

EXISTING ROOF CONSTRUCTION:
BALLASTED EPDM ON LIGHTWEIGHT INSULATING CONCRETE OVER METAL DECK

R-VALUE AT EXISTING LWC INSULATING AT BUILDING PERIMETER:
9" LWC AT 1.49 PER INCH = R-3.725
7" EXP. AT 13.8 PER INCH = R-2.6
TOTAL = R-30.325

R-VALUE AT EXISTING LWC INSULATING DECK 4'-0" FROM ROOF DRAIN:
2.5" LWC AT 1.49 PER INCH = R-3.725
2.5" EXP. AT 13.8 PER INCH = R-3.5
TOTAL = R-13.225 (MINIMUM)

INSULATION TYPE (PER DOE INSULATION FACT SHEET)

FIBER GLASS BLANKET OR BATT	2.9 to 3.8	(avg. 3.2)
FIBER GLASS BATT	3.7 to 4.3	(avg. 3.8)
LOOSE FILL FIBER GLASS	2.3 to 2.7	(avg. 2.5)
LOOSE FILL ROCK WOOL	2.7 to 3.0	(avg. 2.8)
PERFECT OR VERMICULITE	2.4 to 3.7	(avg. 3.1)
EXPANDED POLYSTYRENE BOARD	3.8 to 5.0	(avg. 4.4)
EXTRUDED POLYSTYRENE BOARD	4.5 to 5.0	(avg. 4.8)
POLYISOCYANURATE BOARD, UNFACED	5.8 to 6.3	(avg. 5.8)
POLYISOCYANURATE BOARD, FACED	7.0 to 7.5	(avg. 7.2)
SPRAY POLYURETHANE FOAM	5.6 to 6.3	(avg. 5.9)

INSULATION TYPE (NON-DOE SOURCE)

CELLULAR LIGHTWEIGHT CONCRETE	1.0 to 2.22	(avg. 1.62)
VERMICULITE LIGHTWEIGHT CONCRETE	3.9 to 1.48	(avg. 1.62)
GYPSUM	0.5	
CONCRETE	3	

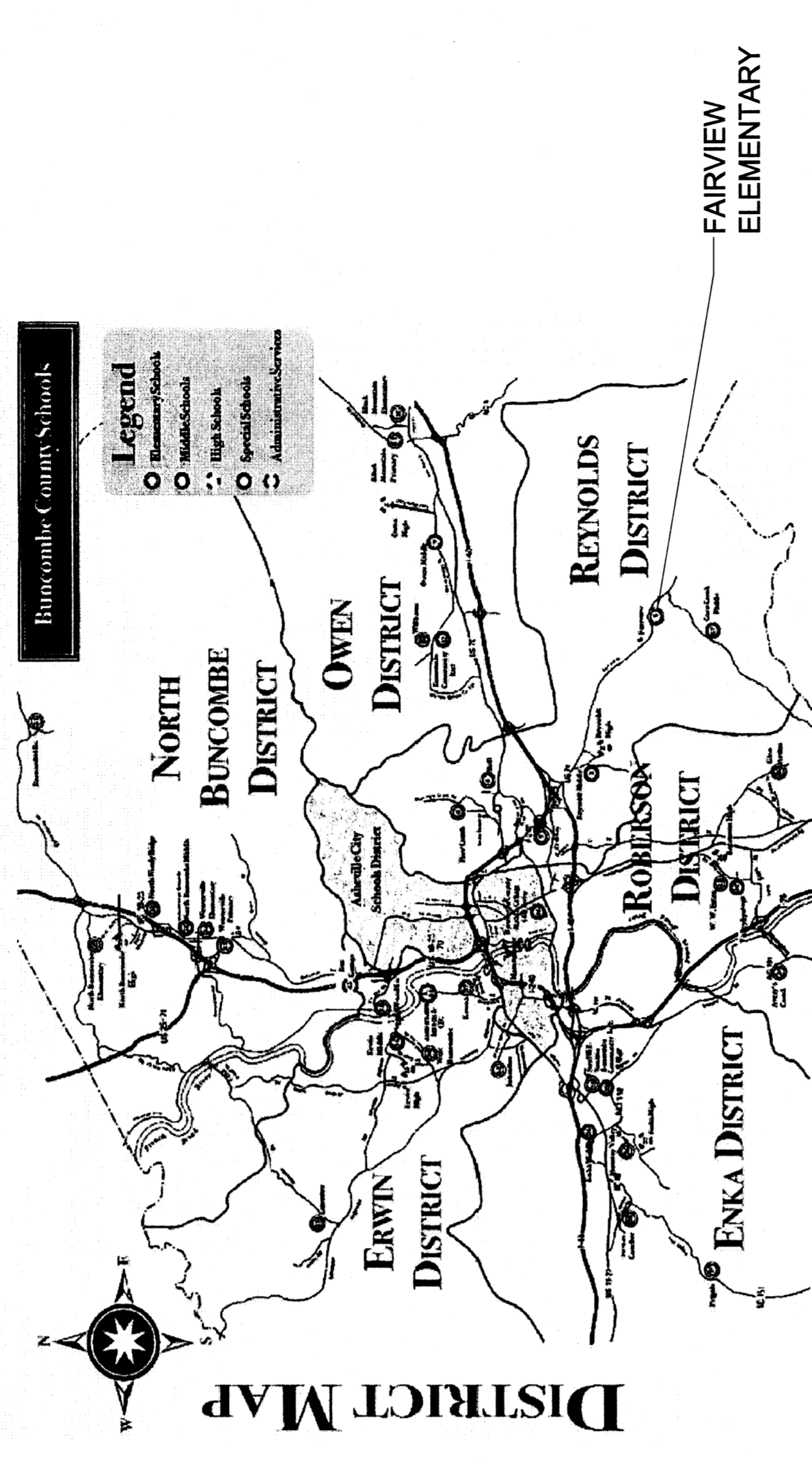
ADD 3" POLYISOCYANURATE OVER WHOLE ROOF:
TOTAL = R-30.625 (MINIMUM)
(R-48 PERIMETER)

ADD 1 1/2" POLYISOCYANURATE INSULATION:
TOTAL = R-22 (MINIMUM)
(R-38 PERIMETER)

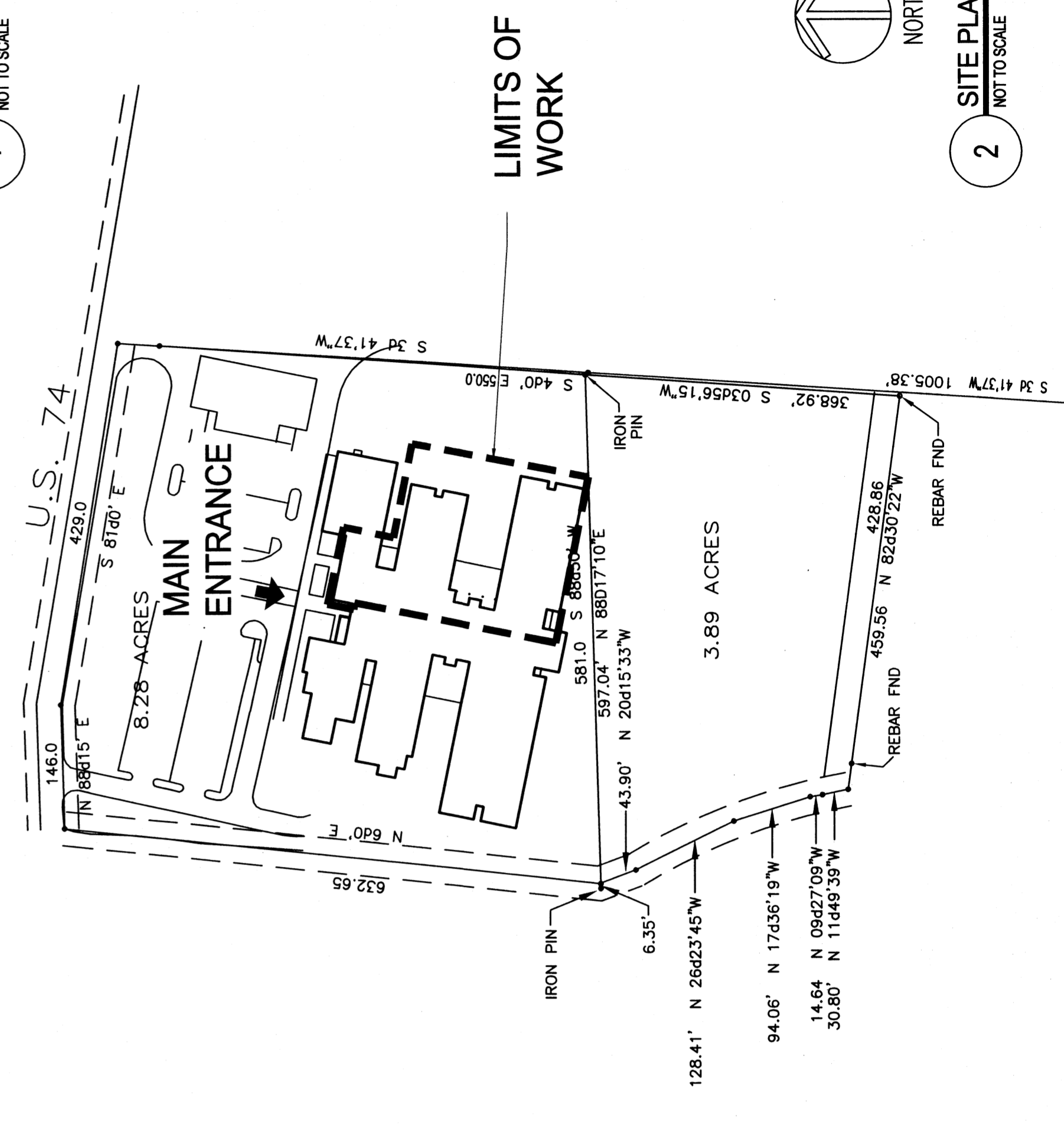
AT LOCATIONS NOTED BELOW WHERE THE EXISTING ROOF ADJOINS A WALL AND MUST TERMINATE BELOW AN EXISTING THRU-WALL FLASHING, PROVIDE:
1 1/2" POLYISO AT R-5.8 PER INCH = R-8.7
(2009 NC BUILDING CODE SECTION 104.10)



