

STRUCTURAL DESIGN

FULLY OPEN CARPORT 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:

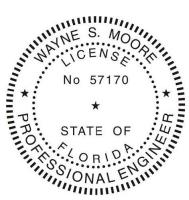
Tubular Building Systems, LLC 631 SE Industrial Circle Lake City, Florida 32025

Prepared by:

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

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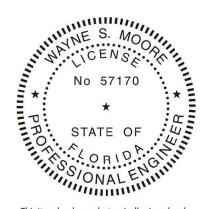
INSTALLATION NOTES AND SPECIFICATIONS

- 1_{F} DESIGN IS FDR A MAXIMUM 30'-0" WIDE imes 20'-0" EAVE HEIGHT FULLY DPEN CARPORT.
- 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 = 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. 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 ON-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 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.
- II. GROUND ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL WITHIN 6° OF EACH RAFTER COLUMN ALONG SIDES
- 12 GROUND ANCHORS (SDIL NAILS) CONSIST OF #4 REBAR W/ WELDED NUT x 30° LONG IN SUITABLE SDIL CONDITIONS MAY BE USED FOR LOW (\$\(\frac{1}{2}\) 108 MPH NOMINAL) WIND SPEEDS ONLY. OPTIONAL ANCHORAGE MAY BE USED IN SUITABLE SDILS 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:

SOIL SITE CLASS = D RISK CATEGORY I/II/III R= 3.25 $I_F = 1.0$

S_{DS}= 1.522 $V = C_S W$

 $S_{n_1} = 0.839$



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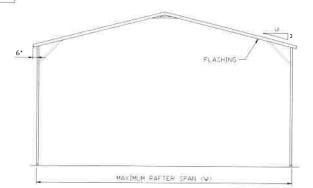
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PROJECT MGR: VSM	DATE: 12-18-17	SCALE: NTS		NO: 225/17300S	
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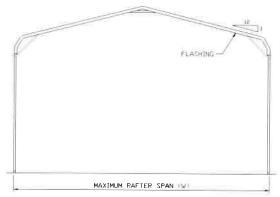
BOX EAVE FRAME RAFTER ENCLOSED BUILDING



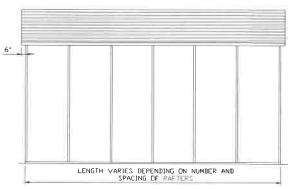
TYPICAL END ELEVATION-HORIZONTAL ROOF

SCALE: NTS

BOW FRAME RAFTER ENCLOSED BUILDING

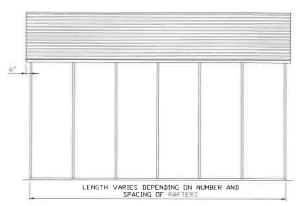


TYPICAL END ELEVATION
SCALE: NTS



TYPICAL SIDE ELEVATION-HORIZONTAL ROOF

SCALE: NTS



TYPICAL SIDE ELEVATION
SCALE: NTS



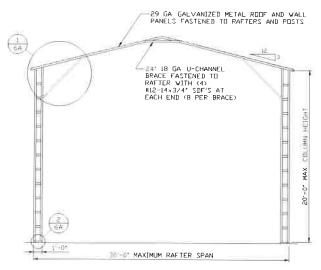
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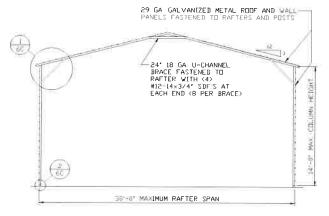
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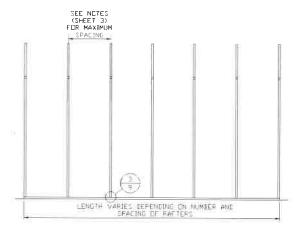
29 GA GALVANIZED METAL ROOF AND WALL PANELS FASTENED TO RAFTERS AND POSTS E41 18 GA U-CHANNEL BRACE FASTENED TO RAFTER WITH (4) #12-14×3/4' SDF'S AT EACH END (8 PER BRACE) IMI. Į. (88)

