

STRUCTURAL DESIGN

ENCLOSED BUILDING EXPOSURE B

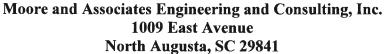
MAXIMUM 30'-0" WIDE X 20'-0" EAVE HEIGHT- BOX EAVE FRAME AND BOW FRAME

18 December 2017 Revision 4 M&A Project No. 16022S/17300S

Prepared for:

Tubular Building Systems, LLC 631 SE Industrial Circle Lake City, Florida 32025





401 S. Main Street, Suite 200 Mount Airy, NC 27030





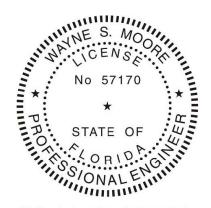


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CLIENT: TBS	SHT. 2	DWG. NO SK-3		REV. 4	_	

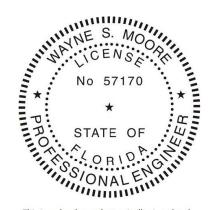
INSTALLATION NOTES AND SPECIFICATIONS

- 1 DESIGN IS FOR A MAXIMUM 30'-0" WIDE \times 20'-0" EAVE HEIGHT ENCLOSED STRUCTURES
- 2. DESIGN WAS DONE IN ACCORDANCE WITH THE 2017 FLORIDA BUILDING CODE (FBC) 6TH EDITION, 2012 INTERNATIONAL BUILDING CODE (IBC), AND 2015 IBC.
- 3. DESIGN LOADS ARE AS FOLLOWS:
 A) DEAD LOAD = 1.5 PSF
 B) LIVE LOAD = 12 PSF
 C) GROUND SNOW LOAD = 10 PSF
- 4 LOW ULTIMATE WIND SPEED 105 TO 140 MPH (NOMINAL WIND SPEED 81 TO 108 MPH); MAXIMUM RAFTER/POST AND END POST SPACING = 50 FFFT.
- 5. HIGH ULTIMATE WIND SPEED 141 TO 170 MPH (NOMINAL WIND SPEED 109 TO 132 MPH): MAXIMUM RAFTER/POST AND END POST SPACING = 40 FEET
- 6. LOW HAZARD RISK CATEGORY I (WIND)
- 7. WIND EXPOSURE CATEGORY B.
- 8. SPECIFICATIONS APPLICABLE TO 29 GAUGE METAL PANELS FASTENED DIRECTLY TO 2 1/2' × 2 1/2' 14 GAUGE TUBE STEEL (TS) FRAMING MEMBERS. FOR VERTICAL PANELS, 29 GAUGE METAL PANELS SHALL BE FASTENED TO 18 GAUGE HAT CHANNELS (UNLESS OTHERWISE NOTED).
- 9 AVERAGE FASTENER SPACING DN-CENTERS ALONG RAFTERS OR PURLINS, AND POSTS, INTERIOR = 9° OR END = 6°, (MAX)
- 10. FASTENERS CONSIST OF #12-14x3/4' SELF-DRILLING FASTENER (SDF), USE CONTROL SEAL WASHER WITH EXTERIOR FASTENERS, SPECIFICATIONS APPLICABLE DNLY 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 SHALL BE INSTALLED THROUGH BASE RAIL WITHIN 6' OF EACH RAFTER COLUMN ALONG SIDES.
- 12. GROUND ANCHORS (SOIL NAILS) CONSIST OF #4 REBAR W/WELDED NUT x 30" LONG IN SUITABLE SOIL CONDITIONS MAY BE USED FOR LOW (\$108 MPH NOMINAL) WIND SPEEDS ONLY. OPTIONAL ANCHORAGE MAY BE USED IN SUITABLE SOILS AND MUST BE USE IN UNSUITABLE SOILS AS NOTED.
- 13. OPTIONAL BASE RAIL ANCHORAGE MAY BE USED FOR LOW AND MUST BE USED FOR HIGH WIND SPEEDS.
- 14. WIND FORCES GOVERN OVER SEISMIC FORCES, SEISMIC PARAMETERS ANALYZED ARE:

