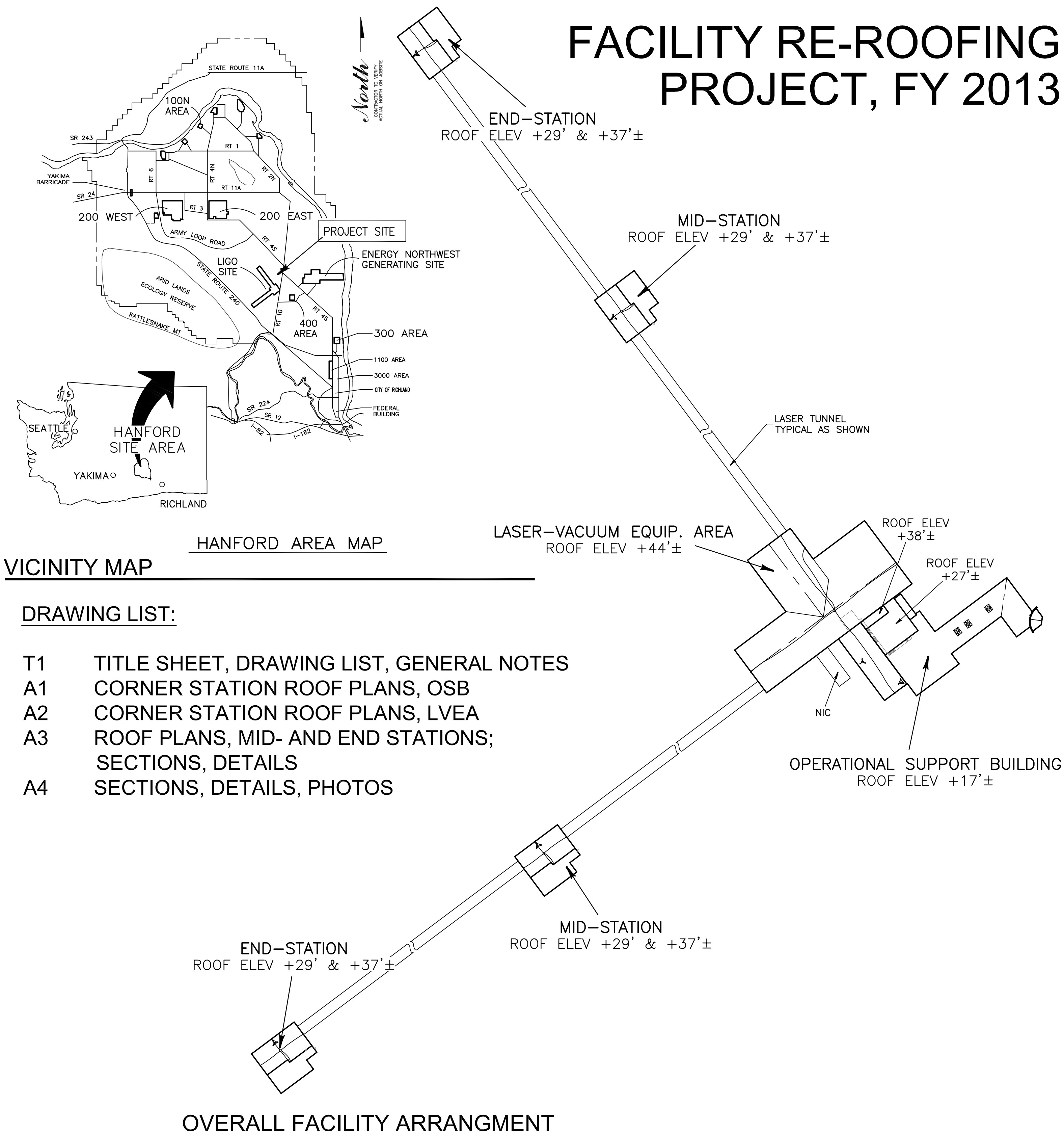


**GENERAL NOTES:**

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF STATE AND LOCAL RULES AND STANDARDS OF GOVERNING AGENCIES HAVING JURISDICTION.
2. ALL DIMENSIONS AND LINEAR DISTANCES SHOWN ARE APPROXIMATE. ALL CRITICAL CONSTRUCTION DIMENSIONS ARE TO BE FIELD VERIFIED.
3. PER IBC TABLE 1704, NO SPECIAL INSPECTIONS ARE REQUIRED. THE ENGINEER WILL PERFORM PERIODIC OBSERVATIONS DURING CONSTRUCTION.
4. CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF SITE AND CONSTRUCTION CONDITIONS. DISCREPANCIES BETWEEN SITE CONDITIONS AND THE CONSTRUCTION DRAWINGS SHALL BE CALLED TO THE ATTENTION OF THE ENGINEER. WORK DONE WITHOUT THE ENGINEER'S APPROVAL IS THE RESPONSIBILITY OF THE CONTRACTOR.
5. BEFORE BEGINNING ANY DEMOLITION WORK COORDINATE THE SAME WITH THE OBSERVATORY MANAGER. ALL DETAILS OF FACILITY COORDINATION DURING THE WORK WILL BE ADDRESSED IN THE PRE-CONSTRUCTION (PRE-INSTALLATION) CONFERENCE.
6. THE CONTRACTOR IS TO PERFORM ALL CONSTRUCTION WORK IN A MANNER THAT WILL ALLOW THE OBSERVATORY TO CONTINUE IN OPERATION WITH DUE CONSIDERATION FOR PEDESTRIAN ACCESS TO THE BUILDINGS. CONTRACTOR WILL MAKE EVERY EFFORT TO MINIMIZE DISRUPTIONS TO THE OBSERVATORY IN TERMS OF NOISE, IMPACT VIBRATION, DUST, ETC.
7. THE SCOPE OF WORK IS TO INSTALL A NEW SINGLE-MEMBRANE WHITE EPDM ROOFING SYSTEM WITH ALL NEW FLASHINGS AND RELATED APPURTENANCES OVER THE EXISTING BITUMINOUS ROOFING SYSTEM. ALL BUBBLES IN THE EXISTING BITUMINOUS ROOFING SHALL BE CUT OUT, BUT THE MAJORITY OF THE EXISTING ROOFING CAN BE LEFT IN PLACE UNDER THE NEW RECOVER BOARD.
8. SCOPE INCLUDES THE REMOVAL AND REPLACEMENT OF ALL FASCIAS, FLASHINGS, COPINGS AND OTHER RELATED METAL ACCESSORIES. THE COPING AT THE TOP OF THE CURVED WALL OVER THE MAIN OSB ENTRANCE MAY REMAIN IN PLACE. THE EPDM EXPANSION JOINT MATERIALS BETWEEN THE OSB AND THE LVEA BUILDINGS IS JUDGED TO BE IN GOOD CONDITION AND WILL REMAIN. CONTRACTOR IS TO EXERCISE DUE CARE TO PRESERVE AND PROTECT THE EXPANSION JOINTS. VERTICAL EXPANSION JOINTS ARE TO BE LEFT AS-IS. AS SHOWN IN THE DETAILS, THE HORIZONTAL EXPANSION JOINTS ARE TO BE COVERED WITH NEW EPDM FLASHING MATERIAL TO ADD ADDITIONAL LAYER OF LONG-TERM PROTECTION TO THE SAME.
9. SCOPE INCLUDES THE REMOVAL (RELOCATION) AND RESETTING OF A LIGHTNING ARREST NETWORK; AS WELL AS THE REMOVAL AND REINSTALLATION OF OTHER, MINOR ROOF-MOUNTED EQUIPMENT; AND THE INSTALLATION OF CERTAIN NEW GUTTERS, DOWNSPOUTS, SPLASH BLOCKS WHERE SHOWN.

# LIGO - LASER INTERFEROMETER GRAVITATIONAL-WAVE OBSERVATORY

## FACILITY RE-ROOFING PROJECT, FY 2013



**HANFORD AREA MAP**  
**VICINITY MAP**

**DRAWING LIST:**

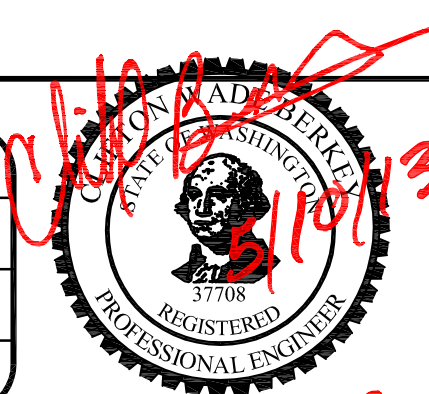
- T1 TITLE SHEET, DRAWING LIST, GENERAL NOTES
- A1 CORNER STATION ROOF PLANS, OSB
- A2 CORNER STATION ROOF PLANS, LVEA
- A3 ROOF PLANS, MID- AND END STATIONS; SECTIONS, DETAILS
- A4 SECTIONS, DETAILS, PHOTOS

**OVERALL FACILITY ARRANGMENT**

NO SCALE T1

0	5/10/13	RWB	APPROVED FOR CONSTRUCTION	GH
REV No	DATE	BY	APPROVED	

DRAWN BY:	RWB
CHECKED BY:	CLIFF BERKEY
DESIGN A/E:	CWB
DESIGN GM:	RWB
H/EI APPROVAL:	



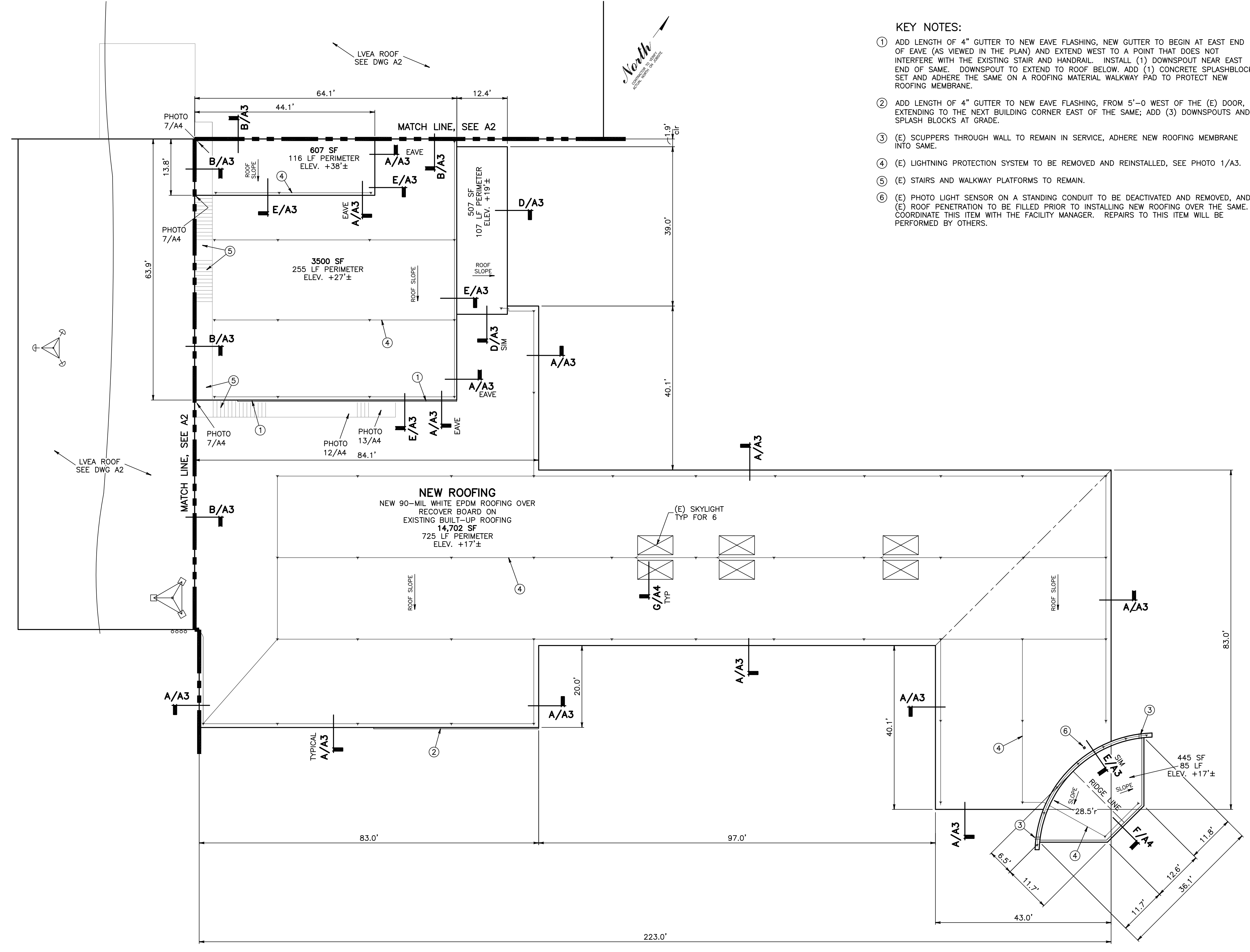
<b>TITLE SHEET</b> <b>DRAWING LIST, GENERAL NOTES</b>	
PROJECT NUMBER:	12258.0
CAD FILE:	12258T1.DWG



