SECTION 07 53 23 - ETHYLENE-PROPYLENE-DIENE-MONOMER (EPDM) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fully-adhered ethylene-propylene-diene-terpolymer (EPDM) roofing system.
2. Accessory roofing materials.

3. Roof insulation.
4. Insulation accessories and cover board.

5. Walkway pads.

B. Related Requirements:

1. Section 06 10 00 "Rough Carpentry for wood nailers, curbs, and blocking.

2. Section 07 01 50.19 “Preparation for Re-Roofing” for coordination with existing historic roof pavers to remain

3. Section 07 14 16 “Cold Fluid-Applied Waterproofing” for coordination with EPDM installation.
4. Section 07 62 00 "Sheet Metal Flashing and Trim" for metal roof flashings and counterflashings.
5. Section 07 92 00 "Joint Sealants" for joint sealants, joint fillers, and joint preparation.
6. Section 22 14 23 "Storm Drainage Piping Specialties" for roof drains.

1.2 DEFINITIONS

A. Roofing Terminology: Definitions in ASTM D1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to work of this Section.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Roofing Conference: Before starting roof removal, conduct conference at Project site.

1. Meet with Contracting Officer, roofing Installer, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

4. Review deck substrate requirements for conditions and finishes, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. For insulation and roof system component fasteners, include copy of SPRI's Directory of Roof Assemblies listing.

B. Shop Drawings: Include roof plans, sections, details, and attachments to other work, including the following:

1. Layout and thickness of insulation.
2. Base flashings and membrane terminations.
3. Flashing details at penetrations.

4. Tapered insulation, thickness, and slopes.
.

C. Samples for Verification: For the following products:

1. Roof membrane and flashings of color required.
2. Walkway pads, of color required.

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

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and manufacturer.

B. Manufacturer Certificates:

1. Performance Requirement Certificate: Signed by roof membrane manufacturer, certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

a. Submit evidence of complying with performance requirements.

2. Special Warranty Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.

C. Product Test Reports: For components of roof membrane and insulation, for tests performed by a qualified testing agency, indicating compliance with specified requirements.

D. Evaluation Reports: For components of roofing system, from ICC-ES.

E. Field Test Reports.

F. Field quality-control reports.

G. Sample Warranties: For manufacturer's special warranties.

1.6 CLOSEOUT SUBMITTALS

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

1.7 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturers: A qualified manufacturer that is listed in SPRI's Directory of Roof Assemblies for roofing system identical to that used for this Project.
2. Installers: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.

1. Special warranty includes roof membrane, base flashings, roof insulation, fasteners, and other components of roofing system.

2. Warranty Period: 30 years from Date of Substantial Completion.

B. 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, and walkway products, 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 base 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. Roofing and flashings to remain watertight.

1. Accelerated Weathering: Roof membrane 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. SPRI's Directory of Roof Assemblies 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 SPRI's Directory of Roof Assemblies for roof assembly identical for that specified for this Project.

1. Wind Uplift Load Capacity: 90 psf.

D. ENERGY STAR Listing: Roofing system to be listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.

E. 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.

F. 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.

2.2 ETHYLENE-PROPYLENE-DIENE-TERPOLYMER (EPDM) ROOFING

A. EPDM Sheet: ASTM D4637, non-reinforced EPDM sheet with factory-applied tape for fully adhered roofing systems.

1. Manufacturers: Subject to compliance with requirements, provide materials from Carlisle Syntec Systems or equal.

2. Thickness: 90 mils, nominal. Unreinforced.

3. Exposed Face Color: White.

4. Standard Widths: 10’-0”

5. Standard Lengths: 100’-0”

6. Source Limitations: Unless otherwise approved by the membrane manufacturer, all products (including insulation, fasteners, and edgings) must be manufactured and supplied by the roofing system manufacturer and covered by the warranty. Manufacturer of roof membrane shall also manufacture all polymeric components for the roofing system, including but not limited to membrane, adhesives, primers, flashings, caulks and tapes. .

2.3 ACCESSORY ROOFING MATERIALS

A. General: Accessory materials recommended by roofing system manufacturer for intended use and compatible with other roofing components.

1. Adhesive and Sealants: Comply with VOC limits of authorities having jurisdiction.

B. Sheet Flashing: 90-mil- thick EPDM, partially cured or cured, according to application.

C. Protection Sheet: Epichlorohydrin or neoprene nonreinforced flexible sheet, 55 to 60 mils thick, recommended by EPDM manufacturer for resistance to hydrocarbons, non-aromatic solvents, grease, and oil.

D. Slip Sheet: Manufacturer's standard, of thickness required for application.

E. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.

F. Bonding Adhesive: A high-strength, yellow-colored, synthetic rubber adhesive used for bonding Sure-White EPDM membranes to various surfaces, as recommended by roof membrane manufacturer..

G. Seaming Material: Manufacturer's standard, synthetic-rubber polymer primer and 3-inch- wide minimum, butyl splice tape with release film.

H. Lap Sealant: Manufacturer's standard, single-component sealant, colored to match membrane roofing.

I. Water Cutoff Mastic: Manufacturer's standard butyl mastic sealant.

J. Metal Termination Bars: Manufacturer's standard, predrilled stainless steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.

K. Metal Battens: Manufacturer's standard, aluminum-zinc-alloy-coated, approximately 1 inch wide by 0.05 inch thick, prepunched.

L. Ballast Retaining Bar: Perimeter securement system consisting of a slotted extruded-aluminum retention bar with an integrated compression fastening strip.

1. Fasteners: 1-1/2-inch stainless steel fasteners with neoprene washers.

M. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, molded pipe boot flashings, preformed inside and outside corner sheet flashings, reinforced EPDM securement strips, T-joint covers, in-seam sealants, termination reglets, cover strips, and other accessories.

1. Provide white flashing accessories for white EPDM membrane roofing.

2.4 ROOF INSULATION

A. General: Preformed roof insulation boards manufactured or approved by EPDM roof membrane manufacturer, approved for use in SPRI's Directory of Roof Assemblies listed roof assemblies.

B. Insulation: ASTM 1289-06, Type II, Class 2 (109 psi max). Rigid insultation panel composed of a high-density, closed-cell polyisocyanurate foam core laminated to coated-glass fiber-mat facer for use as a cover board or recover board meeting requirements as follows:

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. Carlisle SecurShield HD Cover Board; Carlisle Construction Materials Company.

   .

2. Size: 48 by 96 inches.
3. Thickness: 2-1/2”.

C. Tapered Insulation: Provide factory-tapered insulation boards where required to meet minimum positive slope requirements for drainage.

1. Material: Match roof insulation.
2. Minimum Thickness: 1/4 inch.
3. Slope:

a. Roof Field: 1/4 inch per foot unless otherwise indicated on Drawings.
b. Saddles and Crickets: 1/2 inch per foot unless otherwise indicated on Drawings.

2.5 INSULATION ACCESSORIES AND COVER BOARD

A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with other roofing system components.

B. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:

1. Full-spread, spray-applied, low-rise, elongating, impact resistant two-component insulating urethane adhesive used to attach insultation.

2. Verify adhesives and sealants comply with the following limits for VOC content:

a. Plastic Foam Adhesives: 50 g/L.
b. Gypsum Board and Panel Adhesives: 50 g/L.
c. Multipurpose Construction Adhesives: 70 g/L.
d. Fiberglass Adhesives: 80 g/L.
e. Contact Adhesives: 80 g/L.
f. PVC Welding Compounds: 510 g/L.
g. Other Adhesives: 250 g/L.
h. Single-Ply Roof Membrane Sealants: 450 g/L.
i. Nonmembrane Roof Sealants: 300 g/L.
j. Sealant Primers for Nonporous Substrates: 250 g/L.
k. Sealant Primers for Porous Substrates: 775 g/L.

2.6 WALKWAYS

A. Flexible, Pressure-Sensitive Walkway Pads: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads, approximately 3/16 inch thick and acceptable to roofing system manufacturer, with Factory-Applied Tap on the underside of the walkway.

1. Size: Approximately 30 by 30 inches.
2. Color: Sure-Seal cool gray, contrasting with roof membrane.

PART 3 - EXECUTION

3.1 EXAMINATION

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

1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

3. 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 not less than three test probes.
b. Submit test reports within 24 hours of performing tests.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing system installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 INSTALLATION OF ROOFING, GENERAL

A. Install roofing system according to roofing system manufacturer's written instructions, SPRI's Directory of Roof Assemblies assembly requirements, and FM Global Property Loss Prevention Data Sheet 1-29.

B. 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.

3.4 INSTALLATION OF INSULATION

A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at end of workday.

B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.

C. Installation Over Existing Concrete Paver Deck:

1. Install base layer of insulation with joints staggered not less than 24 inches in adjacent rows.

   a. Where installing composite and noncomposite insulation in two or more layers, install noncomposite board insulation for bottom layer and intermediate layers, if applicable, and install composite board insulation for top layer.
   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 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.

      1) Trim insulation so that water flow is unrestricted.

   e. Fill gaps exceeding 1/4 inch with insulation.
   f. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

   g. Adhere base layer of insulation to roof deck according to SPRI's Directory of Roof Assemblies listed roof assembly requirements for specified Wind Uplift Load Capacity 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. Install upper layers of insulation and tapered insulation with joints of each layer offset not less than 12 inches from previous layer of insulation.

   a. Staggered end joints within each layer not less than 24 inches in adjacent rows.

   b. Install with long joints continuous and with end joints staggered not less than 12 inches in adjacent rows.
   c. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
   d. Make joints between adjacent insulation boards not more than 1/4 inch in width.
   e. 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 is unrestricted.

   f. Fill gaps exceeding 1/4 inch with insulation.
   g. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

   h.

i. Adhere each layer of insulation to substrate using adhesive according to SPRI's Directory of Roof Assemblies listed roof assembly requirements for specified Wind Uplift Load Capacity 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.

3.5 INSTALLATION OF ADHERED ROOF MEMBRANE

A. Adhere roof membrane over area to receive roofing according to roofing system manufacturer's written instructions.

B. Unroll membrane roof membrane and allow to relax before installing.

C. Start installation of roofing in presence of roofing system manufacturer's technical personnel.

D. Accurately align roof membrane, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

E. Bonding Adhesive: Apply to substrate 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.

F. In addition to adhering, mechanically fasten roof membrane securely at terminations, penetrations, and perimeters if required by roofing system manufacturer.

G. Apply roof membrane with side laps shingled with slope of roof deck where possible.

H. Adhesive Seam Installation: Clean both faces of splice areas, apply splicing cement.

1. Firmly roll side and end laps of overlapping roof membrane to ensure a watertight seam installation.
2. Apply lap sealant and seal exposed edges of roofing terminations.
3. Apply a continuous bead of in-seam sealant before closing splice if required by roofing system manufacturer.

I. Repair tears, voids, and lapped seams in roof membrane that do not comply with requirements.

J. Spread sealant or mastic bed over deck-drain flange at roof drains, and securely seal roof membrane in place with clamping ring.

3.6 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 splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet flashing terminations.

E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.7 INSTALLATION OF WALKWAYS

A. Flexible Walkways: Install walkway products according to manufacturer's written instructions.

1. Install flexible walkways at the indicated locations:

2. Provide 6-inch clearance between adjoining pads.
3. Adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.8 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to inspect substrate conditions, surface preparation, roof membrane application, sheet flashings, protection, and drainage components, and to furnish reports to Contracting Officer.

B. Perform one of the following tests:

1. Flood Testing: Flood test each roofing area for leaks, according to recommendations in ASTM D5957, after completing roofing and flashing. Install temporary containment assemblies, plug or dam drains, and flood with potable water.

a. 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.

b. Flood each area for 24 hours.
c. 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.

d. Testing agency to prepare survey report indicating locations 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. After infrared scan, locate specific areas of leaks by electrical capacitance/impedance testing or nuclear hydrogen detection tests.
   b. 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.

   c. Testing agency to prepare survey report of initial scan indicating locations of entrapped moisture, if any.

3. Electrical Capacitance/Impedance Testing: Testing agency surveys entire roof area for entrapped water within roof assembly according to ASTM D7954/D7954M.

   a. 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.

   b. Testing agency to prepare survey report 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.

3.9 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction 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.

B. 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.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.10 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:
2. Owner Address:
3. Building Name/Type:
4. Building Address:
5. Area of Work:
6. Acceptance Date: _____.
7. Warranty Period:
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 150 mph;
   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.
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.

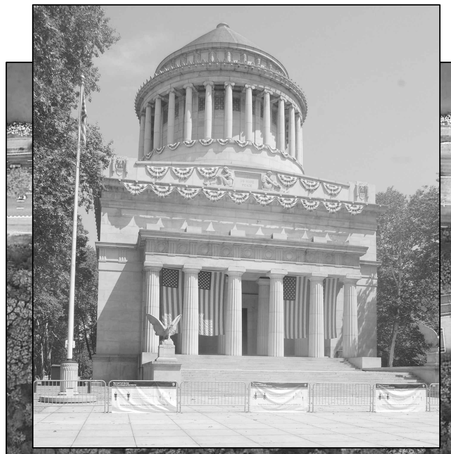
E. IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____, _____.

