

STRUCTURAL DESIGN

UTILITY BUILDING

MAXIMUM 30'-0" WIDE X 14'-0" EAVE HEIGHT- BOX EAVE FRAME AND BOW FRAME

28 August 2013 Revision 2 M&A Project No. 12117S

Prepared for:

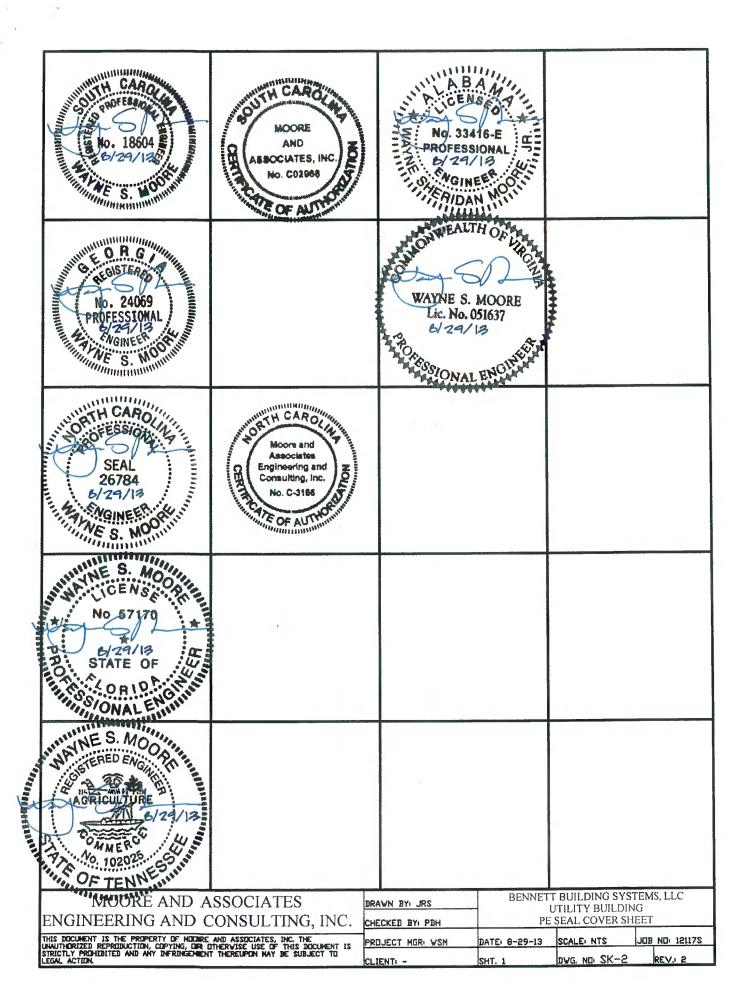
Mr. Danny Lowery President- Steel Structures 1660 Dixon Airline Road Augusta, Georgia 30906



Prepared by:

Moore and Associates Engineering and Consulting, Inc. 1009 East Avenue North Augusta, SC 29841



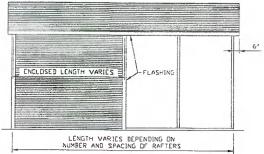


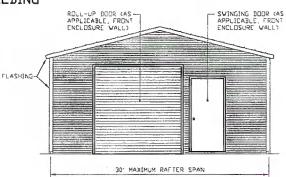
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BOX EAVE FRAME RAFTER ENCLOSED BUILDING (Sheets 4, 5, 8, 9, 11, 12, 13, AND 15)

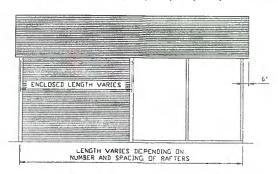




TYPICAL SIDE ELEVATION-HORIZONTAL ROOF

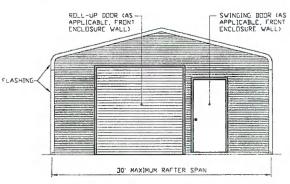
SCALE 1/8' = 1'-0'

BOW FRAME RAFTER ENCLOSED BUILDING (Sheets 6, 7, 8, 10, 11, 12, AND 14)



SCALE: 1/8' = 1'-0'

