

STRUCTURAL DESIGN

ENCLOSED BUILDING

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

20 August 2019 Revision 0 M&A Project No. 19164S

Prepared for:

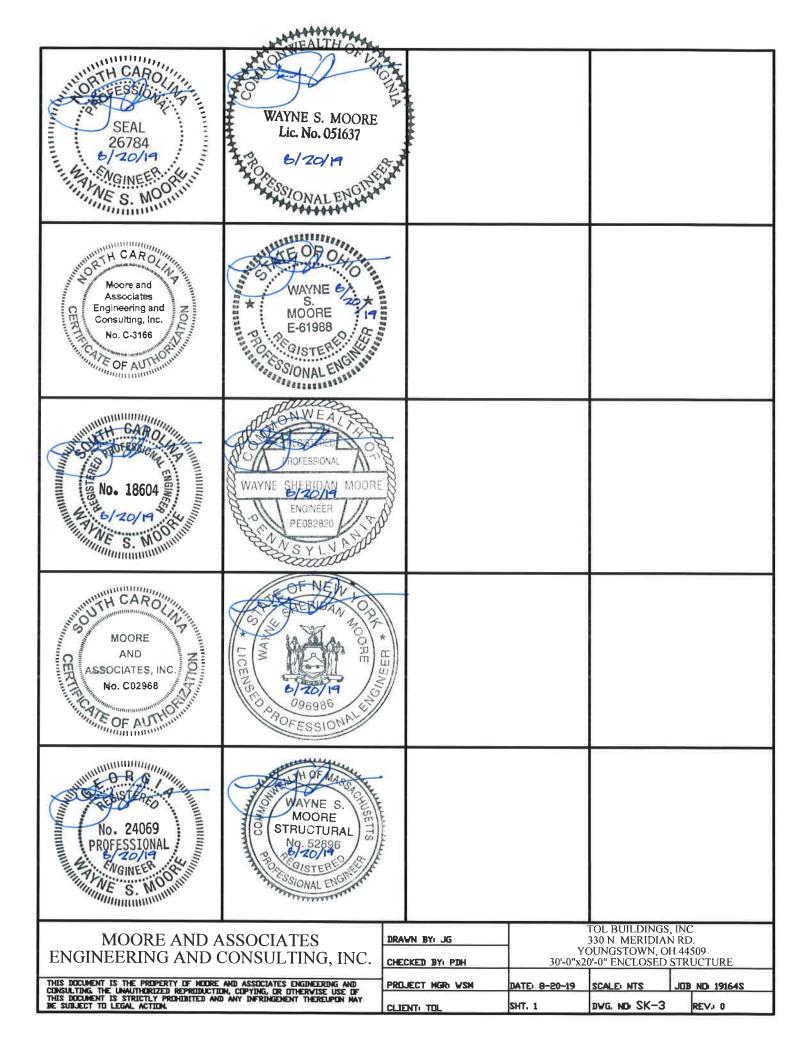
TOL Buildings, Inc. 330 N. Meridian Rd. Youngstown, Ohio 44509

Prepared by:

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

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





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ENGINEERING AND CONSULTING, INC.	CHECKED BY: PDH	YOUNGSTOWN, OH 44509 30'-0"x20'-0" ENCLOSED STRUCTURE			
MOORE AND ASSOCIATES	DRAWN BYI JG		330 N. MERIDIAN		

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UILDINGS, INC. MERIDIAN RD. STOWN, OH 44509 NCLOSED STRUCTURE JOB NO 19164S SHT. 2A DWG. NO SK-3 REV. 0 CLIENT: TOL

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 2018 NORTH CAROLINA BUILDING CODE, 2015 INTERNATIONAL BUILDING CODE (IBC). AND 2012 IBC
- 3 DESIGN LOADS ARE AS FOLLOWS
 - A) DEAD LOAD = 15 PSF
 - B) LÍVÉ LOAD = 12 PSF (20 PSF FOR RISK CAT. II)
 - C) GROUND SNOW LOAD
- = 30 PSF (< 24'-0') FOR U-CHANNEL PEAK BRACE = 60 PSF (<30'-0'), WITH WELDED RAFTER TIE TO SINGLE 12 GA TS @ 3'-0' DC = 70 PSF (24'-0' < W < 30'-0') (UNBALANCED SNOW LOADS DUE TO DRIFTING HAVE NOT BEEN EVALUATED.)
- 4 ULTIMATE WIND SPEED (LW) 105 (RC I) (115 MPH (RC I/II) TO 145 (RC I) (155 MPH (RC I/II)) (NOMINAL WIND SPEED 81 (89) TO 108 (120) MPH) MAXIMUM RAFTER/POST AND END POST SPACING = 4.0 FEET (5.0 FEET FOR WIND SPEED 105 MPH (TO < 145 MPH RC | DNLY)
- 5 END WALL COLUMN/POSTS ARE EQUIVALENT TO SIDE WALL COLUMN/POSTS IN SIZE AND SPACING UNLESS NOTED OTHERWISE
- 6 RISK CATEGORY I AND II
- 7 WIND EXPOSURE CATEGORY B OR C
- 8 SPECIFICATIONS APPLICABLE TO 29 GAUGE (FOR SL < 60 PSF) AND 26 GAUGE (FOR SL > 60 PSF) METAL PANELS FASTENED DIRECTLY TO 2 1/2'x2 1/2'-14 GAUGE TUBE STEEL (TS) FOR (RC I) AND 2 1/4'x2 1/4'-12 GAUGE (TS) FOR (RC II) FRAMING MEMBERS (UNLESS NOTED OTHERWISE)
- 9 AVERAGE FASTENER SPACING ON-CENTERS ALONG RAFTERS OR HAT CHANNELS, AND COLUMNS (INTERIOR OR END) = 8° OC (MAX)
- 10 FASTENERS CONSIST OF #12-14×3/4" SELF-DRILLING FASTENER (SDF), USE CONTROL SEAL WASHER WITH EXTERIOR FASTENERS SPECIFICATIONS APPLICABLE ONLY FOR MEAN ROOF HEIGHT OF 20 FEET OR LESS ROOF SLOPES VARY FROM 412, 3:12, 2:12 TO 1:12
- 11 ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL WITHIN 6' OF EACH RAFTER COLUMN ALONG SIDES
- 12 STANDARD GROUND ANCHORS (SOIL NAILS) CONSIST OF #4 REBAR W/ WELDED NUT x 30' LONG SOIL NAILS MAY BE USED FOR WIND SPEEDS & 145 MPH AND IN SUITABLE SOIL CONDITIONS OPTIONAL ANCHORAGE MAY BE USED IN SUITABLE SOILS AND MUST BE USED FOR WIND SPEEDS > 145 MPH AND/OR IN UNSUITABLE SOILS AS NOTED
- 13 WIND FORCES GOVERN OVER SEISMIC FORCES SEISMIC PARAMETERS ANALYZED ARE

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

R = 3.25

I_E= 10 $\Lambda = \mathbb{C}^2 M$ e ecos =202

S_{DI}= 1258 g

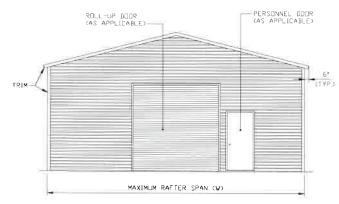
- 14 FOR RISK CATEGORY II. MAXIMUM THRESHOLD HEIGHT FOR PERSONNEL DODR(S) USED FOR DEFINED MEANS OF EGRESS IS 1/2"
- 15 APPLY LAP SEALANT TO METAL ROOF PANELS FOR ROOF SLOPES LESS THAN 312