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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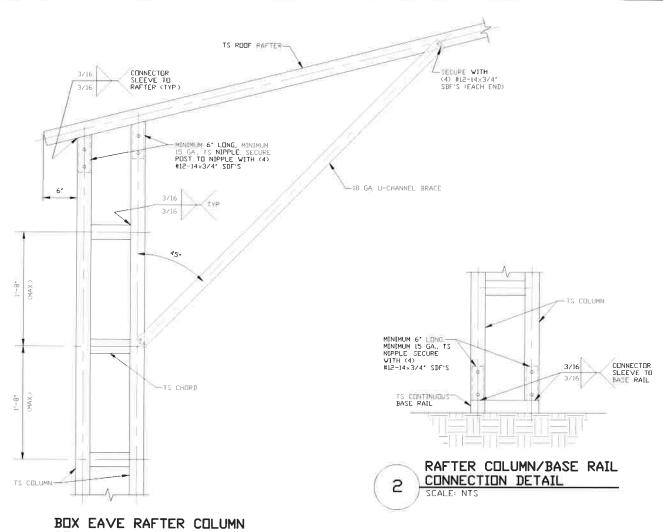
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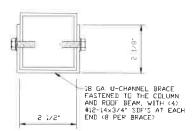
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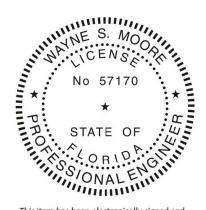


CONNECTION DETAIL

1 FOR HEIGHTS 16'-0' < TO < 20'-0'



BRACE SECTION



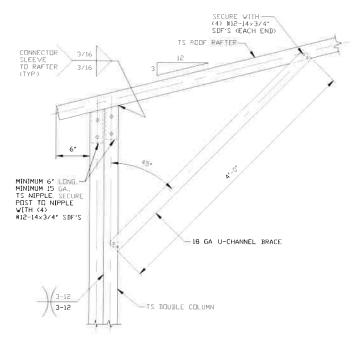
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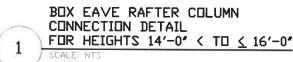
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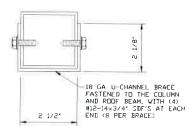
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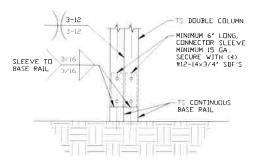






BRACE SECTION

SCALE: NTS



RAFTER COLUMN/BASE RAIL CONNECTION DETAIL

2

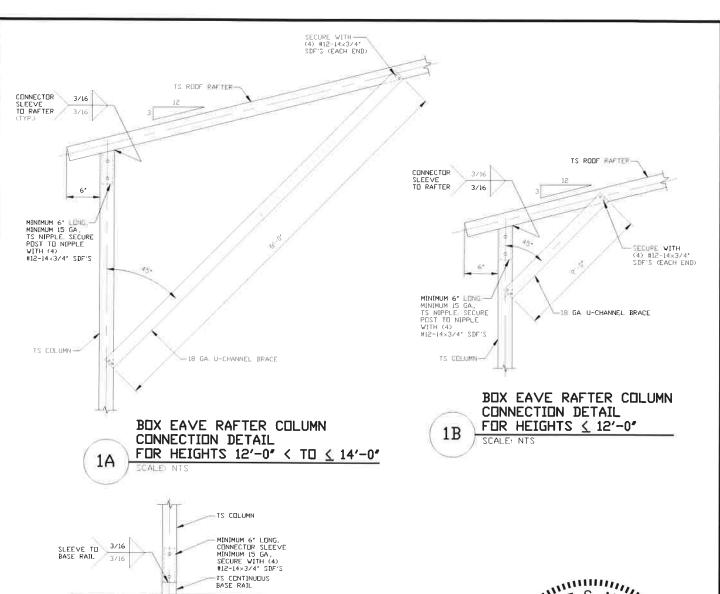
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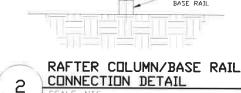
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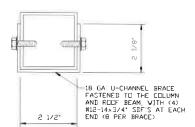
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BRACE SECTION

