

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:

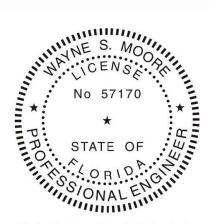
Moore and Associates Engineering and Consulting, Inc.



1009 East Avenue North Augusta, SC 29841

401 S. Main St., Suite 200 Mt. Airy, NC 27030





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STEEL BUILDINGS AND STRUCTURES

DWG. ND SK-3

REV. 8

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PROJECT MGR: VSM	DATE: 2-14-20	SCALE: NTS	JUB ND 18068S 18156\$/18290\$/20019\$				
CHECKED BY PDH	MOUNT AIRY, NC 27030 30'-0"x20'-0" ENCLOSED STRUCTURE						
DRAWN BY: LT		P.O. BOX 1287,					

SHT, 2

CLIENT: SBSI

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 (\leq 26'-0"), 35 PSF (26'-0" (\forall \leq 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
- II, 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 \times 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:

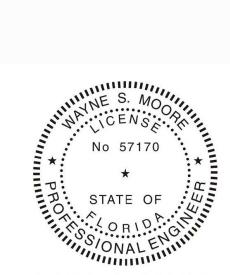
SOIL SITE CLASS = D

RISK CATEGORY I

R = 3.25 $S_{DS} = 2.039$ g $I_E = 1.0$ V= $C_S W$

 $S_{D1} = 1.258 g$

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



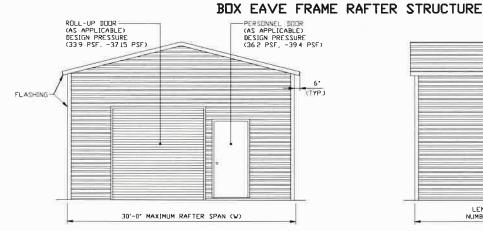
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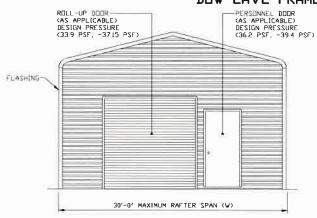
LENGTH VARIES DEPENDING DN NUMBER AND SPACING OF RAFTERS TYPICAL SIDE ELEVATION

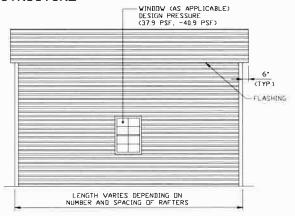
TYPICAL END ELEVATION

SCALE: NTS

SCALE: NTS

BOW EAVE FRAME RAFTER STRUCTURE





TYPICAL END ELEVATION

SCALE: NTS

TYPICAL SIDE ELEVATION

SCALE: NTS



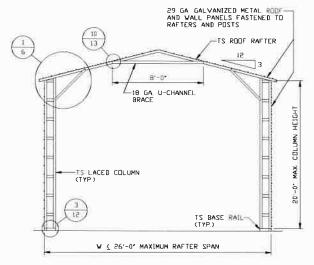
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	DOM BY IT	STEEL BUILDINGS AND STRUCTURES, INC.					



TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS

29 GA GALVANIZED METAL RODF
AND WALL PANELS FASTENED TO
RAFTERS AND POSTS

TS COLLAR TIE

15'-0"

12

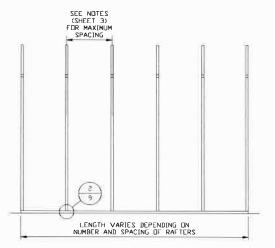
3

15'-0"

TS BASE RAIL
(TYP)

26'-0" < V < 30'-0" MAXIMUM RAFTER SPAN

TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS

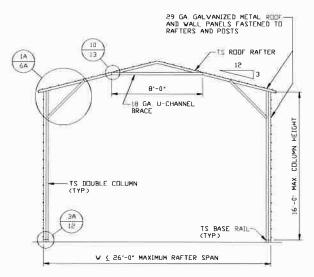


TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION SCALE: NTS



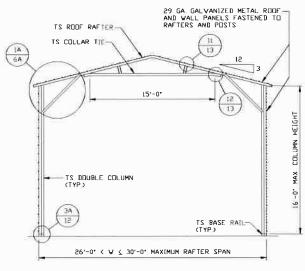
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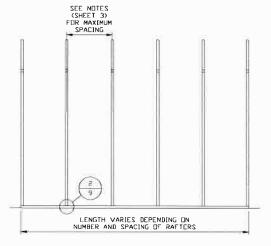