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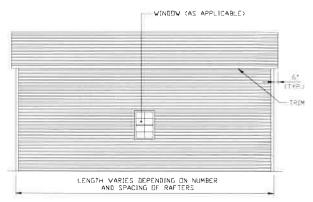
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CHECKED BY: PDH		20'-0" ENCLOSED			
DRAWN BY: JG		TOL BUILDINGS, INC. 330 N. MERIDIAN RD. YOUNGSTOWN, OH 44509			

BDX EAVE FRAME RAFTER STRUCTURE (Sheets 4, 5, 5A, 5B, 5C ,5D, 5E, 6, 6A, 6B, 6C, 6D, 6E, 6F, 6G, 9, 9A, 10, 12, 13, 14, 14A, 16, 17, AND 18



TYPICAL END ELEVATION

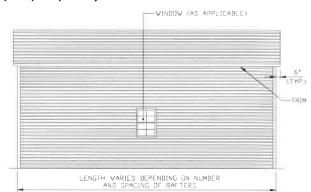


TYPICAL SIDE ELEVATION

BDW FRAME RAFTER STRUCTURE (Sheets 4, 7, 7A, 7B, 7C, 7D, 7E, 8, 8A, 8B, 8C, 8D, 8E, 8F, 8G 9, 9A, 11, 12, 13, 15, 15A, 17 AND 18)



TYPICAL END ELEVATION SCALE NTS



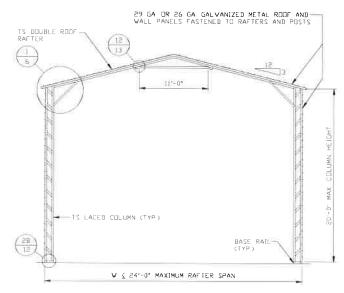
TYPICAL SIDE ELEVATION SCALE NTS

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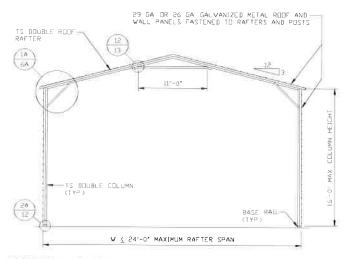
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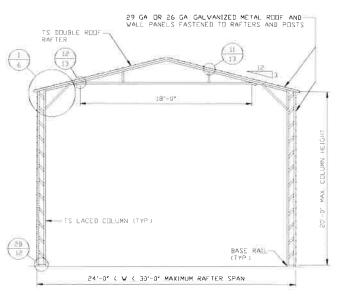
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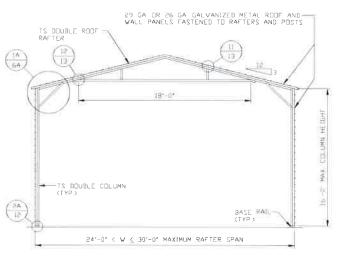
TYPICAL RAFTER/COLUMN END FRAME SECTION



TYPICAL RAFTER/COLUMN END FRAME SECTION SCALE NTS



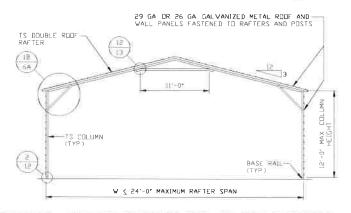
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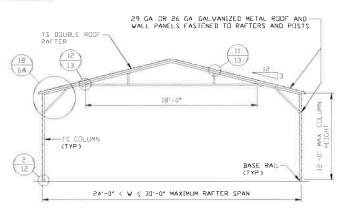


TYPICAL RAFTER/COLUMN END FRAME SECTION
SCALE: NTS

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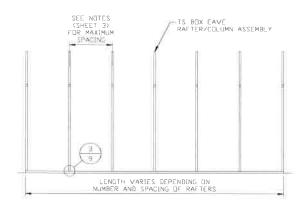




TYPICAL RAFTER/COLUMN END FRAME SECTION

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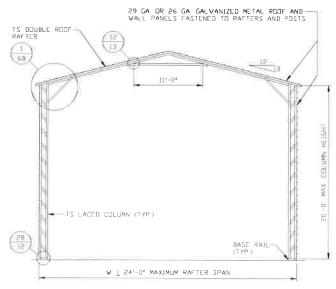


TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

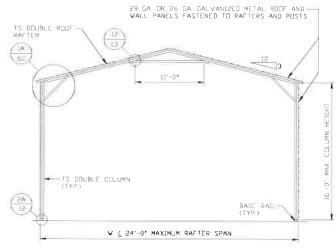
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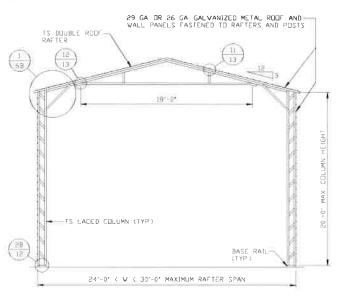
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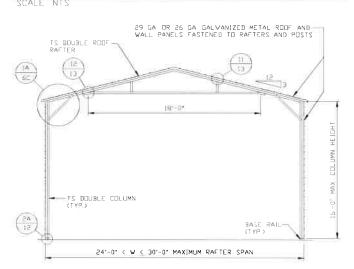
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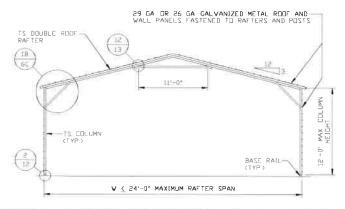
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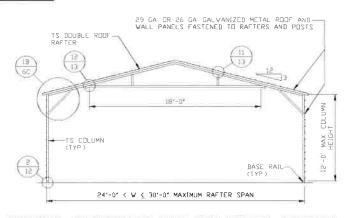
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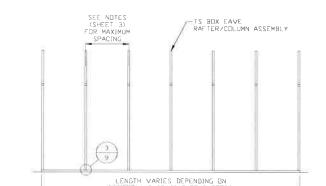
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TYPICAL RAFTER/COLUMN END FRAME SECTION

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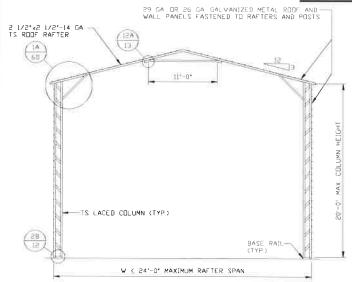


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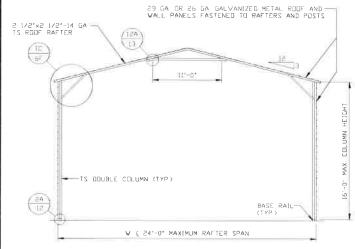
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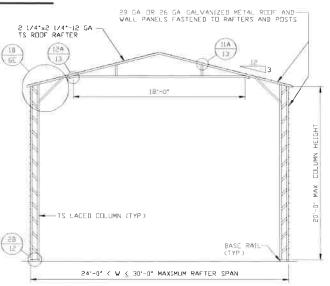
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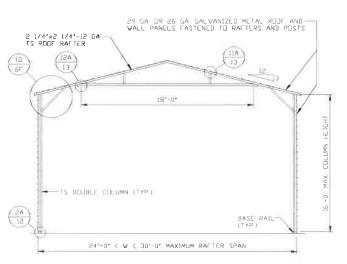
TYPICAL RAFTER/COLUMN END FRAME SECTION



