



**Oregon State
University**

**Construction Contracts
Administration, Procurement
Contracts & Materials
Management (PCMM)**
Oregon State University
644 SW 13th Ave.
Corvallis, Oregon 97333

**P 541-737-4261
F 541-737-5546
oregonstate.edu**

4/17/2019

Oregon State University
Construction Contract Administration
Wilson Hall Roof Replacement

ADDENDUM NO. 1

THIS ADDENDUM IS BEING ISSUED for clarification and/or revisions of the drawings and specifications as noted. This document is hereby made a part of the Contract Documents to the extent as though it was originally included herein.

The following changes shall be made to the TECHNICAL SPECIFICATIONS:

- Item 1 DELETE specification section 06 10 00 in its ENTIRETY. REPLACE specification section 06 10 00 dated 04/16/2019 attached to this addendum.
- Item 2 DELETE specification section 07 01 50.19 in its ENTIRETY. REPLACE specification section 07 01 50.19 dated 04/16/2019 attached to this addendum.
- Item 3 DELETE specification section 07 53 23 in its ENTIRETY. REPLACE specification section 07 53 23 dated 04/16/2019 attached to this addendum.
- Item 4 DELETE specification section 07 62 00 in its ENTIRETY. REPLACE specification section 07 62 00 dated 04/16/2019 attached to this addendum.
- Item 5 DELETE specification section 07 72 00 in its ENTIRETY. REPLACE specification section 07 72 00 dated 04/16/2019 attached to this addendum.
- Item 6 DELETE specification section 15 05 00 in its ENTIRETY. REPLACE specification section 15 05 00 dated 04/16/2019 attached to this addendum.
- Item 7 DELETE specification section 16 05 00 in its ENTIRETY. REPLACE specification section 16 05 00 dated 04/16/2019 attached to this addendum.

The following changes shall be made to the DRAWINGS:

- Item 2 DELETE drawing set in its ENTIRETY labelled "95% Review Set". REPLACE with drawings labelled "Bid Set" attached to this addendum.

END OF ADDENDUM NO. 1

OSU - WILSON HALL ROOF REPLACEMENT PROJECT

H O L S T

110 SE 8TH AVE.
PORTLAND, OR
97214

HOLSTARC.COM

WILSON ROOF REPLACEMENT

1030 SW MADISON AVE
CORVALLIS, OR 97331

PERMIT # xxx

JOB NO. 17070.01



1108 SE GRAND AVENUE, SUITE 300
PORTLAND, OREGON 97214
PH. 503 280 8759 FAX: 503 280 8866

BID SET

APRIL 2019

issue: _____ date

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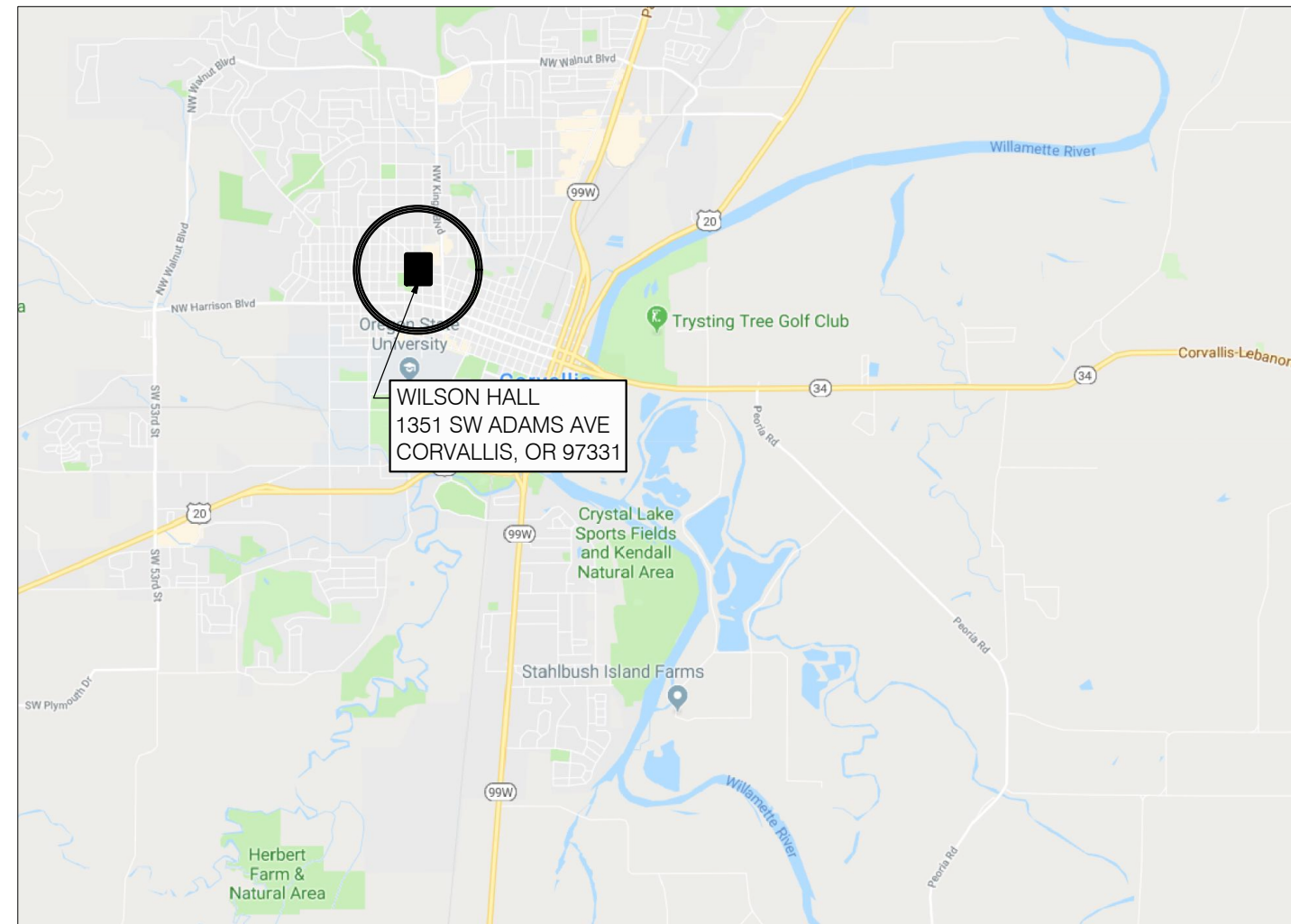
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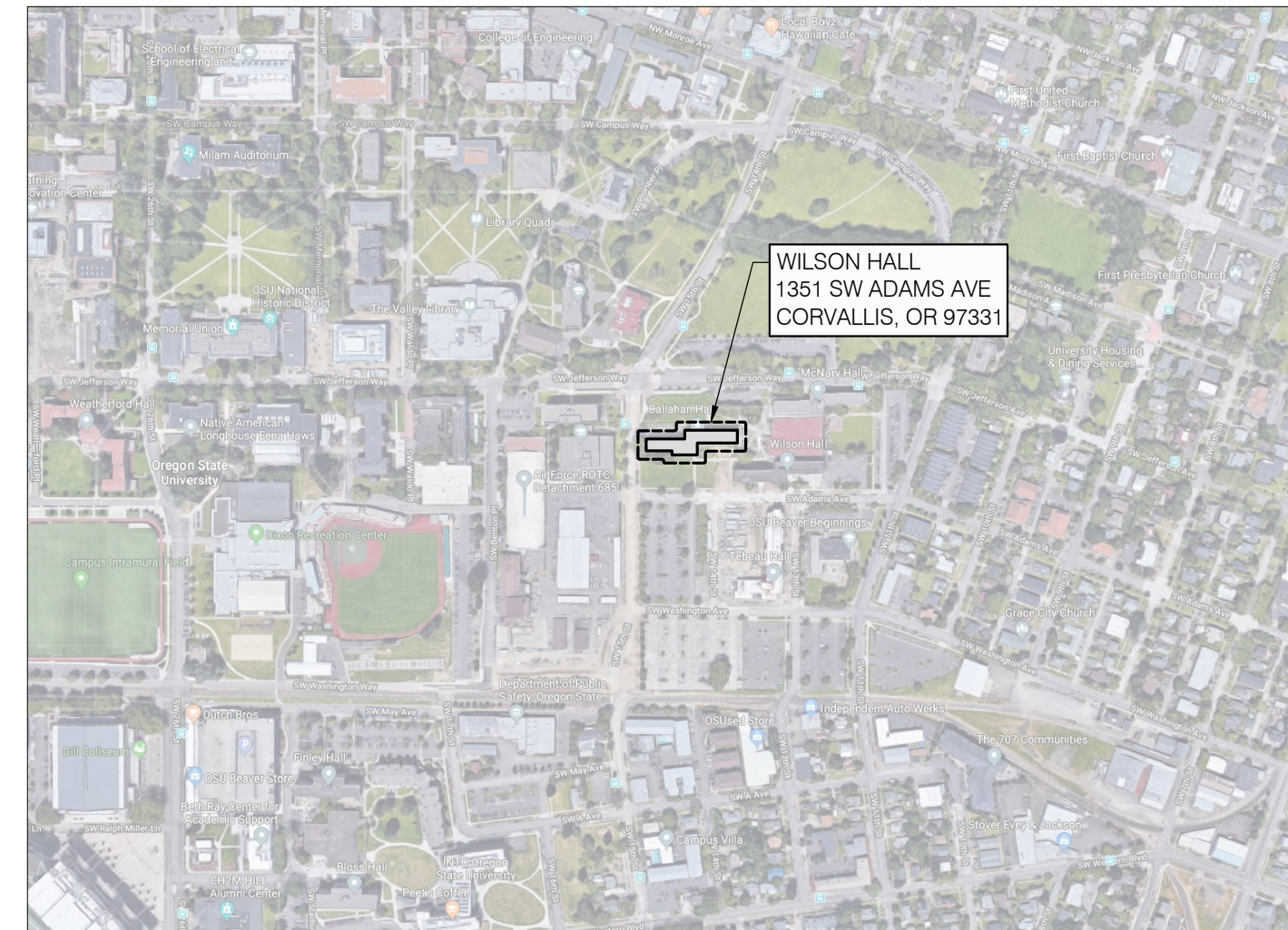
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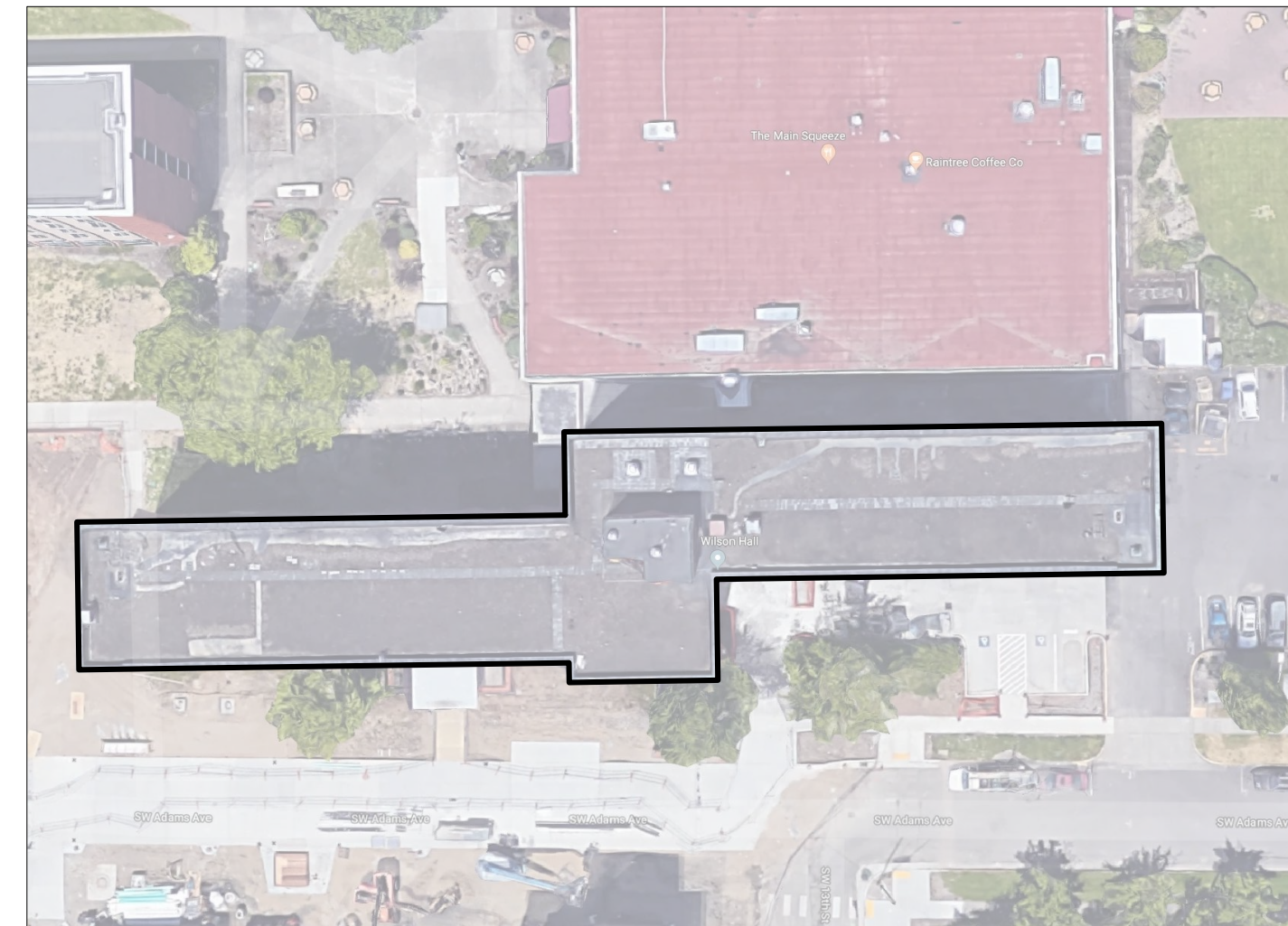
SITE MAPS



1 LOCATION MAP
GI-1 SCALE: NTS



2 VICINITY MAP
GI-1 SCALE: NTS



3 SITE PLAN
GI-1 SCALE: NTS

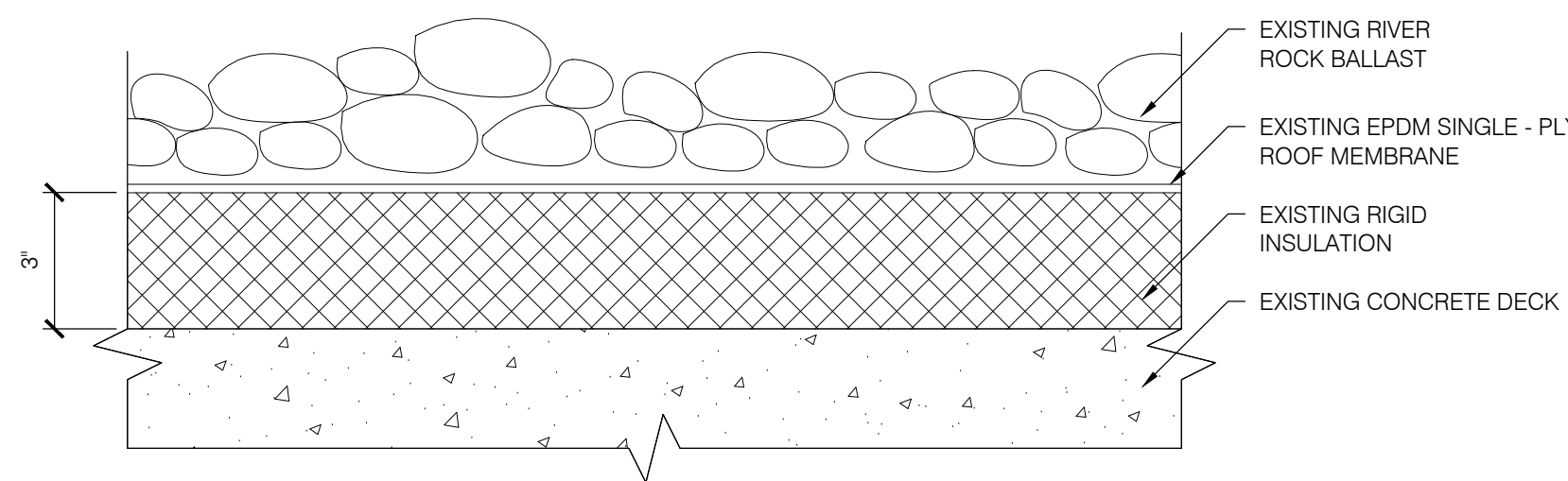
DRAWING SCHEDULE

GI-1	GENERAL INFORMATION
R100	WILSON HALL - DEMO ROOF PLAN
R101	WILSON HALL - ROOF PLAN
R200	DETAILS
R201	DETAILS
A101	ROOF PLAN + DETAILS
A102	LADDER + GUARDRAIL INFORMATION