SDIL SITE CLASS = D RISK CATEGORY I/II/III

R= 3.25 I_E = 1.0 S_{DS} = 1.522 V= $C_S W$

 $2^{DI} = 0.839$



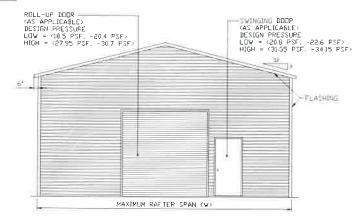
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PREJECT MGR: VSM	DATE: 12-18-17	JOB NO: 16022S/17300S				
CLIENT: TBS	знт. з	DVG. NO: SK-3	REV. 4			

BOX EAVE FRAME RAFTER ENCLOSED BUILDING



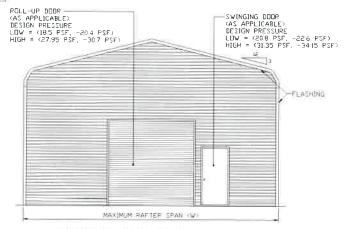
TYPICAL END ELEVATION-HORIZONTAL ROOF

SCALE: NTS

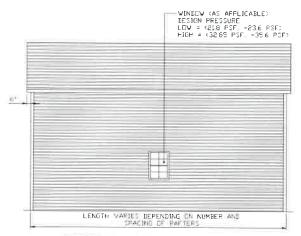
TYPICAL SIDE ELEVATION—HORIZONTAL ROOF

-WINDOW (AS APPLICABLE) DESIGN PRESSURE LOW = (218 PSF, -236 PCF) HIGH = (2285 PSF, -356 PSF)

BOW FRAME RAFTER ENCLOSED BUILDING



TYPICAL END ELEVATION



TYPICAL SIDE ELEVATION
SCALE: NTS



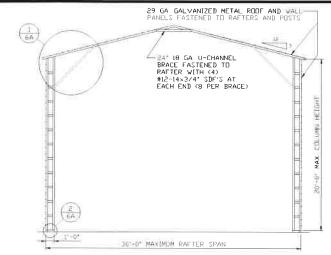
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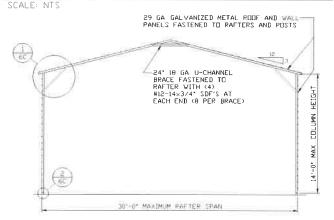
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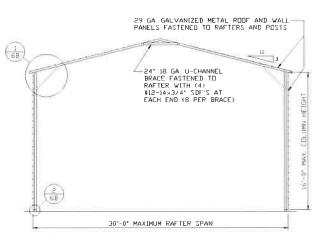
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	PROJECT MGR: VSM	DATE: 12-18-17	SCALE: NTS	JOB NO: 160225/173005	
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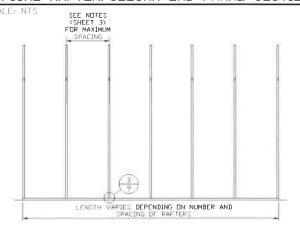
TYPICAL RAFTER/COLUMN END FRAME SECTION



