

THE SCHOOL DISTRICT OF PHILADLPHIA  
SCHOOL REFORM COMMISSION  
Office of Capital Programs  
440 North Broad Street, 3<sup>rd</sup> Floor – Suite 371  
Philadelphia, PA 19130

TELEPHONE: (215) 400-4730

Addendum No. 1

**Subject:** Laura H. Carnell Elementary School Roof Replacement  
General Construction B-072C of 2017/18  
USA Project No. 2018-093

**Location:** Laura H. Carnell Elementary School  
1100 Devereaux Avenue  
Philadelphia, Pennsylvania

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**This Addendum, dated 17th of October, 2019, shall modify and become part of the Contract Documents for the work of this project. Any items not mentioned herein, or affected by, shall be performed strictly in accordance with the original documents.**

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**A. BIDDER'S QUESTIONS:**

**QUESTION 1:** The Roof Insulation Spec calls for a thickness of 7.5", it also calls for 5.5" thickness minimum, but at the prebid Anthony Bier said that we needed just code which would be 5.2" insulation not including coverboard. Please clarify the total maximum/minimum thickness as well as how many layers of insulation we are to use to make up this amount.

**Response 1: Insulation thickness has been removed from the specs. Refer to the attached drawings for the desired thickness. See attached revised Specification Section 07 2200 "Roof Insulation".**

**QUESTION 2:** The District stated during the Pre-Bid that aluminum or steel ladders could be used. Please clarify if in fact we are able to use aluminum ladders in lieu of the steel that is called out on the drawings.

**RESPONSE 2: The Contractor shall provide steel ladders as specified on the drawings.**

**QUESTION 3:** . The spec calls out for Silver flash to be used on the vertical flashings. Please confirm that this is not the case since it will be the Kee Flashing and the three course stripping will only be at the horizontal intersection of the flashing and field membranes.

**RESPONSE 3: Silver Flash is not to be used for the KEE flashing used at the parapets, but is to be used on the SBS flashing as illustrated on the Drawings. See attached revised Specification 07 5200 "Modified Bituminous Membrane Roofing".**

**QUESTION 4:** Roof Area I has a large fence that has flaking paint on it. Are we to include this with all of the rest of the non-ferrous metal to be scraped and painted?

**RESPONSE 4: The Contractor shall paint the fence as indicated on the drawings.**

**B. CHANGES TO DRAWINGS:**

- 1. DELETE Drawing A-105 and REPLACE with revised Drawing A-105, attached. (Revision No. 1 dated 10-17-19).**
- 2. DELETE Drawing A-106 and REPLACE with revised Drawing A-106, attached. (Revision No. 1 dated 10-17-19).**
- 3. DELETE Drawing A-107 and REPLACE with revised Drawing A-107, attached. (Revision No. 1 dated 10-17-19).**
- 4. DELETE Drawing A-108 and REPLACE with revised Drawing A-108, attached. (Revision No. 1 dated 10-17-19).**
- 5. DELETE Drawing A-110 and REPLACE with revised Drawing A-110, attached. (Revision No. 1 dated 10-17-19).**

**C. ATTACHMENTS**

- 1. Pre-Bid Meeting Sign-In Sheet dated October 10, 2019**
- 2. Specification Section 07 2200**
- 3. Specification Section 07 5200**
- 4. Drawing A-105**
- 5. Drawing A-106**
- 6. Drawing A-107**
- 7. Drawing A-108**
- 8. Drawing A-110**

**End of Addendum**

## SIGN-IN SHEET

- School Name: CARNELL L.
- Scope of Work: ROOF REPLACEMENT
- Conference Date: OCTOBER 10, 2019

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## SECTION 07 2200 - ROOF INSULATION

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. This section includes information for the installation of the flat and/or tapered rigid polyisocyanurate insulation system, and roof recovery board, over the properly prepared concrete roof deck for the specified Modified Bituminous Membrane Roof System – Torch Applied.
- B. Prime the existing properly prepared concrete roof deck substrate in accordance with the project specification prior to installing the insulation system.
- C. The Contractor shall provide all labor, equipment and materials to install the specified flat and/or tapered rigid polyisocyanurate roof insulation over the properly prepared concrete roof deck in the specified cold applied insulation adhesive in accordance with the project specification. On top of the polyisocyanurate insulation system, a water-resistant, fiber-reinforced gypsum recovery board shall be installed, and adhered with the specified cold-applied insulation adhesive in accordance with the project specifications.
- D. Install specified tapered crickets between all drains and scuppers.
- E. Install specified tapered crickets/saddles at all roof top equipment.
- F. Install specified tapered sumps at all drains and scuppers. No drains or scuppers will be accepted without tapered sumps.
- G. Smooth any build up of materials along the insulation to prevent air pockets. Shave, trim and grind down any irregularities to make all new insulation fit properly.

#### 1.2 RELATED SECTIONS

- A. Division 6 Section “Rough Carpentry” for wood nailers, cants, curbs, and blocking and for wood-based, structural-use roof deck panels and walls.
- B. Division 7 Section “Modified Bituminous Membrane Roofing – Torch Applied”
- C. Division 7 Section “Modified Bituminous Membrane Re-Roofing Procedures”
- D. Division 7 Section “Sheet Metal Flashing and Trim”
- E. Division 7 Section “Joint Sealers”
- F. Division 7 Section “Manufactured Roof Specialties”

#### 1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM):
  - 1. ASTM C-1289, Specification for Faced Rigid Polyisocyanurate Thermal Insulation
  - 2. ASTM D-312-00, Specification for Asphalt Used in Roofing.
  - 3. ASTM D-1863, Specification for Mineral Aggregate Used on Built-Up Roofs.
  - 4. ASTM D-2178, Standard Specification for Asphalt Glass Felts used in Roofing and Waterproofing.

5. ASTM D-4601, Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.
  6. ASTM D-5147, Sampling and Testing Modified Bituminous Sheet Material.
  7. ASTM E108-00, Test Methods for Fire Test of Roof Coverings.
- B. Cast Iron Soil Pipe Institute, Washington, D.C. (CISPI)
- C. National Roofing Contractors Association (NRCA):
1. Roofing and Waterproofing Manual.
- D. Underwriters Laboratories, Inc. (UL):
1. Fire Hazard Classifications.
- E. Warnock Hersey (WH):
1. Fire Hazard Classifications.
- F. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
- G. Steel Deck Institute, St. Louis, Missouri (SDI)
- H. Southern Pine Inspection Bureau, Pensacola, Florida (SPIB)
- I. Insulation Board, Polyisocyanurate (FS HH-I-1972)
- J. Insulation Board, Thermal (Fiberboard) (FS LLL-1-535B)
- 1.4 SUBMITTALS
- A. Product Data: Provide manufacturer's specification data sheets for each product in accordance with this specification.
- B. Provide approval letters from insulation manufacturer for use of their insulation within this particular roofing system type.
- C. Provide a sample of each insulation type.
- D. Shop Drawings
1. Submit four (4) copies of manufacturer's shop drawings indicating complete installation details of tapered insulation system, including identification of each insulation block, flat insulation system, sequence of installation, layout, drain locations, scupper locations, sumps, roof slopes, thicknesses, tapered crickets and saddles.
  2. Shop drawing shall include: Outline of roof, location of drains, location of scuppers, sumps, complete board layout of tapered insulation components, thickness and the minimum and average "R" value for the completed insulation system.
- E. Certification
1. Submit roof manufacturer's certification that insulation furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's Edge-to-Edge Roof system warranty.
- 1.5 QUALITY ASSURANCE
- A. Certify that roof system furnished is approved by an approved third party testing facility in accordance with ASTM E108, Class A for external fire and meets local or nationally recognized building codes.

- B. Certify that the roof system is adhered properly to meet or exceed the specific project wind uplift requirements listed in Article 1.16 "Design and Performance Criteria" of Division 7 Section "Modified Bituminous Membrane Roofing – Torch Applied".
- C. Pre-installation Meeting: Refer to Division 7 Section Modified Bituminous Membrane Roofing – Torch Applied specifications for pre-installation meeting requirements.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site with seals and labels intact, in manufacturer's original containers, dry and undamaged.
- B. Store all insulation materials in a manner to protect them from the wind, sun and moisture damage prior to and during installation. Any insulation that has been exposed to any moisture shall be removed from the project site.
- C. Keep materials enclosed in a watertight, ventilated enclosure (i.e. tarpaulins).
- D. In accordance with the manufacturer's recommendations, immediately remove the plastic wrapping on the recovery boards and cover with a watertight, ventilated enclosure (i.e. tarpaulins). Prevent the formation of condensation on the boards.
- E. Store materials off the ground and roof surfaces. Any warped, broken or wet insulation boards shall be removed from the site.
- F. Do not leave unused materials on the roof overnight or when roofing work is not in progress unless protected from weather and other moisture sources.
- G. It is the responsibility of the contractor to secure all material and equipment on the job site. If any material or equipment is stored on the roof, the contractor must make sure that the integrity of the deck is not compromised at any time. Damage to the deck caused by the contractor will be the sole responsibility of the contractor and will be repaired or replaced at his expense.

### PART 2 - PRODUCTS

#### 2.1 APPROVED EQUIVALENT

- A. Basis of Design: Materials, manufacturer's product designations, and/or manufacturer's names specified herein shall be regarded as the minimum standard of quality required for work of this Section. Comply with all manufacturer and contractor/fabricator quality and performance criteria specified in Part 1.
- B. See GENERAL CONDITIONS, GC-4.23 SUBSTITUTIONS (OR EQUAL) for additional requirements and procedures.

#### 2.2 INSULATION MATERIALS

- A. Thermal Insulation Properties and Approved Insulation Boards.
  - 1. Rigid Flat Polyisocyanurate Roof Insulation; ASTM C-1289:
    - a. Qualities: Flat rigid closed cell polyisocyanurate foam core bonded to heavy duty glass fiber mat facers.
    - b. Board Size: Four feet by four feet (4' x 4')
    - c. Compressive Strength: 20 psi
    - d. Thickness: **As indicated on drawings.**
    - e. **Deleted.**

- f. Source of Supply:
  - 1) H-Shield; Hunter Panels
  - 2) E'NRG'Y-3; Johns Manville
  - 3) EnergyGuard; GAF
  - 4) Approved Equivalent
- g. Insulation board shall meet the following requirements:
  - 1) UL, WH or FM listed under Roofing Systems
  - 2) Federal Specification HH-I-1972, Class 1
- 2. Nonstructural, water-resistant, fiber-reinforced gypsum substrate roof recovery board:
  - a. Qualities: Nonstructural, water resistant, fiber-reinforced gypsum roof board
  - b. Board Size: Four feet by four feet (4' x 4')
  - c. Thickness: One-Half (1/2) inch
  - d. R-Value: 0.50 minimum
  - e. Source:
    - 1) United States Gypsum Company (USG)
    - 2) Approved Equivalent
  - f. Insulation board shall meet the following requirements:
    - 1) UL, WH, FM listed under Roofing Systems.
    - 2) Federal Specification LLL-I-535-B.

## 2.3 RELATED MATERIALS

- A. Rigid Cant and Tapered Edge Strips: Preformed rigid perlite insulation units of sizes/shapes indicated as per the approved manufacturer.
  - 1. Acceptable Manufacturers:
    - a. Johns Manville
    - b. GAF
    - c. Approved Equivalent
- B. Crickets: Shall be fabricated from tapered polyisocyanurate insulation and shall ensure complete drainage of the roof system.
  - 1. Shall be fabricated from 1/2":1' tapered polyisocyanurate
- C. Insulation Adhesive Primer: INSUL-LOCK HR UNIVERSAL PRIMER or approved equal.
- D. Insulation Adhesive: INSUL-LOCK HR or Approved Equal; Cold applied, highly elastomeric, high rise, fast setting, two-component with a one step application mechanism, VOC compliant, foamable insulation adhesive that contains no solvents and sets in minutes. Designed to adhere approved insulation to insulation, structural decks, base sheets, smooth and graveled surfaced built-up roofs.
  - 1. Tensile Strength (ASTM D 412-92) 250 psi
  - 2. Density (ASTM D 1875-90) 8.5 lbs/gal
  - 3. Viscosity (ASTM D 2556-93a) 22,000-60,000 cP
  - 4. Peel Strength (ASTM D 903) 17 lb/in
  - 5. Flexibility (ASTM D 816-82) Pass @ -70°F
- E. Roof Board Joint Tape: Six (6) inches wide glass fiber mat with adhesive compatible with insulation board facers.

## PART 3 - EXECUTION

### 3.1 INSPECTION OF SURFACES

- A. Roofing contractor shall be responsible for preparing an adequate substrate to receive insulation.

1. Verify that deck surfaces and project conditions are ready to receive work of this section.
2. Verify that deck is supported and secured to structural members.
3. Verify that new drain bowl assemblies and scuppers are installed and set at proper height to permit a slope of  $\frac{1}{2}$ " per foot within the sump. Raise drains to the proper height above the roof deck to allow for the proper slope within the tapered insulation sump. The sump shall be an eight (8) foot square sump unless required to be larger to accommodate drainage around equipment.
4. Verify that work which penetrates roof deck has been completed.
5. Verify that wood nailers are properly and securely installed.
6. Examine surfaces for defects, rough spots, ridges, depressions, foreign material, moisture, and unevenness.
7. Verify that existing wood blocking and nailers that are of the size and type specified to be used are sound and not rotted or deteriorated. Replace deteriorated wood with new wood of like kind, size and configuration per the project details and specifications.
8. Verify that deck surfaces are dry, free of snow or ice, not rotten or deteriorated, do not have bacterial growth and are structurally sound. Replace decking that is wet, deteriorated, has bacterial growth or is not structurally sound in like kind to match existing.
9. Do not proceed until defects are corrected.
10. Do not apply insulation until substrate is dry. Confirm that moisture content of the wood blocking, nailers and concrete roof decks does not exceed twelve (12) percent by moisture meter tests.
11. The surface must be thoroughly cleaned immediately prior to application using compressed air, vacuum equipment or hand/power brooms to remove dust, loose dirt or debris.
12. Use additional insulation to fill depressions and low spots that would otherwise cause ponding water.
13. Contractor is responsible to verify existing substrate and substrate is sloped, or plumb/level, as stated in/on the project documents prior to installation of insulation system. All defects in roof pitch to be accommodated with tapered insulation to insure a positive pitch to all roof drains and scuppers.

### 3.2 INSTALLATION

- A. Adhere Polyisocyanurate Insulation System to Concrete Roof Deck and Adhered Underlying Layers of Polyisocyanurate Insulation
1. Over the entire concrete deck surface, prime concrete surfaces with specified insulation adhesive primer at the rate of 1 (one) gallon per one-hundred fifty (150) to two-hundred fifty (250) square feet depending on surface conditions.
  2. In accordance with the adhesive manufacturer's recommendations, embed all layers of insulation board in the specified cold applied insulation adhesive to the prepared concrete roof deck and/or previously installed layer(s) of insulation. Stagger end joints of boards so all open joints will be eliminated. Walk in each piece of insulation and leave boards completely adhered to the vapor barrier/temporary roof and/or previous layers of insulation. Each insulation board shall be butt firmly against adjoining panels. All open joints shall be eliminated.
  3. Apply specified insulation adhesive directly to the insulation board in a ribbon pattern in  $\frac{3}{4}$ " beads, using an automatic applicator, at the maximum spacing listed below. Immediately place the insulation board. Do not slide the insulation board into the wet adhesive. Do not allow the insulation adhesive to skin over. Briefly step each board into place to ensure contact with the adhesive. Substrates with irregular or uneven surfaces may prevent the insulation from making positive contact with the adhesive. In these cases, relief cuts or a temporary weight may be required.
    - a. Beads shall be at 12 inches o.c. maximum per 4' x 4' board in Zone 1 (field of roof)
    - b. Beads shall be at 8 inches o.c. maximum per 4' x 4' board in Zone 2 (perimeter of roof)



- c. Beads shall be at 6 inches o.c. maximum per 4' x 4' board in Zone 3 (corners of roof)
  4. Zones 2 & 3 must extend onto the roof area a minimum distance of 10% of the building width.
- B. Recovery Board Attachment with Cold Applied Insulation Adhesive
1. The surface must be thoroughly cleaned using compressed air, vacuum equipment or hand/power brooms to remove dust, loose dirt or debris.
  2. Apply specified insulation adhesive directly to the newly installed polyisocyanurate insulation in a ribbon pattern in  $\frac{3}{4}$ " wide beads at one (1) foot on center. This equals four (4) ribbons equally spaced per 4' x 4' board. Immediately place the recovery board into the wet adhesive. Do not slide the recovery board into the adhesive. Do not allow the adhesive to skin over. Briefly step each board into place to ensure contact with the adhesive. Substrates with irregular or uneven surfaces may prevent the insulation from making positive contact with the adhesive. In these cases, relief cuts or a temporary weight may be required.
- C. General Installation Requirements.
1. Approved insulation shall be sumped and tapered around all roof drains and scuppers. Tapered insulation sump shall start with a thickness required to achieve  $\frac{1}{2}$ " per foot slope for the specified minimum dimension four (4) feet from the center line of the drain or scupper for an eight (8) foot square sumps. Install tapered insulation sump in such a way to provide proper slope for runoff. Shape insulation with tool as required so completed surface is smooth and flush with ring of drain. Under no circumstances will the membrane be left unsupported in an area greater than one quarter ( $\frac{1}{4}$ ) inch. Install recovery board over tapered insulation sump as required.
  2. All boards shall be cut and fitted where the roof deck intersects a vertical surface. The boards shall be cut to fit a minimum of one quarter ( $\frac{1}{4}$ ) inch away from the vertical surface.
  3. Install no more insulation at one time than can be roofed on the same day.
  4. Install temporary water cut-offs at completion of each day's work and remove upon resumption of work. Install an envelope water stop at the edge of insulation to prevent water infiltration into new insulation/roof system.
  5. Cant Strips/Tapered Edge Strips: Install preformed forty five (45) degree perlite cant strips at junctures of vertical surfaces. Provide preformed perlite tapered edge strips at perimeter of edges of roof that do not terminate at vertical surfaces and/or indicated on the drawings. Tape joints of insulation as per manufacturer's requirements. The wall/cant juncture will be examined for air passage. If airflow is present, joint between cant and wall will be sealed with closed cell joint backing and joint sealant.

### 3.3 CLEANING

- A. Remove debris and cartons from roof deck. Leave insulation clean and dry, ready to receive roofing membrane.

END OF SECTION 07 2200

SECTION 07 5200 - MODIFIED BITUMINOUS MEMBRANE ROOFING – TORCH/COLD APPLIED

PART 1 - GENERAL

1.1 SUMMARY

- A. Torch applied asphalt modified bituminous membrane roofing over prepared substrate and insulation system.
  - 1. Remove existing roof system back to the concrete roof decks.
  - 2. Install the specified flat roof insulation system and roof recovery board in accordance with Division 7 Section "Roof Insulation"
  - 3. Install one (1) ply of the specified SBS base roofing ply by torch methods.
  - 4. Install one (1) ply of the specified SBS base flashing ply by torch methods.
  - 5. Install one (1) ply of the specified SBS modified mineral surfaced cap roof membrane ply by torch methods.
  - 6. Where noted, install one (1) ply of the specified KEE thermoplastic flashing membrane ply with cold applied adhesive. Heat weld all seams of the KEE flashing membrane ply.
  - 7. Where noted, install one (1) ply of the specified SBS mineral surfaced flashing membrane ply by torch methods.
  - 8. Equipment Rails

1.2 SECTION INCLUDES

- A. This portion of the specification sets forth the general requirements and describes materials and workmanship for installing the hot applied modified bituminous membrane roof system over prepared substrates.
- B. Roofing contractor shall furnish and install all materials described herein unless specifically noted otherwise.
- C. This section is for work on roofs where indicated on the drawings as otherwise.

1.3 RELATED SECTIONS

- A. Division 6 Section "Rough Carpentry" for wood nailers, cants, curbs, and blocking and for wood-based, structural-use roof deck and walls.
- B. Division 7 Section "Roof Insulation".
- C. Division 7 Section "Modified Bituminous Membrane Re-Roofing Procedures".
- D. Division 7 Section "Sheet Metal Flashing and Trim".
- E. Division 7 Section "Joint Sealers".

1.4 REFERENCES

- A. American Society of Civil Engineers (ASCE):
  - 1. ASCE 7, Minimum Design Loads for Buildings and Other Structures.
- B. American Society for Testing and Materials (ASTM):
  - 1. ASTM D41, Specification for Asphalt Primer Used in Roofing, Dampproofing and Waterproofing.

2. ASTM D451, Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products.
3. ASTM D1079, Terminology Relating to Roofing, Waterproofing and Bituminous Materials.
4. ASTM D1863, Specification for Mineral Aggregate Used as a Protective Coating for Roofing.
5. ASTM D2822, Specification for Asphalt Roof Cement.
6. ASTM D2824, Specification for Aluminum-Pigmented Asphalt Roof Coating.
7. ASTM D4601, Specification for Asphalt Coated Glass Fiber Base Sheet Used in Roofing.
8. ASTM D5147, Test Method for Sampling and Testing Modified Bituminous Sheet Materials.
9. ASTM D6162, Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.
10. ASTM D6163, Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.
11. ASTM E108, Test Methods for Fire Test of Roof Coverings.
12. ASTM D6754-02 Specification for Ketone Ethylene Ester (KEE) Based Sheet Roofing.

- C. National Roofing Contractors Association (NRCA):
1. Roofing and Waterproofing Manual.

- D. Underwriters Laboratories, Inc. (UL):
1. Fire Hazard Classifications.

- E. Warnock Hersey (WH):
1. Fire Hazard Classifications.

#### 1.5 SYSTEM DESCRIPTION

- A. It is the intent of this specification to install a long-term, quality roof system that meets or exceeds all current NRCA guidelines as stated in the most recent edition of the NRCA Roofing and Waterproofing Manual. Please discuss any concerns with the Engineer and Roofing System Manufacturer.

#### 1.6 DISCLOSURE OF MATERIALS AND SUBSTITUTIONS

- A. The materials outlined herein are the type of materials that should be used in this project. When a particular make or trade name is specified, it shall be indicative of the minimum standard required.
1. If an alternate material is bid, the material must be equal or exceed the specifications, and submitted by the bidding Roofing Contractor to the Architect for approval and include the following:
    - a. Written application with explanation of why it should be considered.
    - b. Material product data sheets.
    - c. A certificate from an accredited testing laboratory comparing the physical and performance attributes of the proposed material with those materials denoted as pre-approved systems or the characteristics noted in the material specification section, including but not limited to the following:
      - 1) Modified roofing membrane(s) and flashings substantiating Flexibility, Tensile Strength and Tear Strength. Test results must be dated, notarized and be on testing laboratory stationary. Testing for SBS membrane must follow standard ASTM D 5147 test methods. Testing shall be performed at 77°F. Tests at 0°F shall not be considered.
    - d. A list of at least five (5) jobs where the proposed alternate material was used under similar conditions. These jobs shall be located within fifty (50) miles of the L.

Carnell Elementary School. Each job must be at least five (5) years old, and each must be available for inspection by the Architect.

- e. The materials installed for the waterproofing membrane must be physically manufactured and guaranteed by the material supplier.
- f. A sample warranty by the manufacturer of the modified bitumen membrane roofing system. The manufacturer must be the organization that physically manufactures and guarantees the modified roofing membrane, pre-manufactured metal edge fascia system, and pre-manufactured metal coping cap system.
- g. All products must be in accordance with the Health, Safety and Environmental Control (H, S & E) Regulations, e.g., No asbestos materials, no harmful solvent release materials, etc.
- h. In making a request for submission, Bidder/Contractor represents:
  - i. He/she has personally investigated the proposed product or method, and determined that it is equal or superior in all respects to that specified.
  - j. He/she will provide the same guarantee for substitution as for the product and method specified.
  - k. He/she will coordinate installation of accepted substitution in work, making such changes as may be required for work to be completed in all respects.
  - l. He/she waives all claims for additional cost related to substitution, which consequently become apparent.
  - m. Cost data is complete and includes all related cost under his/her contract or other contracts, which may be affected by the substitution.
  - n. He will reimburse the Owner for all redesign cost by the Architect for accommodation of the substitute.
2. See GENERAL CONDITIONS, GC-4.23 SUBSTITUTIONS (OR EQUAL) for additional requirements and procedures.
3. Only substitutes approved in writing by the Architect will be considered.

#### 1.7 SUBMITTALS

- A. Product Data: Provide manufacturer's technical product data for each type of roofing product specified. Include data substantiating that materials comply with specified requirements.
- B. Samples: Submit two (2) samples of each product specified.
- C. Manufacturer's Installation Instructions: Submit installation instructions and recommendations indicating special precautions required for installing the membrane.
- D. Manufacturer's Fire Compliance Certificate: Certify that roof system furnished is approved by Factory Mutual, Underwriters Laboratories, Warnock Hersey or approved third party testing facility in accordance with ASTM E108, Class A for external fire and meets local or nationally recognized building codes.
- E. Manufacturer's Wind Uplift Certificate: The physical manufacturer of the modified bitumen membrane must provide certification that the proposed roof system will be secured properly to the structure to meet or exceed the specific project wind uplift requirements per Section 1.16 Design and Performance Criteria of this specification.
- F. Manufacturer's Manufacturing Certificate: Certify that modified membrane materials to be used on this project are physically manufactured by the distributing manufacturer in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.
- G. Manufacturer's Manufacturing Certificate: Submit a certified copy of the roofing manufacturer's ISO 9001:2008 compliance certificate.

- H. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147. Testing must be performed at 77°F. Tests at 0°F will not be considered.
- I. Submit a copy of an unexecuted manufacturer's warranty for review.
- J. Provide approval letters from insulation manufacturer for use of their insulation within this particular roofing system type.
- K. Provide a sample of each insulation type.
- L. Shop Drawings:
  - 1. Submit four (4) copies of manufacturer's shop drawings indicating complete installation details of tapered, and flat, insulation system, including identification of each insulation block, sequence of installation, layout, drain locations, scupper locations, roof slopes, thicknesses, tapered crickets and saddles.
  - 2. Shop drawing shall include: Outline of roof, location of drains, location of scuppers, sumps, complete board layout of tapered insulation components, thickness and the minimum and average "R" value for the completed insulation system.
- M. Design Loads: Submit copy of manufacturer's minimum design load calculations according to ASCE 7-10, Method 2 for Components and Cladding, prepared by an engineer employed by the system manufacturer as a full-time staff engineer. In no case shall the design loads be taken to be less than those detailed in article 1.16 of this specification.

#### 1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum 12 years documented experience and having ISO 9001:2008 certification.
- B. Manufacturer: The manufacturer must also have current ISO 9001:2008 certification for the manufacturing of the products to be utilized on this project.
- C. Installer: Company specializing in modified bituminous roofing installation with a minimum 5-years experience and certified by roofing system manufacturer as qualified to install manufacturer's roofing materials.
- D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work and at any time roofing work is in progress. Maintain proper supervision of workmen.
  - 1. Maintain a copy of the specifications in the possession of the Supervisor/Foremen and on the roof at all times.
- E. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer.
  - 1. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.
- F. Immediately correct roof leakage during construction. If the Contractor does not respond within twenty-four (24) hours, the Owner has the right to hire a qualified contractor and backcharge the original contractor.

- G. Insurance Certification: Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

#### 1.9 PRE-INSTALLATION CONFERENCE

- A. Pre-Roofing Conference: Convene a pre-roofing conference approximately two (2) weeks before scheduled commencement of modified bituminous roofing system installation and associated work.
- B. Require attendance of installer of each component of associated work, installers of deck or substrate construction to receive roofing work, installers of rooftop units and other work in and around roofing which must precede or follow roofing work (including mechanical work if any), Architect, Owner, roofing system manufacturer's representative, and other representatives directly concerned with performance of the Work, including (where applicable) Owner's insurers, testing agencies and governing authorities.
- C. Objectives of conference to include:
  1. Review foreseeable methods and procedures related to roofing work.
  2. Tour representative areas of roofing substrates (decks), inspect and discuss condition of substrate, roof drains, curbs, penetrations and other preparatory work performed by others.
  3. Review structural loading limitations of deck and inspect deck for loss of flatness and for required attachment.
  4. Review roofing system requirements (drawings, specifications and other contract documents).
  5. Review required submittals both completed and yet to be completed.
  6. Review and finalize construction schedule related to roofing work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
  7. Review required inspection, testing, certifying and material usage accounting procedures.
  8. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing (if not mandatory requirement).
  9. Record discussion of conference including decisions and agreements (or disagreements) reached and furnish copy of record to each party attending. If substantial disagreements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.
  10. Review notification procedures for weather or non-working days.
- D. The Owner's Representative will designate one of the conference participants to record the proceedings and promptly distribute them to the participants for record.
- E. The intent of the conference is to resolve issues affecting the installation and performance of roofing work. Do not proceed with roofing work until such issues are resolved the satisfaction of the Owner and Architect. This shall not be construed as interference with the progress of Work on the part of the Owner or Architect.

