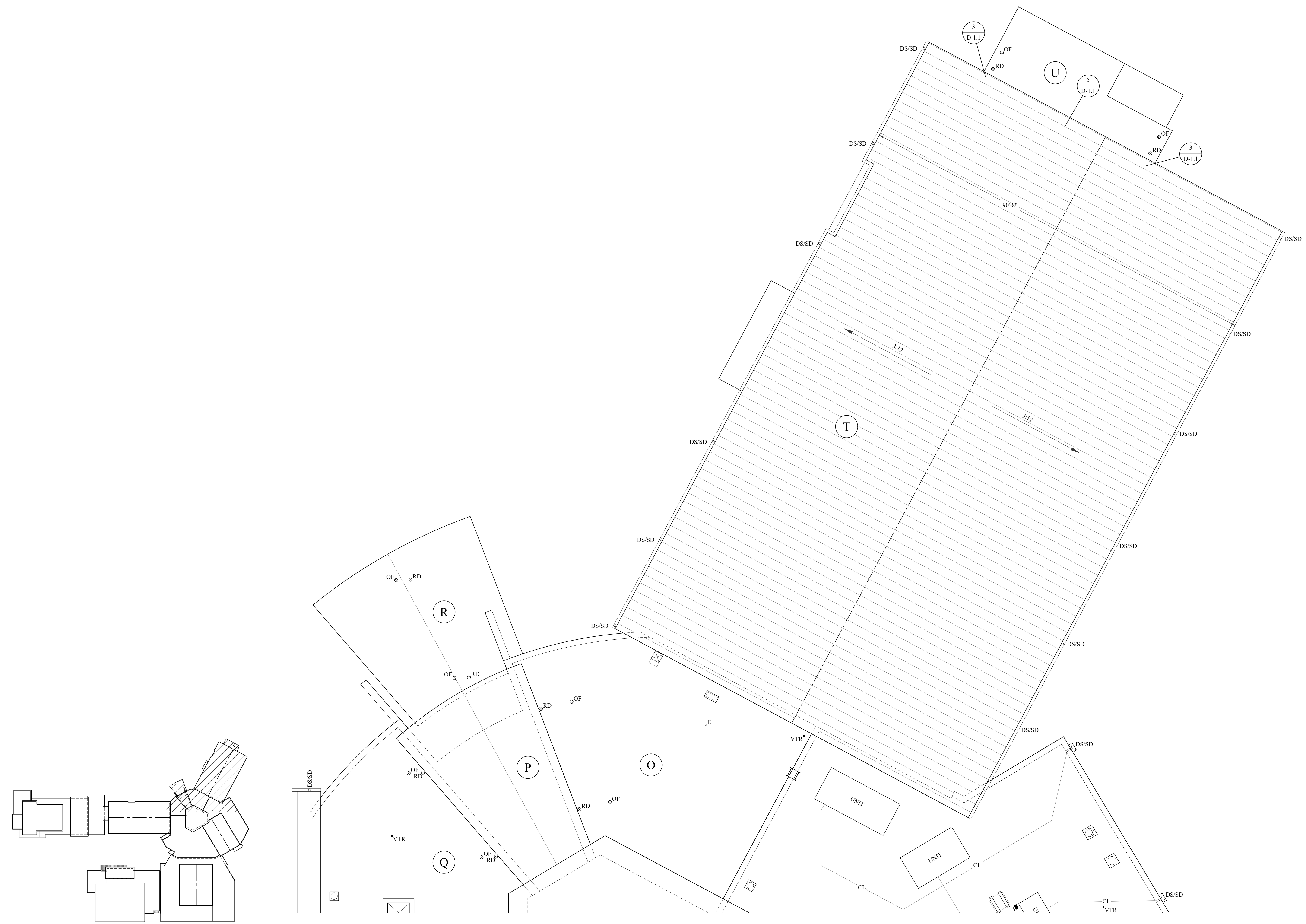
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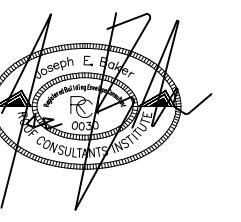
ROOF REPAIR PLAN