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TYPICAL RAFTER/COLUMN END FRAME SECTION SCALE NTS



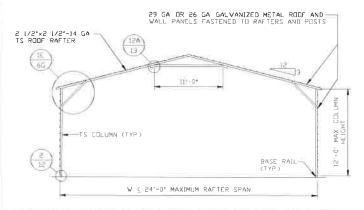
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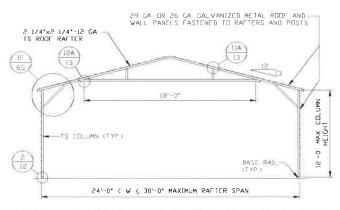
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-			FOL BUILDINGS,	INC			

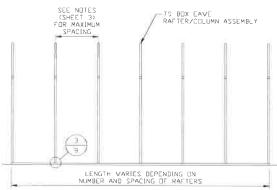
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TYPICAL RAFTER/COLUMN END FRAME SECTION

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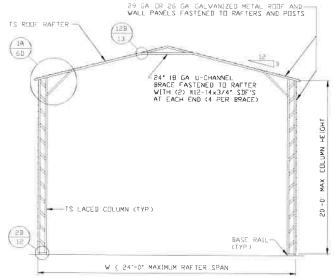


TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

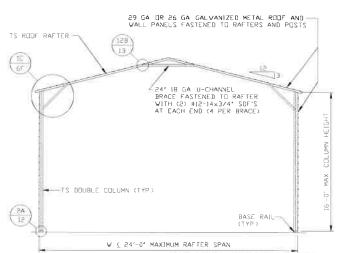
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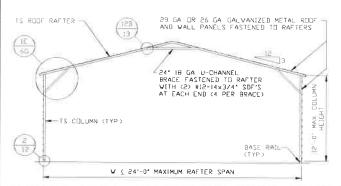
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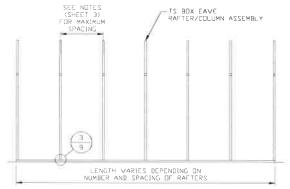
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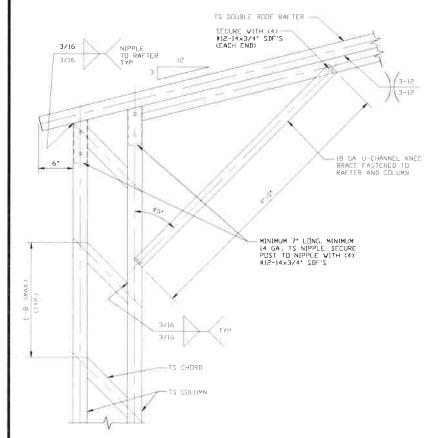
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	PROJECT MOR: VSM	DATE: 8-20-19	SCALE: NTS	JOB	ND 19164S
	CLIENT: TOL	SHT. 5F	DWG. NO SK-3		REV. 0

$60 \text{ PSF} < \text{SL} \le 70 \text{ PSF}$ **EXPOSURE B**



-IB GA U-CHANNEL BRACE FASTENED TO THE COLUMN AND ROOF BEAM WITH (4) BI2-14x3/4" SDF'S AT EACH END (12 PER BRACE)

BRACE SECTION SCALE: NTS

	BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR
(1)	HEIGHTS 16'-0" < T□ < 20'-0"
(±)	SCALE NTS

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	PRELJECT MGR: VSM	DATE: 8-20-19	SCALE: NTS	JOB	ND: 19164S		
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. 1	CHECKED BY: PDH	30'-0"x20'-0" ENCLOSED STRUCTURE					
		YC	YOUNGSTOWN, OH 44509				
	DRAWN BY: JG	Į.	330 N. MERIDIAN	N RE).		

TOL BUILDINGS, INC.

$60 \text{ PSF} < \text{SL} \le 70 \text{ PSF}$ **EXPOSURE B** TS DOUBLE ROOF RAFTER -SECURÉ WITH (4): #12-14x3/4' SDF'S (EACH END) CONNECTOR SLEEVE TO RAFTER 3/16 3/16 3-12 TS DOUBLE ROOF RAFTER SECURE WITH (4) #12-14x3/4° SDF'S (EACH END) 3/16 CONNECTOR SLEEVE TO RAFTER MINIMUM 7' LONG, — CONNECTOR SLEEVE MINIMUM 14 GA, SECURE COLUMN TO SLEEVE WITH (4) #12-14x3/4' SDF'S 3/16 3-15 MINIMUM 7' LONG CONNECTOR SLEEVE MINIMUM 14 GA SECURE COLUMN TO SLEEVE WITH (4) #12-14×3/4' SDF'S TS DOUBLE COLUMN BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR 18 GA U-CHANNEL KNEE BRACE FASTENED TO RAFTER AND COLUMN HEIGHTS 12'-0" < T□ < 16'-0" 1A TS COLUMN BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS **≤** 12'-0" 1B 18 GA U-CHANNEL BRACE FASTENED TO THE COLUMN AND ROOF BEAM WITH (4) #12-14×3/4" SDF'S AT EACH END (12 PER BRACE)

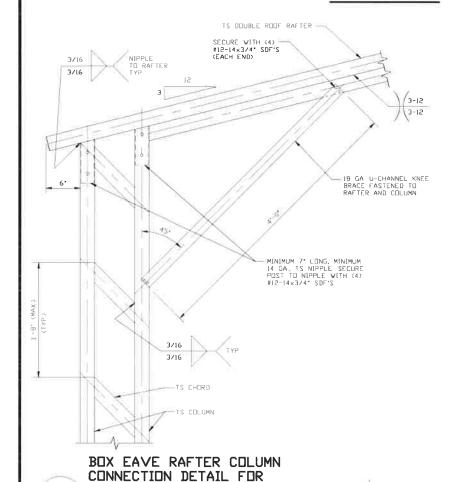
MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.

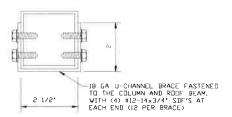
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BRACE SECTION

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PROJECT MGR: VSM	DATE: 8-20-19	SCALE: NTS		B ND: 19164S				
CHECKED BY: PDH		20'-0" ENCLOSEI						
DRAWN BY: JG		TOL BUILDINGS, INC. 330 N. MERIDIAN RD. YOUNGSTOWN, OH 44509						

$\frac{60 \text{ PSF} < \text{SL} \le 70 \text{ PSF}}{\text{EXPOSURE C}}$





BRACE SECTION

SCALE, NITS

MOORE AND ASSOCIATES
ENGINEERING AND CONSULTING, INC.

HEIGHTS 16'-0' < T□ < 20'-0"

1

SCALE: NTS

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	CLIENT: TOL	SHT. 6B	DWG. NO SK-	3	REV. 0	
ī	PROJECT MGR: VSM	DATE: 8-20-19	SCALE: NTS	J01	ND 19164S	
٠	CHECKED BY: PDH	YOUNGSTOWN, OH 44509 30'-0"x20'-0" ENCLOSED STRUCTURE				
	DRAWN BY: JG		C.)			