#### 1.10 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site with seals and labels intact, in manufacturer's original containers, dry and undamaged.
- B. Store and handle roofing sheets in a dry, well-ventilated, weather-tight place to ensure no possibility of significant moisture exposure. Store rolls of modified membranes and other sheet

materials on pallets or other raised surface. Stand all roll materials on end. Cover roll goods with a canvas tarpaulin or other breathable material (not polyethylene).

- C. In accordance with the manufacturer's recommendations, immediately remove the plastic wrapping on the nonstructural, water-resistant, fiber-reinforced roof recovery boards and cover with a watertight, ventilated enclosure (i.e. tarpaulins). Prevent the formation of condensation on the boards.
- D. Do not leave unused materials on the roof overnight or when roofing work is not in progress unless protected from weather and other moisture sources.
- E. It is the responsibility of the contractor to secure all material and equipment on the job site. If any material or equipment is stored on the roof, the contractor must make sure that the integrity of the deck is not compromised at any time. Damage to the deck caused by the contractor will be the sole responsibility of the contractor and will be repaired or replaced at his expense.

#### 1.11 MANUFACTURER'S INSPECTIONS

- A. When the project is in progress, the roofing system manufacturer will provide the following:
  1. Keep the Architect informed as to the progress and quality of the work as observed.
  2. Provide job site inspections a minimum of three (3) days a week with reports to the Architect.
  3. Report to the Architect in writing any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor's attention.
  4. Confirm after completion that manufacturer has observed no applications procedures in conflict with the specifications other than those that may have been previously reported and corrected.

#### 1.12 PROJECT CONDITIONS

- A. Proceed with roofing work only when existing and forecasted weather conditions will permit unit of work to be installed in accordance with manufacturer's recommendations and warranty requirements. The temperature of the modified membranes, adhesives, substrate surfaces and ambient shall be a minimum of 40 degrees F and rising. It is recommended that the cold applied adhesives shall be stored at a temperature of 70 to 80 degrees F.
- B. Do not apply roofing insulation or membrane to damp deck surface.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

#### 1.13 SEQUENCING AND SCHEDULING

- A. Sequence installation of modified bituminous sheet roofing with related units of work specified in other sections to ensure that roof assemblies including roof accessories, flashing, trim and joint sealers are protected against damage from effects of weather, corrosion and adjacent construction activity.
- B. Fully complete the installation of insulation system and base roofing ply assembly, and/or the installation of the modified bituminous membrane roof ply each day. Phase construction between the base roofing ply and modified membrane roof ply (top ply) is acceptable.

1.14 WARRANTY

- A. Upon completion of installation, and acceptance by the Owner and Architect, the manufacturer will supply to the Owner a single-source, twenty-five (25) year Edge-to-Edge No Dollar Limited (NDL) Warranty covering the roof system. Warranty shall include the modified bitumen roof system, flashings, and the transition between all systems, and shall be an Edge-to-Edge roof warranty provided by ONE manufacturer.
- B. Installer will submit a minimum of a three (3) year warranty to the membrane manufacturer with a copy directly to Owner.
- C. At the request of the Owner, the manufacturer will provide an annual inspection of the roof. These inspection requests can occur for the life of the warranty.

1.15 DESIGN AND PERFORMANCE CRITERIA

- A. Installed roof system shall withstand negative (uplift) design wind loading pressures complying with the following criteria.

1. Zone 1 - Field of roof	38 psf	1-60
2. Zone 2 - Perimeter	64 psf	1-75
3. Zone 3 - Corners	96 psf	1-105
- B. Zones 2 and 3 must extend onto the roof area a minimum distance equal to 10 feet.

1.16 SITE CONDITIONS

- A. Field measurements and material quantities:
  - 1. Contractor shall have SOLE responsibility for accuracy of all measurements, estimates of material quantities and sizes, and site conditions that will affect work.
- B. Existing Conditions:
  - 1. Building space directly under roof area covered by this specification will be utilized by on-going operations. Do not interrupt Owner operations unless prior written approval is received from Owner.
- C. Waste Disposal:
  - 1. Do not re-use, re-cycle or dispose of materials except in accordance with all applicable regulations. The use of products is responsible for proper use and disposal of product containers.
- D. Safety Requirements:
  - 1. All application, material handling, and associated equipment shall conform to and be operated in conformance with OSHA safety requirements.
  - 2. Comply with federal, state, local and Owner fire and safety requirements.
  - 3. Advise Owner whenever work is expected to be hazardous to Owner, employees, and/or operators.
  - 4. Maintain a crewman as a floor area guard whenever roof decking is being repaired or replaced.
  - 5. Maintain fire extinguisher within easy access whenever power tools, roofing kettles, fuels, solvents, torches and open flames are being used.



## PART 2 – PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

- A. When a particular trade name or performance standard is specified it shall be indicative of the minimum standard required. Product names for the materials used in this section shall be based on performance characteristics of the modified bitumen roof system manufactured by The Garland Company, Cleveland, OH, ((610) 715-1700 or (973) 224-3069) and shall form the basis of the contract documents.
- B. This specification is based on the performance characteristics of the system identified herein. Any proposed systems, specified or not, must meet or exceed the following listed characteristics and be submitted for approval. Additionally, all Warranty Criteria (Section 1.15) and Design and Performance Criteria (Section 1.16) must be met and submitted as well as all items listed in the Disclosure of Materials and Substitutions (Section 1.7). See GENERAL CONDITIONS, GC-4.23 SUBSTITUTIONS (OR EQUAL) for additional requirements and procedures.
- C. Any item or materials submitted as a substitution to the basis of design manufacturer specified, must be submitted by the bidding Contractor and must comply in all respects as to the quality and performance of the brand name specified. Should the Contractor choose to submit a substitute product, he shall assume all monetary or other risk involved, should the Architect find the substitution unacceptable.
- D. Provide primary products, including each type of roofing membrane, base roofing ply, base flashing ply, modified membrane flashing ply, modified membrane roof ply, cold applied adhesives and miscellaneous flashing materials from a single source roof manufacturer. A roof manufacturer is defined as the company who physically manufactures the modified membrane products and provides the Edge-to-Edge roof system warranty. Provide secondary products (insulation, mechanical fasteners, etc.) only as recommended by the roof manufacturer of primary products for use with the roof system specified.
- E. The following manufacturers are acceptable, providing they meet these specifications and the minimum standards stated.
  - 1. The Garland Company, Inc. (Basis of Design)
  - 2. Approved Equal

### 2.2 DESCRIPTION

- A. Modified bituminous roofing work including but not limited to:
  - 1. Install the specified roof insulation system and recovery board in accordance with Division 7 Section 07 2200.
  - 2. SBS Base Roofing Ply: HPR TORCH BASE SHEET; One (1) ply of 110 mil thick SBS Torch Grade Base Sheet fully adhered to approved torchable roof recovery board with roofer's torches, covered with one (1) ply of SBS modified cap roof membrane ply installed by torch methods.
  - 3. SBS Base Flashing Ply (Torch Applied): HPR TORCH BASE SHEET; One (1) ply of 110 mil thick SBS Torch Grade Base Sheet fully adhered to approved torchable insulation with roofer's torches, covered with one (1) ply of SBS mineral surfaced flashing membrane ply installed by torch methods, or with KEE thermoplastic flashing membrane ply in specified cold applied adhesive.
  - 4. SBS Modified Mineral Surfaced Membrane Roofing Ply (Torch Applied): STRESSPLY IV MINERAL; One (1) ply of 195 mil thick SBS (Styrene-Butadiene-Styrene) mineral surfaced rubber modified roofing membrane with a dual fiberglass scrim. This membrane is designed for torch applications and has a burn-off backer that indicates when the material is hot enough to be installed.

5. KEE Fleece Backed Thermoplastic Membrane Flashing Ply: SOLAR BRITE FB MEMBRANE; One (1) ply of 60 mil KEE (Ketone Ethylene Ester) thermoplastic membrane, polyester reinforced scrim and a polyester fleece on the back side.
6. KEE Fleece Backed Thermoplastic Membrane Flashing Ply Adhesive: KEE FBWB ADHESIVE; a waterbased, rubberized asphalt adhesive designed specifically for adhering KEE fleece backed thermoplastic membranes to a variety of substrates.

## 2.3 BITUMINOUS MATERIALS

- A. Asphalt Primer: V.O.C. compliant, ASTM D-41.
- B. Asphalt Roofing Mastic: V.O.C. compliant, ASTM D-2822, Type II.
- C. KEE Fleece Backed Thermoplastic Membrane Flashing Ply Adhesive: KEE FBWB ADHESIVE cold applied flashing adhesive.
- D. KEE Mastic for 3-course of KEE Membrane to SBS Modified Membrane Roof Ply: KEE LOCK MASTIC
- E. Aluminized Asphalt Roofing Mastic for Vertical Seams of SBS Modified Membrane Flashings: SILVER-FLASH.
- F. Elastomeric Asphaltic Sealant: GARLA-FLEX SEALANT.

## 2.4 SHEET MATERIALS

- A. SBS Base Roofing Ply and Base Flashing Ply: HPR TORCH BASE SHEET
  1. HPR TORCH BASE SHEET: 110 mil SBS Torch Grade Base Sheet with woven fiberglass scrim reinforcement with the following minimum performance requirements according to ASTM D-5147.
  2. Properties: (Finished Membrane):
    - a. Tensile Strength (ASTM D-5147): 2 in/min. @ 73.4 ± 3.6°F; MD 210 lbf/in; CMD 210 lbf/in.
    - b. Tear Strength (ASTM D-5147): 2 in/min. @ 73.4 ± 3.6°F; MD 250 lbf; CMD 250 lbf.
    - c. Elongation at Maximum Tensile (ASTM D-5147): 2 in/min. @ 73.4 ± 3.6°F; MD 4.0%; CMD 4.0%.
    - d. Thickness: 110 mils
    - e. Post-Consumer Recycled Content : 6%
- B. SBS Mineral Surfaced Modified Membrane Roofing Ply (Torch Applied): STRESSPLY IV MINERAL
  1. STRESSPLY IV MINERAL: 195 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced rubber modified roofing membrane with a dual fiberglass scrim. This membrane is designed for torch applications and has a burn-off backer that indicates when the material is hot enough to be installed. The membrane has the following minimum performance characteristics according to ASTM D 6163 Type III Grade S
  2. Tensile Strength (ASTM D-5147): 2 in/min. @ 73.4 ± 3.6°F; MD 210 lbf/in; CMD 210 lbf/in
  3. Tear Strength (ASTM D-5147): 2 in/min. @ 73.4 ± 3.6°F; MD 250 lbf; CMD 250 lbf
  4. Elongation at Maximum Tensile (ASTM D-5147): 2 in/min. @ 73.4 ± 3.6°F; MD 6.0%; CMD 6.0%
  5. Low Temperature Flexibility (ASTM D-5147): Passes -20°F (-29°C)
  6. Thickness: 195 mils

- C. SBS Mineral Surfaced Modified Membrane Flashing Ply (Torch Applied): STRESSPLY IV MINERAL
1. STRESSPLY IV MINERAL: 195 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced rubber modified roofing membrane with a dual fiberglass scrim. This membrane is designed for torch applications and has a burn-off backer that indicates when the material is hot enough to be installed. The membrane has the following minimum performance characteristics according to ASTM D 6163 Type III Grade S
  2. Tensile Strength (ASTM D-5147): 2 in/min. @ 73.4 ± 3.6°F; MD 210 lbf/in; CMD 210 lbf/in
  3. Tear Strength (ASTM D-5147): 2 in/min. @ 73.4 ± 3.6°F; MD 250 lbf; CMD 250 lbf
  4. Elongation at Maximum Tensile (ASTM D-5147): 2 in/min. @ 73.4 ± 3.6°F; MD 6.0%; CMD 6.0%
  5. Low Temperature Flexibility (ASTM D-5147): Passes -20°F (-29°C)
  6. Thickness: 195 mils
- D. KEE Thermoplastic Membrane Flashing Ply: SOLAR BRITE MEMBRANE FLASHING
1. SOLAR BRITE MEMBRANE FLASHING COMPONENTS: 60 mil KEE (Ketone Ethylene Ester) thermoplastic membrane, non-reinforced membranes. The membrane has the following minimum performance characteristics according to ASTM D 6754-02
- E. Reinforcing Mesh for Flashing Seams: GARMESH Styrene-Butadiene-Rubber (SBR) coated, woven, fiberglass scrim.

## 2.5 SURFACINGS

- A. Mineral Surfaced Membrane: Roofing Granules shall meet requirements of ASTM D-451 and/or be recommended by the membrane manufacturer. Loose granules for bleedout shall match size and color of granulated membrane sheet.
- B. Mineral Surfaced Membrane: If minerals are not applied properly into the bleedout, apply manufacturers' PYRAMIC BASE COATING on field seams of modified bitumen roofing ply and broadcast minerals into the coating while it is still wet. Roofing Granules shall meet requirements of ASTM D-451 and/or be recommended by the membrane manufacturer.
- C. **Deleted.**

## 2.6 RELATED MATERIALS

- A. Cementitious Repair Mortar, Trowel Grade: One- or two-component, factory-mixed, polymer-modified cementitious mortar.
1. In-place material resistant to freeze/thaw conditions.
  2. Mixed with water or latex type bonding agent in proportions as recommended by manufacturer.
  3. Integral corrosion inhibitor.
- B. Roof Insulation and Roof Recovery Board: In accordance with Division 7 Sections 07 2200.
- C. Roof Insulation and Roof Recovery Board Adhesives: In accordance with Division 7 Section 07 2200.
- D. Nails and Fasteners: Non-ferrous metal or hot dipped galvanized fasteners complying with ASTM A153 and connectors complying with ASTM A653, Class G185; Type 304 or Type 316 stainless steel fasteners and connectors shall be used with new generation of pressure-treated wood; except that hard copper nails shall be used with copper; aluminum or stainless steel nails shall be used with aluminum; and stainless steel nails shall be used with stainless steel.

Fasteners shall be self-clinching type of penetrating type as recommended by the manufacturer of the wood blocking/nailer material. Nails and fasteners shall be flush-driven through flat metal discs of not less than one (1) inch diameter. Omit metal discs when one-piece composite nails or fasteners with heads not less than one (1) inch diameter are used.

- E. Metal Discs: Flat discs or caps of zinc-coated sheet metal not lighter than twenty-eight (28) gauge and not less than one (1) inch in diameter. Form discs to prevent dishing. Bell or cup shaped caps are not acceptable.
- F. Metal Flashing Sheet: Metal flashing sheet is specified in Division 7 Section "Sheet Metal Flashing and Trim".
- G. Lead Flashing Sheet: Meets Federal Specification QQ-L-201, Grade B, four (4) pounds per square foot.
- H. Metal Termination Bars:
  - 1. Shall be heavy flat bar aluminum unless otherwise recommended by membrane manufacturers.
  - 2. Material shall be .125" x 1" (minimum) aluminum conforming to ASTM B-221, mill finish.
- I. Urethane Sealant: One part, non-sag sealant as provided by or recommended by the membrane manufacturer for moving joints.
  - 1. Tensile Strength (ASTM D412): 250 psi
  - 2. Ultimate Elongation (ASTM D412): 950%
  - 3. Hardness, Shore A (ASTM C920): 35
  - 4. Adhesion-in-Peel (ASTM C920): 25 pli
  - 5. 100% Modulus (ASTM D412): 50 psi
  - 6. Bond (Durability-Class 25, ASTM C920): Passes
  - 7. Service Temperature Range: -40°F to +180°F
  - 8. Stain and Color Change (ASTM C920): Passes
  - 9. Tack Free Time (ASTM C679 (max 72 hrs.): 16 hrs.
  - 10. Weep and Sag (ASTM C920 (max 3/16" (4mm))): Passes
  - 11. Weight loss after heat aging (ASTM C920 (max 10%)): Passes
- J. Pitch Pocket Sealer: Two-part, 100% solids, pourable, self leveling, urethane sealant for filling pitch pans as provided by or recommended by the membrane manufacturer.
  - 1. Viscosity: A Component: 100,000 to 150,000 cps; B Component 500 to 2,000 cps
  - 2. Pot Life: End Point 1 million centipoises: @ 100°F – 20 to 30 minutes; @ 70°F – 40 to 50 minutes.
  - 3. Durometer (ASTM D 2240): 40 to 50 shore
  - 4. Elongation (ASTM D 412): 250%; 100 mil @ 70°F
  - 5. Specific Gravity Cured Rubber 1.01
  - 6. Tensile Strength (ASTM D 412): 200 psi, 100 mil
  - 7. Peel Adhesion (ASTM C 836): Cotton Webbing Bonded to:
    - a. Aluminum – 15 pli
    - b. Concrete – 18 pli
    - c. Steel Galvanized – 19 pli
    - d. Wood – 20 pli
  - 8. Moisture Vapor Transmission (ASTM E96): 0.05 Perms
- K. Non-Shrink Grout: Use an all weather fast setting chemical action concrete material to fill pitch Pans.
  - 1. 1. Flexural Strength (ASTM C-78 (modified)) 7 days 1100psi
  - 2. 2. High Strength (ASTM C-109 (modified)) 24 days 8400lbs (3810kg)

- L. Protection and Walkway Pads: Recycled rubber (97% recycled rubber), anti-skid surface pads, manufactured as a traffic pad for foot traffic and acceptable to roofing system manufacturer, ½ inch and ¾" thick minimum, as noted.
  - 1. Pad Size: 3'-0" x 4'-0"
- M. Protection and Walkway Pads Adhesive: GREENLOCK STRUCTURAL SEALANT.
- N. Fluid Applied Flashing System: TUFF-FLASH a multi-purpose, asphaltic polyurethane based, low-odor, liquid flashing membrane system reinforced with an approved reinforcing scrim as provided by the roof membrane manufacturer.
- O. Existing Drains: All existing drain bowls shall be removed down to the first elbow and replaced. New clamping rings and strainers shall be cast iron. On roof sections having a gravel surfacing, a perforated stainless steel gravel guard that is integral with the clamping ring shall be installed.
- P. Liquid Flashing System: TUFF-FLASH; As manufactured, supplied and recommended by manufacturer reinforced with a polyester reinforcing mat.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrate surfaces to receive modified bituminous membrane roof system and associated work and conditions under which roofing will be installed. Do not proceed with roofing until unsatisfactory conditions have been corrected in a manner acceptable to the manufacturer.
- B. Prior to installing the finish modified membrane roofing ply, the contractor must notify the roof system manufacturer representative, and Architect, to examine the roof area for high and low spots. It may be necessary to mist the roof with water to identify the problem areas. The contractor will correct all problem areas identified. This examination should take place no less than 24 hours in advance of installing the finished membrane.
- C. Verify that deck surfaces and project conditions are ready to receive work of this section.
- D. Verify that deck is supported and secured to structural members.
- E. Verify that deck is clean and smooth, free of depressions, projections or ripples, and is properly sloped to drains.
- F. Verify that adjacent roof members do not vary more than 1/4 inch in height.
- G. Verify that deck surfaces are dry, free of snow or ice, not rotten or deteriorated, do not have bacterial growth and are structurally sound.
- H. Confirm that moisture content within the concrete roof deck, wood blocking and nailers does not exceed twelve (12) percent by moisture meter tests.
- I. Verify that openings, curbs, pipes, conduit, sleeves, ducts, and other items which penetrate the roof are set solidly, and that wood cant strips, wood nailing strips and reglets are set in place. Verify that all roof curb heights are satisfactory and that the wood blocking height along the perimeter of the building and/or roof levels is satisfactory to provide positive roof pitch away from the building edge.

- J. Contractor is responsible to verify existing substrate is sloped, or plumb/level, as stated in/on the project documents prior to installation of the insulation system. All defects in roof pitch to be accommodated with tapered insulation to insure a positive pitch to all roof drains.

### 3.2 PREPARATION - REMOVAL

- A. Clean substrate of debris and other substances detrimental to roofing installation according to the roof system manufacturer's written instructions. Remove sharp objects.
- B. Protect other work from spillage of roofing materials and prevent materials from entering or clogging drains and conductors. Use roof drain plugs as required to prevent materials from entering and clogging roof drains and conductors. Remove roof drain plugs at the end of each workday, or when rain is forecasted. Replace or restore other work damaged by installation of the modified bituminous roofing system.
  - 1. Prior to beginning work, contractor shall verify/test that existing roof drains are in working, or non-working, order. If the drains are in non-working order, the Owner shall address the non-working drain to working conditions. If the drains are in working order, then the contractor will be required to maintain, and deliver, the drains back to the Owner in working order.
- C. All existing roofing shall be torn off and removed completely down to the roof structure decking. Dispose off-site in dumpsters.
- D. Tear off only enough roofing which can be successfully re-roofed in a single day.

### 3.3 PREPARATION – CONCRETE DECK

- A. Fill honeycombing and imperfections in deck surface with Cementitious Repair Mortar as per manufacturer's instructions.
- B. Prior to installing the insulation system onto the concrete deck, prime the concrete deck surfaces with asphalt primer at the rate of 1 (one) gallon per one-hundred fifty (150) to two-hundred fifty (250) square feet.

### 3.4 ROOF DRAINS

- A. Existing Drains: All existing drains will be replaced down to the first elbow. New drains shall be accordance with project documents and specified above. Sizes shall match existing. Drains will have new deck clamps, threaded receivers, and cast iron metal strainers. On roof sections having a gravel surfacing, a perforated stainless steel gravel guard that is integral with the clamping ring shall be installed. Drains shall be installed prior to the roof installation at the proper height above the roof deck, and in accordance with the project documents.

### 3.5 GENERAL INSTALLATION REQUIREMENTS

- A. Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing the roof system.
- B. Insurance/Code Compliance: Where required by code, install and test the roofing system to comply with governing regulation and specified insurance requirements.
- C. Protect other work from spillage of roofing materials and prevent materials from entering or clogging gutter downspout drainpipes. Replace or restore other work damaged by installation of the modified bituminous roofing system.

- D. Coordinate installation of roofing system components so that base sheet, insulation, recovery board and roofing plies are not exposed to precipitation or left exposed overnight. Provide cut-offs at end of each day's work to cover exposed roofing ply modified membranes, recovery board and insulation with one (1) ply of base roofing ply applied torch methods, and with joints and edges sealed with the specified cold applied adhesive. Install reinforcing scrim as needed. Remove cut-offs immediately before resuming work.
- E. Substrate Joint Penetrations: Prevent adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.
- F. Apply roofing materials as specified by manufacturer's instructions.
  - 1. Keep roofing materials dry before and during application.
  - 2. Begin and apply only as much roofing in one day as can be completed that same day in accordance with following; fully complete the installation of insulation system and base roofing plies, and/or the installation of the modified bituminous membrane roof ply each day. Phase construction between the base roofing plies and modified membrane roof ply (top ply) is acceptable.
- G. Envelope Waterstops: Where the existing roof system is wet, install temporary water cut-offs at completion of each day's work and remove upon resumption of work. Install an envelope water stop at the edge of insulation to prevent water infiltration into new insulation/roof system. Install envelope waterstop flashing 4 - 6 inches under face edge of new insulation and wrapped up face and back onto the newly installed roof system a 4 - 6 inches from the face in the specified cold applied adhesive, top dress waterstop with the specified cold applied adhesive and reinforcing scrim as needed. As required, seal joints and edges with the specified cold applied adhesive. Remove envelope waterstop immediately before resuming work.
- H. A minimum two-hour fire watch is required for each day that torch-applied membranes are installed.
- I. Keep an approved rated fire extinguisher every 3,000 square feet maximum on the roof. The fire extinguisher shall be placed in a central location in that area where all workers know where it is and how to operate in properly.

### 3.6 INSULATION INSTALLATION

- A. Refer to Roof Insulation Specification Division 7 Sections 07 22 00 for complete installation requirements.
- B. Deck types: Concrete.
- C. Insulation: Flat rigid polyisocyanurate insulation with a minimum thickness and compressive strength as specified, and 1/2" thick nonstructural, water-resistant, fiber-reinforced gypsum roof recovery board.
- D. Insulation Attachment: Polyiso shall be fully adhered to the prepared and primed concrete roof deck, and subsequent layers of polyiso, with the specified cold-applied insulation adhesive in accordance with the project specifications and manufacturer's recommendations. The recovery board shall be installed over the polyisocyanurate insulation system with the specified cold-applied insulation adhesive in accordance with the project specifications and the manufacturer's recommendations.

### 3.7 BASE ROOFING PLIES INSTALLATION

- A. Install one (1) ply of the specified Base Roofing Ply to the properly prepared roof recovery board substrate. Shingle in proper direction to shed water on each area of roofing.
- B. To an approved recovery board, lay out the roll of the first ply in the course to be followed and unroll six (6) feet.
- C. Using a roofing torch, heat the surface of the coiled portion until the burn-off backer melts away. At this point, the material is hot enough to lay into the substrate. Progressively unroll the sheet while heating and press down with your foot to insure a proper bond.
- D. After the major portion of the roll is bonded, re-roll the first six (6) feet and bond it in a similar fashion.
- E. Repeat this operation with subsequent rolls with side laps of four (4) inches and end laps of eight (8) inches.
- F. Give each lap a finishing touch by passing the torch along the joint and spreading the melted bitumen evenly with a rounded trowel to insure a smooth, tight seal. Ensure a uniform and complete bleed out from the side and end laps.
- G. Extend base roofing ply to the top edge of cants at wall and projection bases.
- H. Install base flashing ply to all perimeter and projection details.

### 3.8 SBS MODIFIED MEMBRANE ROOF PLY TORCH APPLIED APPLICATION

- A. Prior to installing the modified membrane roofing ply, the contractor must notify the roof system manufacturer representative, and Owner's representative, to examine the roof area for high and low spots. It may be necessary to mist the roof with water to identify the problem areas. The contractor will correct all problem areas identified. This examination should take place no less than 24 hours in advance of installing the finished membrane.
- B. Prior to installing the modified membrane cap sheet, clean the base roofing ply of debris and other substances detrimental to roofing installation according to the roof system manufacturer's written instructions. Remove sharp objects.
- C. Over the specified Base Roofing Plies, lay out the roll in the course to be followed and unroll six (6) feet. Seams for the top layer of modified membrane will be staggered over the Base Roofing Ply sheet seams. End laps of the specified Modified Membrane Roofing Ply shall be staggered 12-inches minimum with the Base Roofing Ply end laps.
- D. Using a roofing torch, heat the surface of the coiled portion until the burn-off backer melts away. At this point, the material is hot enough to lay into the substrate. Progressively unroll the sheet while heating and press down with your foot to insure a proper bond.
- E. After the major portion of the roll is bonded, re-roll the first six (6) feet and bond it in a similar fashion.
- F. Repeat this operation with subsequent rolls with side laps of four (4) inches and end laps of eight (8) inches. End laps of the specified Modified Membrane Roofing Ply shall be staggered 12-inches minimum.



- G. Give each lap a finishing touch by passing the torch along the joint and spreading the melted bitumen evenly with a rounded trowel to insure a smooth, tight seal. Ensure a uniform and complete bleed out from the side and end laps.
- H. Aesthetics will be a punch list item. The roof must match the owner's standards for appearance. The desired result of heat welding the laps should be a small uniform pencil line bead of compound visible at all the laps.
- I. Extend modified membrane roofing ply to the top edge of cants at wall and projection bases.
- J. Install modified flashing plies to all perimeter and projection details.

### 3.9 SBS MODIFIED FLASHING MEMBRANE INSTALLATION

- A. Seal all curb flashings with an application of the specified cold applied flashing adhesive and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
- B. Prepare all penetrations, expansion joints, and where shown on the drawings to be flashed with asphalt primer at the rate of one hundred (100) square feet per gallon. Allow primer to dry tack free.
- C. The wall/cant juncture will be examined for air passage. If airflow is present, the joint between the cant and wall will be sealed with a closed cell joint backing and reglet joint sealant.
- D. Use the modified membrane flashing ply specified as the flashing membrane. Adhere to the underlying base flashing ply with specified cold applied flashing adhesive at a rate of three (3) gallons per one hundred (100) square feet. Secure at a minimum of eight (8) inches from the finished roof at all vertical surfaces with a continuous termination bar fastened at six (6) inches on center.
- E. Solidly adhere the entire sheet of flashing membrane to the base flashing ply and substrate with the specified cold-applied flashing adhesive. The adhesive shall be held back 4" from the side laps and 8" from end laps. Care should be taken to eliminate air entrapment under the membrane.
- F. Heat weld all seams with a Leister Variant or approved modified bitumen heat welding machine. Torching is not permitted. Hand weld T joints and hard to reach areas. Membrane without selvage edge are to be butted together and sealed with a heat welded utility roll.
- G. Aesthetics will be a punch list item. The roof must match the owner's standards for appearance. The desired result of heat welding the laps should be a small uniform pencil line bead of compound visible at all the laps.
- H. **Deleted.**
- I. Coordinate counter flashings, cap flashings, expansion joints, and similar work with modified bitumen roofing work as specified in other sections.
- J. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work as specified in other sections.
- K. K. Flash all penetrations as specified below and per the project documents. If specific detail is not shown in drawings or specified below, flash detail in accordance with the manufacturer's specifications to comply with the specified guaranty.