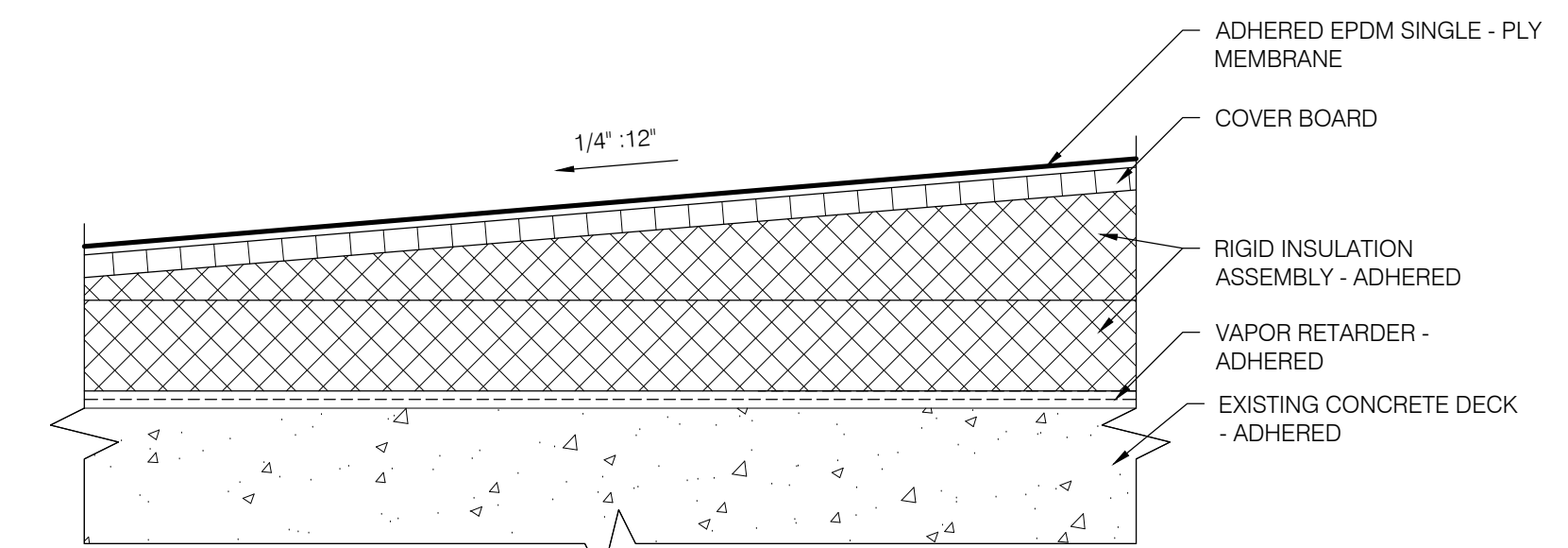
GENERAL NOTES

- CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL DIMENSIONS AND CONDITIONS OF THE PROJECT, INCLUDING VERIFICATION OF EXISTING ROOF SYSTEM CONSTRUCTION AND MATERIALS
- CONTRACTOR STAGING AND STORAGE AREAS SHALL BE AS DIRECTED BY THE OWNER'S REPRESENTATIVE AT THE PRE-CONSTRUCTION MEETING. CONTRACTOR SHALL ASSUME A REASONABLE AMOUNT OF STORAGE AND STAGING SPACE WILL BE MADE AVAILABLE
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING BUILDING SURFACES, FINISHES, AND SYSTEMS FROM DAMAGE, DISCOLORATION, ETC. DURING THE COURSE OF ALL CONSTRUCTION ACTIVITIES
- PERSONAL FALL PROTECTION DEVICES ARE NOT, NOR WILL BE, PROVIDED BY THE OWNER ON ANY ROOF AREA DESIGNATED TO RECEIVE WORK. PERSONAL FALL PROTECTION IS THE RESPONSIBILITY OF THE CONTRACTOR
- EXISTING MATERIALS AND CONSTRUCTION ARE NOTED ON THE DRAWINGS AS EXISTING OR EXIST. ALL OTHER NOTATIONS INDICATE NEW MATERIALS, PRODUCTS, AND CONSTRUCTION UNLESS OTHERWISE STATED OR INDICATED
- ALL CONSTRUCTION SHALL CONFORM TO THE 2014 OREGON STRUCTURAL SPECIALTY CODE, AND ALL LOCAL GOVERNING BUILDING CODES AND ORDINANCES
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING UTILITIES WHETHER SHOWN HEREIN OR NOT, AND TO PROTECT UTILITIES FROM DAMAGE. THE CONTRACTOR SHALL BEAR ALL EXPENSES OF REPAIR OR REPLACEMENT OF UTILITIES OR OTHER PROPERTY DAMAGED BY OPERATIONS IN CONJUNCTION WITH THE EXECUTION OF THE WORK
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT BUILDING OCCUPANTS AND PASSERS-BY FROM FALLING DEBRIS OR EQUIPMENT. DO NOT THROW MATERIALS FROM THE ROOF
- THIS PROJECT INCLUDES A BASE BID FOR REPLACEMENT OF EXISTING ROOF SYSTEMS AND ASSOCIATED METAL FLASHINGS. THIS PROJECT DOES NOT INCLUDE ANY INCREASE IN AREA OR CHANGES IN OCCUPANCY

ROOF ASSEMBLIES



4 EXISTING ROOF ASSEMBLY
GI-1 SCALE: 3" = 1' 0"



5 NEW ROOF ASSEMBLY
GI-1 SCALE: 3" = 1' 0"

PROJECT TEAM

OWNER

Oregon State University
UHDS Maintenance Center
601 SW 35th St.
Corvallis, Oregon 97331
tel: (541) 737-2428
Contact: Patrick Robinson

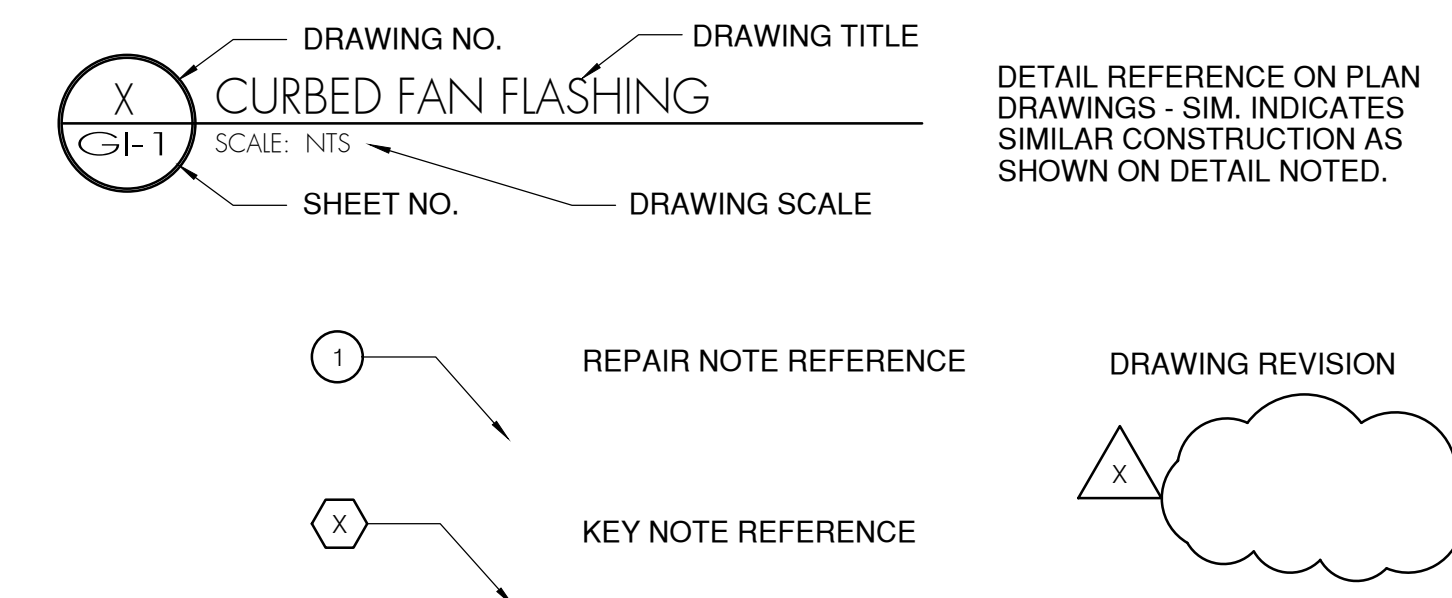
ROOF CONSULTANT

Professional Roof Consultants, Inc.
1108 SE Grand Ave., Suite 300
Portland, Oregon 97214
tel: (503) 280-8759
fax: (503) 280-8866
Contact: Faron Hall RRO, CDT

ARCHITECT

Holst Architecture, P.C.
110 SE 8th Ave
Portland, Oregon 97214
tel: (503) 233-9856
Contact: Ken Riddle

DRAWING SYMBOLS



title:

GEN INFO

sheet:

GI-1

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**WILSON ROOF
REPLACEMENT**

1030 SW MADISON AVE
CORVALLIS, OR 97331

PERMIT # xxx

JOB NO. 17070.01



1108 SE GRAND AVENUE, SUITE 300
PORTLAND, OREGON 97214
PH. 503 280 8759 FAX: 503 280 8866

BID SET

APRIL 2019

issue: _____ date: _____
: _____
: _____

revision: _____ date: _____

title:
DEMO PLAN

sheet:
R100

GENERAL NOTES

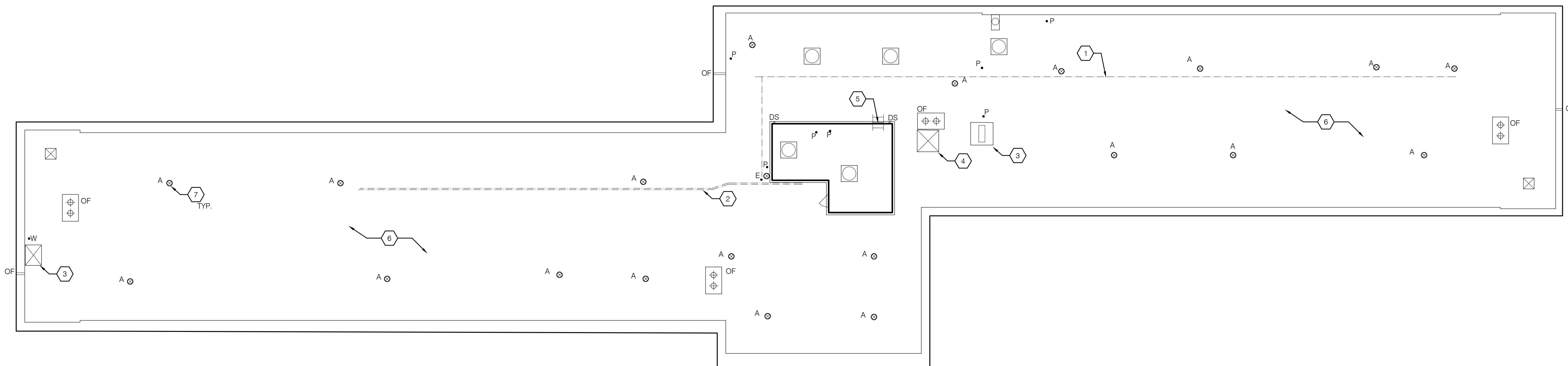
1. ALL ITEMS REMOVED FROM ROOF SHALL BE TRANSPORTED OFF-SITE USING APPROVED AND SAFE METHODS OF OFF-LOADING.
2. CONTRACTOR SHALL EMPLOY MEANS OF PROTECTING BUILDING OCCUPANTS AND GENERAL PUBLIC AT ALL TIMES DURING THE COURSE OF CONSTRUCTION.
3. TEMPORARY STAGING, SCAFFOLDING, AND RUNWAYS SHALL BE ALLOWED IN DESIGNATED LOCATIONS ONLY.
4. PROTECT LAWN, VEGETATION AND OTHER PROPERTY DURING DEMOLITION ACTIVITIES.
5. MAKE USE OF EXTERNAL POWER-RELAY DEVICES AS NECESSARY TO DISTRIBUTE POWER TO EQUIPMENT. ELECTRICAL HOOK-UP IS PERMITTED ONLY WHERE APPROVED BY THE UNIVERSITY.
6. EXISTING ELECTRICAL CONDUITS - DISCONNECT AS NECESSARY TO INSTALL NEW ROOF SYSTEM. NOTIFY, COORDINATE AND OBTAIN AUTHORIZATION FROM THE UNIVERSITY 48 HOURS PRIOR TO DISCONNECTION.
7. CAMERAS, ANTENNAS OR SATELLITE DISHES ARE NOT TO BE REMOVED, RELOCATED OR TAKEN OFFLINE WITHOUT PRIOR WRITTEN APPROVAL OF THE UNIVERSITY.

KEY NOTES

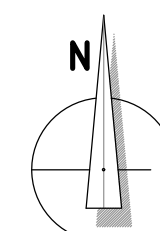
1. REMOVE EXISTING ELECTRICAL CONDUIT AND EXISTING WIRES BACK TO ROOF TOP PENETRATION. CAP WIRES INSIDE WEATHERTIGHT JUNCTION BOX.
2. REMOVE EXISTING ELECTRICAL CONDUIT AND EXISTING WIRES BACK TO WALL MOUNT JUNCTION BOX.
3. REMOVE EXISTING MASONRY CHIMNEY TO POINT BELOW ROOF DECK AND INFILL OPENING IN ROOF DECK - REF: A1.01
4. REMOVE EXISTING TRASH CHUTE TO POINT BELOW ROOF DECK AND INFILL OPENING IN ROOF DECK - REF: A1.01
5. REMOVE EXISTING ROOF ACCESS LADDER.
6. REMOVE EXISTING ROOF SYSTEM
7. REMOVE AND DISPOSE EXISTING FLANGED VENTS. TYPICAL AT ALL LOCATIONS.

LEGEND

- EXISTING GUTTER AND DOWNSPOUT - REMOVE
- EXISTING INTERIOR DRAIN WITH OVERFLOW
- EXISTING ACCESS LADDER - REMOVE
- EXISTING ACCESS DOOR
- EXISTING ELECTRICAL PENETRATION
- EXISTING PLUMBING VENT PIPE
- EXISTING CURBED EXHAUST FAN
- EXISTING CURBED VENT
- EXISTING MASONRY CHIMNEY TO BE DECOMMISSIONED AND REMOVED
- EXISTING CURBED VENT TO BE DECOMMISSIONED AND REMOVED
- EXISTING CONDUIT TO BE DECOMMISSIONED AND REMOVED
- EXISTING FLANGED VENT TO BE DECOMMISSIONED AND REMOVED
- EXISTING SCUPPER THROUGH WALL TO BE DECOMMISSIONED AND INFILLED



1 WILSON HALL - DEMO PLAN
R100 3/32" = 1' 0"



WILSON ROOF REPLACEMENT

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CORVALLIS, OR 97331

PERMIT # xxx

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PORTLAND, OREGON 97214
PH. 503 280 8759 FAX: 503 280 8866

BID SET

APRIL 2019

issue: _____ date: _____
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: _____

revision: _____ date: _____

title:
ROOF PLAN

sheet:

R101

GENERAL NOTES

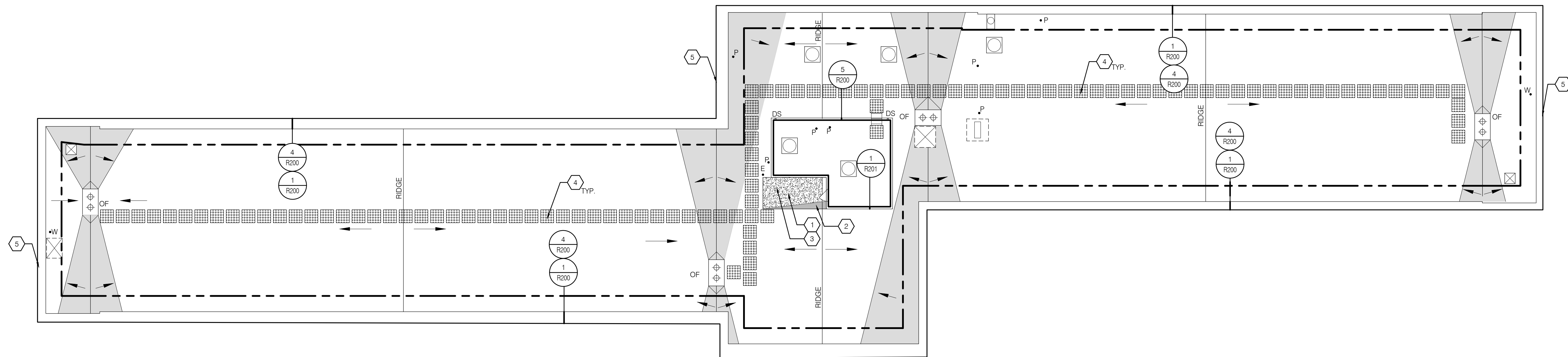
- ALL ITEMS TRANSPORTED TO ROOF SHALL BE TRANSPORTED USING APPROVED AND SAFE METHODS OF LOADING.
- CONTRACTOR SHALL EMPLOY MEANS OF PROTECTING BUILDING OCCUPANTS AND GENERAL PUBLIC AT ALL TIMES DURING THE COURSE OF CONSTRUCTION.
- TEMPORARY STAGING, SCAFFOLDING, AND RUNWAYS SHALL BE ALLOWED IN DESIGNATED LOCATIONS ONLY.
- PROTECT ADJACENT ROOF MEMBRANE SYSTEMS WHICH ARE NOT SCHEDULED FOR REPLACEMENT.
- ALL PERMITTING MANAGED BY OWNER. SCAFFOLD ERECTION TO BE COMPLETED IN COMPLIANCE WITH OSHA STANDARDS.

KEY NOTES

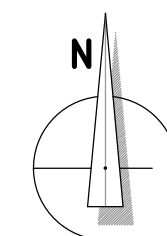
- PROVIDE TAPERED INSULATION TO CORNER OF PENTHOUSE AND INSTALL FLAT STOCK INSULATION TO MAINTAIN ELEVATION TO ROOF ACCESS DOOR IN AREA INDICATED.
- PROVIDE TAPERED INSULATION CRICKET TO PROVIDE TRANSITION BETWEEN FLAT STOCK INSULATION AND TAPERED INSULATION ASSEMBLIES.
- PROVIDE WALK PAD 2 AT ROOF ACCESS LANDING, EXTENDING OVER LOCATION OF FLAT STOCK INSULATION.
- PROVIDE CONTINUOUS PATH OF WALK PADS TO ALL ROOF ACCESS LOCATIONS AND ROOF DRAINS AS INDICATED.
- INFILL ABANDONED OVERFLOW SCUPPER WITH NON-SHRINK GROUT. REMOVE EXTERIOR DRAIN NOZZLE AND ESCUTCHEON. PROVIDE COPPER COVER PLATE WITH HEMMED EDGES, SET IN CONTINUOUS SEALANT, AND SECURED WITH MIN 2 MASONRY ANCHORS.