R-1.4



KEY PLAN

4
R-1.4 ROOF REPAIR PLAN
1" = 10"



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CHARLESTON AREA OFFICE

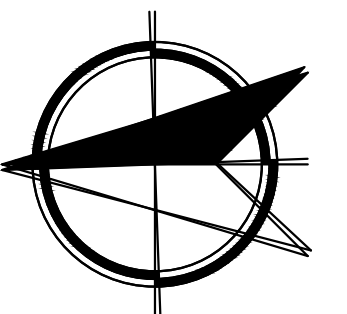
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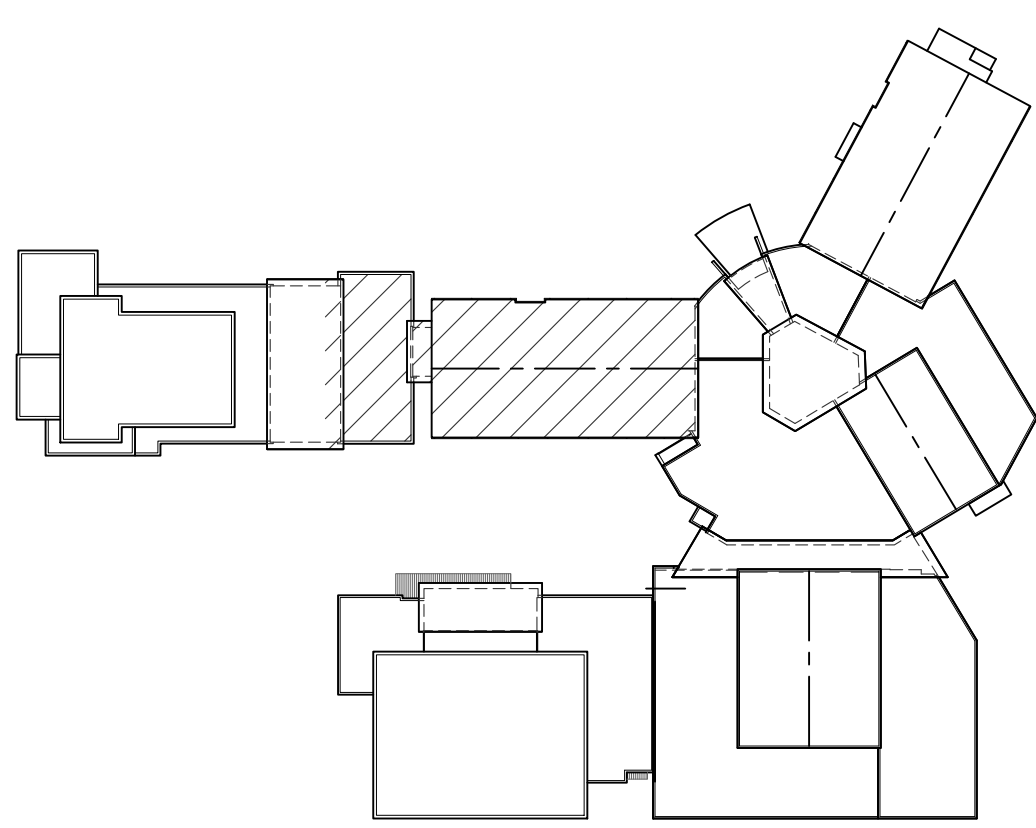
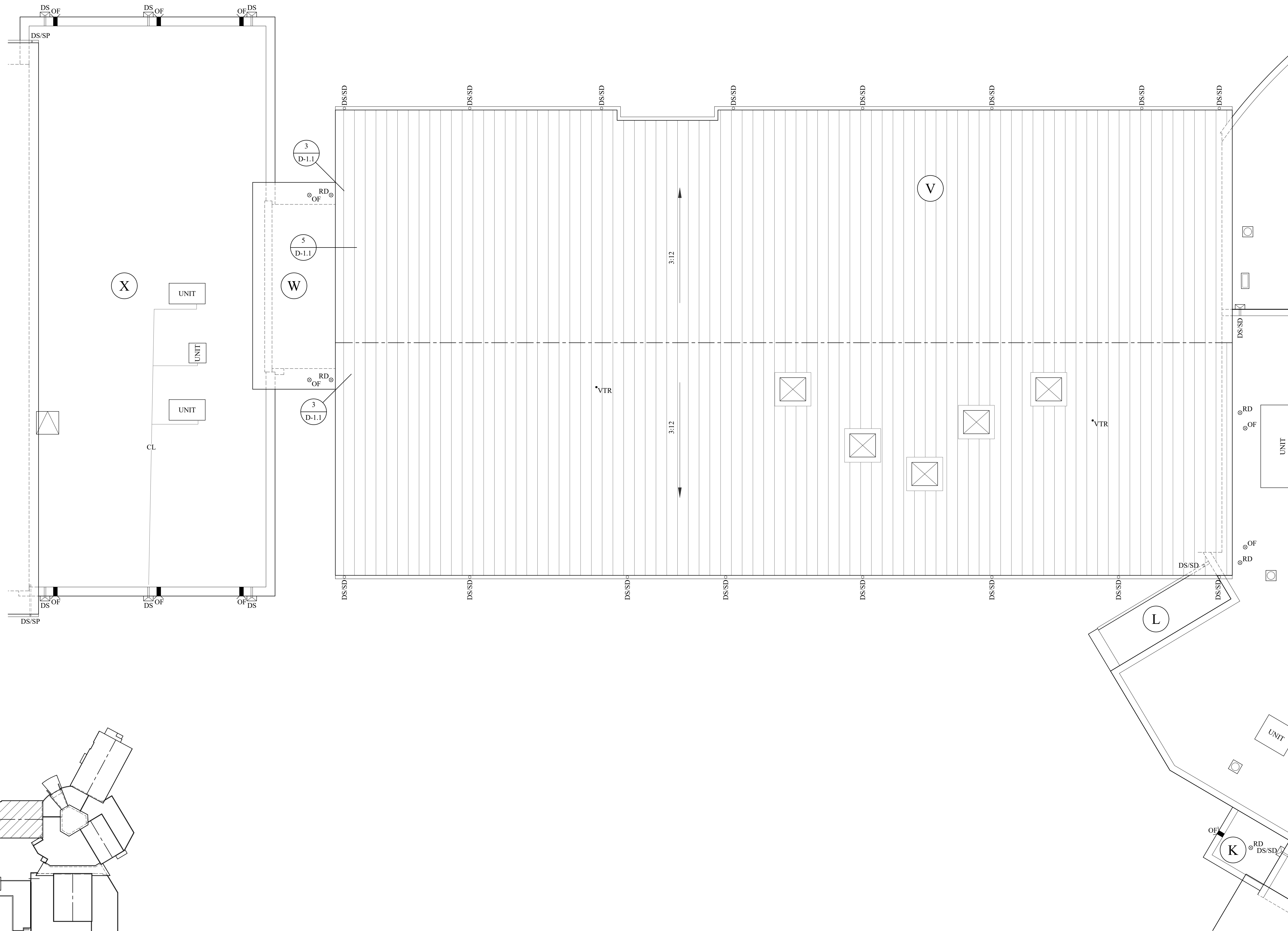
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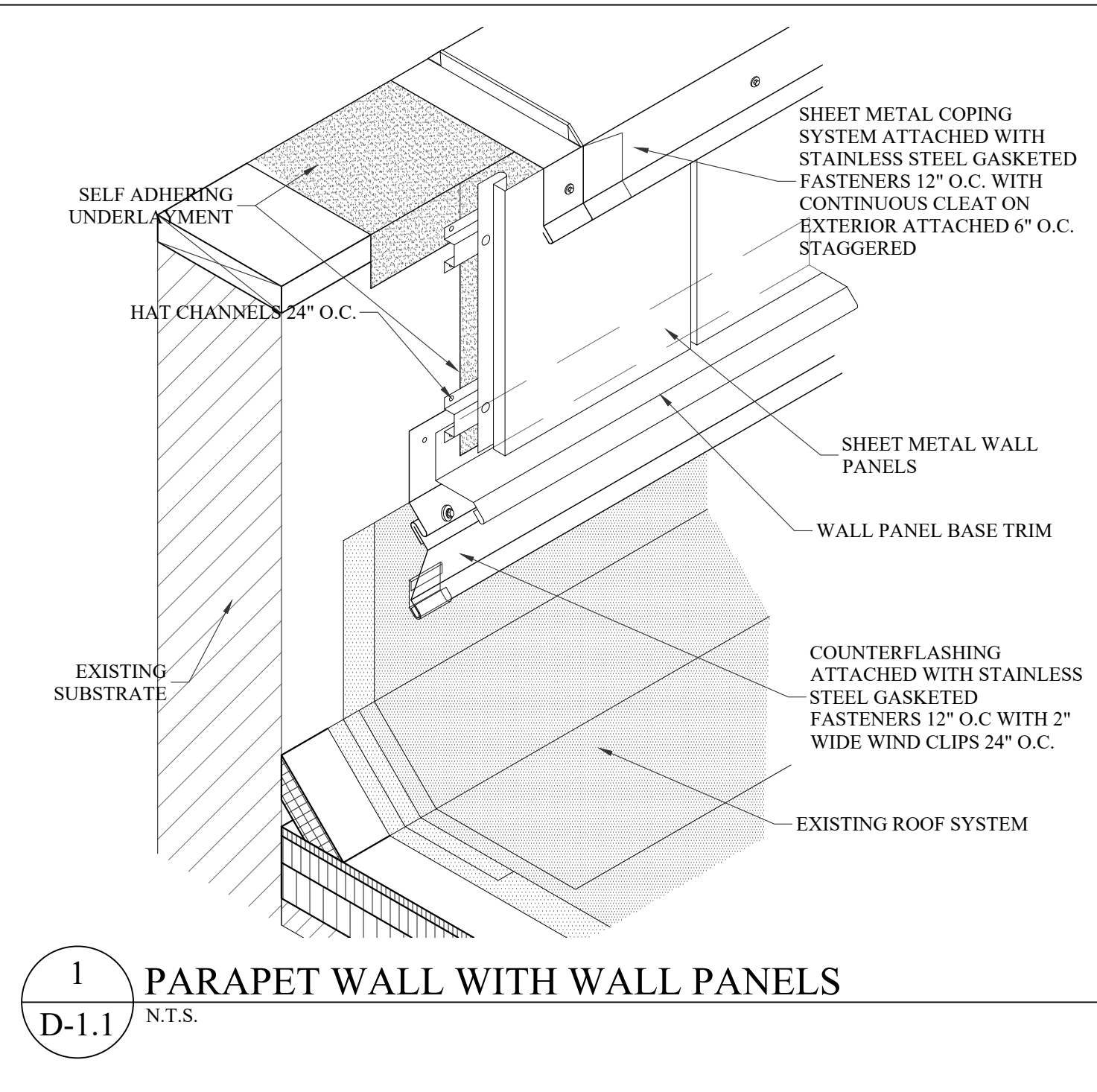
ROOF REPAIR PLAN