TYPICAL END ELEVATION-HORIZONTAL ROOF



TYPICAL SIDE ELEVATION

TYPICAL END ELEVATION

INSTALLATION NOTES AND SPECIFICATIONS

- 1 DESIGN IS FOR A MAXIMUM 30' WIDE x 14' EAVE HEIGHT STRUCTURES
- 2 DESIGN WAS DONE IN ACCORDANCE WITH THE 2010 FLORIDA BUILDING CODE (FBC) WITH 2012 SUPPLEMENT AMENDMENTS. 2006 INTERNATIONAL BUILDING CODE (IBC), 2009 IBC AND 2012 IBC
- 3 DESIGN LOADS ARE AS FOLLOWS

A) DEAD LOAD

B) LIVE LOAD

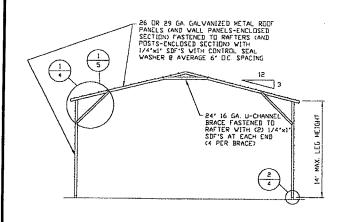
= 1.5 PSF = 1.2 PSF

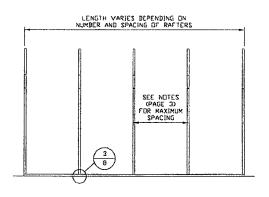
C) SNOW LOAD

= 18.1 PSF

- 4 LOW ULTIMATE WIND SPEED 105 TO 140 MPH (NOMINAL WIND SPEED 81 TO 108 MPH) MAXIMUM RAFTER/POST AND END POST SPACING = 5.0 FEET
- 5 HIGH ULTIMATE WIND SPEED 141 TO 170 MPH (NOMINAL WIND SPEED 109 TO 132 MPH) MAXIMUM RAFTER/POST AND END POST SPACING = 4.0 FEET.
- 6. RISK CATEGORY I.
- 7 WIND EXPOSURE CATEGORY B
- 8 SPECIFICATIONS APPLICABLE TO 26 AND 29 GAUGE METAL PANELS FASTENED DIRECTLY TO 2 1/4" x 2 1/4" 14 GAGE STEEL TUBE FRAMING MEMBERS
- 9 AVERAGE FASTENER SPACING ON-CENTERS ALONG RAFTERS OR PURLINS, AND POSTS (INTERIOR OR END) = 6 INCHES
- 10 FASTENERS CONSIST OF 1/4'-14x3/4" SELF-DRILLING FASTENER (SDF), USE CONTROL SEAL WASHER WITH EXTERIOR FASTENERS
 SPECIFICATIONS APPLICABLE CONLY FOR MEAN ROOF HEIGHT OF 20 FEET OR LESS, AND ROOF SLOPES OF 14" (3:12 PITCH) OR LESS SPACING
 REQUIREMENTS FOR OTHER ROOF HEIGHTS AND/OR SLOPES MAY VARY
- 11 GROUND ANCHORS CONSISTING OF #4 REBAR W/WELDED NUT x 24' LONG MAY BE USED FOR LOW ((108 MPH NOMINAL) WIND SPEEDS ONLY
- 12 GROUND ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL WITHIN 6° OF EACH RAFTER POST ALONG SIDES FOR HIGH WIND, EVERY OTHER POST FOR LOW WIND.
- 13 OPTIONAL BASE RAIL ANCHORAGE MAY BE USED FOR LOW AND HIGH (> 117 MPH 139 MPH NOMINAL) WIND SPEEDS

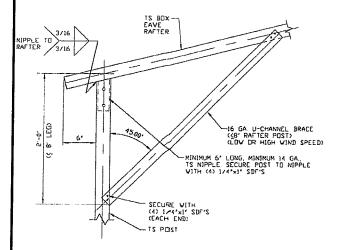
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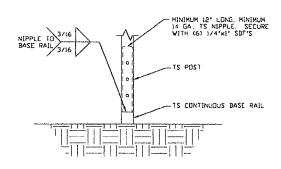




TYPICAL RAFTER/POST END FRAME SECTION SCALE: 1/8' = 1'-0'

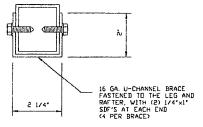
TYPICAL RAFTER/POST SIDE FRAMING SECTION SCALE: 1/8' = 1'-0'