<b>L I G O</b> LIGO HANFORD FACILITY REROOF	
<b>HIBBS ENGINEERING, INC.</b> KENNEWICK, WASHINGTON	

LIGO-D1300361	0
v2 1of5	v2
DRAWING NUMBER	REV.

- KEY NOTES:**
- ADD LENGTH OF 4" GUTTER TO NEW EAVE FLASHING, NEW GUTTER TO BEGIN AT EAST END OF EAVE (AS VIEWED IN THE PLAN) AND EXTEND WEST TO A POINT THAT DOES NOT INTERFERE WITH THE EXISTING STAIR AND HANDRAIL. INSTALL (1) DOWNSPOUT NEAR EAST END OF SAME. DOWNSPOUT TO EXTEND TO ROOF BELOW. ADD (1) CONCRETE SPLASHBLOCK, SET AND ADHERE THE SAME ON A ROOFING MATERIAL WALKWAY PAD TO PROTECT NEW ROOFING MEMBRANE.
  - ADD LENGTH OF 4" GUTTER TO NEW EAVE FLASHING, FROM 5'-0" WEST OF THE (E) DOOR, EXTENDING TO THE NEXT BUILDING CORNER EAST OF THE SAME; ADD (3) DOWNSPOUTS AND SPLASH BLOCKS AT GRADE.
  - (E) SCUPPERS THROUGH WALL TO REMAIN IN SERVICE, ADHERE NEW ROOFING MEMBRANE INTO SAME.
  - (E) LIGHTNING PROTECTION SYSTEM TO BE REMOVED AND REINSTALLED, SEE PHOTO 1/A3.
  - (E) STAIRS AND WALKWAY PLATFORMS TO REMAIN.
  - (E) PHOTO LIGHT SENSOR ON A STANDING CONDUIT TO BE DEACTIVATED AND REMOVED, AND (E) ROOF PENETRATION TO BE FILLED PRIOR TO INSTALLING NEW ROOFING OVER THE SAME. COORDINATE THIS ITEM WITH THE FACILITY MANAGER. REPAIRS TO THIS ITEM WILL BE PERFORMED BY OTHERS.



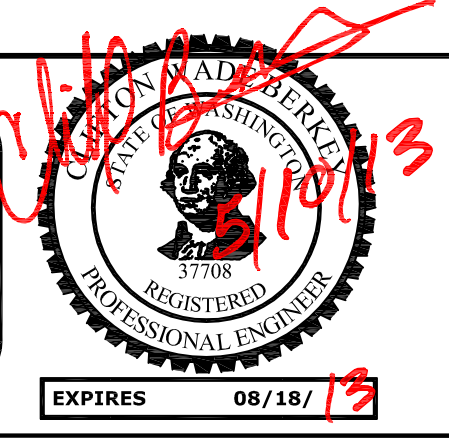
**CORNER STATION ROOF PLANS: OPERATIONAL SUPPORT BUILDING**

1" = 12' A1

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REV No	DATE	BY	APPROVED	APPROVED

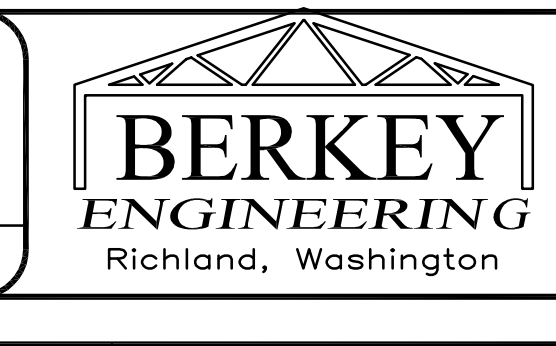
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**CORNER STATION ROOF PLANS  
OPERATIONAL SUPPORT BUILDING (OSB)**

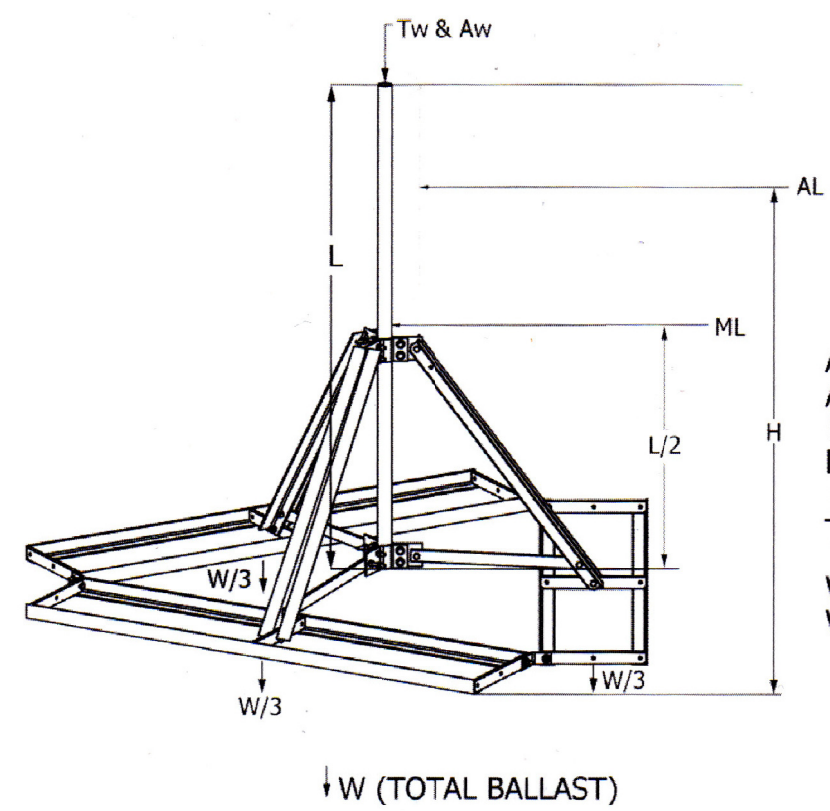
PROJECT NUMBER: 12258.0 CAD FILE: 12258A1.DWG



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KENNEWICK, WASHINGTON

LIGO-D1300361	0
v2 2of5	v2
DRAWING NUMBER	REV.



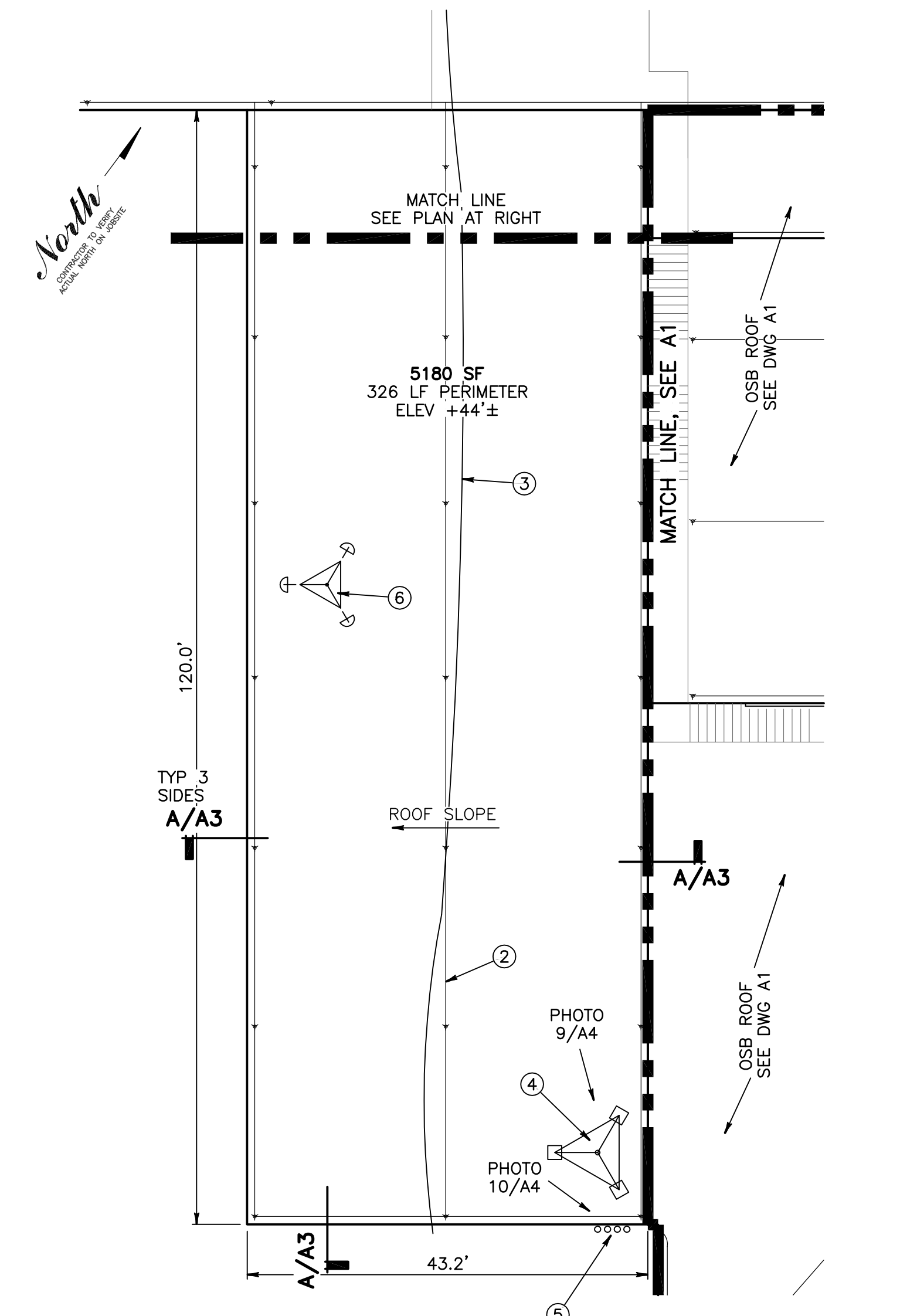
**BALLAST REQUIREMENTS**  
 NOTE: Equation includes a 1.5 factor of safety for overturning  
 $W = [(AL * H) + (ML * L / 2) - (TW * 2.92) - (Aw * 2.92)] * 0.515$