TYPICAL RAFTER/COLUMN END FRAME SECTION



TYPICAL RAFTER/COLUMN END FRAME SECTION



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

SCALE: NTS



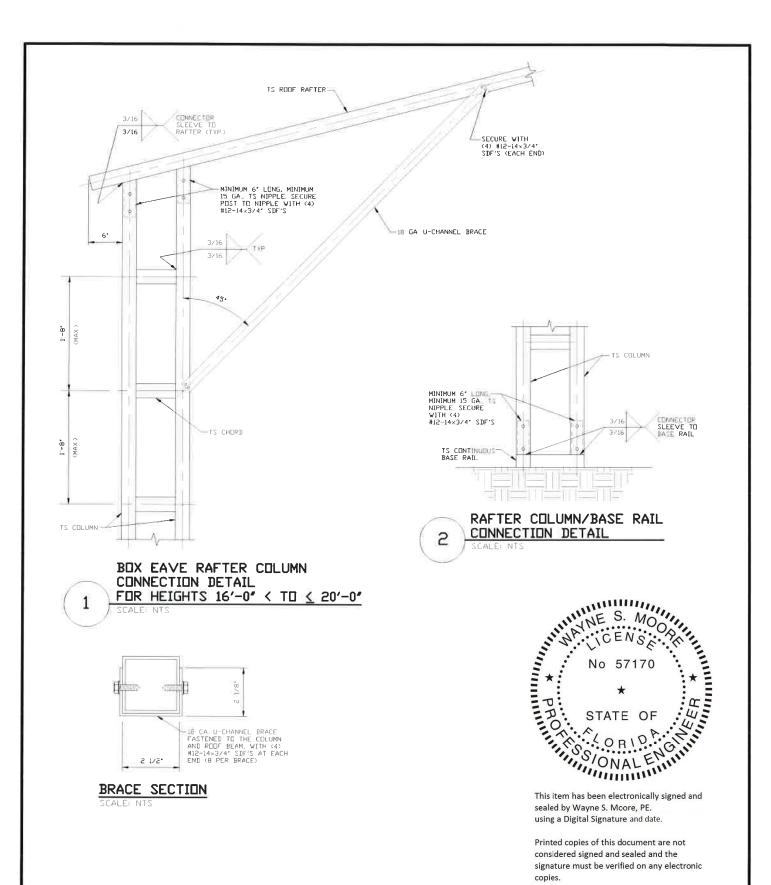
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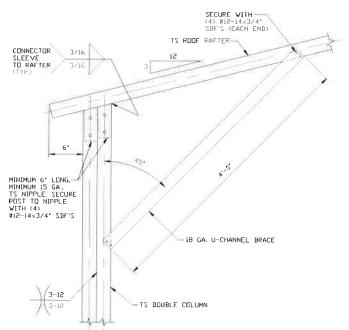
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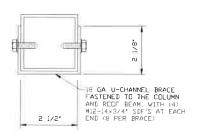
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CLIENT: TRS	SHT. 5	DWG. NO: SK-3		REV. 4		



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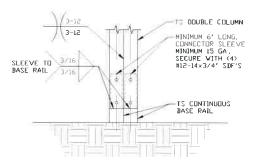


BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 14'-0" < TO < 16'-0"

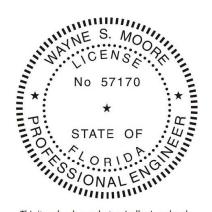


BRACE SECTION

SCALE: NTS



RAFTER COLUMN/BASE RAIL CONNECTION DETAIL



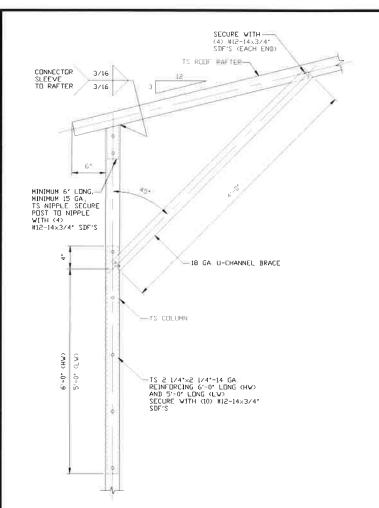
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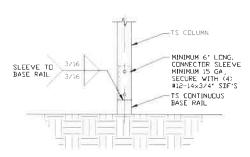
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PROJECT MGR: VSM	DATE: 12-18-17 SHT. 6B	SCALE: NTS	JOB NO 16022S/17300S REV.: 4	

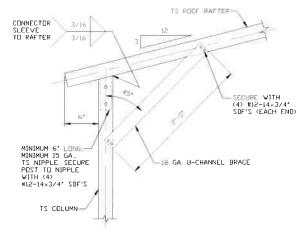


BOX EAVE RAFTER COLUMN CONNECTION DETAIL

FOR HEIGHTS 10'-0' < TO \(\) 14'-0'