LEGEND

- | | | | | | |
|--|--|---------------------------------------|--|--|---|
| | | NEW GUTTER AND DOWNSPOUT | | | EXISTING CURBED VENT |
| | | EXISTING INTERIOR DRAIN WITH OVERFLOW | | | EXISTING MASONRY CHIMNEY TO BE DECOMMISSIONED
REF: SHEET A 1.01 |
| | | NEW ACCESS LADDER | | | EXISTING CURBED VENT TO BE DECOMMISSIONED
REF: SHEET A 1.01 |
| | | EXISTING ACCESS DOOR | | | WALK PAD 1 |
| | | ELECTRICAL PENETRATION | | | WALK PAD 2 |
| | | EXISTING PLUMBING VENT | | | TAPERED INSULATION CRICKETS |
| | | EXISTING WATER LINE PENETRATION | | | INDICATES DIRECTION OF SLOPE OF TAPERED INSULATION AND TAPERED CRICKETS |
| | | EXISTING CURBED EXHAUST FAN | | | ROOF EDGE RAILING SYSTEM |



1 WILSON HALL - ROOF PLAN
R101 3/32" = 1' 0"



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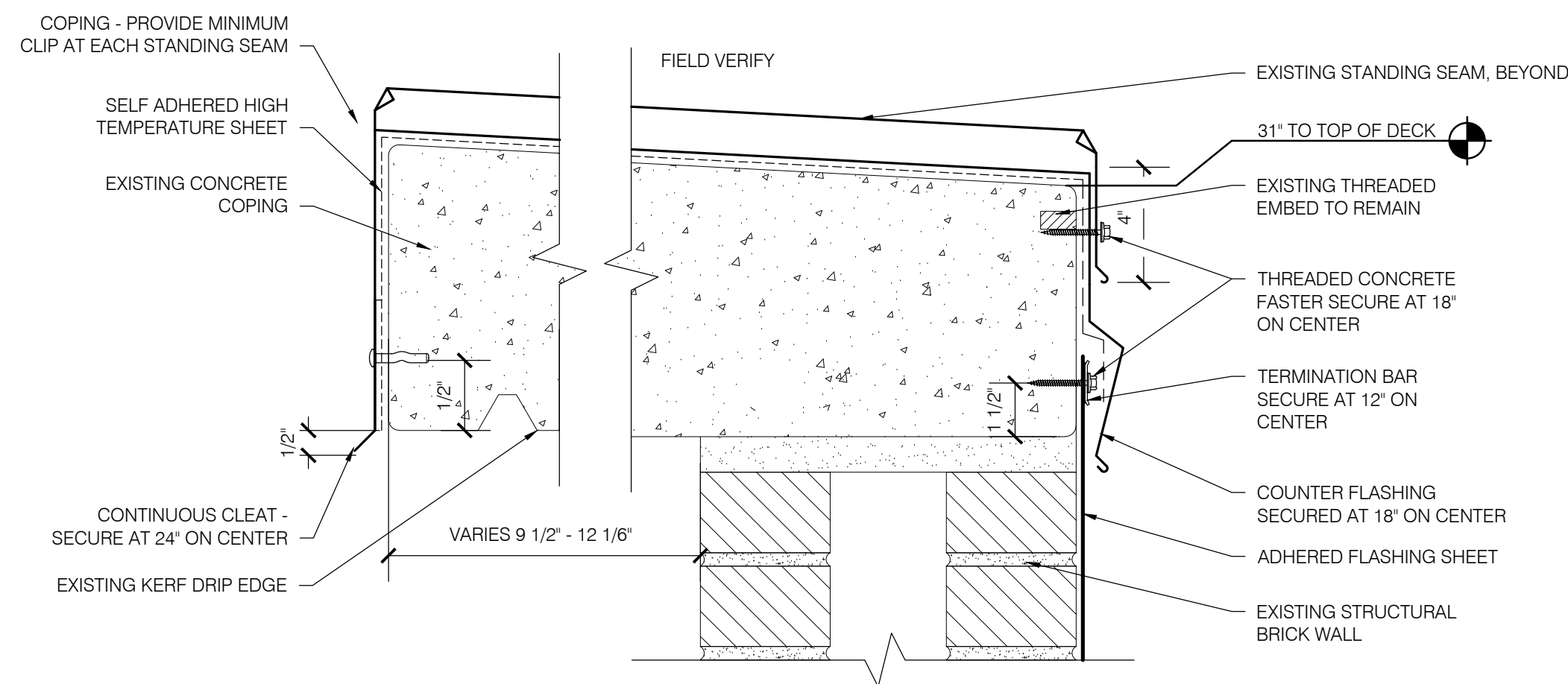
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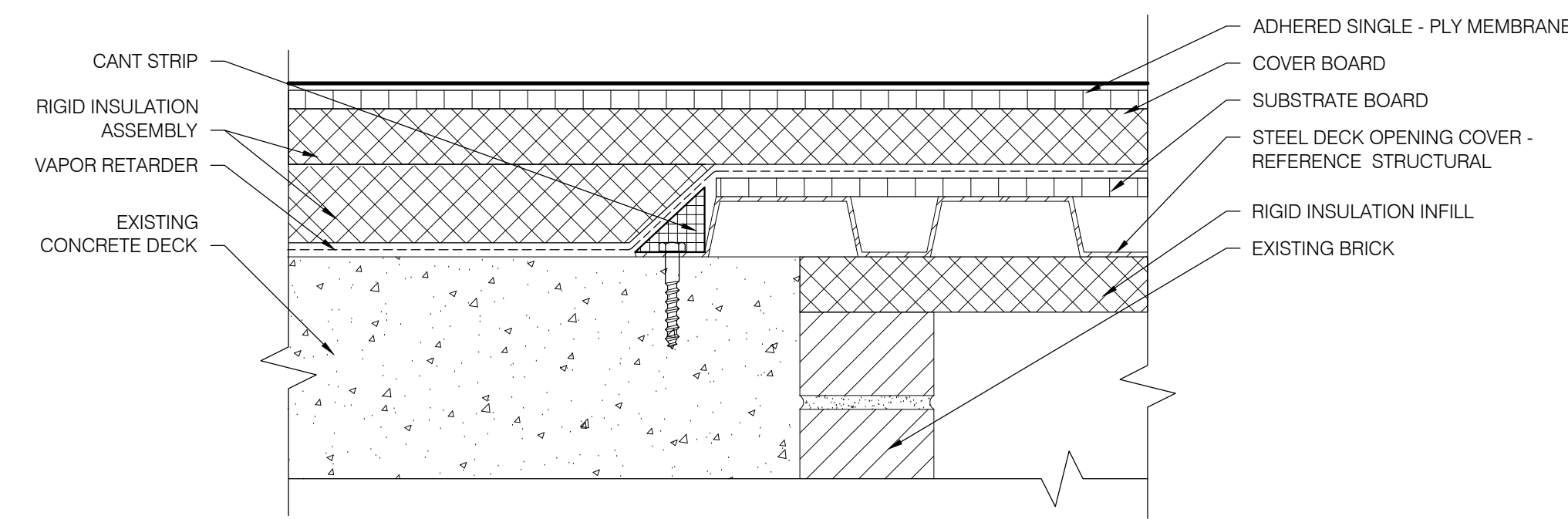
DETAILS

sheet:

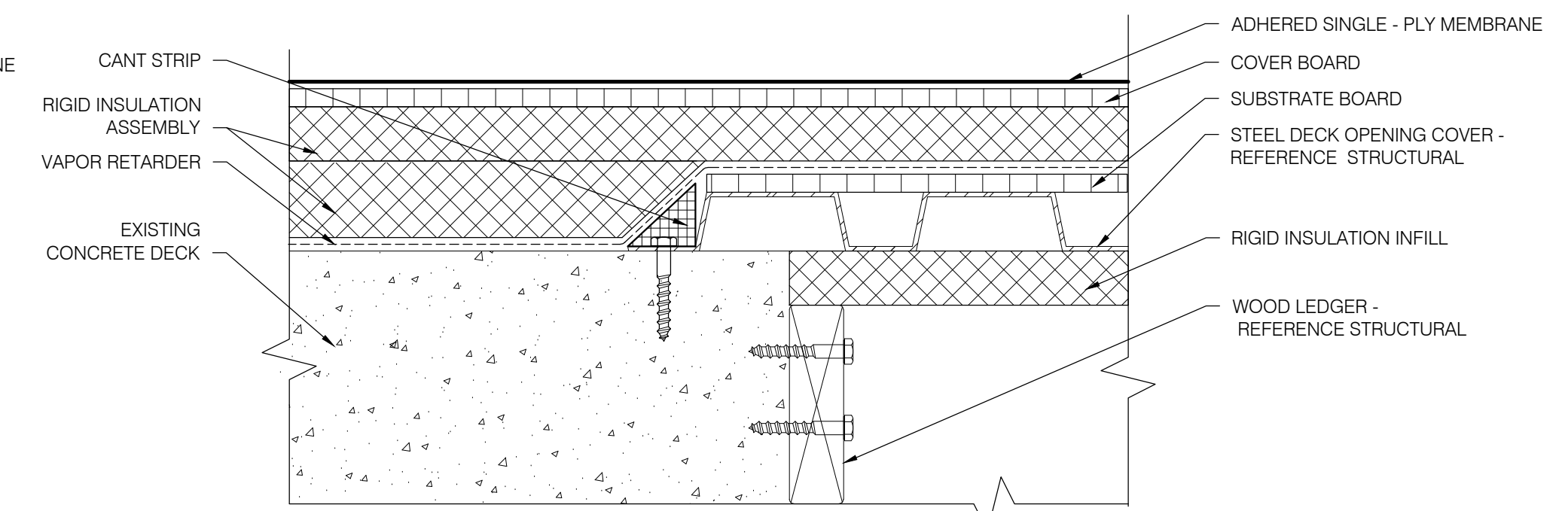
R200



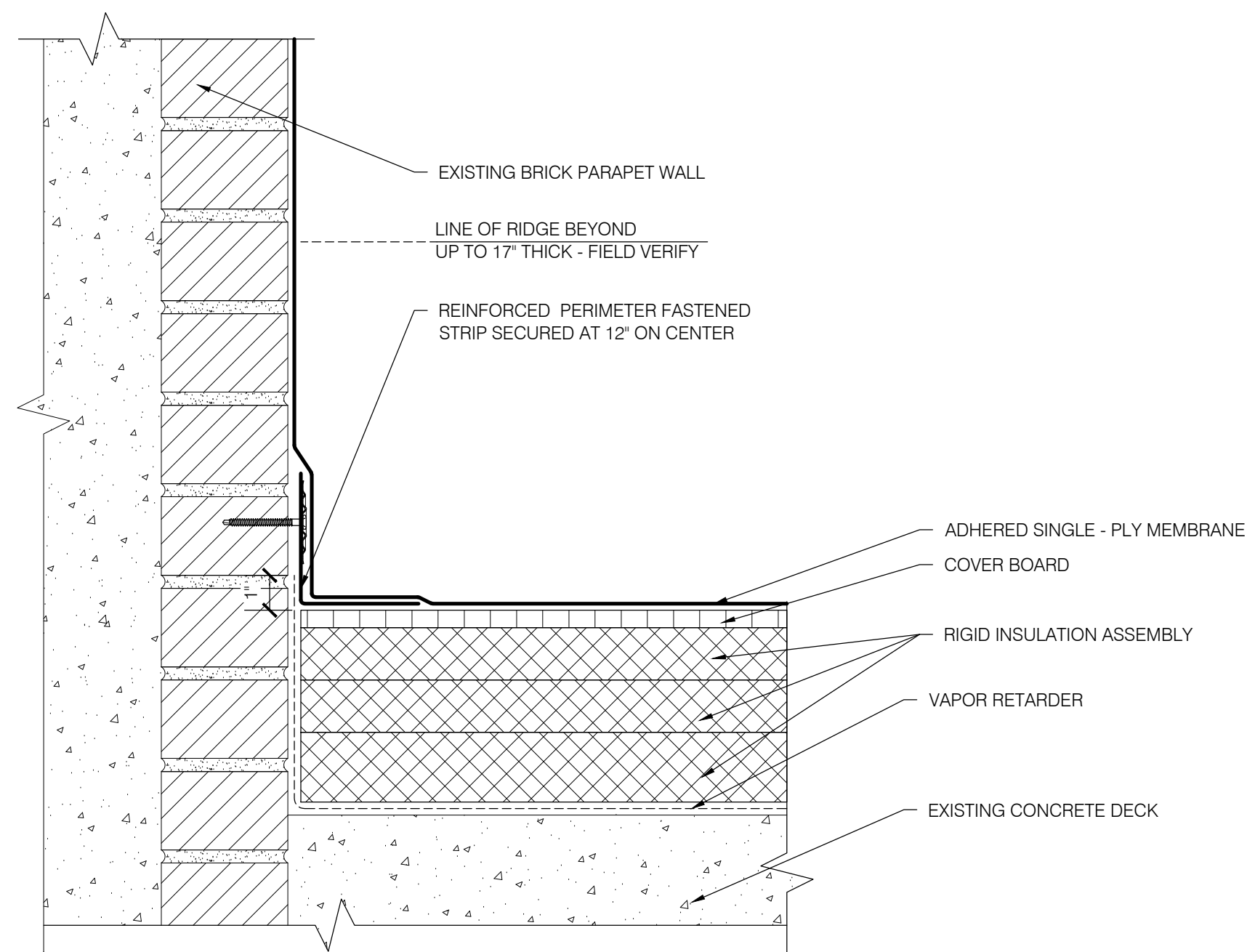
1 COPING AT PARAPET
R200 SCALE: 3"=1'-0"



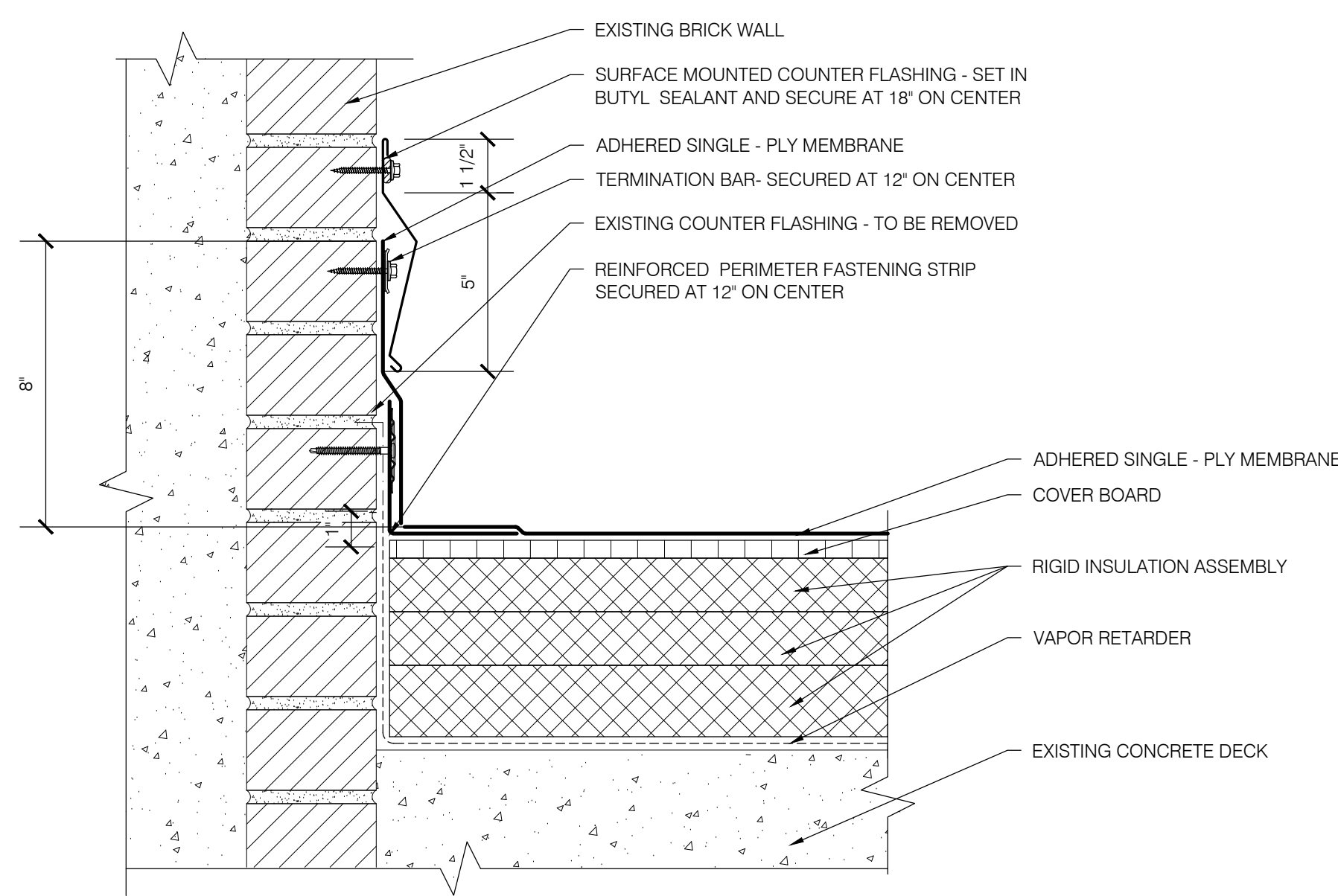
2 INFILL AT DEMOLISHED CHIMNEY
R200 SCALE: 3"=1'-0"



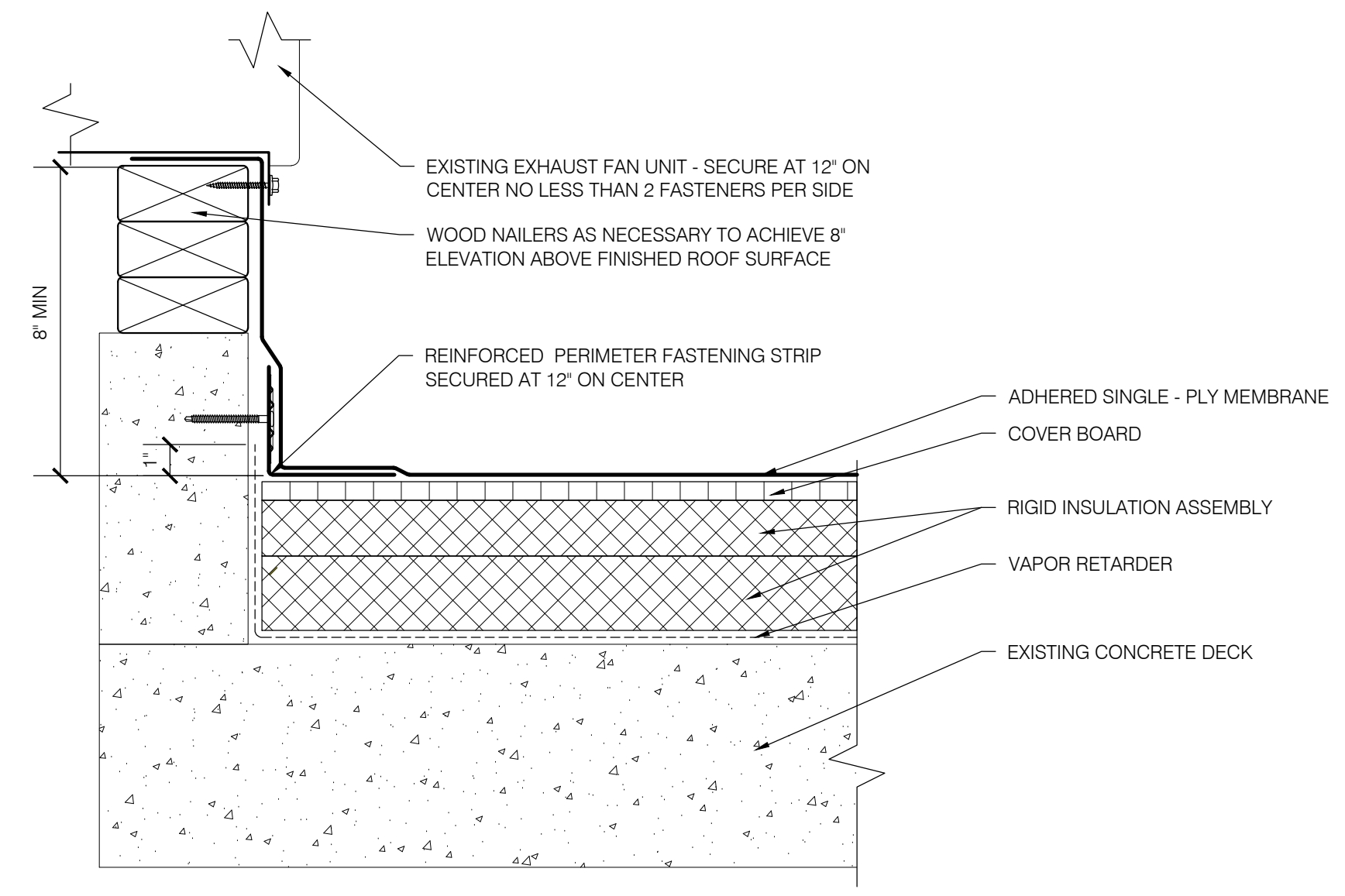
3 INFILL AT DEMOLISHED LAUNDRY CHUTE
R200 SCALE: 3"=1'-0"