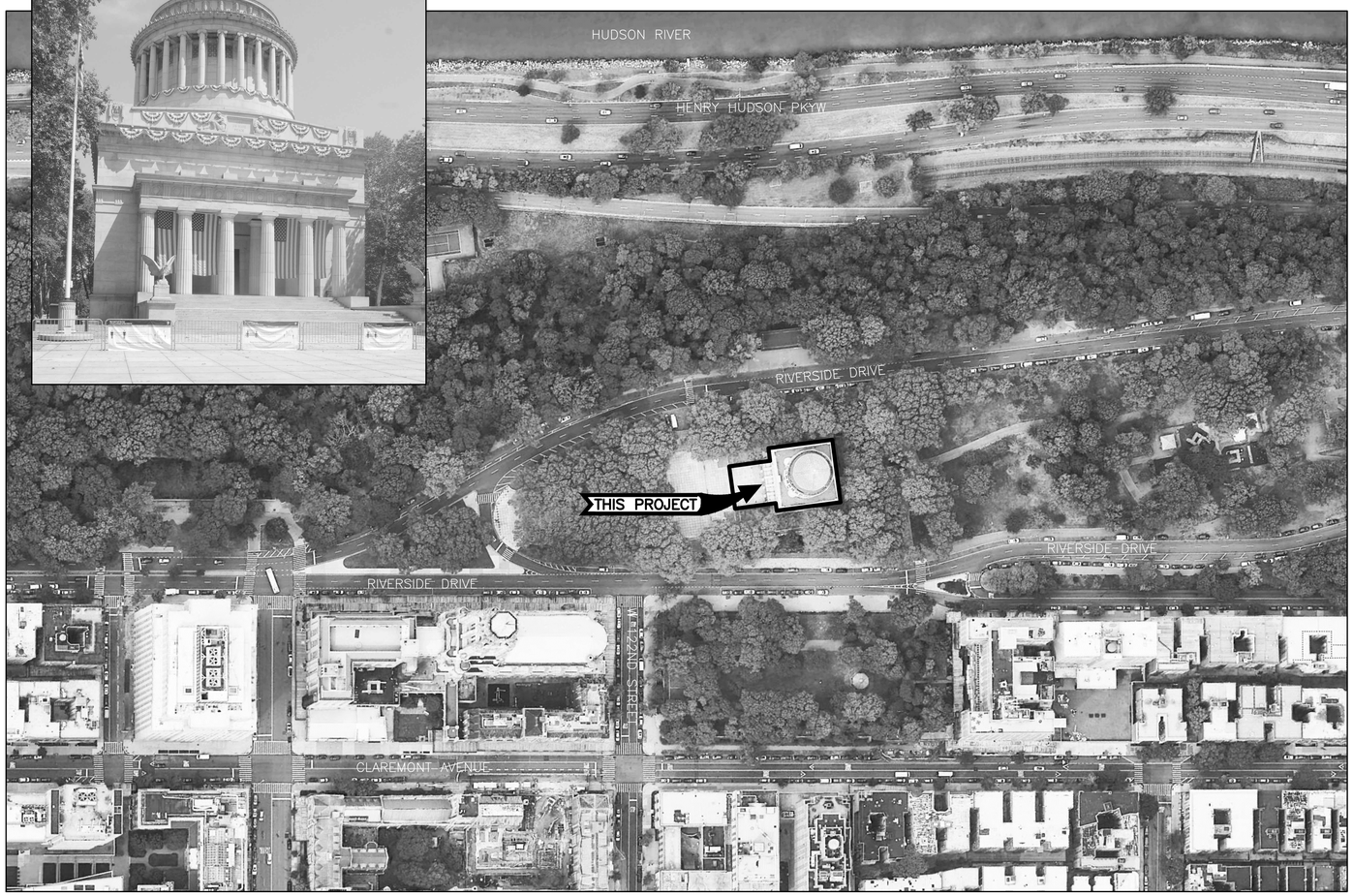
1. Authorized Signature: _____.
2. Name: _____.
3. Title: _____.

END OF SECTION 07 53 23

GENERAL GRANT NATIONAL MEMORIAL
NEW YORK, NEW YORK

247283 REPLACE EPDM ROOF





SITE LOCATION PLAN

DRAWING INDEX:

SHEET	Sheet Number	Sheet Title
1.	T1.0	COVER
2.	C1.0	SITE PLAN
3.	C1.1	TREE PROTECTION DETAILS
4.	G1	BUILDING ELEVATIONS – EXISTING CONDITIONS
5.	G2	BUILDING ELEVATIONS – EXISTING CONDITIONS
6.	G3	BUILDING SECTION – EXISTING CONDITIONS
7.	A1.0	GROUND FLOOR PLAN
8.	A1.1	ROOF PLANS
9.	A1.2	ROOF PLANS
10.	A1.3	ROOF PLANS
11.	A2.1	DETAIL ELEVATIONS
12.	A2.2	DETAIL ELEVATIONS
13.	A3.0	MEMBRANE ROOF DETAILS
14.	A3.1	MEMBRANE ROOF DETAILS

GENERAL NOTES:

1. THIS PROPERTY HAS BEEN DETERMINED TO POSSESS HISTORIC (E.G., ARCHITECTURAL, ENGINEERING, ARTISTIC) SIGNIFICANCE AND IS LISTED IN THE NATIONAL REGISTER OF HISTORIC PLACES. THE CONTRACTOR SHALL RECOGNIZE THAT ALL ASPECTS OF THE PROPERTY MAY POTENTIALLY CONTRIBUTE TO THIS SIGNIFICANCE AND THE CONTRACTOR SHALL NOT JUDGE THE RELATIVE SIGNIFICANCE OF ANY FEATURES NOR THE IMPACT OF ANY OR ALL PROPOSED WORK; THIS RESPONSIBILITY SHALL REST SOLELY WITH THE CONTRACTING OFFICER. CONSEQUENTLY, NO DEVIATIONS FROM THE CONTRACT DOCUMENTS SHALL BE PERFORMED AND NO FEATURES OR MATERIALS SHALL BE ALTERED, REMOVED, REUSED, OR TAKEN FROM THE PREMISES, WITHOUT THE WRITTEN APPROVAL OF THE CONTRACTING OFFICER AS BEING CONSISTENT WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. ALL WORK SHALL BE CONSISTENT WITH THE SECRETARY OF THE INTERIOR'S STANDARDS FOR THE TREATMENT OF HISTORIC PROPERTIES.
2. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXISTING CONDITIONS AND DIMENSIONS IN THE FIELD PRIOR TO COMMENCING WORK. DISCREPANCIES ARE TO BE RESOLVED WITH THE CONTRACTING OFFICER.
3. THE CONTRACTOR SHALL NOT SCALE DRAWINGS TO DETERMINE ANY DIMENSIONS.
4. ALL DIMENSIONS SHOWN ARE MEASURED TO FINISHED SURFACES, UNLESS NOTED OTHERWISE.