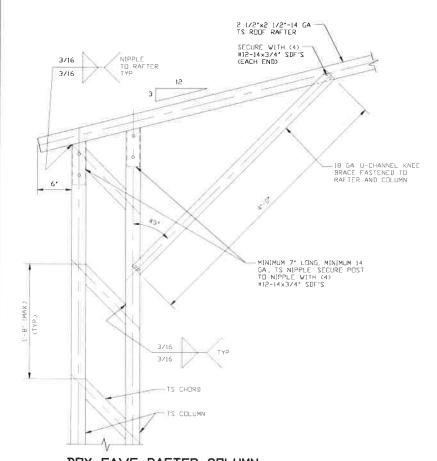
$\underline{60 \text{ PSF} < \text{SL} \leq 70 \text{ PSF}}$ **EXPOSURE C** TS DOUBLE ROOF RAFTER = SECURE WITH (4) = #12-14x3/4' SDF'S (EACH END) CONNECTOR SLEEVE TO RAFTER 3/16 3/16 3-12 3-12 TS DOUBLE ROOF RAFTER SECURE WITH (4) #12-14x3/4' SDF'S (EACH END) CONNECTOR SLEEVE TO RAFTER 3/16 MINIMUM 7' LONG, CONNECTOR SLEEVE MINIMUM 14 GA SECURE COLUMN TO SLEEVE WITH (4) #12-14x3/4' SDF'S MINIMUM 12' LONG = CONNECTOR SLEEVE MINIMUM 14 GA, SECURE COLUMN TO SLEEVE WITH (4) #12-14x3/4' SDF'S 3-15 TS DOUBLE COLUMN BOX EAVE RAFTER COLUMN 18 GA U-CHANNEL KNEE BRACE FASTENED TO RAFTER AND COLUMN CONNECTION DETAIL FOR HEIGHTS 12'-0' < TO < 16'-0' 1A TS COLUMN BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS **≤** 12'-0" 1B SCALE: NTS -18 GA U-CHANNEL BRACE FASTENED TO THE COLUMN AND ROOF BEAM WITH (4) #12-14×3/4" SDF'S AT EACH END (12 PER BRACE)

BRACE SECTION

SCALE: NTS

MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.	DRAVN BY: JG CHECKED BY: PDH	Y	TOL BUILDINGS 330 N. MERIDIA1 DUNGSTOWN, O 0'-0" ENCLOSED I	Ń RD. H 44509
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$\frac{SL \leq 60 \text{ PSF}}{EXPOSURE B/C}$



18 GA U-CHANNEL BRACE FASTENED TID THE COLLUMN AND RODE BEAM, WITH (4) #12-14x32/4* SDF'S AT EACH END (12 PER BRACE)

BRACE SECTION

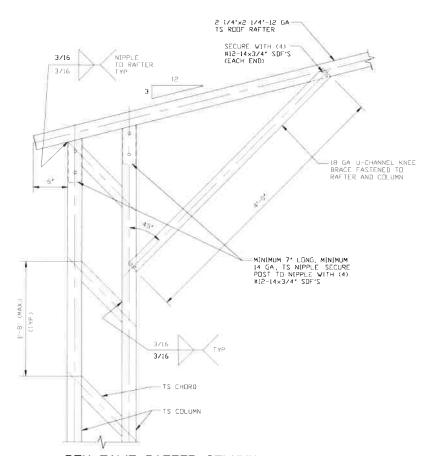
SCALE: NTS

BOX EAVE RAFTER COLUMN
CONNECTION DETAIL FOR
HEIGHTS 16'-0" < TO \(\) 20'-0"

2CHEEL MIZ

MOORE AND ASSOCIATES	DRAWN BY: JG		TOL BUILDINGS, 330 N. MERIDIAN		
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$SL \leq 60 PSF$ **EXPOSURE B/C**



-18 GA U-CHANNEL BRACE FASTENED TO THE COLUMN AND ROOF BEAM, WITH (4) #12-14×3/4" SDF'S AT EACH END (12 PER BRACE)

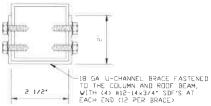
BRACE SECTION

	BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 16'-0" < TO < 20'-0"
(1B)	SCALE NTS

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	YOUNGSTOWN, OH 44509						
CHECKED BY: PDH	30'-0"x20	0'-0" ENCLOSED S	TRUCTURE				
PREJECT MGR: VSM	DATE: 8-20-19	SCALE: NTS	JOB ND 19164S				
CLIENT: TOL	SHT. 6E	DWG. ND: SK-3	REV. 0				

$SL \le 60 PSF$ **EXPOSURE B/C** 2 1/4"x2 1/4"~12 GA TS ROOF RAFTER 2 1/2*x2 1/2*-14 GA TS ROOF RAFTER SECURE WITH (4) = HIZ-L4×3/4' SDF'S (EACH END) SECURE WITH (4) = #12-14×3/4° SDF'S (EACH END) MINIMUM 7' LONG. -CONNECTOR SLEEVE MINIMUM 14 GA. SECURE COLUMN TO SLEEVE WITH (4) #12-14x3/4" SDF'S MINIMUM 7' LONG, CONNECTOR SLEEVE MINIMUM 14 GA, SECURE COLUMN TO SLEEVE WITH (4) #12-14x3/4' SDF'S 18 GA U-CHANNEL KNEE BRACE FASTENED TO RAFTER AND COLUMN LO GA U-CHANNEL KNEE BRACE FASTENED TO RAFTER AND COLUMN TS DOUBLE COLUMN -TS DOUBLE COLUMN BOX EAVE RAFTER COLUMN BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR CONNECTION DETAIL FOR HEIGHTS 12'-0" < TO ≤ 16'-0" HEIGHTS 12'-0" < TD ≤ 16'-0" 1D 1C

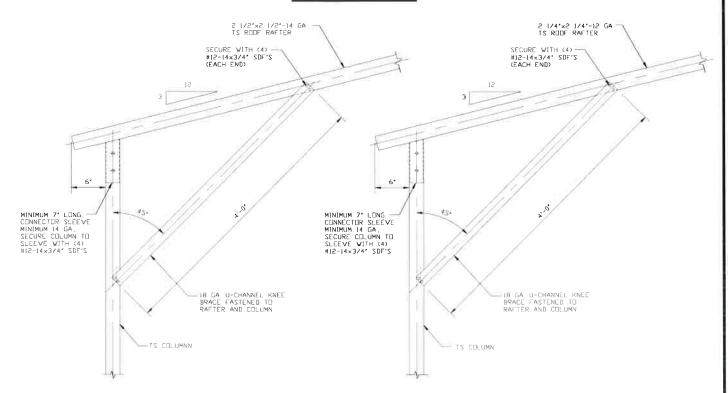


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MOORE AND ASSOCIATES	DRAWN BY: JG		TOL BUILDINGS, IN 330 N. MERIDIAN R	D.