- L. Roof Drain:
1. Plug drain to prevent debris from entering plumbing.
  2. Run complete roof system plies over drain. Cut out plies inside drain bowl.
  3. Set 4lb. lead flashing (thirty (30) inch square minimum) in ¼ inch bed of mastic. Run lead into drain a minimum of two (2) inches. Prime lead at a rate of one hundred (100) square feet per gallon and allow to dry.
  4. Install base flashing ply (forty (40) inch square minimum) in the specified cold applied flashing adhesive.
  5. **Install modified membrane (forty-eight (48) inch square minimum) in the specified cold applied flashing adhesive. Seal edge of modified flashing plies with a three-course application of SILVER-FLASH aluminized mastic and reinforcing mesh.**
  6. **Install clamping ring over flashing.**
  7. Remove drain plug and install strainer.
- M. **Deleted.**
- N. Plumbing/Soil Stack **Vents:**
1. Minimum stack height is twelve (12) inches.
  2. Run roof system over the entire surface of the roof. Seal the base of the stack with specified GARLA-FLEX SEALANT.
  3. Prime flange of new lead sleeve. Install properly sized lead sleeve set in ¼ inch bed of the specified solvent free, cold applied flashing adhesive.
  4. Install base flashing ply in the specified cold-applied flashing adhesive.
  5. Install modified membrane in the specified cold-applied flashing adhesive.
  6. Caulk the intersection of the membrane with GARLA-FLEX SEALANT.
  7. Turn sleeve a minimum of one (1) inch down inside of stack. For pipes 2 inches or less in diameter, lead top caps will be required.
- O. Pitch Pocket:
1. Run all plies up to the penetration.
  2. Seal base of penetration to roof surface with GARLA-FLEX SEALANT.
  3. Place the pitch pocket over the penetration in a bed of the specified cold applied flashing adhesive, and prime all flanges.
  4. Strip in flange of pitch pocket with one (1) ply of base flashing ply in the specified cold applied flashing adhesive. Extend six (6) inches onto field of roof.
  5. Install the modified membrane in the specified cold applied flashing adhesive extending nine (9) inches onto field of the roof.
  6. Fill pitch pocket half full with non-shrink grout. Let this cure and top off with specified two-part pourable sealer.
  7. Caulk joint between roof system and pitch pocket with the specified GARLA-FLEX SEALANT.
- P. Heat Stack:
1. Minimum stack height is twelve (12) inches.
  2. Run roof system over the entire surface of the roof. Seal the base of the stack with specified GARLA-FLEX SEALANT.
  3. Prime flange of new sleeve. Install properly sized sleeves set in ¼ inch bed of specified cold applied flashing adhesive.
  4. Install base flashing ply in the specified cold applied flashing adhesive.
  5. Install modified membrane in the specified cold applied flashing adhesive.
  6. Caulk the intersection of the membrane with the specified GARLA-FLEX SEALANT.
  7. Install new collar over cape. Weld collar or install stainless steel draw brand.
- Q. **Deleted.**

R. **Deleted.**

S. Curb Detail/**Exhaust Fans and Gravity Vents:**

1. Prime vertical at a rate of one hundred (100) square feet per gallon and allow to dry.
2. Set cant in cold applied insulation adhesive. Run base roofing ply over cant and stop at the top edge of the cant strip.
3. Install base flashing ply by torch methods covering curb with six (6) inches on to field of the roof.
4. Install modified membrane over cant and stop at the top edge of the cant strip.
5. Install a ply of modified flashing ply installed the specified cold-applied flashing adhesive over the base flashing ply, nine (9) inches on to field of the roof. Attach top of membrane to top of wood curb and nail at eight (8) inches o.c. Allow the flashing system to cure and apply a three-course application of Silver-Flash mastic and mesh at all vertical seams.
6. Terminate the flashing system at the top of the curb and fasten with cap nails at eight (8) inches on center. Install an 0.040" aluminum slip flashing under the equipment support cover and fasten to the curb at eight (8) inches on center with neoprene gasketed screws. The slip flashing shall cover the top of the flashing system three (3) inches minimum.

T. **Deleted.**

U. **Deleted.**

### 3.10 KEE THERMOPLASTIC FLASHING MEMBRANE INSTALLATION

- A. Seal all wall and parapet flashings with an application on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
- B. Prepare all walls where shown on the drawings to be flashed.
- C. The wall/cant juncture will be examined for air passage. If airflow is present, the joint between the cant and wall will be sealed with a closed cell joint backing and reglet joint sealant.
- D. Use the KEE Thermoplastic membrane flashing ply specified as the flashing membrane. Adhere to the underlying base flashing ply with specified cold applied flashing adhesive at a rate of one (1) gallon per sixty (60) square feet. Secure at a minimum of eight (8) inches from the finished roof at all vertical surfaces with a continuous termination bar fastened at six (6) inches on center.
- E. Solidly adhere the entire sheet of flashing membrane to the base flashing ply and substrate with the specified cold-applied flashing adhesive. The adhesive shall be held back 4" from the side laps and 8" from end laps. Care should be taken to eliminate air entrapment under the membrane.
- F. Hot Air Welding
  1. General
    - a. All seams must be clean and dry prior to initiating any field welding.
    - b. Remove foreign materials from the seams (dirt, oils, etc.) with Acetone or authorized alternative. Use CLEAN WHITE COTTON cloths and allow approximately five minutes for solvents to dissipate before initiating the automatic welder. Do not use denim or synthetic rags for cleaning.
    - c. All welding shall be performed only by qualified personnel to ensure the quality and continuity of the weld.
    - d. Contaminated areas within a seam will inhibit proper welding and will require a membrane patch

2. Hand Welding
  - a. The lap or seam area of the membrane should be intermittently tack welded to hold the membrane in place.
  - b. The back "interior" edge of the membrane shall be welded first, with a thin, continuous weld to concentrate heat along the exterior edge of the lap during the final welding pass.
  - c. The nozzle of the hand held hot air welder shall be inserted into the lap at a 45° angle to the lap. Once the polymer on the material begins to flow, a hand roller shall be use to apply pressure at a right angle to the tip of the hand welder. Properly welded seams shall utilize a 1-1/2 inch wide nozzle, to create a homogeneous weld, a minimum of 1-1/2 inches in width.
  - d. Smaller nozzles may be used for corners, and other field detailing, maintaining a minimum 1 inch weld.
  
- G. Aesthetics will be a punch list item. The installation must match the owner's standards for appearance.
  
- H. Parapet Wall with Pre-Manufactured Metal Coping Cap:
  1. Remove the existing metal coping cap, prepare wall and install new approved wood blocking fasten to top of wall with approved tapcon masonry anchors at eighteen (18) inches o.c., staggered pattern. Two (2) fasteners will be located within two (2) inches of the blocking section ends, each side. Width of wood blocking shall equal the width of the existing wall. Top of wood blocking shall be a minimum of twelve (12) inches above top of roof. The joints of the wood blocking MUST be staggered between layers.
  2. Minimum flashing height is twelve (12) inches, and maximum flashing height is thirty (30) inches. Prime vertical wall at a rate of one hundred (100) square feet per gallon and allow to dry.
  3. Set cant in specified cold applied insulation adhesive. Run base roof ply over cant and stop at the top edge of the cant strip.
  4. Install base flashing ply by torch methods wrapped over top of wall and down the outside face of the wood blocking, and with six (6) inches on to field of the roof. Nail membrane at eight (8) inches o.c. to outside face of nailers on top of the wall.
  5. Install modified membrane over cant and stop at the top of the cant strip.
  6. Install KEE Thermoplastic flashing ply in the specified cold applied flashing adhesive over the base flashing ply wrapped onto and over top of wall, with nine (9) inches on to the field of the roof. Nail membrane at eight (8) inches o.c. to outside face of nailers on top of the wall. Allow the flashing system to cure and apply a three-course application of KEE LOCK MASTIC and 6" wide GARMESH over the leading edge of the KEE Thermoplastic flashing membrane and roof system.
  7. Install new metal fascia/extender system with continuous cleat. Fasten to wall structure or wood blocking as specified. Metal fascia extender shall cover the bottom of the wood nailer and top of wall (interface between wood blocking and wall) a minimum of two (2) inches.
  8. Install specified pre-manufactured metal coping cap system.
  
- I. Reglet Mounted Counterflashing:
  1. Remove existing counterflashing system to allow the installation of the new roof flashing and counterflashing system.
  2. Minimum flashing height is eight (8) inches. Maximum flashing height is twenty-four (24) inches. Prime vertical wall at a rate of one hundred (100) square feet per gallon and allow to dry.
  3. Set cant in specified cold applied insulation adhesive. Run base roof ply over cant and stop at the top edge of the cant strip.
  4. Install base flashing ply by torch methods covering curb and with six (6) inches on to field of the roof.

5. Install modified membrane over cant and stop at the top of the cant strip.
6. Install KEE Thermoplastic flashing ply in the specified cold applied flashing adhesive over the base flashing ply wrapped onto and over top of wall, with nine (9) inches on to the field of the roof. Nail membrane at eight (8) inches o.c. to outside face of nailers on top of the wall. Allow the flashing system to cure and apply a three-course application of KEE LOCK MASTIC and 6" wide GARMESH over the leading edge of the KEE Thermoplastic flashing membrane and roof system. Install the specified termination bar even with the top of the flashing, and secure the termination bar through both plies of the flashing system and into wall every six (6) inches on center. Seal the top of the termination bar/flashing with the specified KEE Thermoplastic flashing membrane sealant.
7. Cut reglet in masonry one joint above flashing.
8. Install new reglet counterflashing with lead expansion wedges at 12" on center and seal reglet opening with high grade polyurethane sealant. End joints shall be interlocking and overlapping not less than 3". Corners shall be mitered and welded to a watertight condition. The bottom of the cap flashing insert shall project ¼" from the face of the wall with a down turned drip edge (provide a down turned hem in areas subject to human contact). New counterflashing shall cover the termination bar a minimum of four (4) inches.

### 3.11 APPLICATION OF SURFACING

- A. Prior to installation of surfacing, the completed roof system must be inspected and approved by the Architect and Manufacturer. All repairs must be made by the Contractor prior to the application of the surfacing system. All bitumen materials have properly cured per the manufacturer's recommendations prior to applying the coating system.
- B. SBS MODIFIED MINERAL SURFACED MEMBRANE ROOFING PLY SURFACING
  1. If the heat welded bead of compound is found not to be acceptable, allow the compound to properly cure per the manufacturer's recommendations, and apply manufacturers' PYRAMIC BASE COATING on all field seams of the modified membrane roofing ply at a rate of two (2) gallons per square, and immediately broadcast loose minerals into the coating while it is still wet.

### 3.12 FIELD QUALITY CONTROL

- A. Correct defects or irregularities discovered during field inspection.
- B. Require attendance of roofing materials manufacturers' representative(s) at site during installation of the roofing system.

### 3.13 CLEANING

- A. Remove bitumen adhesive drippings from all walls, windows, floors, ladders and finished surfaces.
- B. In areas where finished surfaces are soiled by asphalt or any other sources of soiling caused by work of this section, consult manufacturer of surfaces for cleaning instructions and conform to their instructions.
- C. Repair or replace defaced or disfigured finishes caused by work of this section.

3.14 FINAL INSPECTION

- A. At completion of roofing installation and associated work, meet with Contractor, Architect, Owner, roofing system manufacturer's representative, and other representatives directly concerned with performance of roofing system.
- B. Walk roof surface areas of the building, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. List all items requiring correction or completion and furnish copy of list to each party in attendance.
- C. If core cuts verify the presence of damp or wet materials; the Roofing Contractor shall be required to replace the damaged areas at his own expense.
- D. Repair or replace deteriorated or defective work found at time above inspection as required to produce an installation which is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- E. Notify the Architect, Owner and roofing system manufacturer upon completion of corrections.
- F. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.

END OF SECTION 07 5200

SEAL:



ARRAND CHRISTOPHER  
STATE AND LICENSE NO. XXXXX20XX

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ISSUED FOR BID  
AUGUST 9, 2019

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1	10/17/19	ADDENDUM NO. 1

SCHOOL & LOCATION  
**LAURA H. CARNELL ELEMENTARY SCHOOL**

1100 DEVEREAUX AVENUE,  
PHILADELPHIA, PENNSYLVANIA

PROJECT TITLE

**ROOF REPLACEMENT**

DRAWING TITLE

**OVERALL ROOF EXISTING AND DEMOLITION PLAN**

DRAWING SCALE As indicated	
LOCATION NO. 7220	FILE NO. 2018-093
DRAWN BY RG/LD	CHECKED BY R.JH
B-072C OF 2017 / 18	

DRAWING NO.

**A-105**

SHEET 5 OF 13

08-09-2019 ISSUED FOR BID

**EXISTING ROOF CONDITION CHART**

ROOF AREAS	DECK		VAPOR RETARDER		INSULATION		ATTACHMENT		MEMBRANE / SURFACE / COATING			COMMENTS		
	CONCRETE	WOOD (8" MIN. 1/2" SLOPED)	NONE	BASE SHEET	#15 FELT UNDERLAYMENT	2" POLYISO INSULATION BOARD	3" PERLITE	THICKNESS	BITUMEN	MECHANICAL	2 PILES OF MODIFIED BITUMEN		MINERAL SURFACE (GRANULAR)	ASPHALT SHINGLES
ROOF A								2.34"						A
ROOF B								2.34"						A
ROOF C								2.34"						A
ROOF D								2.34"						A
ROOF E								2.34"						A
ROOF F								2.34"						A
ROOF G								2.34"						A
ROOF H								2.34"						A
ROOF I								2.34"						A
ROOF J								2.34"						A
ROOF K								2.34"						A
ROOF L								2.34"						A
ROOF M								2.34"						A

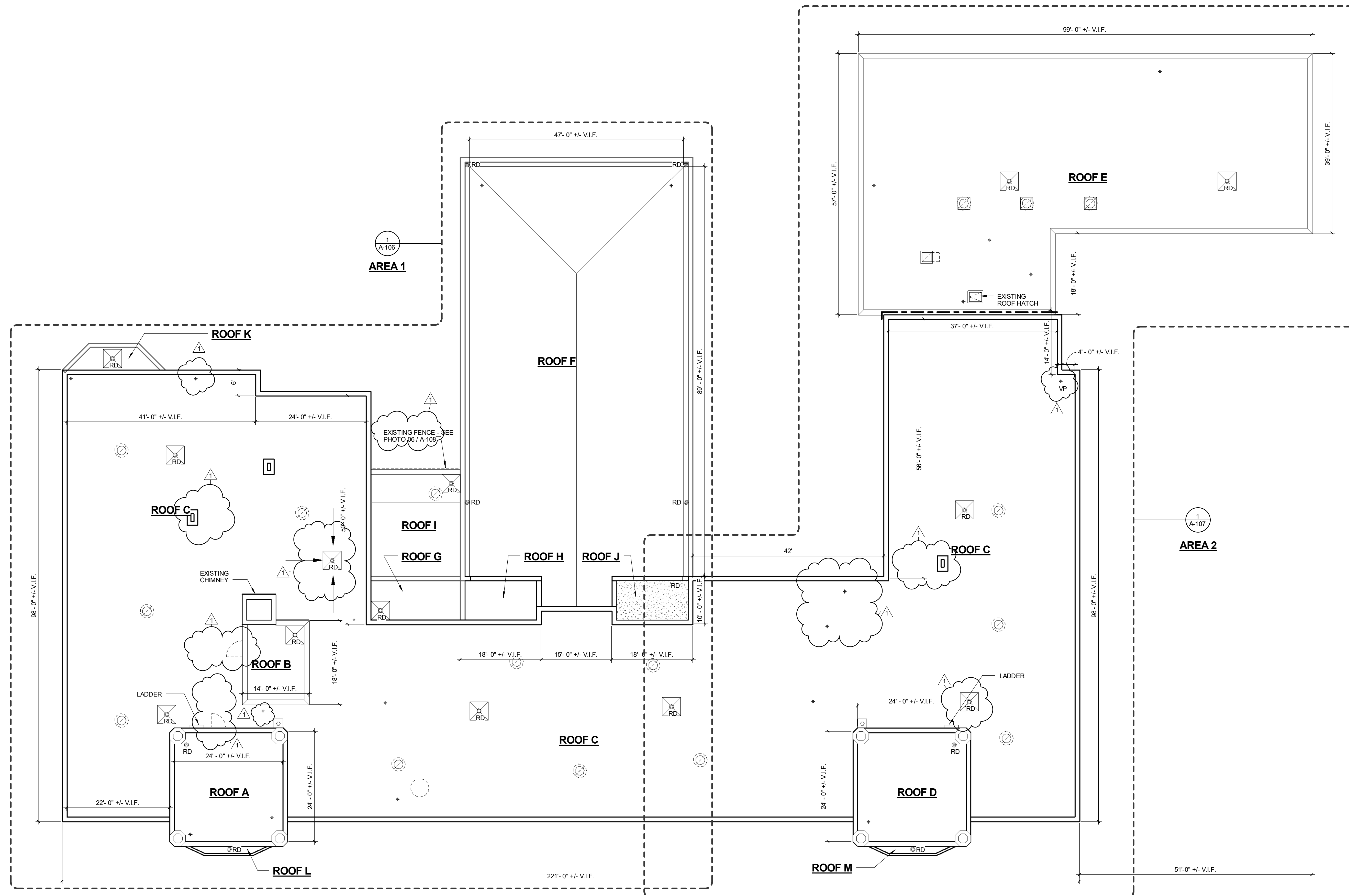
**SCOPE OF WORK NOTES**

**ROOF DEMOLITION AND PREPARATION WORK  
ROOF AREAS A, B, C, D, E, G, H, I, J, K, L & M**

- REMOVE ALL EXISTING MINERAL SURFACED MODIFIED BITUMEN ROOFING, PERLITE, POLYISOCYANURATE INSULATION, BASE SHEET, (COAL TAR PITCH ON ROOF B) AND FLASHINGS TO EXPOSE EXISTING CONCRETE DECK AND MASONRY WALLS.
- REMOVE ALL EXISTING METAL TERMINATION BARS, COUNTER FLASHING, PITCH POCKETS, CANT STRIPS, ETC. AS INDICATED OR REQUIRED. CLEAN EXISTING MASONRY SURFACES OF ALL OLD SEALANTS AND FLASHING MATERIALS. ALL COPPER THRU-WALL FLASHINGS TO REMAIN UNLESS OTHERWISE NOTED.
- PROVIDE COMPATIBLE DRAIN BOWL ADAPTER WITH GASKET, ADJUSTABLE EXTENSION SLEEVE AT ALL EXISTING DRAIN LOCATIONS. PROVIDE CLAMPING RING AND DOME STRAINERS UPON COMPLETION OF CAP SHEET. SEE PLUMBING.
- EXAMINE EXISTING CONCRETE DECK AND REPAIR ANY DETERIORATED OR DAMAGED DECK AREAS IN ACCORDANCE WITH THE REQUIREMENTS INDICATED IN THE PROJECT MANUAL. NOTIFY ARCHITECT OF ANY DAMAGE.
- EXAMINE ALL EXISTING WOOD NAILERS AND REPLACE DETERIORATED PIECES IN ACCORDANCE WITH THE REQUIREMENTS INDICATED IN THE PROJECT MANUAL. NOTIFY ARCHITECT OF ANY DAMAGE.
- RAISE ANY / ALL PROJECTION CURBS TO A MINIMUM OF 8" ABOVE THE TOP SURFACE OF THE NEW ROOFING SYSTEM.

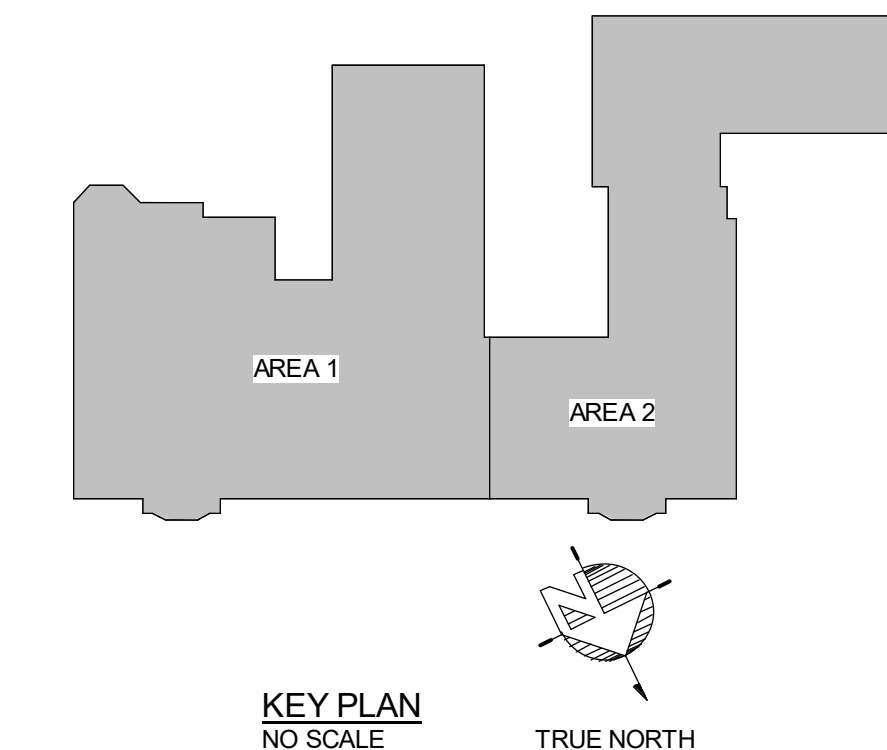
**ROOF DEMOLITION AND PREPARATION WORK ROOF AREA F**

- REMOVE ALL EXISTING ASPHALT SHINGLE, UNDERLAYMENT, STEP FLASHING AND FASTENERS TO EXPOSE EXISTING WOOD DECK AND ADJACENT MASONRY WALL.
- REMOVE ALL EXISTING ROOF PENETRATION FLASHINGS, METAL TERMINATION BARS, COUNTER FLASHING, ETC. AS INDICATED OR REQUIRED. CLEAN EXISTING MASONRY SURFACES OF ALL OLD SEALANTS AND FLASHING MATERIALS. ALL COPPER THRU-WALL FLASHING AND GUTTER LINER TO REMAIN UNLESS OTHERWISE NOTED. SOLDER ALL OPEN OR IRREGULAR SEAMS AT EXISTING GUTTER LINER TO PROVIDE A SMOOTH SUITABLE SUBSTRATE FOR THE REPLACEMENT ROOF SYSTEM.
- REMOVE AND REPLACE ALL EXISTING ROOF DRAINS IN ITS ENTIRETY. SEE PLUMBING.
- EXAMINE EXISTING WOOD DECK AND WOOD NAILERS. REPLACE ANY DETERIORATED OR DAMAGED DECK AREAS AND WOOD NAILERS IN ACCORDANCE WITH THE REQUIREMENTS INDICATED IN THE PROJECT MANUAL. NOTIFY ARCHITECT OF ANY DAMAGE.



**LEGEND**

- ARROW SHOWN INDICATES CONSTANT THICKNESS POLYISOCYANURATE INSULATION OVER EXISTING SLOPED DECK. NOTE: UNLESS OTHERWISE NOTED, EXISTING DECK IS SLOPED TO DRAIN.
- ARROW SHOWN INDICATES 1/2" PER FOOT SLOPE TAPERED CRICKET.
- EXISTING EXPANSION JOINT REMOVE AND REPLACE EXISTING EXPANSION JOINT ASSEMBLY.
- PROVIDE COMPATIBLE DRAIN BOWL ADAPTER WITH GASKET, ADJUSTABLE EXTENSION SLEEVE AT ALL EXISTING DRAIN LOCATIONS. PROVIDE CLAMPING RING AND DOME STRAINERS UPON COMPLETION OF CAP SHEET. SEE PLUMBING.
- EXISTING MECHANICAL EQUIPMENT REMOVE AND REPLACE EXISTING FLASHING.
- EXISTING MECHANICAL EQUIPMENT ON EXISTING CURB REMOVE AND REPLACE EXISTING FLASHING.
- EXISTING MECHANICAL EQUIPMENT, TEMPORARILY REMOVE AND REINSTALL, DISCONNECT AND RECONNECT AS REQUIRED, PROVIDE PRE-MANUFACTURED EQUIPMENT SUPPORTS.
- EXISTING HEAT VENT REMOVE AND REPLACE EXISTING FLASHING.
- EXISTING PLUMBING VENT PIPE - REMOVE AND REPLACE EXISTING FLASHING.
- EXISTING ROOF PENETRATION WITH PITCH POCKET (MISCELLANEOUS PIPE, CONDUIT, POST-UP, ETC.) REMOVE AND REPLACE EXISTING PITCH POCKET IN ITS ENTIRETY.



1 OVERALL ROOF EXISTING AND DEMOLITION PLAN  
SCALE: 3/32" = 1'-0"



**PROPOSED CONDITIONS CHART**

ROOF AREAS	DECK	VAPOR RETARDER / UNDERLAYMENT	INSULATION	MEMBRANE / SURFACE / COATING	COMMENTS
EXISTING CONCRETE DECK PRIMED WITH QUICK DRYING ASPHALT PRIMER	WOOD (8" - 12" SLOPED)	NONE	1/2" COVER BOARD SET IN COLD APPLIED ADHESIVE	ASPHALT SHINGLE	UL RATING
ROOF A	•	•	•	•	A
ROOF B	•	•	•	•	A
ROOF C	•	•	•	•	A
ROOF D	•	•	•	•	A
ROOF E	•	•	•	•	A
ROOF F	•	•	•	•	A
ROOF G	•	•	•	•	A
ROOF H	•	•	•	•	A
ROOF I	•	•	•	•	A
ROOF J	•	•	•	•	A
ROOF K	•	•	•	•	A
ROOF L	•	•	•	•	A
ROOF M	•	•	•	•	A

**LEGEND**

- ARROW SHOWN INDICATES CONSTANT THICKNESS POLYISOCYANURATE INSULATION OVER EXISTING SLOPED DECK. NOTE: UNLESS OTHERWISE NOTED, EXISTING DECK IS SLOPED TO DRAIN.
- ARROW SHOWN INDICATES 1/2" PER FOOT SLOPE TAPERED CRICKET.
- EXISTING EXPANSION JOINT REMOVE AND REPLACE EXISTING EXPANSION JOINT ASSEMBLY.
- PROVIDE COMPATIBLE DRAIN BOWL ADAPTER WITH GASKET, ADJUSTABLE EXTENSION SLEEVE AT ALL EXISTING DRAIN LOCATIONS. PROVIDE CLAMPING RING AND DOME STRAINERS UPON COMPLETION OF CAP SHEET. SEE PLUMBING.
- EXISTING MECHANICAL EQUIPMENT REMOVE AND REPLACE EXISTING FLASHING.
- EXISTING MECHANICAL EQUIPMENT ON EXISTING CURB REMOVE AND REPLACE EXISTING FLASHING.
- EXISTING MECHANICAL EQUIPMENT, TEMPORARILY REMOVE AND REINSTALL, DISCONNECT AND RECONNECT AS REQUIRED. PROVIDE PRE-MANUFACTURED EQUIPMENT SUPPORTS.
- EXISTING HEAT VENT REMOVE AND REPLACE EXISTING FLASHING.
- EXISTING PLUMBING VENT PIPE - REMOVE AND REPLACE EXISTING FLASHING.
- EXISTING ROOF PENETRATION WITH PITCH POCKET (MISCELLANEOUS PIPE, CONDUIT, POST-UP, ETC.) REMOVE AND REPLACE EXISTING PITCH POCKET IN ITS ENTIRETY.