3 ENERGY CODE
SCALE: 1" = 30'-0"

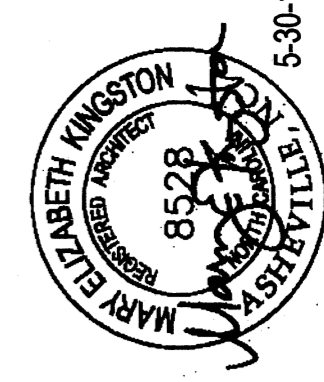


1 VICINITY MAP
NOT TO SCALE



2 SITE PLAN
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COVER

DESIGNED BY: MBK
DATE: MAY 30, 2012
PROJECT CODE:

EXISTING ROOF CONSTRUCTION INFORMATION

SURFACING: 0.45 EPDM - BALLASTED
INSULATION: LIGHTWEIGHT INSULATING CONCRETE
ROOF DECK: METAL

LEGEND

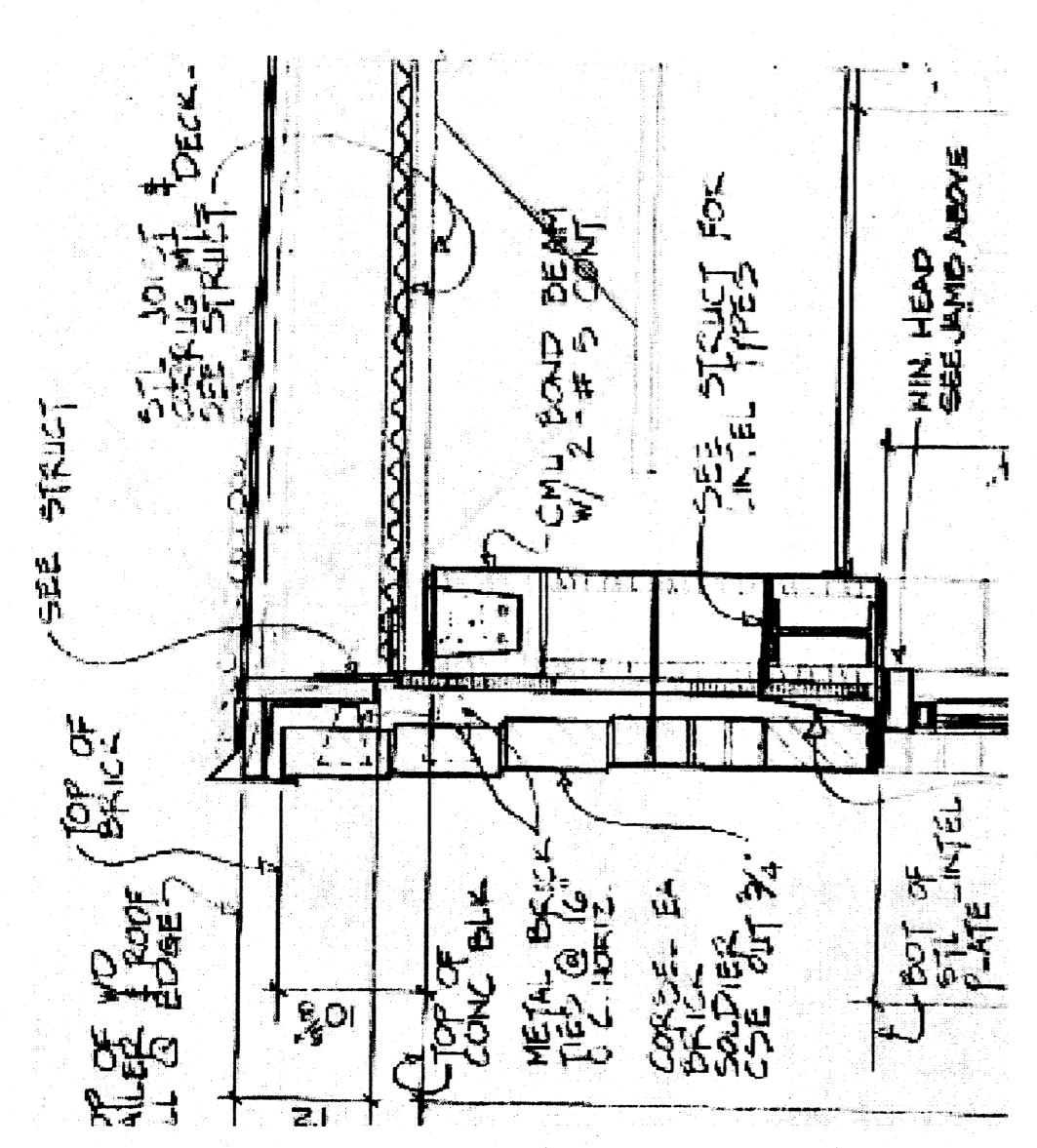
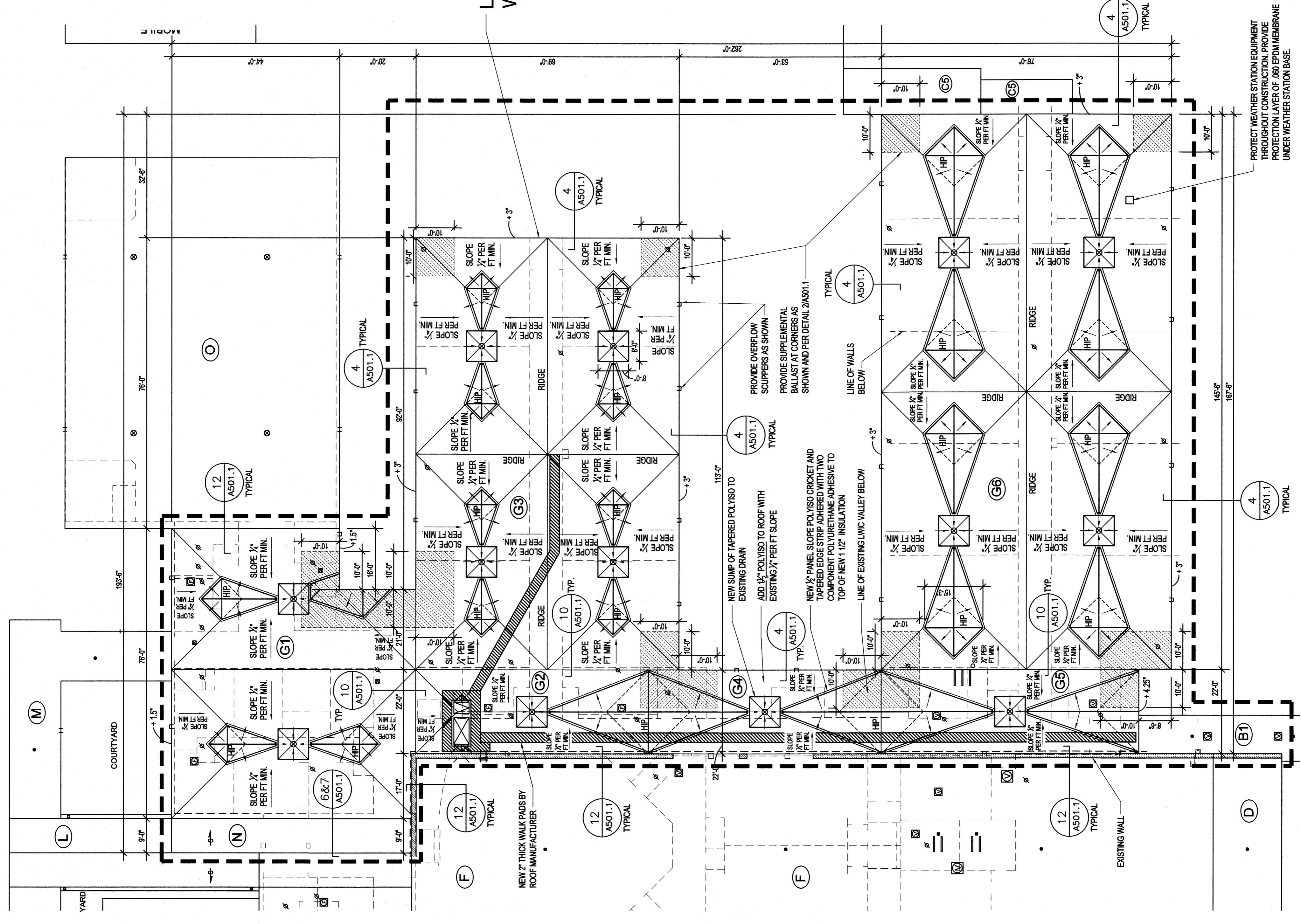
	PARAPET WALL
	ROOF EDGE
	CONDUIT
	DRAIN PIPING
	CONTROL EXPANSION JOINT
	ROOF AREA DIVIDER
	DOWNSPOUT
	THRU-WALL SCUPPER
	PRIMARY ROOF DRAIN
	PIPE PENETRATION
	SOIL STACK
	CONDUIT, GAS PIPES
	PITCH POCKET
	GRAVITY VENT/VENTILATOR
	EQUIPMENT CURB
	ROOF HATCH
	SKYLIGHT
	SUPPORT CURB (SLEEPERS)
	CHIMNEY
	VACANT CURB
	DETAIL NUMBER
	PHOTOGRAPH LOCATOR
	ROOF LADDER
	SECONDARY ROOF DRAIN
	HOT STACK
	ELEVATION CHANGE
	OVERFLOW ROOF DRAIN PIPE
	THRU-EDGE SCUPPER
	WALKPAD
	SECTOR DESIGNATION