$SL \le 60 PSF$ **EXPOSURE B/C**



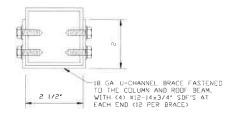
BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR 1E

SCALE: NTS

BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS **≤** 12'-0"

SCALE NTS

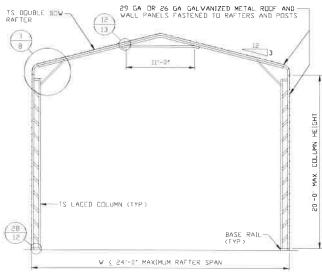
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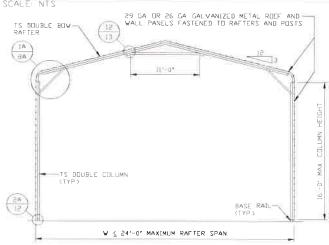
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MOORE AND ASSOCIATES	DRAWN BY: JG	1	TOL BUILDINGS, 330 N. MERIDIAN	

$\frac{60 \text{ PSF} < \text{SL} \le 70 \text{ PSF}}{\text{EXPOSURE B}}$

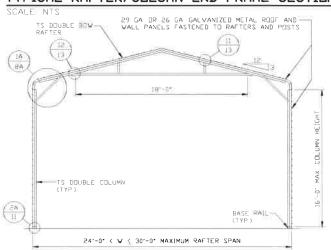


TYPICAL RAFTER/COLUMN END FRAME SECTION



TYPICAL RAFTER/COLUMN END FRAME SECTION

TYPICAL RAFTER/COLUMN END FRAME SECTION



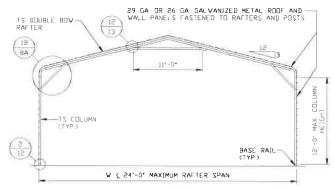
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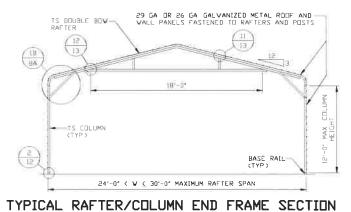
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	PROJECT MGR: WSM	DATE: 8-20-19	SCALE: NTS	Jos	ND 19164S				
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	DRAWN BY: JG		TOL BUILDINGS, INC. 330 N. MERIDIAN RD.						

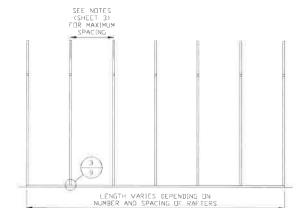
$\frac{60 \text{ PSF} < \text{SL} \le 70 \text{ PSF}}{\text{EXPOSURE B}}$





TYPICAL RAFTER/COLUMN END FRAME SECTION SCALE NTS

SCALE NITS

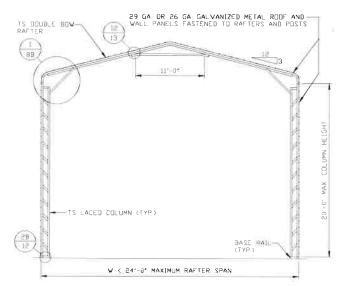


TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

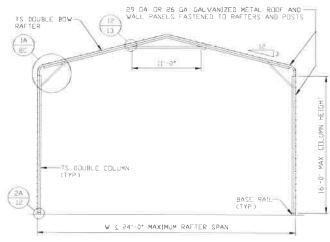
SCALE NTS

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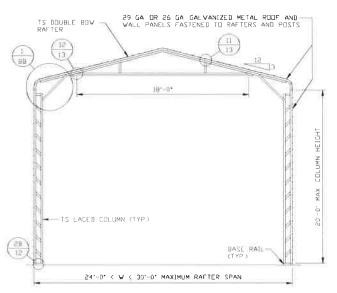
$60 \text{ PSF} < \text{SL} \le 70 \text{ PSF}$ **EXPOSURE C**



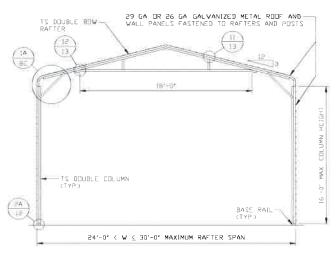
TYPICAL RAFTER/COLUMN END FRAME SECTION



TYPICAL RAFTER/COLUMN END FRAME SECTION



TYPICAL RAFTER/COLUMN END FRAME SECTION



TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE NTS

DRAWN BY: JG

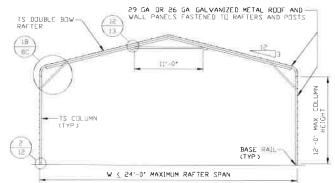
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TOL BUILDINGS, INC 330 N. MERIDIAN RD. YOUNGSTOWN, OH 44509 30'-0"x20'-0" ENCLOSED STRUCTURE

PROJECT MGR: VSM	DATE: 8-20-19	SCALE: NTS JO	B ND 19164S
CLIENT: TO	SHT. 7B	DWG. ND: SK-3	REV. 0

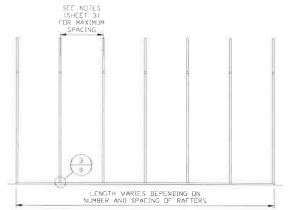
$\frac{60 \text{ PSF} < \text{SL} \le 70 \text{ PSF}}{\text{EXPOSURE B/C}}$



TYPICAL RAFTER/COLUMN END FRAME SECTION

TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

SCALE: NTS



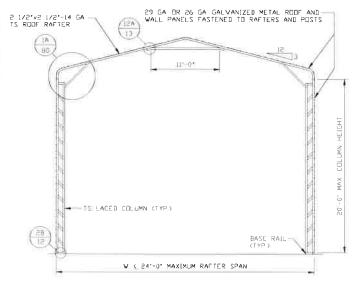
TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

SCALE: NTS

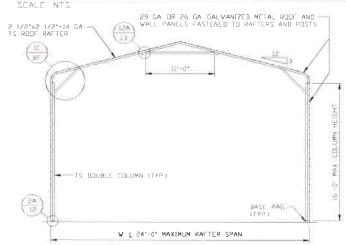
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MOORE AND ASSOCIATES	DRAWN BYI JG		TOL BUILDINGS 330 N. MERIDIA	., .	

$SL \le 60 PSF$ **EXPOSURE B/C**

2 1/4"x2 1/4"-12 GA TS ROOF RAFTER



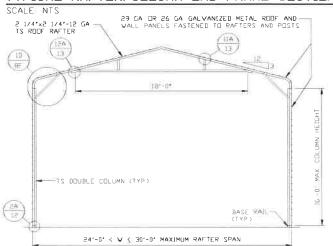
TYPICAL RAFTER/COLUMN END FRAME SECTION



TYPICAL RAFTER/COLUMN END FRAME SECTION

AII) (EI) 18'-0" TS LACED COLUMN (TYP) 24'-0' < W < 30'-0' MAXIMUM RAFTER SPAN TYPICAL RAFTER/COLUMN END FRAME SECTION SCALE NTS

29 GA OR 26 GA GALVANIZED METAL ROOF AND WALL PANELS FASTENED TO RAFTERS AND POSTS



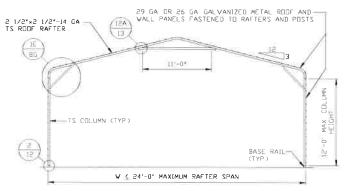
TYPICAL RAFTER/COLUMN END FRAME SECTION

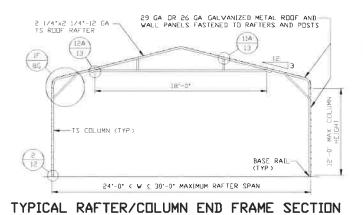
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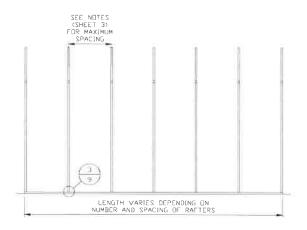
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9	CHECKED BY: PDH		20'-0" ENCLOSED			
Ç.	DRAWN BY: JG		TOL BUILDINGS 330 N. MERIDIA OUNGSTOWN, C	Ń RE)	