**ROOF SCOPE OF WORK NOTES**

**REPLACEMENT ROOFING SYSTEM**

**ROOF AREAS A, B, C, D, E, G, H, I, J, K, L & M (SLOPED-TO-DRAIN CONCRETE DECK)**

- PROVIDE FIRE RETARDANT TREATED (FRT) WOOD BLOCKING AS INDICATED OR REQUIRED.
- PROVIDE 5/8" PLYWOOD ON THE ROOFSIDE OF ALL PARAPET RISING WALLS AND FASTEN TO EXISTING SUBSTRATE AT 2" ON CENTER WITH NON-CORROSIVE FASTENERS.
- PROVIDE COMPATIBLE DRAIN BOWL ADAPTER WITH GASKET, ADJUSTABLE EXTENSION SLEEVE AT ALL EXISTING DRAIN LOCATIONS. PROVIDE CLAMPING RING AND DOME STRAINERS UPON COMPLETION OF CAP SHEET. SEE PLUMBING.
- PROVIDE BASE LAYER OF 3" CONSTANT THICKNESS POLYISOCYANURATE INSULATION SET IN COLD APPLIED ADHESIVE OVER PRIMED CONCRETE DECK.
- PROVIDE TOP LAYER OF 3" CONSTANT THICKNESS POLYISOCYANURATE INSULATION SET IN COLD APPLIED INSULATION ADHESIVE OVER BASE LAYER INSULATION WITH ALL JOINTS STAGGERED.
- PROVIDE 1/2" PER FOOT SLOPE TAPERED CRICKETS SET IN COLD APPLIED INSULATION ADHESIVE AT HIGH SIDE OF ROOF PENETRATIONS AND AS INDICATED OR REQUIRED.
- PROVIDE 1/2" WATER RESISTANT, FIBER REINFORCED GYPSUM ROOF RECOVERY BOARD SET IN COLD APPLIED ADHESIVE OVER TAPERED CRICKETS AND POLYISOCYANURATE INSULATION WITH ALL JOINTS STAGGERED.
- PROVIDE CANT STRIPS SET IN COLD APPLIED ADHESIVE ALONG PERIMETER WALLS, RISING WALLS, AROUND EQUIPMENT CURBS AND AT ALL 90 DEGREE TRANSITION.
- BASE ROOFING PLY - TORCH APPLIED:** PROVIDE 1 PLY OF 110 MIL SBS BASE ROOFING PLY - TORCH DOWN MEMBRANE, TORCH APPLIED OVER COVER BOARD AND CANT STRIPS. AT CURBS AND RISING WALL CONDITIONS, TERMINATE MEMBRANE AT THE TOP OF CANT STRIPS AND SEAL.
- BASE FLASHING PLY - TORCH APPLIED:** PROVIDE 110 MIL SBS BASE FLASHING PLY - TORCH DOWN MEMBRANE, TORCH APPLIED AT ALL FLASHING LOCATIONS, AS INDICATED OR REQUIRED. EXTEND FLASHING PLY 6" MINIMUM TO THE FIELD OF THE ROOF MEASURED FROM THE TOE OF THE CANT STRIP.
- NOTE: PROVIDE BASE FLASHING PLY - COLD APPLIED AT ALL LOCATIONS WHERE FLASHING WILL BE IN DIRECT CONTACT WITH SHEET METAL.**
- SBS CAP SHEET - TORCH APPLIED:** PROVIDE 195 MIL SBS MODIFIED MINERAL SURFACED CAP ROOF MEMBRANE PLY TORCH APPLIED OVER SBS BASE ROOFING PLY AND BASE FLASHING PLY WITH ALL SEAMS HEAT WELDED. AT CURBS AND RISING WALL CONDITIONS, TERMINATE MEMBRANE AT THE TOP OF CANT STRIPS.
- KEE FLASHING MEMBRANE - COLD APPLIED:** PROVIDE FLEECE-BACKED KEE THERMOPLASTIC FLASHING MEMBRANE PLY SET IN COLD APPLIED ADHESIVE OVER PLYWOOD SUBSTRATE. EXTEND FLASHING MEMBRANE 6" MINIMUM TO THE FIELD OF THE ROOF MEASURED FROM THE TOE OF THE CANT STRIP, AND CONTINUE UP THE RISING WALL TO THE UNDERSIDE OF EXISTING LIMESTONE COPING. PROVIDE A CONTINUOUS STRIP-IN OF 6" WIDE NON FLEECE-BACKED KEE THERMOPLASTIC MEMBRANE HEAT WELDED OVER KEE THERMOPLASTIC FLASHING MEMBRANE PLY JOINT SEAMS. PROVIDE 3 COURSE APPLICATION OF REINFORCING SCRIUM AND POLYETHER MASTIC CENTERED AT THE TRANSITION OF KEE FLASHING MEMBRANE PLY AND SBS MODIFIED MINERAL SURFACED CAP ROOF MEMBRANE.
- PROVIDE CAST IRON CLAMPING RING AND DOME STRAINERS AT ALL ROOF DRAIN LOCATIONS. SEE PLUMBING.
- PROVIDE 2-PIECE COUNTER FLASHING; "SLIP METAL" COUNTER FLASHING; TERMINATION BAR; ALL MISCELLANEOUS ITEMS AND ACCESSORIES AS INDICATED OR REQUIRED FOR A COMPLETE INSTALLATION. NOTE: AT EXISTING LIMESTONE COPING CONDITION, LOCATE 2-PIECE COUNTER FLASHING AT THE BOTTOM OF THE EXISTING LIMESTONE COPING.
- PROVIDE LEAD FLASHING AT ALL EXISTING PLUMBING VENT PIPES AND STRIP-IN AS INDICATED.
- PROVIDE PITCH POCKETS AT ALL MISCELLANEOUS PIPE, CONDUITS AND POST-UP ROOF PENETRATIONS AS INDICATED.
- PROVIDE WALK WAY PADS AS INDICATED.
- AT ALL EXISTING METAL ROOF VENTS WIRE BRUSH TO REMOVE RUST, PRIME SURFACE AND PAINT.

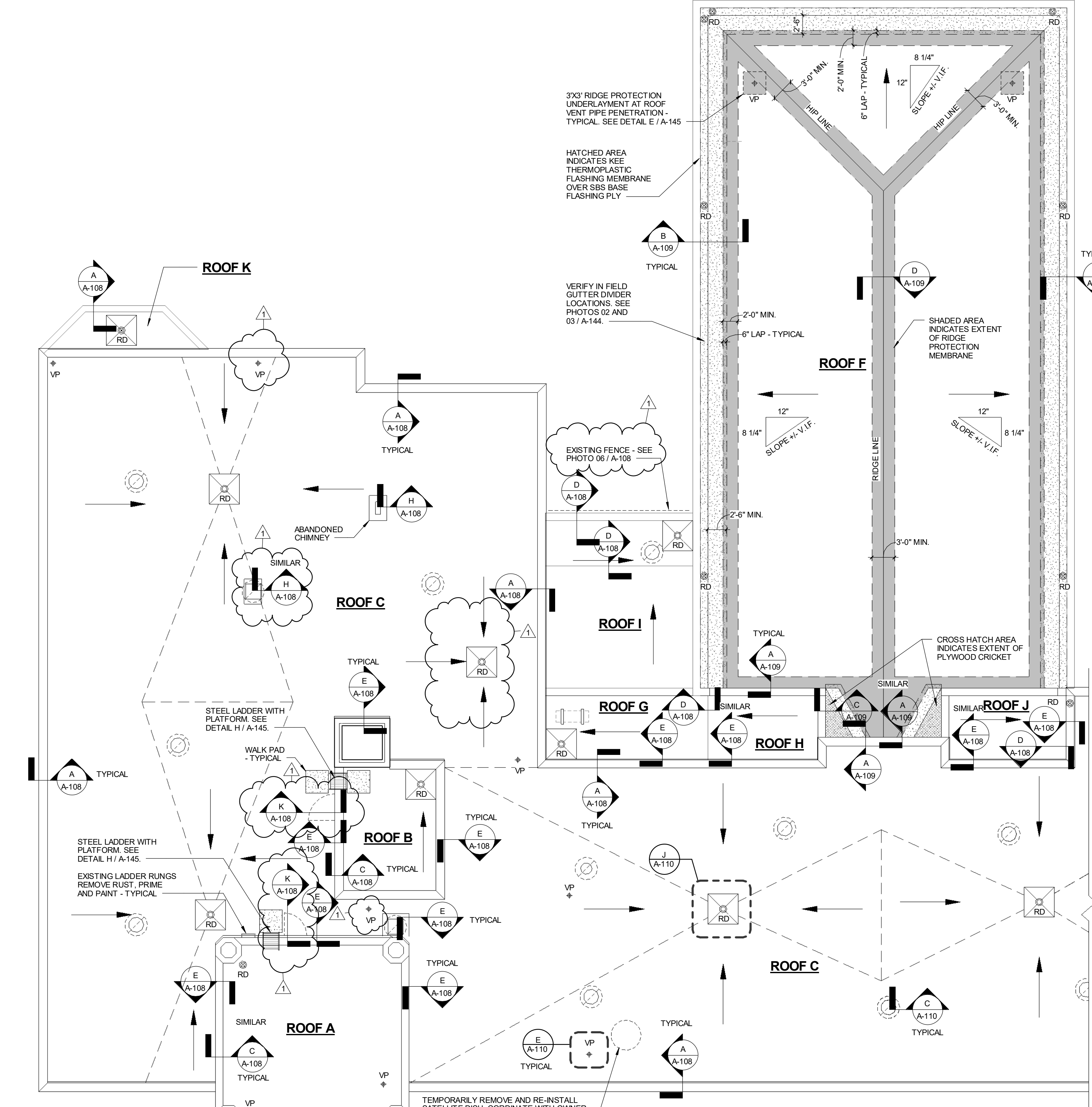
**REPLACEMENT ROOFING SYSTEM**

**ROOF AREA F (SLOPED WOOD DECK)**

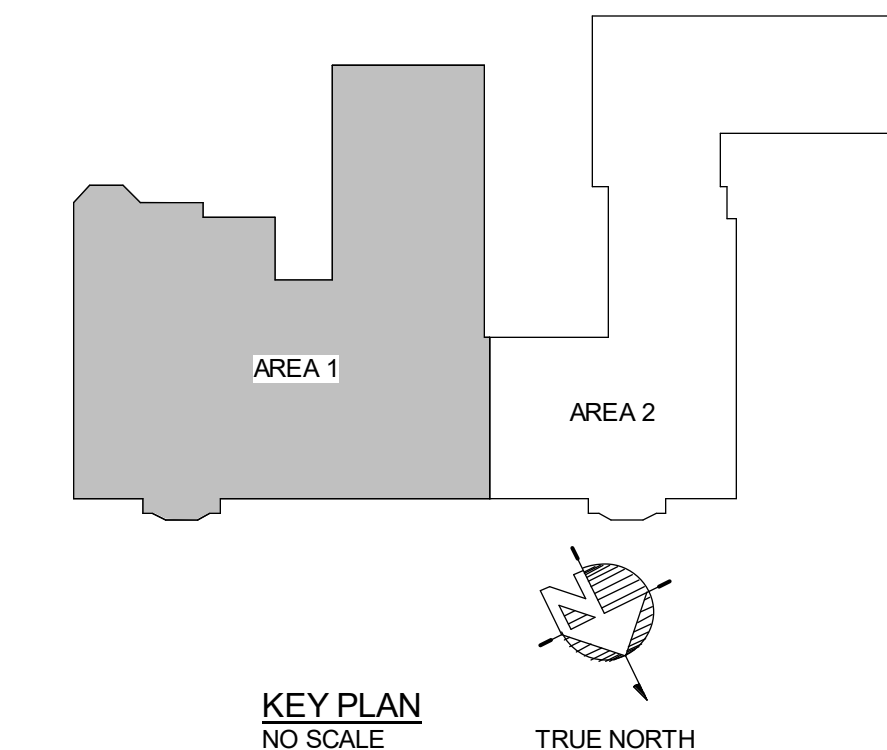
- PROVIDE PRE-MANUFACTURED COMPOSITE NAILABLE INSULATION BOARD (5/8" PLYWOOD WITH 6" TOTAL THICKNESS OF POLYISOCYANURATE INSULATION WITH PLYWOOD SIDE FACING UP, AND FASTENED TO EXISTING WOOD DECK ROOF FRAMING. VERIFY LOCATION OF EXISTING DECK FRAMING.
- AT RIDGE, HIP, STEP FLASHING RISING WALL CONDITION AND PIPE PENETRATIONS, PROVIDE SELF-ADHERING RIDGE PROTECTION UNDERLAYMENT OVER PLYWOOD, AT ROOF TO RISING WALL FLASHING LOCATION, PROVIDE ONE PIECE RIDGE PROTECTION UNDERLAYMENT WITH 90 DEGREE TURN THAT EXTEND UP THE VERTICAL SURFACE OF THE RISING WALL TO THE UNDERSIDE OF EXISTING THRU-WALL FLASHING, AND 18" MINIMUM TO THE FIELD OF THE ROOF MEASURED FROM THE BASE OF THE RISING WALL. AT RIDGE AND HIP LOCATION, PROVIDE 3" WIDE RIDGE PROTECTION UNDERLAYMENT CENTERED ON THE RIDGE OR HIP. AT PENETRATION LOCATIONS, PROVIDE 36" SQUARE RIDGE PROTECTION UNDERLAYMENT.
- AT GUTTER LOCATION, PROVIDE CANT STRIP AT ALL 90 DEGREE TRANSITION. PROVIDE FRT PLYWOOD AT ALL PARAPET RISING WALL. PROVIDE SBS BASE FLASHING PLY OVER THE ENTIRE SURFACE OF EXISTING COPPER LINED GUTTER, FRT PLYWOOD ON PARAPET WALL AND CANT STRIP. EXTEND SBS BASE FLASHING PLY UP THE SLOPED DECK OVER THE COMPOSITE NAILABLE BOARD, MINIMUM OF 2'-6" MEASURED FROM THE LOW POINT OF SLOPE. CONTINUE SBS BASE FLASHING PLY UP THE VERTICAL SURFACE OF THE FRT PLYWOOD OVER THE PARAPET WALL AND TERMINATE AT THE UNDERSIDE OF STONE COPING.
- AT THE GUTTER LOCATION, PROVIDE FLEECE-BACKED KEE THERMOPLASTIC FLASHING MEMBRANE PLY SET IN COLD APPLIED ADHESIVE OVER THE ENTIRE SURFACE OF SBS BASE FLASHING PLY, INCLUDING THE RISING WALL AND SLOPED DECK ADJACENT TO THE GUTTER. EXTEND FLASHING MEMBRANE PLY 6" MINIMUM BEYOND THE EDGE OF THE SBS BASE FLASHING PLY. PROVIDE A CONTINUOUS STRIP-IN OF 6" WIDE NON FLEECE-BACKED KEE THERMOPLASTIC MEMBRANE HEAT WELDED AT ALL JOINT SEAMS.
- PROVIDE A LAYER OF UNDERLAYMENT OVER THE ENTIRE SURFACE OF PLYWOOD DECK NOT COVERED BY THE KEE THERMOPLASTIC FLASHING MEMBRANE AND RIDGE PROTECTION UNDERLAYMENT WITH 6" MINIMUM OVERLAP.
- PROVIDE STAINLESS FLASHING, STEP FLASHING AND ALL MISCELLANEOUS ITEMS AS INDICATED OR REQUIRED FOR A COMPLETE INSTALLATION. ALL EXISTING THRU-WALL COUNTER FLASHING TO REMAIN. BEND UP THRU-WALL FLASHING TO FACILITATE FLASHING WORK AND BEND DOWN UPON COMPLETION OF WORK. SOLDER ALL JOINT SEAMS.
- PROVIDE ASPHALT SHINGLES OVER RIDGE PROTECTION UNDERLAYMENT. UNDERLAYMENT AND STEP FLASHING. AT STEP FLASHING CONDITION, ALTERNATE THE PLACEMENT OF ASPHALT SHINGLE AND STEP FLASHING TO CREATE A DOWNSTREAM SHINGLE EFFECT. PROVIDE STARTER STRIP ASPHALT SHINGLE 2" MINIMUM MEASURED FROM THE BOTTOM OF THE SLOPE.
- PROVIDE SELF SEALING RIDGE / HIP CAP SHINGLE AT ALL RIDGE AND HIP LOCATIONS.
- PROVIDE COMPLETE ROOF DRAIN ASSEMBLY WITH CAST IRON CLAMPING RING AND DOME STRAINERS AT ALL DRAIN LOCATIONS. SEE PLUMBING.
- PROVIDE PIPE BOOT FLASHING AT ALL EXISTING VENT PIPE LOCATIONS.

**ADDITIONAL GENERAL REQUIREMENTS**

- PRIOR TO STARTING ANY ROOF DEMOLITION WORK, THE CONTRACTOR SHALL CONDUCT WATER FLOW TEST ON ALL EXISTING ROOF DRAINS AND INFORM THE OWNER OF ANY CLOGGED DRAINS. THE OWNER WILL CLEAN OUT ALL CLOGGED DRAINS. ANY DRAIN LINES FOUND TO BE CLOGGED AFTER WORK BEGINS SHALL BE IMMEDIATELY CLEARED AS REQUIRED, INCLUDING REPLACEMENT AS NECESSARY AT THE CONTRACTOR'S EXPENSE. CONTRACTOR TO PERFORM WATER FLOW TEST ON ALL DRAINS AT THE COMPLETION OF THE PROJECT AND CLEAR ANY AND ALL OBSTRUCTION TO THE SATISFACTION OF THE OWNER.
- THE CONTRACTOR SHALL ENSURE THAT THE ENTIRE ROOF SHALL BE WATERTIGHT AT THE END OF EACH WORK DAY.
- CONTRACTOR SHALL DISCONNECT POWER AND EVACUATE ALL SPLIT AC EQUIPMENT PRIOR TO REMOVING THE EXISTING ROOF SYSTEM AND THE INSTALLATION OF THE NEW ROOFING AND EQUIPMENT CURBS, RECHARGE UNITS AND RECONNECT POWER. START UP AND TEST ALL UNITS FOR PROPER OPERATION.
- ALL EXISTING VENT STACK, MISCELLANEOUS PIPE / CONDUIT PENETRATIONS, ETC., WHETHER OR NOT INDICATED ON THE DRAWINGS ARE EXISTING TO REMAIN UNLESS OTHERWISE NOTED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FLASH ALL PLUMBING VENTS AND OTHER ROOF PENETRATIONS AS INDICATED IN THE DETAILS.
- THE CONTRACTOR SHALL TEMPORARILY REMOVE AND REINSTALL ANY AND ALL EXISTING ITEMS AS NECESSARY TO FACILITATE THE WORK. CONTRACTOR TO VERIFY IN FIELD.
- ANY AND ALL ELECTRICAL ITEMS (LIGHTS, JUNCTION BOXES, CONDUITS AND PANELS) SHALL BE REMOVED AND REINSTALLED IN ACCORDANCE WITH THE ELECTRICAL CODES, AS REQUIRED TO FACILITATE ROOF WORK.
- THE CONTRACTOR IS REQUIRED TO MEET ALL OF THE "BEST PRACTICE" REQUIREMENTS OF THE MANUFACTURER OF THE PRODUCTS, MATERIALS AND / OR SYSTEMS INCORPORATED IN THIS PROJECT. WHERE A SPECIFIC REQUIREMENT OF THE ARCHITECT IS IN VARIANCE TO A REQUIREMENT OF THE MANUFACTURER, THE GREATER QUANTITY OR QUALITY OF WORK SHALL BE PROVIDED.
- PROVIDE FLASHING AT ALL CURB MOUNTED MECHANICAL EQUIPMENT AS THEY OCCUR ON THE ROOF. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INCREASE OR REBUILD ANY CURB THAT IS EITHER DETERIORATED, DAMAGED, OR MUST BE RAISED TO PROPERLY FACILITATE INSTALLATION OF INSULATION, ROOFING AND FLASHING.
- ALL WOOD CURBS, BLOCKING, ETC., SHALL BE FIRE RETARDANT TREATED WOOD. AT ANY CASE WHERE THE TOP SURFACE OF THE ROOF SYSTEM TO THE BOTTOM OF THE NEWLY INSTALLED TERMINATION BAR IS LESS THAN THE 8" MINIMUM REQUIREMENT FLASHING HEIGHT, THE EXISTING COUNTERFLASHING SHALL BE REMOVED AND REPLACED WITH SURFACE APPLIED REGLET / COUNTERFLASHING SYSTEM, UNLESS OTHERWISE NOTED. DO NOT COVER OR BLOCK MASONRY WEEP HOLES.
- THE LOCATION OF ALL ROOF EQUIPMENT, CURBS AND PENETRATIONS ARE APPROXIMATE. CONTRACTOR SHALL VERIFY ALL FIELD CONDITIONS. IF A MECHANICAL UNIT FALLS IN A VALLEY, CONTRACTOR TO CRICKET WATER FLOW AROUND THE UNIT.
- PROVIDE CRICKETS ON THE HIGH SIDE OF ALL CURBS AND ROOF PENETRATIONS AS REQUIRED, WHETHER OR NOT INDICATED.
- PROVIDE TAPERED EDGE STRIPS AT ALL LOCATIONS TO COMPENSATE VARYING INSULATION HEIGHT AS REQUIRED.
- BLOCKING HEIGHTS SHOWN ON CURBS AND EDGE CONDITIONS ARE APPROXIMATE AND SHALL BE FIELD VERIFIED. CONTRACTOR SHALL PROVIDE ALL FULL DIMENSION BLOCKING AS INDICATED AND / OR REQUIRED.
- WIRE BRUSH TO REMOVE RUST ON LADDER RUNGS AND FERROUS METAL. CLEAN SURFACE, PRIME AND PAINT. PROVIDE ABRASIVE COATING ON RUNGS.
- THE CONTRACTOR SHALL PROVIDE NEOPRENE GASKETED FASTENERS AT ALL EXPOSED FASTENING CONDITIONS.
- DEMOLITION AND ALTERATION NOTES ARE NOT ALL INCLUSIVE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT AND ASSESS EACH AREA AND TO FULFILL THE INTENT OF THE WORK INDICATED BY THE CONTRACT DOCUMENTS. VERIFY ALL DIMENSIONS WITHIN THE CONTRACT LIMITS. BRING DEVIATIONS FROM THE CONTRACT DOCUMENTS TO THE ATTENTION OF THE ARCHITECT. THE EXTENT OF DEMOLITION AND REMOVAL INCLUDES, BUT IS NOT LIMITED TO WORK SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL COORDINATE ALL WORK WITH THE ELECTRICAL AND PLUMBING CONTRACTORS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR DAILY CLEANUP OF CONSTRUCTION DEBRIS.
- BEFORE DEMOLITION BEGINS, CONTRACTOR SHALL COORDINATE SEQUENCE AND SCHEDULES FOR ALL WORK AND RELOCATION OR DISPOSAL OF ALL MATERIALS WITH OWNER.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND RE-INSTALLATION OF ALL MEP EQUIPMENT, CONDUITS, SUPPORTS ETC. ON ALL SURFACES WHERE WORK IS OCCURRING. CONTRACTOR SHALL DISCONNECT AND REMOVE, MODIFY AND EXTEND CONDUITS, CONDUITORS, WIRING, SUPPORTS, BRACKETS AND PIPING WITH MATERIALS MATCHING EXISTING AS REQUIRED TO RESTORE OPERATION OF ALL AFFECTED EQUIPMENT. NOT ALL EQUIPMENT IS INDICATED ON THE DRAWINGS. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ALL EXISTING EQUIPMENT AND RELOCATE AS REQUIRED TO COMPLETE THE WORK.



**1 PARTIAL ROOF REPLACEMENT PLAN - AREA 1**  
SCALE: 1/8" = 1'-0"



ARMAND CHRISTOPHER  
STATE AND LICENSE NO. 10000200X

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**ISSUED FOR BID**  
AUGUST 9, 2019

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SCHOOL & LOCATION  
**LAURA H. CARNELL ELEMENTARY SCHOOL**  
1100 DEVEREAUX AVENUE,  
PHILADELPHIA, PENNSYLVANIA

**ROOF REPLACEMENT**

DRAWING TITLE  
**PARTIAL ROOF REPLACEMENT PLAN - AREA 1**

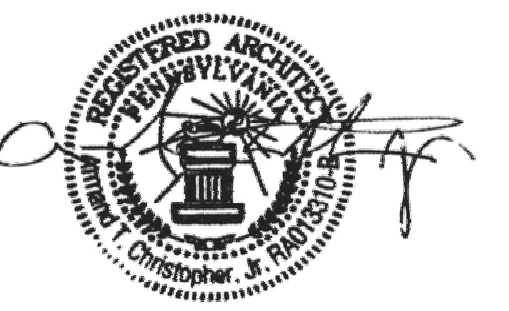
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LOCATION NO.	7220
FILE NO.	2018-093
DRAWN BY	RJH
CHECKED BY	RJH
DATE	8-07-2017

DRAWING NO.  
**A-106**

08-09-2019 ISSUED FOR BID



SEAL:



ARMAND CHRISTOPHER  
STATE AND LICENSE NO. DATE  
0000200X

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ISSUED FOR BID  
AUGUST 9, 2019

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NO.	DATE	REVISION

SCHOOL & LOCATION  
**LAURA H. CARNELL ELEMENTARY SCHOOL**

1100 DEVEREAUX AVENUE,  
PHILADELPHIA, PENNSYLVANIA

PROJECT TITLE

**ROOF REPLACEMENT**

DRAWING TITLE

**PARTIAL ROOF REPLACEMENT PLAN - AREA 2**

DRAWING SCALE

As Indicated

LOCATION NO. FILE NO.

7220 2018-093

DRAWN BY CHECKED BY

RG R.JH

8-072C OF 2017 / 18

DRAWING NO.

**A-107**

SHEET 7 OF 13

**ROOF SCOPE OF WORK NOTES**

**REPLACEMENT ROOFING SYSTEM  
ROOF AREAS A, B, C, D, E, G, H, I, J, K, L & M  
(SLOPED-TO-DRAIN CONCRETE DECK)**

- PROVIDE FIRE RETARDANT TREATED (FRT) WOOD BLOCKING AS INDICATED OR REQUIRED.
- PROVIDE 5/8" PLY WOOD ON THE TOE SIDE OF ALL PARALLEL RISING WALLS AND FASTEN TO EXISTING SUBSTRATE AT 12" ON CENTER WITH NON-CORROSIVE FASTENERS.
- PROVIDE COMPATIBLE DRAIN BOWL ADAPTER WITH GASKET, ADJUSTABLE EXTENSION SLEEVE AT ALL EXISTING DRAIN LOCATIONS. PROVIDE CLAMPING RING AND DOME STRAINERS UPON COMPLETION OF CAP SHEET. SEE PLUMBING.
- PROVIDE BASE LAYER OF 3" CONSTANT THICKNESS POLYISOCYANURATE INSULATION SET IN COLD APPLIED INSULATION ADHESIVE OVER PRIME CONCRETE DECK.
- PROVIDE TOP LAYER OF 3" CONSTANT THICKNESS POLYISOCYANURATE INSULATION SET IN COLD APPLIED INSULATION ADHESIVE OVER BASE LAYER INSULATION WITH ALL JOINTS STAGGERED.
- PROVIDE 1/2" PER FOOT SLOPE TAPERED CRICKETS SET IN COLD APPLIED INSULATION ADHESIVE AT HIGH SIDE OF ROOF PENETRATIONS AND AS INDICATED OR REQUIRED.
- PROVIDE 1/2" WATER RESISTANT, FIBER REINFORCED GYPSUM ROOF RECOVERY BOARD SET IN COLD APPLIED ADHESIVE OVER TAPERED CRICKETS AND POLYISOCYANURATE INSULATION WITH ALL JOINTS STAGGERED.
- PROVIDE CANT STRIPS SET IN COLD APPLIED ADHESIVE ALONG PERIMETER WALLS, RISING WALLS, AROUND EQUIPMENT CURBS AND AT ALL 90 DEGREE TRANSITION.
- BASE ROOFING PLY - TORCH APPLIED:** PROVIDE 1 PLY OF 110 MIL SBS BASE ROOFING PLY - TORCH DOWN MEMBRANE, TORCH APPLIED OVER COVER BOARD AND CANT STRIPS. AT CURBS AND RISING WALL CONDITIONS, TERMINATE MEMBRANE AT THE TOP OF CANT STRIPS AND SEAL.
- BASE FLASHING PLY - TORCH APPLIED:** PROVIDE 110 MIL SBS BASE FLASHING PLY - TORCH DOWN MEMBRANE, TORCH APPLIED AT ALL FLASHING LOCATIONS, AS INDICATED OR REQUIRED. EXTEND FLASHING PLY 6" MINIMUM TO THE FIELD OF THE ROOF MEASURED FROM THE TOE OF THE CANT STRIP.
- NOTE: PROVIDE BASE FLASHING PLY - COLD APPLIED AT ALL LOCATIONS WHERE FLASHING WILL BE IN DIRECT CONTACT WITH SHEET METAL.
- SBS CAP SHEET - TORCH APPLIED:** PROVIDE 195 MIL SBS MODIFIED MINERAL SURFACED CAP ROOF MEMBRANE PLY, TORCH APPLIED OVER SBS BASE ROOFING PLY AND BASE FLASHING PLY WITH ALL SEAMS HEAT WELDED. AT CURBS AND RISING WALL CONDITIONS, TERMINATE MEMBRANE AT THE TOP OF CANT STRIPS.
- KEE CAP FLASHING MEMBRANE - COLD APPLIED:** PROVIDE FLEECE-BACKED KEE THERMOPLASTIC FLASHING MEMBRANE PLY SET IN COLD APPLIED ADHESIVE OVER PLYWOOD SUBSTRATE. EXTEND FLASHING MEMBRANE PLY 9" MINIMUM TO THE FIELD OF THE ROOF MEASURED FROM THE TOE OF THE CANT STRIP, AND CONTINUE UP THE RISING WALL TO THE UNDERSIDE OF EXISTING LIMESTONE COPING. PROVIDE A CONTINUOUS STRIP-IN OF 6" WIDE NON FLEECE-BACKED KEE THERMOPLASTIC MEMBRANE HEAT WELDED OVER KEE THERMOPLASTIC FLASHING MEMBRANE PLY JOINT SEAMS. PROVIDE 3 COURSE APPLICATION OF REINFORCING SCRM AND POLYETHER MASTIC, CENTERED AT THE TRANSITION OF KEE FLASHING MEMBRANE PLY AND SBS MODIFIED MINERAL SURFACED CAP ROOF MEMBRANE.
- PROVIDE CAST IRON CLAMPING RING AND DOME STRAINERS AT ALL ROOF DRAIN LOCATIONS. SEE PLUMBING.
- PROVIDE 2-PIECE COUNTER FLASHING: "SLIP METAL" COUNTER FLASHING; TERMINATION BAR; ALL MISCELLANEOUS ITEMS AND ACCESSORIES AS INDICATED OR REQUIRED FOR A COMPLETE INSTALLATION. NOTE: AT EXISTING LIMESTONE COPING CONDITION, LOCATE 2-PIECE COUNTER FLASHING AT THE BOTTOM OF THE EXISTING LIMESTONE COPING.
- PROVIDE LEAD FLASHING AT ALL EXISTING PLUMBING VENT PIPES AND STRIP-IN AS INDICATED.
- PROVIDE PITCH POCKETS AT ALL MISCELLANEOUS PIPE, CONDUITS AND POST-UP ROOF PENETRATIONS AS INDICATED.
- PROVIDE WALK WAY PADS AS INDICATED.
- AT ALL EXISTING METAL ROOF VENT'S WIRE BRUSH TO REMOVE RUST, PRIME SURFACE AND PAINT.