TYPICAL RAFTER/COLUMN FRAME SECTION

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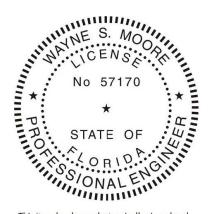


TYPICAL RAFTER/COLUMN FRAME SECTION



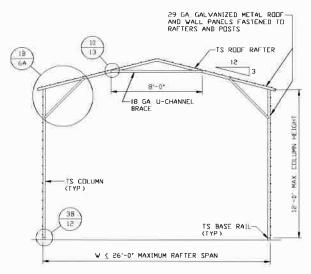
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SCALE: NTS



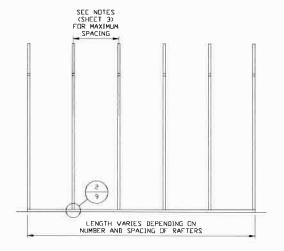
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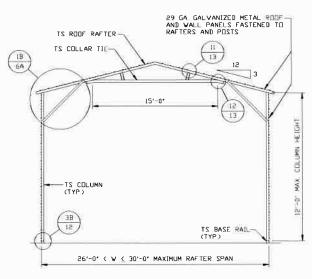
TYPICAL RAFTER/COLUMN FRAME SECTION

SCALE: NTS



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

SCALE: NTS



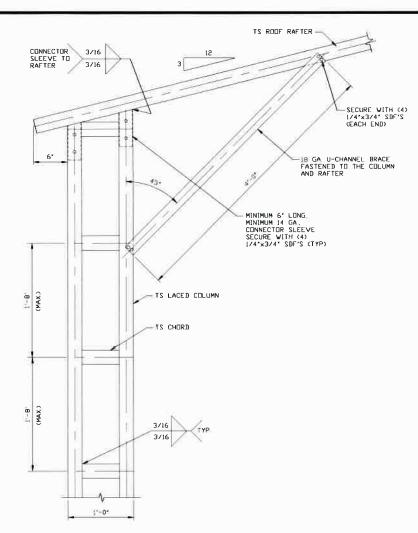
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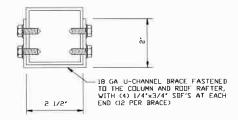
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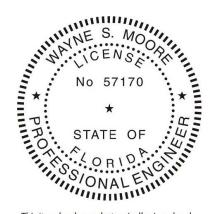


BRACE SECTION

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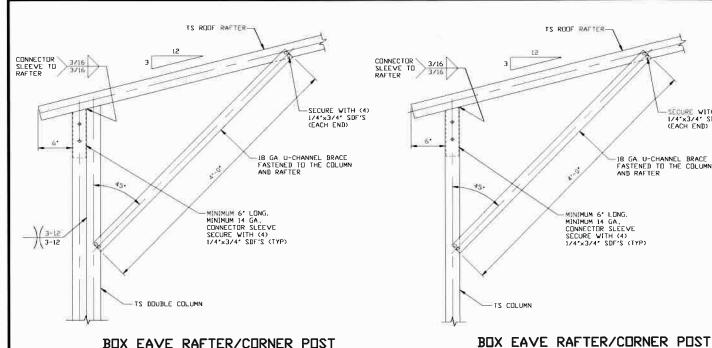
BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL FOR HEIGHTS 16'-0' < TO < 20'-0' SCALE NTS

1

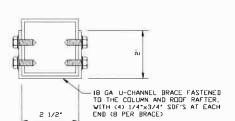


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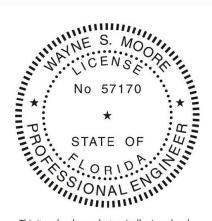


BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL FOR HEIGHTS 12'-0" < TO < 16'-0" 1A



BRACE SECTION

SCALE: NTS



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)

CONNECTION DETAIL

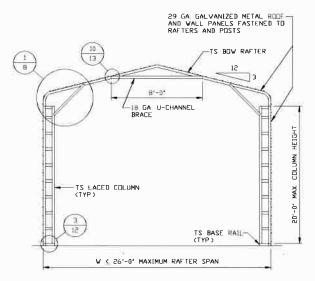
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1B

FOR HEIGHTS < 12'-0'