$SL \le 60 PSF$ **EXPOSURE B/C**





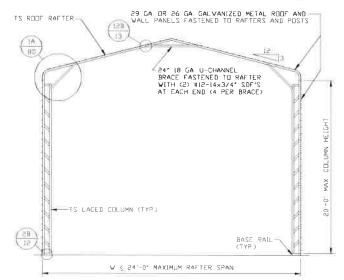
TYPICAL RAFTER/COLUMN END FRAME SECTION SCALE NTS



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

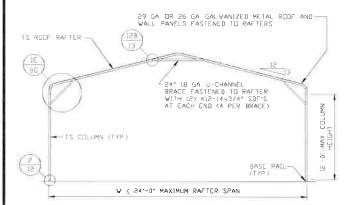
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$\frac{\text{SL} \leq 30 \text{ PSF}}{\text{EXPOSURE B/C}}$



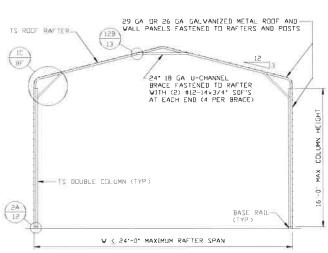
TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE NTS



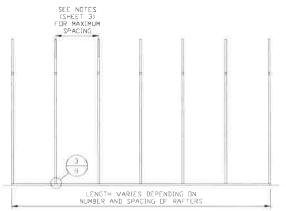
TYPICAL RAFTER/COLUMN END FRAME SECTION

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TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE: NT



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

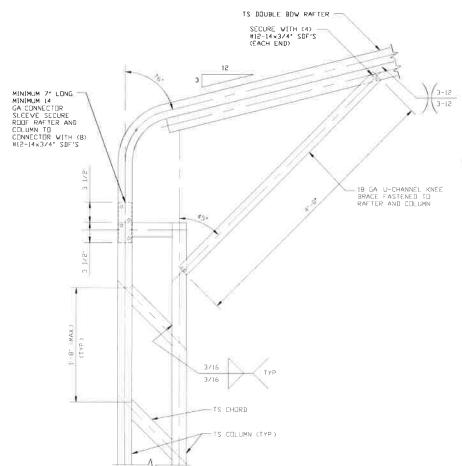
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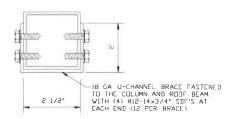
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•	CHECKED BY: PDH	30'-0"x20'-0" ENCLOSÉD STRUCTURE			
	DRAWN BY: JG	TOL BUILDINGS, INC. 330 N. MERIDIAN RD. YOUNGSTOWN, OH 44509			

$\frac{60 \text{ PSF} < \text{SL} \le 70 \text{ PSF}}{\text{EXPOSURE B}}$





BRACE SECTION

SCALE NTS

BOW EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 16'-0" < TO \(20'-0"

SCALE NTS

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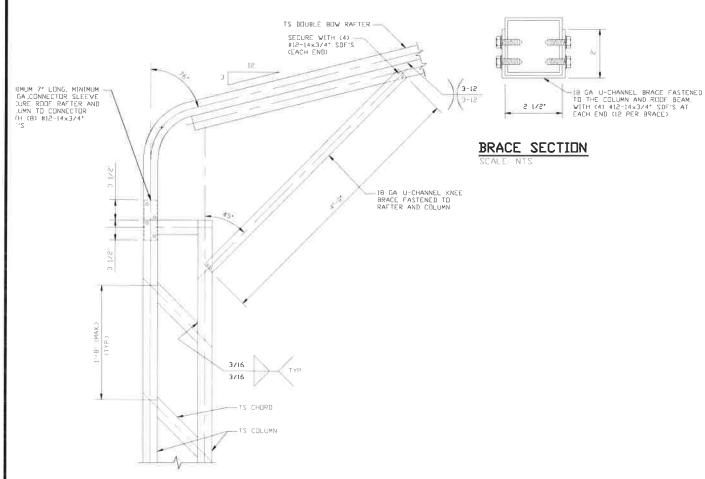
$60 \text{ PSF} < \text{SL} \le 70 \text{ PSF}$ **EXPOSURE B** TS DOUBLE BOW RAFTER SECURE WITH (4) #12-14×3/4° SDF'S (EACH END) TS DOUBLE BOW RAFTER SECURE WITH (4) = #I2-I4×3/4' SDF'S (END) 3-12 3-12 MINIMUM 7' LONG MINIMUM 14 GA,CONNECTOR SLEEVE SECURE ROOF RAFTER AND COLUMN TO CONNECTOR WITH (8) #12-14×3/4' SDF'S -18 GA U-CHANNEL KNEE BRACE FASTENED TO RAFTER AND COLUMN TS DOUBLE COLUMN MINIMUM 7' LONG CONNECTOR SLEEVE MINIMUM 14 GA, SECURE COLUMN TO SLEEVE WITH (4) HI2-14x3/4" SDF'S 18 GA U-CHANNEL KNEE BRACE FASTENED TO RAFTER AND COLUMN TS COLUMN BOW EAVE RAFTER COLUMN CONNECTION DETAIL FOR BOW EAVE RAFTER COLUMN HEIGHTS 12'-0" < T□ < 16'-0" CONNECTION DETAIL FOR 1A SCALE: NTS HEIGHTS **≤** 12'-0" 1B -18 GA U-CHANNEL BRACE FASTENED TO THE COLUMN AND ROOF BEAM, WITH (4) #12-14×3/4" SDF'S AT EACH END (12 PER BRACE)

BRACE SECTION

SCALE NTS

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$60 \text{ PSF} < \text{SL} \le 70 \text{ PSF}$ **EXPOSURE C**



BOW EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 16'-0" < T□ < 20'-0"

SCALE: NTS

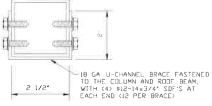
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2	CHECKED BY: PDH	30'-0"x2	20'-0" ENCLOSEI) STR	UCTURE	
_	PROJECT MGR: VSM	DATE: 8-20-19	SCALE: NTS	103	ND: 19164S	
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	CLIENT, TO	SHT. AR	DWG ND SK-3	}	REV. 0	

$60 \text{ PSF} < \text{SL} \le 70 \text{ PSF}$ **EXPOSURE C** TS DOUBLE BOW RAFTER SECURE WITH (4) = #12-14×3/4' SDF'S (EACH END) TS DOUBLE BOW RAFTER = SECURE WITH (4)= #12-14x3/4' SDF'S (EACH END) 3-12 3-12 MINIMUM 7' LONG MINIMUM 14 GA CONNECTOR SLEEVE SECURE RODF RAFTER AND COLUMN TO CONNECTOR WITH (8) #12-14x3/4' SDF'S 18 GA U-CHANNEL KNEE BRACE FASTENED TO RAFTER AND COLUMN TS DOUBLE COLUMN MINIMUM 7' LONG— CONNECTOR SLEEVE MINIMUM 14 GA SECURE COLUMN TO SLEEVE WITH (4) #12-14x3/4' SDF'S TS COLUMN BOW EAVE RAFTER COLUMN CONNECTION DETAIL FOR BOW EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 12'-0" < T□ < 16'-0" 1A HEIGHTS ≤ 12'-0" 1B