LIMITS OF WORK

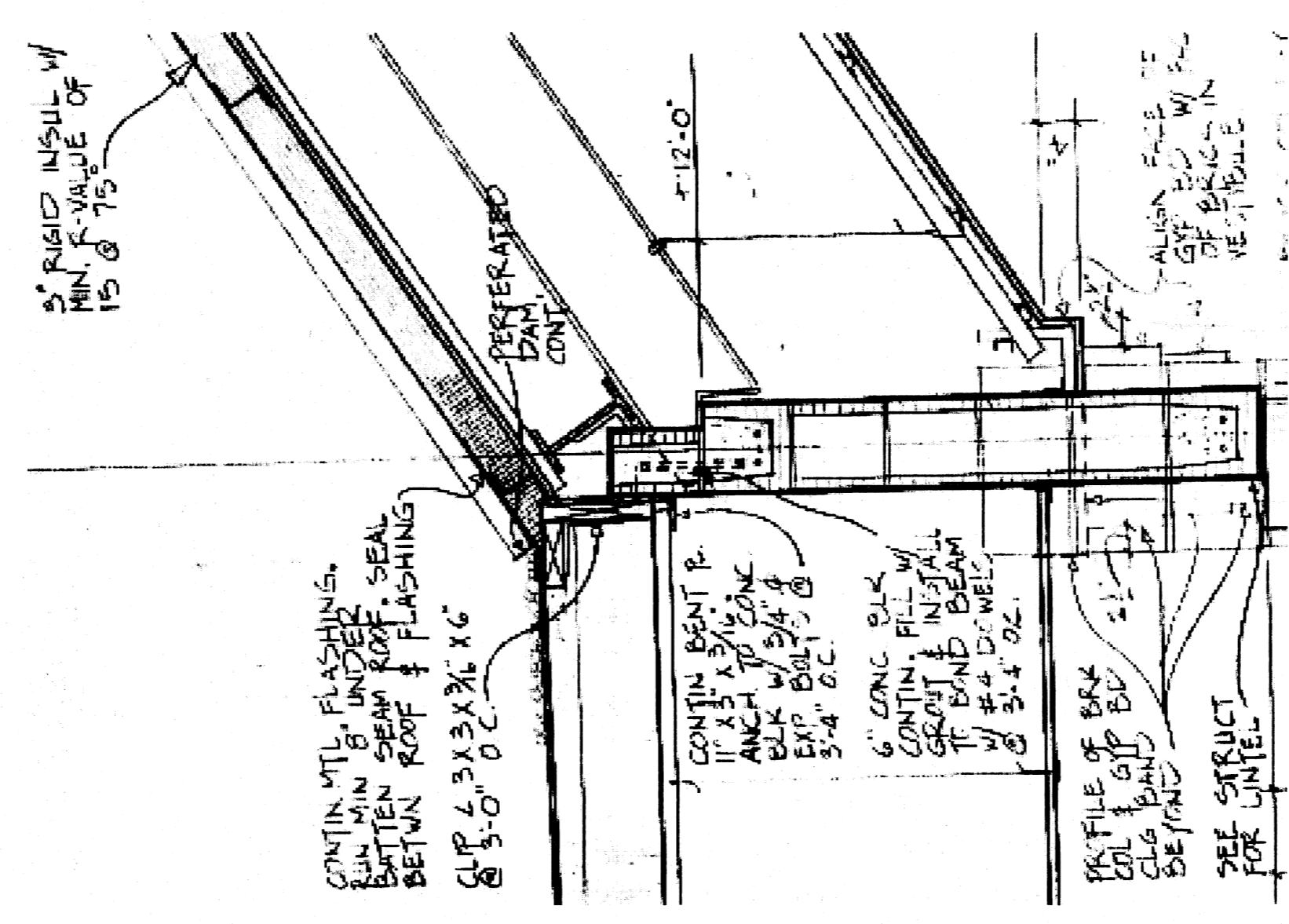
GENERAL NOTES:

1. PROVIDE POSITIVE DRAINAGE AT ALL POINTS ON ROOF.
2. PROVIDE .060 EPDM MEMBRANE WITH BALLAST ENHANCEMENT AT CORNERS AND ADDITIONAL INSULATION AS NOTED.
3. ROOF AREAS G1 & G2: INSTALL 2 LAYERS OF 1/2" INSULATION, ADD VALERS, RETROFIT ROOF DRAINS, EXPANSION JOINTS, NEW FLASHINGS AND NEW ROOF SYSTEM ON EXISTING LIGHTWEIGHT INSULATING CONCRETE DECK.
4. ROOF AREAS G1, G2, G4 & G5: PROVIDE ONLY ONE LAYER OF 1/2" THICK INSULATION. PROVIDE ONLY ONE NEW WALKER AT PERIMETER. SUMP NEW INSULATION TO DRAINS. DRAINS ARE NOT RETROFITTED AT THESE ROOF AREAS.
5. ROOF AREA N: PROVIDE POLYISO INSULATION BETWEEN METAL RISERS AND NEW EPDM MEMBRANE.
6. PROVIDE #4 OR #304 STAINLESS STEEL FASTENERS WHERE IN CONTACT WITH PRESSURE TREATED WOOD.
7. EXTEND EXISTING PIPES PER DETAIL 1/A501.1 AS REQUIRED TO PROVIDE LENGTH OF 12" ABOVE DECK.
8. EXTEND CURBS TO REMAIN ABOVE DECK 8" MINIMUM PER DETAIL 5/A501.1.
9. CONTRACTOR TO VERIFY CONDITION OF EXISTING VALERS. IF DECAYED, CONTACT OWNER TO VERIFY AND REPLACE PER UNIT PRICE.
10. IF CROSSING ANOTHER ROOF TO ACCESS ROOF UNDER CONTRACT, PROVIDE PROTECTION. ANY EXPENSES DUE TO DAMAGES TO OTHER ROOFS SHALL BE BORNE BY THE CONTRACTOR. PROTECT ALL ROOFS FROM DAMAGE. PROVIDE GUARANTEE. DAMAGES TO WARRANTED ROOFS SHALL BE REPAIRED AS REQUIRED BY WARRANTY AND COST BORNE BY THE CONTRACTOR.
11. PROVIDE ROOF DRAIN ALTERATIONS PER DETAIL 3/A501.1.
12. PROVIDE NEW 1/2" SLOPE PANEL, TAPERED POLYISO CRICKETS ADHERED WITH 2 COMPONENT POLYURETHANE ADHESIVE AS SHOWN.
13. AT ROOF DRAINS: PROVIDE ALL NEW STAINLESS STEEL BOLTS. PROVIDE NEW CAST IRON CLAMPING RING AND DOME IF REQUIRED.
14. PROVIDE POSITIVE DRAINAGE IN ALL AREAS.
15. PROVIDE ONE NEW ELECTRICAL PIPE PENETRATION PER DETAIL 9/A501.1 AT LOCATION COORDINATED IN FIELD FOR INSTALLATION OF TRANSMITTER PROVIDED BY BUNCOMBE COUNTY GOVERNMENT.