AL Horizontal antenna load  
 AW Antenna weight  
 H Height from roof to center of antenna  
 ML Horizontal mast load  
 L Length of mast  
 TW Tripod weight  
 W Total Ballast Required  
 W/3 Required ballast per Tray

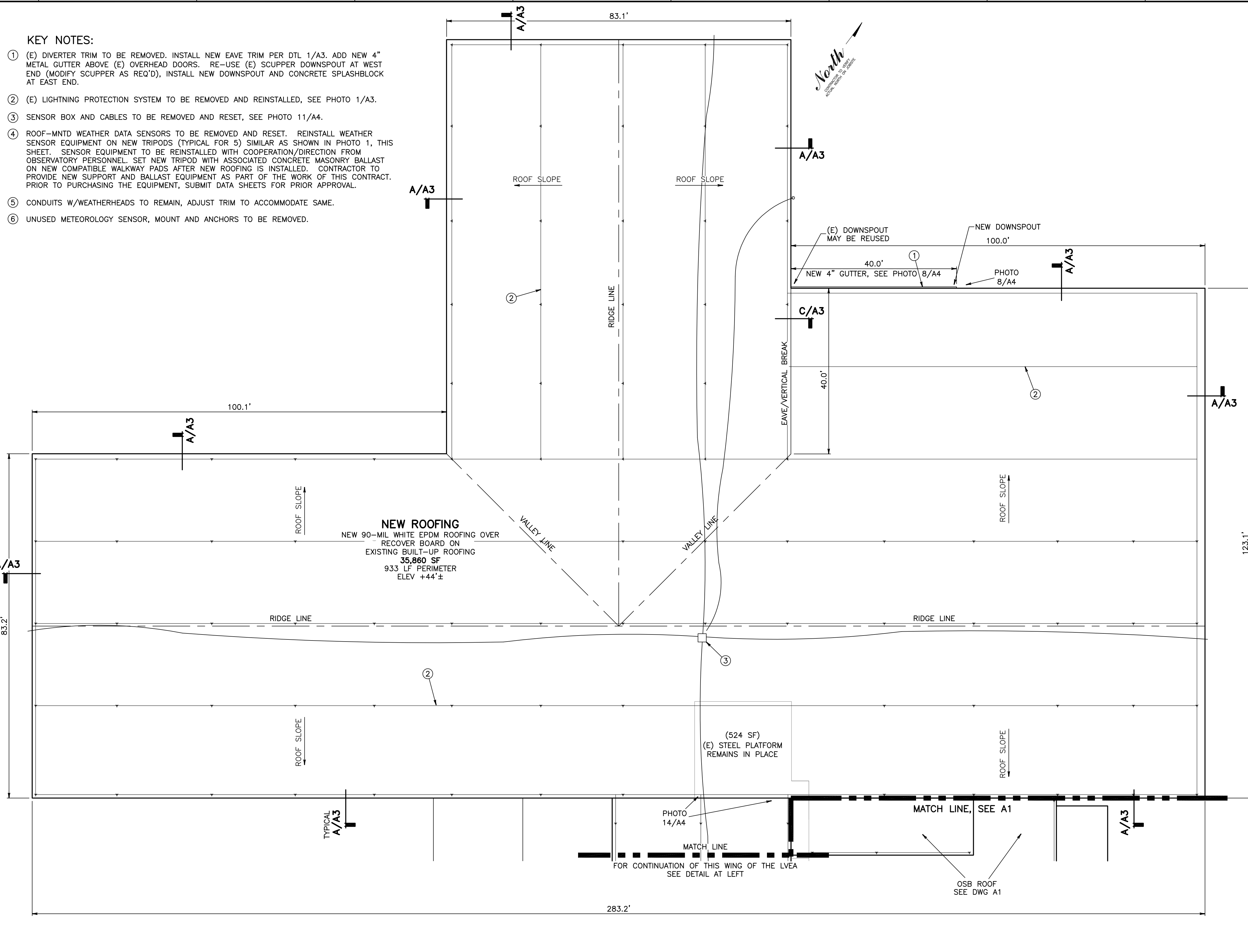
**valmont** New York 1-888-438-7761 Atlanta 1-866-901-0603  
 Los Angeles 1-888-776-1937 Dallas 1-888-809-5151  
 Salem 1-888-880-9191 www.sitepro1.com

**SITE PRO 1**  
 A valmont COMPANY

**PHOTO 1**



- KEY NOTES:**
- (E) DIVERTER TRIM TO BE REMOVED. INSTALL NEW EAVE TRIM PER DTL 1/A3. ADD NEW 4" METAL GUTTER ABOVE (E) OVERHEAD DOORS. RE-USE (E) SCUPPER DOWNSPOUT AT WEST END (MODIFY SCUPPER AS REQ'D), INSTALL NEW DOWNSPOUT AND CONCRETE SPLASHBLOCK AT EAST END.
  - (E) LIGHTNING PROTECTION SYSTEM TO BE REMOVED AND REINSTALLED, SEE PHOTO 1/A3.
  - SENSOR BOX AND CABLES TO BE REMOVED AND RESET, SEE PHOTO 11/A4.
  - ROOF-MNTD WEATHER DATA SENSORS TO BE REMOVED AND RESET. REINSTALL WEATHER SENSOR EQUIPMENT ON NEW TRIPODS (TYPICAL FOR 5) SIMILAR AS SHOWN IN PHOTO 1, THIS SHEET. SENSOR EQUIPMENT TO BE REINSTALLED WITH COOPERATION/DIRECTION FROM OBSERVATORY PERSONNEL. SET NEW TRIPOD WITH ASSOCIATED CONCRETE MASONRY BALLAST ON NEW COMPATIBLE WALKWAY PADS AFTER NEW ROOFING IS INSTALLED. CONTRACTOR TO PROVIDE NEW SUPPORT AND BALLAST EQUIPMENT AS PART OF THE WORK OF THIS CONTRACT. PRIOR TO PURCHASING THE EQUIPMENT, SUBMIT DATA SHEETS FOR PRIOR APPROVAL.
  - CONDUITS W/WEATHERHEADS TO REMAIN, ADJUST TRIM TO ACCOMMODATE SAME.
  - UNUSED METEOROLOGY SENSOR, MOUNT AND ANCHORS TO BE REMOVED.

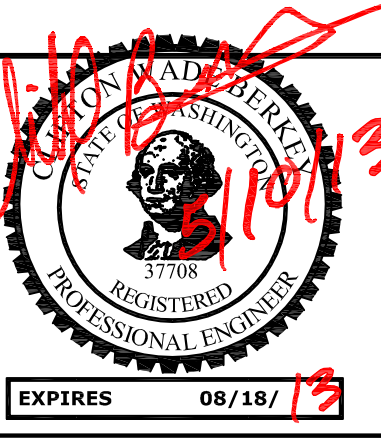


**CORNER STATION ROOF PLANS: LASER VACUUM EQUIPMENT AREA**

1" = 12' A2

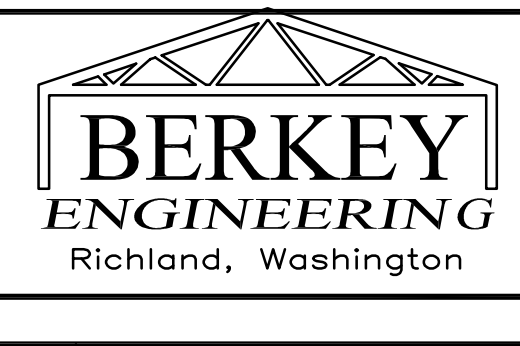
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REV	DATE	BY	APPROVED	APPROVED

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 CHECKED BY: CLIFF BERKEY  
 DESIGN A/E: CWB DESIGN GM: RWB  
 HDI APPROVAL:



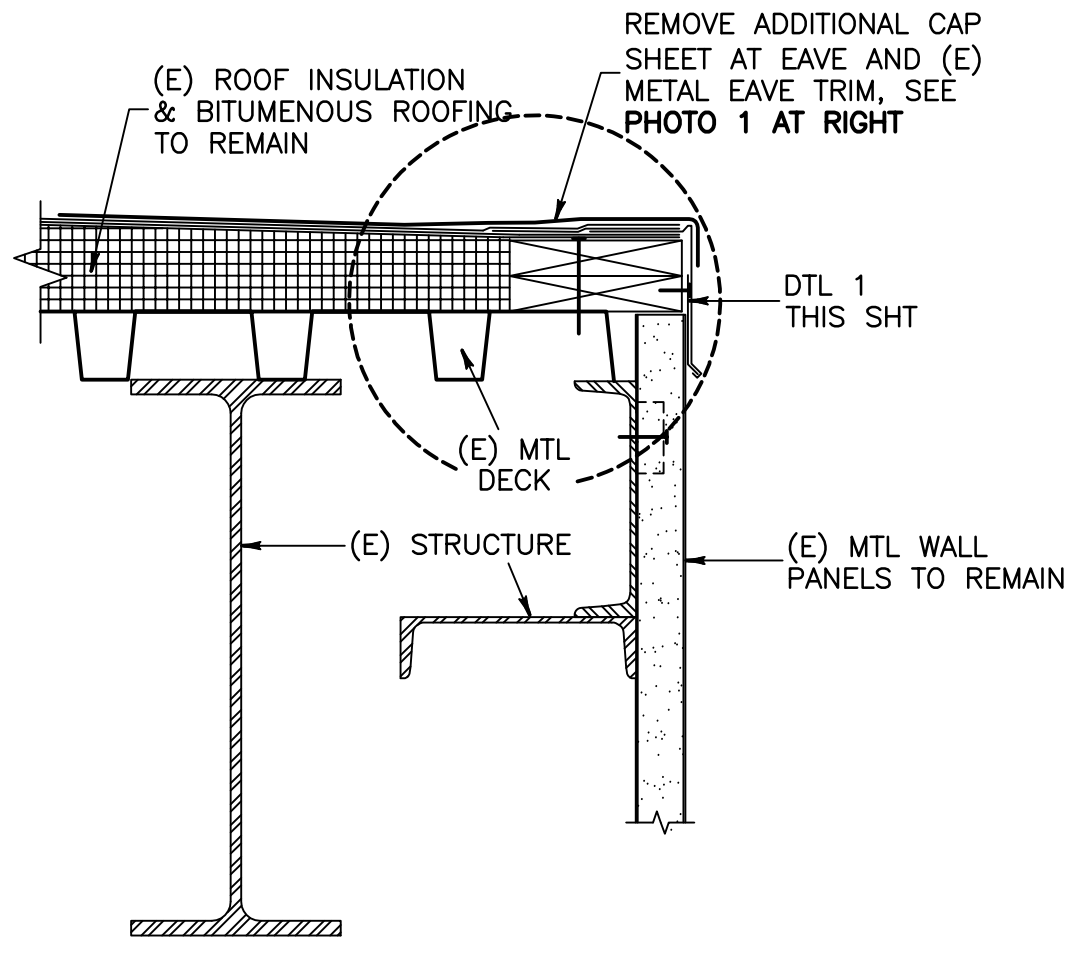
**CORNER STATION ROOF PLANS  
 LASER VACUUM EQUIPMENT AREA (LVEA)**

PROJECT NUMBER: 12258.0 CAD FILE: 12258A2.DWG

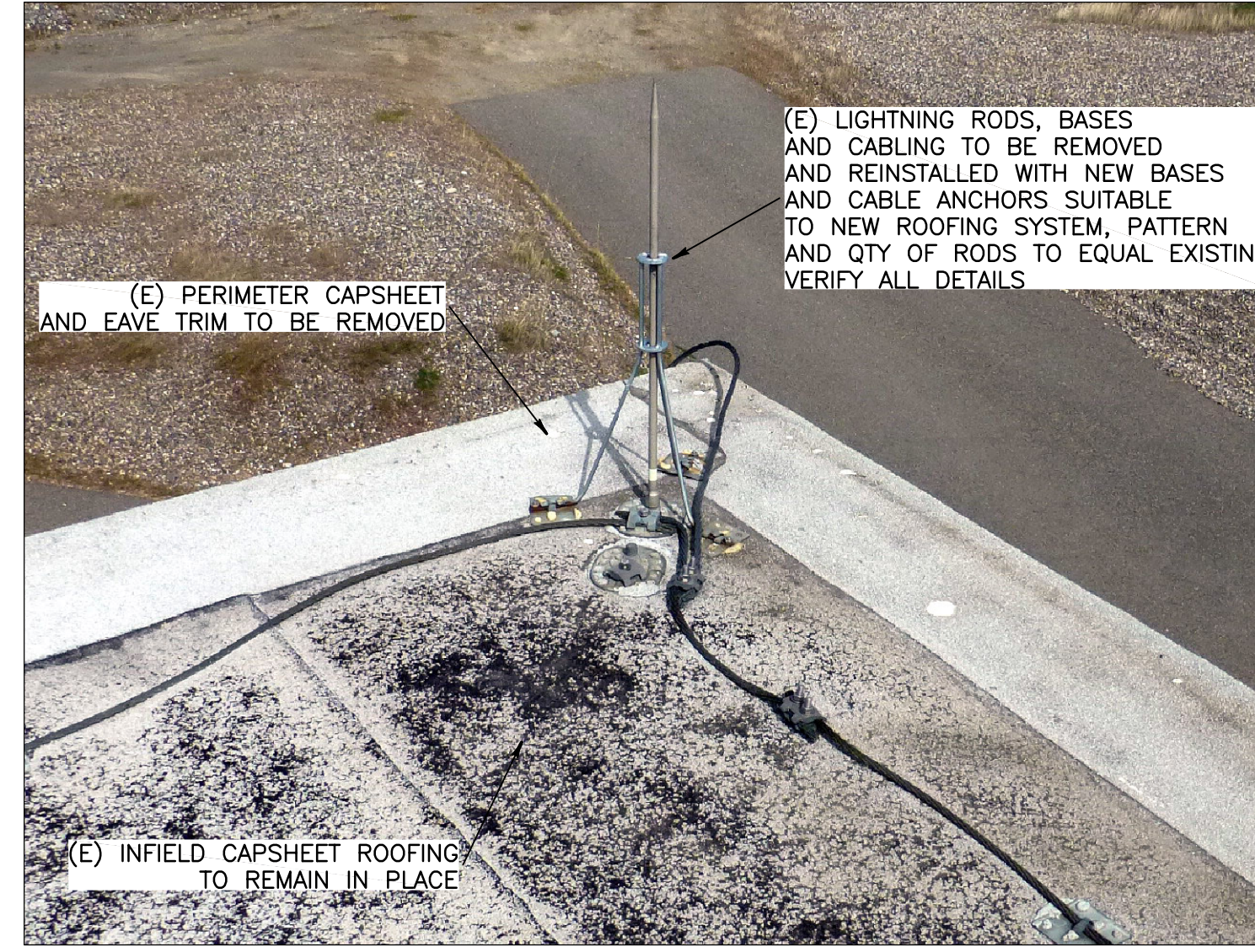


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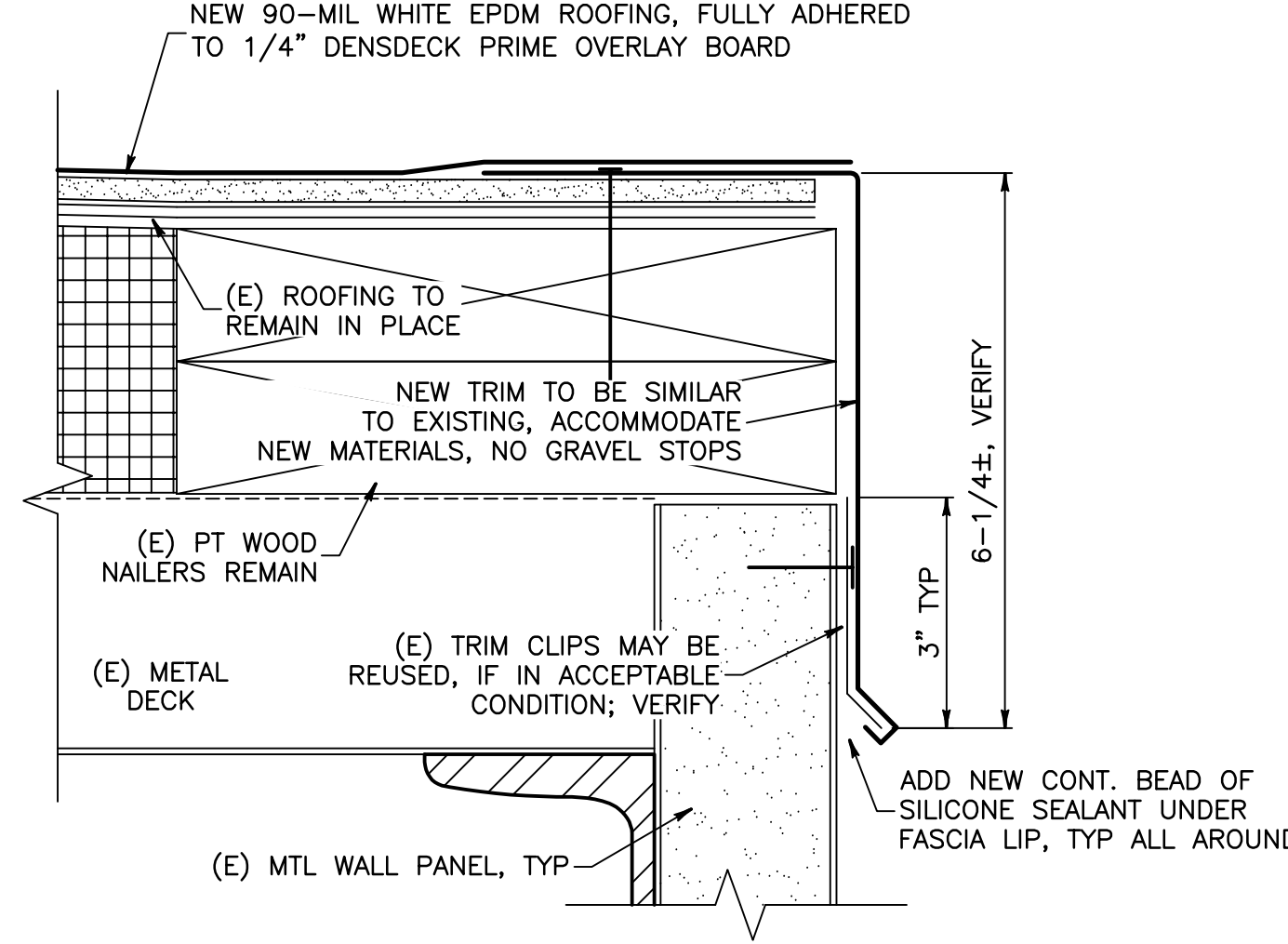
LIGO-D1300361  
 v2 3of5  
 DRAWING NUMBER: REV. 0 v2



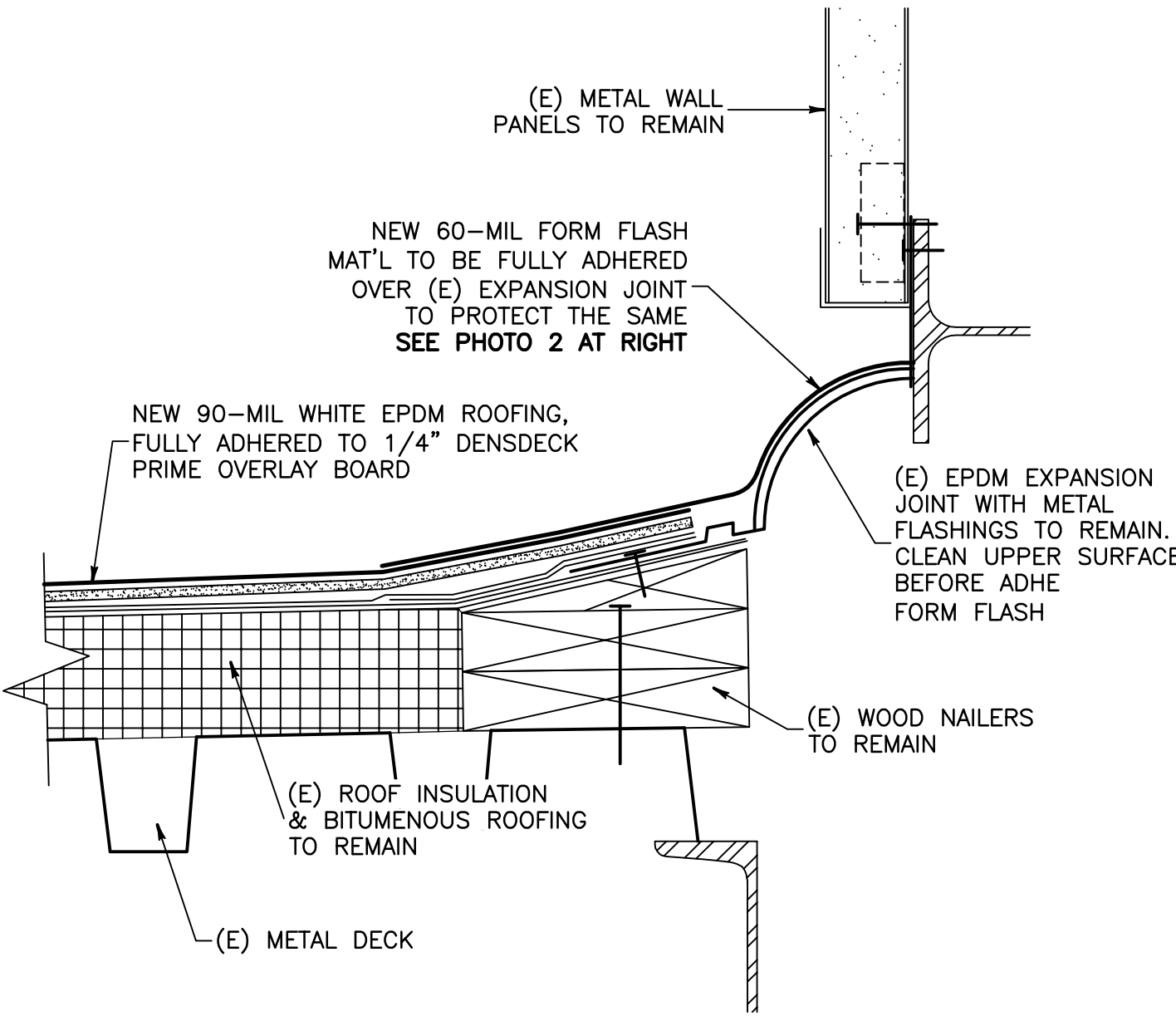
**SECTION A**  
EXISTING EAVE CONDITION  
REF 1-1/2" = 1'-0"