4 BASE FLASHING AT PARAPET
R200 SCALE: 3"=1'-0"



5 BASE FLASHING AT PENTHOUSE
R200 SCALE: 3"=1'-0"



6 EXHAUST FAN
R200 SCALE: 3"=1'-0"



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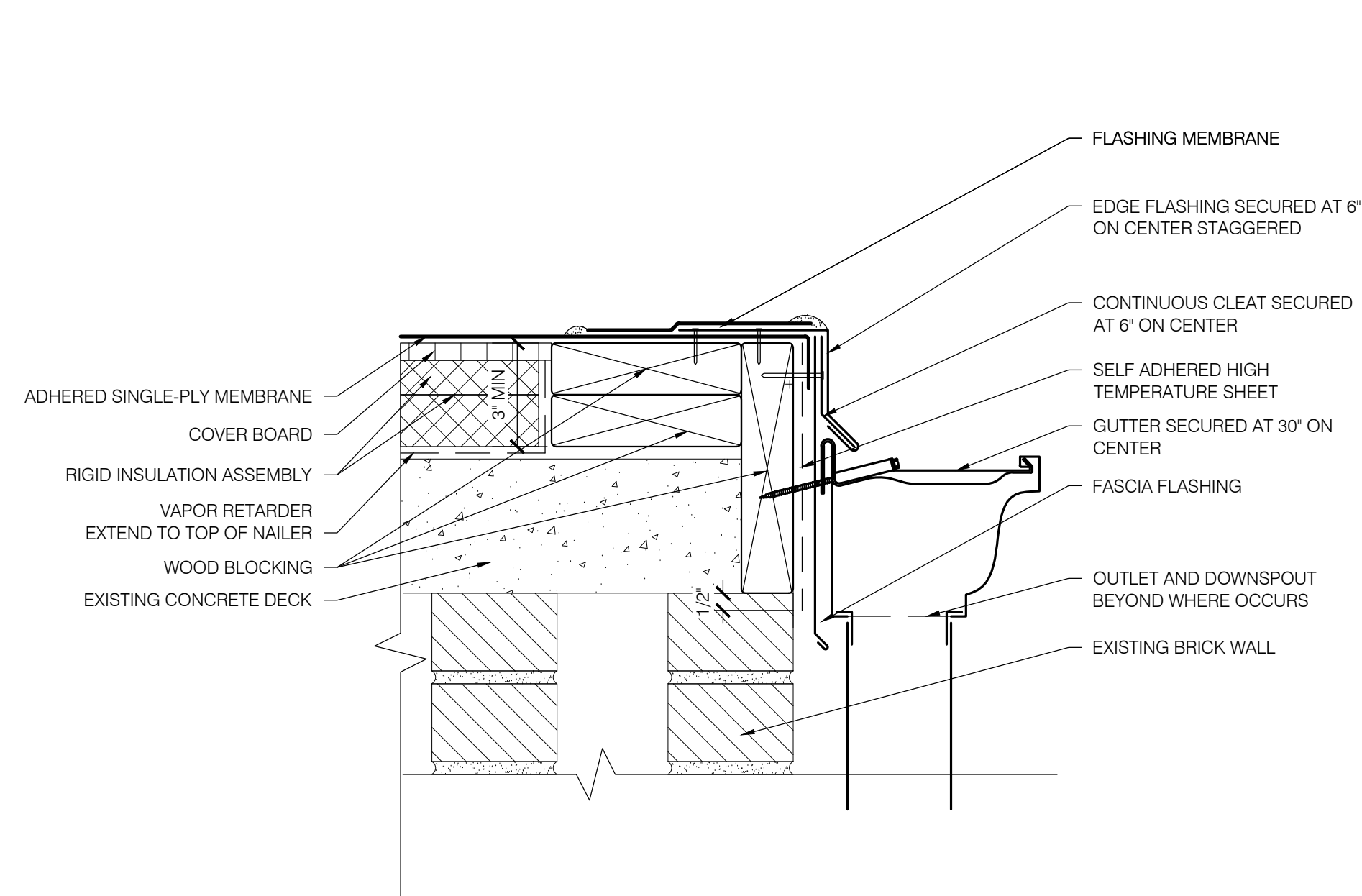
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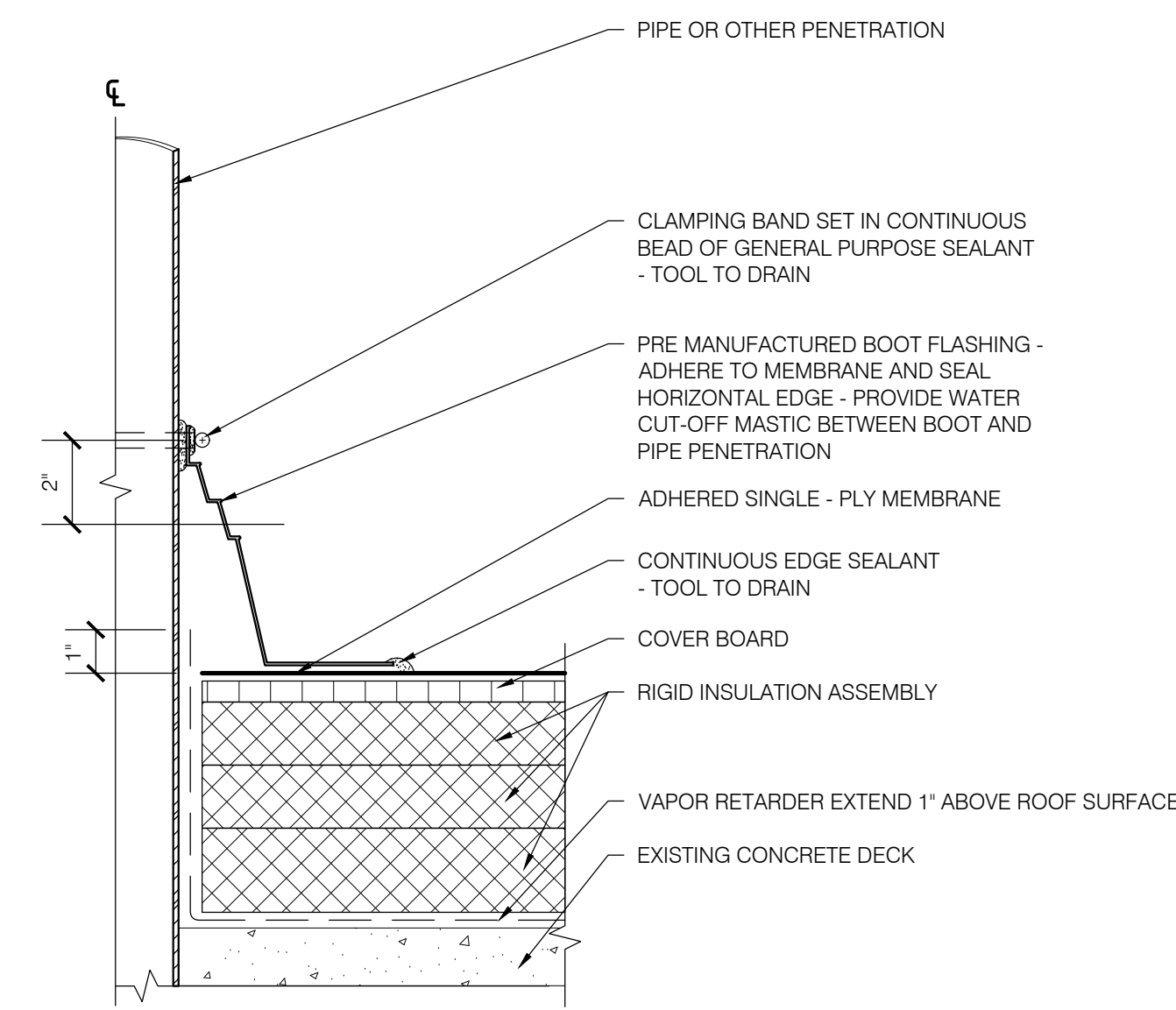
DETAILS

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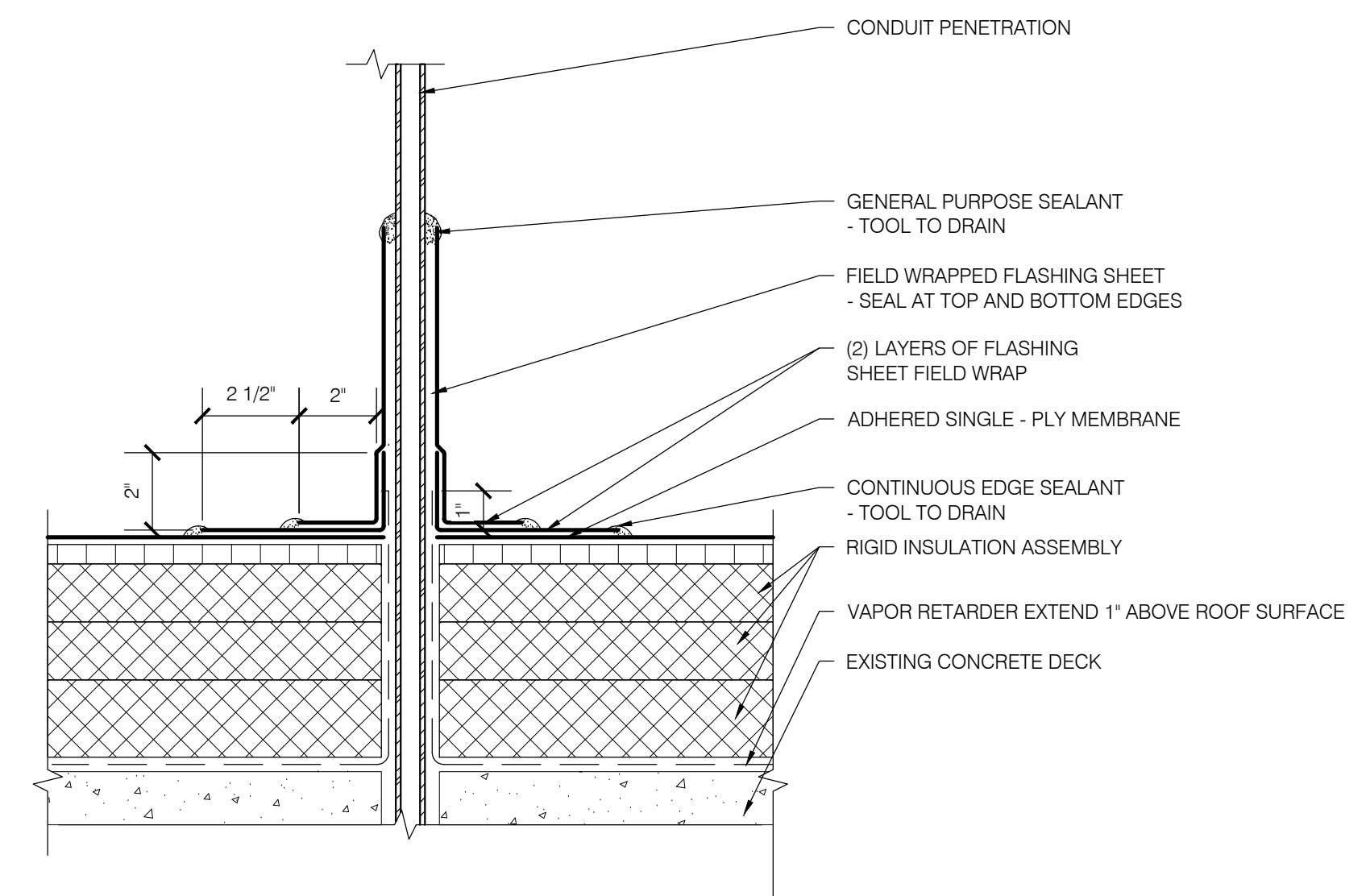
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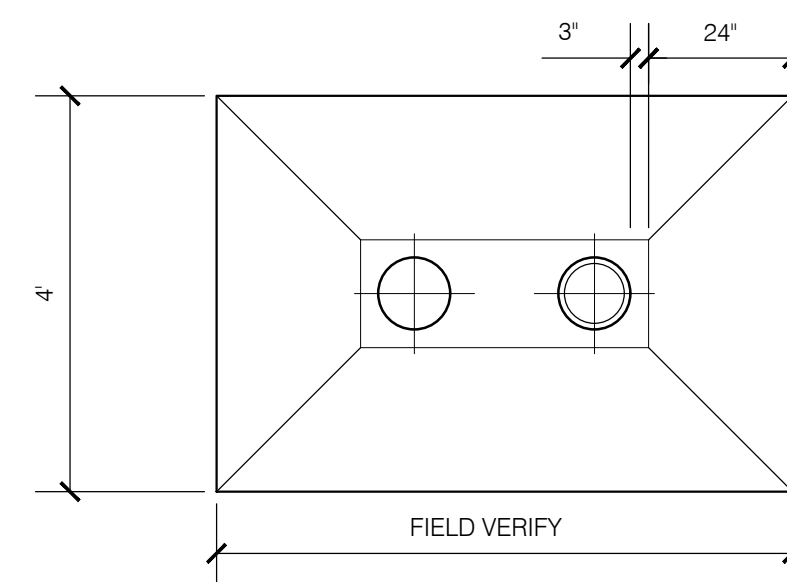
1 GUTTER AT PENTHOUSE
R201 SCALE: 3" = 1' 0"



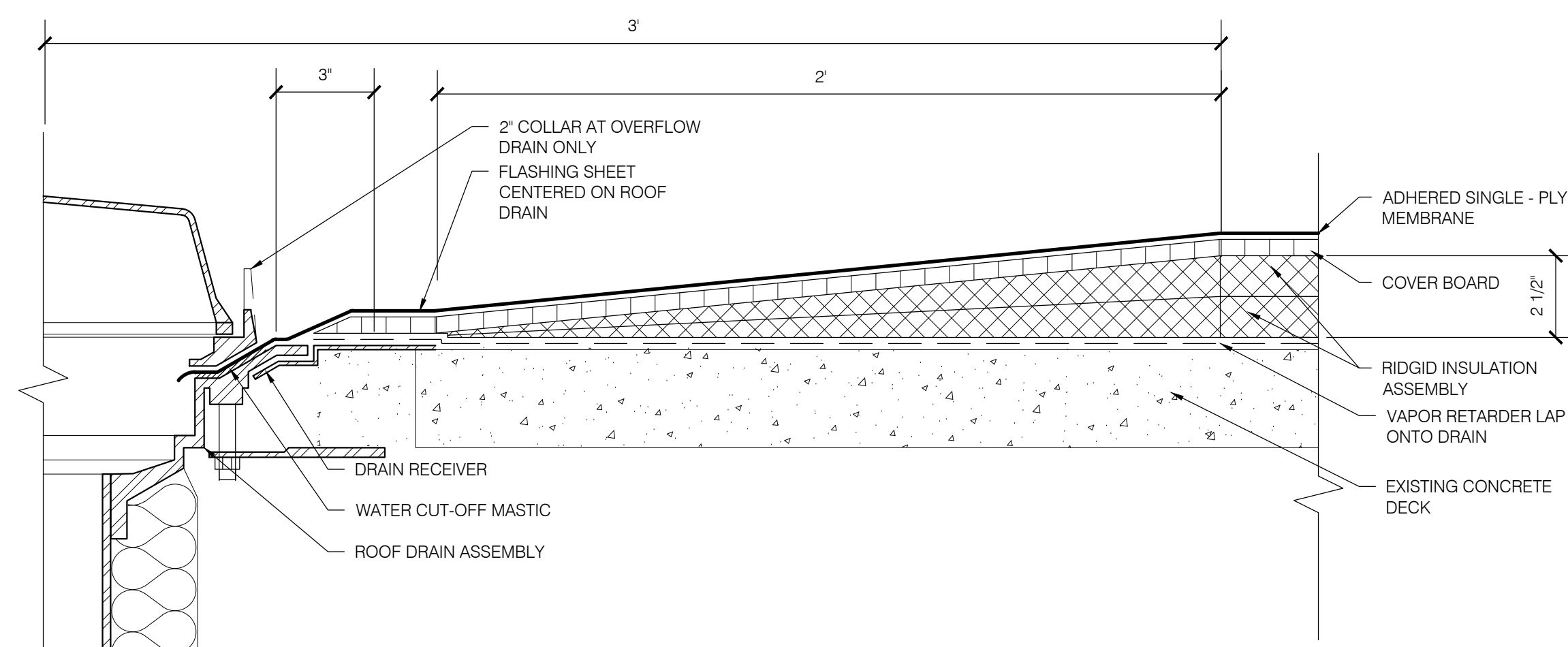
2 PIPE PEN - EPDM (BOOT)
R201 SCALE: 3" = 1' 0"



3 PIPE PENETRATION
R201 SCALE: 3" = 1' 0"



4A PLAN AT DRAIN SUMP
R201 NO SCALE



4 DRAIN
R201 SCALE: 3" = 1' 0"

GENERAL NOTES

1. MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE 2014 EDITION OF THE OREGON STRUCTURAL SPECIALTY CODE AND THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
2. THE GENERAL STRUCTURAL NOTES SUPPLEMENT THE REQUIREMENTS OF THE PROJECT SPECIFICATIONS. IN CASE OF APPARENT CONFLICT IN OR BETWEEN THE CONTRACT DRAWINGS AND SPECIFICATIONS, CONTACT THE OWNER'S REPRESENTATIVE FOR CLARIFICATION PRIOR TO PROCEEDING WITH THE RELATED WORK. FOR BIDDING PURPOSES, THE MORE COSTLY PROVISION SHALL PREVAIL.
3. REFERENCES IN THE CONTRACT DOCUMENTS TO CODES, RULES, REGULATIONS, STANDARDS, MANUFACTURER'S INSTRUCTIONS, AND REQUIREMENTS OF REGULATORY AGENCIES ARE TO THE LATEST PRINTED EDITION OF EACH IN EFFECT AT THE DATE OF SUBMISSION OF BID UNLESS THE DOCUMENT DATE IS INDICATED. THE DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, USE SIMILAR DETAILS OF CONSTRUCTION, SUBJECT TO REVIEW BY THE OWNER'S REPRESENTATIVE.
4. THE GENERAL STRUCTURAL NOTES SUPPLEMENT THE REQUIREMENTS OF THE PROJECT SPECIFICATIONS. IN CASE OF APPARENT CONFLICT IN OR BETWEEN THE CONTRACT DRAWINGS AND SPECIFICATIONS, CONTACT THE OWNER'S REPRESENTATIVE FOR CLARIFICATION PRIOR TO PROCEEDING WITH THE RELATED WORK. FOR BIDDING PURPOSES THE MORE COSTLY PROVISION SHALL PREVAIL. DO NOT SCALE THE DRAWINGS.
5. THE DRAWINGS INDICATE THE STRUCTURAL ASPECTS OF THE WORK AND REFER TO INTEGRAL ASPECTS OF THE WORK DESIGNED BY OTHERS, INCLUDING BUT NOT LIMITED TO ARCHITECTURAL SYSTEMS & COMPONENTS, AND MECHANICAL, ELECTRICAL, & PLUMBING SYSTEMS & EQUIPMENT. COORDINATE ALL ASPECTS OF THE WORK AND VERIFY DIMENSIONS.
7. THE DRAWINGS INDICATE THE STRUCTURE IN ITS FINAL CONDITION. BRACE, SHORE, AND SEQUENCE AS NECESSARY TO MAINTAIN STABILITY AND PROTECT THE STRUCTURE DURING CONSTRUCTION. RETAIN A REGISTERED, PROPERLY QUALIFIED CIVIL ENGINEER TO DESIGN NECESSARY TEMPORARY MEASURES. SITE OBSERVATIONS BY THE OWNER'S REPRESENTATIVE WILL NOT INCLUDE OBSERVATIONS OF THE ABOVE IDENTIFIED MEASURES.
8. INFORMATION RELATING TO EXISTING CONDITIONS INDICATED IN THE DRAWINGS IS BASED ON INFORMATION PROVIDED BY OTHERS; NO GUARANTEE IS GIVEN AS TO THE ACCURACY THEREOF. REPORT CONDITIONS THAT CONFLICT WITH THE CONTRACT DOCUMENTS TO THE OWNER'S REPRESENTATIVE FOR RESOLUTION PRIOR TO PROCEEDING WITH RELATED WORK. DO NOT DEVIATE FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN DIRECTION FROM THE OWNER'S REPRESENTATIVE.
9. REFER TO DRAWINGS BY OTHERS, INCLUDING BUT NOT LIMITED TO ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING DISCIPLINES, FOR SIZE, QUANTITY, AND LOCATION OF FLOOR, ROOF, AND WALL OPENINGS AND PENETRATIONS NOT SHOWN ON THE STRUCTURAL DRAWINGS. SUBMIT FINAL SIZING AND LOCATION REQUIREMENTS OF OPENINGS TO THE OWNER'S REPRESENTATIVE FOR REVIEW.
10. REPORT APPARENT DISCREPANCIES AND/OR CONFLICTS IN THE CONTRACT DOCUMENTS TO THE OWNER'S REPRESENTATIVE. OBTAIN CLARIFICATION FROM THE OWNER'S REPRESENTATIVE PRIOR TO PROCEEDING WITH THE RELATED WORK.
11. THE EXISTING BUILDING IS ASSUMED TO HAVE BEEN DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE STANDARD OF PRACTICE AT THE TIME IT WAS CONSTRUCTED. TAKE PRECAUTIONS NECESSARY TO PRESERVE THE EXISTING BUILDING.