SCALE: NTS



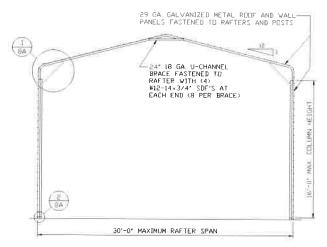
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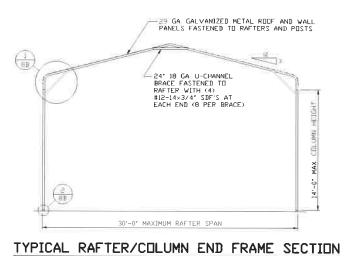
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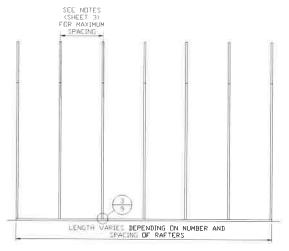




TYPICAL RAFTER/COLUMN END FRAME SECTION

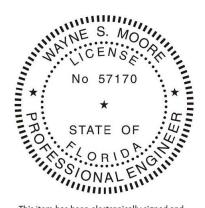
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TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

SCALE: NTS



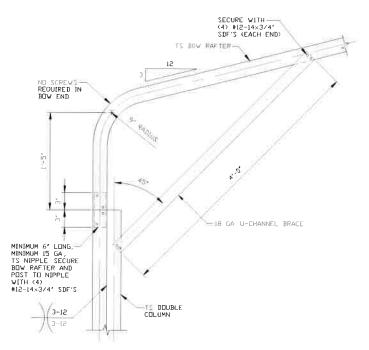
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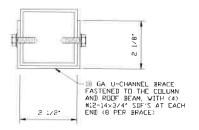
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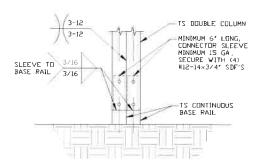


BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 14'-0" < TO < 16'-0"

1

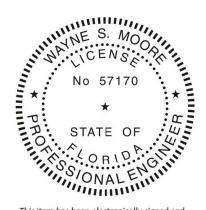


BRACE SECTION



RAFTER COLUMN/BASE RAIL CONNECTION DETAIL

2



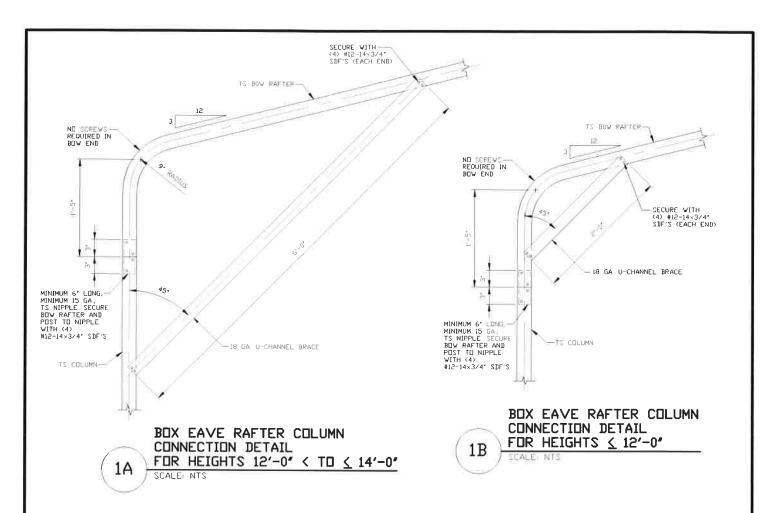
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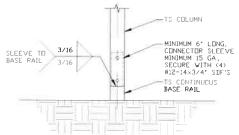
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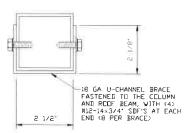
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2 RAFTER COLUMN/BASE RAIL CONNECTION DETAIL