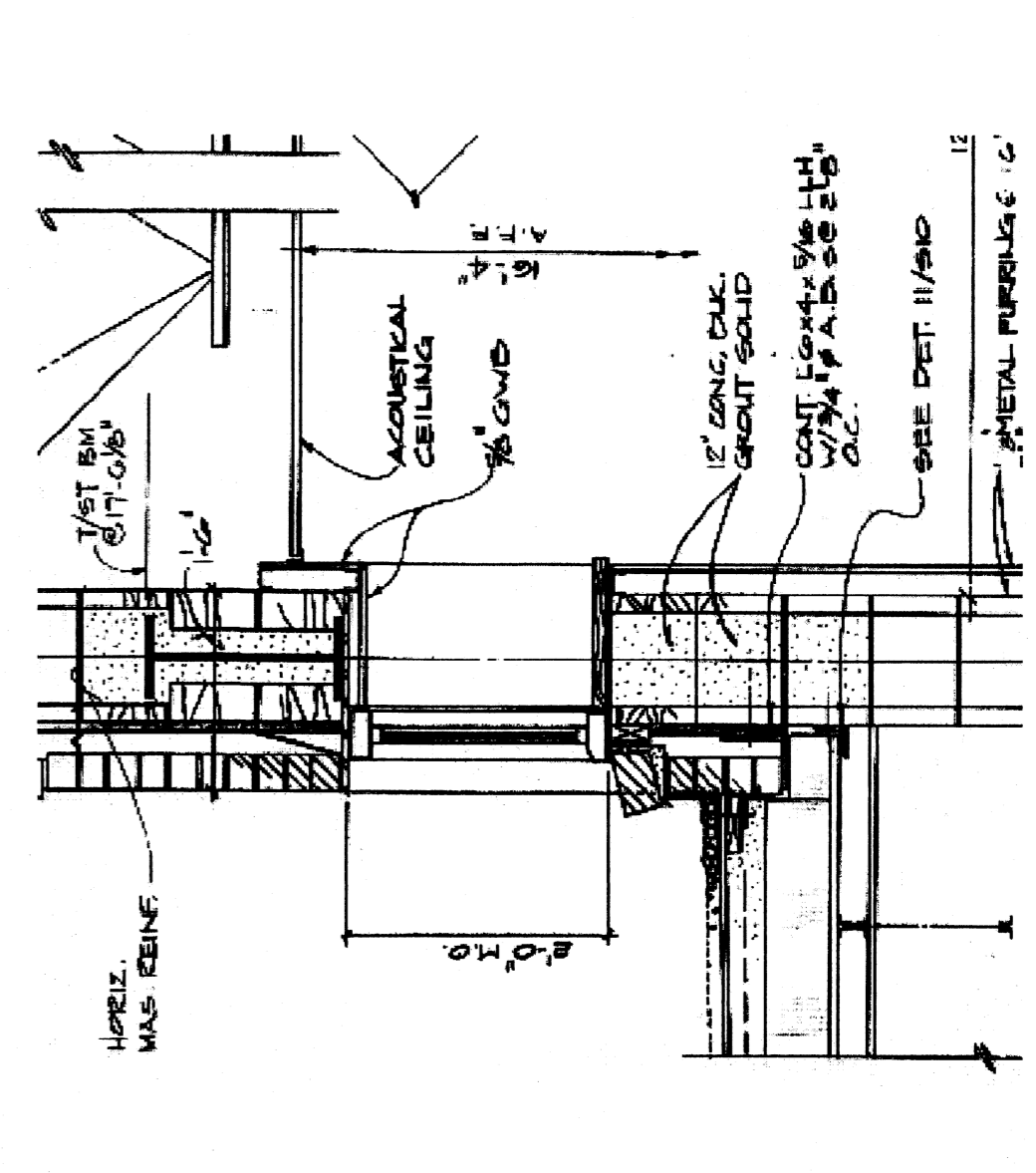
DIMENSIONS AND SQUARE FOOTAGES ARE PROVIDED FOR CONVENIENCE ONLY. CONTRACTOR TO VERIFY INFORMATION.



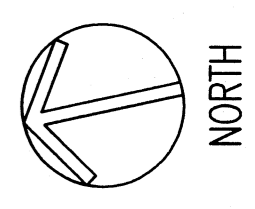
3 EXISTING ROOF EDGE DETAIL
NOT TO SCALE



4 EXISTING DETAIL
NOT TO SCALE

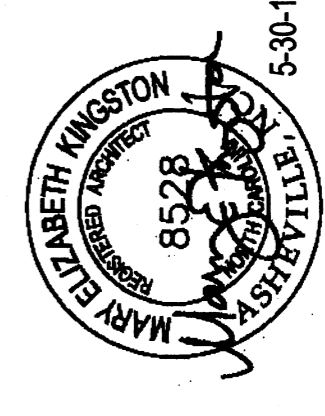


5 EXISTING WINDOW / ROOF DETAIL
NOT TO SCALE



1 ROOF PLAN
SCALE: 1/8" = 1'-0"

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A102.1

DESIGNED BY: MBK
DATE: MAY 30, 2012
PROJECT CODE:

WOOD NAILER SECUREMENT CRITERIA

REQUIREMENTS BASED ON FACTORY MUTUAL LOSS PREVENTION DATA BULLETIN WITH MODIFICATIONS

One of the most often overlooked details on a roofing system is the attachment method for wood nailers at the perimeter of the roof. Factory Mutual (FM) publishes design recommendations for the attachment of wood nailers to various substrates and for the attachment of perimeter flashing details to wood nailers. This information is contained in Factory Mutual's Loss Prevention Data Bulletin 1-49. In accordance with that bulletin, the information listed below should be referenced when selecting an appropriate perimeter attachment method.

General Criteria

- Wood nailers that are anchored to steel, wood or masonry decking should not be less than 2" X 6" nominal (minimum 1-1/2" X 5-1/2").
 - Wood nailers should be Douglas Fir, Southern Yellow Pine or of wood having similar decay resistant properties.
- Attachment to Masonry Walls**
When fastening to a masonry wall, a 1/2 inch anchor bolt is placed 48 inches on center at an 8 inch minimum depth (12 inches minimum when masonry walls are composed of lightweight aggregate or cinder) as shown in Figure 1. Each anchor bolt is positioned (staggered) if the wood nailer is wider than 6 inches) in a block core or air space and tightly filled with concrete to the depth of the bolt.
- Note:** Plastic parts must not be used with masonry anchors.

Factory Mutual has specific requirements concerning filling of cores or voids in the top course of cinder blocks. For example:
Projects located in Zone 2 (FM 1-90 securement) - fill the entire top course.
Projects located in Zone 1 (FM 1-60 securement) - fill only required Where anchor bolts are positioned (48 inches on center in the field, 24 inches on center at roof corners)

At outside corners, the fastening density must be increased within the first 8 feet in each direction by positioning anchor bolts 24 inches on center.

An alternate method may be used by installing 3/8 inch diameter anchor bolts spaced 32 inches apart. For outside corners, bolts are fastened 16 inches apart, 8 feet from each side of the corner. If additional wood nailers are needed, refer to Figure 9 for attachment of additional wood nailers.

Attachment to Steel and Wood Decking: Penetration of the fasteners should be to the top flutes only. The fasteners must be staggered as shown in Figure 2.

Caution: Attention should be paid to the Factory Mutual requirement which calls for galvanized steel washers (minimum 5/8 inch outside diameter) to be used in conjunction with galvanized screws. This requirement is not recognized in most cases and most often forgotten. The staggered fastening pattern should be increased within 8 feet from outside corners as shown in Figure 3.

If the perimeter nailer is to be secured to a steel angle, anchor bolts must be positioned at 48 inch centers as shown in Figure 4.

On wood decks, the staggered fastening pattern with galvanized steel screws should be utilized as shown in Figure 2.

Attachment of Additional Wood Nailers: When additional wood nailers are required, they must be attached with galvanized nails or lag screws that penetrate into the bottom nailer at 1-1/4 inches using a staggered fastening pattern in two rows at 24 inches apart as shown in Figure 5.