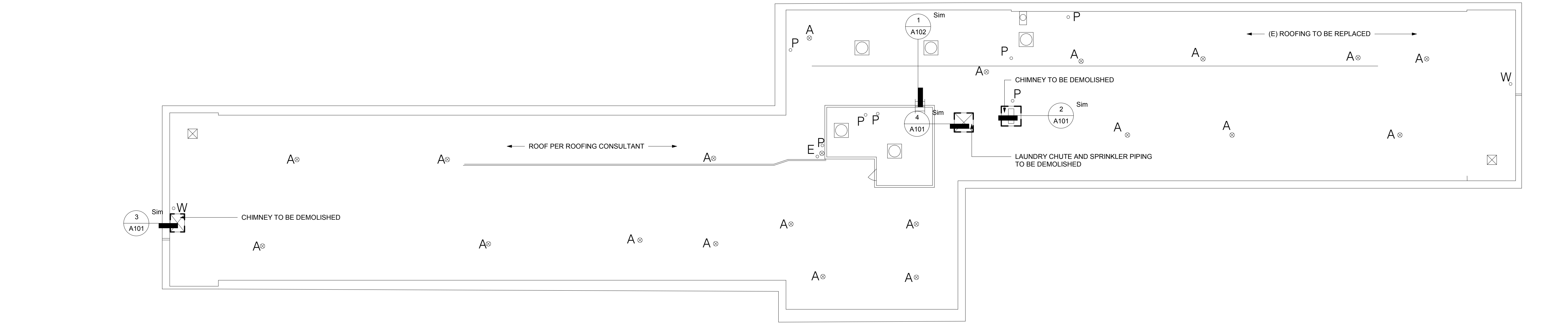
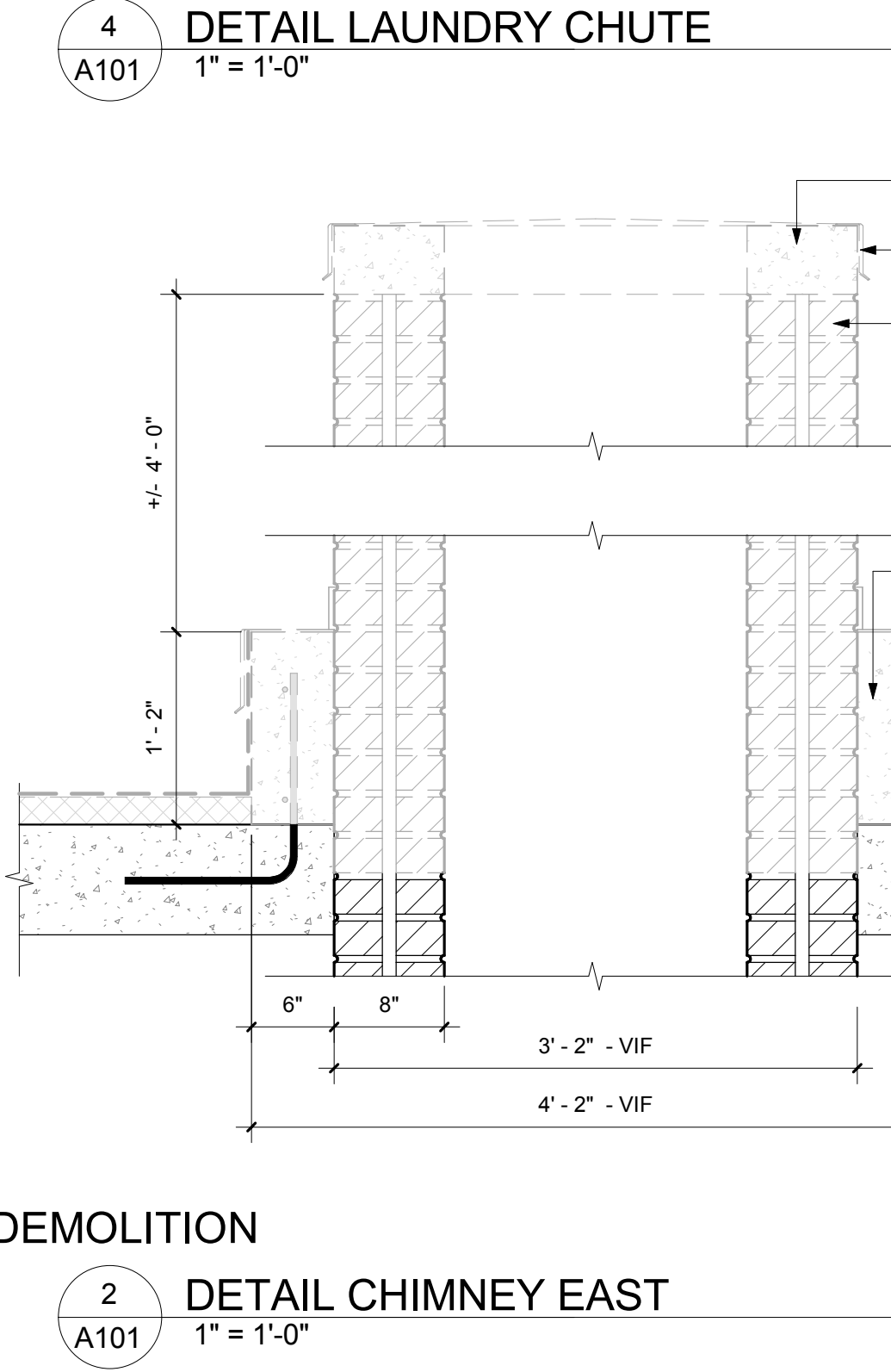
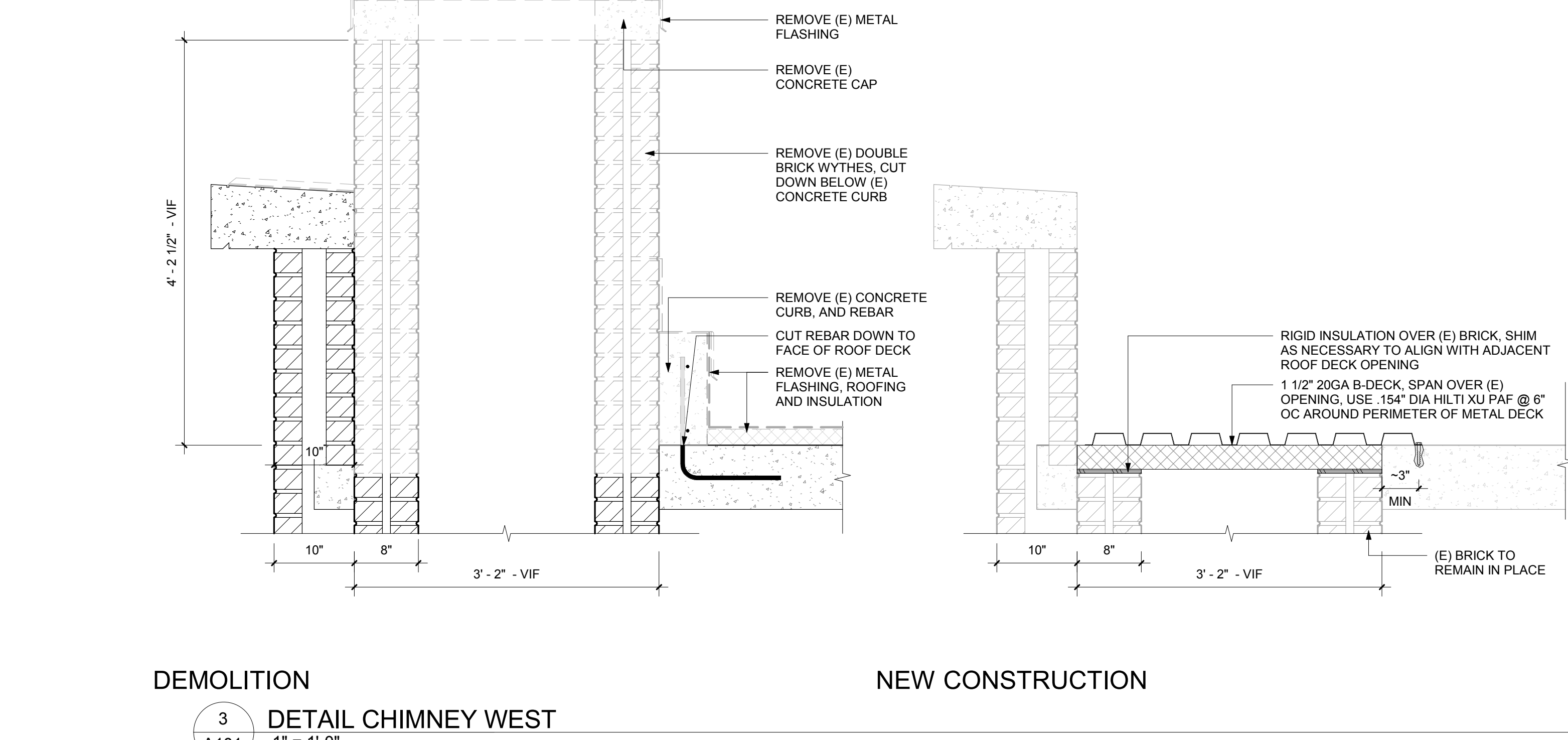
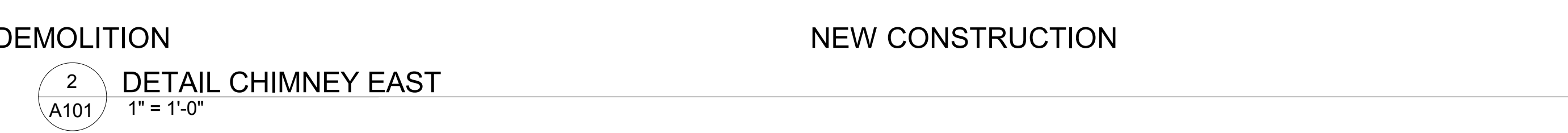
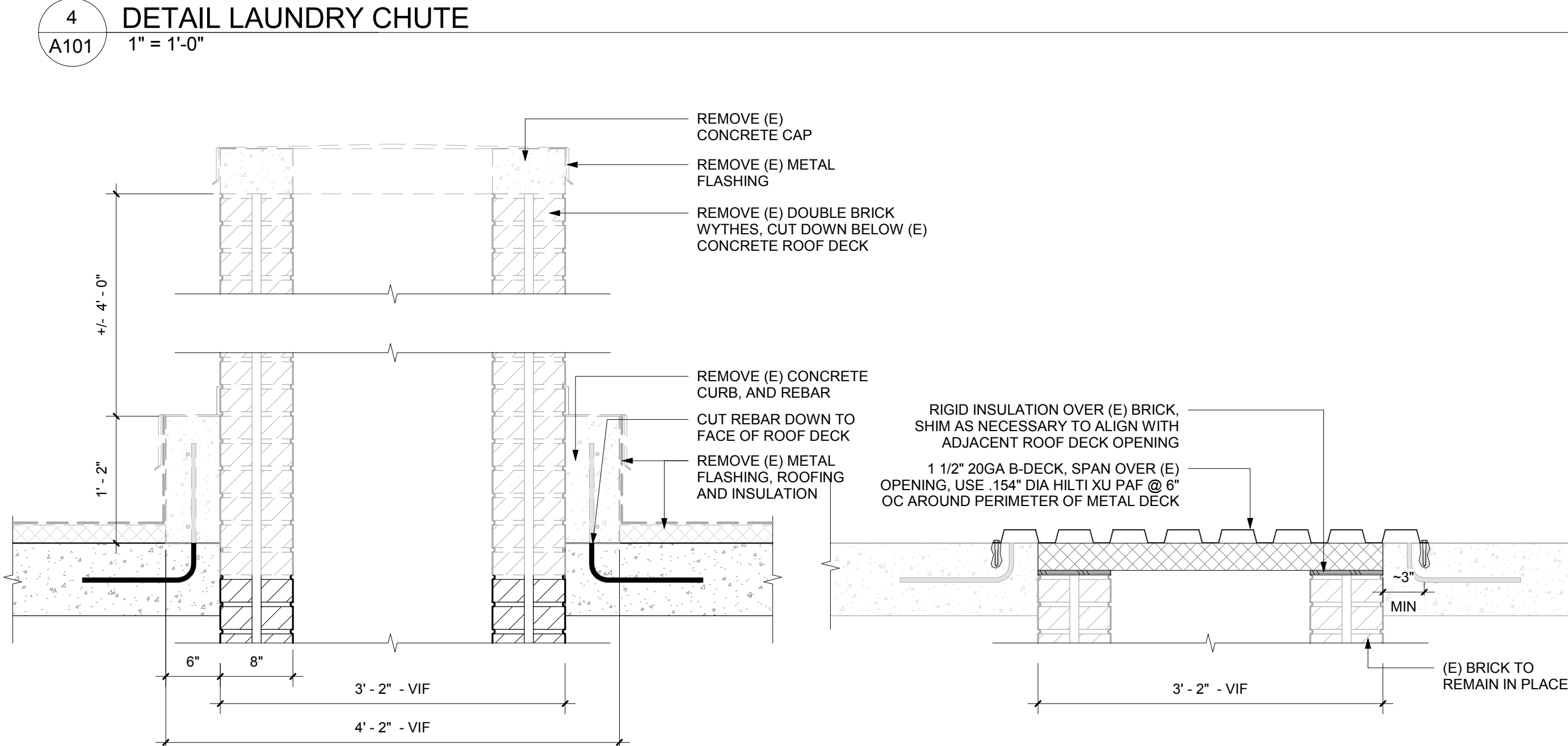
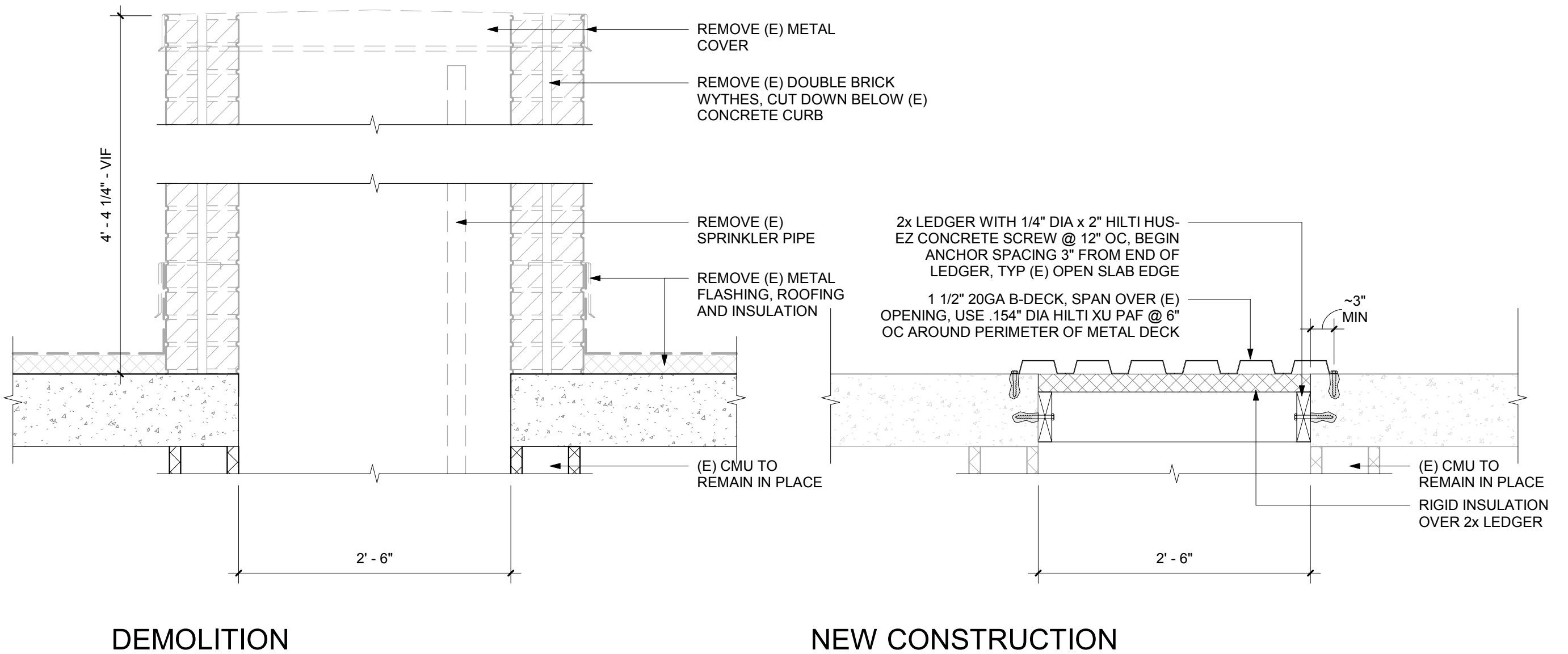
MECHANICAL ANCHORS