**PHOTO 1**  
EXISTING EAVE CONDITION  
REF



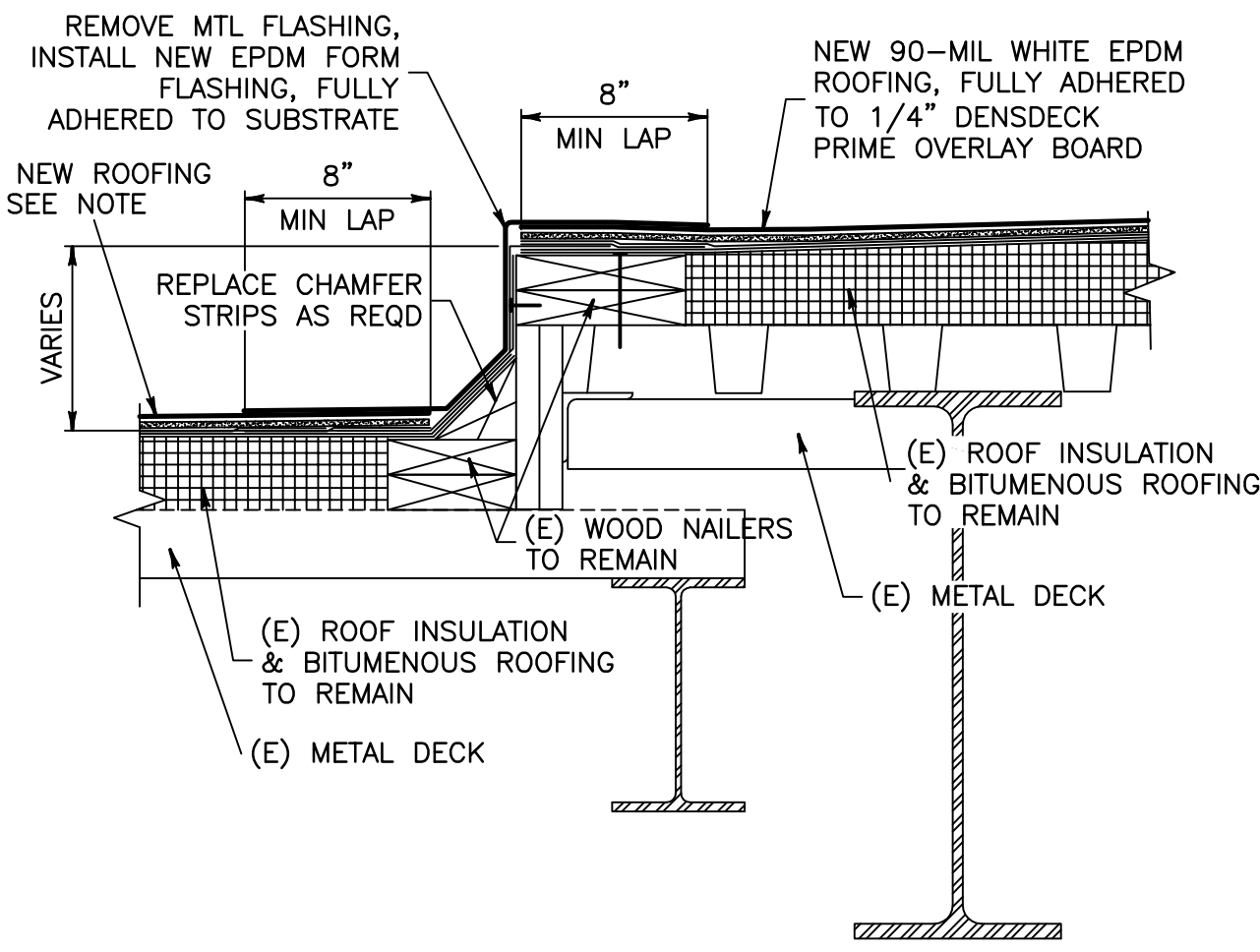
**DETAIL 1**  
NEW EAVE CONDITION  
REF HALF SCALE



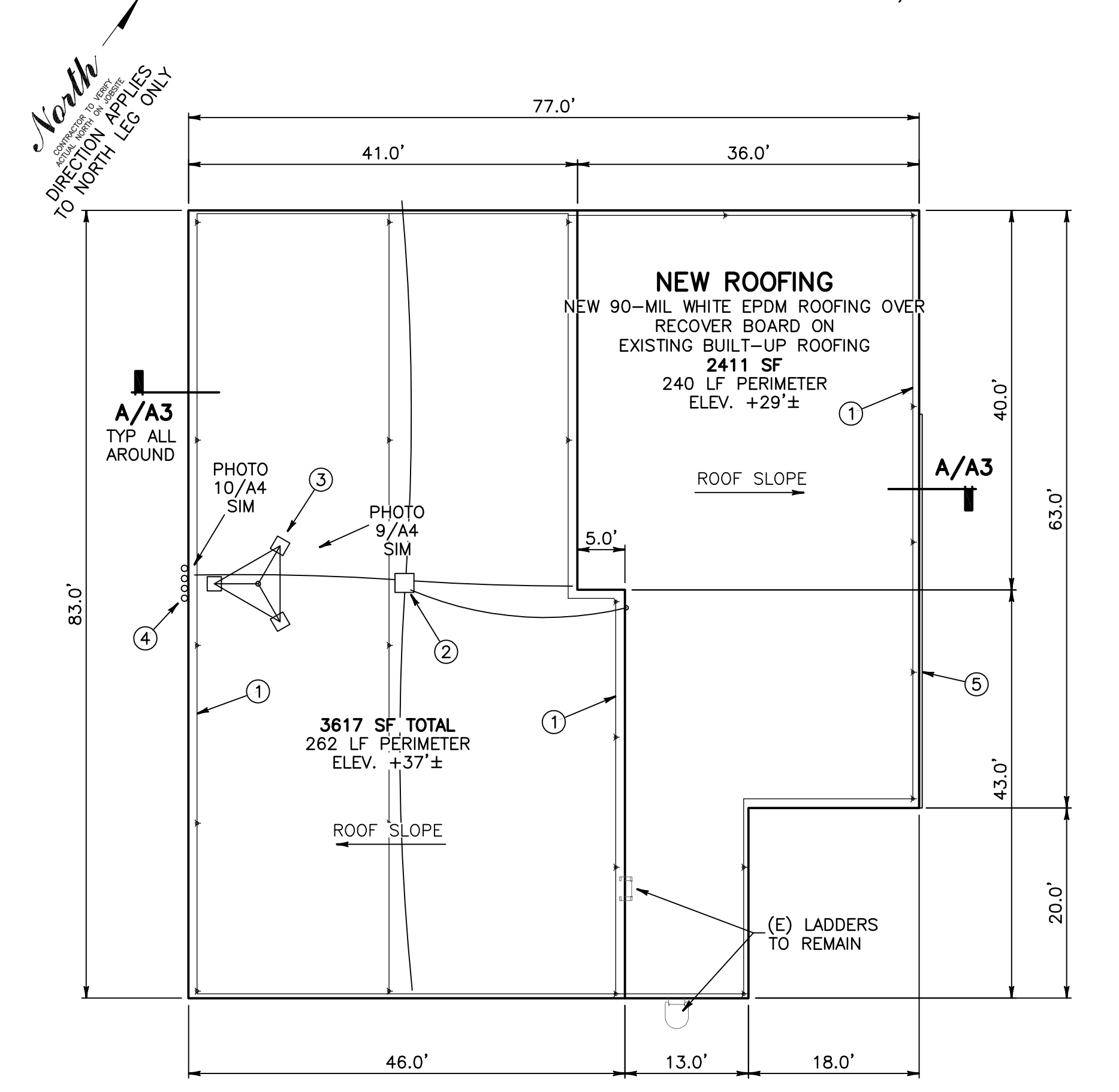
**SECTION B**  
EXPANSION JOINT FLASHING DETAIL  
REF 3" = 1'-0"



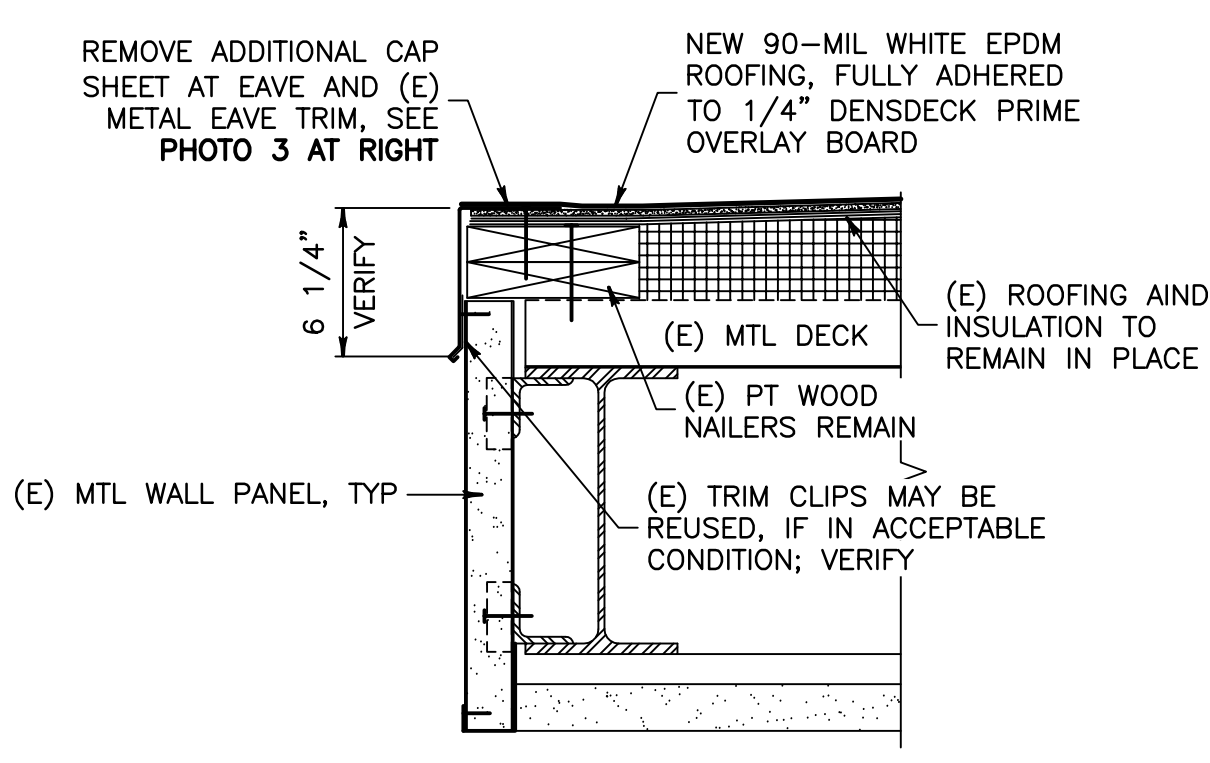
**PHOTO 2**  
EXISTING EXPANSION JOINT CONDITION  
REF