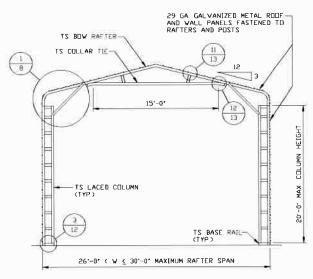
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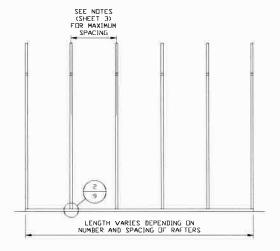
TYPICAL RAFTER/COLUMN FRAME SECTION

SCALE: NIS



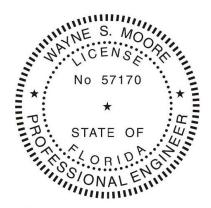
TYPICAL RAFTER/COLUMN FRAME SECTION

SCALE: NTS



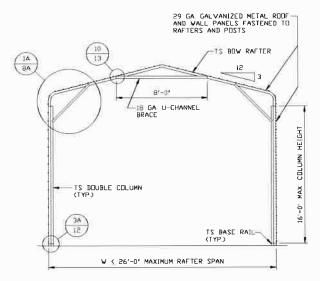
TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

SCALE: NTS



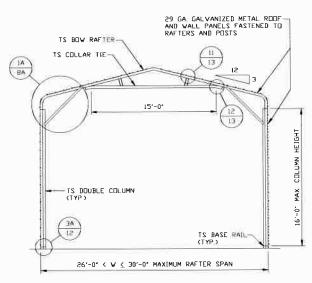
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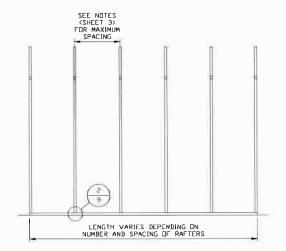
TYPICAL RAFTER/COLUMN FRAME SECTION

SCALE: NTS



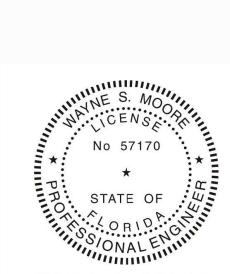
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SCALE: NTS



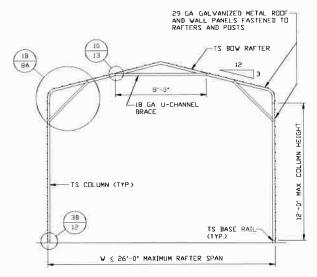
TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

SCALE: NTS

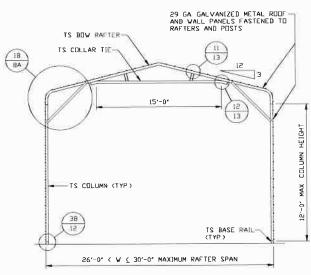


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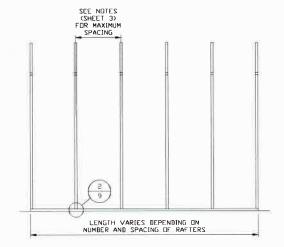
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TYPICAL RAFTER/COLUMN FRAME SECTION SCALE: NTS



TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS

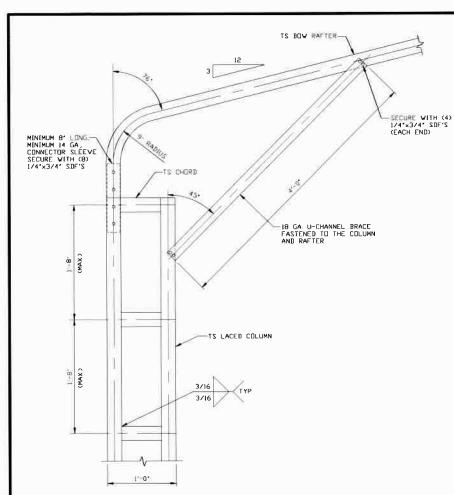


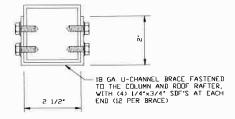
TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION SCALE: NTS



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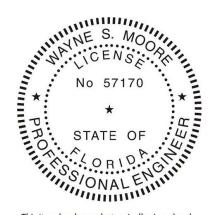
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MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.	CHECKED BY: PDH		MOUNT AIRY, 20'-0" ENCLOSI	NC 270	
MOODE AND AGGOGLATEG	POALOL DV. LT	STEEL BU	P.O. BOX		TURES, INC.