1. EXPANSION OR WEDGE ANCHORS INTO CONCRETE SHALL BE KWIK BOLT TZ BY HILTI (ICC #ESR-1917), UNLESS OTHERWISE NOTED, INSTALLED IN ACCORDANCE WITH THE ICC REPORT.
2. SUBSTITUTION OF SPECIFIED ANCHORS BY OTHER PRODUCTS REQUIRES SUBMISSION OF A CURRENT REPORT FROM THE ICC EVALUATION SERVICE AND AN ENGINEERING ANALYSIS SUBSTANTIATING THE EQUIVALENCE OF THE PROPOSED SUBSTITUTION.
3. PROVIDE STAINLESS STEEL FASTENERS FOR EXTERIOR USE OR WHEN EXPOSED TO WEATHER. PROVIDE GALVANIZED CARBON STEEL ANCHORS AT OTHER LOCATIONS, UNLESS OTHERWISE NOTED.
4. LOCATE REINFORCEMENT AND CONFIRM FINAL ANCHOR LOCATIONS PRIOR TO FABRICATING PLATES, MEMBERS, AND OTHER STEEL ASSEMBLIES ATTACHED WITH MECHANICAL ANCHORS.
5. IF REINFORCEMENT IS ENCOUNTERED DURING DRILLING, ABANDON AND SHIFT THE HOLE LOCATION TO AVOID THE REINFORCEMENT. PROVIDE A MINIMUM OF 2 ANCHOR DIAMETERS OR 1 INCH, WHICHEVER IS LARGER, OF SOUND CONCRETE BETWEEN THE DOWEL AND THE ABANDONED HOLE. FILL THE ABANDONED HOLE WITH NON-SHRINK GROUT. IF SHIFTING THE ANCHOR OR DOWEL AS DESCRIBED ABOVE IS NOT PRACTICABLE, CONTACT THE ENGINEER OF RECORD FOR AN ACCEPTABLE LOCATION.
6. MINIMUM EMBEDMENT DEPTH OF ANCHORS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:

ANCHOR DIA.	EMBEDMENT IN CONCRETE	EMBEDMENT IN MASONRY
1/4 INCH	2 INCHES	2 INCHES
3/8 INCH	2 INCHES	2 1/2 INCHES
1/2 INCH	3 INCHES	3 1/2 INCHES

ADHESIVE ANCHORS AND DOWELS

1. ANCHORS AND DOWELS INSTALLED INTO CONCRETE SHALL BE HIT RE-500-SD BY HILTI (ICC #ESR-2322). MINIMUM EMBEDMENT DEPTH FOR ANCHORS AND DOWELS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:
- | ROD DIA. | EMBEDMENT | BAR SIZE | EMBEDMENT |
|------------|--------------|----------|--------------|
| 3/8 INCH | 4 INCHES | #3 | 5 INCHES |
| 1/2 INCH | 5 INCHES | #4 | 6 1/2 INCHES |
| 5/8 INCH | 6 INCHES | #5 | 8 INCHES |
| 1 1/2 INCH | 4 1/2 INCHES | | |
2. SIMPSON STRONG-TIE (ICC #ESR-5279). MINIMUM EMBEDMENT DEPTH FOR ANCHORS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:
- | ROD DIA. | EMBEDMENT |
|----------|--------------|
| 3/8 INCH | 3 1/2 INCHES |
| 1/2 INCH | 4 1/2 INCHES |
3. ANCHORS SHALL BE ASTM A36 THREADED RODS WITH ASTM A 563 GRADE A NUTS AND ANSI B18 22.1 TYPE A WASHERS, UNLESS OTHERWISE NOTED. ASTM A 563 GRADE DH HEAVY HEX NUTS AND ASTM F 436 WASHERS SHALL BE PROVIDED AT ANCHORS DESIGNATED AS ASTM A193.
 4. DOWELS SHALL BE ASTM A615 GRADE 60 REINFORCING STEEL.
 5. REMOVE GREASE, OIL, RUST, AND OTHER LAITANCE FROM RODS AND DOWELS PRIOR TO INSTALLATION.
 6. LOCATE REINFORCEMENT AND CONFIRM FINAL ANCHOR LOCATIONS PRIOR TO FABRICATING PLATES, MEMBERS, AND OTHER STEEL ASSEMBLIES ATTACHED WITH ADHESIVE ANCHORS.
 7. IF REINFORCEMENT IS ENCOUNTERED DURING DRILLING, ABANDON AND SHIFT THE HOLE LOCATION TO AVOID THE REINFORCEMENT. PROVIDE A MINIMUM OF 2 ANCHOR DIAMETERS OR 1 INCH, WHICHEVER IS LARGER, OF SOUND CONCRETE BETWEEN THE DOWEL AND THE ABANDONED HOLE. FILL THE ABANDONED HOLE WITH NON-SHRINK GROUT. IF SHIFTING THE ANCHOR OR DOWEL AS DESCRIBED ABOVE IS NOT PRACTICABLE, CONTACT THE ENGINEER OF RECORD FOR AN ACCEPTABLE LOCATION.



1
A101
LEVEL 01 FLOOR PLAN - NEW ROOF
3/32" = 1'-0"

WILSON ROOF REPLACEMENT



BID SET

APRIL 2019

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 : _____ : _____
 : _____ : _____

revision: _____ date: _____

title:
ROOF PLAN + DETAILS

sheet:

A101

WILSON ROOF REPLACEMENT

1030 SW MADISON AVE
CORVALLIS, OR 97331

PERMIT # xxx

JOB NO. 17070.01



KATTSAFE GW34 RAILING

Aluminum non-penetrating roof fall protection guardrail system

The **KATTSAFE GW34** non-penetrating permanent guardrail system provides the highest level of safety for maintenance personnel when working at heights and other fall risk areas. The high quality mill finish aluminum means the railing fits in with the surrounding of the rooftop environment and does not affect the aesthetics of the building. The GW34 guardrail features a plastic coated steel weighted base that is completely non-penetrating and sits on top of the roofing membrane.

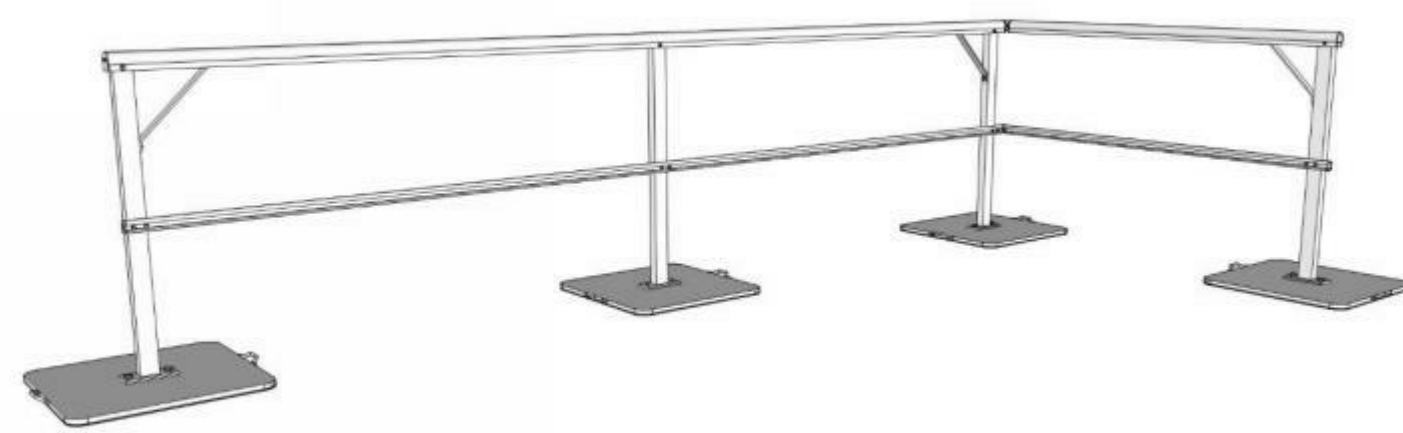
The **KATTSAFE GW34** system is simple and quick to install. These guardrail systems are held in stock, ready to ship and can be customized on-site to meet your requirements.

APPLICATIONS INCLUDE:

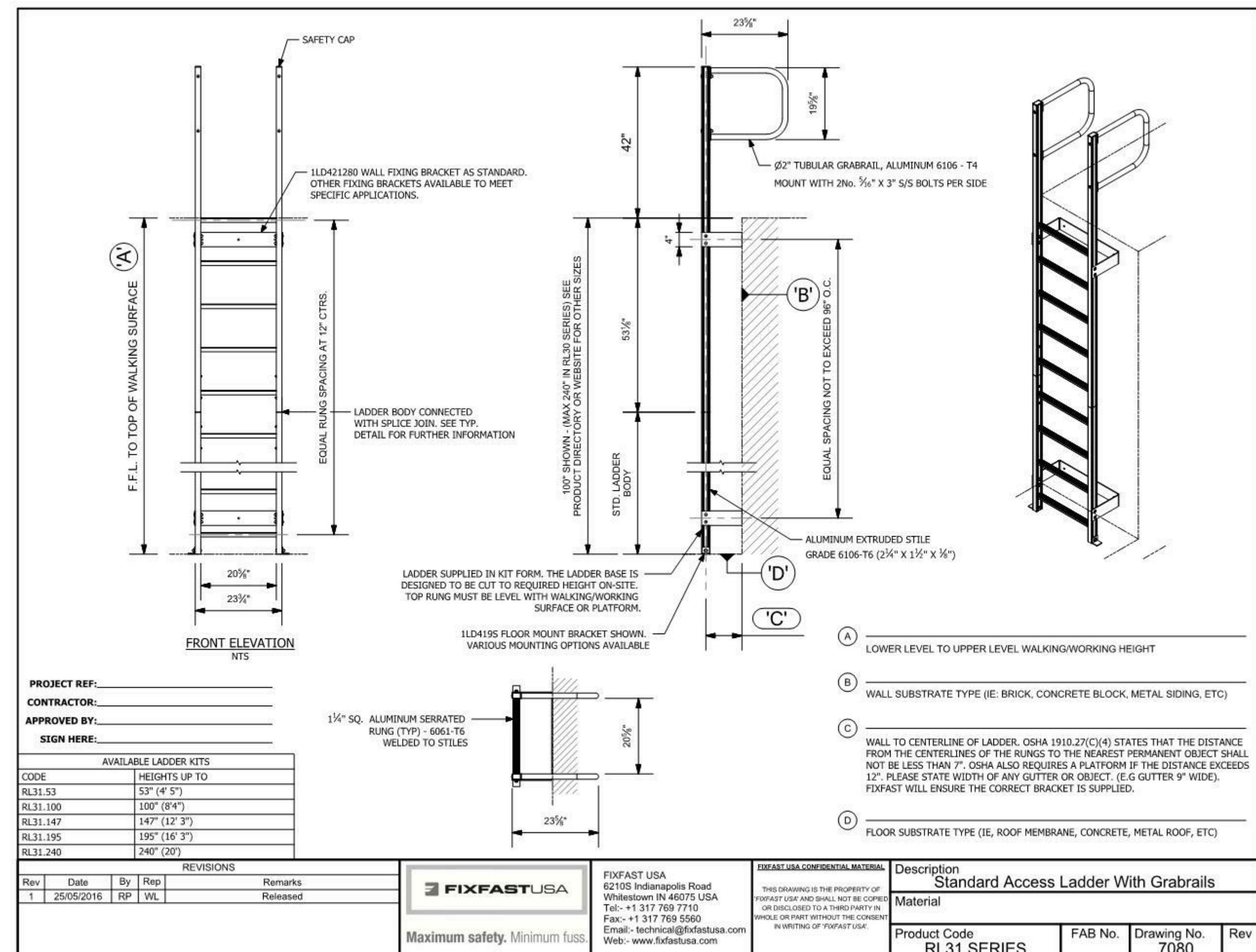
- Fall protection around roof perimeter
- Protection around rooftop equipment and machinery, and other unprotected fall edges
- A positive barrier system - ideal for roof walkway systems, platforms and structures

FEATURES:

- Manufactured of high tensile aluminum – Corrosion resistant and low maintenance
- Continuous guardrail system – Improved aesthetics and performance
- Industry leading warranty
- Can be customized on-site to meet the required application and ensure perfect fit
- Mill finish as standard – Custom colors available
- Meets and exceeds OSHA CFR 29 1926.502 and 1910.29 Standards



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GUARDRAIL
INFORMATION**

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A102

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Rooftop equipment bases and support curbs.
2. Wood blocking and nailers.

B. Related Sections include the following:

1. Section 070150 - "Preparation for Roof Replacement" for removal of existing roof system.
2. Section 075323 - "Ethylene-Propylene-Diene-Monomer (EPDM) Roofing."
3. Section 150500 - "Basic Mechanical Materials and Methods" for mechanical disconnections and reconnections.
4. Section 160500 - "Basic Electrical Materials and Methods" for electrical disconnections and reconnections.

1.2 DEFINITIONS

A. Exposed Framing: Framing not concealed by other construction.

B. Dimension Lumber: Lumber of 2-inches nominal or greater but less than 5-inches nominal in least dimension.

C. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. AWWA: American Wood Protection Association.
2. CLIB: West Coast Lumber Inspection Bureau.
3. WWPAA: Western Wood Products Association.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

B. ALSC: American Softwood Lumber Standard.

C. DOC: American Softwood Lumber Standard developed by the Department of Commerce.

1. DOC PS1: Structural Plywood.
2. DOC PS2: Performance Standard for Wood Based Structural Use Panels.
3. DOC PS20: Establishes sizes, green/dry relationships, methods of assigning design values, industry nomenclature/inspection provisions, R-inspection provisions, and grade marking requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 - 2. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

2.2 PLYWOOD SHEATHING

- A. DOC PS 1 or PS 2, exposure 1. C-D plugged in thicknesses indicated.
- B. Size: 5/8-inch x 4-foot x 8-foot panels.

2.3 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Rooftop equipment bases and support curbs.
- B. For items of dimension lumber size, provide Construction or No. 2 grade lumber and the following species:
 - 1. Hem-fir; WCLIB or WWPA.
 - 2. Western woods; WCLIB or WWPA.
- C. For concealed boards, provide lumber with 15 percent maximum moisture content and any of the following species and grades:
 - 1. Hem-fir or hem-fir (north); Construction or No. 2 Common grade; NLGA, WCLIB, or WWPA.
 - 2. Western woods; Construction or No. 2 Common grade; WCLIB or WWPA.
- D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

2.4 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Wood Screws: ASME B18.6.1.
- C. Lag Bolts: ASME B18.2.1.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Provide blocking and framing as indicated and as required to support materials.
- C. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- D. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.
- E. Use steel threaded fasteners where securing to steel structures. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Secure wood nailer to concrete substrate at 24-inches on center with ½-inch anchor bolts at a minimum depth of 8-inch penetration into concrete.
- D. Secure subsequent wood nailers at with galvanized nails or lag screws the penetrate into bottom nailer at 1-1/4-inches using a staggered fastening pattern in two rows at 24-inches on center. Increase fastening pattern to 12-inches on center at corners extending outward 8-feet minimum.

- E. Verify fastening of existing wood nailers and install additional fasteners to meet with the fastening requirements as defined above for new construction. Enhance fastening at corners by 100% for a minimum of eight feet.

3.3 PLYWOOD SHEATHING INSTALLATION

- A. Install in accordance with the Contract Documents, approved good carpentry practices, and IBS and SFM requirements.
- B. Install plywood sheathing so that long dimension is parallel to main supporting members.
- C. Install with panel edges staggered 4-feet from adjacent panel edges.
- D. Space panels approximately 1/8-inch apart at edges and ends.
- E. Secure plywood sheathing using fasteners as indicated on the drawings and in accordance with nailing schedules required by Building Code.
- F. Minimum edge distance of fasteners from edge of panels shall be 3/4-inch.
- G. Do not over-drive fasteners so that the head of the fastener is below the top surface of the panel.

3.4 PROTECTION

- A. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

SECTION 070150.19 - PREPARATION FOR REROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Full tear-off of entire roof system of roof areas indicated.
2. Removal of base flashings.

B. Related Sections include the following:

1. Section 061053 - "Miscellaneous Rough Carpentry" for installation of wood curbs, nailers, and wall sheathing.
2. Section 075323 - "Ethylene-Propylene-Diene-Monomer (EPDM) Roofing."
3. Section 150500 - "Basic Mechanical Materials and Methods" for mechanical disconnections and reconnections.
4. Section 160500 - "Basic Electrical Materials and Methods" for electrical disconnections and reconnections.

1.2 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.
- B. Roof Re-Cover Preparation: Existing roofing system is to remain and be prepared for new roof installed over it.
- C. Full Roof Tear-Off: Removal of existing roofing system from deck.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Temporary Roofing Submittal: Product data and description of temporary roofing system. If temporary roof remains in place, include surface preparation requirements needed to receive permanent roof, and submit a letter from roofing manufacturer, stating acceptance of the temporary roof and that its inclusion does not adversely affect the roofing system's resistance to fire and wind

1.4 INFORMATIONAL SUBMITTALS

- A. Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations. Submit before Work begins.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Approved by warrantor of existing roofing system to work on existing roofing.
- B. Reroofing Conference: Conduct conference at Project site.

1.6 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately below reroofing area. Conduct reroofing so Owner's operations are not disrupted. Provide Owner with not less than **72** hours' notice of activities that may affect Owner's operations.
 - 1. Coordinate work activities daily with Owner so Owner can place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.
 - 2. Before working over structurally impaired areas of deck, notify Owner to evacuate occupants from below affected area. Verify that occupants below work area have been evacuated before proceeding with work over impaired deck area.
- B. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.
- C. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- D. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.
 - 1. Remove only as much roofing in one day as can be made watertight in the same day.
 - 2. Have necessary waterproof canvas or plastic sheeting readily available in case of emergency. The Contractor will be held liable for any damage to building interior due to Contractor's negligence.
 - 3. Protect open roofs and flashings to prevent the entrance of moisture or rain water into the existing structure until new materials have been applied and roof is in a watertight condition.
- E. Hazardous Materials: It is not expected that hazardous materials, such as asbestos-containing materials, will be encountered in the Work.
 - 1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Owner. Hazardous materials will be removed by Owner under a separate contract.

PART 2 - PRODUCTS

2.1 INFILL AND REPLACEMENT MATERIALS

- A. Use infill materials matching existing roofing system materials unless otherwise indicated.

2.2 AUXILIARY REROOFING MATERIALS

- A. General: Use auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of new roofing system.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work, if applicable. Cover air-intake louvers before proceeding with roof replacement work that could affect indoor air quality.
- B. Test existing roof drains to verify that they are not blocked or restricted. Immediately notify Owner of any blockages or restrictions.
- C. Do not traverse roof areas or store materials or tools on roof areas that are not being reroofed.
- D. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.
- E. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
 - 1. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new roofing system, provide alternative drainage method to remove water and eliminate ponding. Do not permit water to enter into or under existing roofing system components that are to remain.

3.2 ROOF TEAR-OFF

- A. General: Notify Owner each week of extent of roof tear-off proposed for that week and obtain authorization to proceed.
- B. Remove aggregate ballast from roofing.
- C. Full Roof Tear-Off: Remove existing roofing and other roofing system components down to the roof deck.
 - 1. Remove excess bitumen, unadhered felts, and wet felts from concrete deck.
 - 2. Remove fasteners from deck and parapet walls when applicable.
 - 3. Remove existing sheet metal flashings, wall panels, and copings.

3.3 DECK PREPARATION

- A. Inspect deck after tear-off of roofing system.

