

STRUCTURAL DESIGN ENCLOSED BUILDING

MAXIMUM 30'-0" WIDE X 20'-0" EAVE HEIGHT-BOX EAVE FRAME AND BOW FRAME

14 February 2020 Revision 8 M&A Project No. 16062S/16155S/16207S/17155S/17200S/18068S/18156S/18290S/20019S

Prepared for:

Steel Buildings and Structures, Inc. P.O. Box 1287 Mt. Airy, NC 27030

Prepared by:

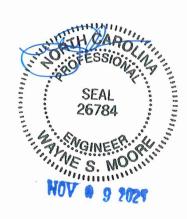
Moore and Associates Engineering and Consulting, Inc.

1009 East Avenue North Augusta, SC 29841

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INSTALLATION NOTES AND SPECIFICATIONS

- 1. DESIGN IS FOR MAXIMUM 30'-0' WIDE x 20'-0' EAVE HEIGHT ENCLOSED STRUCTURES.
- 2. DESIGN WAS DONE IN ACCORDANCE WITH THE 2017 FLORIDA BUILDING CODE (FBC) 6TH EDITION, 2018 NORTH CAROLINA BUILDING CODE, 2006 INTERNATIONAL BUILDING CODE (IBC), 2009 IBC, 2012 IBC, 2015 IBC AND 2018 IBC.
- 3. DESIGN LOADS ARE AS FOLLOWS:

A) DEAD LOAD

= 1.5 PSF

B) LIVE LOAD

- = 12 PSF

C) GROUND SNOW LOAD = 30 PSF (< 26'-0"), 35 PSF (26'-0" (W < 30'-0")

NOTE: (UNBALANCED SNOW LOADS DUE TO DRIFTING HAVE NOT BEEN EVALUATED).

- 4. 3-SECOND GUST ULTIMATE WIND SPEED (V_{ULT}) = 105 TO 145 MPH (NOMINAL WIND SPEED = 82 TO 112 MPH):
- 5. MAXIMUM RAFTER/COLUMN AND END COLUMN SPACING = 5.0 FEET (UNLESS NOTED OTHERWISE). 6. END WALL COLUMNS (POSTS) ARE EQUIVALENT TO SIDE WALL POSTS IN SIZE AND SPACING (UNLESS NOTED OTHERWISE).
- 7. RISK CATEGORY I.
- 8. WIND EXPOSURE CATEGORY B.
- 9. SPECIFICATIONS APPLICABLE TO 29 GAUGE METAL PANELS FASTENED DIRECTLY TO 2 1/2" x 2 1/2" 14 GAUGE TUBE STEEL (TS) FRAMING MEMBERS (UNLESS NOTED OTHERWISE).
- 10. AVERAGE FASTENER SPACING ON-CENTERS ALONG RAFTERS OR HAT CHANNELS, AND COLUMNS (INTERIOR OR END) = 8 INCHES.
- 11. FASTENERS CONSIST OF 1/4*x3/4* SELF-DRILLING FASTENER (SDF), USE CONTROL SEAL WASHER WITH EXTERIOR FASTENERS.

 SPECIFICATIONS APPLICABLE ONLY 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. ROOF SLOPES LESS THAN 3:12 REQUIRE USE OF LAP JOINT SEALANT.
- 12. GROUND ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL WITHIN 6' OF EACH COLUMN.
- 13. STANDARD GROUND ANCHORS (SOIL NAILS) CONSIST OF #4 REBAR W/ WELDED NUT x 36' LONG AND MAY BE USED IN SUITABLE SOILS.

 OPTIONAL ANCHORAGE MAY BE USED IN SUITABLE SOILS AND MUST BE USED IN UNSUITABLE SOILS AS NOTED.
- 14. WIND FORCES GOVERN OVER SEISMIC FORCES. SEISMIC PARAMETERS ANALYZED ARE:

SDIL SITE CLASS = D

RISK CATEGORY I

R= 3.25

 $I_{F} = 1.0$ $\Lambda = C^2 M$

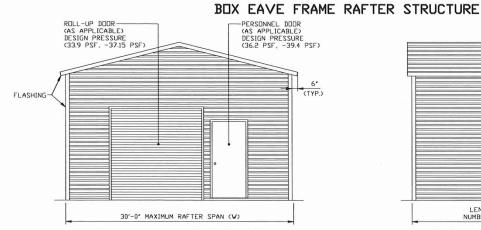
 $S_{DS} = 2.039 g$

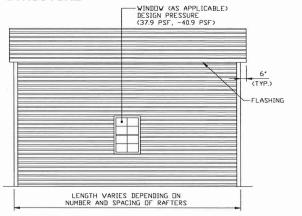
 $S_{D1} = 1.258 g$

15. WINDOW AND DOOR DESIGN PRESSURES ARE APPLICABLE TO THE STATE OF FLORIDA ONLY.



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TYPICAL END ELEVATION

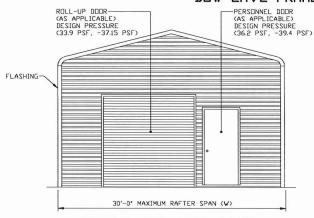
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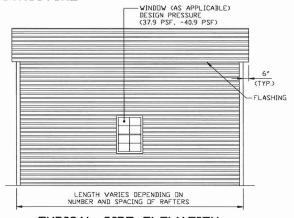
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TYPICAL SIDE ELEVATION

SCALE: NTS

BOW EAVE FRAME RAFTER STRUCTURE





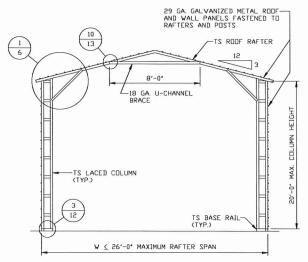
TYPICAL END ELEVATION

SCALE: NTS

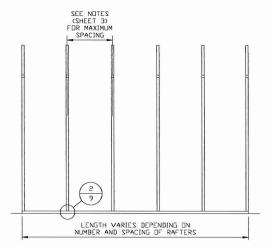
TYPICAL SIDE ELEVATION



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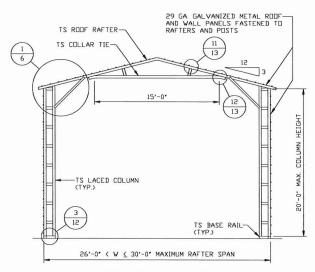


TYPICAL SCALE: NTS RAFTER/COLUMN FRAME SECTION



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

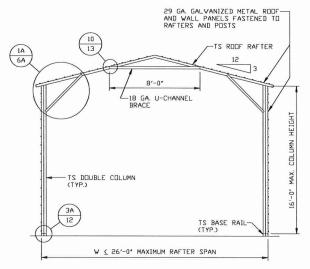
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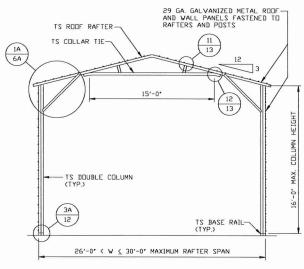
TYPICAL RAFTER/COLUMN FRAME SECTION SCALE: NTS

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TYPICAL RAFTER/COLUMN FRAME SECTION SCALE: NTS



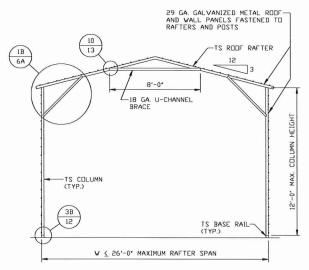
TYPICAL RAFTER/COLUMN FRAME SECTION SCALE: NTS

SEE NOTES (SHEET 3) FOR MAXIMUM SPACING 9 LENGTH VARIES DEPENDING ON NUMBER AND SPACING OF RAFTERS

TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION



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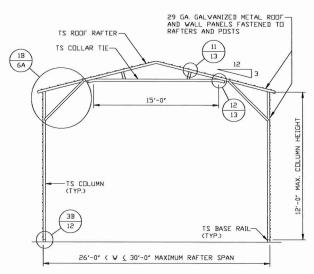


TYPICAL RAFTER/COLUMN FRAME SECTION SCALE: NTS

SEE NOTES
(SHEET 3)
FOR MAXINUM
SPACING

LENGTH VARIES DEPENDING ON
NUMBER AND SPACING OF RAFTERS

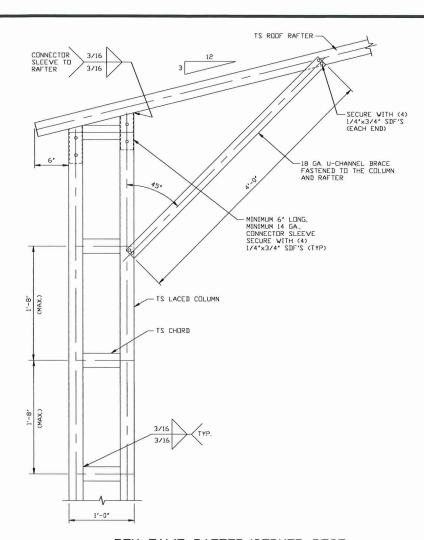
TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION SCALE: NTS