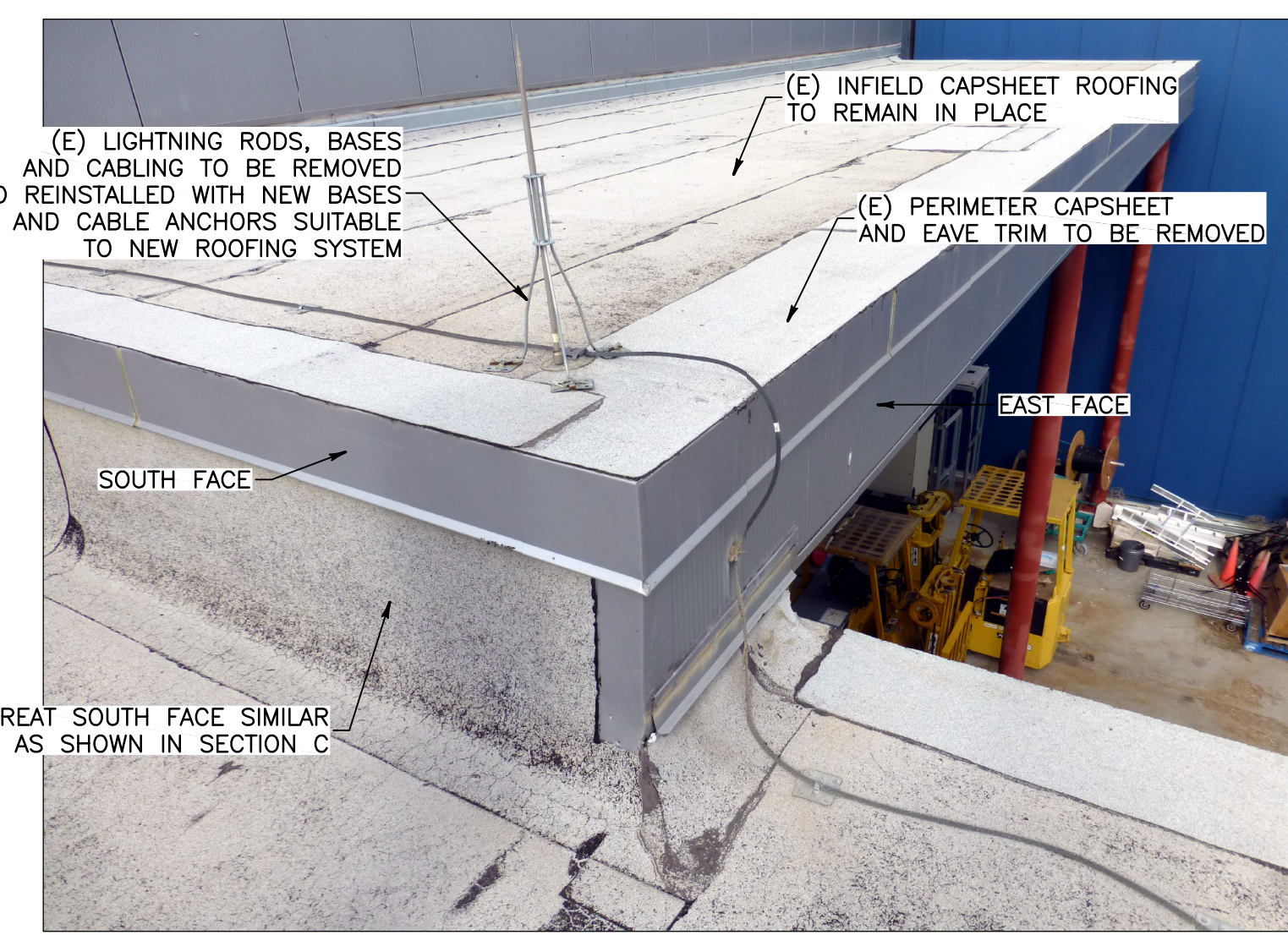
**SECTION C**  
ROOF TRANSITION  
REF 1-1/2" = 1'-0"



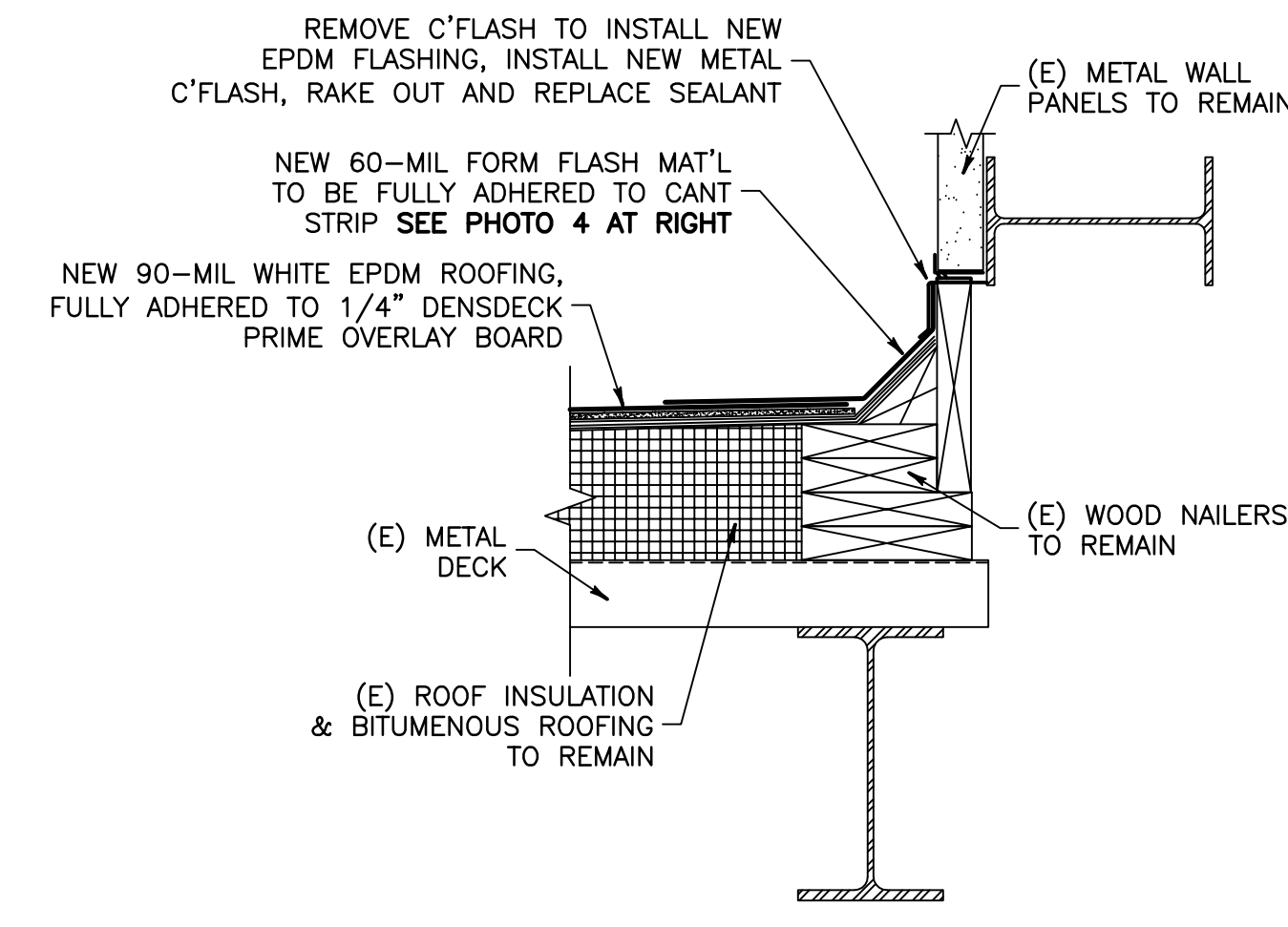
**MID- AND END-STATIONS: ROOF PLAN**  
NORTH LEG STATIONS AS SHOWN. WEST LEG STATIONS ARE MIRROR-IMAGE TYPICAL 4 PLACES  
1" = 12'



**SECTION D**  
LOADING DOCK EAVE CONDITION  
REF 1-1/2" = 1'-0"



**PHOTO 3**  
EXISTING LOADING DOCK CONDITION  
REF



**SECTION E**  
ROOF TRANSITION  
REF 1-1/2" = 1'-0"

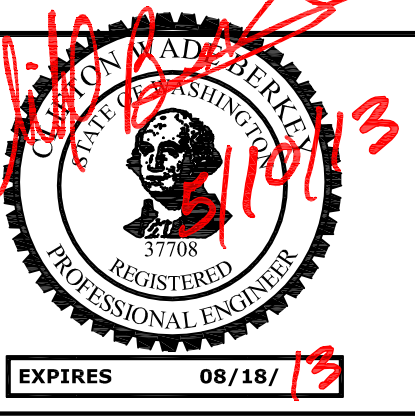


**PHOTO 4**  
FLASHING DETAIL  
REF

- KEY NOTES:**
- (E) LIGHTNING PROTECTION SYSTEM TO BE REMOVED AND REINSTALLED, SEE PHOTO 1/A3.
  - SENSOR BOX AND CABLES TO BE REMOVED AND RESET, SEE PHOTO 11/A4.
  - ROOF-MNTD WEATHER DATA SENSORS TO BE REMOVED AND RESET ON SUITABLE WALKWAY PADS AFTER NEW ROOFING IS INSTALLED.
  - CONDUITS W/WEATHERHEADS TO REMAIN, ADJUST TRIM TO ACCOMMODATE SAME.
  - THIS NOTE APPLIES TO THE MID-STATION ON THE WEST LEG ONLY:** ADD LENGTH OF 4" GUTTER TO NEW EAVE FLASHING, FROM 10'-0" WEST OF THE CENTERLINE OF THE (E) OVERHEAD DOOR, EXTENDING TO THE NEXT BUILDING CORNER EAST OF THE SAME; ADD (3) DOWNSPOUTS AND SPLASH BLOCKS AT GRADE. (NOTE: ARRANGEMENT SHOWN BELOW IS MIRROR-IMAGE OF EXISTING CONDITIONS AT THIS MID-STATION)

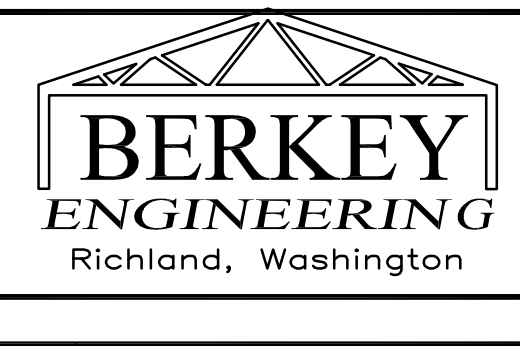
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05/10/13	RWB		
REV No	DATE	BY	APPROVED