**ADDITIONAL GENERAL REQUIREMENTS**

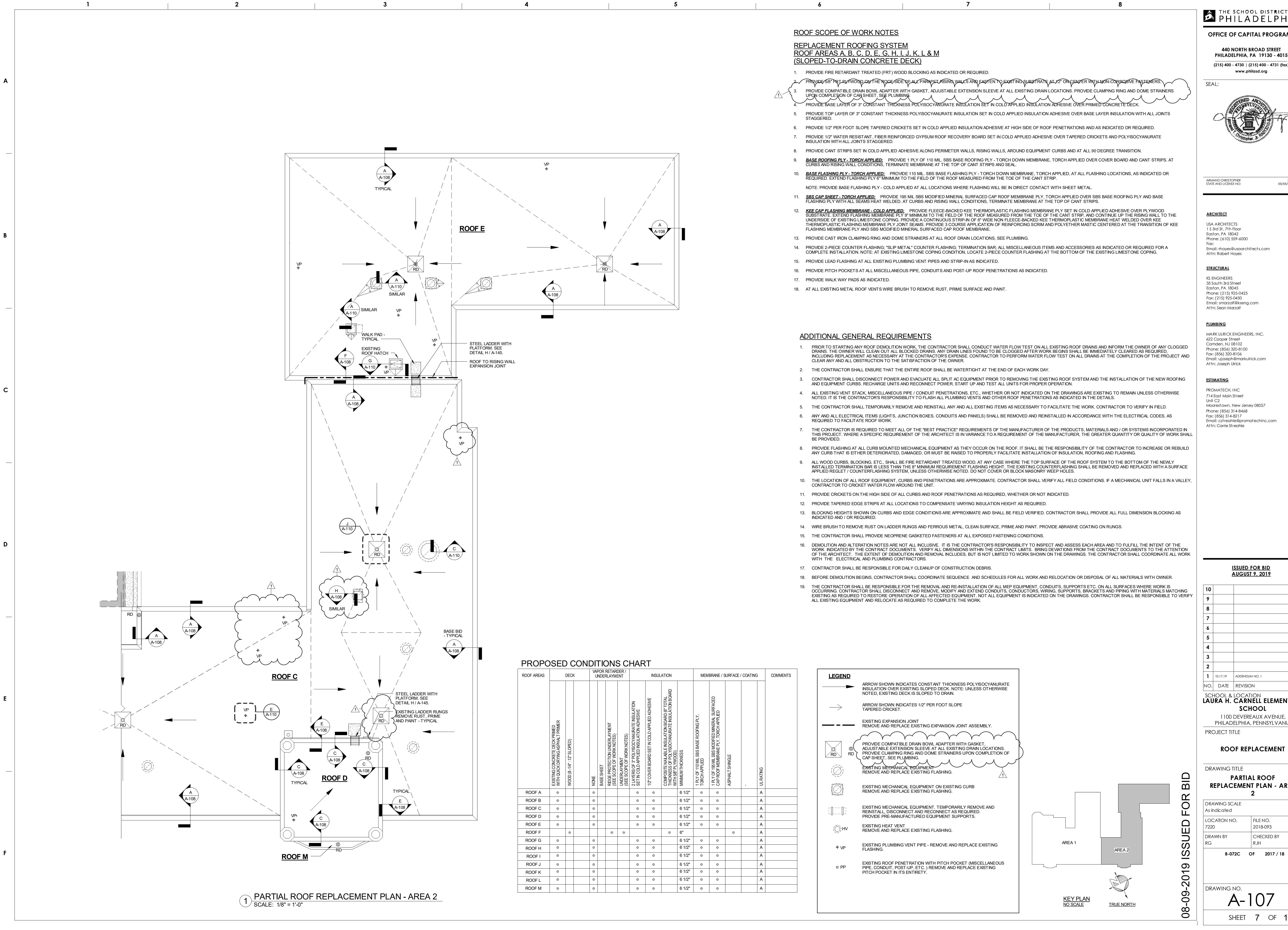
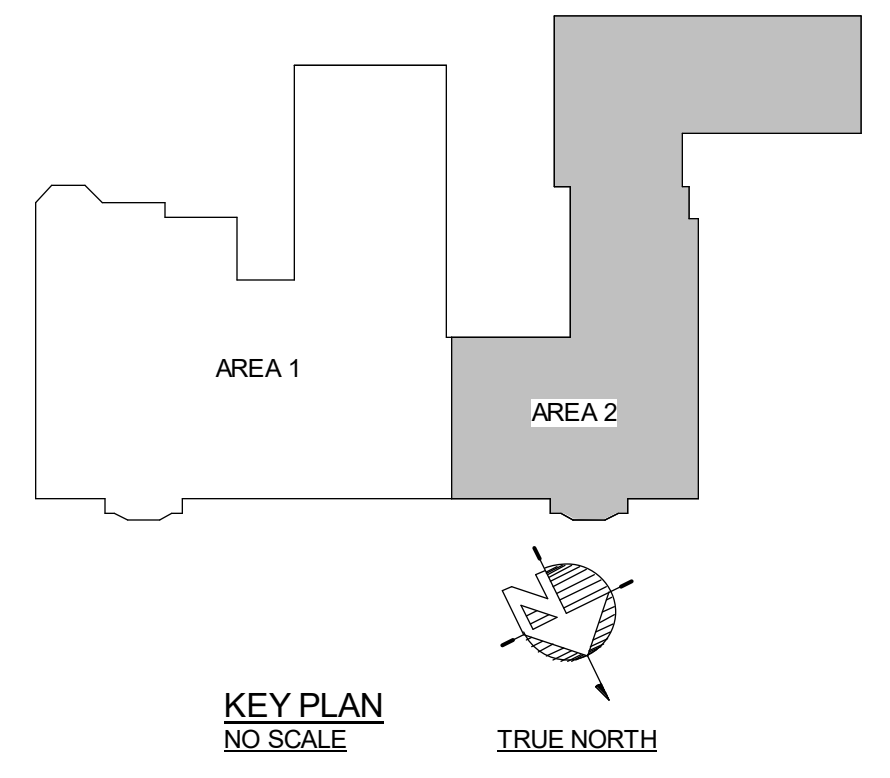
- PRIOR TO STARTING ANY ROOF DEMOLITION WORK, THE CONTRACTOR SHALL CONDUCT WATER FLOW TEST ON ALL EXISTING ROOF DRAINS AND INFORM THE OWNER OF ANY CLOGGED DRAINS. THE OWNER WILL CLEAN OUT ALL BLOCKED DRAINS. ANY DRAIN LINES FOUND TO BE CLOGGED AFTER WORK BEGINS SHALL BE IMMEDIATELY CLEARED AS REQUIRED, INCLUDING REPLACEMENT AS NECESSARY AT THE CONTRACTOR'S EXPENSE. CONTRACTOR TO PERFORM WATER FLOW TEST ON ALL DRAINS AT THE COMPLETION OF THE PROJECT AND CLEAR ANY AND ALL OBSTRUCTION TO THE SATISFACTION OF THE OWNER.
- THE CONTRACTOR SHALL ENSURE THAT THE ENTIRE ROOF SHALL BE WATERTIGHT AT THE END OF EACH WORK DAY.
- CONTRACTOR SHALL DISCONNECT POWER AND EVALUATE ALL SPLIT AC EQUIPMENT PRIOR TO REMOVING THE EXISTING ROOF SYSTEM AND THE INSTALLATION OF THE NEW ROOFING AND EQUIPMENT CURBS. RECONNECT POWER, START UP AND TEST ALL UNITS FOR PROPER OPERATION.
- ALL EXISTING VENT STACK, MISCELLANEOUS PIPE / CONDUIT PENETRATIONS, ETC., WHETHER OR NOT INDICATED ON THE DRAWINGS ARE EXISTING TO REMAIN UNLESS OTHERWISE NOTED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FLASH ALL PLUMBING VENTS AND OTHER ROOF PENETRATIONS AS INDICATED IN THE DETAILS.
- THE CONTRACTOR SHALL TEMPORARILY REMOVE AND REINSTALL ANY AND ALL EXISTING ITEMS AS NECESSARY TO FACILITATE THE WORK. CONTRACTOR TO VERIFY IN FIELD.
- ANY AND ALL ELECTRICAL ITEMS (LIGHTS, JUNCTION BOXES, CONDUITS AND PANELS) SHALL BE REMOVED AND REINSTALLED IN ACCORDANCE WITH THE ELECTRICAL CODES, AS REQUIRED TO FACILITATE ROOF WORK.
- THE CONTRACTOR IS REQUIRED TO MEET ALL OF THE "BEST PRACTICE" REQUIREMENTS OF THE MANUFACTURER OF THE PRODUCTS, MATERIALS AND / OR SYSTEMS INCORPORATED IN THIS PROJECT, WHERE A SPECIFIC REQUIREMENT OF THE ARCHITECT IS IN VARIANCE TO A REQUIREMENT OF THE MANUFACTURER, THE GREATER QUANTITY OR QUALITY OF WORK SHALL BE PROVIDED.
- PROVIDE FLASHING AT ALL CURB MOUNTED MECHANICAL EQUIPMENT AS THEY OCCUR ON THE ROOF. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INCREASE OR REBUILD ANY CURB THAT IS EITHER DETERIORATED, DAMAGED, OR MUST BE RAISED TO PROPERLY FACILITATE INSTALLATION OF INSULATION, ROOFING AND FLASHING.
- ALL WOOD CURBS, BLOCKING, ETC., SHALL BE FIRE RETARDANT TREATED WOOD. AT ANY CASE WHERE THE TOP SURFACE OF THE ROOF SYSTEM TO THE BOTTOM OF THE NEWLY INSTALLED TERMINATION BAR IS LESS THAN THE 8" MINIMUM REQUIREMENT FLASHING HEIGHT, THE EXISTING COUNTERFLASHING SHALL BE REMOVED AND REPLACED WITH A SURFACE APPLIED REGLET / COUNTERFLASHING SYSTEM, UNLESS OTHERWISE NOTED. DO NOT COVER OR BLOCK MASONRY WEEP HOLES.
- THE LOCATION OF ALL ROOF EQUIPMENT, CURBS AND PENETRATIONS ARE APPROXIMATE. CONTRACTOR SHALL VERIFY ALL FIELD CONDITIONS. IF A MECHANICAL UNIT FALLS IN A VALLEY, CONTRACTOR TO CRICKET WATER FLOW AROUND THE UNIT.
- PROVIDE CRICKETS ON THE HIGH SIDE OF ALL CURBS AND ROOF PENETRATIONS AS REQUIRED, WHETHER OR NOT INDICATED.
- PROVIDE TAPERED EDGE STRIPS AT ALL LOCATIONS TO COMPENSATE VARYING INSULATION HEIGHT AS REQUIRED.
- BLOCKING HEIGHTS SHOWN ON CURBS AND EDGE CONDITIONS ARE APPROXIMATE AND SHALL BE FIELD VERIFIED. CONTRACTOR SHALL PROVIDE ALL FULL DIMENSION BLOCKING AS INDICATED AND / OR REQUIRED.
- WIRE BRUSH TO REMOVE RUST ON LADDER RUNGS AND FERROUS METAL. CLEAN SURFACE, PRIME AND PAINT. PROVIDE ABRASIVE COATING ON RUNGS.
- THE CONTRACTOR SHALL PROVIDE NEOPRENE GASKETED FASTENERS AT ALL EXPOSED FASTENING CONDITIONS.
- DEMOLITION AND ALTERATION NOTES ARE NOT ALL INCLUSIVE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT AND ASSESS EACH AREA AND TO FULFILL THE INTENT OF THE WORK INDICATED BY THE CONTRACT DOCUMENTS. VERIFY ALL DIMENSIONS WITHIN THE CONTRACT LIMITS. BRING DEVIATIONS FROM THE CONTRACT DOCUMENTS TO THE ATTENTION OF THE ARCHITECT. THE EXTENT OF DEMOLITION AND REMOVAL INCLUDES, BUT IS NOT LIMITED TO WORK SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL COORDINATE ALL WORK WITH THE ELECTRICAL AND PLUMBING CONTRACTORS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR DAILY CLEANUP OF CONSTRUCTION DEBRIS.
- BEFORE DEMOLITION BEGINS, CONTRACTOR SHALL COORDINATE SEQUENCE AND SCHEDULES FOR ALL WORK AND RELOCATION OR DISPOSAL OF ALL MATERIALS WITH OWNER.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND RE-INSTALLATION OF ALL MEP EQUIPMENT, CONDUITS, SUPPORTS ETC. ON ALL SURFACES WHERE WORK IS OCCURRING. CONTRACTOR SHALL DISCONNECT AND REMOVE, MODIFY AND EXTEND CONDUITS, CONDUCTORS, WIRING, SUPPORTS, BRACKETS AND PIPING WITH MATERIALS MATCHING EXISTING AS REQUIRED TO RESTORE OPERATION OF ALL AFFECTED EQUIPMENT. NOT ALL EQUIPMENT IS INDICATED ON THE DRAWINGS. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ALL EXISTING EQUIPMENT AND RELOCATE AS REQUIRED TO COMPLETE THE WORK.

**PROPOSED CONDITIONS CHART**

ROOF AREAS	DECK	VAPOR RETARDER / UNDERLAYMENT	INSULATION	MEMBRANE / SURFACE / COATING	COMMENTS
	EXISTING CONCRETE DECK (PRIME WITH CLAMPING RING AND DOME STRAINERS) WOOD (8'-11/2" x 12" SLOPED)	NONE	BASE SHEET UNDERLAYMENT (SEE SCOPE OF WORK NOTES) 2 LAYERS OF 2 POLYISOCYANURATE INSULATION SET IN COLD APPLIED INSULATION ADHESIVE 1/2" COVER BOARD SET IN COLD APPLIED ADHESIVE COMPOSITE LAYER INSULATION BOARD 8" TOTAL THICKNESS OF POLYISOCYANURATE INSULATION BOARD WITH 5/8" PLY WOOD MINIMUM THICKNESS	1 PLY OF 110 MIL SBS BASE ROOFING PLY, TORCH APPLIED 1 PLY OF 195 MIL SBS MODIFIED MINERAL SURFACED CAP ROOF MEMBRANE PLY, TORCH APPLIED ASPHALT SINGLE	ULTRATING
ROOF A	o	o	o	o	A
ROOF B	o	o	o	o	A
ROOF C	o	o	o	o	A
ROOF D	o	o	o	o	A
ROOF E	o	o	o	o	A
ROOF F	o	o	o	o	A
ROOF G	o	o	o	o	A
ROOF H	o	o	o	o	A
ROOF I	o	o	o	o	A
ROOF J	o	o	o	o	A
ROOF K	o	o	o	o	A
ROOF L	o	o	o	o	A
ROOF M	o	o	o	o	A

**LEGEND**

- ARROW SHOWN INDICATES CONSTANT THICKNESS POLYISOCYANURATE INSULATION OVER EXISTING SLOPED DECK. NOTE: UNLESS OTHERWISE NOTED, EXISTING DECK IS SLOPED TO DRAIN.
- ARROW SHOWN INDICATES 1/2" PER FOOT SLOPE TAPERED CRICKET.
- EXISTING EXPANSION JOINT REMOVE AND REPLACE EXISTING EXPANSION JOINT ASSEMBLY.
- PROVIDE COMPATIBLE DRAIN BOWL ADAPTER WITH GASKET, ADJUSTABLE EXTENSION SLEEVE AT ALL EXISTING DRAIN LOCATIONS. PROVIDE CLAMPING RING AND DOME STRAINERS UPON COMPLETION OF CAP SHEET. SEE PLUMBING.
- EXISTING MECHANICAL EQUIPMENT REMOVE AND REPLACE EXISTING FLASHING.
- EXISTING MECHANICAL EQUIPMENT ON EXISTING CURB REMOVE AND REPLACE EXISTING FLASHING.
- EXISTING MECHANICAL EQUIPMENT, TEMPORARILY REMOVE AND REINSTALL, DISCONNECT AND RECONNECT AS REQUIRED. PROVIDE PRE-MANUFACTURED EQUIPMENT SUPPORTS.
- EXISTING HEAT VENT REMOVE AND REPLACE EXISTING FLASHING.
- EXISTING PLUMBING VENT PIPE - REMOVE AND REPLACE EXISTING FLASHING.
- EXISTING ROOF PENETRATION WITH PITCH POCKET (MISCELLANEOUS PIPE, CONDUIT, POST-UP, ETC.) REMOVE AND REPLACE EXISTING PITCH POCKET IN ITS ENTIRETY.

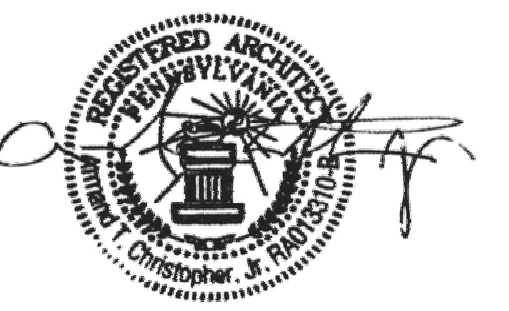


**1 PARTIAL ROOF REPLACEMENT PLAN - AREA 2**  
SCALE: 1/8" = 1'-0"

08-09-2019 ISSUED FOR BID



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ISSUED FOR BID  
AUGUST 9, 2019

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1	10.17.19	ADDENDUM NO. 1

SCHOOL & LOCATION  
LAURA H. CARNELL ELEMENTARY SCHOOL

1100 DEVEREAUX AVENUE,  
PHILADELPHIA, PENNSYLVANIA

PROJECT TITLE

ROOF REPLACEMENT

DRAWING TITLE

ROOF DETAILS

DRAWING SCALE  
As indicated

LOCATION NO. FILE NO.  
7220 2018-093

DRAWN BY CHECKED BY  
RG/RB R.JH

B-072C OF 2017 / 18

DRAWING NO.

A-108

SHEET 8 OF 13

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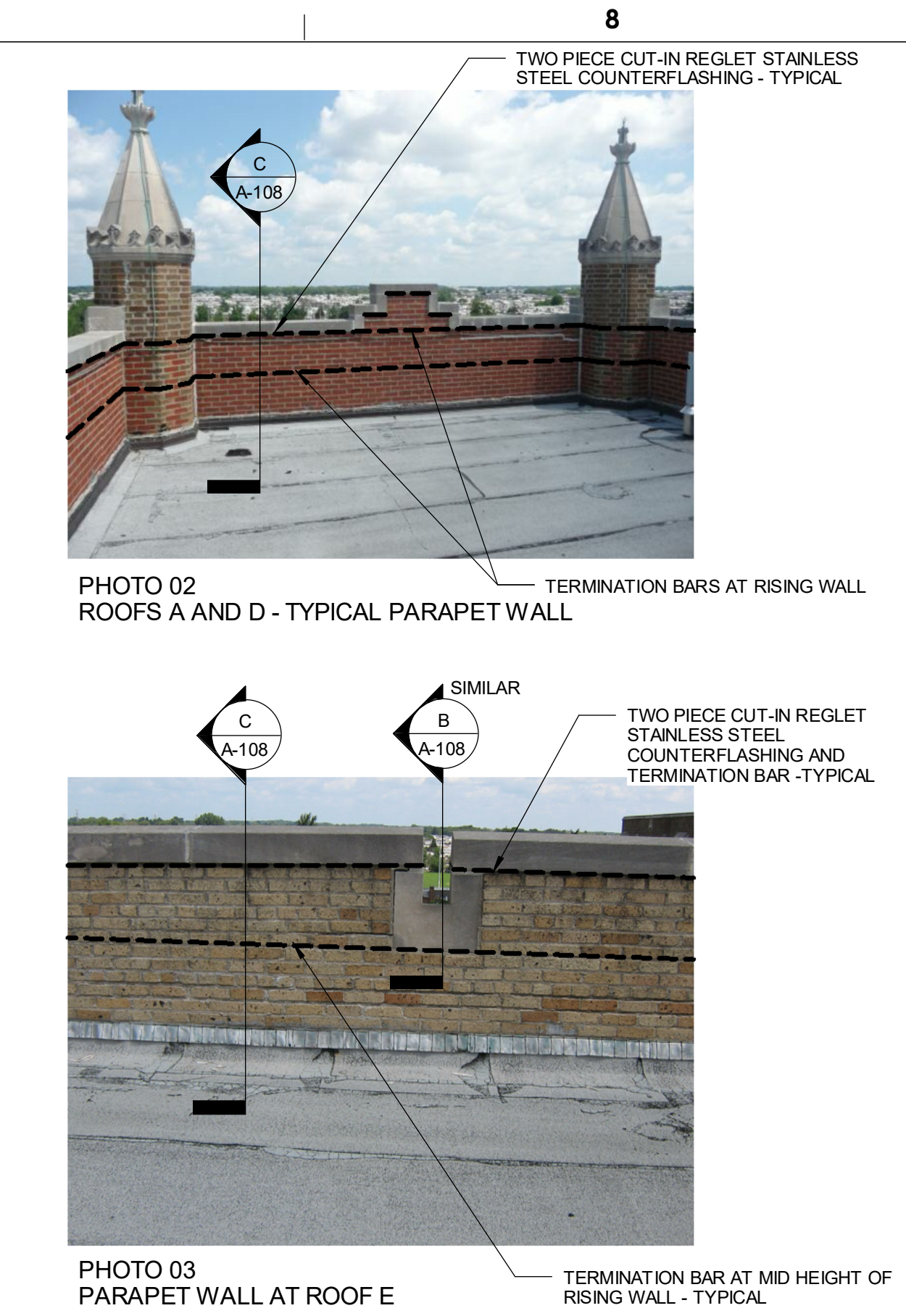