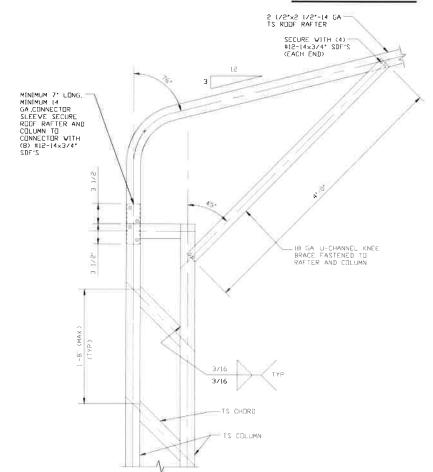


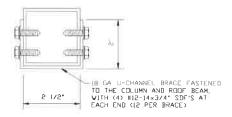
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$\frac{SL \le 60 \text{ PSF}}{EXPOSURE B/C}$





BRACE SECTION

SCALE: NTS

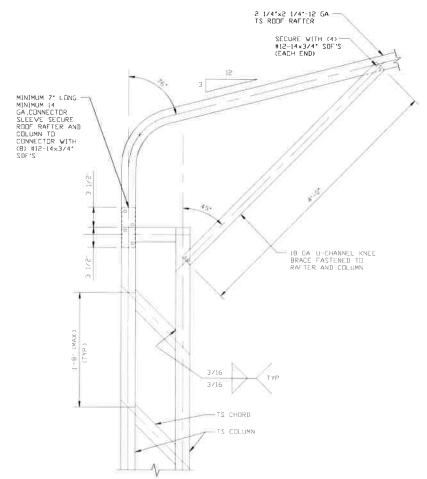
BOW EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 16'-0' < TO < 20'-0'

SCALE: NTS

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_	PROJECT MGR: VSM	DATE: 8-20-19	SCALE: NTS	an.	ND 19164S				
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$SL \le 60 PSF$ **EXPOSURE B/C**



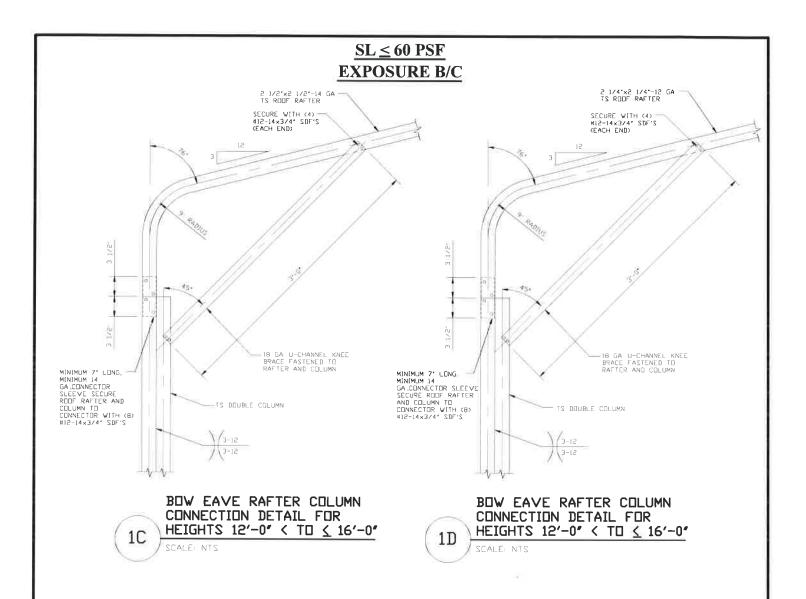
18 GA U-CHANNEL BRACE FASTENED TO THE COLLUMN AND ROOF BEAM WITH (4) #12-14-37-4' SDF'S AT EACH END (12 PER BRACE)

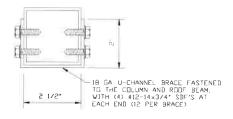
BRACE SECTION SCALE: NTS

BOW EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 16'-0" < T□ < 20'-0" 1B

SCALE NTS

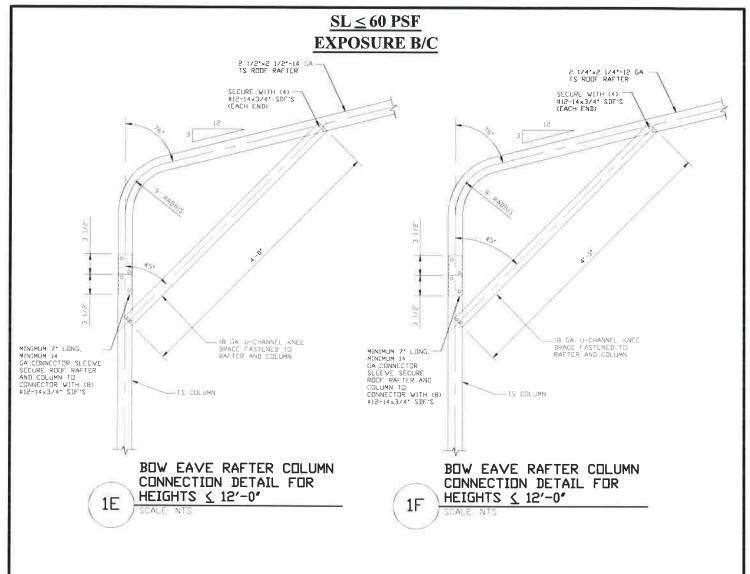
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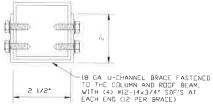




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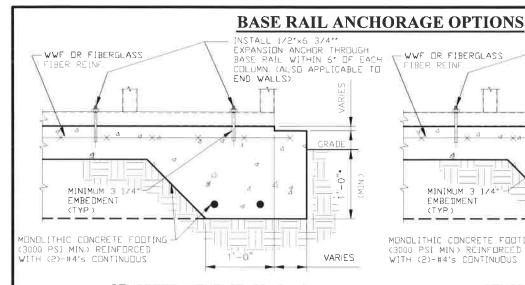




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INSTALL 1/2"x6 3/4" EXPANSION ANCHOR THROUGH BASE RAIL WITHIN 6° OF EACH WWF OR FIBERGLASS FIBER REINF COLUMN (ALSO APPLICABLE TO END WALLS) 7 MINIMUM 3 1/4" EMBEDMENT MONDLITHIC CONCRETE FOOTING: (3000 PSI MIN) REINFORCED VARIES WITH (2)-#4's CONTINUOUS

3A

CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE

(MINIMUM ANCHOR EDGE DISTANCE IS 4") * COORDINATE WITH LOCAL BUILDING CODE AND/OR BUILDING OFFICIAL REGARDING REQUIRED FOOTING DEPTH

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:

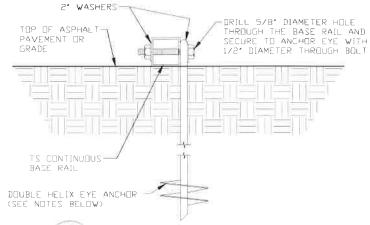
- REINFORCEMENT IS BENT COLD
- 2 THE DIAMETER OF THE BEND MEASURED ON THE INSIDE OF THE BAR, IS NOT LESS THAN SIX-BAR DIAMETERS.
 3 REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE SHALL NOT
- BE FIELD BENT

HELIX ANCHOR NOTES:

- 1 FOR VERY DENSE AND/OR CEMENTED SANDS, 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
- 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
- 4 FOR LODSE 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 MONOLITHIC SLAB BASE RAIL ANCHORAGE