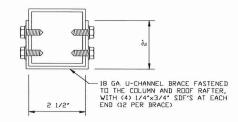


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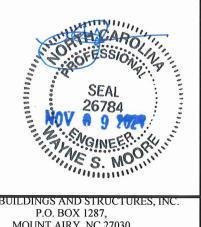




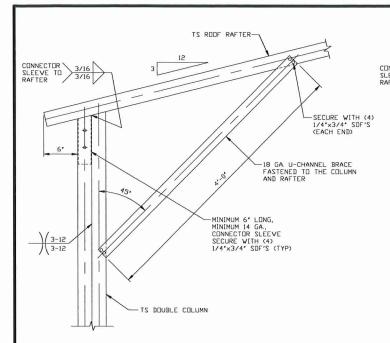
BRACE SECTION SCALE: NTS

BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL FOR HEIGHTS 16'-0" < TO ≤ 20'-0" SCALE: NTS

1



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BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL

FOR HEIGHTS 12'-0" < TO < 16'-0"

SCALE: NTS

CONNECTOR 3/16

SLEEVE TO 3/16

3 SECURE WITH (4)

1/4*x3/4* SDF'S

(EACH END)

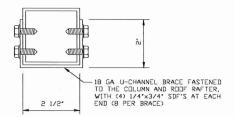
18 GA. U-CHANNEL BRACE
FASTENED TO THE COLUMN
AND RAFTER

MINIMUM 6* LONG,
MINIMUM 14 GA.,
CONNECTOR SLEEVE
SECURE WITH (4)
1/4*x3/4* SDF'S (TYP)

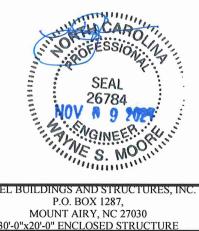
BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL FOR HEIGHTS <u>≤</u> 12′-0″

SCALE: NTS

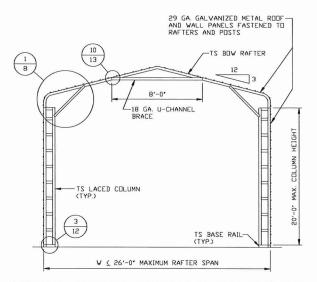
1B



BRACE SECTION
SCALE: NTS



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TYPICAL RAFTER/COLUMN FRAME SECTION SCALE: NTS

29 GA. GALVANIZED METAL ROUF
AND WALL PANELS FASTENED TO
RAFTERS AND POSTS

TS COLLAR TIE—

13

12

15'-0'

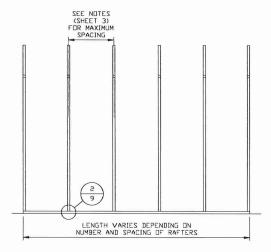
15 LACED COLUMN

(TYP.)

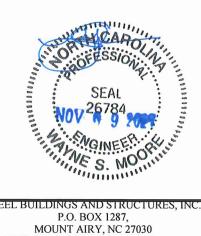
TS BASE RAIL—
(TYP.)

26'-0' < V \(\) 30'-0' MAXIMUM RAFTER SPAN

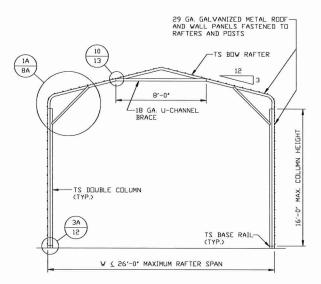
TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION



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TYPICAL RAFTER/COLUMN FRAME SECTION SCALE: NTS

29 GA. GALVANIZED METAL ROOF
AND VALL PANELS FASTENED TO
RAFTERS AND POSTS

TS BOW RAFTER

TS COLLAR TIE

11

13

15'-0'

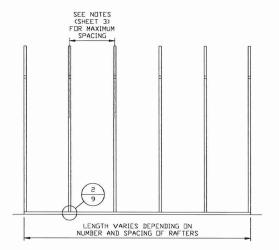
15 DOUBLE COLUMN

TS BASE RAIL

(TYP.)