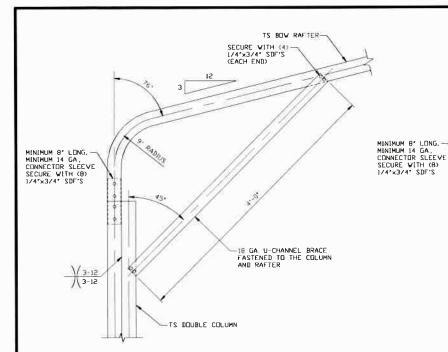
BRACE SECTION SCALE: NTS





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BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL

1A SCALE: NTS

BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL

50 HEIGHTS 12'-0' < TO 5 16'-0'

TS BOW RAFTER

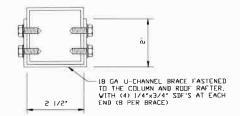
SECURE VITH (431/4-x3/4- SDF'S
(EACH END)

12

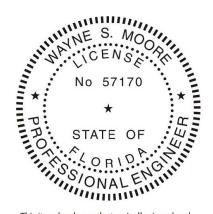
18 GA U-CHANNEL BRACE
FASTENED TO THE COLUMN
AND RAFTER

BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL FOR HEIGHTS < 12'-0"

1B) FOR HI

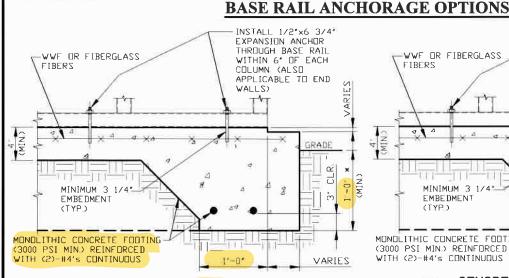


BRACE SECTION
SCALE: NTS



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MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.	CHECKED BY: PDH		P.O. BOX I MOUNT AIRY, ENCLOSE "0'-0"	
		STEEL BUI		STRUCTURES, INC.



INSTALL 1/2"x6 3/4" EXPANSION ANCHOR THROUGH BASE RAIL WITHIN 6' OF EACH WWF OR FIBERGLASS COLUMN. (ALSO APPLICABLE TO END (2JJAW VARI CMIN) GRADE α C (MIN) 9 MINIMUM 3 1/ **EMBEDMENT** (TYP) MONOLITHIC CONCRETE FOOTING (3000 PSI MIN) REINFORCED WITH (2)-#4's CONTINUOUS 1'-0" VARIES

CONCRETE MONOLITHIC SLAB ANCHORAGE BASE RAIL 2

MINIMUM ANCHOR EDGE DISTANCE IS 4'.
* COORDINATE WITH LUCAL CODES/ORD.

GENERAL NOTES

CONCRETE MONOLITHIC SLAB DESIGN BASED ON MINIMUM SDIL 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:

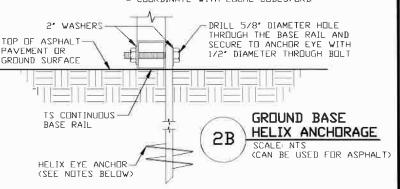
- REINFORCEMENT IS BENT COLD.
 THE DIAMETER OF THE BEND, MEASURED ON THE INSIDE OF THE BAR, IS NOT LESS THAN SIX-BAR DIAMETERS.
- REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE FIELD BENT

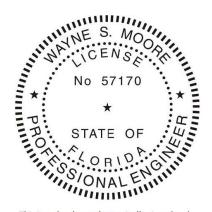
HELIX ANCHOR NOTES:

- 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
- FOR CORAL USE MINIMUM (2) 4' HELICES WITH MINIMUM 30' EMBEDMENT OR SINGLE 6' HELIX WITH MINIMUM 50' EMBEDMENT
- 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
- FOR LODSE TO MEDIUM DENSE SANDS, FIRM TO STIFF CLAYS AND SILTS ALLUVIAL FILL, USE MINIMUM (2) 6' HELICES WITH MINIMUM 50' EMBEDMENT
- 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 2A