BRACE SECTION

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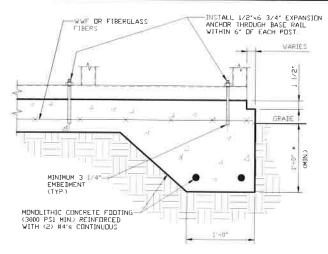
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BASE RAIL ANCHORAGE OPTIONS FOR LOW AND HIGH WIND SPEED





CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE

(MINIMUM ANCHOR EDGE DISTANCE IS 4") * 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 I 1/2 INCHES ELSEWHERE.

REINFORCING STEEL:

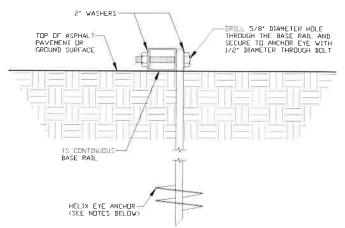
THE TURNDOWN REINFORCING STEEL SHALL BE ASTM A615 GRADE 60. THE SLAB REINFORCEMENT SHALL BE WELDED WIRE FABRIC MEETING ASTM A185 OR FIBERGLASS FIBER REINFORCEMENT.

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

- I. 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.

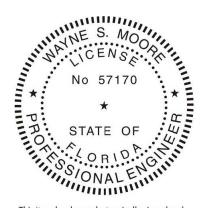
HELIX ANCHOR NOTES:

- IN 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 (2) 4" HELICES WITH MINIMUM 3C 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 60 INCH EMBEDMENT:



3B

GROUND BASE HELIX ANCHORAGE (CAN BE USED FOR ASPHALT)



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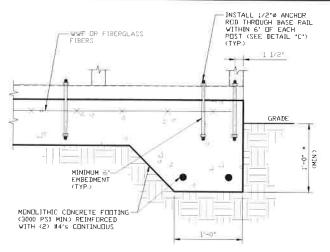
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DRAWN BY: LT CHECKED BY: PDH	TUBULAR BUILDING SYSTEMS 30'-0"x20'-0" FULLY OPEN CARPORT EXP. B		
PROJECT MGR: VSM	DATE: 12-18-17	SCALE: NTS	JOB NO: 160225/173005
CLIENT: TBS	SHT. 9A	DWG. NO SK-1	REV. 4

OPTIONAL FOUNDATION ANCHORAGE FOR LOW & HIGH WIND SPEED





CONCRETE MONOLITHIC SLAB BASE RAIL ANCHURAGE

(MINIMUM ANCHOR EDGE DISTANCE IS 1 1/2") * COURDINATE 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 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.