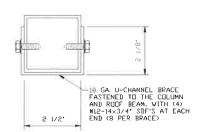


2 RAFTER COLUMN/BASE RAIL
CONNECTION DETAIL
SCALE: NTS



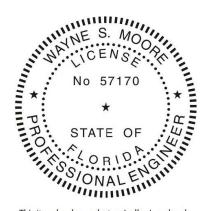
BOX EAVE RAFTER COLUMN CONNECTION DETAIL

FOR HEIGHTS \(\) 10'-0"



BRACE SECTION

SCALE: NTS



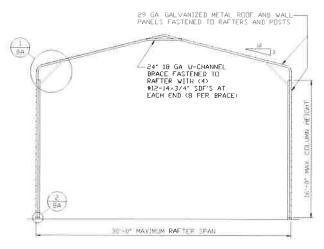
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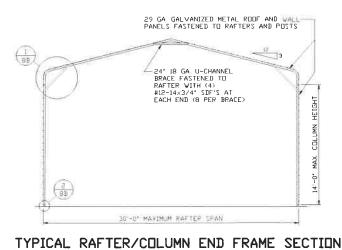
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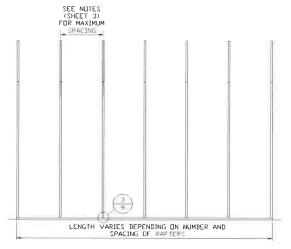




TYPICAL RAFTER/COLUMN END FRAME SECTION

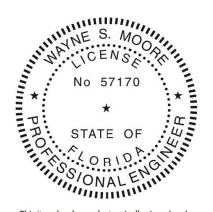
SCALE: NTS

SCALE: NTS



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

SCALE: NTS



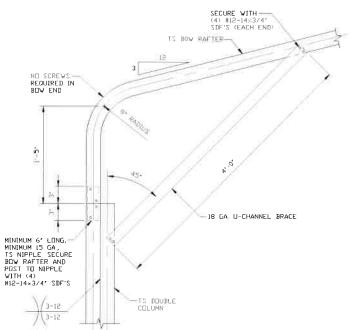
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CLIENT: TRS	SHT. 7	DWG. ND: SK-3		REV. 4	

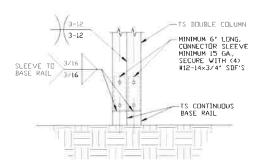


BOX EAVE RAFTER COLUMN FOR HEIGHTS 14'-0" < TO ≤ 16'-0"

<u>,</u> 'n -18 GA U-CHANNEL BRACE FASTENED TO THE COLUMN AND REOF BEAM, WITH (4) #12-14/3/4' SDF'S AT EACH END (8 PER BRACE)

CONNECTION DETAIL

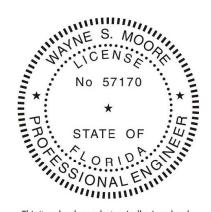
BRACE SECTION



RAFTER COLUMN/BASE RAIL CONNECTION DETAIL

SCALE: NTS

2



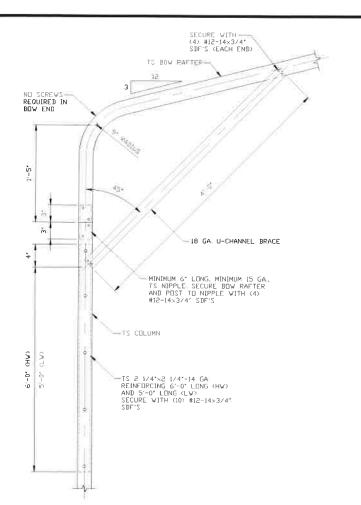
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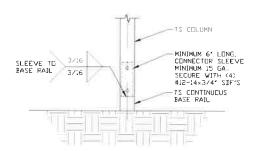
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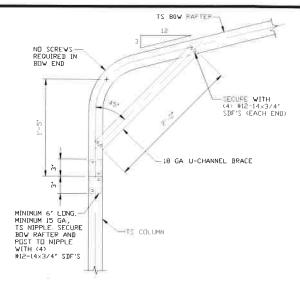