OPTIONS:

1. OPTION A: DOME CHAMBER; PREPARE AND PAINT STRUCTURAL STEEL MEMBERS.
2. OPTION B: PORCH STONE ROOF; CLEAN AND REPOINT

ABBREVIATIONS:

CONC. = CONCRETE
C.O.R. = CONTRACTING OFFICER REPRESENTATIVE
EX. = EXISTING
EXIST. = EXISTING
MAS. = MASONRY
M.H. = MANHOLE
N.S. = NON SHRINK
O.C. = ON CENTER
OPT. = OPTION (SEE ABOVE)
STD. = STANDARD
TYP. = TYPICAL
V.I.F. = VERIFY IN FIELD
T.O.S. = TOP OF SLAB
T&B = TOP AND BOTTOM
S.O.G. = SLAB ON GRADE
CONN. = CONNECTION
MAX. = MAXIMUM
MIN. = MINIMUM
PSI = POUNDS PER SQUARE INCH
KSI = KIPS PER SQUARE INCH
PEN. = PENETRATION

REVISION: 1

04/15/2026

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REGISTERED ARCHITECT JOHN G. WAITE, JR. 014431 STATE OF NEW YORK

Mark	Sheet	REVISION	Date	Initial
1	C1.0	AS NOTED	6/16	EAS
1	A1.1	AS NOTED	6/16	EAS
1	A2.2	AS NOTED	6/16	EAS
1	A3.1	AS NOTED	6/16	EAS

QUALITY DESIGN CERTIFICATION

- ☐ Prepared in Accordance with Design Development (Title I) _____ Drawing No.
  OR
- ☐ Variance from Design Development (Title I) Approved by Superintendent on _____ Date
  OR
- ☐ Construction Drawing Not Preceded by Design Development (Title I)

Project Manager _____ Date _____

NATIONAL PARK SERVICE — Department of the Interior

CONSTRUCTION DRAWINGS

UNITED STATES
DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE
DENVER SERVICE CENTER

TITLE OF DRAWING
REHABILITATE GENERAL GRANT'S TOMB
LOCATION WITHIN PARK
RIVERSIDE DR AT 122ND ST
NAME OF PARK
GENERAL GRANT MEMORIAL

REGION	COUNTY	STATE
NER	NEW YORK	NEW YORK

DRAWING NO. 665 / 14,001
PKG. NO. 247283
SHEET 1 OF 14

6/16/26 ESEHL A:\20F0040 NPS GEGR ROOF DOME SIDEWALK\06 - CONSTRUCTION DOCUMENTS\247283 DOME\01 SHEETS\T1.0 DOME COVER.DWG

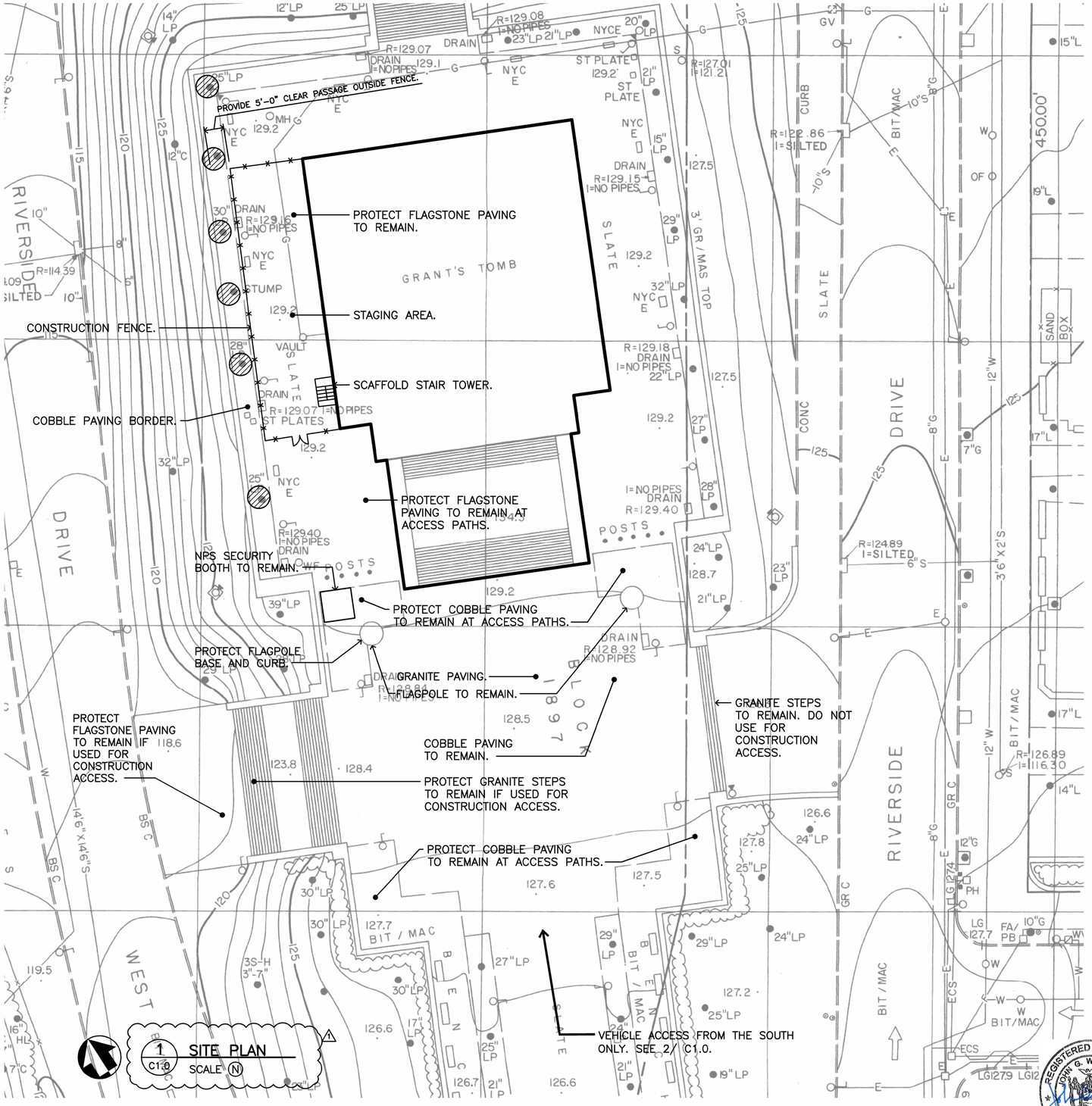
A:\20F0040 nps gegr roof dome sidewalk\06 - construction documents\247283 dome\01 sheets\T1.0 Dome Cover.dwg, 6/16/2026 11:63:14 PM, esehl

SITE NOTES:

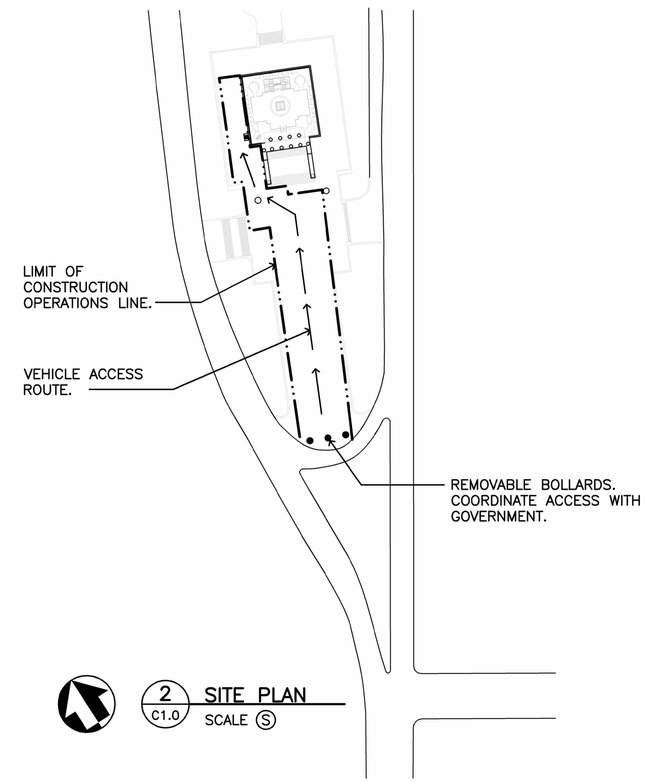
1. PROVIDE PROTECTION MATTING AT ENTIRE STAGING AREA.
2. PROVIDE PLANKING AND PROTECTION FOR VEHICLES OVER CLASS 4: OVER 16,000lbs. GVW AT GRANITE AND FLAGSTONE PLAZA. REPLACE ANY STONES BROKEN, TO MATCH.
3. PROTECT CURBS DURING VEHICLE ACCESS.

LEGEND:

TREE PROTECTION. SEE 1/C1.1 FOR DETAILS.



1 C1.0 SITE PLAN
SCALE (N)



2 C1.0 SITE PLAN
SCALE (S)

SCALE (S) 100 0 100 200 SCALE OF FEET 1" = 100'

SCALE (N) 20 0 20 40 SCALE OF FEET 1" = 20'

REVISION: 1 06/16/2026

DESIGNED: JGWA CADD LV TECH. REVIEW: AEW DATE: 04/15/2026	SUB SHEET NO. C1.0	TITLE OF SHEET REPLACE EPDM ROOF REHABILITATE GENERAL GRANT'S TOMB SITE PLAN GENERAL GRANT NATIONAL MEMORIAL NEW YORK, NEW YORK	DRAWING NO. 665 / 14,001 PMIS/PKG NO. 247283 SHEET 2 OF 14

REGISTERED ARCHITECT JOHN G. WAITE JR. 014437 STATE OF NEW YORK

6/16/26 ESEHL A:\20F0040 NPS GEGR ROOF DOME SIDEWALK\06 - CONSTRUCTION DOCUMENTS\247283 DOME\01 SHEETS\C1.0 SITE PLAN.DWG

A:\20F0040 nps gegr roof dome sidewalk\06 - construction documents\247283 dome\01 sheets\C1.0 SITE PLAN.dwg, 6/16/2026 11:37:17 AM, esehl

REMOVAL NOTES:

1. REMOVE ALL FLASHING, EXISTING TERMINATOR BARS, FASTENERS AND RELATED SEALANTS.
2. REMOVE ALL STONE BALLAST, MEMBRANES AND INSULATION.
3. REMOVE ROOF DRAINS AND OTHER ACCESSORIES.

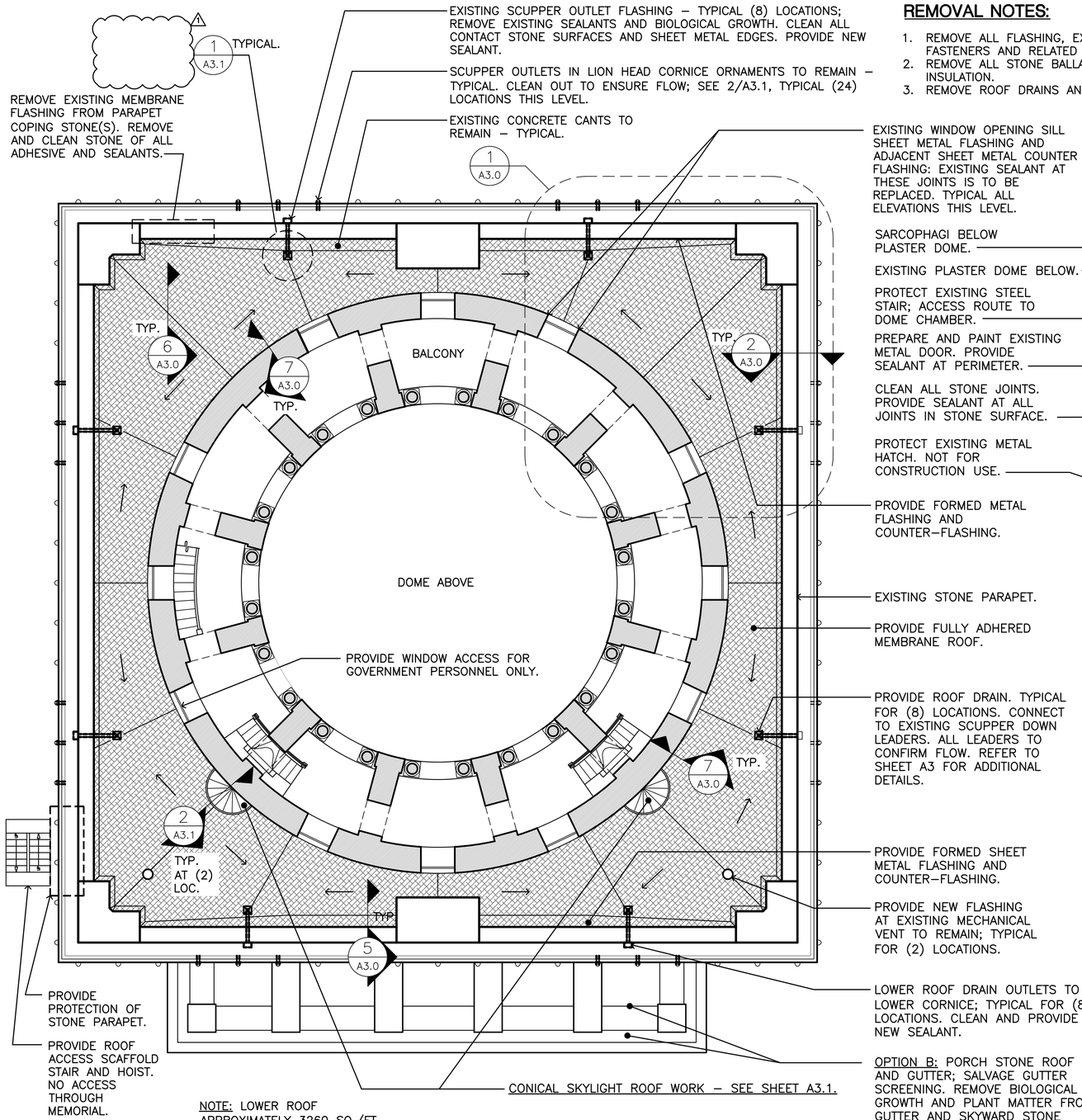
PROTECTION NOTES:

1. PROTECT ALL STONE SURROUNDING THE DOME ACCESS DOORS AT THE COLONNADE AND CONICAL DOME LEVELS.
2. PROTECT STONE PARAPET AND ROOF SURFACE AT ACCESS TOWER.