26'-0' < V \(\) 30'-0' MAXIMUM RAFTER SPAN

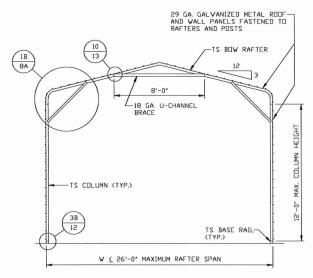
TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS



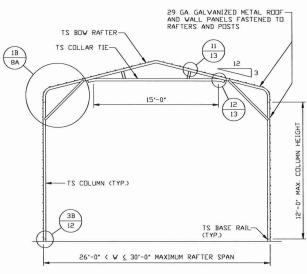
TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION SCALE: NTS



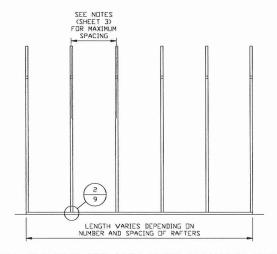
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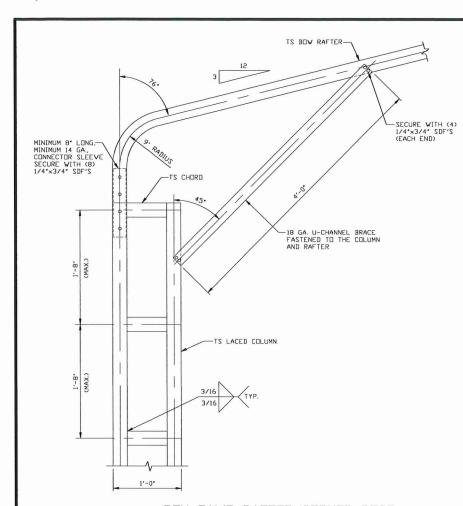
TYPICAL RAFTER/COLUMN FRAME SECTION

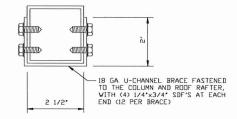


TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION



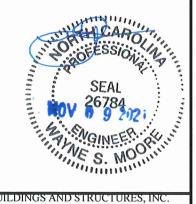
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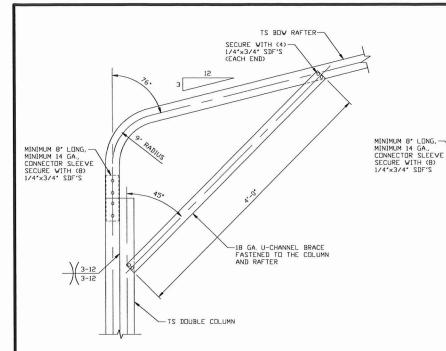


BRACE SECTION SCALE: NTS

BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL FOR HEIGHTS 16'-0" < TO < 20'-0" 1



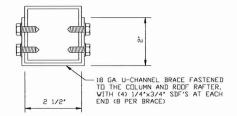
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BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL FOR HEIGHTS 12'-0" < TO < 16'-0" SCALE: NTS

BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL FOR HEIGHTS \(\) 12'-0"

1B) FUR HEI

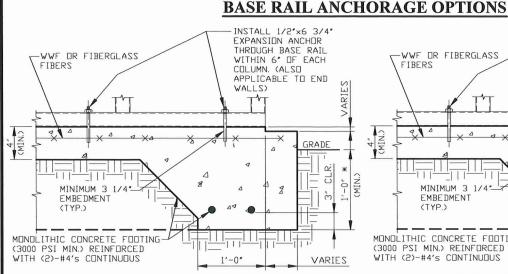


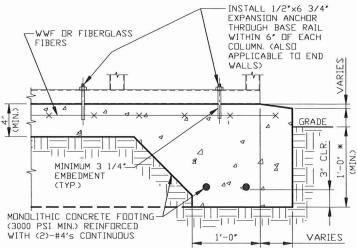
BRACE SECTION
SCALE: NTS

1A



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2

CONCRETE MONOLITHIC SLAB BASE RAIL ANCHURAGE

SCALE: NTS MINIMUM ANCHOR EDGE DISTANCE IS 4' * COORDINATE WITH LOCAL CODES/ORD.

GENERAL NOTES

NOTE: CONCRETE MONOLITHIC SLAB DESIGN BASED ON MINIMUM SOIL BEARING CAPACITY OF 1,500 PSF.