BOX EAVE RAFTER COLUMN CONNECTION DETAIL

FOR HEIGHTS 10'-0' < TO \(\) 14'-0'

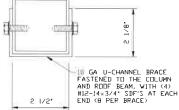


2 RAFTER COLUMN/BASE RAIL CONNECTION DETAIL SCALE: NTS



BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS & 10'-0'

1B



BRACE SECTION

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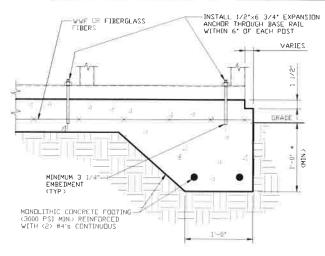
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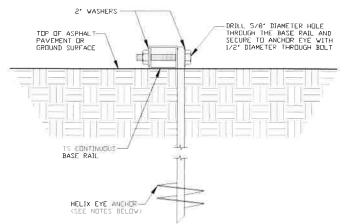
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	CLIENT: TBS	SHT. ӨВ	DWG. NO: SK-3	REV. 4

BASE RAIL ANCHORAGE OPTIONS FOR LOW AND HIGH WIND SPEED





3A

CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE

SCALE: NTS (MINIMUM ANCHOR EDGE DISTANCE IS 4") * COURDINATE WITH LOCAL CODES/ORD

3B

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

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 SHALL BE PER ACI-318: 3 INCHES 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 INCHES ELSEWHERE.

REINFORCING STEEL

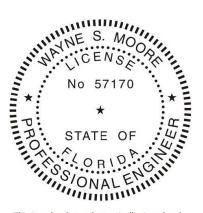
THE TURNDOWN REINFORCING STEEL SHALL BE ASTM A615 GRADE 60. THE SLAB REINFORCEMENT SHALL BE WELDED WIRE FABRIC MEETING ASTM A185 OR FIBERGLASS FIBER REINFORCEMENT.

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

- 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.
- 3 REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE FIELD BENT.

HELIX ANCHOR NOTES:

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



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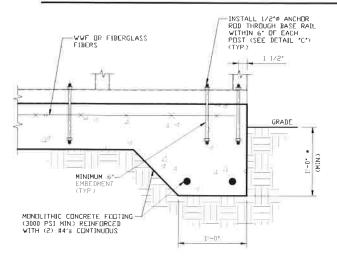
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PROJECT MGR: VSH	DATE: 12-18-17	SCALE: NTS	JOB NO: 160225/173005		
CLIENT: TBS	SHT. 9A	DWG. NO: SK-3	REV,i 4		

OPTIONAL FOUNDATION ANCHORAGE FOR LOW & HIGH WIND SPEED





CONCRETE MONOLITHIC SLAB BASE RAIL ANCHURAGE

(MINIMUM ANCHOR EDGE DISTANCE IS 1 1/2") * COORDINATE WITH LOCAL CODES/ORD

GENERAL NOTES

CONCRETE

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

COVER OVER REINFORCING STEEL!

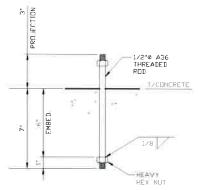
FOR FOUNDATIONS, MINIMUM CONCRETE COVER OVER REINFORCING FUR FOUNDATIONS, MINIMUM CONCRETE COVER OVER REINFORCING BARS SHALL BE PER ACI-318:

3 INCHES 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 INCHES ELSEWHERE

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.

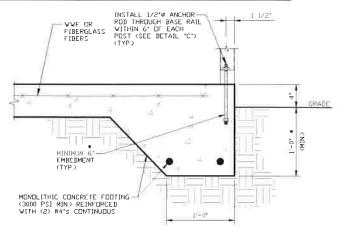
REINFORCEMENT MAY BE BENT IN THE SHOP OR THE FIELD PROVIDED:

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



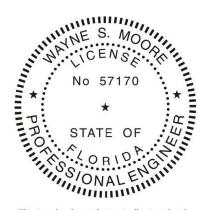


ANCHOR ROD THROUGH BASE RAIL DETAIL



CONCRETE MONOLITHIC SLAB BASE RAIL ANCHURAGE 1B

> (MINIMUM ANCHOR EDGE DISTANCE IS 1 1/2") * COORDINATE WITH LOCAL CODES/ORD.