R-1.5

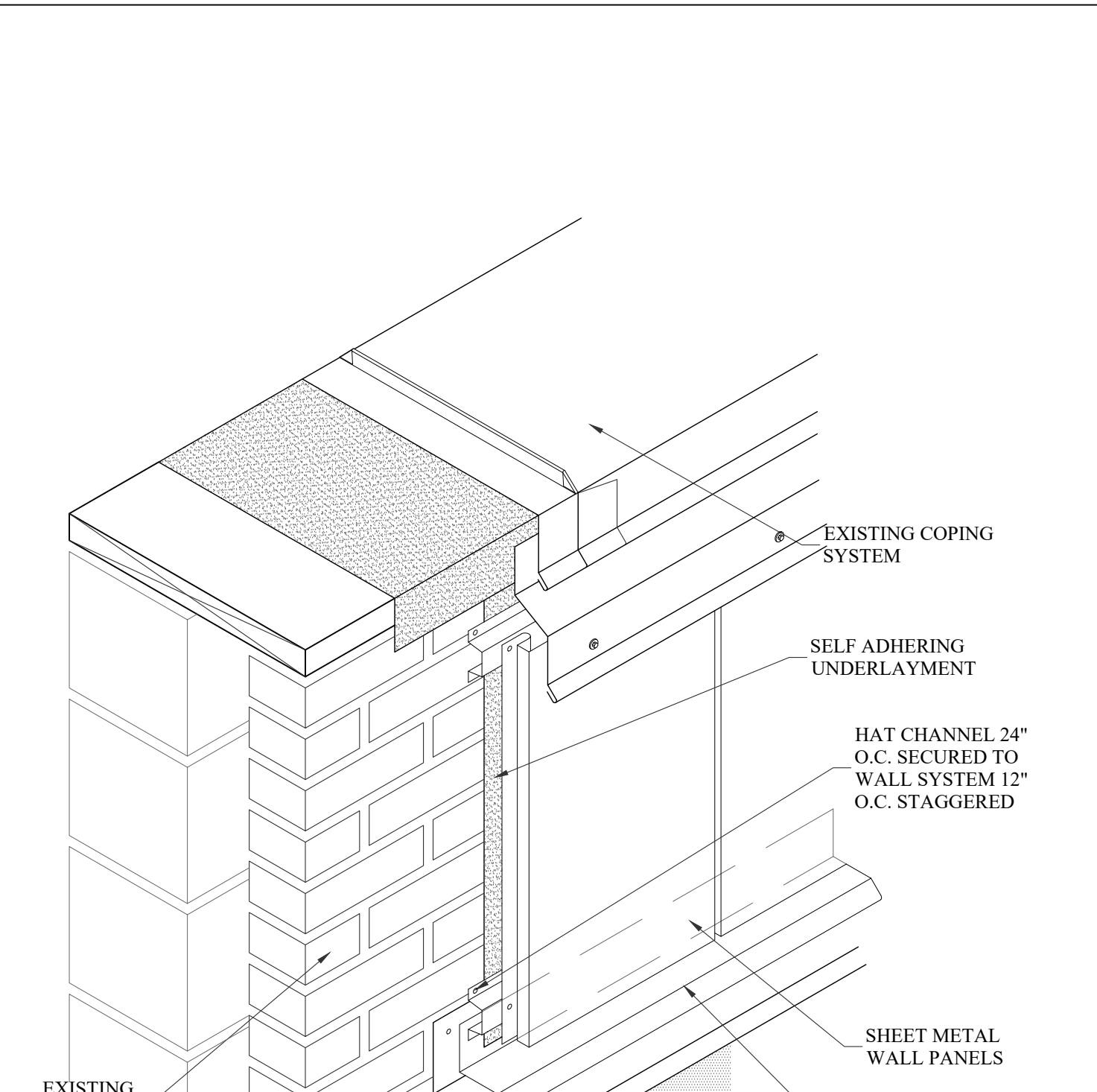


KEY PLAN

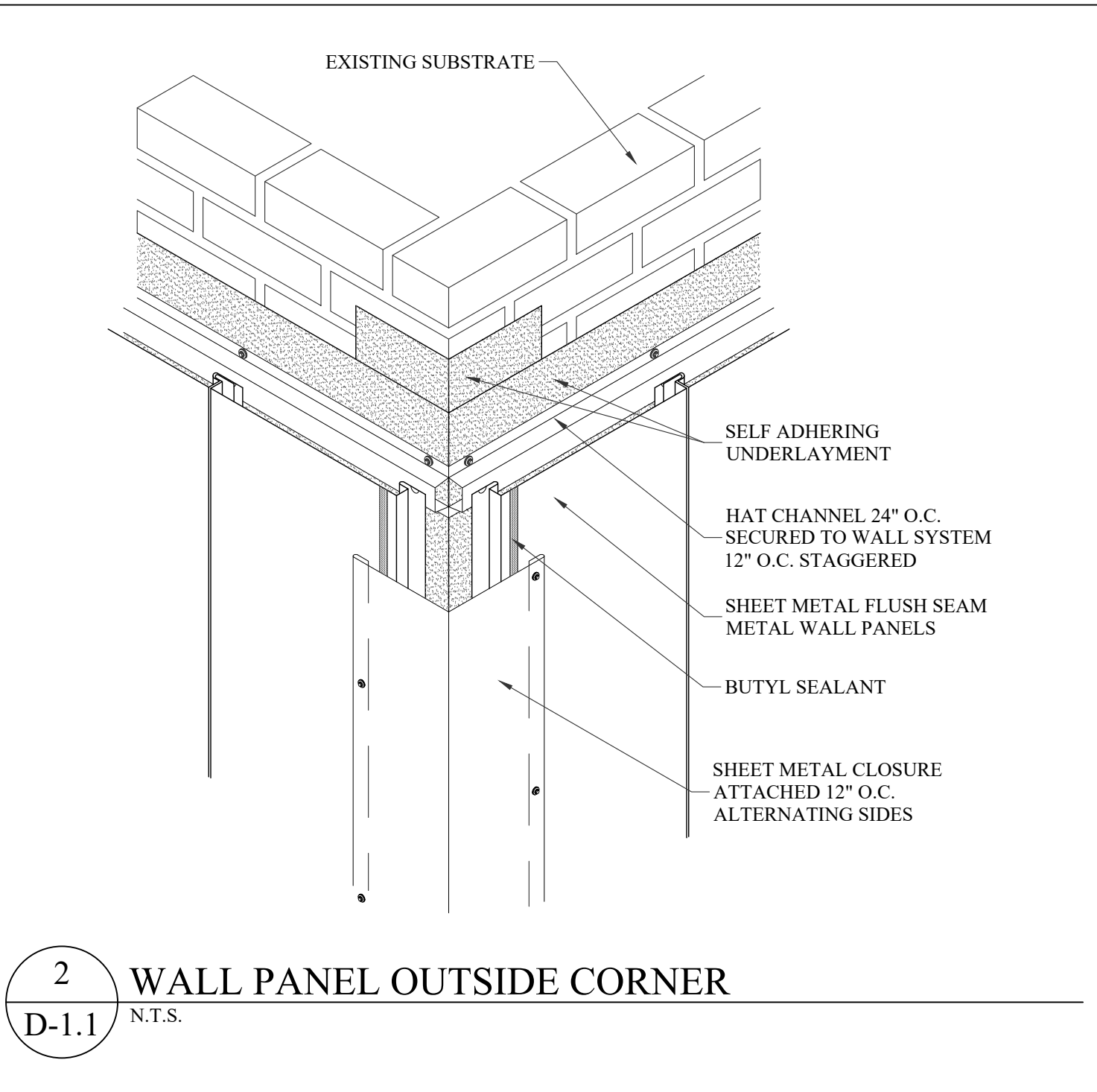
5