PHOTO 02  
ROOFS A AND D - TYPICAL PARAPET WALL

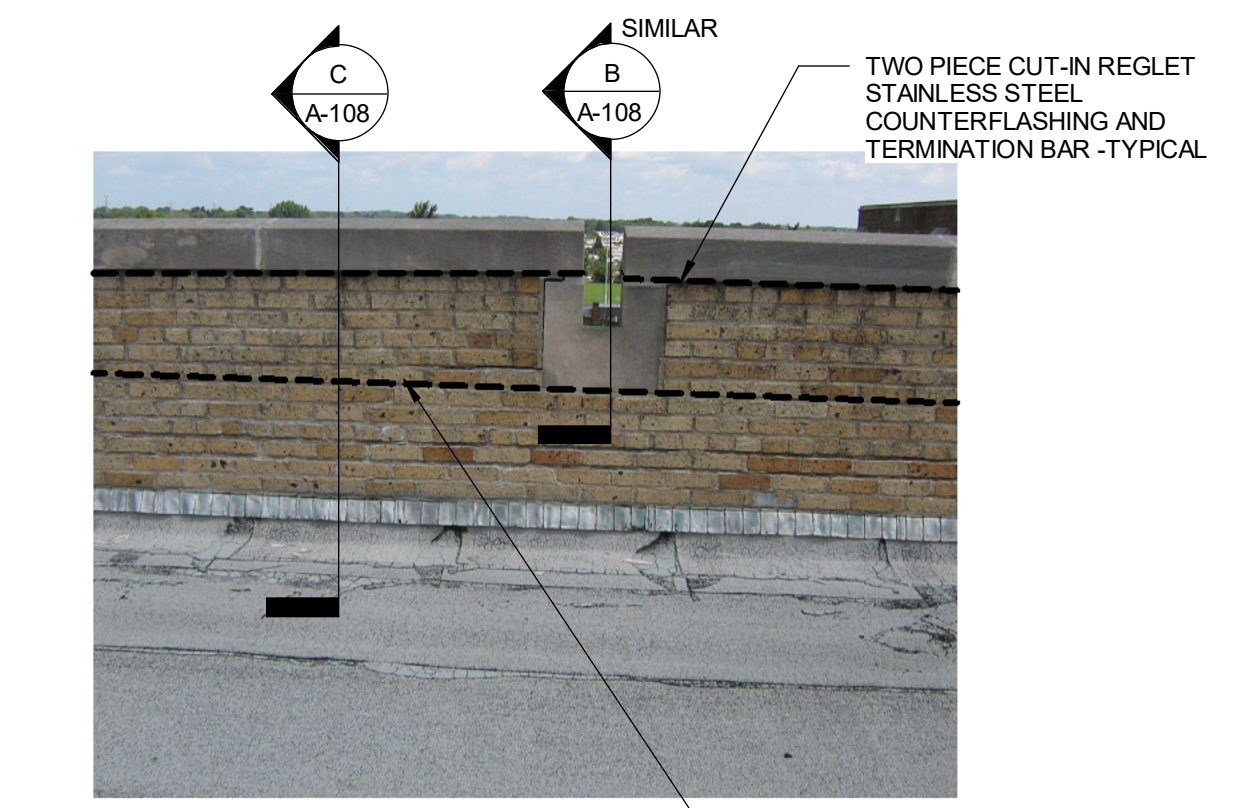


PHOTO 03  
PARAPET WALL AT ROOF E

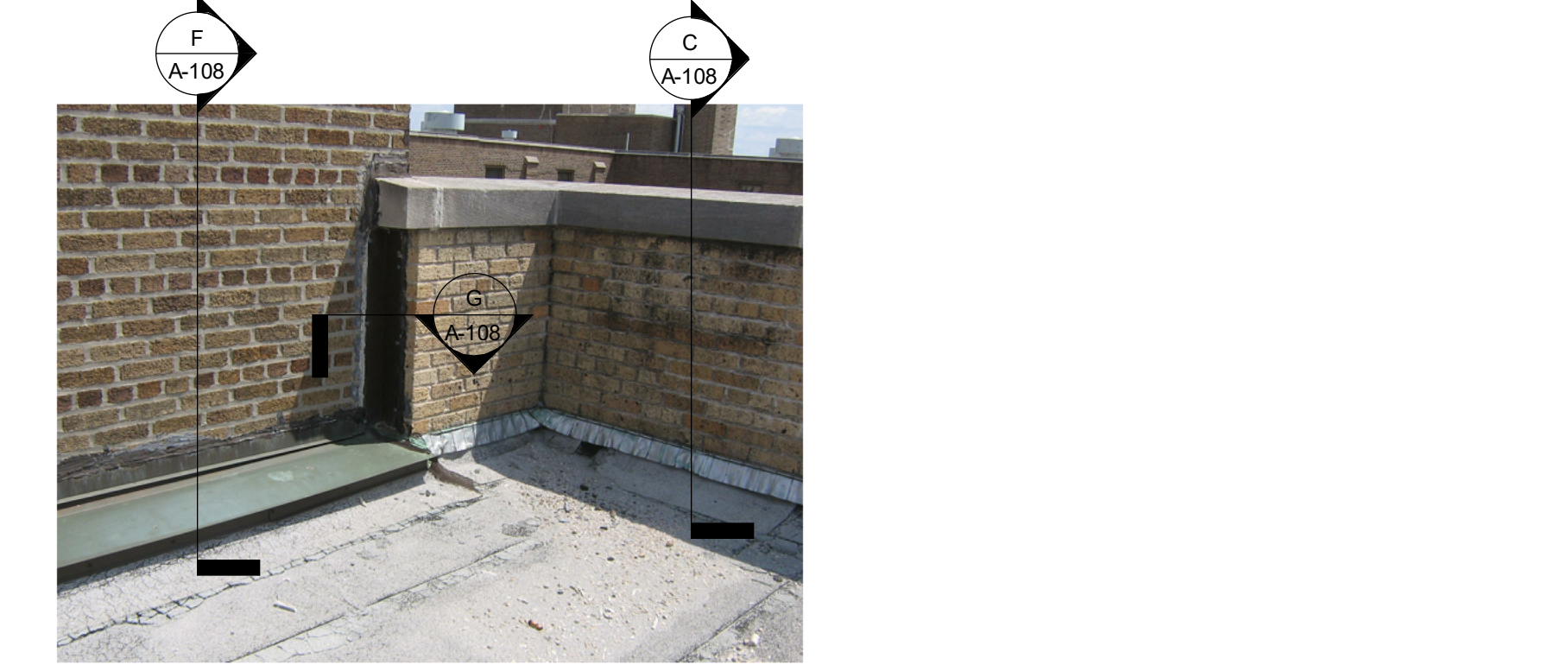
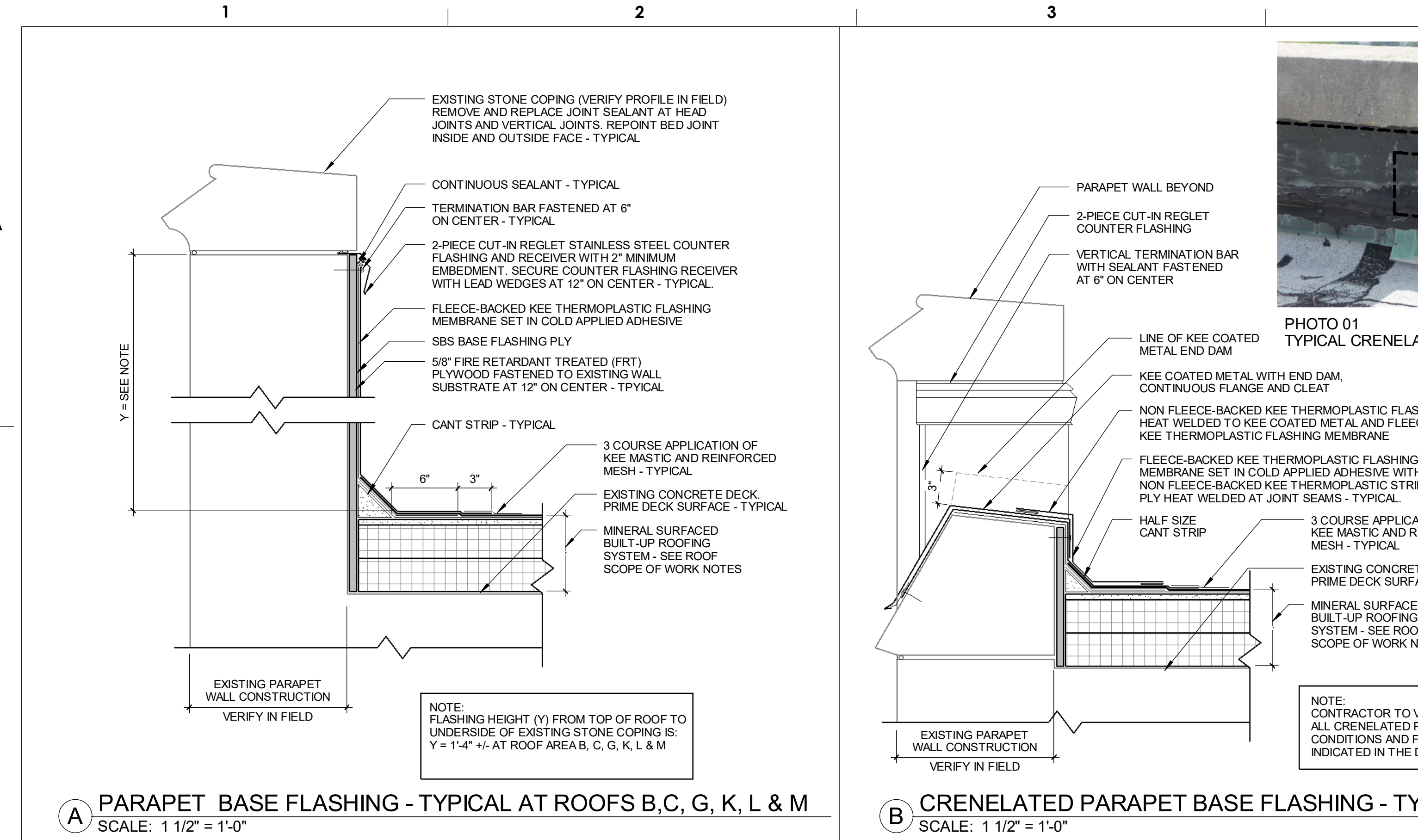
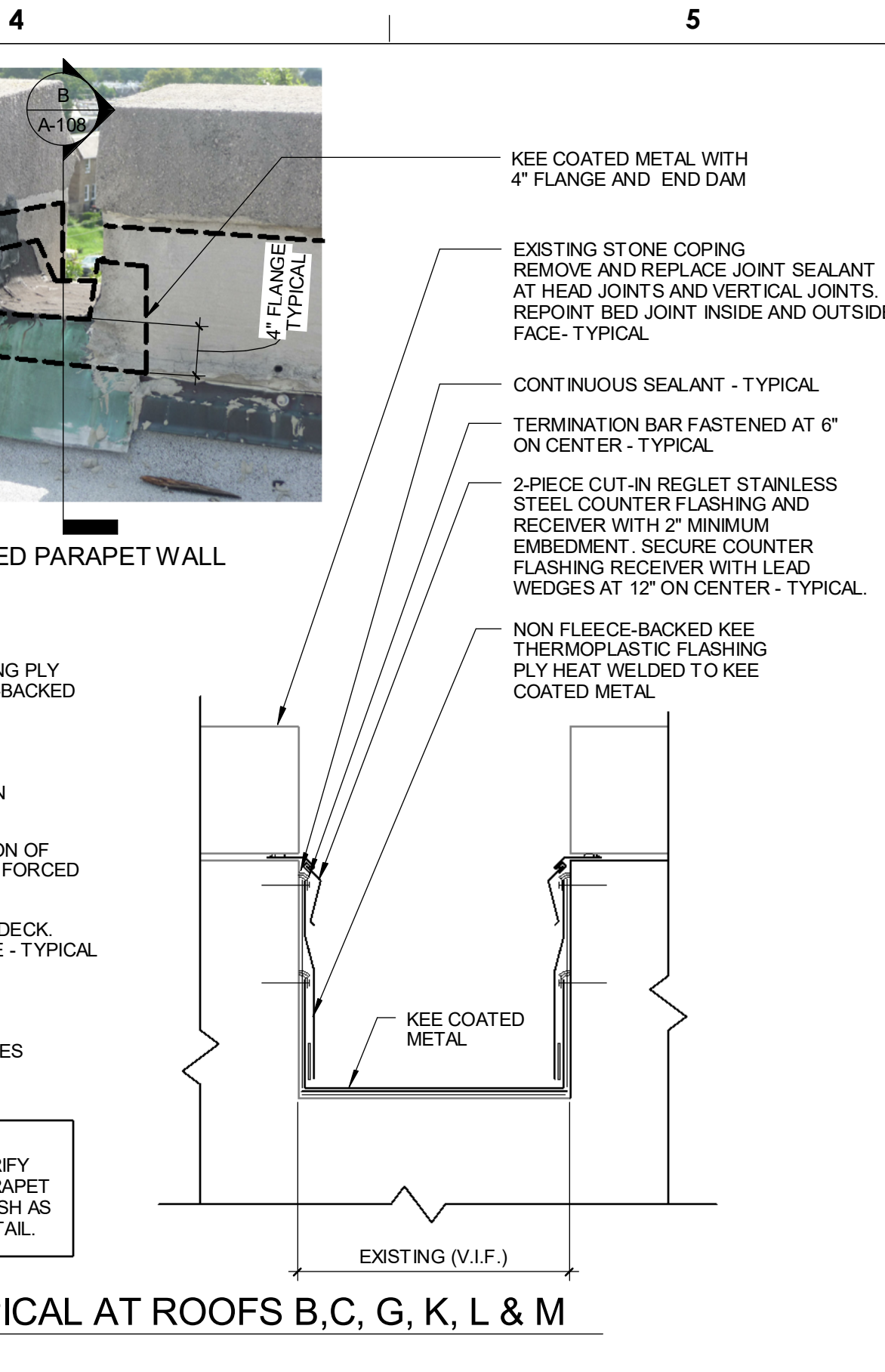
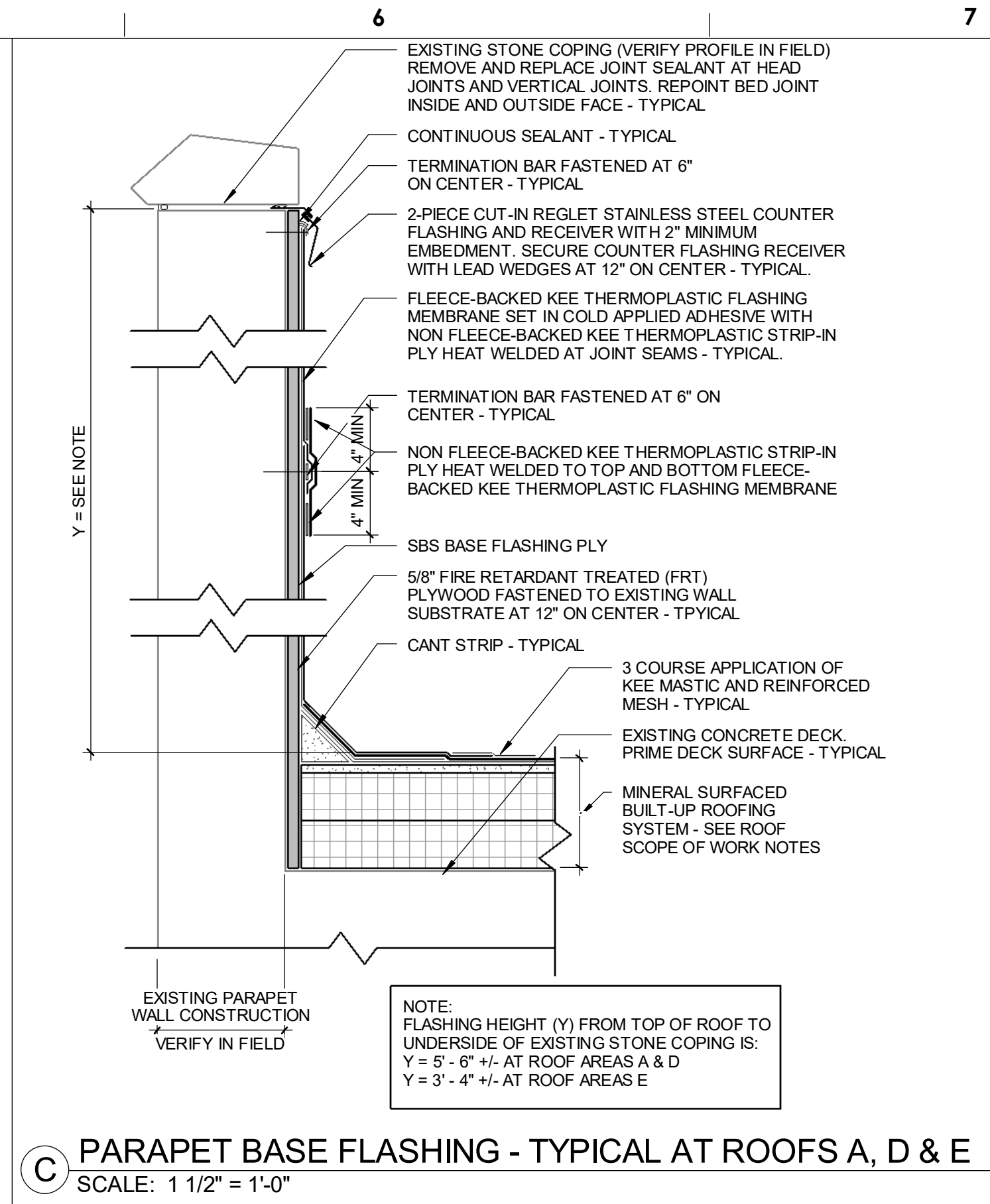
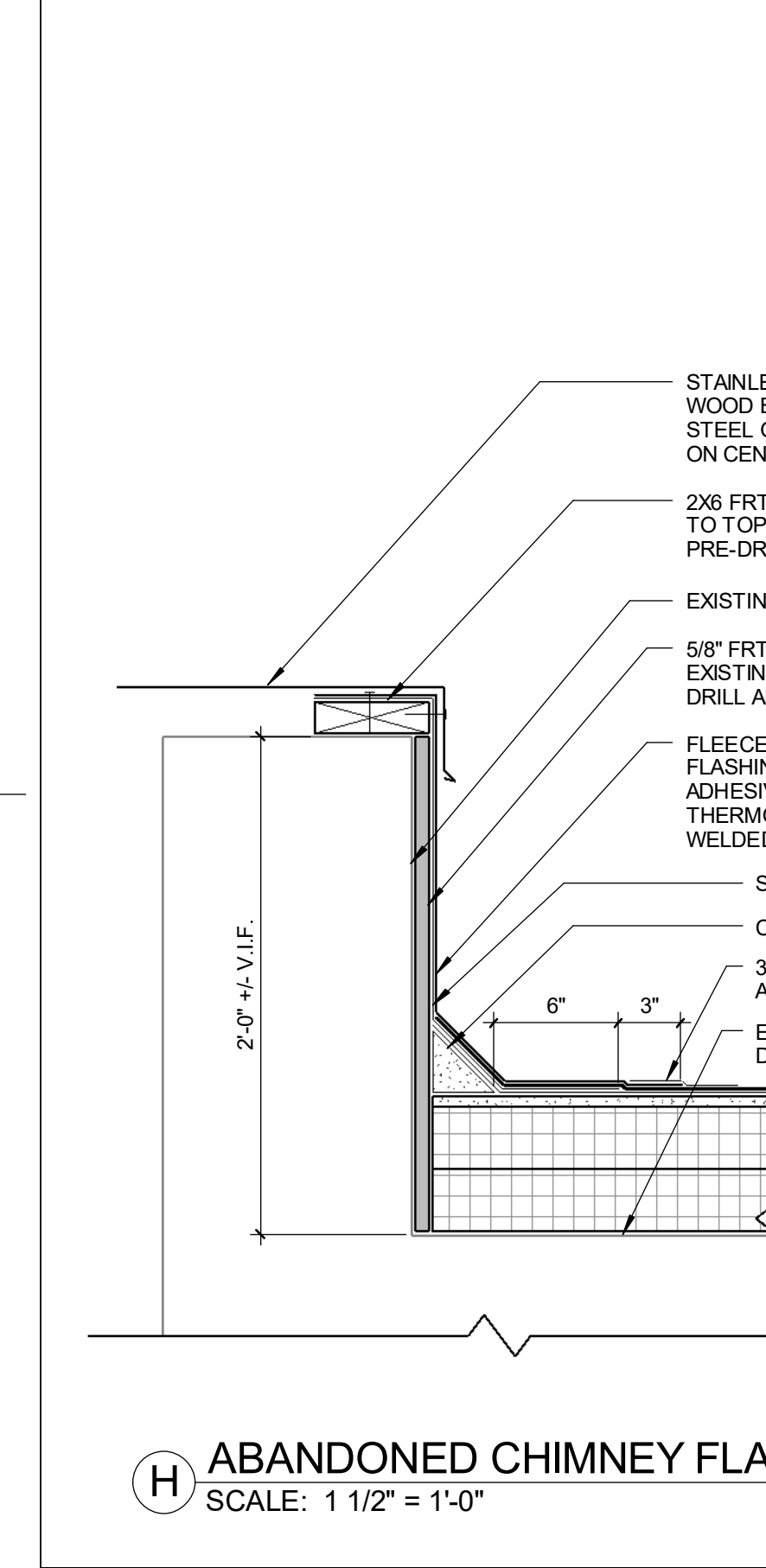
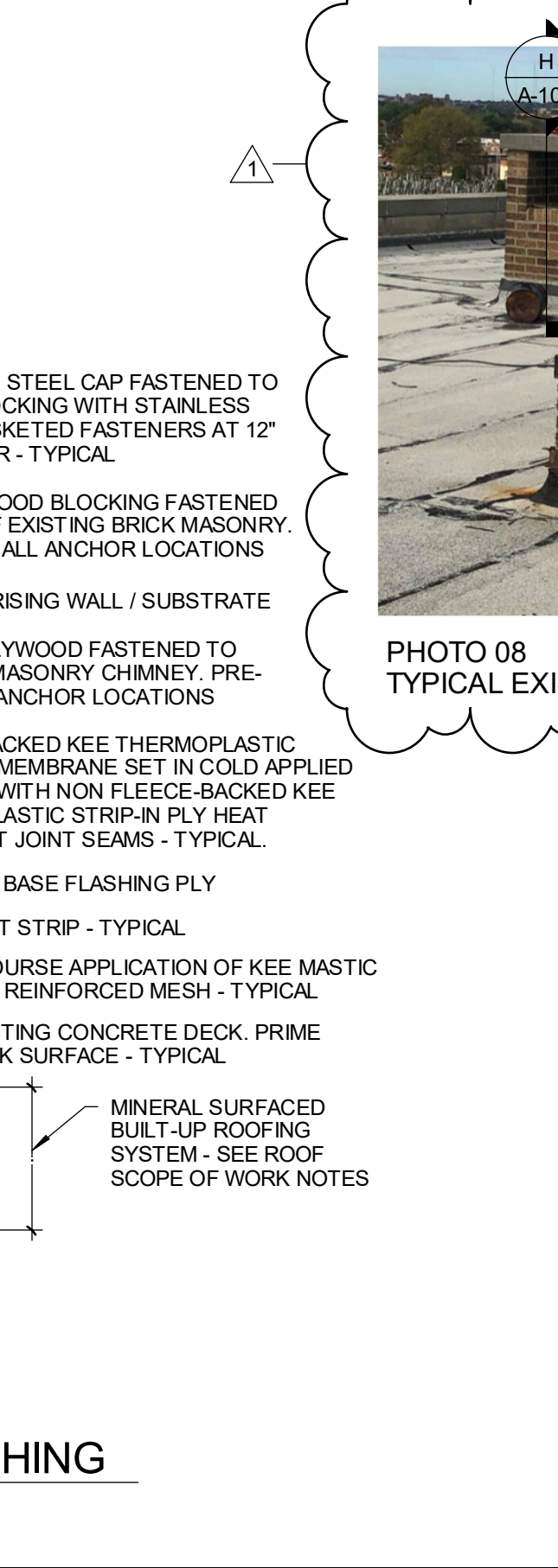
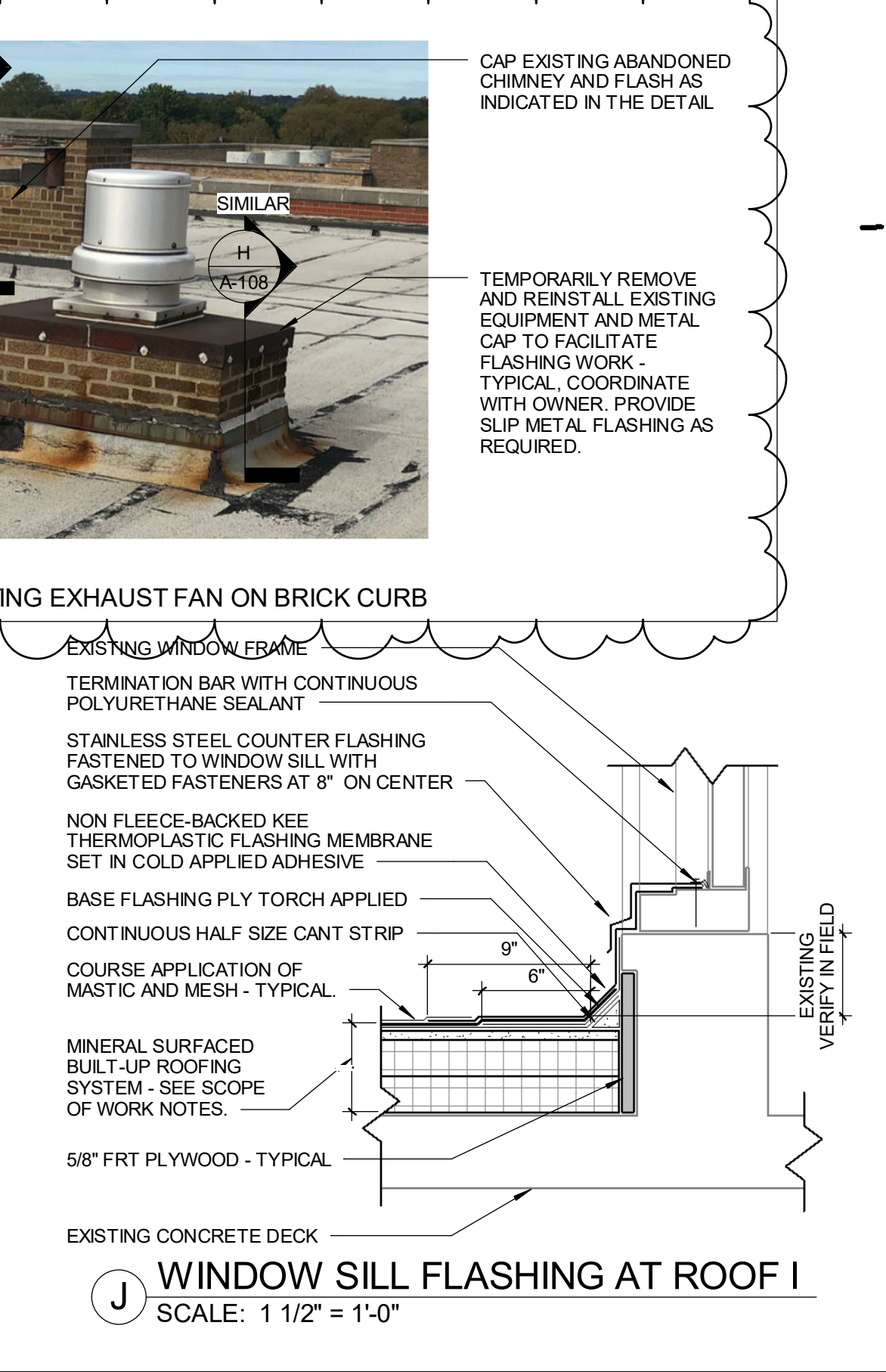
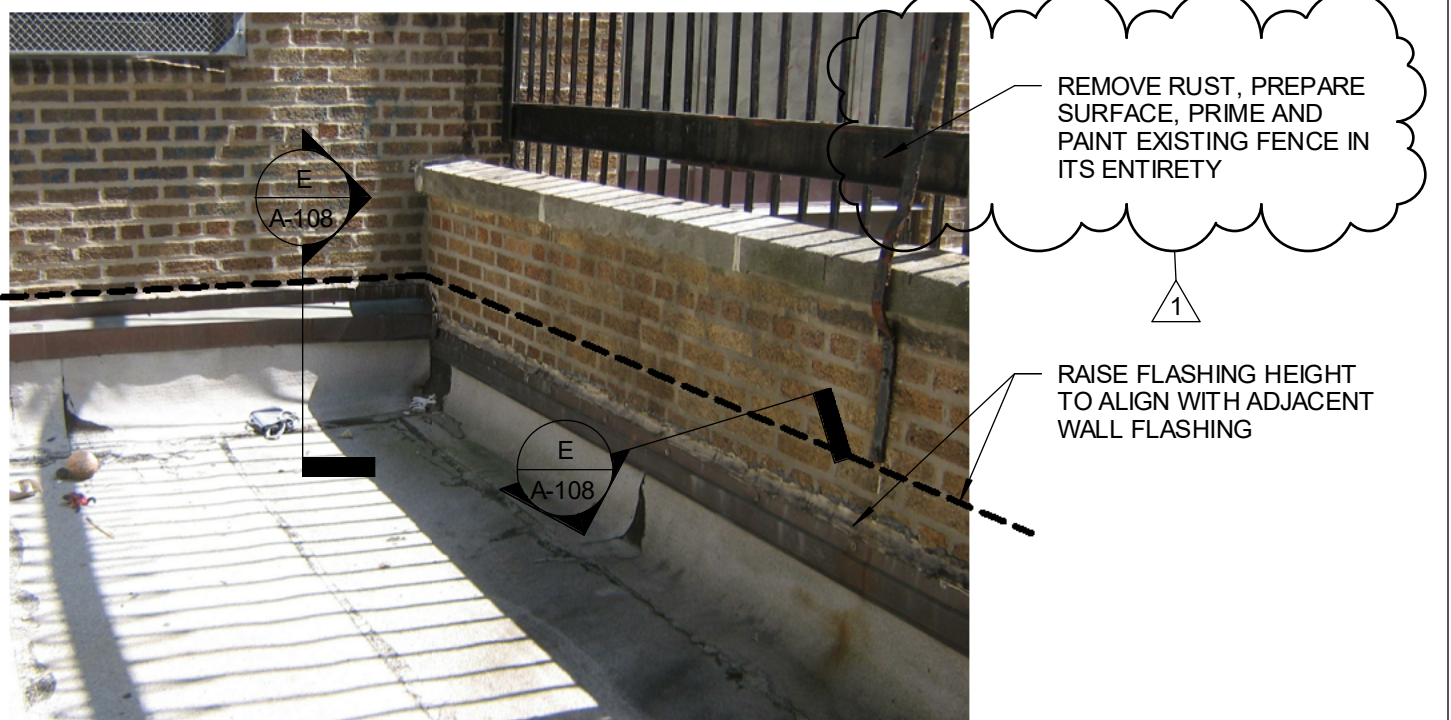
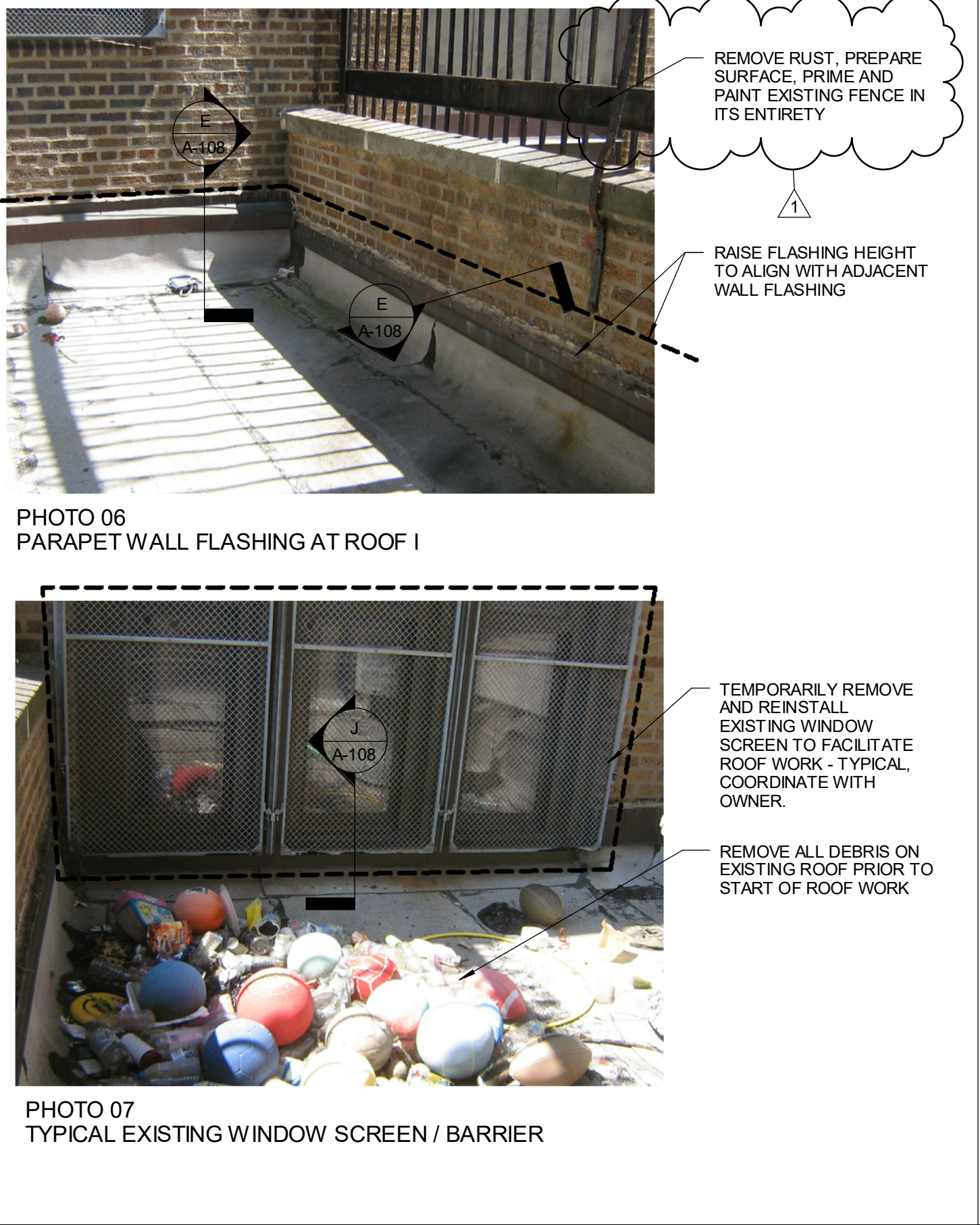
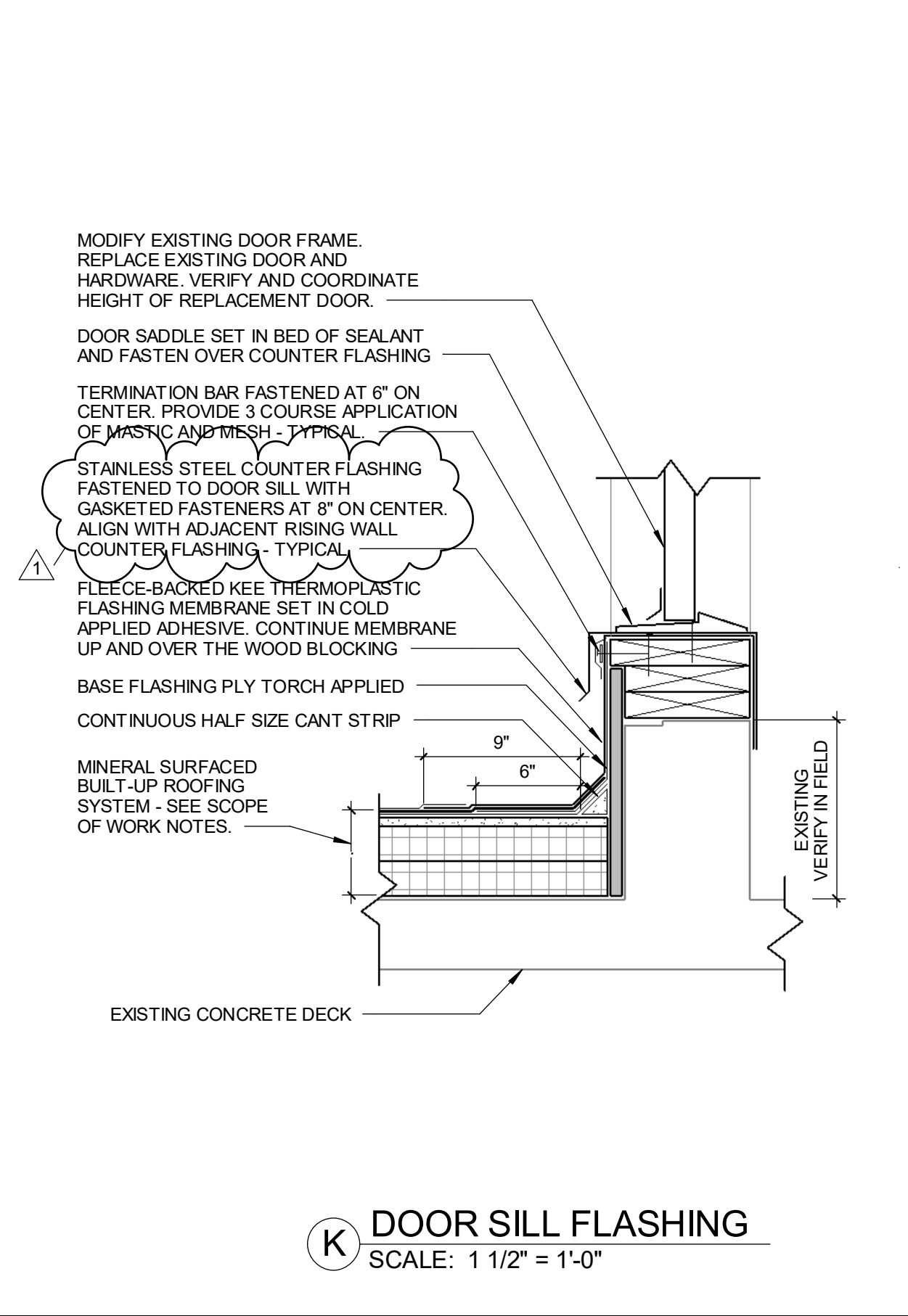
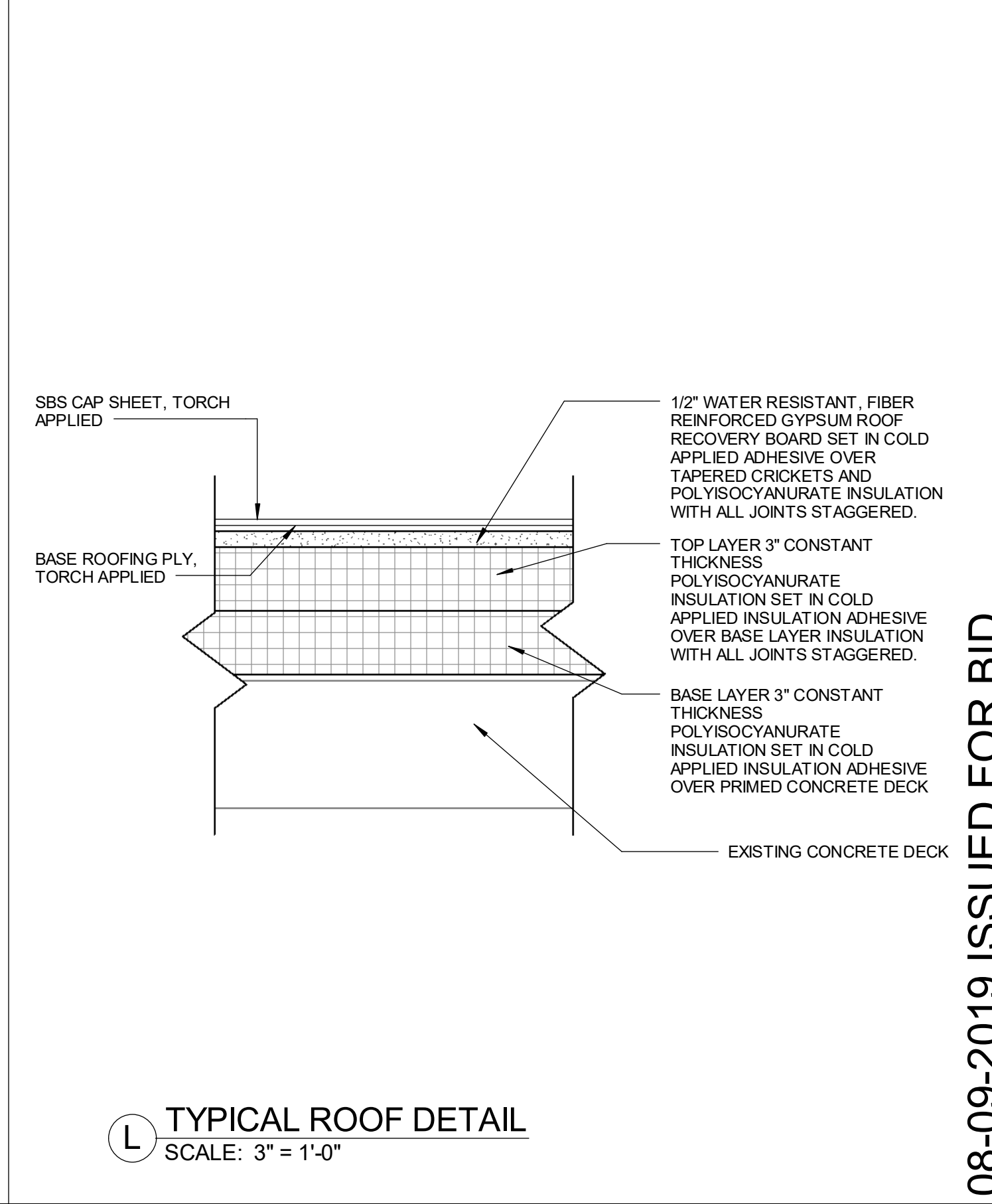
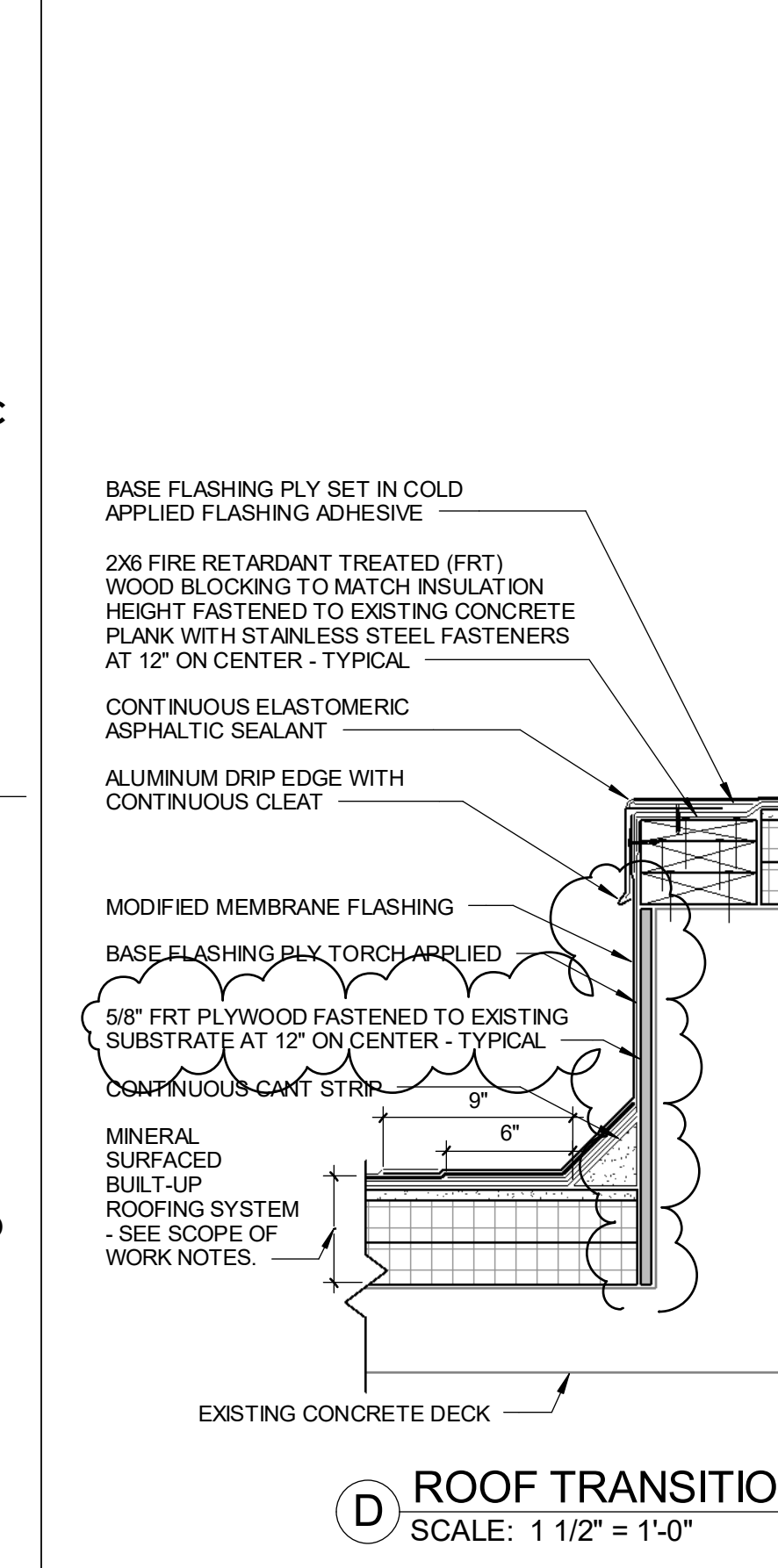
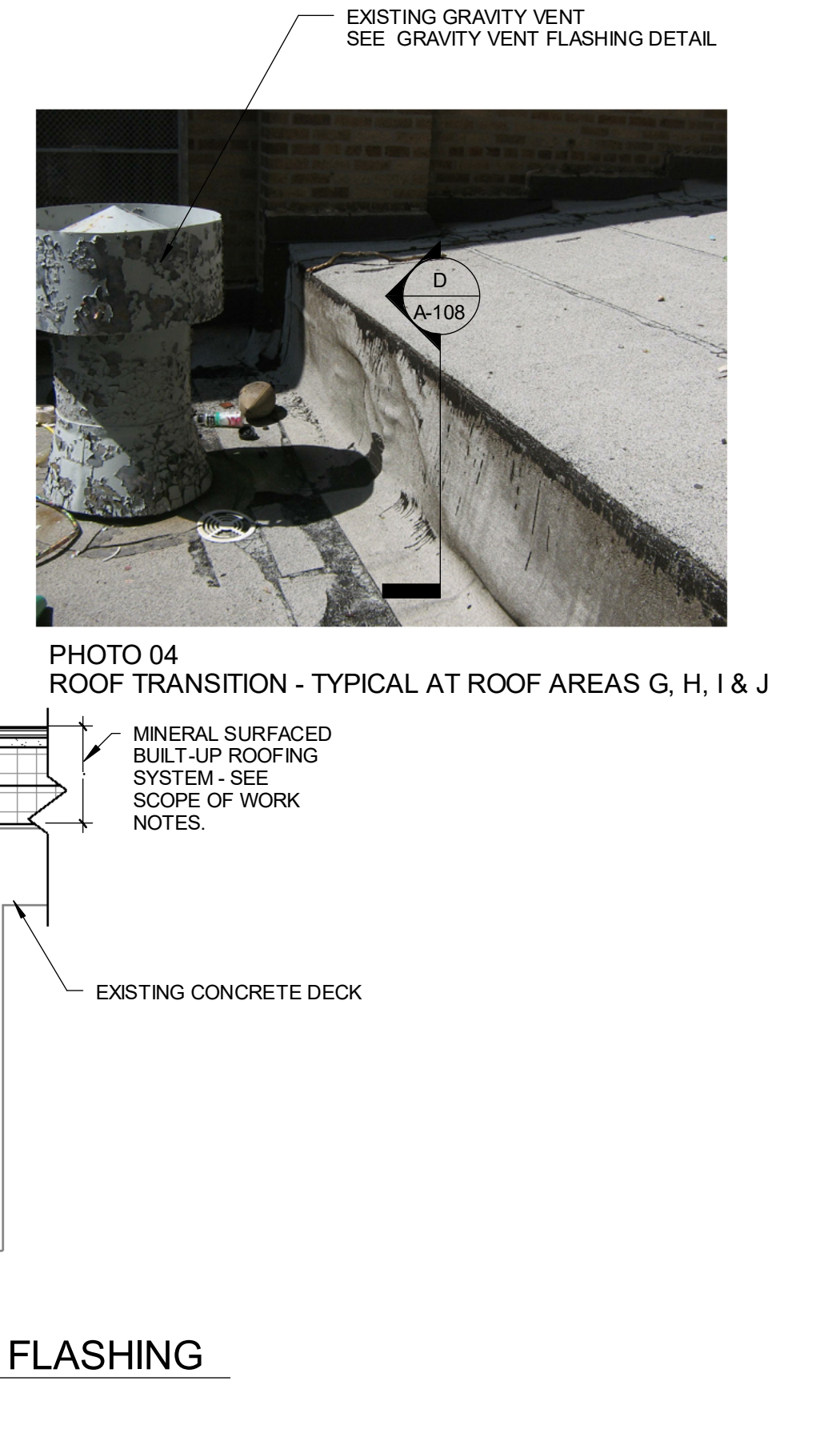
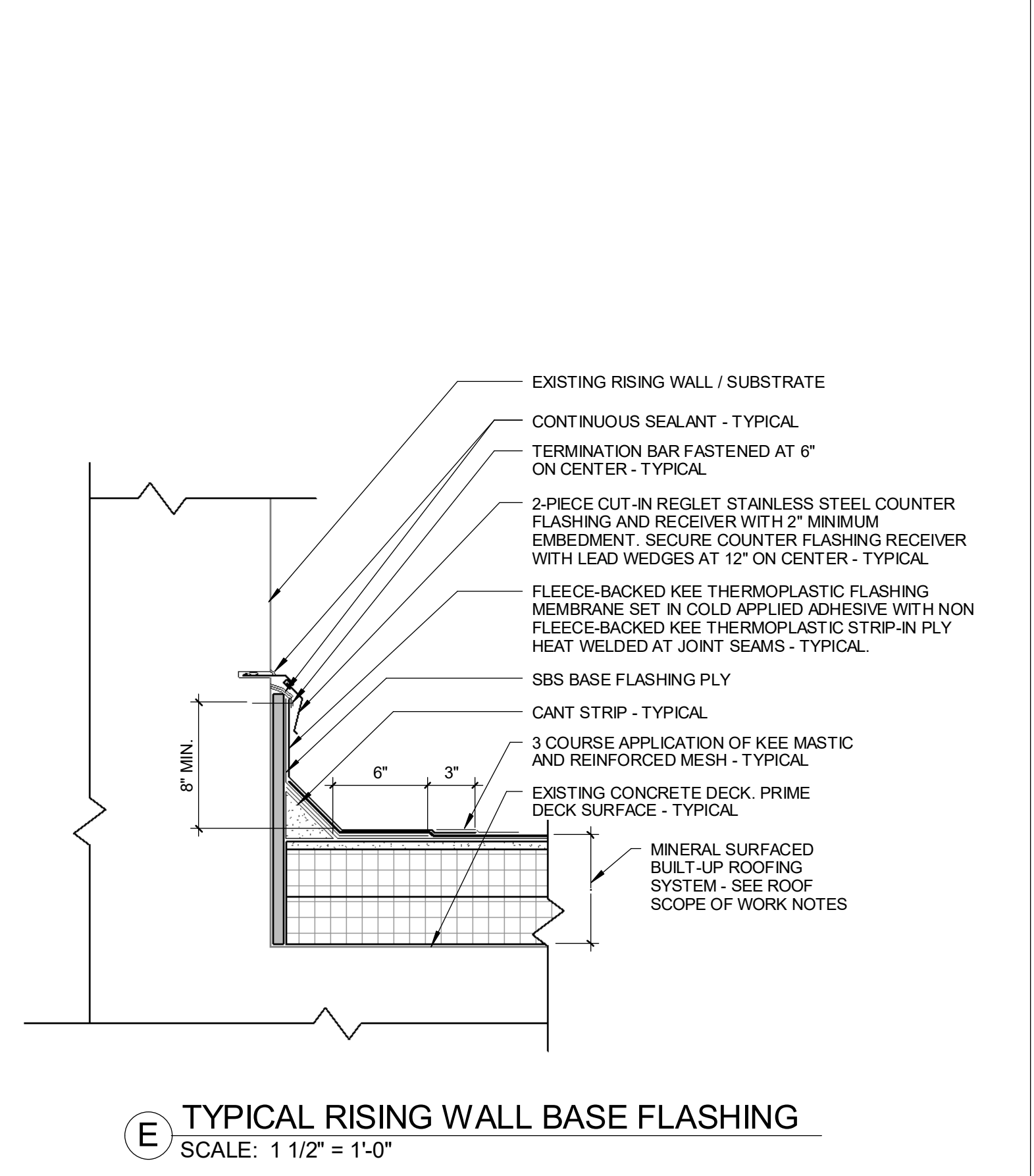
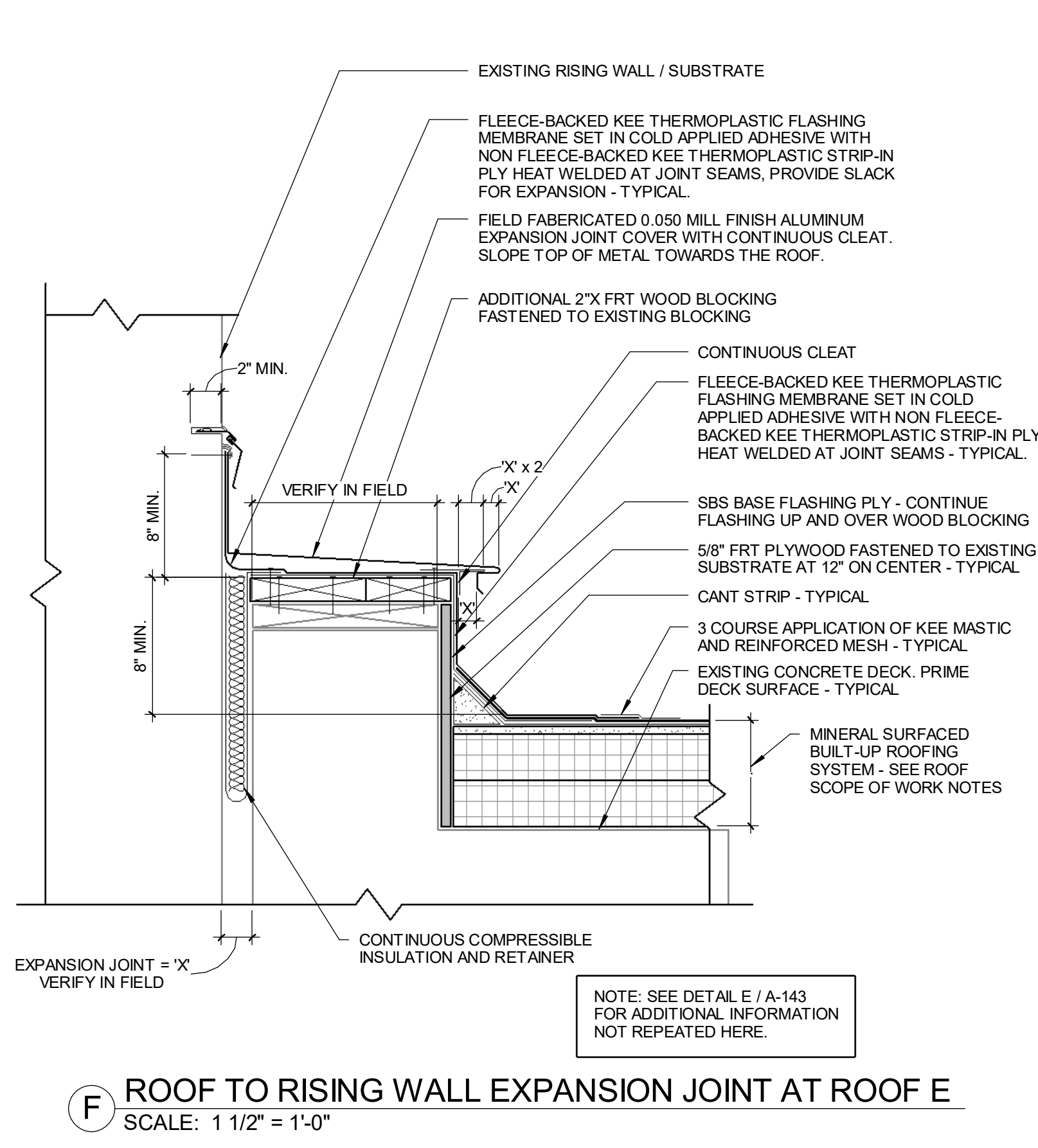
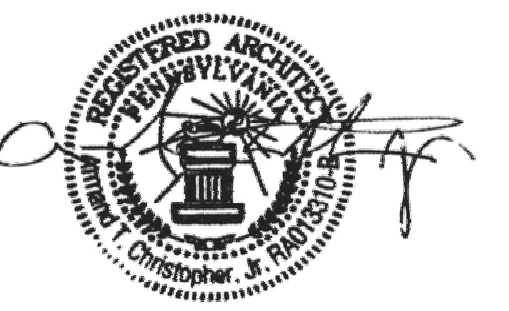