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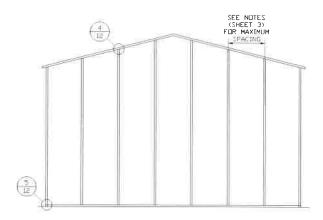
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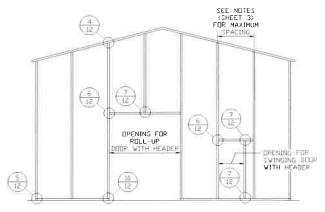
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PROJECT MGR: VSM	DATE: 12-18-17	SCALE: NTS	JOB NO: 16022S/17300S
CLIENT: TBS	SHT. 9B	DVG. NO: SK-3	REV.1 4

BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



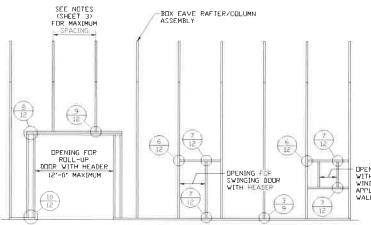
TYPICAL BOX EAVE RAFTER

END WALL FRAMING SECTION



TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

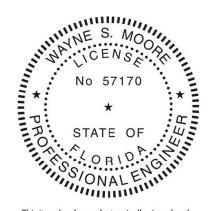
SCALE: NTS



DPENING FOR WINDOW WITH HEADER AND WINDOW RAIL (ALSO APPLICABLE TO END WALLS)

TYPICAL BOX EAVE RAFTER SIDE WALL OPENINGS FRAMING SECTION

SCALE: NTS



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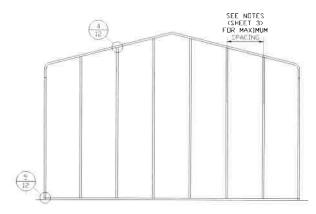
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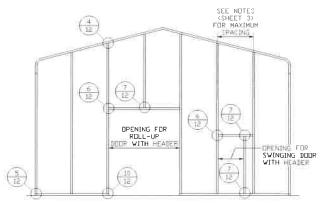
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_	PROJECT MGR: VSM	DATE: 12-18-17	SCALE: NTS	JDB ND: 16022S/17300S				
	CLIENT, TRS	SHT. 10	DWG. ND: SK-3	REV. 4				

BOW RAFTER END WALL AND SIDE WALL OPENINGS



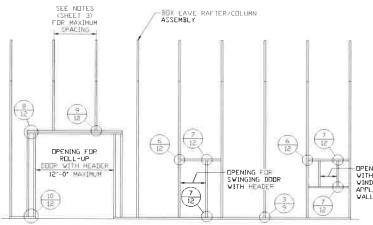
TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION

SCALE: NTS



TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

SCALE: NTS



-OPENING FOR WINDOW WITH HEADER AND WINDOW RAIL (ALSO APPLICABLE TO END WALLS)

TYPICAL BOX EAVE RAFTER SIDE WALL OPENINGS FRAMING SECTION

SCALE: NTS



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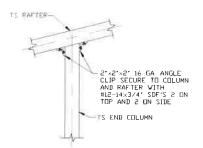
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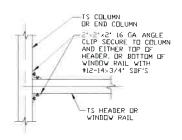
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CLIENT: TBS	SHT. 11	DAC ND 2K-3	REV. 4	

BOW AND BOX EAVE RAFTER WALL OPENING DETAILS



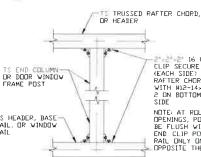
TS COLUMN (CORNER) MINIMUM 6' LONG, MINIMUM 15 GA, TS NIPPLE SECURE WITH (4) #12-14×3/4' SDF'S 2'x2'x2' 16 GA CLIP ANGLE SECURE TO RAFTER COLUMN AND BASE RAIL W/(4) #12-14x3/4" SDF'S NIPPLE TO 3/16 BASE RAIL 3/16 TS CONTINUOUS BASE RAIL