R-1.5 ROOF REPAIR PLAN
1" = 10'



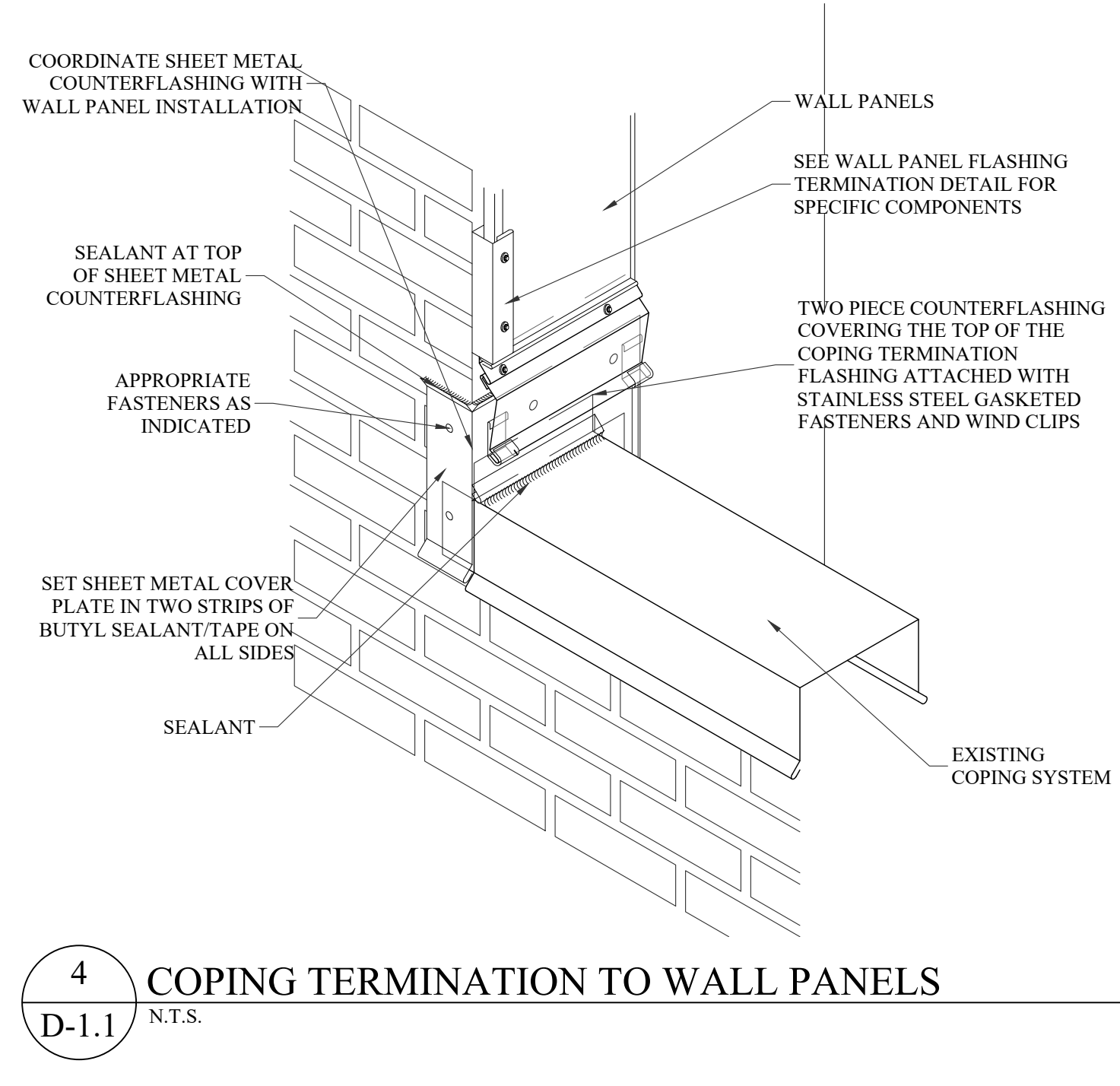
1 PARAPET WALL WITH WALL PANELS
D-1.1 N.T.S.