The increased fastening density within 8 feet from outside corners is still required and must comply with Figure 3.

Even though not emphasized in the bulletin, contractors should examine or question existing conditions to determine if existing wood nailers are attached in compliance with the above criteria. If not, existing wood nailers should be refastened using of these options and additional wood nailers must be secured following Figure 5.

Wood nailers play a major role in the performance of the roofing system and contribute to the wind uplift resistance of the roof edge which is the first line of defense during wind storms. It is important to comply with the above requirements and periodically check various updates published by Factory Mutual not only for the attachment of wood nailers, but also for the securement of metal edging, especially those which are shop fabricated.

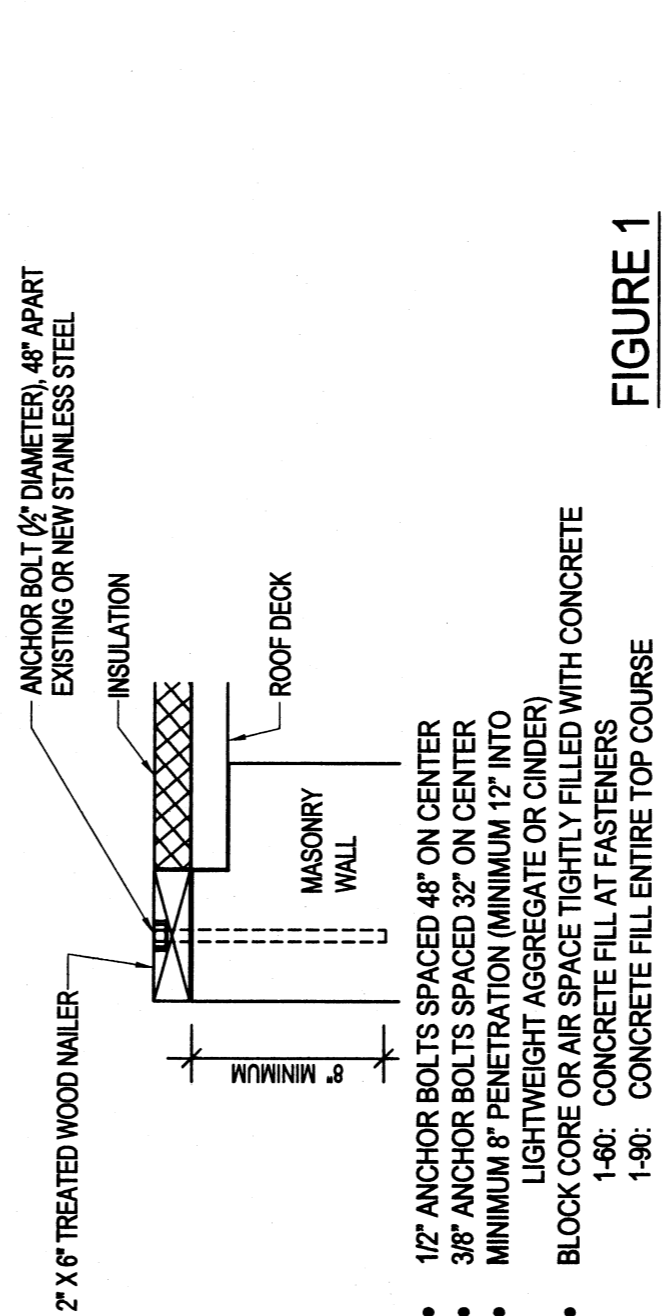


FIGURE 1
1-80: CONCRETE FILL AT FASTENERS
1-90: CONCRETE FILL ENTIRE TOP COURSE

FM1-49 ROOF EDGE RECOMMENDATIONS

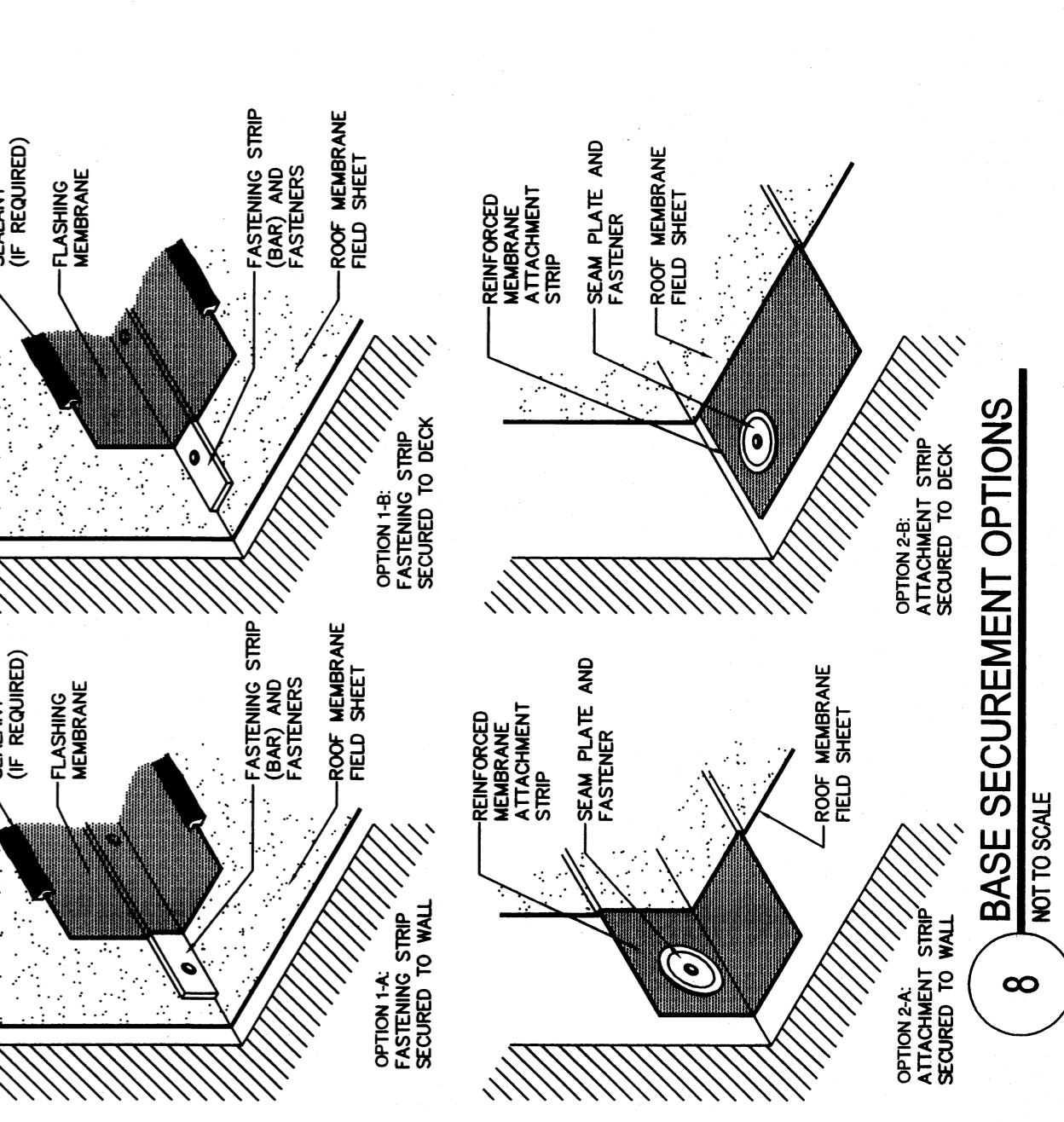


FIGURE 2
OPTION 1A: FASTENING STRIP SECURED TO WALL
OPTION 1B: FASTENING STRIP SECURED TO DECK
OPTION 2A: ATTACHMENT STRIP SECURED TO WALL
OPTION 2B: ATTACHMENT STRIP SECURED TO DECK