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





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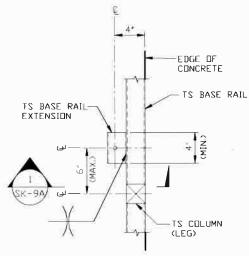
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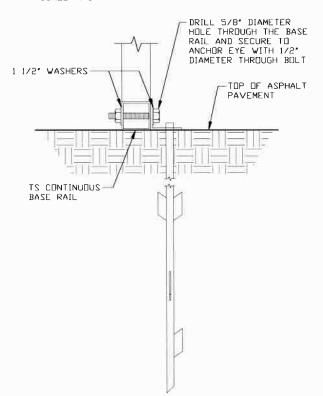
_		STEEL BUIL	LDINGS AND S	TRUC	TURES, INC.				
	DRAWN BY: LT		P.O. BOX 1	287,					
		1 N	MOUNT AIRY, NC 27030						
•	CHECKED BY: PDH	30'-0"x2	30'-0"x20'-0" ENCLOSED STRUCTURE						
				JUB ND 18068S					
	PROJECT MGR: WSM	DATE: 2-14-20	SCALE: NTS	181563	20102/200195				
	CLIENT: SBSI	SHT. 9	DWG. ND: SK-	3	REV. 8				

ADDITIONAL BASE RAIL ANCHORAGE OPTION

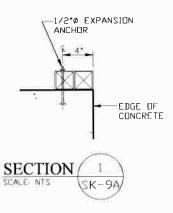


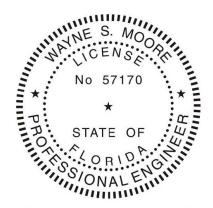
TYPICAL ANCHOR DETAIL WHEN BASE RAIL IS NEAR EDGE OF CONCRETE

SCALE: NTS





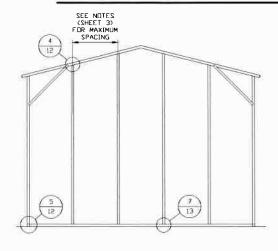




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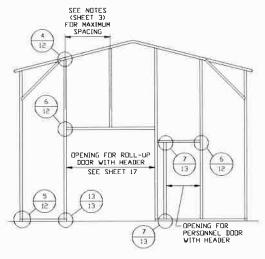
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ENGINEERING AND CONSULTING, INC.	CHECKED BY: PDH		UCTURE		
MOORE AND ASSOCIATES	DRAWN BY: LT		ILDINGS AND P.O. BOX MOUNT AIRY.	1287,	

BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



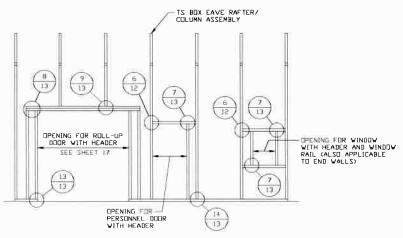
TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION

SCALE: NTS



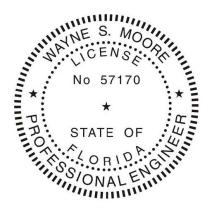
TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

SCALE: NTS



TYPICAL BOX EAVE RAFTER SIDE WALL OPENINGS FRAMING SECTION

SCALE: NTS

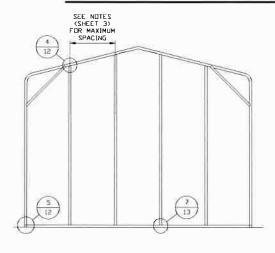


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		STEEL BUI	LDINGS AND		TURES, INC.

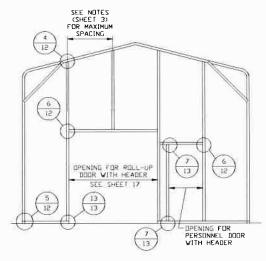
	CHECKED BY: PDH	MOUNT AIRY, NC 27030 30'-0"x20'-0" ENCLOSED STRUCTURE				
_	PROJECT MGR: VSM	DATE: 2-14-20			ND 18068S S/18290S/20019S	
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BOW EAVE RAFTER END WALL AND SIDE WALL OPENINGS



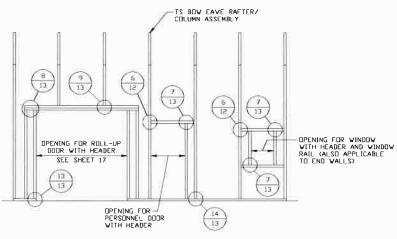
TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION

SCALE: NTS



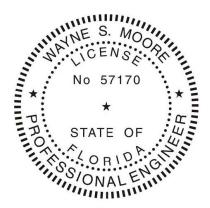
TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