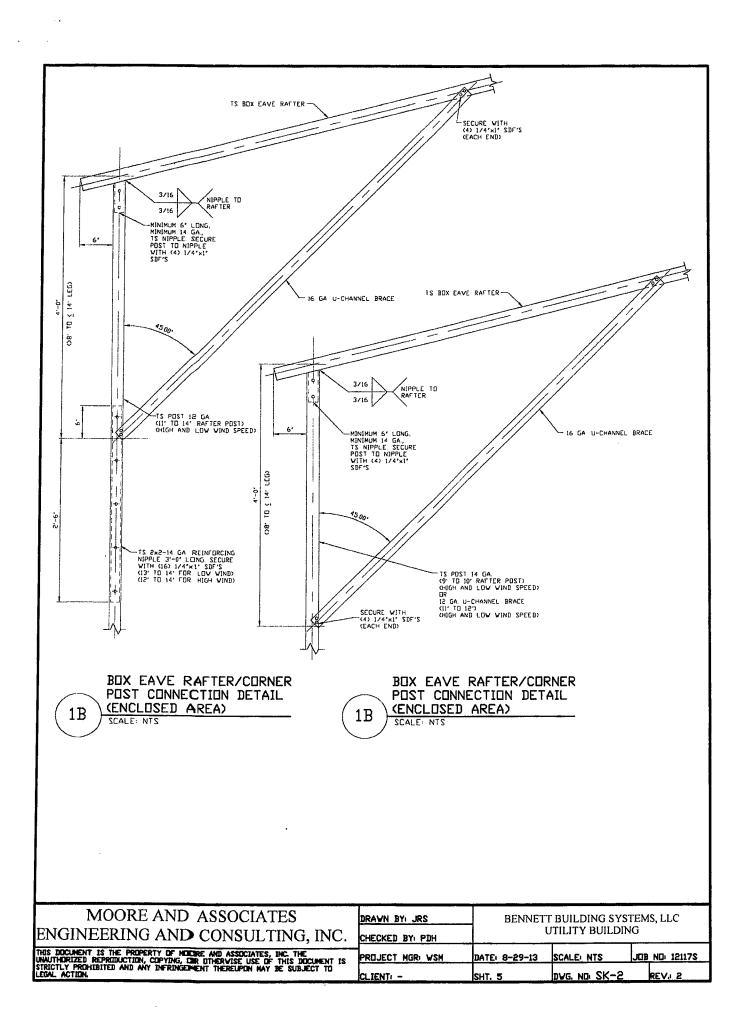
BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL
FOR OPEN OR ENCLOSED AREAS
WITH LEG HEIGHT <8'-0"

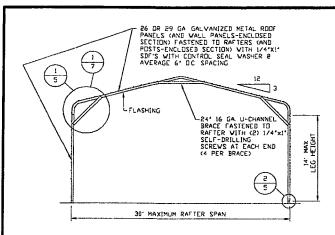
2 RAFTER POST/BASE RAIL CONNECTION DETAIL SCALE: NTS



BRACE SECTION
SCALE: NTS

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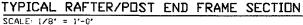


TYPICAL RAFTER/POST_SIDE FRAMING SECTION

3

SEE NOTES (PAGE 3) FOR MAXIMUM SPACING

LENGTH VARIES DEPENDING ON NUMBER AND SPACING OF RAFTERS



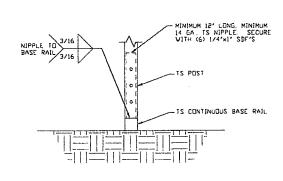
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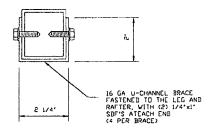
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BOW RAFTER/CORNER POST CONNECTION DETAIL FOR OPEN OR ENCLOSED AREAS WITH LEG HEIGHT LESS THAN 8'-0' SCALE: NTS