- B. Prepare all concrete roof decks in accordance with roofing / waterproofing manufacturer's installation instruction instructions for vapor retarder materials to achieve wind uplift resistance as specified.
- C. Verify that concrete substrate is visibly dry and free of moisture at start of each day's work. Do not proceed with roofing work if moisture is present.
- D. If deck surface is unsuitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Owner. Do not proceed with installation until directed by Owner.

3.4 INFILL MATERIALS INSTALLATION

- A. Immediately after roof tear-off, infill abandoned opening as shown and specified on Drawings.
- B. Install new roofing patch over roof infill area. If new roofing is installed the same day tear-off is made, roofing patch is not required.

3.5 BASE FLASHING REMOVAL

- A. Remove existing base flashings. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.

3.6 DISPOSAL

- A. Collect demolished materials and place in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
 - 1. Storage or sale of demolished items or materials on-site is not permitted.
 - 2. Transport and legally dispose of demolished materials off Owner's property.

END OF SECTION 070150.19

SECTION 075323 - ETHYLENE-PROPYLENE-DIENE-MONOMER (EPDM) ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

- A. Fully-adhered ethylene-propylene-diene-monomer (EPDM) roofing system.
- B. Cover board.
- C. Roof insulation (Tapered).
- D. Vapor retarder.

1.3 RELATED SECTIONS

- A. Section 06 1053 "Rough Carpentry".
- B. Section 070150 - "Preparation for Re-Roofing" for removal of existing roof system.
- C. Section 07 6200 - "Sheet Metal Flashing and Trim".
- D. Section 150500 - "Basic Mechanical Materials and Methods" for mechanical disconnections and reconnections.
- E. Section 160500 - "Basic Electrical Materials and Methods" for electrical disconnections and reconnections.

1.4 ABBREVIATIONS

- A. ASTM - ASTM International (formerly American Society for Testing and Materials)
- B. FMG - Factory Mutual Global www.fmglobal.com.
- C. NRCA - National Roofing Contractors Association www.nrca.net.
- D. UL - Underwriters Laboratories.
- E. TIMA - Thermal Insulation Manufacturers Association.
- F. ARMA - Asphalt Roofing Manufacturers Association.
- G. SMACNA - Sheet Metal and Air Conditioning Contractors National Association.
- H. SPRI - Single-ply Roofing Industry.

1.5 REFERENCED STANDARDS

- A. NRCA / ARMA Repair Manual for Low-Slope Roof Systems.
- B. National Roofing Contractors Association (NRCA) - Roofing Membrane Roof Systems – 2015.
- C. Sheet Metal and Air Conditioning National Association (SMACNA) Architectural Sheet Metal Manual, Seventh Edition.

1.6 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed membrane roofing and flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Membrane roofing and flashings shall remain watertight.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
- D. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D 4272.
- E. Uplift Pressures: IBC Basic Wind Speed Design Criteria: The completed membrane roofing system shall meet or exceed IBC Basic Wind Speed Design Criteria of 130 mph, 3 second gust duration, Exposure B, urban and suburban area. IBC uplift pressures shall be calculated in accordance with ASCE 7 "Minimum Design Loads for Buildings and Other Structures, but not less than the following:
 - 1. Field-of-Roof Uplift Pressure: 43 psf.
 - 2. Perimeter Uplift Pressure: 72 psf.
 - 3. Corner Uplift Pressure: 108 psf.
- F. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- G. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is UL listed FM Global approved for thermoset roofing identical to that used for this Project.
- B. Installer Qualifications: Company authorized and trained by the roofing manufacturer. The roofing applicator shall be thoroughly experienced and upon request be able to provide evidence of having at least 5 years' successful experience installing thermoset single ply roofing systems similar to the specified system and having installed at least four roofing applications of similar systems and of equal or greater size within the last 12 months.

1. Crew Experience and Supervision: Provide adequate number of experienced workmen regularly engaged in this type of work who are skilled in the application techniques of the materials specified.
 2. Provide at least one thoroughly trained and experienced foreman/superintendent on the job at all times roofing work is in progress.
- C. Perform Work in accordance with NRCA Roofing and Waterproofing Manual and manufacturer's written instructions.
- D. Roofing manufacturer's technical representative shall make site inspections before, during and after installation of Work and at frequency as required to enable manufacturer to issue specified warranty.
1. Perform and document inspections by designated and properly qualified technical representative of membrane manufacturer.
 2. Verify that materials and Work meet specified requirements.
 3. Should Work and/or materials not meet specified requirements, promptly advise Architect and Consultant with recommended course of action.
- E. Source Limitations: Obtain components including for membrane roofing system identical to that used for this project.
- F. Exterior Fire-Test Exposure: ASTM E 108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.
- G. Fire-Resistance Ratings: Where indicated, provide fire-resistance-rated roof assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- H. Preinstallation Roofing Conference: Conduct conference at Project site.
1. Meet with the Owner, roofing Installer, Architect, Consultant, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
 5. Review structural loading limitations of roof deck during and after roofing.
 6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
 7. Review governing regulations and requirements for insurance and certificates if applicable.
 8. Review temporary protection requirements for roofing system during and after installation.
 9. Review roof observation and repair procedures after roofing installation.

1.8 WARRANTY

- A. Contractor Warranty: The Contractor shall provide a written warranty guaranteeing all roof repairs against defects of quality of Work and materials for a period of two (2) years from the date of Final Acceptance. The warranty shall be delivered to the Owner prior to final acceptance of the Work.

- B. Manufacturer Warranty: Manufacturer agrees to repair or replace components of roofing system specified herein that fail in materials or workmanship, with no dollar limit, within specified warranty period.

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

1.9 SUBMITTALS

- A. Product Data: For each product to be incorporated into the roof system.
- B. Shop Drawings: For each termination, transition, and penetration condition encountered.
- C. Qualification Data: For installer and manufacturer.
- D. Manufacturer Certificate (Assembly Letter): Signed by roofing manufacturer certifying that the roof system complies with Project requirements. Include the following:
 - 1. Description of roof system identifying each component product.
 - 2. Identify membrane bonding adhesive product and coverage rate.
 - 3. Fastener type and frequency for membrane terminations and perimeter securement.
 - 4. Adhesive type and placement pattern for insulation and cover board to resist design uplift pressures.
- E. Product Test Reports: For components of roofing system, for tests performed by manufacturer and witnessed by qualified testing agency.
- F. Research/Evaluation Reports: For components of roofing system, from ICC-ES.
- G. Field quality control reports.
- H. Manufacturer's field inspection reports.
- I. Sample Warranties: For manufacturer's special warranties.
- J. Maintenance Data: For roofing system to include in maintenance manuals.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Store SBS roll goods on ends only; do not lay flat. Flattened rolls shall not be used in the construction of the roof system.
- D. Store and handle roofing materials in accordance with the manufacturer's instructions.

- E. Protect roof level rigid insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with rigid insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- F. Handle and store roofing materials and place equipment in a manner to avoid overloading or resulting in permanent deflection of deck.

1.11 JOB CONDITIONS

- A. Weather Limitations: Proceed with roofing work only when existing and forecasted weather conditions permit roofing to be installed in accordance with manufacturer's written recommendations and warranty requirements.
- B. Have necessary waterproof canvas tarpaulins or plastic sheeting readily available in case of emergency.
- C. Protect open roofs and flashings to prevent the entrance of moisture or rain water into the existing structure until new materials have been applied and roof is in a watertight condition.
- D. Roofing materials shall not be applied when water in any form (i.e., rain, dew, ice, frost, snow, etc.) is present on the deck.
- E. Adhesive applied roofing materials shall not be applied when dirt, dust, debris, oil, etc. is present on the substrate.

1.12 PROTECTION

- A. Provide tarps or plastic sheeting as required to adequately protect opened roofs and flashings and to prevent entrance of moisture or rain water into the existing structure until new materials have been applied and the roof is in a watertight condition.
- B. Do not open any more roof surface at one time than can be adequately covered and protected in the event of sudden, unexpected rainfall.
- C. Have necessary waterproof canvas or plastic sheeting handy in case of emergency. Contractor will be held liable for any damage to building interior due to negligence.
- D. Have necessary fire suppression apparatus on hand and in the vicinity of the Work at all times. Adhered to all NRCA / CERTA application standards during the installation of the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide fully adhered single ply EPDM membrane roofing systems from one of the following:
 - 1. Firestone Building Products.
 - 2. Carlisle SynTec.
 - 3. Or approved.
- B. Source Limitations: Obtain components including roof insulation, fasteners, adhesives and other products necessary for roofing system from same manufacturer as membrane roofing.

2.2 EPDM ELASTIC SHEET MEMBRANE ROOFING

- A. EPDM: ASTM D 4637, Type I, non-reinforced uniform, flexible sheet made from ethylene propylene diene monomer (EPDM), and as follows:
 - 1. Thickness: 60 mils, nominal.
 - 2. Exposed Face Color: Black.
 - 3. Products:
 - a. Firestone RubberGard EPDM Membrane
 - b. Carlisle Sure-Seal EPDM Membrane
 - c. Or approved.

2.3 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.
 - 1. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Sheet Flashing: 60-mil-thick EPDM, partially cured or cured, according to application.
- C. Bonding Adhesive: Manufacturer's standard, solvent-free.
- D. Seaming Material: Manufacturer's standard, synthetic-rubber polymer primer and 3-inch-wide minimum, butyl splice tape with release film.
- E. Fasteners: Factory-coated steel fasteners and metal plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening membrane to substrate, and acceptable to roofing system manufacturer.
- F. Miscellaneous Accessories: Provide lap sealant, water cutoff mastic, metal termination bars, metal battens, pourable sealers, preformed inside and outside corner sheet flashings, reinforced EPDM securement strips, T-joint covers, in-seam sealants, termination bars, cover strips, and other accessories.

2.4 COVER BOARD

- A. Cover Board: ASTM C 1177, glass-mat, water-resistant gypsum substrate, 1/2 inch thick.
 - 1. Product: Georgia-Pacific DensDeck Prime.
 - 2. Unit Size: 4 feet by 4 feet

2.5 ROOF INSULATION

- A. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 2, Grade 2, closed-cell, coated polymer-bonded, glass-fiber mat facer on both major surfaces.
 - 1. Produced using HC blowing agents in lieu of HCFCs, in accordance with standards mandated by the Environmental Protection Agency.
 - 2. Thermal Resistance: Tested for Long Term Thermal Resistance (LTTR) in accordance with CAN/ULC-S770. R-5 per inch of thickness. R-20 average for insulation assembly over roof area.
 - 3. Compressive Strength: Nominal 20 psi per ASTM D 1621.
 - 4. Flame Spread: 35 or less per ASTM E 84.
 - 5. Unit Size: 4 feet by 4 feet.

6. Insulation thickness per layer shall be as shown on the drawings. Maximum thickness of insulation units shall not exceed 2 1/2 inches.
- B. Tapered Insulation: ASTM C 1289, Type II, Class 2, Grade 2, closed-cell, coated polymer-bonded, glass-fiber mat facer on both major surfaces.
 1. Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches unless otherwise indicated.
 2. Compressive Strength: Nominal 20 psi per ASTM D 1621.
 3. Flame Spread: 35 or less per ASTM E 84.
 4. Unit Size: 4 feet by 4 feet.
 5. Maximum thickness of insulation fill units shall not exceed 2 1/2 inches.
 - C. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to 1/2-inch per 12-inches unless otherwise indicated.

2.6 INSULATION ACCESSORIES

- A. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to vapor retarder or to another insulation layer.

2.7 VAPOR RETARDER

- A. Vapor Retarder: ASTM D 5147 Styrene-Butadiene-Styrene (SBS) rubber polymer blend with woven fiber glass-mat, torch applied membrane.
 1. Total thickness: 80 mils minimum.
 2. Primer: ASTM D41 Asphalt Primer.
 3. Products:
 - a. Firestone SBS Glass Torch Base.
 - b. Carlisle SureMB 120TG Base.

2.8 WALKWAYS

- A. Walk Pad 1: Factory-formed, nonporous, heavy-duty, solid-rubber, slip-resisting, surface-textured walkway pads, approximately 3/16-inch-thick and acceptable to roofing system manufacturer.
 1. Products:
 - a. Firestone; QuickSeam Walkway Pad
 - b. Carlisle; Pressure-sensitive Molded Walkway Pads
 - c. Or approved
 2. Color: Black.
- B. Walk Pad 2: Factory-formed, specialized UV resistant TPO pad, 1/2" thick cross grid pattern, embossed surface providing slip-resistance and means for drainage.
 1. Products:
 - a. Firestone; X-Tread Walkway Pad.
 - b. Carlisle; Crossgrip Walkway.
 - c. Or approved
 2. Color: White.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Comply with roofing system manufacturer's written instructions.
- B. Prevent roofing adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.2 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
 - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of rigid insulation.
 - 3. Verify that all curbs, wall surfaces, equipment supports, and other roof penetrations that will receive roofing materials will allow the installation of full-height flashings. Verify heights of all penetrations which are located within crickets and slope upgrades; extend penetrations where necessary.
 - 4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Substrates shall be smooth, without raised edges, sharp edges, protruding or loose nails, and free of foreign materials.
- B. Verify that the existing drainage system is free flowing prior to beginning work. Report any drainage blockage immediately upon identification.
- C. Inspect all substrates for irregularities and defects that prohibit the proper installation of new roofing materials. Notify the Owner of all defects for proper correction, prior to installation of new materials.
- D. Prepare all surfaces and details in accordance with manufacturer's printed instructions.
- E. Prevent materials from entering and clogging drain lines, gutters, and downspouts and from spilling or migrating onto surfaces of other construction.
- F. Prior to installation of vapor retarder, test for moisture in the concrete in accordance with ASTM D 4263. Do not proceed with application of vapor retarder unless test samples yield no visible moisture or surface darkening after the required period of 18 hrs. minimum time.

3.4 VAPOR RETARDER INSTALLATION

- A. Prime substrate to receive vapor retarder. Install torch applied vapor retarder over entire roof area, free of wrinkles, creases, and fishmouths. Overlap side and end lap seams as required by vapor retarder manufacturer but not less than 2 inches. Stagger end lap seams 24 inches minimum.
- B. Extend vapor retarder up intersecting vertical surfaces and other penetrations 1-inch minimum above line of top of cover board.

- C. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into the roof system.

3.5 INSULATION INSTALLATION

- A. Coordinate installing membrane roofing system components, so roof insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system and rigid insulation manufacturer's written instructions for installing roof insulation.
- C. Roof insulation units that become wet or damaged after installation must be removed and replaced.
- D. Provide wood stops at flanged penetrations and edges, and as otherwise shown on the drawings. Provide additional stops as recommended by the manufacturer of the roofing materials.
- E. Install flat board insulation under entire area of roofing to achieve required thickness in two layers. Stagger joints of each succeeding layer from joints of previous layer a minimum of 6 inches in each direction.
- F. Install tapered insulation under area of roofing to conform to slopes indicated.
- G. Install insulation with joints running perpendicular to primary roof slope direction in a continuous straight line. Stagger end joints between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4-inch with insulation.
- H. Cut and fit insulation within 1/4-inch of nailers, projections, and penetrations.
- I. Secure insulation with adhesive to resist design uplift pressures. Adhesive ribbon placement pattern required to resist design uplift pressures shall be provided by roofing system manufacturer.
- J. Install each layer of insulation in insulation adhesive, firmly pressing and maintaining insulation in place.
- K. Provide temporary ballast on insulation until adhesive is set.

3.6 COVER BOARD INSTALLATION

- A. Install cover boards with joints running perpendicular to primary roof slope direction in continuous straight lines. Stagger end joints between rows. Offset joints in cover board layer joints in insulation layer below a minimum of 12 inches in each direction. Fill gaps exceeding 1/4-inch with cover board material.
- B. Cut and fit cover board within 1/4-inch of nailers, projections, and penetrations.
- C. Secure cover board with adhesive to resist design uplift pressures. Adhesive ribbon placement pattern required to resist design uplift pressures shall be provided by roofing system manufacturer.
- D. Install cover board in insulation adhesive, firmly pressing and maintaining cover board in place.
 - 1. Provide temporary ballast on cover board until adhesive is set.

3.7 ADHERED MEMBRANE ROOFING INSTALLATION

- A. Adhere roofing over area to receive roofing according to membrane roofing system manufacturer's written instructions. Unroll membrane roofing and allow to relax before installing.
- B. Accurately align roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- C. Bonding Adhesive: Apply to substrate and underside of roofing at rate required by manufacturer and allow to partially dry before installing roofing. Do not apply to splice area of roofing membrane.
- D. In addition to adhering, mechanically fasten roofing securely at terminations, penetrations, and perimeters.
- E. Tape Seam Installation: Clean and prime both faces of splice areas, apply splice tape, and firmly roll side and end laps of overlapping roofing according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of roofing terminations.
- F. Repair tears, voids, and lapped seams in roofing that do not comply with requirements.
- G. Spread sealant or mastic bed over deck-drain flange at roof drains, and securely seal membrane roofing in place with clamping ring.

3.8 FLASHING INSTALLATION

- A. Install sheet flashings and adhere to substrates according to roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Tape Seam Installation: Clean and prime both faces of splice areas, apply splice tape, and firmly roll side and end laps of overlapping roofing according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of roofing terminations.
- E. Terminate and seal top of sheet flashings.

3.9 WALKWAY INSTALLATION

- A. Walk Pad 1: Install walkway products in locations indicated. Adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.
 - 1. Cut and place with appropriate space between pads to provide drainage, especially at valleys.
- B. Walk Pad 2: Install walkway products in locations indicated. walkway products to substrate with compatible pressure-sensitive flashing membrane looped through cross-tread openings.

3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.
- B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Owner.
 - 1. Notify Owner 48 hours in advance of date and time of inspection.
- C. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.

3.11 PROTECTING AND CLEANING

- A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Owner.
- B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates, and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.
- D. Remove trash, stray fasteners, debris, and installation equipment from site and leave the site clean.

END OF SECTION 075323

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SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

- A. New sheet metal flashings and trim where indicated on the Drawings and within individual specification sections.

1.3 RELATED SECTIONS

- A. Section 075323 - Ethylene-Propylene-Diene-Monomer (EPDM) Roofing.

1.4 ABBREVIATIONS

- A. ASTM - ASTM International (formerly American Society for Testing and Materials)
- B. FMG - Factory Mutual Global www.fmgglobal.com.
- C. NRCA - National Roofing Contractors Association www.nrca.net.
- D. UL - Underwriters Laboratories.
- E. SMACNA - Sheet Metal and Air Conditioning Contractors National Association.
- F. NAAMM - National Association of Architectural Metal Manufacturers.

1.5 REFERENCED STANDARDS

- A. NAAMM National Association of Architectural Metal Manufacturers - Metal Finishes Handbook.
- B. SMACNA Architectural Sheet Metal Manual, Sixth Edition.
- C. ANSI / SPRI ES-1

1.6 QUALITY ASSURANCE

- A. Contractor Qualifications:
 - 1. The applicator responsible for sheet metal repairs shall be a company specializing in sheet metal flashing work with five years' minimum experience.
 - 2. All applicators shall have been in continuous business under the same name for the past ten (10) years.

3. The contractor shall have documented experience in roof maintenance and roof repairs and shall provide evidence of experience upon request.
4. The contractor shall have had a minimum of five (5) projects of similar scope installing roof repairs and performing roof maintenance on existing sheet metal flashing systems.