SCALE: NTS



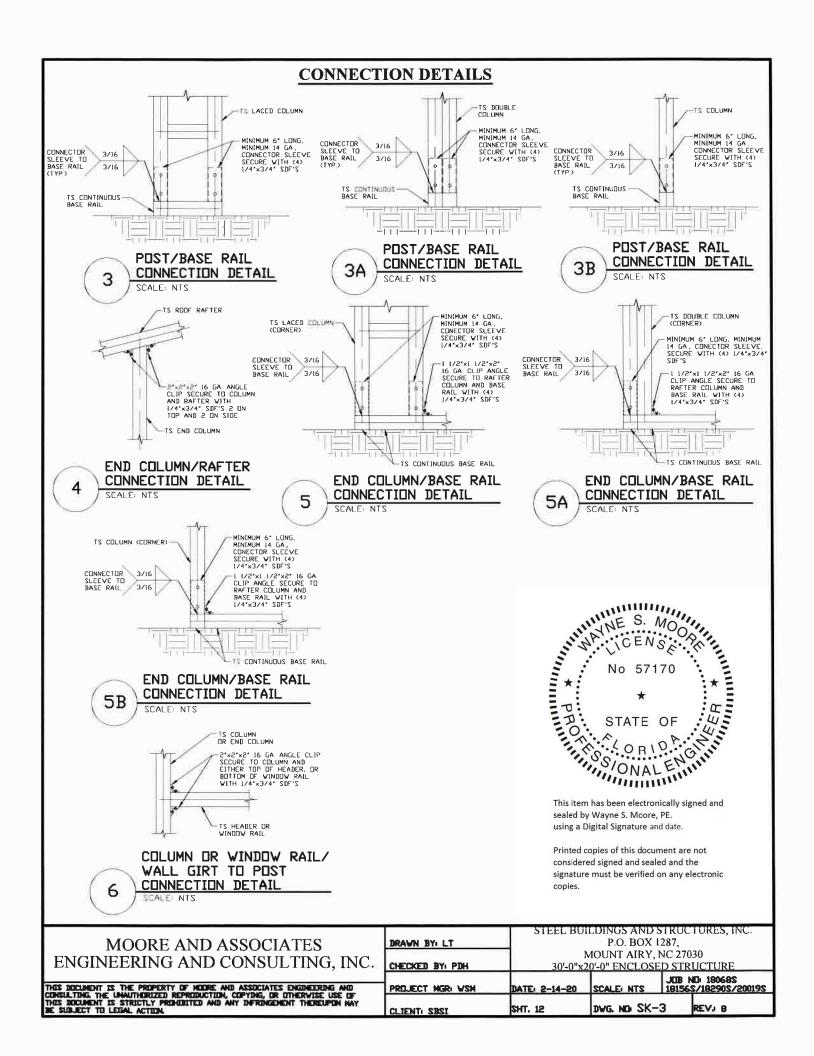
TYPICAL BOX EAVE RAFTER SIDE WALL OPENINGS FRAMING SECTION

SCALE NTS

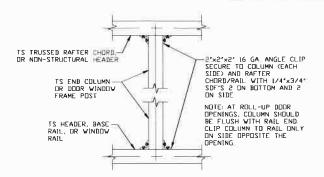


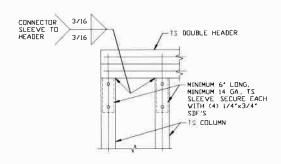
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	MOUNT AIRY, NC 2			NC 27030	
ENGINEERING AND CONSULTING, INC.	CHECKED BY: PDH	30'-0"x2	30'-0"x20'-0" ENCLOSED STRUCTURE		
	-			JUB ND 18068S	
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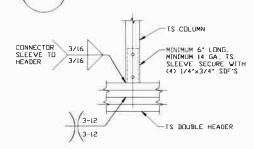
CONNECTION DETAILS