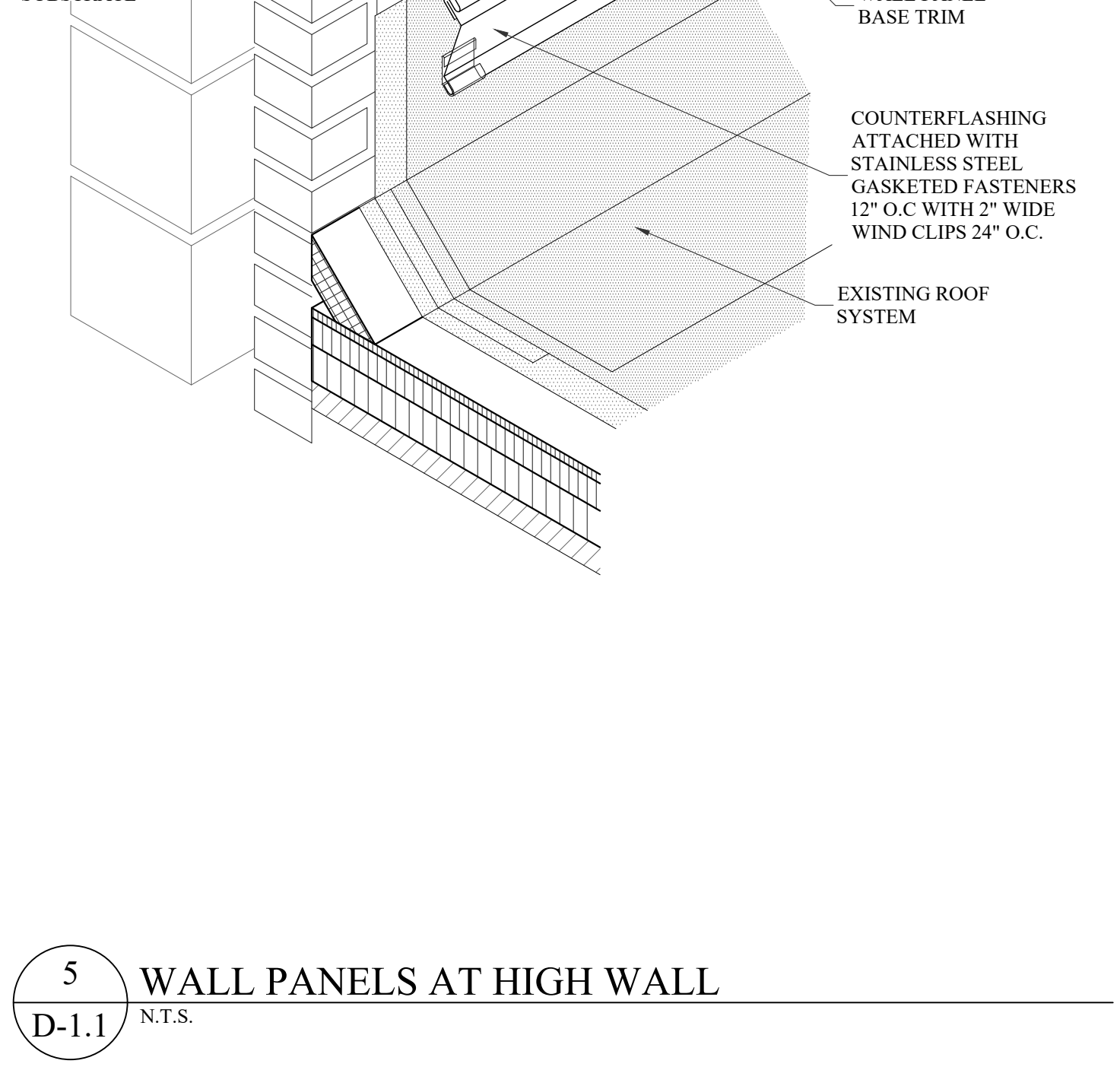
2 WALL PANEL OUTSIDE CORNER
D-1.1 N.T.S.



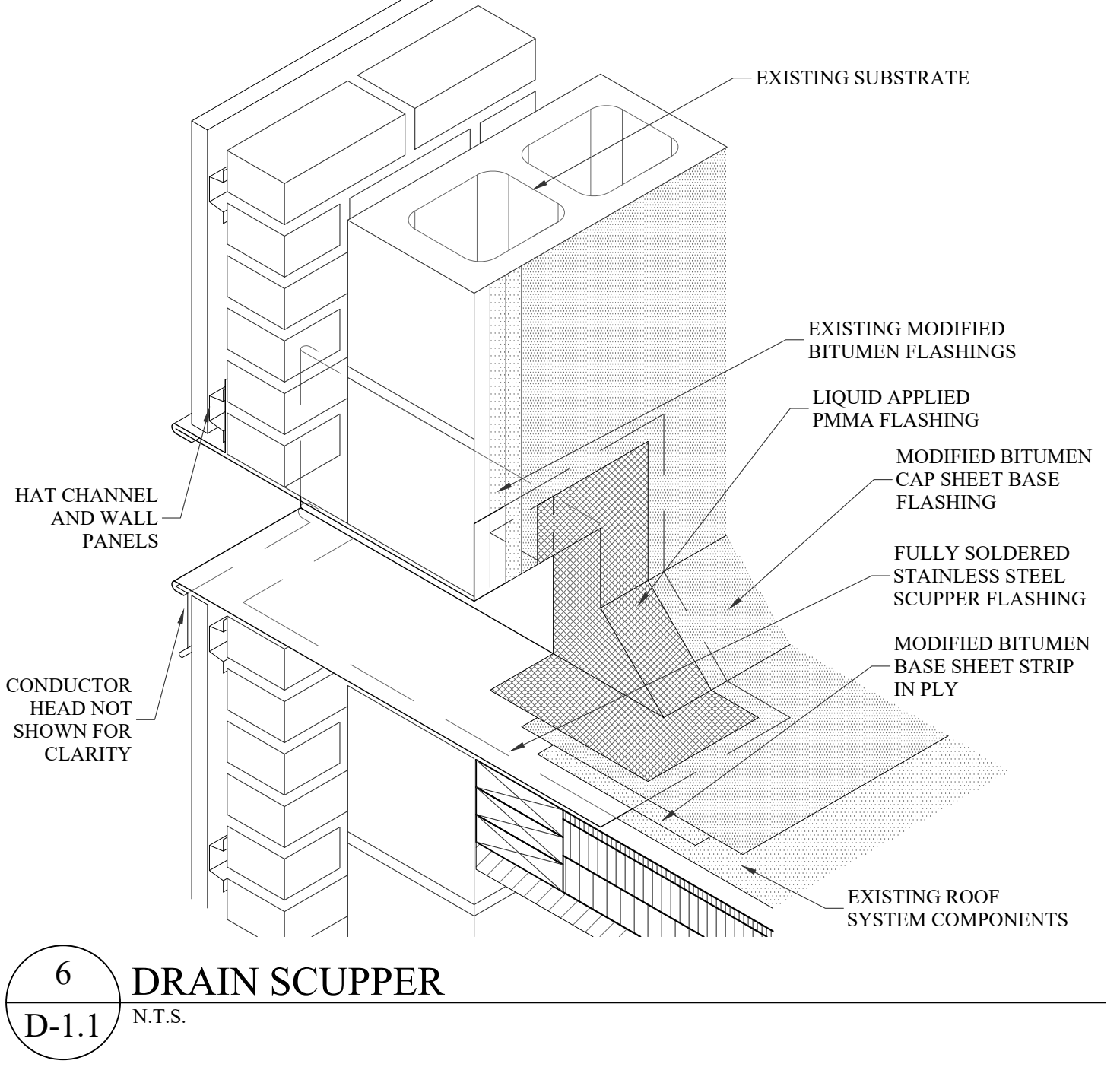
3 WALL PANEL END CLOSURE
D-1.1 N.T.S.