ATTACHMENT TO STEEL AND WOOD DECKING

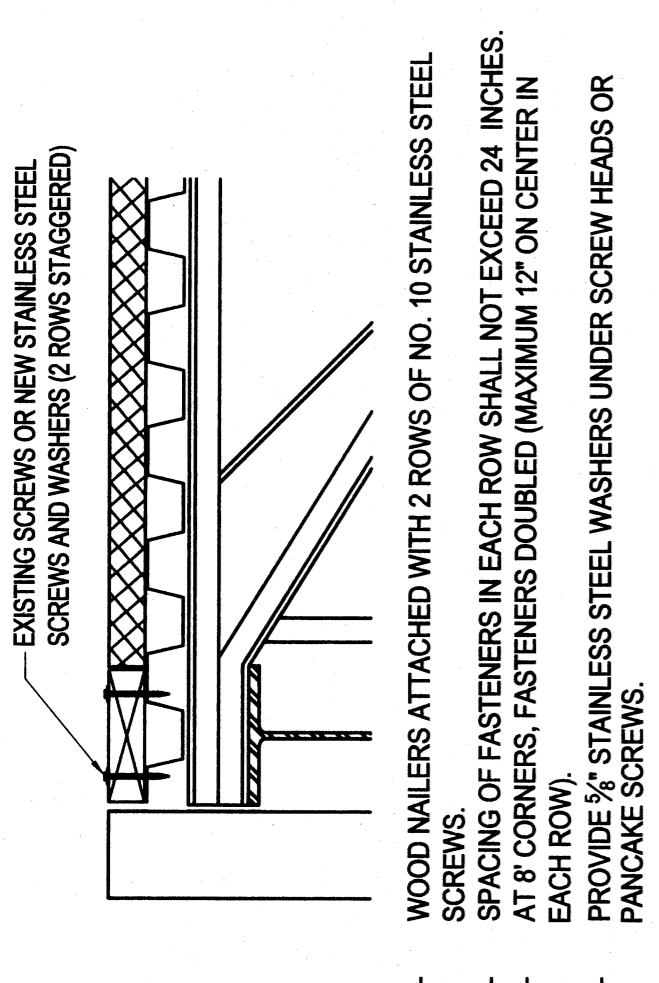


FIGURE 3

FASTENING ENHANCEMENTS AT 8'-0" CORNERS

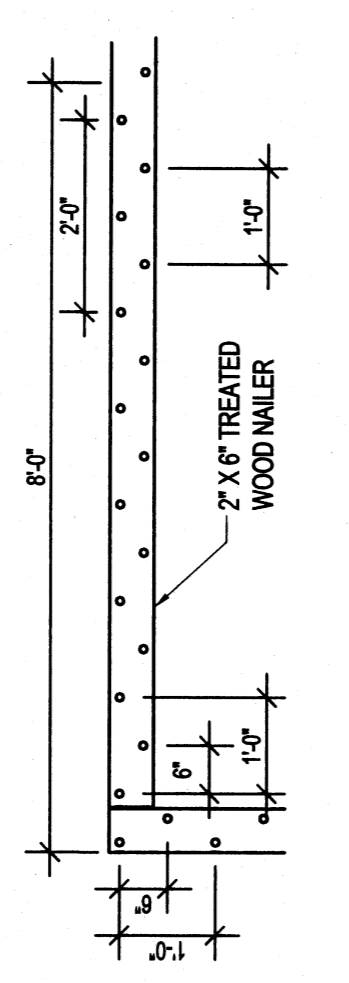


FIGURE 4

FASTENERS SPACED 24" O.C. OUTSIDE CORNER AREA

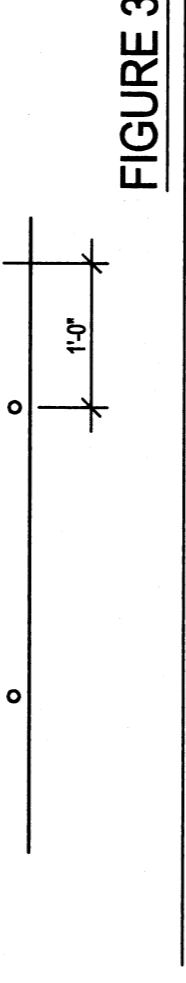


FIGURE 5

FASTENERS THROUGH STEEL ANGLE

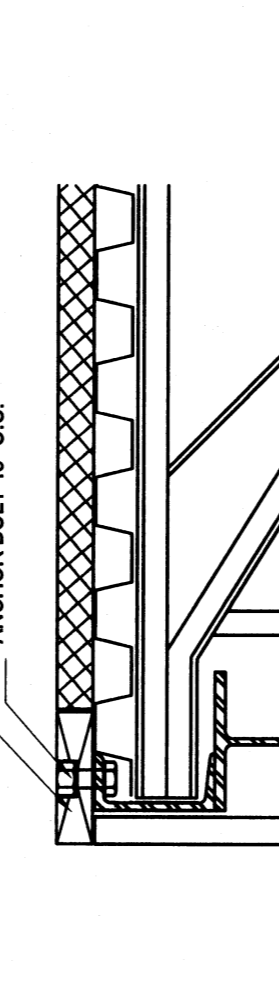


FIGURE 6

FASTENING DOUBLED (2x) MAX.

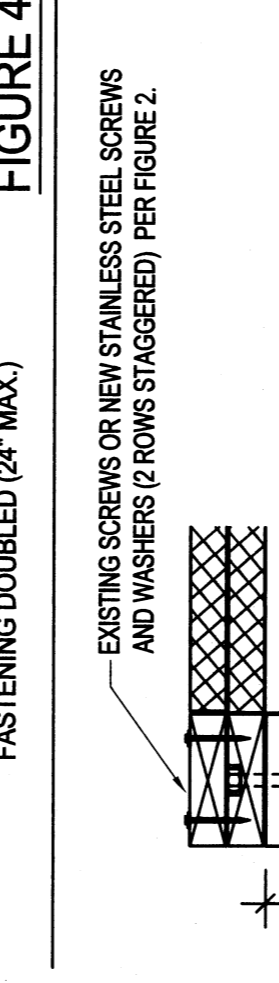


FIGURE 7

SECURE ADDITIONAL NAILERS WITH 2 ROWS OF STAINLESS STEEL NAILS OR LAG SCREWS

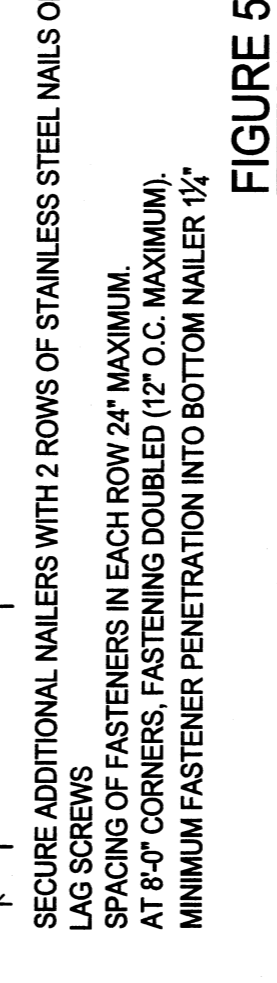


FIGURE 8

MINIMUM FASTENER PENETRATION INTO BOTTOM NAILER 1/2"