DRAWN BY:	RWB
CHECKED BY:	CLIFF BERKEY
DESIGN A/E:	CWB
DESIGN G/M:	RWB



**ROOF PLANS  
MID- AND END-STATIONS;  
SECTIONS, DETAILS**

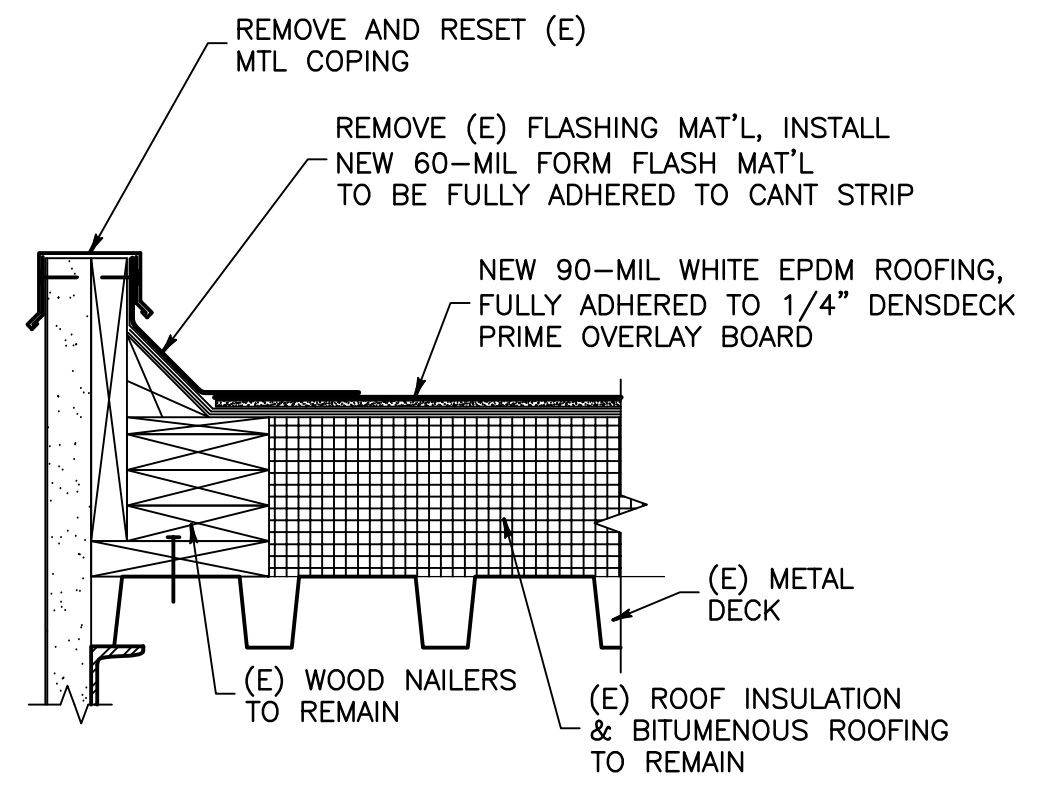
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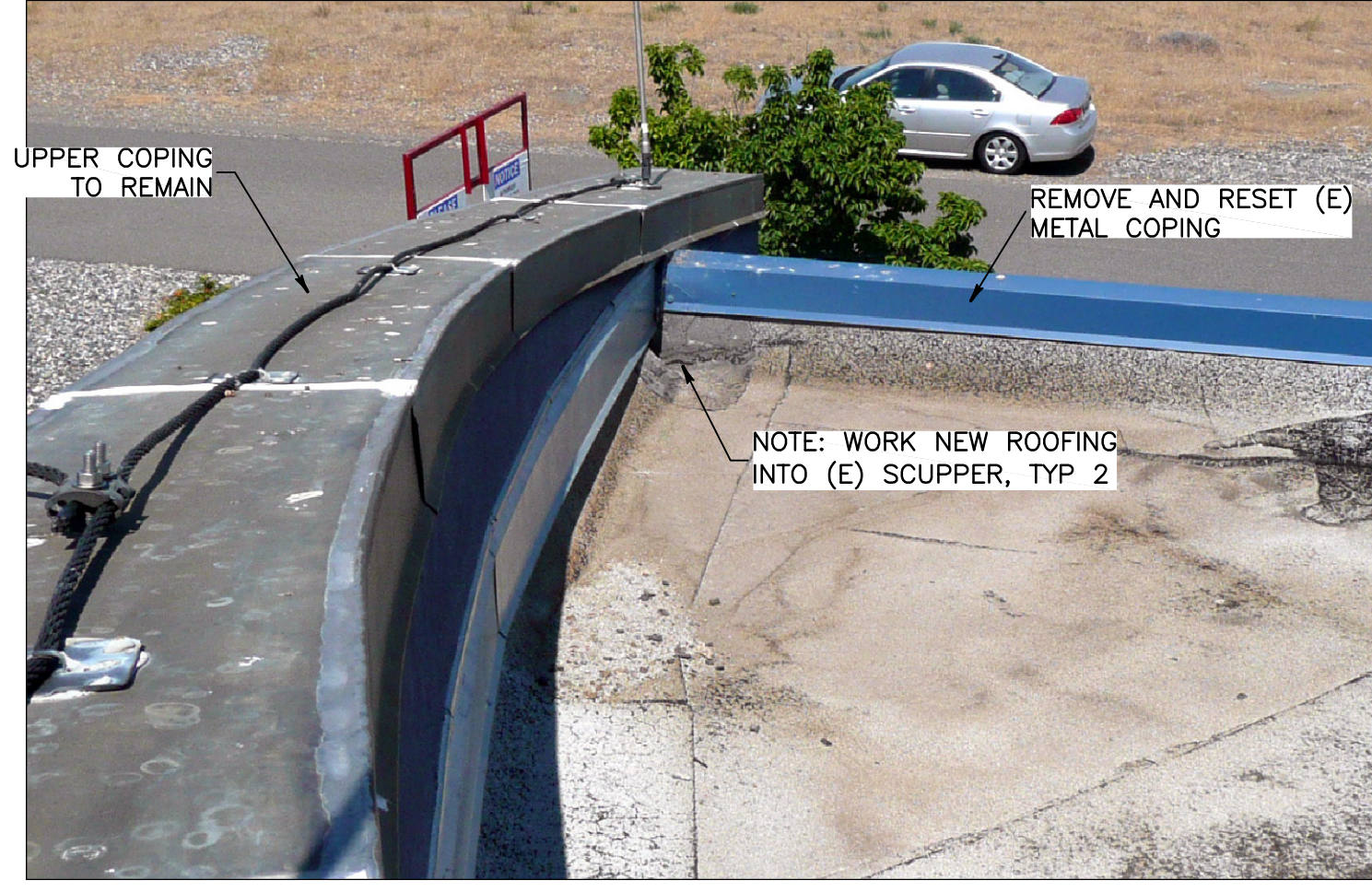
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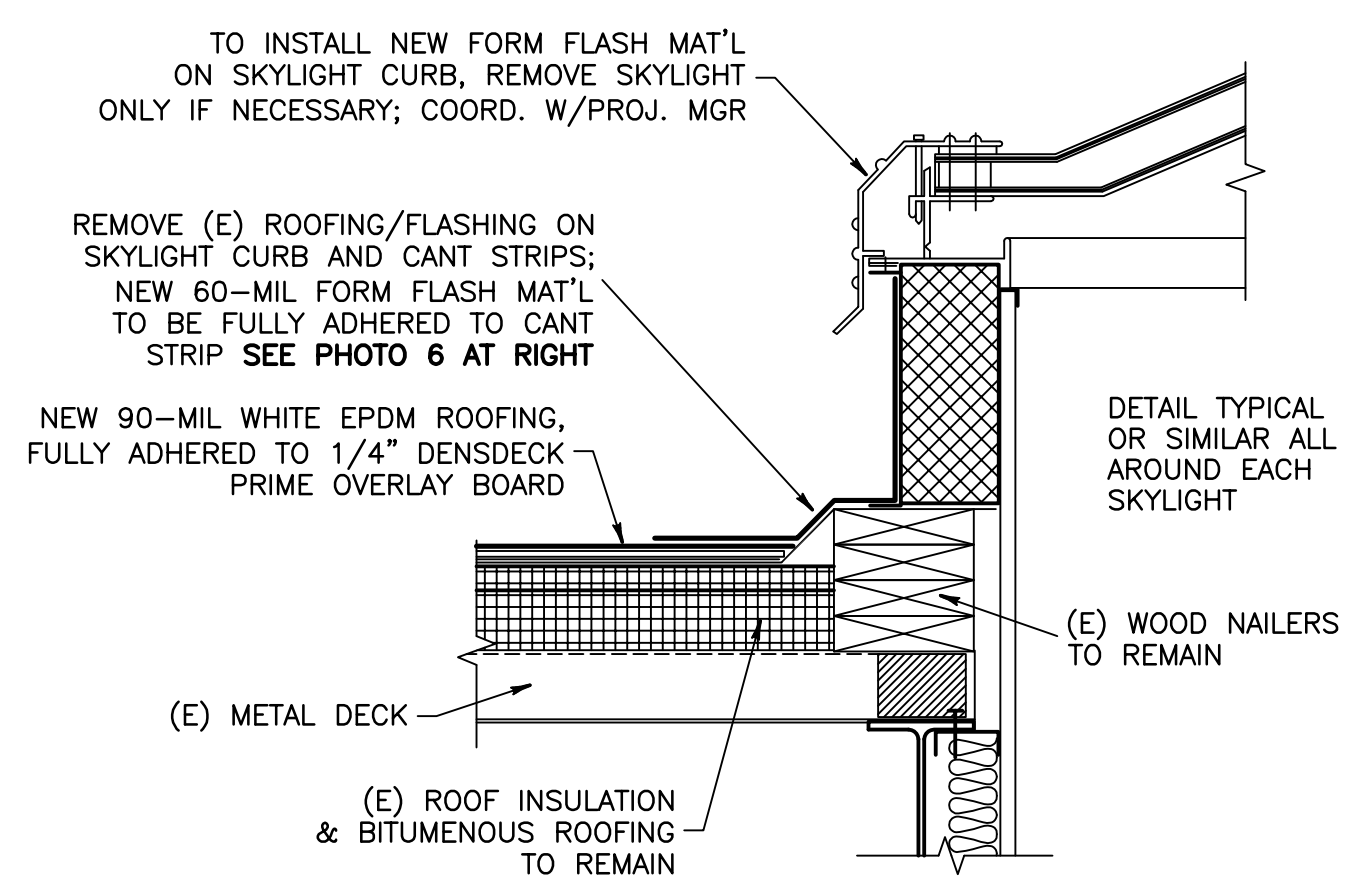
LIGO-D1300361	0
v2 4of5	v2
DRAWING NUMBER	REV.