LEGEND:

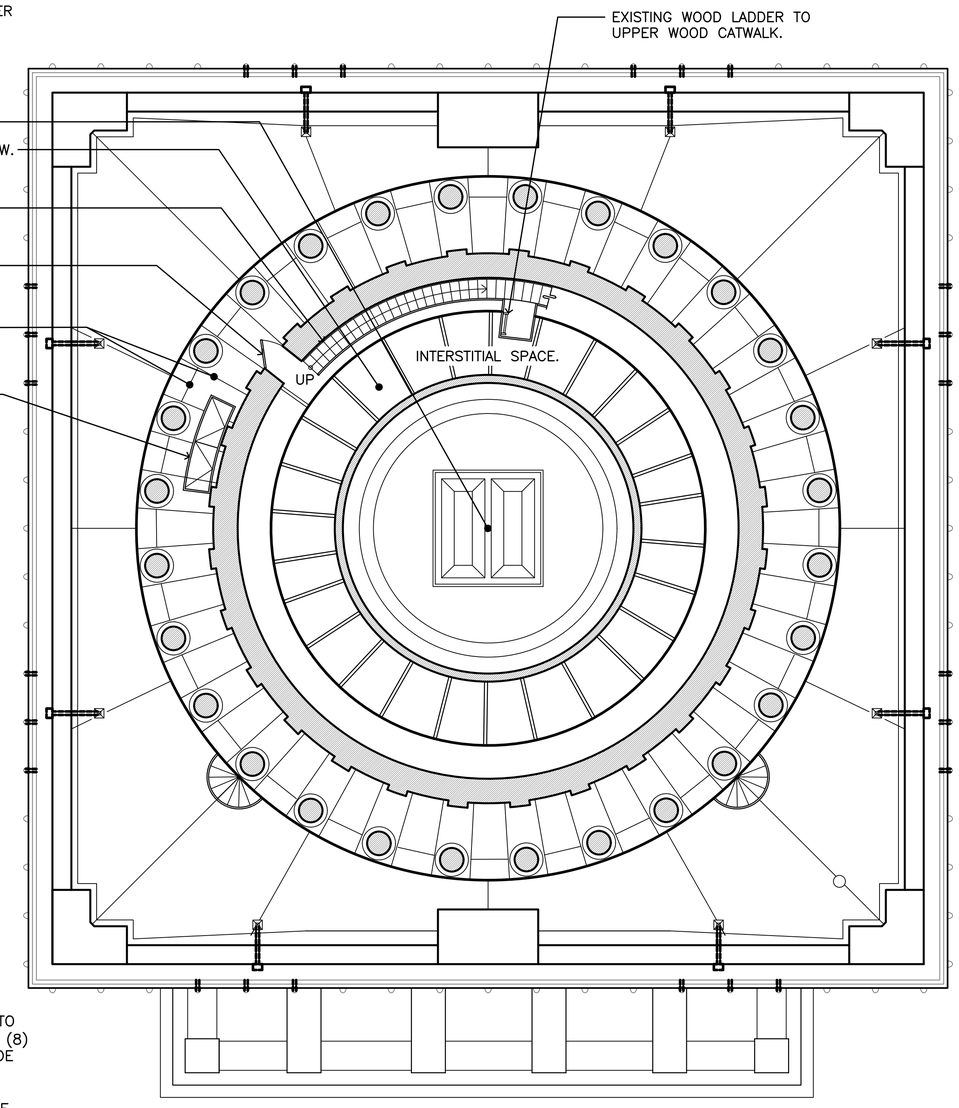
⟵ SLOPE OF ROOF.

PROVIDE MEMBRANE ROOF SYSTEM.



NOTE: LOWER ROOF APPROXIMATELY 3260 SQ./FT.

1 A1.1 LOWER ROOF PLAN WITH BALCONY
SCALE B



2 A1.1 COLONNADE LEVEL
SCALE B

SCALE B 8 0 8 16 SCALE OF FEET 1/8" = 1'–0"

REVISION: 1 06/16/2026

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DESIGNED:	SUB SHEET NO.	TITLE OF SHEET	DRAWING NO.
JGWA	A1.1	REPLACE EPDM ROOF REHABILITATE GENERAL GRANT'S TOMB ROOF PLANS GENERAL GRANT NATIONAL MEMORIAL NEW YORK, NEW YORK	665 14,001
CADD: LV			PMIS/PKG NO. 247283
TECH. REVIEW: AEW			SHEET 8 OF 14
DATE: 04/15/2026			

6/16/26 ESEHL A:\20F0040 NPS GEGR ROOF DOME SIDEWALK\06 – CONSTRUCTION DOCUMENTS\247283 DOME\01 SHEETS\A1.1 ROOF PLANS.DWG

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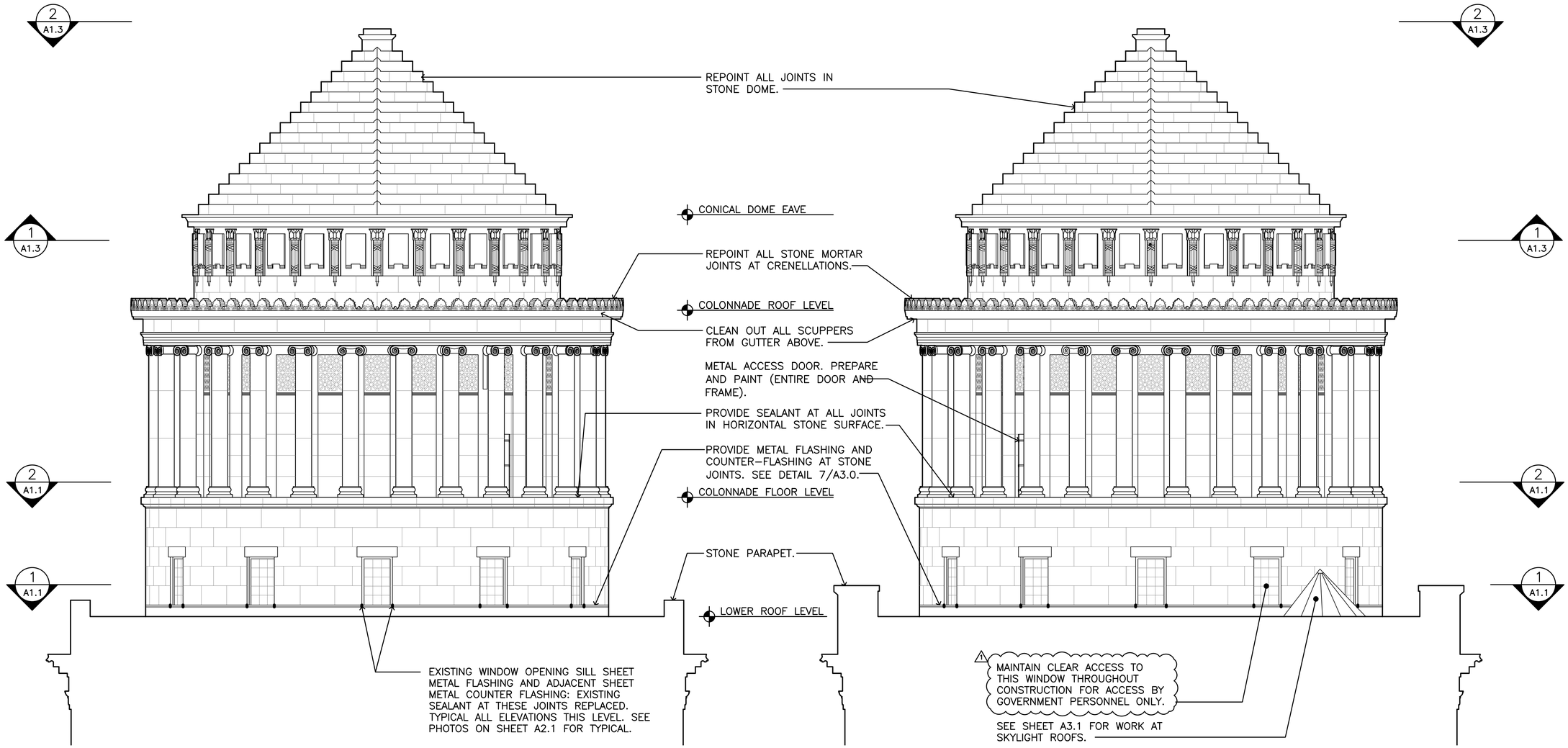