PHOTO 05  
EXPANSION JOINT AT ROOF E





SEAL:



ARMAND CHRISTOPHER  
STATE AND LICENSE NO. 0000220X DATE

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AUGUST 9, 2019

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1	10.17.19	ADDENDUM NO. 1

SCHOOL & LOCATION  
**Laura H. Carnell Elementary School**

1100 DEVEREAUX AVENUE,  
PHILADELPHIA, PENNSYLVANIA

PROJECT TITLE

**ROOF REPLACEMENT**

DRAWING TITLE

**ROOF DETAILS**

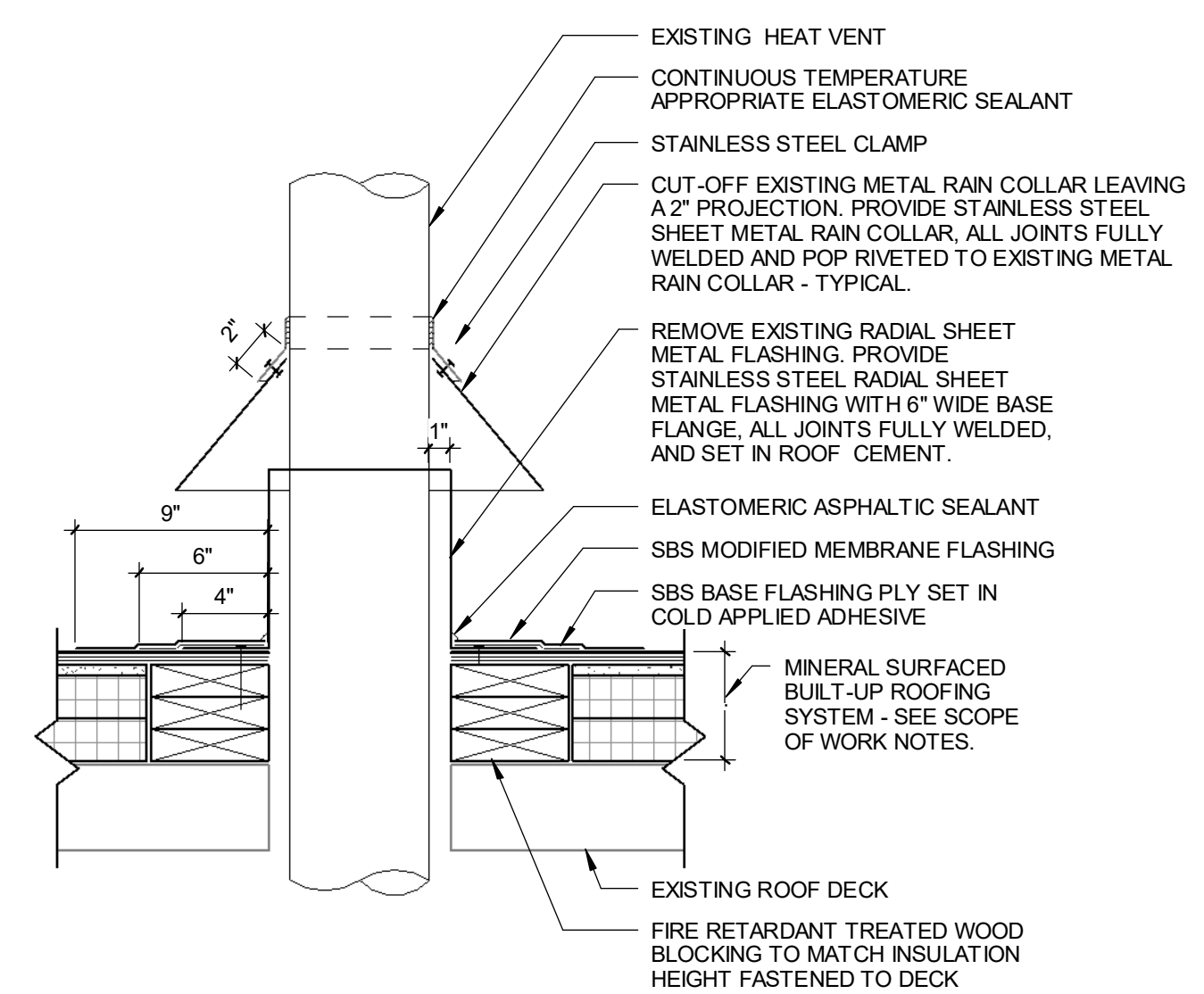
DRAWING SCALE	
As indicated	
LOCATION NO.	FILE NO.
7220	2018-093
DRAWN BY	CHECKED BY
RG/BB	R.JH
B-072C OF 2017 / 18	

DRAWING NO.