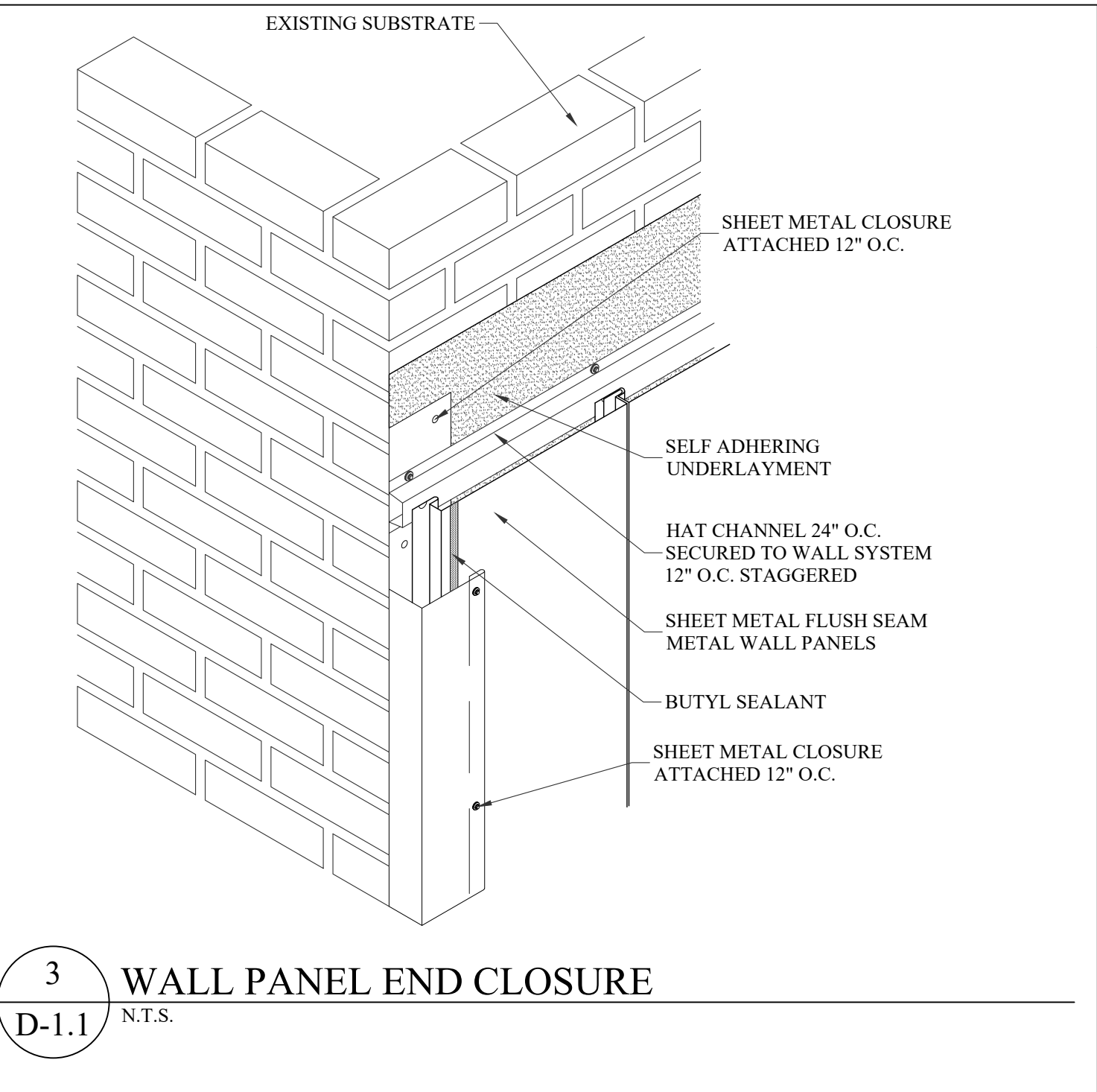
4 COPING TERMINATION TO WALL PANELS
D-1.1 N.T.S.



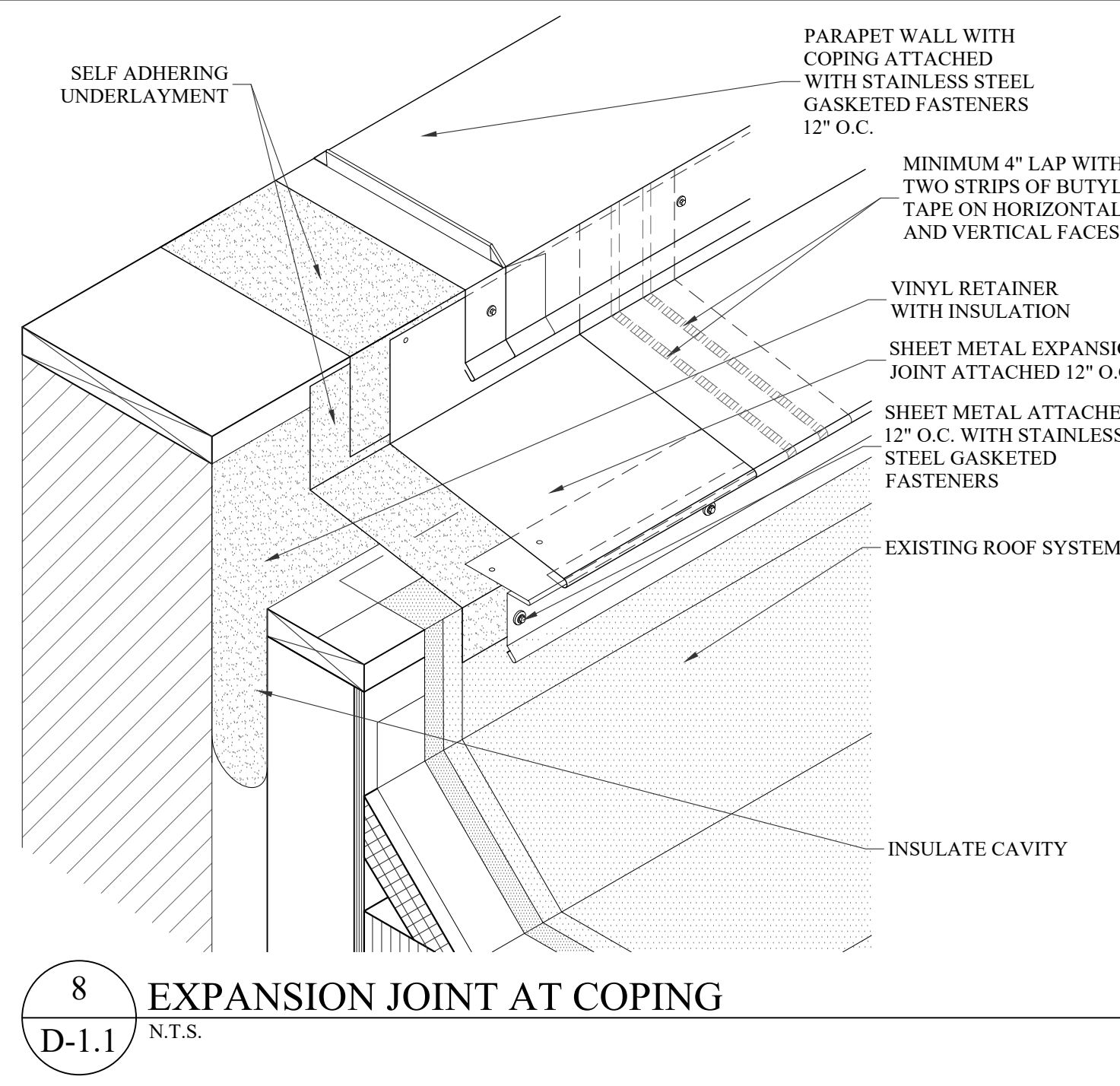
5 WALL PANELS AT HIGH WALL
D-1.1 N.T.S.