1A

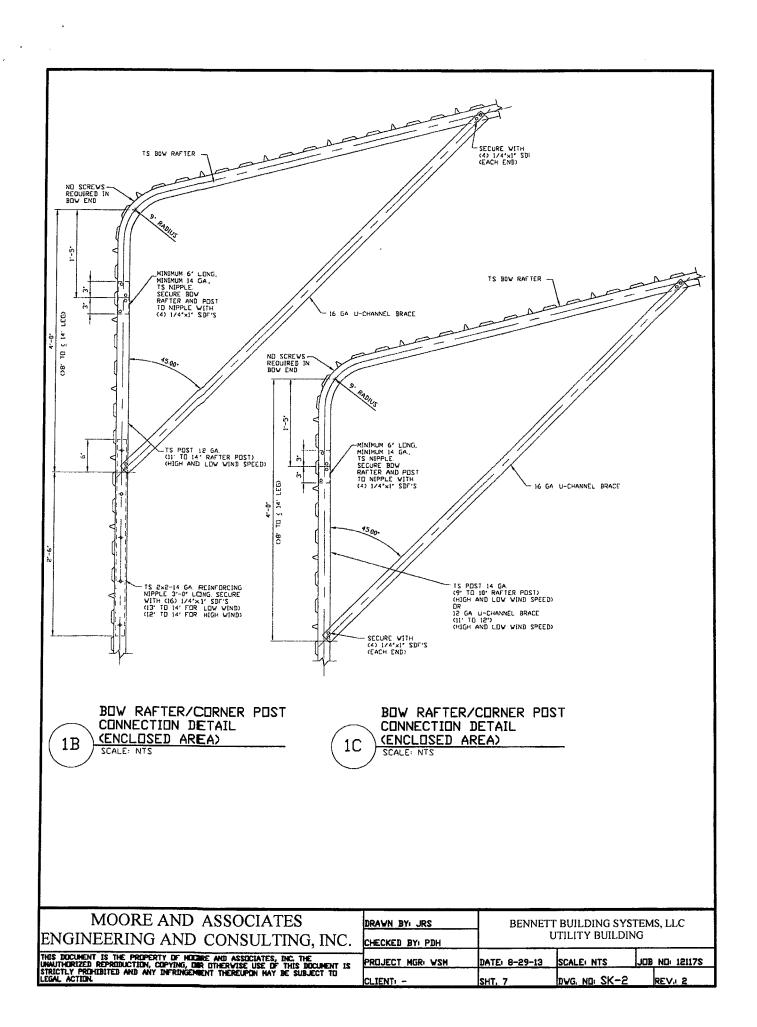


RAFTER POST/ BASE RAIL CONNECTION DETAIL SCALE: NTS

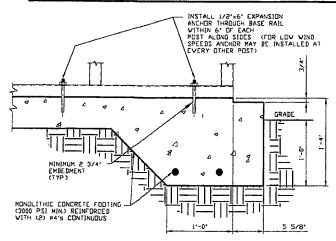


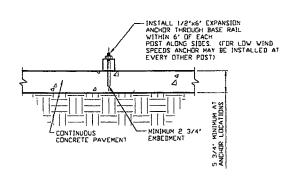
BRACE SECTION SCALE: NTS

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BASE RAIL ANCHORAGE OPTIONS FOR LOW AND HIGH WIND SPEEDS





CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE

MINIMUM ANCHOR EDGE DISTANCE IS 6 3/4"

CONCRETE SLAB BASE RAIL ANCHORAGE **3B** SCALE: NTS

MINIMUM ANCHOR EDGE DISTANCE IS 6 3/4'

GENERAL NOTES

CONCRETE

CONCRETE SHALL HAVE A MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS

COVER OVER REINFORCING STEEL!

FOR FOUNDATIONS, MINIMUM CONCRETE COVER OVER REINFORCING BARS SHALL BE PER ACT-318:
3 INCHES IN FOUNDATIONS WHERE THE CONCRETE IS CAST AGAINST.
AND PERMANENTLY IN CONTACT WITH THE EARTH OR EXPOSED TO
THE EARTH OR VEATHER, AND 1 1/2 INCHES ELSEWHERE

REINFORCING STEEL:

THE REINFORCING STEEL SHALL BE MINIMUM GRADE 60.

GALVANIZATION:

METAL ACCESSORIES FOR USE IN EXTERIOR WALL CONSTRUCTION AND NOT DIRECTLY EXPOSED TO THE WEATHER SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 153, CLASS B-2. METAL PLATE CONNECTORS, SCREWS, BOLTS AND NAILS EXPOSED DIRECTLY TO THE WEATHER SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED

REINFORCEMENT MAY BE BENT IN THE SHOP OR THE FIELD PROVIDED:

- 1 REINFORCEMENT IS BENT COLD;
 2 THE DIAMETER OF THE BEND, MEASURED ON THE INSIDE OF THE BAR, IS NOT LESS THAN SIX-BAR DIAMETERS; AND
 3 REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE SHALL NOT
- BE FIELD BENT

2' WASHERS DRILL 5/8' DIAMETER HOLE THROUGH THE BASE RAIL AND SECURE TO ANCHOR EYE WITH 1/2' DIAMETER THROUGH BOLT TOP OF ASPHALT. PAVEMENT OR GROUND SURFACE TS CONTINUOUS BASE RAIL DOUBLE HELIX EYE ANCHOR -