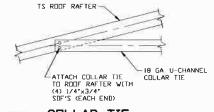


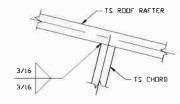


7 COLUMN TO HEADER, BASE RAIL, OR WINDOW RAIL CONNECTION DETAIL

8 DOUBLE HEADER/COLUMN
CONNECTION DETAIL
SCALE NTS



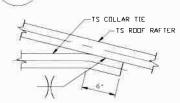




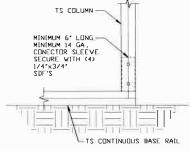
COLUMN/DOUBLE HEADER CONNECTION DETAIL

10 COLLAR TIE CONNECTION DETAIL
SCALE: NTS

RAFTER TO CHORD CONNECTION DETAIL
SCALE: NTS

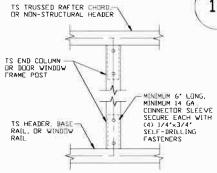


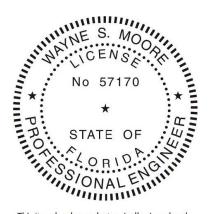
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COLLAR TIE
CONNECTION DETAIL
SCALE: NTS

13 COLUMN/BASE RAIL
CONNECTION DETAIL
SCALE: NTS





COLUMN TO HEADER OR BASE RAIL CONNECTION DETAIL

SCALE: NTS

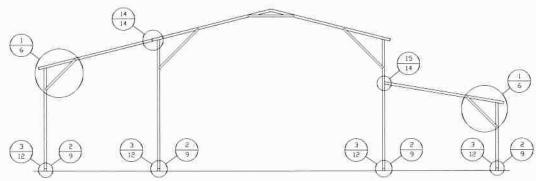
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ENGINEERING AND CONSULTING, INC.

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	PRILIECT MGR: WSM	DATE: 2-14-20	SCALE: NTS		\$\$/18290\$/20019\$		
				JOB	ND: 18068S		
ن•ي-	CHECKED BY: PDH	30'-0"x	RUCTURE				
~			MOUNT AIRY, NC 27030				
	DRAWN BY: LT		P.O. BOX	1287,			
		1 STEEL BU	ILDINGS AND	SIKU	LUKES, INC.		

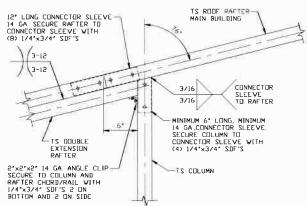
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BOX EAVE RAFTER LEAN-TO OPTIONS



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

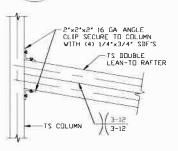
MAXIMUM WIDTH OF SINGLE MEMBER (RAFTER) ROOF EXTENSION LEAN-TO IS 12'-0".
MAXIMUM WIDTH OF DOUBLE MEMBER RAFTER ROOF EXTENSION LEAN-TO IS 16'-0".
FOR SHARED COLUMN HEIGHTS REFERENCE RAFTER COLUMN CONNECTION DETAILS FOR APPROPRIATE COLUMN HEIGHT AND TUBING SPECIFICATIONS



TS ROOF RAFTER 12' LONG CONNECTOR SLEEVE-14 GA SECURE RAFTER TO CONNECTOR SLEEVE WITH (8) 1/4'x3/4' SDF'S SLEEVE TO RAFTER 3/16 MINIMUM 6" LONG, MINIMUM 14 GA,CONNECTOR SLEEVE SECURE COLUMN TO CONNECTOR SLEEVE WITH (4) 1/4"x3/4"SDF'S TS EXTENSION RAFTER NIPPLE TO RAFTER (TYP.) 3/16 TS COLUMN 3/16

> SIDE EXTENSION RAFTER/ COLUMN DETAIL FOR RAFTER SPANS ≤ 12'-0" SCALE: NTS

SIDE EXTENSION RAFTER/ COLUMN DETAIL FOR RAFTER SPANS 12'-0' < TO < 16'-0"



2'x2'x2' 16 GA ANGLE CLIP SECURE TO COLUMN WITH (4) 1/4'x3/4' SDF'S TS LEAN-TO RAFTER TS COLUMN

LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL FOR WIDTHS < 12'-0" 15A

LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL FOR WIDTHS

12'-0" < T□ < 16'-0" 15 SCALE NTS

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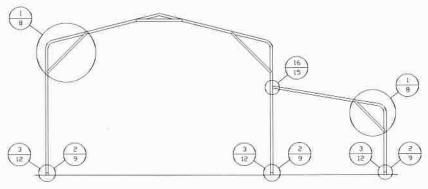
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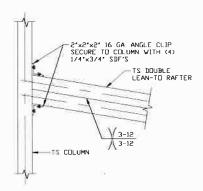
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_	PROJECT MGR: WSM	DATE: 2-14-20	SCALE: NTS		ND: 180685 S/18290S/20019S		
	CHECKED BY: PDH		MOUNT AIRY, NC 27030 30'-0"x20'-0" ENCLOSED STRUCTURE				
	DRAWN BY: LT		P.O. BOX 1287,				