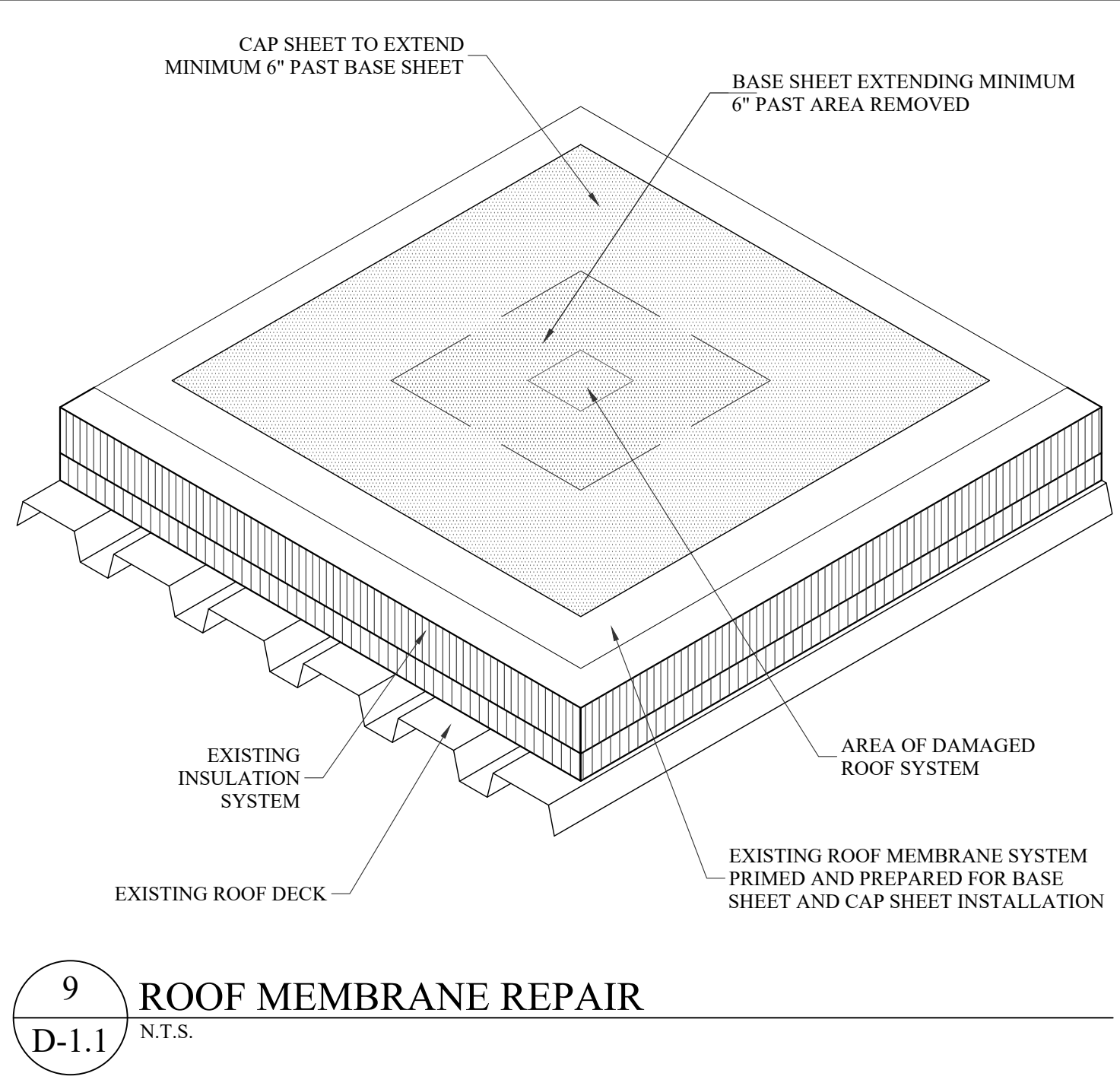
6 DRAIN SCUPPER
D-1.1 N.T.S.