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 ACI-318:

3' IN FOUNDATIONS WHERE THE CONCRETE IS CAST AGAINST AND PERMANENTLY IN CONTACT WITH THE EARTH OR EXPOSED TO THE EARTH OR WEATHER, AND 1 1/2' ELSEWHERE.

REINFORCING STEEL:

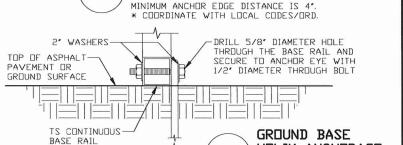
THE TURNDOWN REINFORCING STEEL SHALL BE ASTM A615 GRADE 60. THE SLAB REINFORCEMENT SHALL BE WELDED WIRE FABRIC MEETING ASTM A185 OR FIBERGLASS FIBER REINFORCEMENT.

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

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

HELIX ANCHOR NOTES:

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



CONCRETE SLAB BASE

RAIL ANCHORAGE

HELIX EYE ANCHOR (SEE NOTES BELOW)

2A

HELIX ANCHORAGE SCALE: NTS (CAN BE USED FOR ASPHALT)

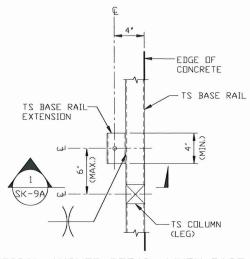


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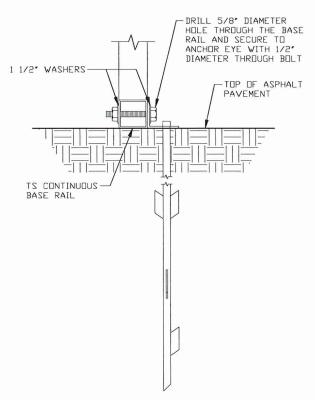
68S 0S/20019S
RE
S, INC.

ADDITIONAL BASE RAIL ANCHORAGE OPTION

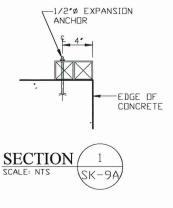


TYPICAL ANCHOR DETAIL WHEN BASE RAIL IS NEAR EDGE OF CONCRETE

SCALE: NTS



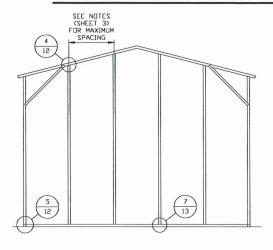
2C ASPHALT BASE ANCHORAGE
SCALE: NTS





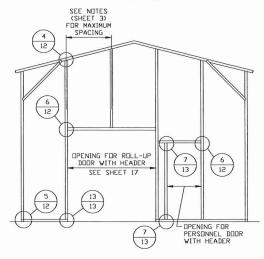
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ENGINEERING AND CONSULTING, INC.	CHECKED BY: PDH	MOUNT AIRY, NC 27030 30'-0"x20'-0" ENCLOSED STRUCTURE			
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BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



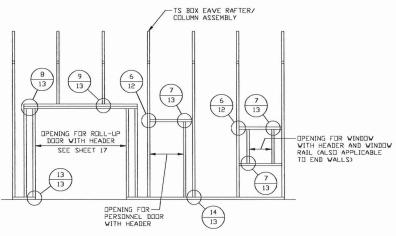
TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION

SCALE: NTS

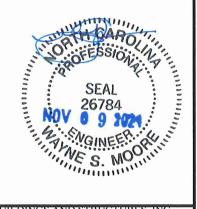


TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

SCALE: NTS

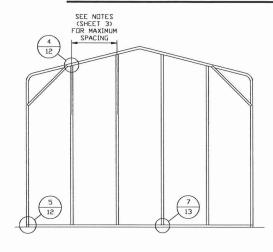


TYPICAL BOX EAVE RAFTER SIDE WALL OPENINGS FRAMING SECTION



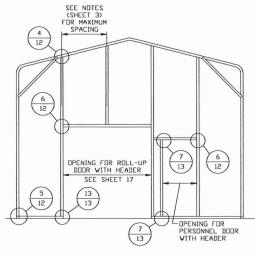
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BOW EAVE RAFTER END WALL AND SIDE WALL OPENINGS



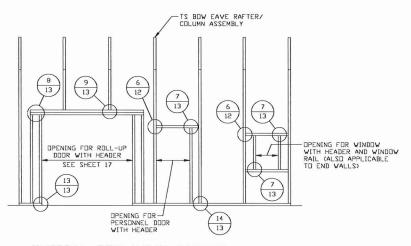
TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION

SCALE: NTS



TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

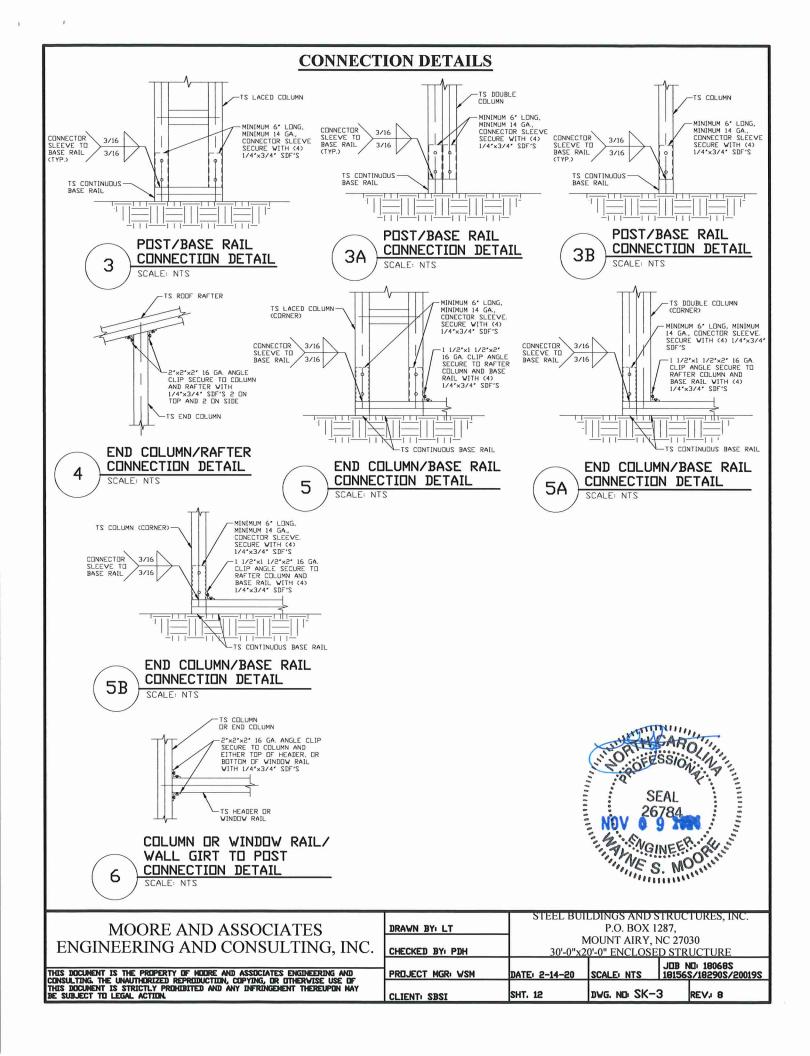
SCALE: NTS



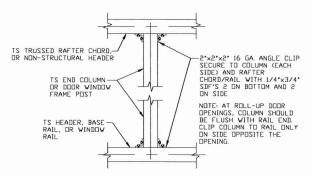
TYPICAL BOX EAVE RAFTER SIDE WALL OPENINGS FRAMING SECTION

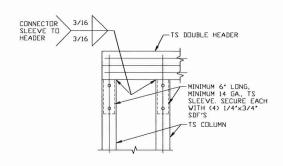


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		MOUNT AIRY, NC 27030			30
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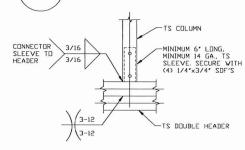
CONNECTION DETAILS

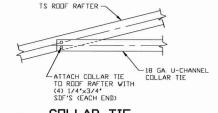


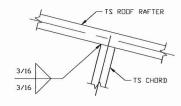


COLUMN TO HEADER, BASE RAIL, OR WINDOW RAIL CONNECTION DETAIL SCALE: NTS

DOUBLE HEADER/COLUMN CONNECTION DETAIL 8



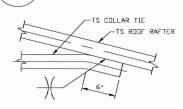




COLUMN/DOUBLE HEADER CONNECTION DETAIL

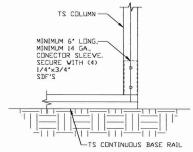
COLLAR TIE CONNECTION DETAIL 10 SCALE: NTS