B. Field Quality Control:

1. The installer shall provide all personnel trained in the application of the materials and systems and shall maintain supervision throughout the entire project.
2. Repair materials shall not be applied when water in any form (i.e., rain, dew, ice, frost, snow, etc.) is present on the repair surfaces.
3. Repair materials shall not be applied during precipitation and shall not be started in the event there is a probability of precipitation during application.

1.7 STORAGE AND HANDLING

- A. Deliver materials to the job site in sealed, undamaged original packaging imprinted with the manufacturer's name, product identification, and pertinent industry regulatory compliance numbers.
- B. Store materials in a dry, protected area. Control temperature of storage areas in accordance with Manufacturer's instructions.
- C. Stack preformed and pre-finished material to prevent twisting, bending, or abrasion, and to provide ventilation.
- D. Prevent contact with materials during storage, which may cause discoloration, staining, or damage.

1.8 WARRANTY

- A. The Contractor shall provide a written warranty guaranteeing all sheet metal and flashing repairs against defects of quality of Work and materials for a period of two (2) years from the date of Final Acceptance.
- B. The warranty shall be delivered to the Owner prior to final acceptance of the Work.

1.9 SUBMITTALS

- A. Manufacturer's published specification data sheets for the proposed materials.

1.10 JOB CONDITIONS

- A. Do not perform Work during rainy weather or immediately thereafter until surfaces are sufficiently dry to receive new Work.

PART 2 - PRODUCTS

2.1 SHEET METALS

- A. Zinc-Coated (Galvanized) Steel Sheet (concealed cleats and anchor clips): ASTM A 653/A 653M, G90 coating designation; structural quality; 22 gauge.
- B. Pre-painted, Metallic-Coated Steel Sheet (roof flashings): 24 gauge; restricted flatness steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - 1. Color: Color shall be selected from manufacturer's full range of standard colors.

2.2 MISCELLANEOUS MATERIALS

- A. Butyl Sealant: ASTM C 1311, single component, solvent release butyl rubber sealant, polyisobutylene plasticized, heavy bodies for hooked-type expansion joints with limited movements.
- B. Sealant: Single -component, Nonsag, Traffic Grade, Urethane Joint Sealant: ASTM C 920. Type S, Grade S, Class 25, for use NT.
 - 1. MasterSeal NP150.
 - 2. Or approved.
- C. Self-Adhering, High-Temperature Sheet: (SAHTS) Minimum 30 to 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
 - 1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F.
 - 2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F.
 - 3. Products: Subject to compliance with requirements, provide one of the following:
 - 4. Henry Company; Blueskin PE200 HT.
 - 5. Or approved.
- D. Provide all miscellaneous items as required for a complete and proper installation.

2.3 FABRICATION - GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.
 - 1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 - 2. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated.
 - 3. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.
 - 4. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.

- B. Fabricate exposed cleats from same material as accessory being anchored.
- C. Fabricate concealed cleats and anchor clips from Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality; 22 gauge.
- D. Field verify dimensions prior to fabrication.
- E. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- F. Form pieces in longest possible lengths.
- G. Hem exposed edges on underside 1/2-inch; miter and seam corners.
- H. Form material with standing seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
 - 1. Standing Seams: 1-inch high with sealant at folded corners.
 - 2. Double S Lock Seams: Form 1-1/4-inch with S shaped seam on each edge of flashing sheet for concealed fastening.
- I. Fabricate corners from one piece with minimum 18-inch long legs; seam for rigidity, seal with sealant. Solder galvanized steel that is not prefinished. Do not solder prefinished steel.
 - 1. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
- J. Fabricate vertical faces with bottom edge formed outward 1/4-inch and hemmed to form drip.
- K. Fabricate flashings to allow toe to extend 4-inches over roofing. Return and break edges.

2.4 SHEET METAL FLASHINGS

- A. Counter Flashing: Fabricate with profiles as shown on the Drawings.
 - 1. Joint Style: Lapped and sealed.
 - 2. Sheet Metal: Pre-painted, metallic-coated sheet, 24-gauge.
 - 3. Color: Selected by Owner from manufacturer's standard color selection.
- B. Coping: Fabricate with profiles as shown on the Drawings.
 - 1. Joint Style: Standing Seam unless otherwise noted.
 - 2. Sheet Metal: Pre-painted, metallic-coated sheet, 24-gauge.
 - 3. Color: Selected by Owner from manufacturer's standard color selection.
- C. Drip Flashing: Fabricate with profiles as shown on the Drawings.
 - 1. Joint Style: Lapped and sealed.
 - 2. Sheet Metal: Pre-painted, metallic-coated sheet, 24-gauge.
 - 3. Color: Selected by Owner from manufacturer's standard color selection.
- D. Fascia Flashing: Fabricate with profiles as shown on the Drawings.
 - 1. Joint Style: S-locks at 48-inches on center.
 - 2. Sheet Metal: Prepainted, metallic-coated sheet, 24 gauge.

3. Color: Selected by Owner from manufacturer's standard color selection.
 4. Provide vertically oriented breaks in sheet metal panels to control oil-canning at 12 inches on center.
- E. Miscellaneous Flashing: Fabricate with profiles as shown on the Drawings and from sheet metal materials indicated.

2.5 ROOF-DRAINAGE SHEET METAL FABRICATIONS

- A. Hanging Gutters: Fabricate roll formed, 6-inch K style gutters, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in continuous seamless sections and provide expansion joints where indicated.
1. Accessories:
 - a. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters.
 - b. Gutter Brackets: Form from 1/8-inch-thick by 1-1/2-inch-wide steel. Prime and paint to match or provide cover to match gutter.
 - c. Gutter Hangers: Hang Fast.
 - B. Downspouts: Fabricate rectangular downspouts to dimensions indicated, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors. Shop fabricate elbows.
 1. Hanger Style: Straps.
 - C. Roof Top Splash Pans: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured Flexible Walkway pads or rolls, manufactured by roofing system manufacturer.

2.6 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions and other conditions affecting performance of work.

1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
1. Torch cutting of sheet metal flashing and trim is not permitted.
- B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.
- C. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
- D. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and butyl sealant.
- E. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
- F. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10-feet with no joints allowed within 24-inches of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1-inch deep, filled with butyl sealant concealed within joints.
- G. Fasteners: Use fasteners of sizes that will penetrate substrate not less than 1-1/4-inches for nails and not less than 3/4-inch for wood screws.
1. Galvanized or Pre-painted, Metallic-Coated Steel: Use fasteners as indicated in Part 2 of this specification.
- H. Seal joints with butyl sealant as required for watertight construction.
1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1-inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F, set joint members for 50 percent movement either way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
 2. Prepare joints and apply sealants in accordance with manufacturer's published installation instructions.

3.3 UNDERLAYMENT INSTALLATION

- A. Water Resistive Barrier: Install wrinkle free, according to manufacturers' written instructions.
1. Tape all seams and membrane terminations to provide and air tight condition.

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

3.4 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal roof flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual, Seventh Edition." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at not less than 6-inch centers, staggered, unless otherwise indicated.
- C. Secure in a waterproof manner by means of snap-in installation and sealant.
- D. Field measure all site conditions prior to fabrication and installation.
- E. Coordinate installation of sheet metal flashings with installation of roof membrane materials.
- F. Insert counter flashing into receivers or behind adjacent flashings and fit tightly to base flashing.
- G. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- H. Secure new flashing intersections to existing flashings as required providing weathertight performance.

3.5 ROOF-DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Hanging Gutters: Join sections with joints riveted and sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant.
- C. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches on center.
- D. Splash Pans: Install where downspouts discharge on low-slope roofs (by others).

3.6 CLEANING AND PROTECTION

- A. Clean and neutralize flux materials. Clean off excess solder and sealants.

- B. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.
- C. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 076200

SECTION 077200 - ROOF ACCESSORIES

GENERAL

1.1 DESCRIPTION

- A. Section Includes:
 - 1. Roof Edge Railing System.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM)
- B. American National Standard Institute (ANSI)
 - 1. ANSI A21.1 – Safety Requirements for Floor and Wall Openings, Railings and Toe Boards.
- C. Occupational Health and Safety Administration (OSHA)
 - 1. OSHA 1910.21 – Guarding Floor and Wall Openings and Holes
 - 2. OSHA 1926.502 – Fall Prevention Systems Criteria and Practices

1.3 SYSTEM DESCRIPTION

- A. General: Provide free-standing guardrail system capable of withstanding loads and stresses within limits and under conditions specified in OSHA and other applicable safety codes.
- B. Design Requirements: Guardrail shall withstand, without failure, a minimum point load of 200 pounds applied in any direction at any point on the top edge, 150 pounds applied in any direction at the mid-rail, and 50 pounds applied in any downward or outward direction at the toe-board if applicable.

1.4 SUBMITTALS

- A. Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- B. Shop Drawings: Show layout, profiles, and details. Provide engineering calculations demonstrating compliance with the references of Section 1.2.
- C. Maintenance Data: Written instructions for maintenance of fall prevention safety devices to be included in the operation and maintenance manual.
- D. Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

- A. **Manufacturer Qualifications:** Firm having at least 10 years continuous experience in manufacturing fall safety equipment similar to systems specified and exhibiting records of successful in-service acceptability and performance. Firm must employ personnel dedicated to providing regularly scheduled Authorized and Competent Person Training courses as mandated by OSHA 1926 and 1910 for owner's authorized safety personnel.
- B. **OSHA Standards:** Comply with Occupational Safety and Health Administration Standards for the Construction Industry 29 CFR § 1926.500 Subpart M (Fall Protection), and with applicable State Administrative Code safety standards for railing.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the job site in good condition and adequately protected against damage as handrails are a finished product.
- B. Inspect rail sections for damage before signing the receipt from the trucking company. Truck driver must note damaged goods on the bill of lading if damaged product is found.
- C. Store products in manufacturer's unopened packaging until ready for installation.

1.7 PROJECT CONDITIONS

- A. **Field Measurements:** Where handrails and railings are indicated to fit to other construction, check actual dimensions of other construction by accurate field measurements before fabrication.
- B. Contractor to coordinate placement & installation of roofing system, insulation, and requirements of guardrail system manufacturer regarding proper installation.

1.8 WARRANTY

- A. **Special Warranty on Painted Finishes:** Manufacturer's standard form in which manufacturer agrees to repair finishes or replace roof accessories that show evidence of deterioration of factory-applied finishes within 10 years from date of Substantial Completion.
- B. Provide Contractor's two year warranty.
- C. **Manufacturer's Warranty:** Provide manufacturer's standard warranty. Materials shall be free of defects in material and workmanship for a period of five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge.

PART 2 - PRODUCTS

2.1 SYSTEMS

- A. Roof Edge Railing System: Manufacturer's standard complete system including rails, clamps, fasteners, and all accessories required for a complete installation.
 - 1. Roof Edge Protection: Provide freestanding, non-penetrating, pedestrian egress barrier system on roof, including pipe railings, uprights, bases, and fittings.
 - 2. Standards: System shall have top and mid rail in accordance with OSHA Standards - 29 CFR 1910.23 (a)(2).
 - 3. Structural Load: 200 lb., minimum, in any direction to all components in accordance with OSHA Regulation 29 CFR 1926.502.
 - 4. Height: 42 inches, minimum.
 - 5. Railings: 1-5/8-inch O.D. hot rolled pickled electric weld tubing, free of sharp edges and snag points.
 - 6. Mounting Bases: Class 30 gray iron material cast with four receiver posts. Provide pads on bottom of bases with materials compatible with roofing membrane - rubber mats are not allowed.
 - 7. Receiver Posts: Shall have a positive locking system into slots that allow rails to be mounted in any direction. Friction locking systems are not allowed. Receiver posts shall have drain holes.
 - 8. Manufacturers: Subject to compliance with requirements provide products listed as follows:
 - a. DBI SALA.
 - b. Roof Top Anchor.
 - c. Or Approved.

2.2 ACCESSORIES

- A. Pipe Securement Brackets: Provide appropriate securement bracket as recommended /supplied by the manufacturer to secure roof top pipes, gas lines, and conduits in a secure and level fashion.

2.3 FINISHES

- A. Finish: Factory finished galvanized steel.
- B. Color: Silver.

2.4 FABRICATION

- A. Assemble components with joints tightly fitted and secured. Accurately form components to suit installation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Owner of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install products in strict accordance with manufacturer's instructions and approved submittals. Locate units level, plumb, and in proper alignment with adjacent work.
 - 1. Place safety railing bases over roof membrane protection pads only.
 - 2. Test units for proper function and adjust until proper operation is achieved.
 - 3. Repair finishes damaged during installation.
 - 4. Restore finishes so no evidence remains of corrective work.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 077200

SECTION 150500 - BASIC MECHANICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Requirements and Summary of Work and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Temporary removal of existing rooftop HVAC equipment and associated exposed ductwork, as required for new roof Work.
 - 2. Reinstallation of existing equipment.
- B. Related Sections include the following:
 - 1. Section 06 1053 "Rough Carpentry".
 - 2. Section 070150 - "Preparation for Re-Roofing" for removal of existing roof system.
 - 3. Section 075323 - "Ethylene-Propylene-Diene-Monomer (EPDM) Roofing."
 - 4. Section 07 6200 - "Sheet Metal Flashing and Trim".
 - 5. Section 160500 - "Basic Electrical Materials and Methods" for electrical disconnections and reconnections.

1.3 QUALITY ASSURANCE

- A. Use personnel with appropriate experience to perform work on HVAC equipment.
- B. All materials shall be installed according to manufacturer's published instructions and Contract Documents.

1.4 COORDINATION

- A. Coordinate installation of required supporting devices and other structural components with reroofing operations.

PART 2 - PRODUCTS

2.1 SHEET METAL

- A. Zinc-Coated (Galvanized) Steel Sheet ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality, 22 gauge galvanized core steel.

2.2 RELATED MATERIALS

- A. Provide misc. accessories, components, and materials required for a complete and proper installation.

PART 3 - EXECUTION

3.1 MATERIALS STORAGE AND HANDLING

- A. Deliver materials to the Project site with Manufacturer's labels intact and legible. Handle materials with care to avoid damage. Store materials inside, protected from weather, dirt and construction dust.

3.2 DISCONNECTION AND RECONNECTION

- A. Disconnect units as required for lifting.
- B. Install supports under units where shown on the Drawings.
- C. Reconnect units after completion of roof system installation.

3.3 PROTECTION

- A. Protect all Work and materials against loss or damage. Close all pipe openings with caps or plugs. At final completion, thoroughly clean and deliver all Work and equipment in an unblemished new condition.
- B. Protect existing wiring, circuits, piping, conduits, etc., from damage during course of Work.
- C. Contractor shall be responsible for damage to adjacent and/or related components of Work, including control systems, due to improper disconnection/reconnection.

3.4 CLEANING

- A. General: Clean all dirt and construction dust and debris from all mechanical facilities and equipment. Touch up paint where finish has been damaged by this Work.

3.5 OPERATION TEST

- A. Prior to acceptance of completed project, operate all mechanical systems modified for a period of at least five days of eight hours each to demonstrate fulfillment of the requirements of the contract.

END OF SECTION 150500

SECTION 160500 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General Requirements and Summary of Work and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Disconnection, re-connection, repair, replacement, or relocation of existing electrical conditions at mechanical units, wall mounted conduit, and all areas requiring upgrades as a result of roof replacement activities.
- B. Related Sections include the following:
 - 1. Section 06 1053 "Rough Carpentry".
 - 2. Section 070150 - "Preparation for Roof Replacement" for removal of existing roof system.
 - 3. Section 075323 - "Ethylene-Propylene-Diene-Monomer (EPDM) Roofing".
 - 4. Section 150500 - "Basic Mechanical Materials and Methods" for mechanical disconnections and reconnections.

1.3 QUALITY ASSURANCE

- A. Meet requirements of the 2008 National Electrical Code w/Washington Amendments – effective March 1, 2013, all rules and regulations of the local serving utility, National Board of Fire Underwriters and 2012 International Building Code w/ Washington Amendments as adopted by the State of Washington.
- B. Qualifications:
 - 1. Use personnel with appropriate experience to perform work on energized equipment and circuits.
 - 2. All materials shall be installed according to manufacturer's published instructions and Contract Documents.

1.4 SUBMITTALS

- A. Submit Shop Drawings and Product Data.

1.5 WIRING METHODS

- A. Wiring methods shall match existing electrical installation method and be installed to local codes.

PART 2 - PRODUCTS

2.1 CONDUIT AND FITTINGS

- A. Zinc coated steel EMT may be employed in all dry, protected locations. Rigid conduits shall be used at all through roof penetrations. Assemble conduits and secure to boxes, panels, etc., with appropriate fittings to maintain electrical continuity. Size conduit for the quantity of type THW conductors installed, per code requirements. All conduits shall be securely supported and fastened.
- B. Galvanized steel conduits and like fittings utilized at exterior applications.

2.2 BOXES

- A. Outlet and junction boxes shall be code gauge galvanized steel of code-required size to accommodate all wire, fittings and devices.

2.3 WIRE AND CONNECTORS

- A. Feeder and branch circuit wire shall be soft drawn copper, number 12 minimum size, with 600-volt type THW, THWN or THHN insulation. Wire shall conform to the latest specifications. Wire shall be suitably protected from weather and damage during storage and handling and in first class condition when installed. Splices shall be made using wire nut connections.

2.4 DEVICES

- A. Wiring devices shall match existing electrical installation or approved, prior to installation, unless existing devices do not comply with current code requirements. Notify Owner in the event that non-compliant devices are present that require upgrade.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Inspect condition of existing fixtures, wiring, and conduit. Notify Owner of any damaged or unsatisfactory materials. Upgrade materials to conform to local codes as instructed by Owner.
- B. Locate all electrical services and disconnect prior to work performed in accordance with this section.

3.2 OUTAGES

- A. Keep outages to occupied areas to a minimum and pre-arrange all outages with Owner. Requests for outages shall state the specific dates and hours and the maximum duration, with the outages kept to these specific times. The Contractor will be liable for any damages resulting from unscheduled outages or for those not confined to the pre-approved times.

- B. Temporary wiring and facilities, if used, shall be removed and the site left clean before final acceptance.

3.3 SUPPORT

- A. Properly and adequately support all electrical equipment, fixtures, panels, outlets, etc. Each fastening device and support shall be capable of supporting not less than four times the ultimate weight of the object or objects fastened to or suspended from the building structure. Supports shall provide proper alignment and leveling of fixtures and equipment.

3.4 INSTALLATION

- A. Disconnect existing power supply and extend conduits as required for appropriate height and proper flashing installation.
- B. Mount all conduits and junction boxes to solid surfaces, using proper fasteners and clamping devices that have been approved. Junction boxes shall be in accessible locations.
- C. Install materials per manufacturer's instructions. Connect to existing wiring as required. All components exposed to weather shall be weatherproof.

3.5 CLEANING

- A. General: Clean all dirt and construction dust and debris from all electrical facilities and equipment. Touch up paint where finish has been damaged by this work.

3.6 OPERATION TEST

- A. Prior to acceptance of completed project, operate all electrical systems for a period of at least five days of eight hours each to demonstrate fulfillment of the requirements of the contract.

END OF SECTION 160500