1 A2.2 NORTH ELEVATION
SCALE (B)

2 A2.2 WEST ELEVATION
SCALE (B)

SCALE (B) 8 0 8 16 1/8" = 1'-0"
SCALE OF FEET

REVISION: 1 06/16/2026

REGISTERED ARCHITECT JOHN G. WAITE JR. 014437 STATE OF NEW YORK

DESIGNED: JGWA CADD LV TECH. REVIEW: AEW DATE: 04/15/2026	SUB SHEET NO. A2.2	TITLE OF SHEET REPLACE EPDM ROOF REHABILITATE GENERAL GRANT'S TOMB DETAIL ELEVATIONS GENERAL GRANT NATIONAL MEMORIAL NEW YORK, NEW YORK	DRAWING NO. 665 14,001 PMIS/PKG NO. 247283 SHEET 12 OF 14

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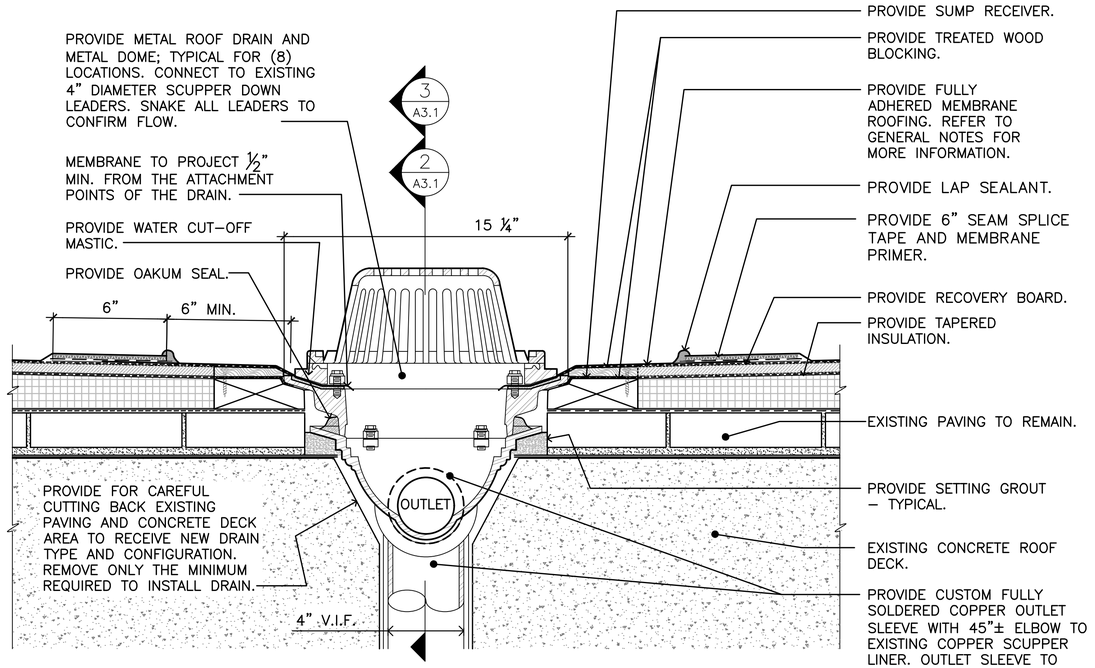
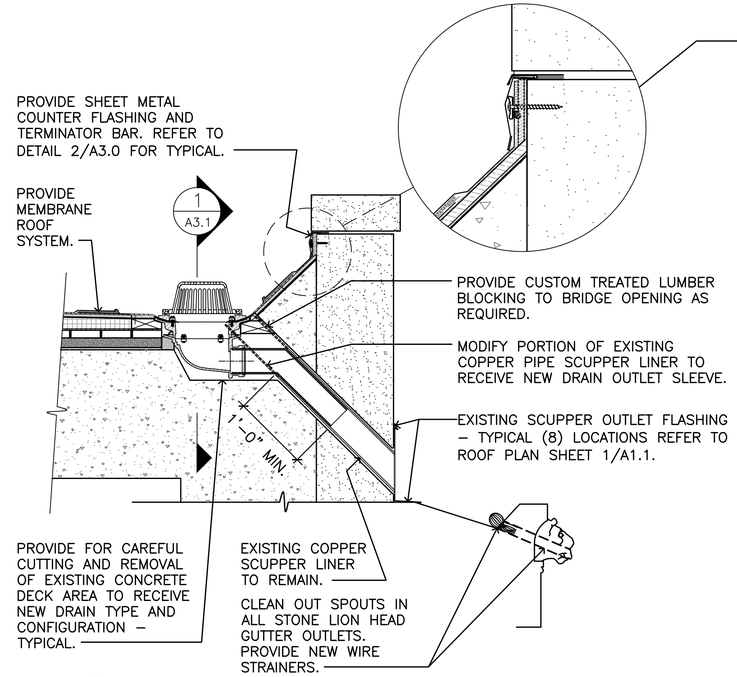
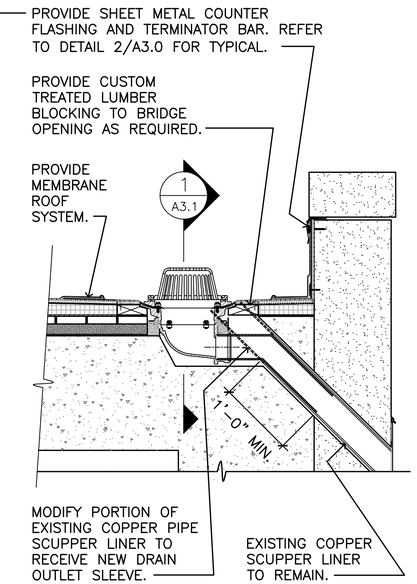