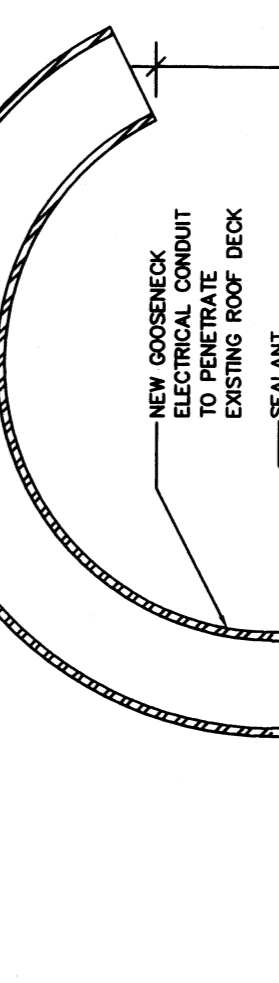


FIGURE 9

ELECTRICAL PENETRATION

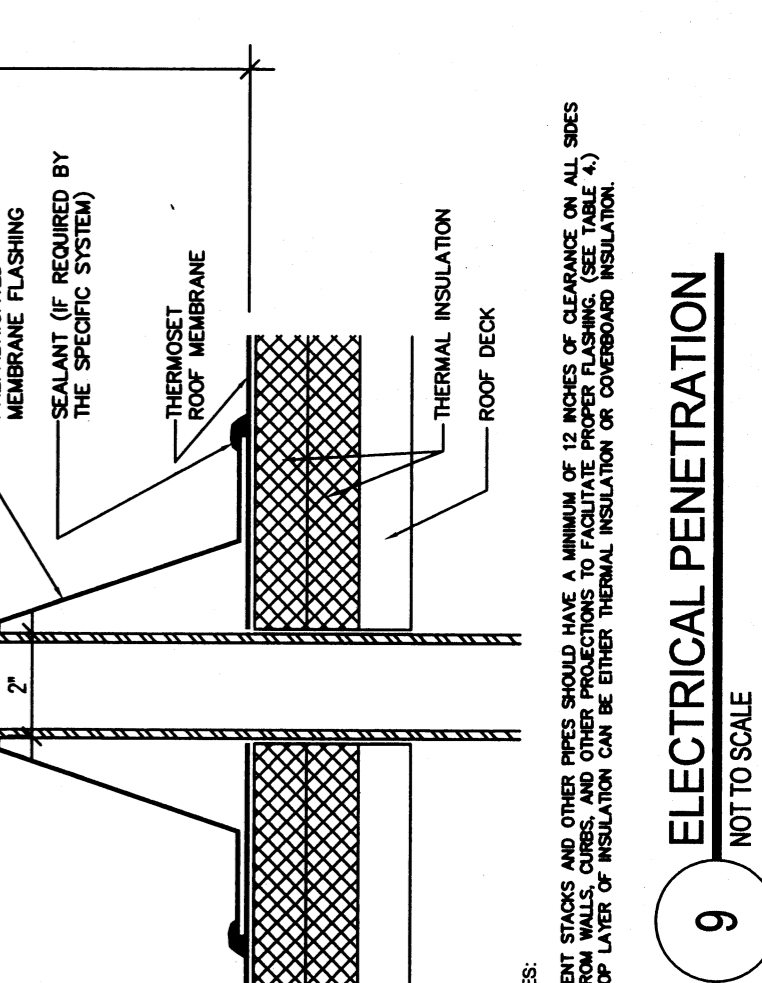


FIGURE 10

BALLASTED ROOFING SYSTEMS-DESIGN CRITERIA

- INSULATION SHALL BE LOOSE- LAID OVER THE SUBSTRATE.
- BALLAST CRITERIA:
A. AT CORNER AND/OR PERIMETER AREAS, BALLAST SHALL BE 2-1/2 INCH NOMINAL ROUNDED WATER WORN GRAVEL CONFORMING TO GRADATION #4 IN ACCORDANCE WITH ASTM D-448 METHOD OF SIZING. COVERAGE RATE SHALL BE A MINIMUM OF 13 POUNDS PER SQUARE FOOT.
B. IN FIELD AREAS, BALLAST SHALL BE 1-1/2 INCH NOMINAL ROUNDED WATER WORN GRAVEL CONFORMING TO GRADATION #4 IN ACCORDANCE WITH ASTM-D448 METHOD OF SIZING. COVERAGE RATE SHALL BE A MINIMUM OF 13 POUNDS PER SQUARE FOOT.
C. REFER TO INSTALLATIONS BELOW FOR CALCULATING CONSERVATIVE PERIMETER AREAS FOR THE NOTED WARRANTY WIND SPEEDS AVAILABLE.

BALLAST REQUIREMENTS FOR 72 MPH WARRANTY:

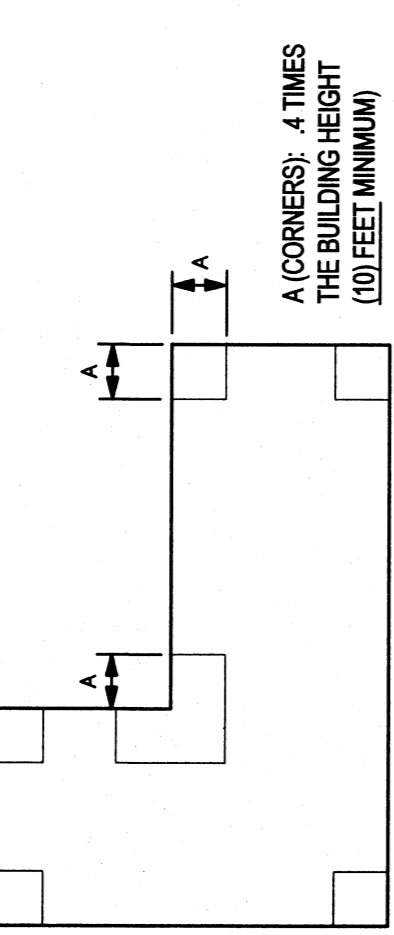


FIGURE 11

SUPPLEMENTAL BALLAST



FIGURE 12

TYPICAL CURB EXTENSION

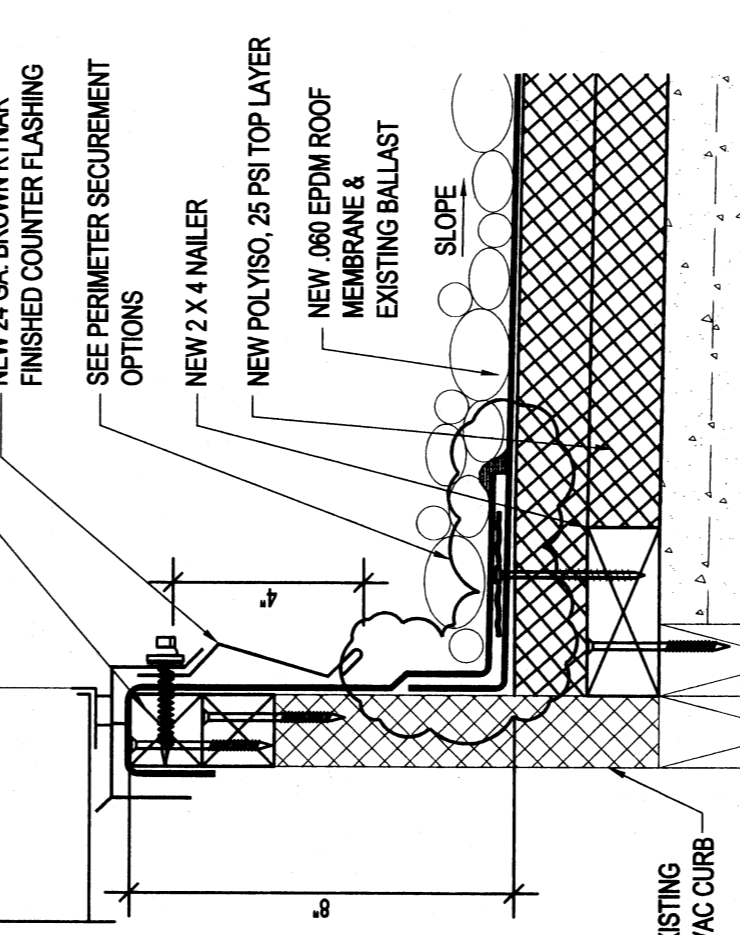


FIGURE 13

ROOF AREA DIVIDER

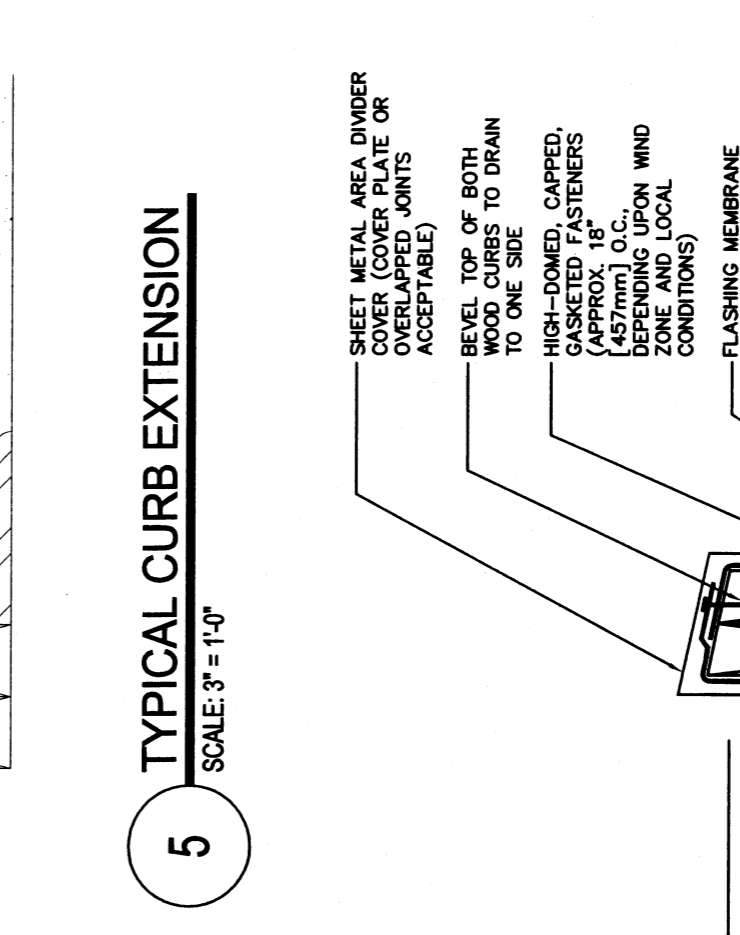


FIGURE 14

PIPE PENETRATIONS

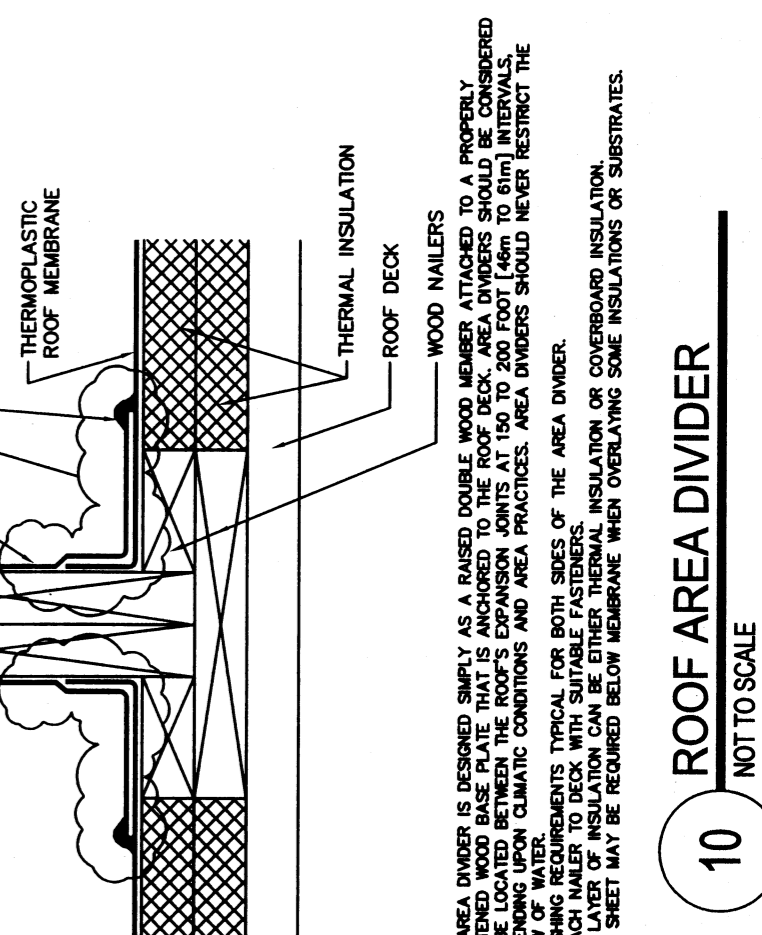


FIGURE 15

RETROFIT ROOF DRAIN DETAIL

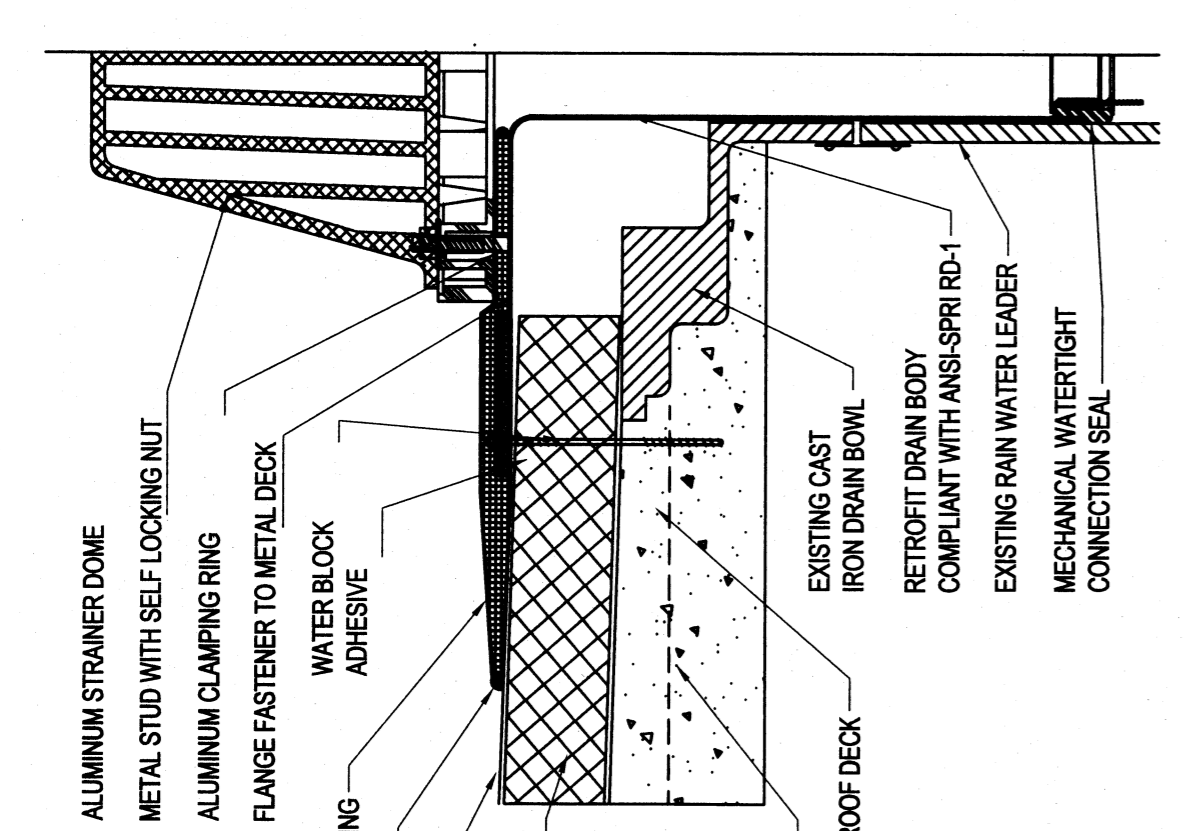


FIGURE 16

ROOF EDGE DETAIL



FIGURE 17

EXPANSION JOINT DETAIL

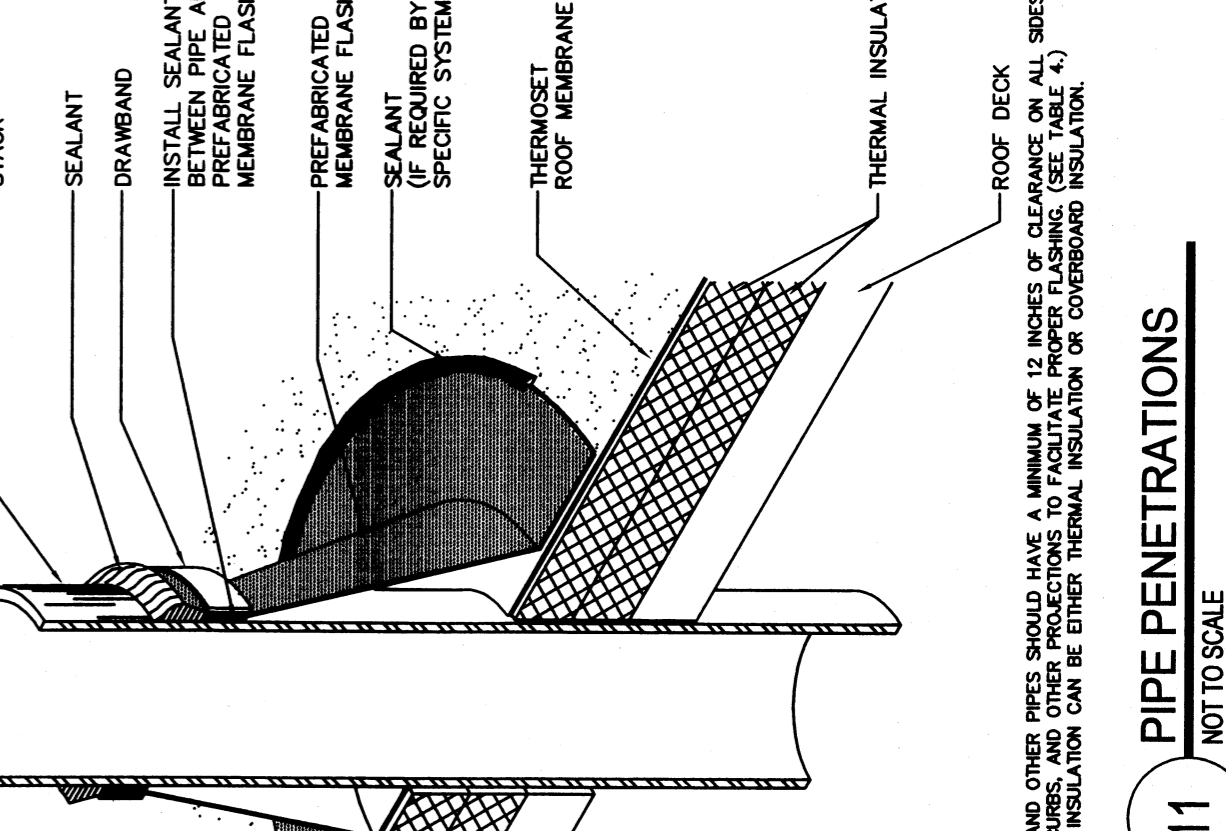


FIGURE 18