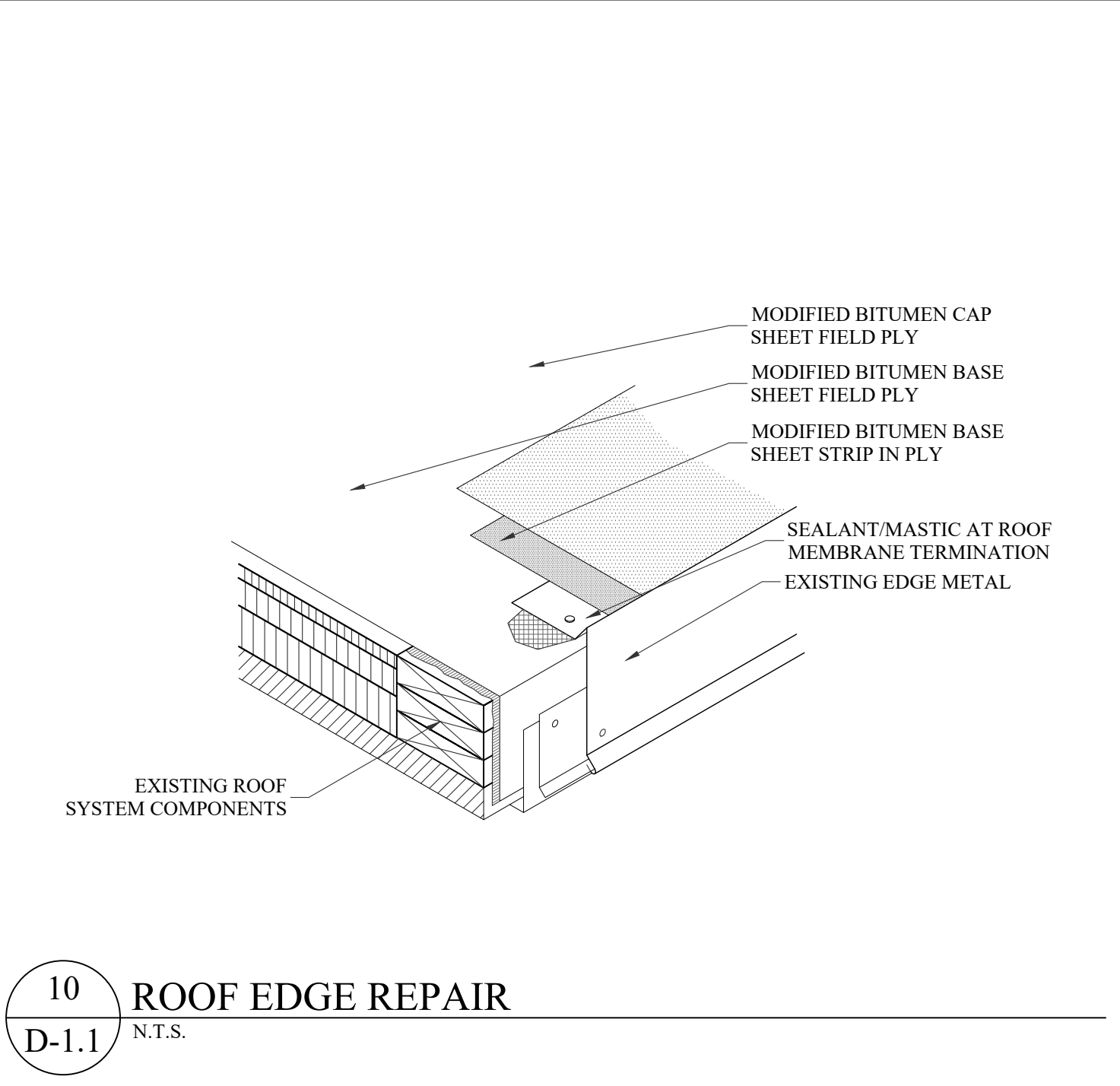
7 CONDUCTOR HEAD AND DOWNSPOUT
D-1.1 N.T.S.



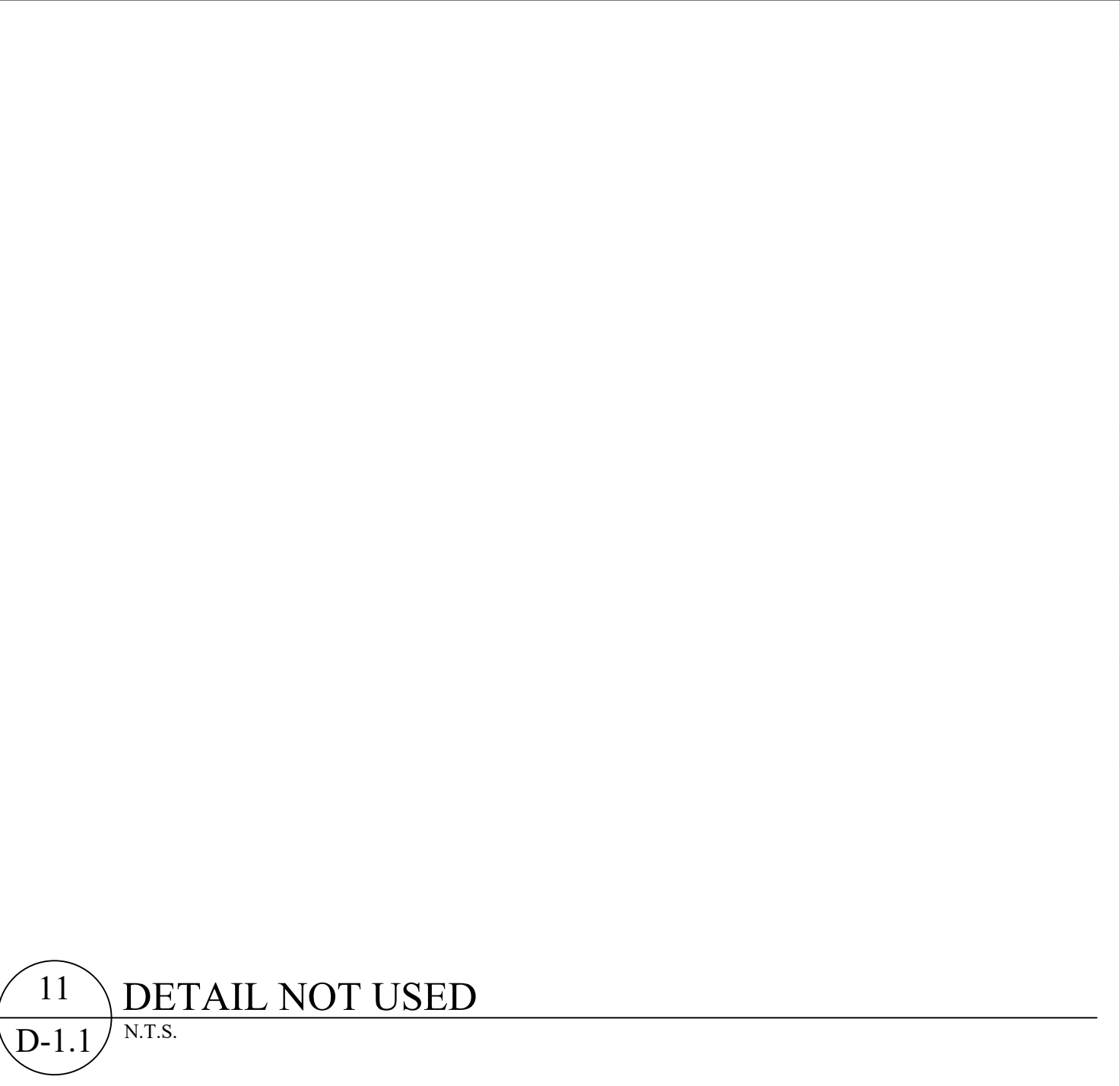
8 EXPANSION JOINT AT COPING
D-1.1 N.T.S.



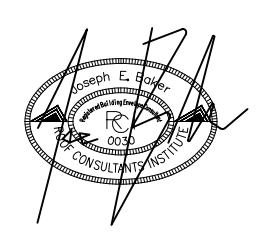
9 ROOF MEMBRANE REPAIR
D-1.1 N.T.S.



10 ROOF EDGE REPAIR
D-1.1 N.T.S.



11 DETAIL NOT USED
D-1.1 N.T.S.


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DETAILS

D-1.1