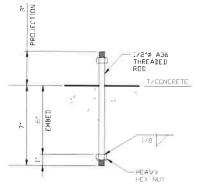
REINFORCING STEEL

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

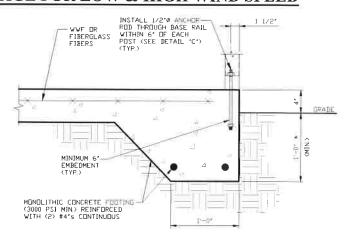
BE FIELD BENT





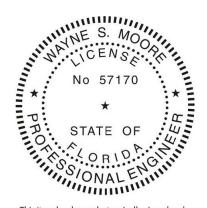
ANCHOR ROD THROUGH BASE RAIL DETAIL

SCALE: NTS



CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE

* COORDINATE WITH LOCAL CODES/ORD



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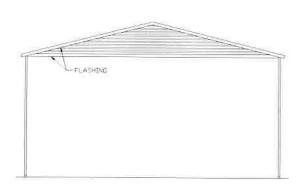
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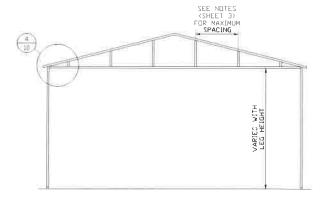
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PROJECT MGR: VSM	DATE: 12-18-17	SCALE: NTS	JOB ND: 16022S/17300S	
CLIENT: TBS	SHT. 9B	DWG. NO: SK-1	REV. 4	

BOX EAVE RAFTER GABLE END OPTION

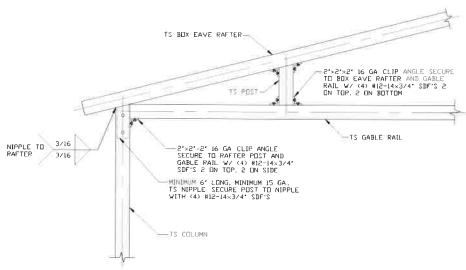




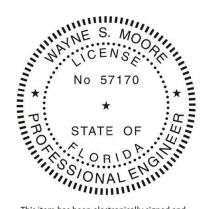
TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION

TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

SCALE: NTS



4 BOX EAVE RAFTER GABLE RAIL TO RAFTER POST CONNECTION DETAIL



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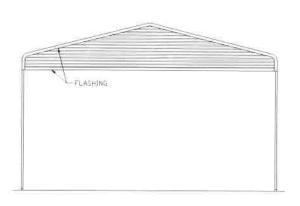
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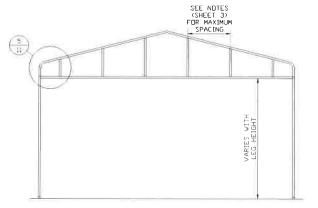
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PROJECT MGR: VSM	DATE: 12-18-17	SCALE: NTS		ND: 22S/17300S
CLIENT: TBS	SHT. 10	DWG. NO: SK-1		REV. 4

BOW RAFTER GABLE END OPTION

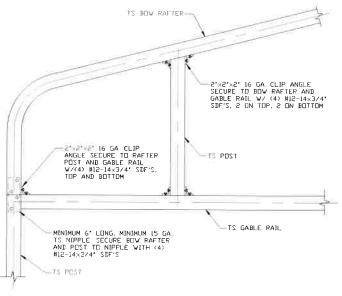




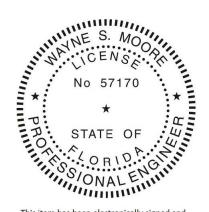
TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION

SCALE: NTS SCALE: NTS

TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION



5 RAFTER/POST CONNECTION DETAIL



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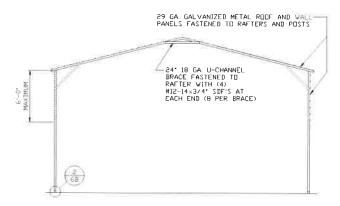
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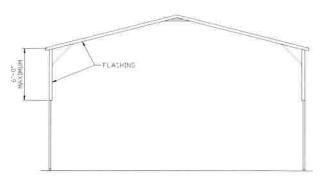
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100	PROJECT MGR: WSM	DATE: 12-18-17	SCALE: NTS		ND: 22S/17300S
	CLIENT: TBS	SHT. 11	DWG. ND: SK-1		REV. 4