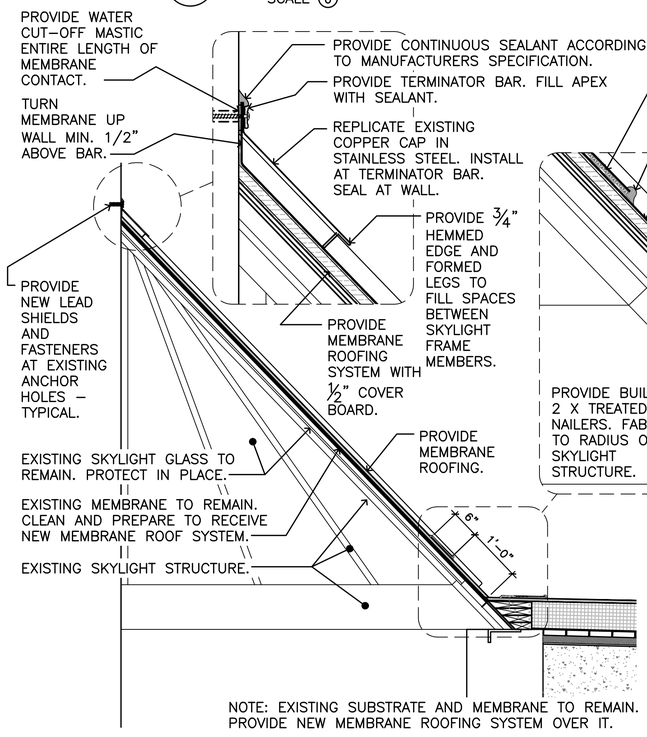
1 A3.1 TYPICAL ROOF DRAIN AND MEMBRANE FLASHING
SCALE J

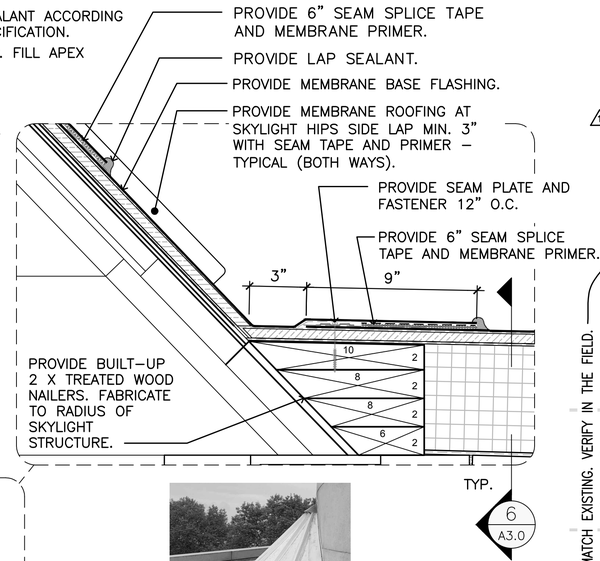


2 A3.1 DRAIN SECTION THRU SCUPPER AND CANT
SCALE H



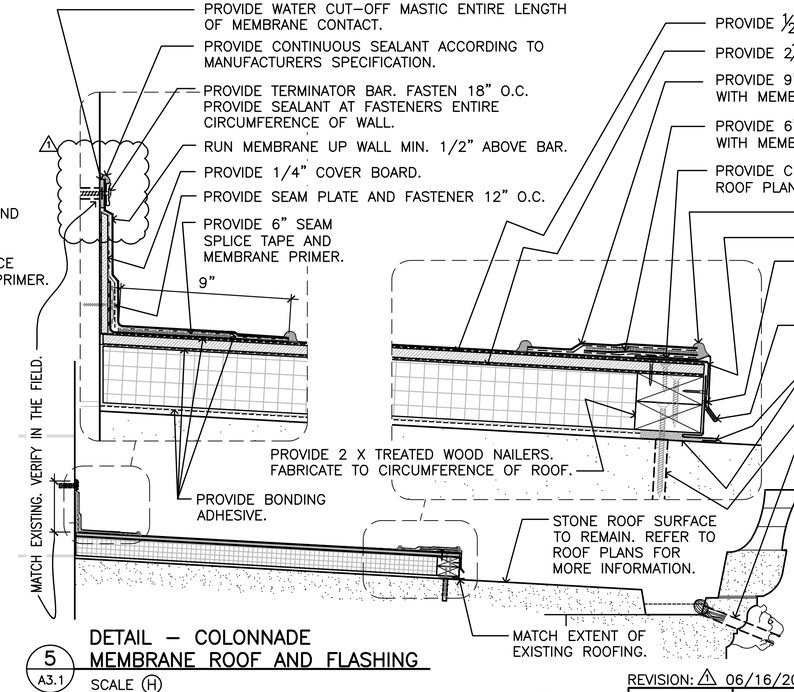
3 A3.1 DRAIN SECTION THRU SCUPPER
SCALE H





EXISTING

4 A3.1 DETAIL – MEMBRANE ROOF AND FLASHING AT CONICAL ROOFS
SCALE G



5 A3.1 DETAIL – COLONNADE MEMBRANE ROOF AND FLASHING
SCALE H

SCALE J 6 3 0 6 — SCALE OF INCHES — 3" = 1'-0"
SCALE H 1 0 1 2 — SCALE OF FEET — 1"=1'-0"
SCALE G 1 0 1 2 3 — SCALE OF FEET — 3/4" = 1'-0"

GENERAL NOTES:

1. PROVIDE FULLY ADHERED MEMBRANE, ADHERE COVER BOARD, TAPERED INSULATION ADHERED TO EXISTING MASONRY DECK.
2. SEAM MEMBRANE TO CONFORM TO EXISTING ROOF GEOMETRY.
3. CONTRACTOR IS TO VERIFY IN THE FIELD ALL DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING WITH THE WORK. REPORT DISCREPANCIES TO THE CONTRACTING OFFICER.

REVISION: 1 06/16/2026

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DESIGNED: JGWA	SUB SHEET NO.	TITLE OF SHEET
CADD EAS	A3.1	REPLACE EPDM ROOF REHABILITATE GENERAL GRANT'S TOMB MEMBRANE ROOF DETAILS GENERAL GRANT NATIONAL MEMORIAL NEW YORK, NEW YORK
TECH. REVIEW: AEW		
DATE: 04/15/2026 1		

DRAWING NO. 665 / 14,001
PMIS/PKG NO. 247283
SHEET 14 OF 14

9/15/21 10:50 ASAUNDERS R22 A:\20F0040 NPS GEGR ROOF DOME SIDEWALK\06 - CONSTRUCTION DOCUMENTS\247283 DOME\01 SHEETS\A3.1 MEMBRANE ROOF DETAILS.DWG
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