3C

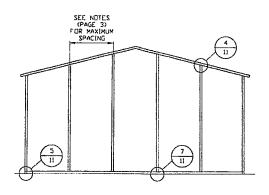
GROUND BASE HELIX ANCHORAGE (CAN BE USED FOR ASPHALT)

HELIX ANCHOR NOTES:

- 1 FOR VERY DENSE AND/OR CEMENTED SANDS, COARSE GRAVEL AND COBBLES, CALICHE, PRELOADED SILTS AND CLAYS USE MINIMUM (2) 4" HELICES WITH MINIMUM 30 INCH EMBEDMENT.
- 2 FOR CORAL USE MINIMUM (23 4' HELICES WITH MINIMUM 30 INCH EMBEDMENT
- 3. FOR MEDIUM DENSE COARSE SANDS, SANDY GRAVELS, VERY STIFF SILTS, AND CLAYS USE MINIMUM (2) 4' HELICES WITH MINIMUM 30 INCH EMBEDMENT.
- FOR LODSE TO MEDIUM DENSE SANDS, FIRM TO STIFF CLAYS AND SILTS ALLUVIAL FILL USE MINIMUM (2) 6' HELICES WITH MINIMUM 50 INCH EMBEDMENT
- FOR VERY LOSE TO MEDIUM DENSE SANDS, FIRM TO STIFFER CLAYS AND SILTS. ALLUVIAL FILL USE MINIMUM (2) 8' HELICES WITH MINIMUM 60 INCH EMBEDMENT.

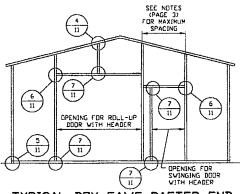
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BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



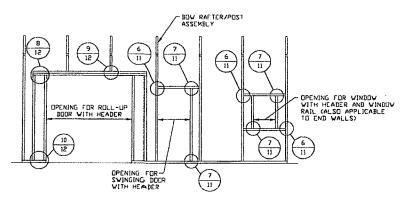
TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION

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



TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

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

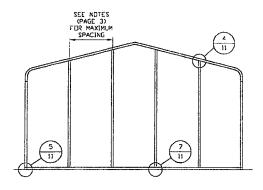


TYPICAL BOX EAVE RAFTER SIDE WALL OPENINGS FRAMING SECTION

SCALE: 1/8' = 1'-0'

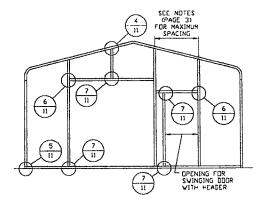
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BOW RAFTER END WALL AND SIDE WALL OPENINGS



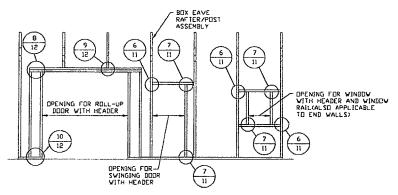
TYPICAL BOW RAFTER END WALL FRAMING SECTION

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



TYPICAL BOW RAFTER END WALL OPENINGS FRAMING SECTION

SCALE: 1/8' = 1'-0'

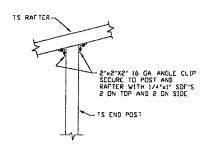


TYPICAL BOW RAFTER SIDE WALL OPENINGS FRAMING SECTION

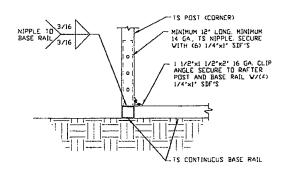
SCALE: 1/8' = 1'-0'

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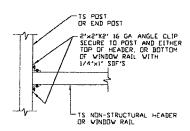
BOX EAVE RAFTER WALL OPENING DETAILS



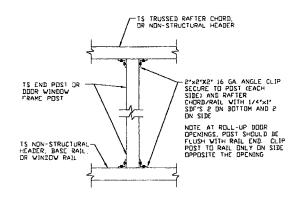
4 END POST/RAFTER CONNECTION DETAIL SCALE: NTS