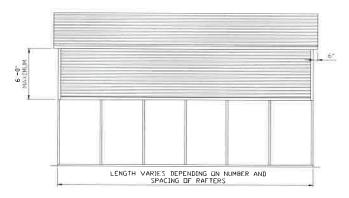
BOX EAVE RAFTER EXTRA SIDE PANEL OPTION



TYPICAL RAFTER/POST FRAME SECTION EXTRA SIDE PANELS



TYPICAL END ELEVATION EXTRA SIDE PANELS SCALE: NTS



TYPICAL SIDE ELEVATION EXTRA SIDE PANELS



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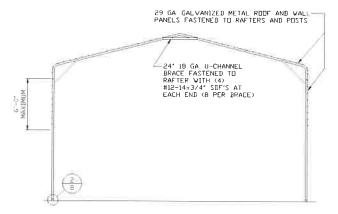
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PROJECT MGR: VSM	DATE: 12-18-17	SCALE: NTS		ND: 22S/17300S
CLIENT: TBS	SHT. 12	DWG. NO: SK-1		REV,ı 4

BOW RAFTER EXTRA SIDE PANEL OPTION



TYPICAL RAFTER/POST FRAME SECTION EXTRA SIDE PANELS

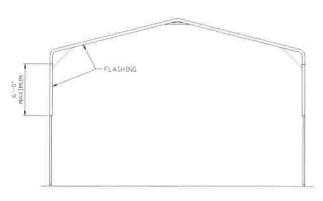
6.

TYPICAL SIDE ELEVATION EXTRA SIDE PANELS

LENGTH VARIES DEPENDING ON NUMBER AND SPACING OF RAFFERS

FLASHING (OPTIONAL)

OPTIONAL 6 — WALL EXTENSION TO MATCH ROOF



TYPICAL END ELEVATION EXTRA SIDE PANELS
SCALE: NTS



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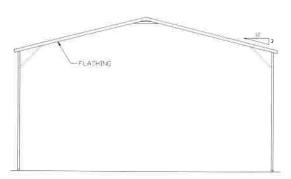
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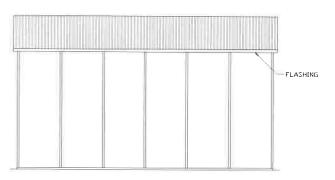
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CHECKED BY: PDH	30'-0"x20'-0" FULLY OPEN CARPORT EXP, B					
PROJECT MGR: VSM	DATE: 12-18-17	SCALE: NTS	JDB ND 16022S/17300S			
CLIENT: TBS	SHT. 13	DVG. NO: SK-1		REV. 4		

BOX EAVE RAFTER VERTICAL ROOF OPTION



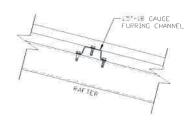
TYPICAL END ELEVATION VERTICAL ROOF/SIDING OPTION

SCALE: NTS



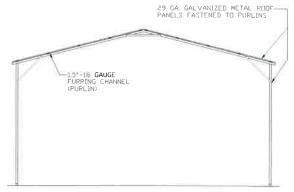
TYPICAL SIDE ELEVATION VERTICAL ROOF/SIDING OPTION

SCALE: NTS



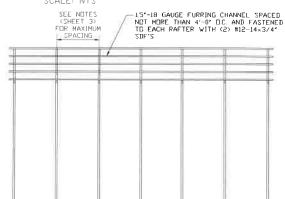
ROOF PANEL ATTACHMENT

(ALTERNATE FOR VERTICAL ROOF PANELS) SCALE: NTS



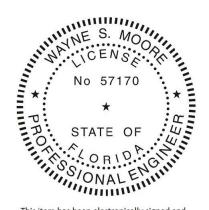
TYPICAL SECTION VERTICAL ROOF/SIDING OPTION

SCALE: NTS



TYPICAL FRAMING SECTION VERTICAL ROOF/SIDING OPTION

SCALE: NTS



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PROJECT MGR: WSM	DATE: 12-18-17	SCALE: NTS	160	3 NO: 225/17300S		
CLIENT: TBS	SHT. 14	DWG. ND: SK-1		REV.I 4		