RAFTER TO CHORD CONNECTION DETAIL 11 SCALE: NTS



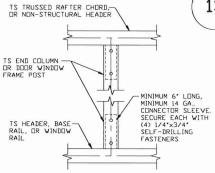
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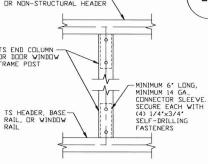
9



COLLAR TIE CONNECTION DETAIL SCALE: NTS

COLUMN/BASE RAIL CONNECTION DETAIL 13 SCALE: NTS





COLUMN TO HEADER OR BASE RAIL CONNECTION DETAIL SCALE: NTS

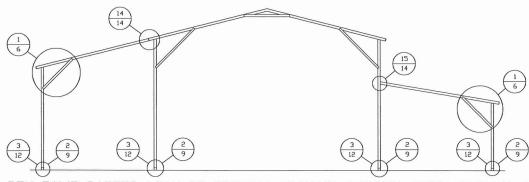


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	DRAWN BY: LT		P.O. BOX 12	287,	,			

BOX EAVE RAFTER LEAN-TO OPTIONS



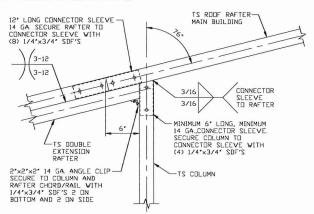
TYPICAL BOX EAVE RAFTER LEAN-TO OPTIONS FRAMING SECTION (BOTH OPTIONS SHOWN)

SCALE: NTS

MAXIMUM WIDTH OF SINGLE MEMBER (RAFTER) ROOF EXTENSION LEAN-TO IS 12'-0'.

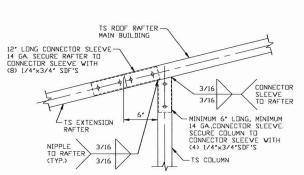
MAXIMUM WIDTH OF DOUBLE MEMBER RAFTER ROOF EXTENSION LEAN-TO IS 16'-0'.

FOR SHARED COLUMN HEIGHTS REFERENCE RAFTER COLUMN CONNECTION DETAILS FOR APPROPRIATE COLUMN HEIGHT AND TUBING SPECIFICATIONS.

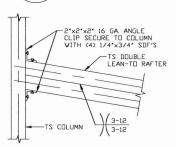


SIDE EXTENSION RAFTER/
COLUMN DETAIL FOR RAFTER

SPANS 12'-0" < TO < 16'-0"



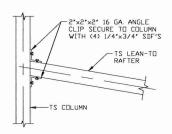
SIDE EXTENSION RAFTER/COLUMN DETAIL FOR RAFTER SPANS & 12'-0"



LEAN-TO RAFTER
TO RAFTER POST
CONNECTION DETAIL
FOR WIDTHS

12'-0" < T□ <u>≤</u> 16'-0"
SCALE: NTS

15



LEAN-TO RAFTER
TO RAFTER POST
CONNECTION DETAIL
FOR WIDTHS & 12'-0"

CLIENT: SBSI

15A) SCALE: NTS



DWG. NO SK-3

REV. 8

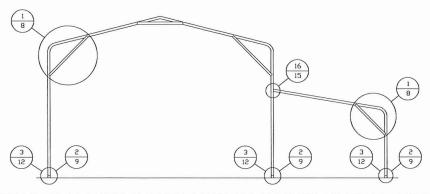
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DRAWN BY: LT	STEEL BUI	LDINGS AND P.O. BOX	STRUCTURES, INC. 1287,			

SHT. 14

BOW EAVE RAFTER LEAN-TO OPTIONS



TYPICAL BOW EAVE RAFTER LEAN-TO OPTIONS FRAMING SECTION

SCALE: NTS

MAXIMUM WIDTH DF SINGLE MEMBER (RAFTER) RODF EXTENSION LEAN-TO IS 12'-0'.

MAXIMUM WIDTH DF DOUBLE MEMBER RAFTER RODF EXTENSION LEAN-TO IS 16'-0'.

MAXIMUM WIDTH DF DOUBLE MEMBER RAFTER RODF EXTENSION LEAN-TO IS 16'-0'.

MAXIMUM WIDTH DF SINGLE MEMBER RAFTER RODF EXTENSION LEAN-TO IS 16'-0'.

MAXIMUM WIDTH DEVELOP.

MAXIMUM WIDTH DF SINGLE MEMBER (RAFTER RODF EXTENSION LEAN-TO IS 16'-0'.