**SECTION F** ENTRANCE CANOPY EDGE CONDITION  
REF 1-1/2" = 1'-0"



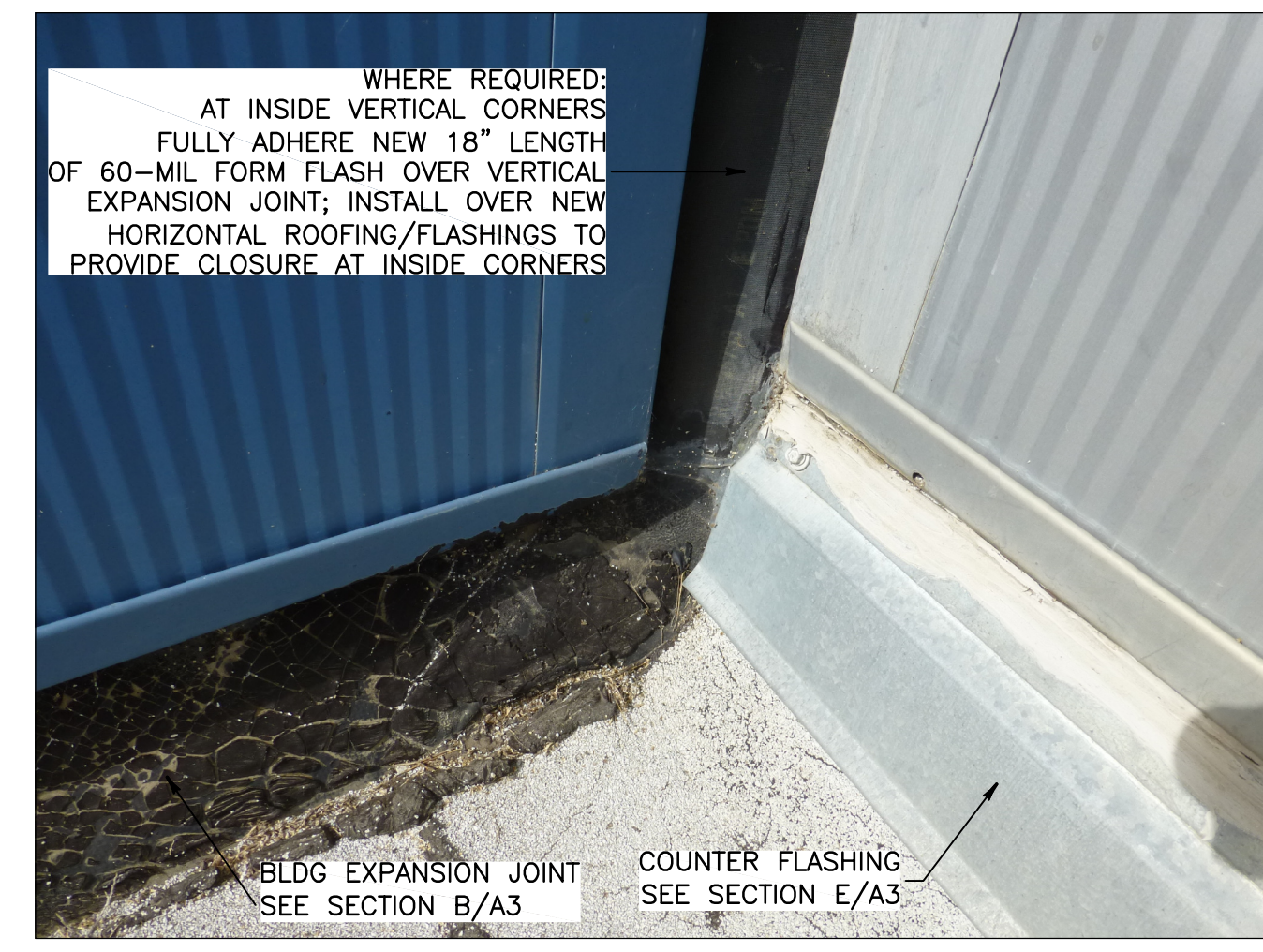
**PHOTO 5** EXISTING EAVE CONDITION  
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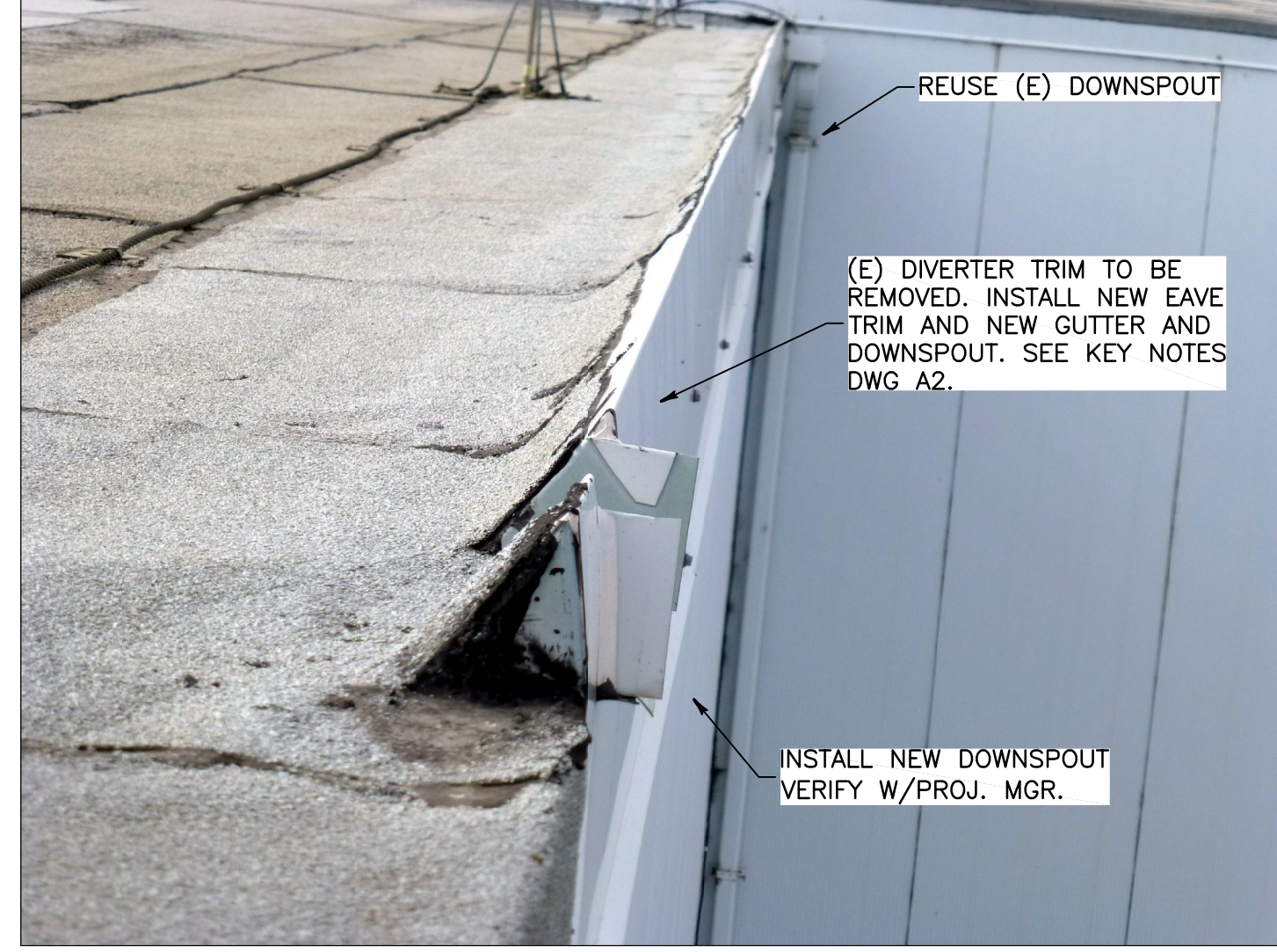
**SECTION G** NEW EAVE CONDITION  
REF HALF SCALE



**PHOTO 6** SKYLIGHT PERIMETER CONDITION  
REF



**PHOTO 7** EXISTING EXPANSION JOINT CORNER CONDITION  
REF



**PHOTO 8** FLASHING, GUTTER CONDITION  
REF



**PHOTO 9** METEOROLOGY STATION CONDITION  
REF



**PHOTO 10** WEATHERHEADS CONDITION  
REF

OBSERVATION DECK SECURITY CAMERA JUNCTION BOX



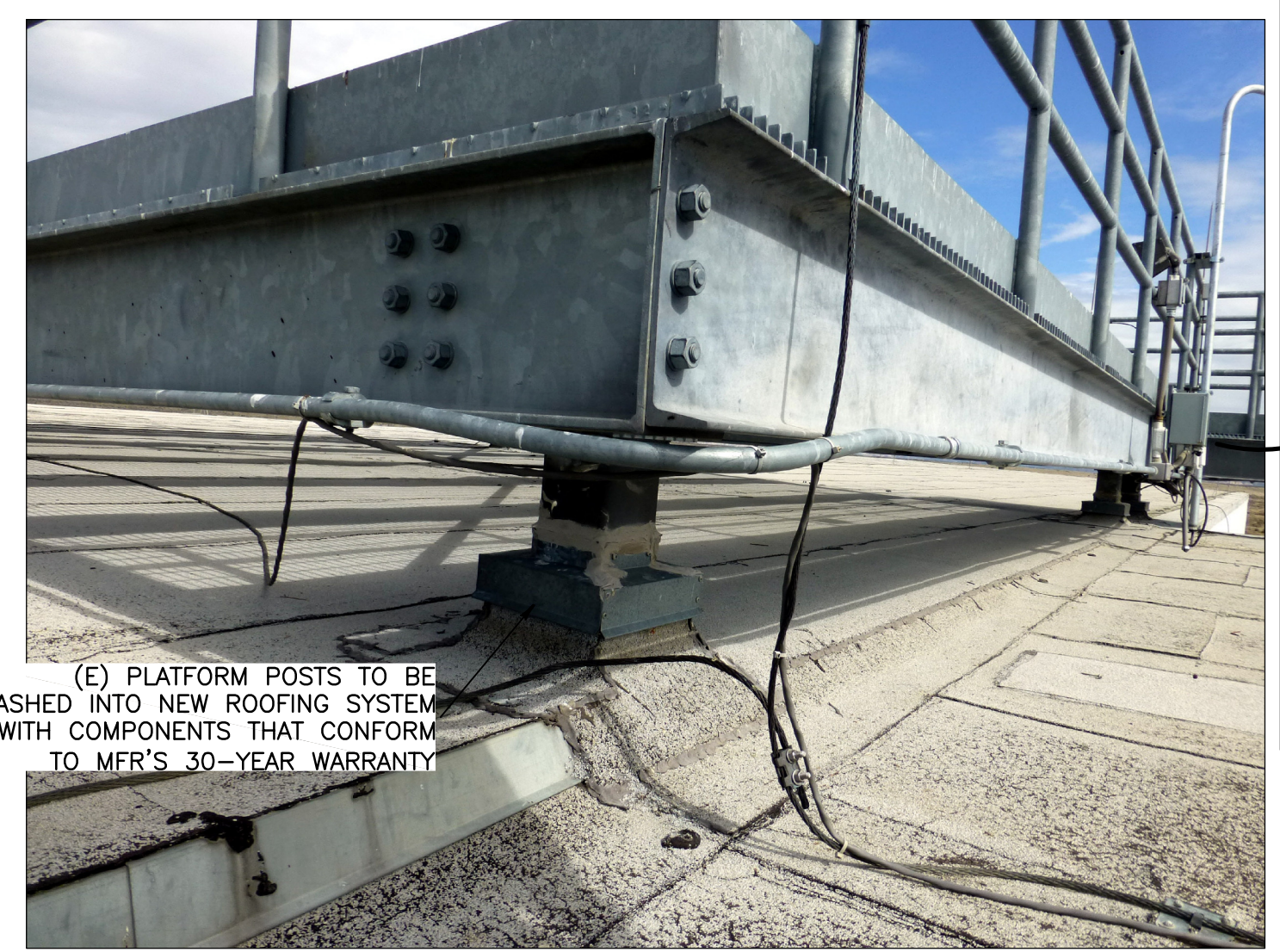
**PHOTO 11** (E) SENSOR BOX AND CABLING CONDITION



**PHOTO 12** EXISTING PLATFORM PEDESTAL CONDITION



**PHOTO 13** EXISTING LANDING CONDITION  
REF



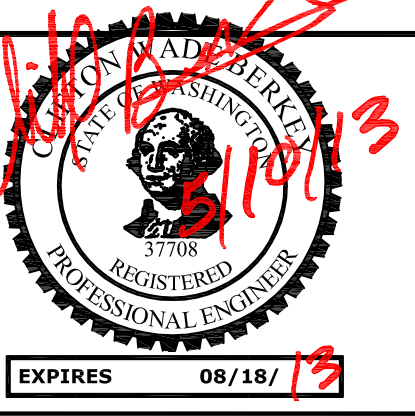
**PHOTO 14** OBSERVATION DECK SUPPORT CONDITION  
REF

NOTE: CABLES FOR SECURITY CAMERA CAN BE RELOCATED WITH CAUTION AS NEEDED FOR THE INSTALLATION OF NEW ROOFING, BUT THE CAMERA MUST REMAIN IN SERVICE.

0	5/10/13	RWB	APPROVED FOR CONSTRUCTION	GH
REV	DATE	BY	APPROVED	

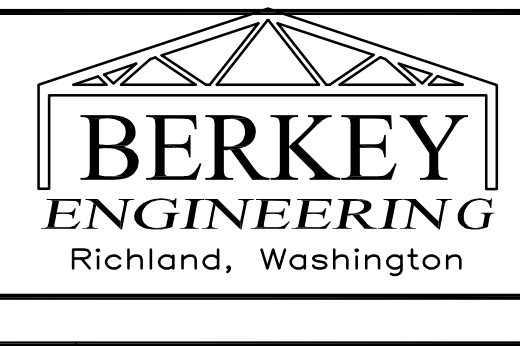
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CHECKED BY:	CLIFF BERKEY
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DESIGN GM:	RWB
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**SECTIONS, DETAILS, PHOTOS**

PROJECT NUMBER: 12258.0 CAD FILE: 12258A4.DWG



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