END COLUMN/RAFTER CONNECTION DETAIL 4

END COLUMN/BASE RAIL CONNECTION DETAIL 5

HEADER OR WINDOW RAIL TO COLUMN CONNECTION DETAIL



IS GA ANGLE
CLIP SECURE TO COLUMN
(EACH SIDE) AND
RAFTER CHORD/RAIL
WITH #12-14×3/4' SDF'S
2 ON BOTTOM AND 2 ON
SIDE

NOTE: AT ROLL-UP DOOR OPENINGS, POST SHOULD BE FLUSH WITH RAIL END CLIP POST TO RAIL ONLY ON SIDE OPPOSITE THE OPENING.

3/16 NIPPLE TO HEADER 3-12 3/16 3-12 MINIMUM 6' LDNG, MINIMUM 15 GA, TS NIPPLE SECURE EACH WITH (4) #12-14x3/4' SDF'S TS COLUMN

TS COLUMN NIPPLE TO HEADER 3/16 MINIMUM 6' LONG, MINIMUM 15 GA., TS NIPPLE SECURE WITH (4) #12-14×3/4" SDF'S DOUBLE HEADER

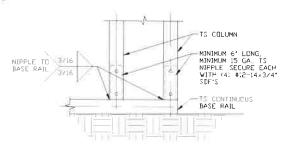
6

COLUMN TO HEADER, BASE RAIL, OR WINDOW RAIL

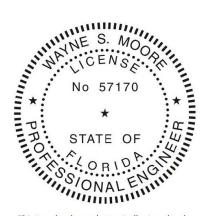
DOUBLE HEADER/COLUMN CONNECTION DETAIL 8

COLUMN/DOUBLE HEADER CONNECTION DETAIL 9

CONNECTION DETAIL



COLUMN/BASE RAIL CONNECTION DETAIL 10



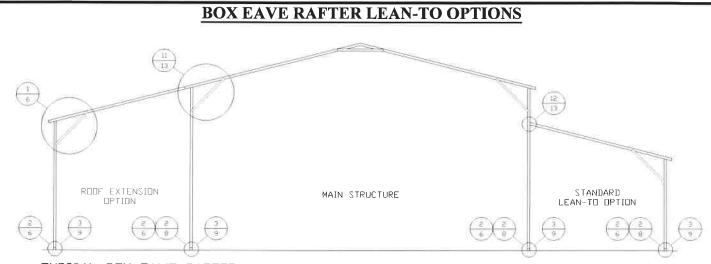
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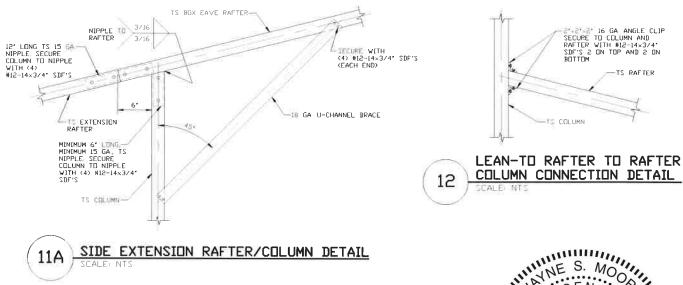
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CLIENT: TBS	SHT. 12	DAC NO 2K-3		REV. 4	



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

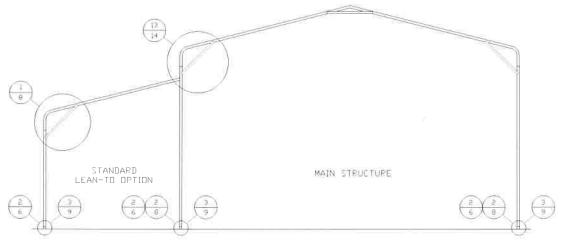
SCALE: NTS
MAXIMUM WIDTH OF SINGLE MEMBER RAFTER LEAN-TO IS 16'-0'.