BOW EAVE RAFTER LEAN-TO OPTIONS



TYPICAL BOW EAVE RAFTER LEAN-TO OPTIONS FRAMING SECTION

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



LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL FOR WIDTHS 12'-0" < T□ < 16'-0"

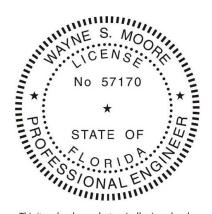
SCALE: NTS

16

2"x2"x2" 16 GA ANGLE CLIP SECURE TO COLUMN WITH (4) 1/4"x3/4" SDF'S TS COLUMN

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

16A SCALE: NTS



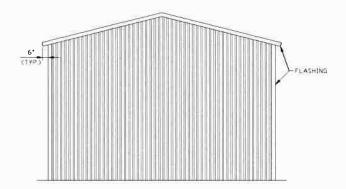
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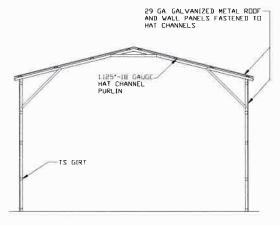
CLIENT: SBSI

BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



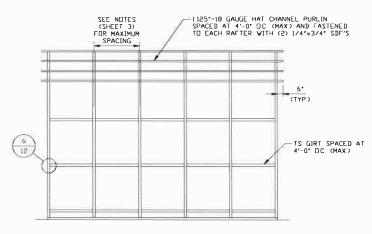
TYPICAL END ELEVATION VERTICAL ROOF/SIDING

SCALE: NTS



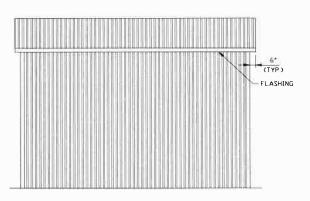
TYPICAL SECTION VERTICAL ROOF/SIDING OPTION

SCALE: NTS



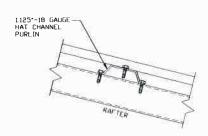
TYPICAL FRAMING SECTION VERTICAL ROOF/SIDING OPTION

SCALE: NTS



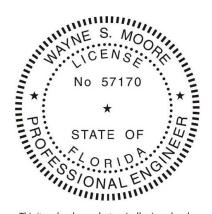
TYPICAL SIDE ELEVATION VERTICAL ROOF/SIDING

SCALE: NTS



PANEL ATTACHMENT

(ALTERNATE FOR VERTICAL ROOF PANELS)
SCALE: NTS



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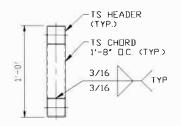
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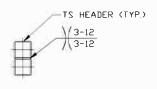
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	CLIENTI SBSI	SHT. 16	DWG. NO SK-	3	REVI B	
	PROJECT MGR: VSM	DATE: 2-14-20	SCALE: NTS		\$/18290\$/20019\$	
				JOB I	ND 18068S	
.	CHECKED BY: PDH	30'-0"x20'-0" ENCLOSED STRUCTURE				
		1 N	MOUNT AIRY, I	VC 270	130	
	DRAWN BY: LT		P.O. BOX 1	287,		
		STEEL BUI	LDINGS AND S	TRUC	TURES, INC.	

SIDE WALL HEADER OPTIONS

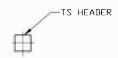




LACED HEADER DETAIL FOR DOOR □PENINGS 12'-0' < LENGTH ≤ 20'-0'</pre>

SCALE: NTS

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

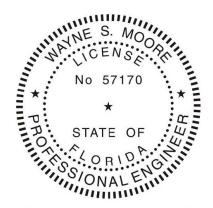


SINGLE HEADER DETAIL FOR DOOR OPENINGS LENGTH < 7'-0" SCALE: NTS

END WALL HEADER OPTIONS



SINGLE HEADER DETAIL FOR DOOR OPENINGS LENGTH < 12'-0'



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MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.	DRAWN BY: LT	STEEL BUILDINGS AND STRUCTURES, INC P.O. BOX 1287, MOUNT AIRY, NC 27030 30'-0"x20'-0" ENCLOSED STRUCTURE			30
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