MAXIMUM WIDTH DF SINGLE MEMBER (RAFTER RODF EXTENSION LEAN-TO IS 16'-0'.

MAXIMUM WIDTH DF SINGLE MEMBER (RAFTER) RODF EXTENSION LEAN-TO IS 16'-0'.

MAXIMUM WIDTH DF SINGLE MEMBER (RAFTER) RODF EXTENSION LEAN-TO IS 16'-0'.

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MAXIMUM WIDTH DF SINGLE MEMBER RAFTER RODF EXTENSION LEAN-TO IS 16'-0'.

MAXIMUM WIDTH DF SINGLE MEMBER RAFTER RODF EXTENSION LEAN-TO IS 16'-0'.

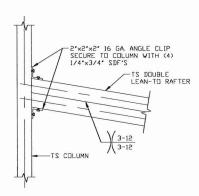
MAXIMUM WIDTH DF SINGLE MEMBER RAFTER RODF EXTENSION LEAN-TO IS 16'-0'.

MAXIMUM WIDTH DF SINGLE MEMBER RAFTER RODF EXTENSION LEAN-TO IS 16'-0'.

MAXIMUM WIDTH DF SINGLE MEMBER RAFTER RODF EXTENSION LEAN-TO IS 16'-0'.

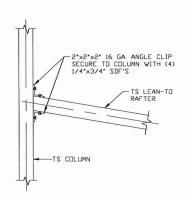
MAXIMUM WIDTH DF SINGLE MEMBER RAFTER RODF EXTENSION LEAN-TO IS 16'-0'.

MAXIMUM WIDTH DF SINGLE MEMBER RAFTER RODF R



LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL FOR WIDTHS 12'-0" < TO ≤ 16'-0"

16 SCALE: NTS



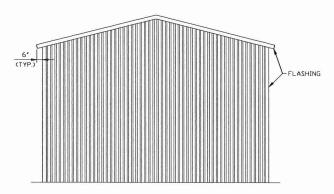
LEAN-TO RAFTER
TO RAFTER POST
CONNECTION DETAIL
FOR WIDTHS \(\) 12'-0'

16A) SCALE: NTS

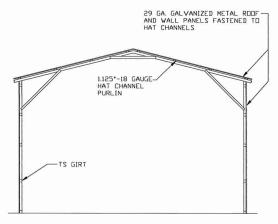


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BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION

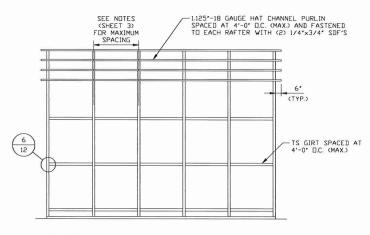


TYPICAL END ELEVATION VERTICAL ROOF/SIDING



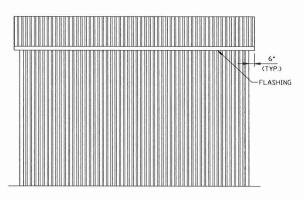
TYPICAL SECTION VERTICAL ROOF/SIDING OPTION

SCALE: NTS

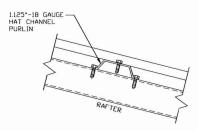


TYPICAL FRAMING SECTION VERTICAL ROOF/SIDING OPTION

SCALE: NTS



TYPICAL SIDE ELEVATION VERTICAL ROOF/SIDING

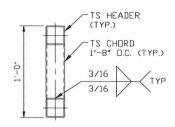


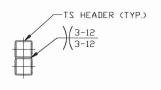
PANEL ATTACHMENT
(ALTERNATE FOR VERTICAL ROOF PANELS)
SCALE: NTS



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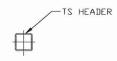
SIDE WALL HEADER OPTIONS





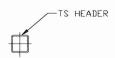
LACED HEADER DETAIL FOR DOOR □PENINGS 12'-0" < LENGTH ≤ 20'-0"</pre>

DOUBLE HEADER DETAIL FOR DOOR □PENINGS 7'-0" < LENGTH ≤ 12'-0"</pre> SCALE: NTS



SINGLE HEADER DETAIL FOR DOOR OPENINGS LENGTH < 7'-0"

END WALL HEADER OPTIONS



SINGLE HEADER DETAIL FOR DOOR OPENINGS LENGTH < 12'-0"
SCALE: NTS



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		MOUNT AIRY, NC 27030				
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