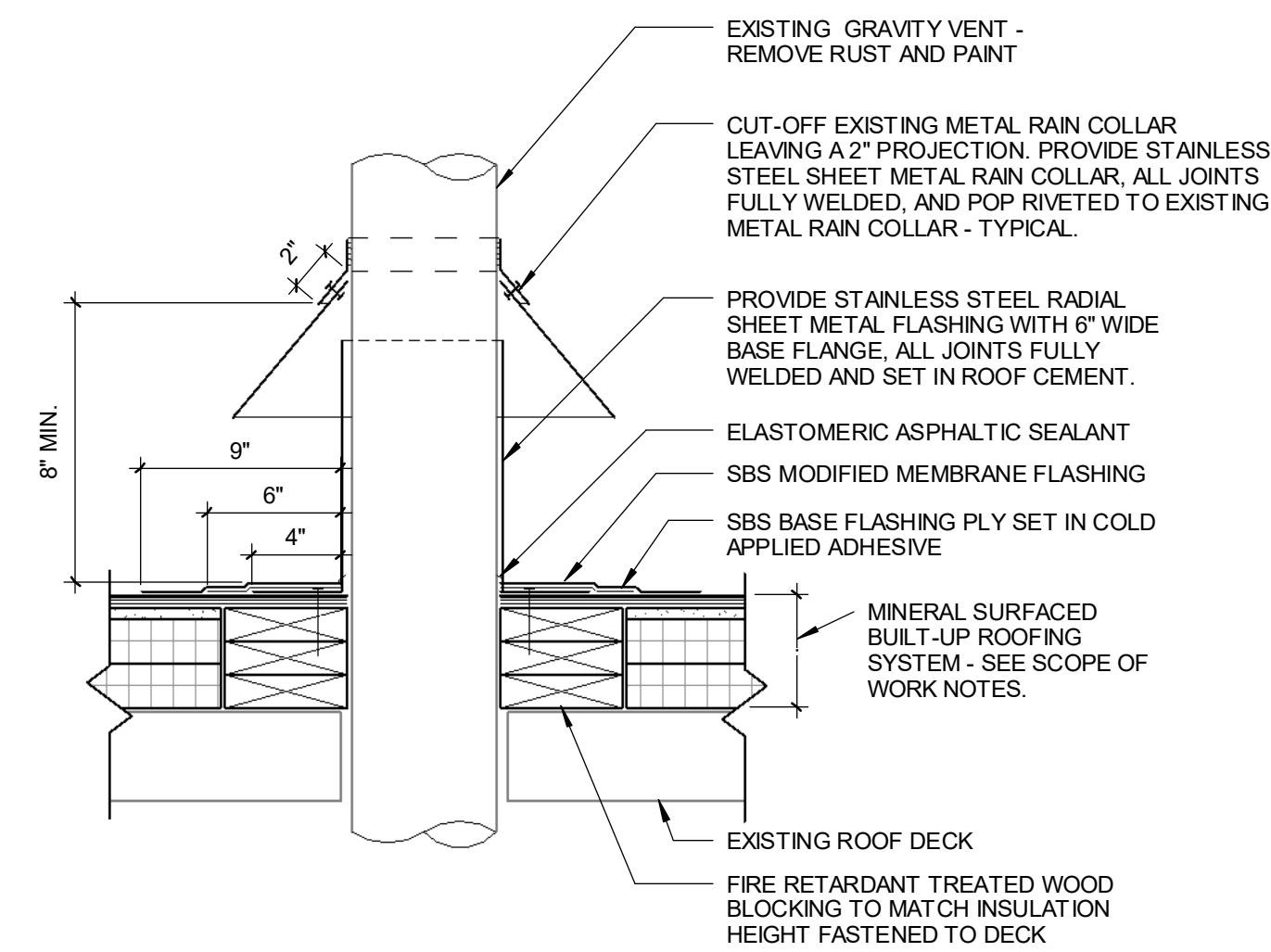
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SHEET 10 OF 13

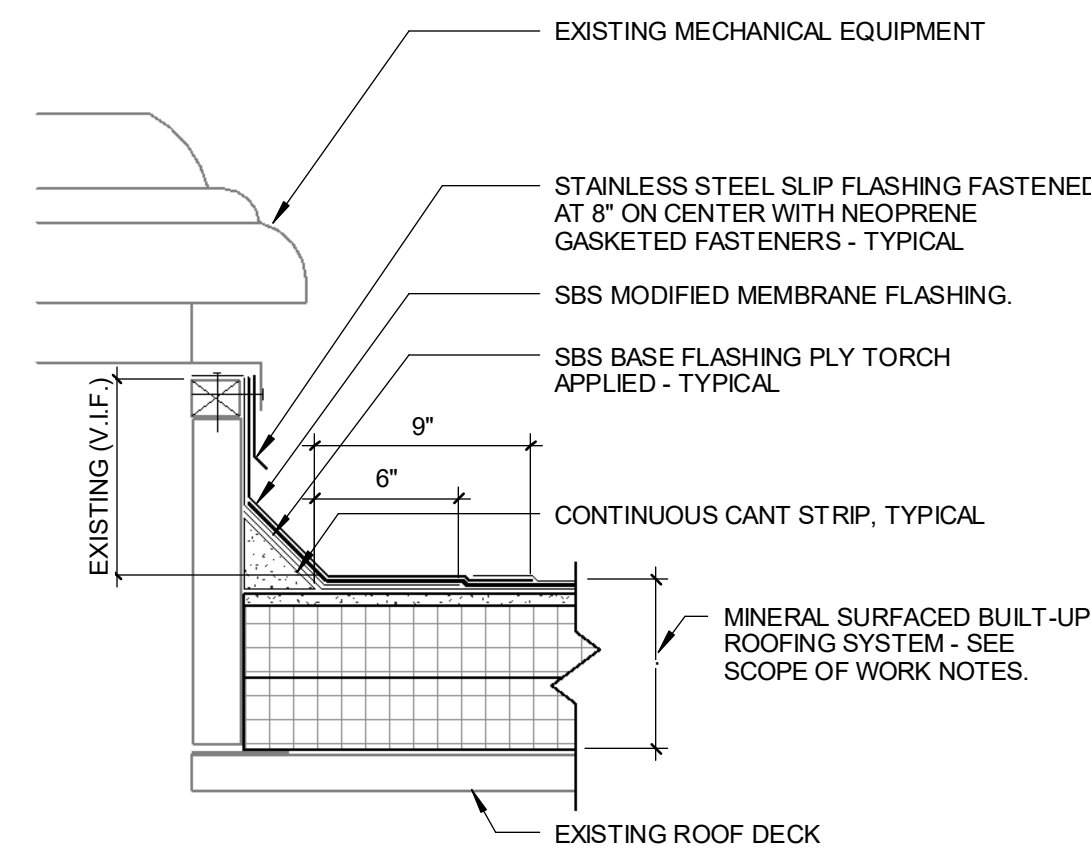
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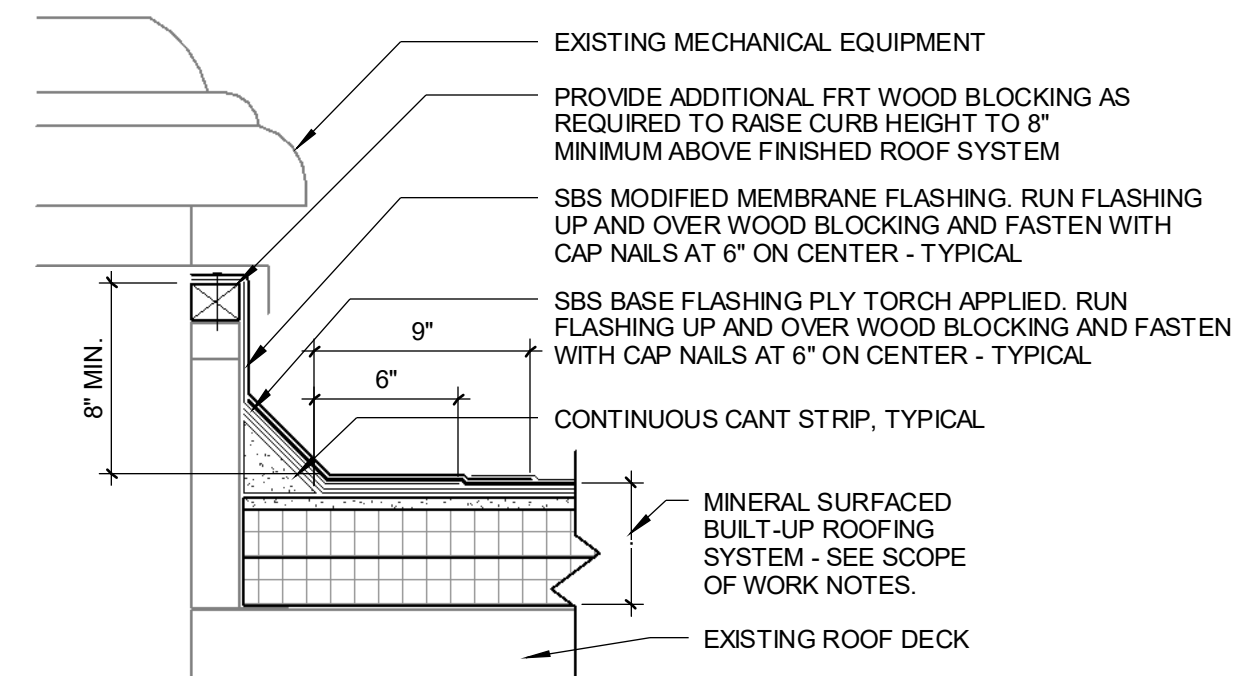
**D TYPICAL HEAT VENT FLASHING**  
SCALE: 1 1/2" = 1'-0"



**C TYPICAL GRAVITY VENT FLASHING**  
SCALE: 1 1/2" = 1'-0"

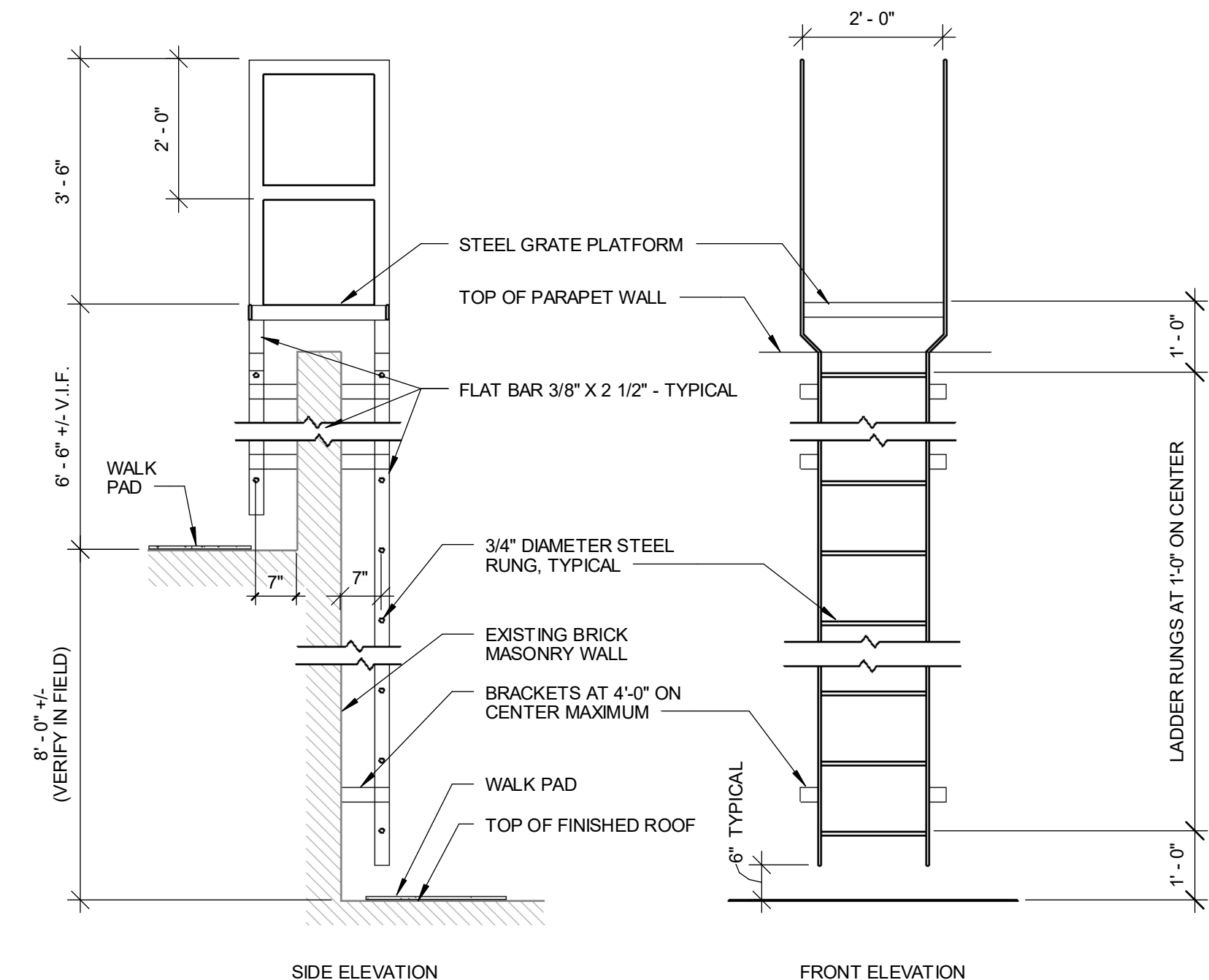


**B EQUIPMENT CURB FLASHING WITH SLIP METAL COUNTER FLASHING**  
SCALE: 1 1/2" = 1'-0"



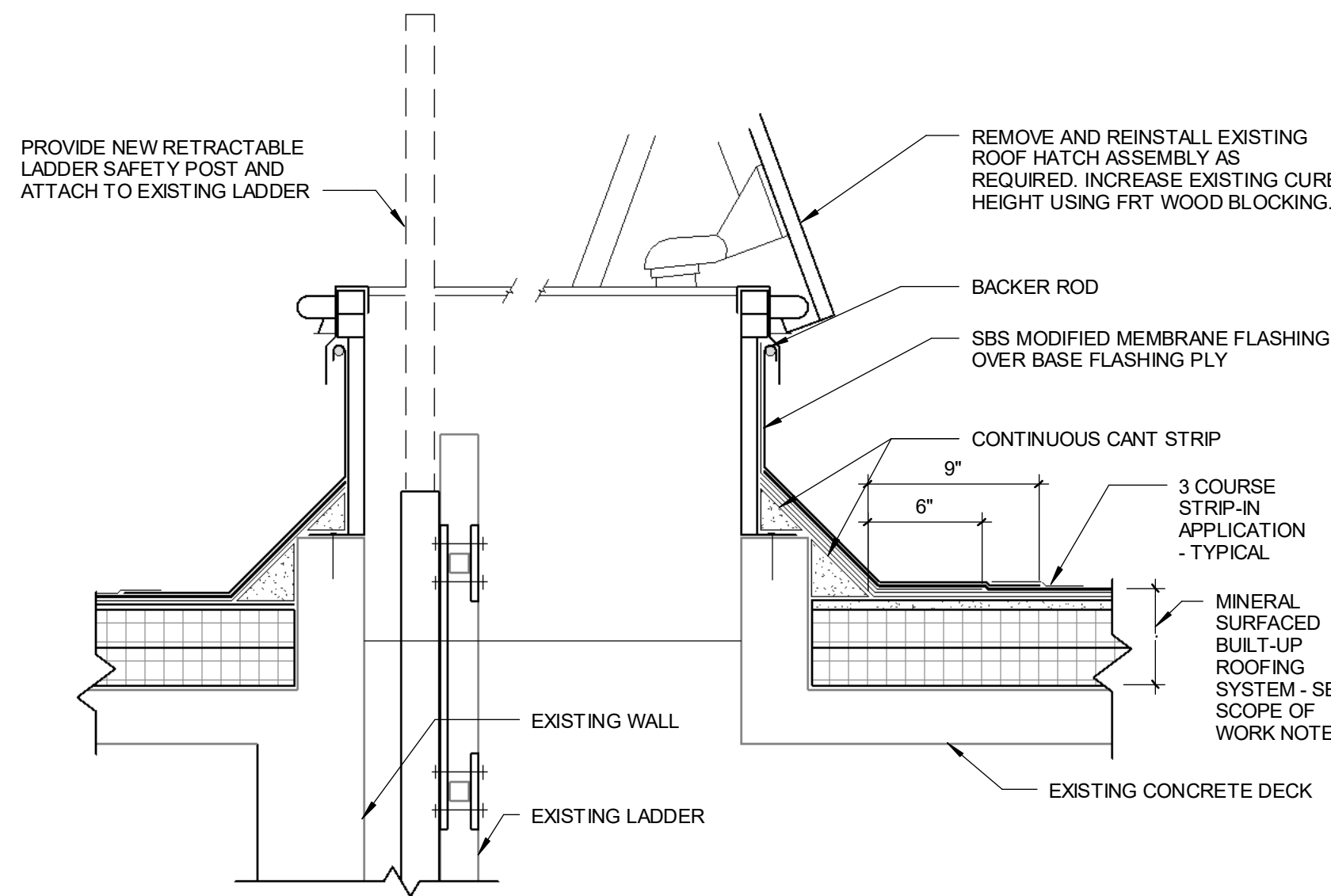
**A EQUIPMENT CURB FLASHING**  
SCALE: 1 1/2" = 1'-0"

NOTE:  
WHERE THE TEMPORARY REMOVAL OF EQUIPMENT (TO FACILITATE FLASHING WORK) IS NOT POSSIBLE, UTILIZE CURB FLASHING DETAIL B / A-145.

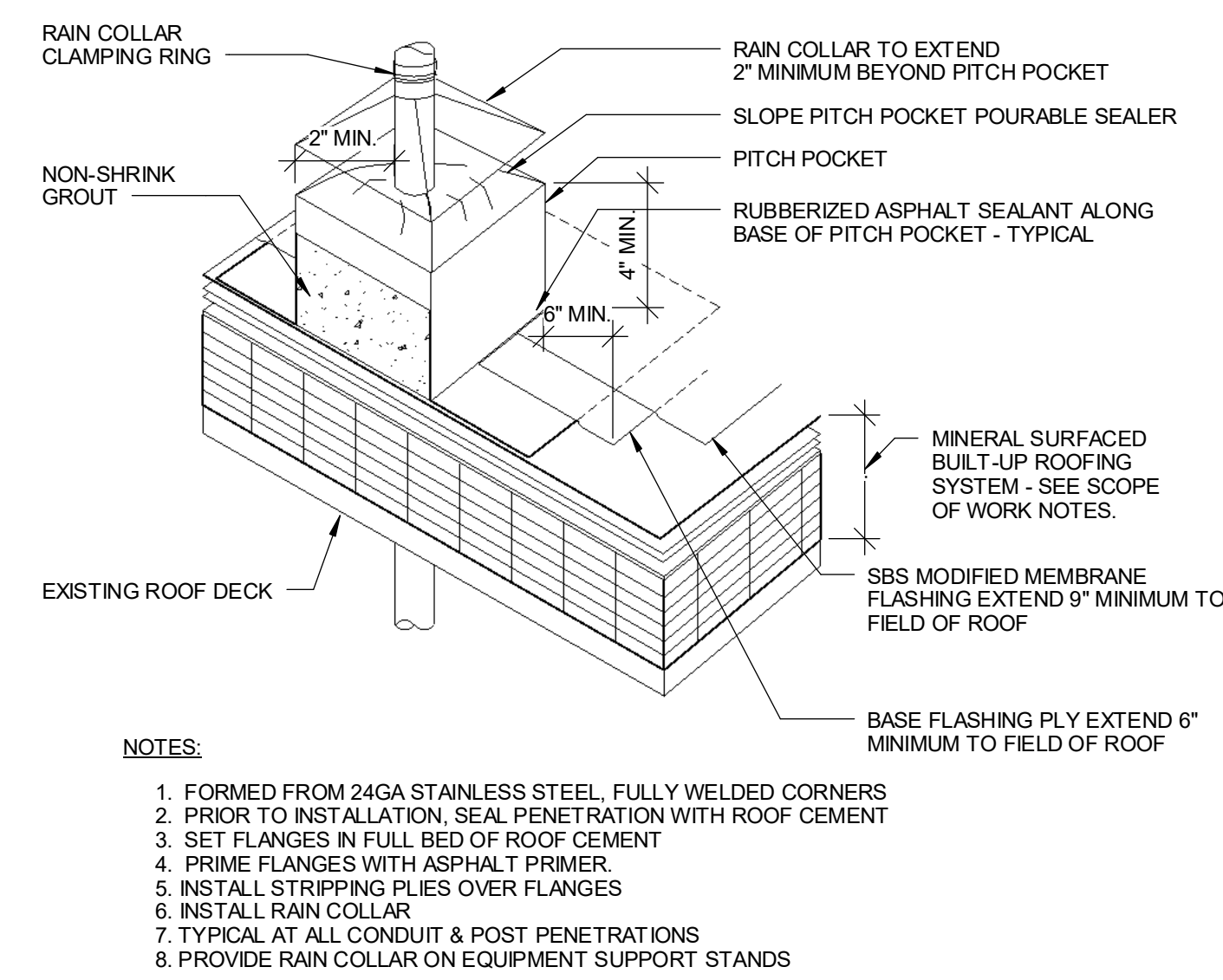


NOTES:  
1. ALL MATERIALS TO BE A36  
2. FINISH TO BE HOT-DIP GALVANIZED  
3. GRIND ALL WELD AND EDGES SMOOTH.

**H ROOF LADDER**  
SCALE: 1/2" = 1'-0"

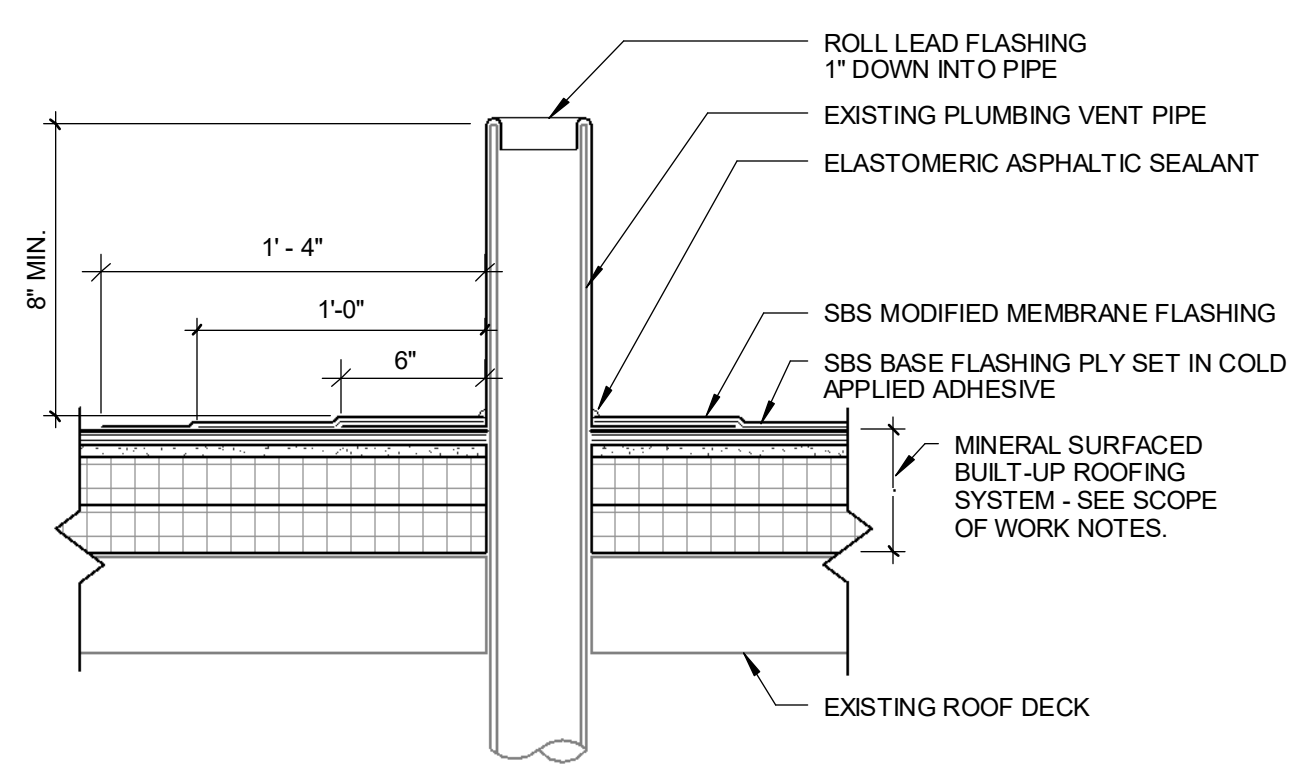


**G ROOF HATCH FLASHING**  
SCALE: 1 1/2" = 1'-0"

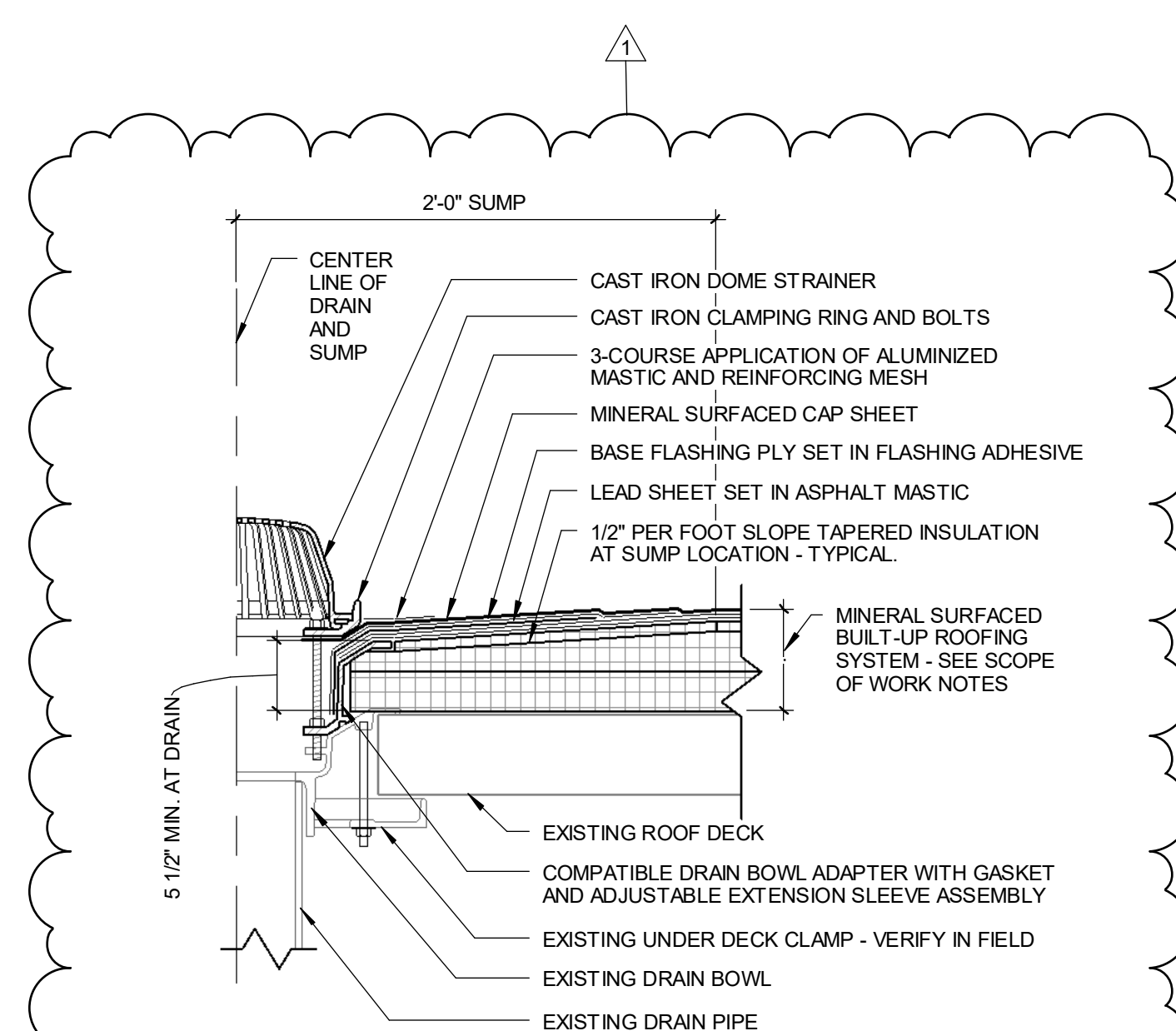


**F TYPICAL PITCH POCKET**  
SCALE: 1 1/2" = 1'-0"

- NOTES:  
1. FORMED FROM 24GA STAINLESS STEEL. FULLY WELDED CORNERS  
2. PRIOR TO INSTALLATION, SEAL PENETRATION WITH ROOF CEMENT  
3. SET FLANGES IN FULL BED OF ROOF CEMENT  
4. PRIME FLANGES WITH ASPHALT PRIMER  
5. INSTALL STRIPPING PILES OVER FLANGES  
6. INSTALL RAIN COLLAR  
7. TYPICAL AT ALL CONDUIT & POST PENETRATIONS  
8. PROVIDE RAIN COLLAR ON EQUIPMENT SUPPORT STANDS



**E TYPICAL VENT FLASHING**  
SCALE: 1 1/2" = 1'-0"



NOTE:  
PROVIDE COMPATIBLE DRAIN BOWL ADAPTER WITH GASKET, ADJUSTABLE EXTENSION SLEEVE, CAST IRON CLAMPING RING AND DOME STRAINER AT ALL EXISTING ROOF DRAINS. VERIFY IN FIELD.

**J TYPICAL ROOF DRAIN FLASHING**  
SCALE: 1 1/2" = 1'-0"