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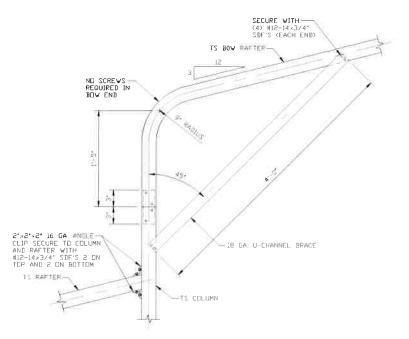
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BOW RAFTER LEAN-TO OPTIONS



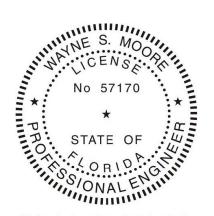
TYPICAL BOW RAFTER LEAN-TO OPTIONS FRAMING SECTION (BOTH OPTIONS SHOWN)

SCALE: NTS MAXIMUM WIDTH OF SINGLE MEMBER RAFTER LEAN-TO IS 16'-0".



SIDE EXTENSION RAFTER/COLUMN DETAIL

SCALE: NTS



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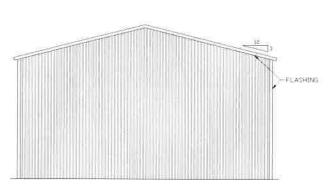
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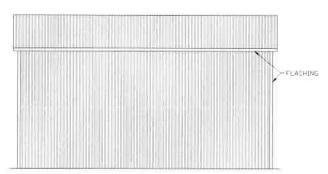
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PROJECT MGR: VSM	DATE: 12-18-17	SCALE: NTS	JOB NO: 160225/173005		
CLIENT: TBS	SHT. 14	DWG. ND: SK-3	REV,1 4		

BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



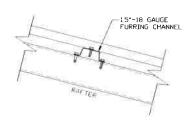
TYPICAL END ELEVATION VERTICAL ROOF/SIDING OPTION

SCALE: NTS



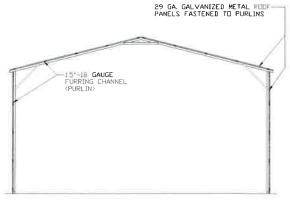
TYPICAL SIDE ELEVATION VERTICAL ROOF/SIDING OPTION

SCALE: NTS



ROOF PANEL ATTACHMENT

(ALTERNATE FOR VERTICAL ROOF PANELS)
SCALE: NTS



TYPICAL SECTION VERTICAL ROOF/SIDING OPTION

SCALE: NTS

SEE NOTES
(SHEET 3)
FOR MAXIMUM
SPACING

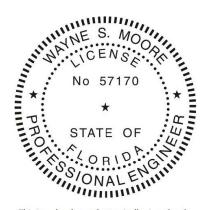
SDF'S

SCALE: NTS

ADT MORE THAN 4'-0' DC AND FASTENED
TO EACH RAFTER WITH (2) Hi2-14×3/4'
SDF'S

TYPICAL FRAMING SECTION VERTICAL ROOF/SIDING OPTION

SCALE: NTS



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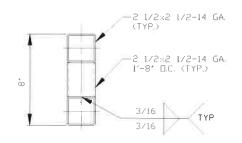
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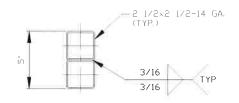
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CHECKED BY: PDH	30-0 A20-	50-0 X20-0 ENCLOSED BUILDING EXP. B				
PROJECT MGR: VSM	DATE: 12-18-17	SCALE: NTS		ND: 225/17300S		
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OPTIONAL DOOR HEADER



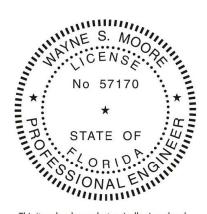
HEADER DETAIL FOR DOOR OPENINGS 12'-0" < LENGTH ≤ 15'-0"

SCALE: NTS



HEADER DETAIL FOR DOOR OPENINGS LENGTH & 12'-0"

SCALE: NTS



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	CLIENT: TBS	SHT. 16	DWG. ND: SK-3	REV. 4	