5 END POST/BASE RAIL
CONNECTION DETAIL
SCALE: NTS



6 HEADER OR WINDOW RAIL TO POST CONNECTION DETAIL

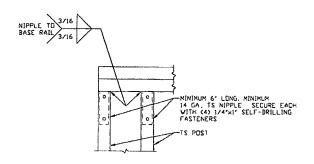


7 POST TO HEADER, BASE RAIL, OR WINDOW RAIL CONNECTION DETAIL

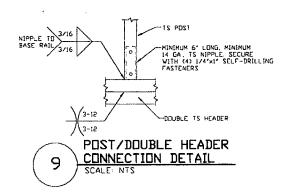
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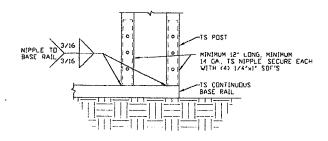
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BOX EAVE RAFTER WALL OPENING DETAILS





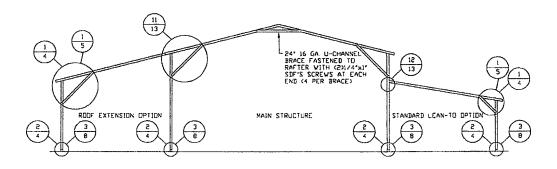




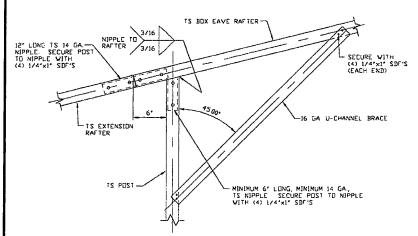
10 POST/BASE RAIL CONNECTION DETAIL
SCALE: NTS

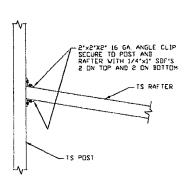
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BOW EAVE RAFTER LEAN-TO OPTIONS



TYPICAL BOX EAVE RAFTER LEAN-TO OPTIONS FRAMING SECTION (BOTH OPTIONS SHOWN) SCALE: 1/8' = 1'-0'





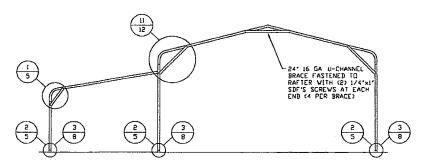
SIDE EXTENSION RAFTER/ CORNER POST DETAIL 11 SCALE: NTS

LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL 12 SCALE: NTS

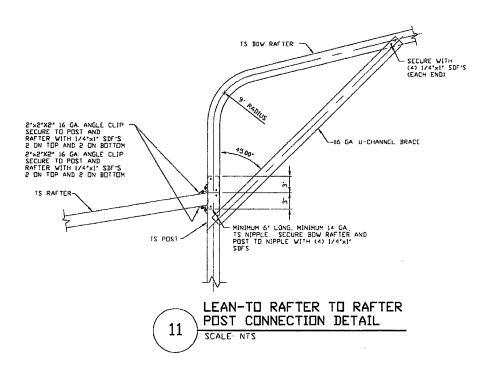
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BOW RAFTER LEAN-TO OPTION

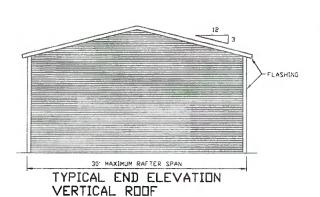


TYPICAL BOW RAFTER LEAN-TO OPTION FRAMING SECTION SCALE: 1/8' = 1'-0'



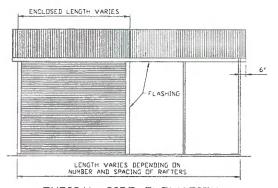
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BOX EAVE RAFTER VERTICAL ROOF OPTION



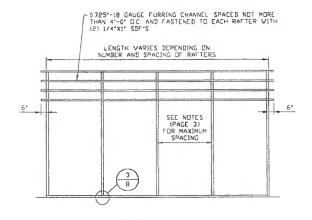
TYPICAL SECTION VERTICAL ROOF OPTION

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



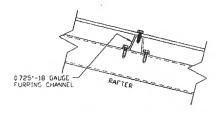
SCALE: 1/8' = 1'-0'

TYPICAL SIDE ELEVATION VERTICAL ROOF
SCALE: 1/8' = 1'-0'



TYPICAL FRAMING SECTION VERTICAL ROOF OPTION

SCALE: 1/8' = 1'-0'



ROOF PANEL ATTACHMENT (ALTERNATE FOR VERTICAL ROOF PANELS) SCALE NTS

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