(MINIMUM ANCHOR EDGE DISTANCE IS 4") * COORDINATE WITH LOCAL BUILDING CODE AND/OR BUILDING OFFICIAL REGARDING REQUIRED FOOTING DEPTH



3B

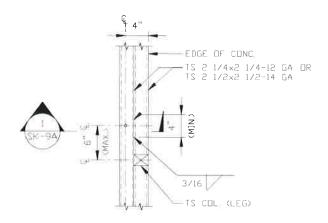
GROUND BASE HELIX ANCHORAGE

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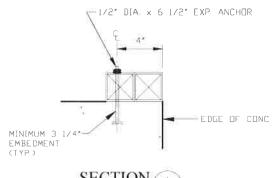
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	PROJECT MGR: VSM	DATE: 8-20-19	SCALE: NTS	JDB	ND 19164S		
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BASE RAIL ANCHORAGE OPTIONS



TYPICAL ANCHOR DETAIL WHEN BASE RAIL IS NEAR EDGE OF CONCRETE

SCALE NTS

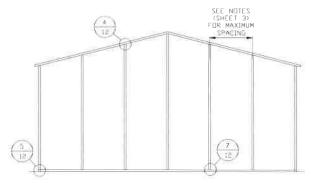




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DRAWN BY: JG	TOL BUILDINGS, INC. 330 N. MERIDIAN RD.					

BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS

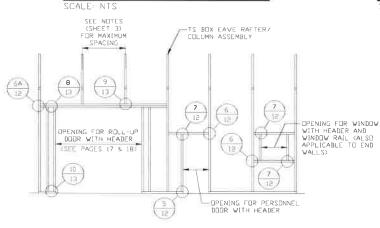


TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION

SEE NOTES (SHEET 3) FOR MAXIMUM SPACING (1) (12) (6) 16) 7 DPENING FOR ROLL-UP DOOR WITH HEADER (SEE PAGES 17 & 18) DPENING FOR PERSONNEL DOOR VITH HEADER (12)

> TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

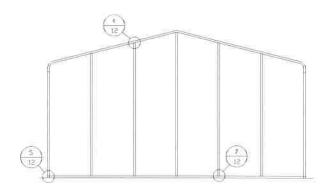
SCALE: NTS



TYPICAL BOX EAVE RAFTER SIDE WALL OPENINGS FRAMING SECTION SCALE: NTS

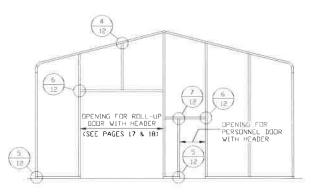
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ENGINEERING AND CONSULTING, INC.	CHECKED BY: PDH		OUNGSTOWN, OF 0'-0" ENCLOSED S			
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BOW RAFTER END WALL AND SIDE WALL OPENINGS



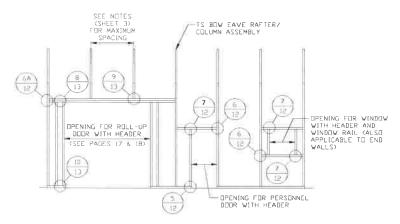
TYPICAL BOW RAFTER END WALL FRAMING SECTION

SCALE NTS



TYPICAL BOW RAFTER END WALL OPENINGS FRAMING SECTION

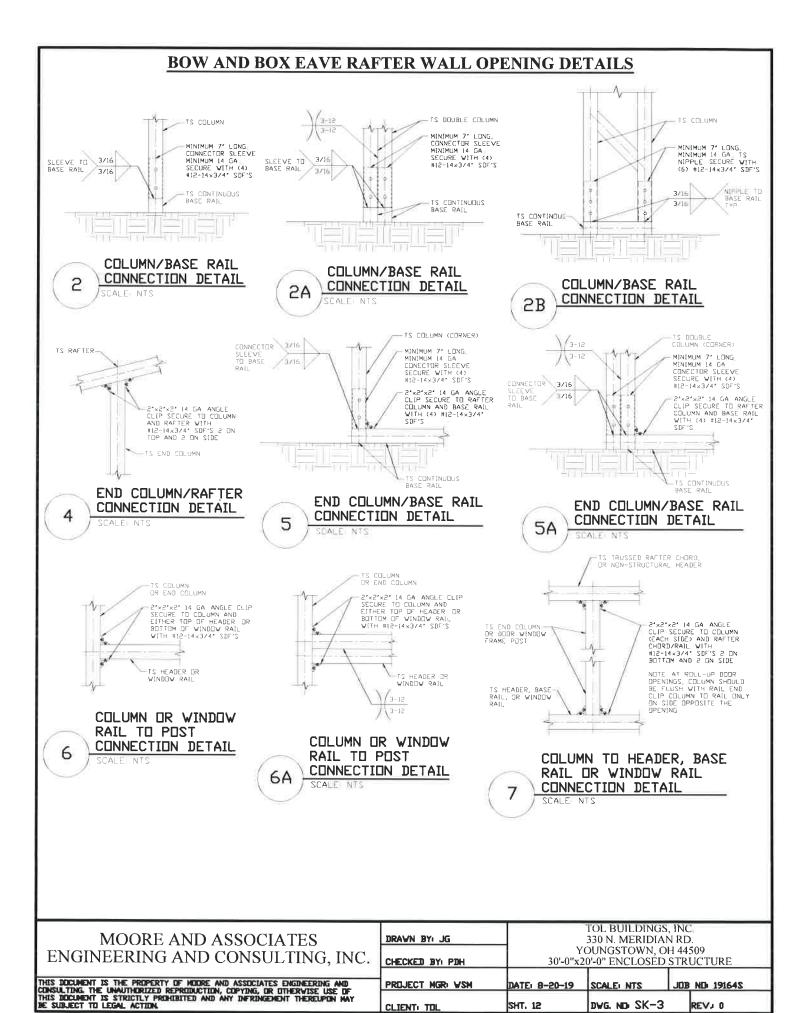
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TYPICAL BOW RAFTER SIDE WALL OPENINGS FRAMING SECTION

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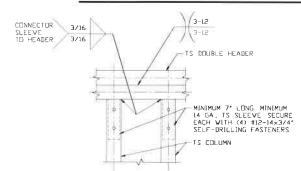
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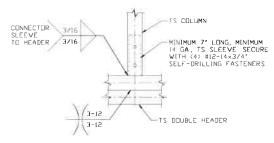
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SHT. 12

CLIENT: TOL

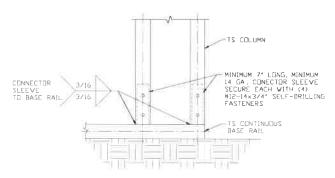
BOW AND BOX EAVE RAFTER WALL OPENING DETAILS

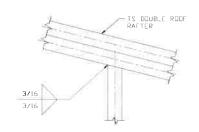




DOUBLE HEADER/COLUMN CONNECTION DETAIL 8







COLUMN/BASE RAIL CONNECTION DETAIL 10

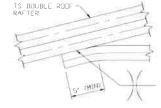
RAFTER TO CHORD CONNECTION DETAIL 11

TS ROOF RAFTER











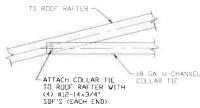
12

COLLAR TIE CONNECTION DETAIL

DRAWN BY: JG

12A

18 GA U-CHANNEL COLLAR TIE



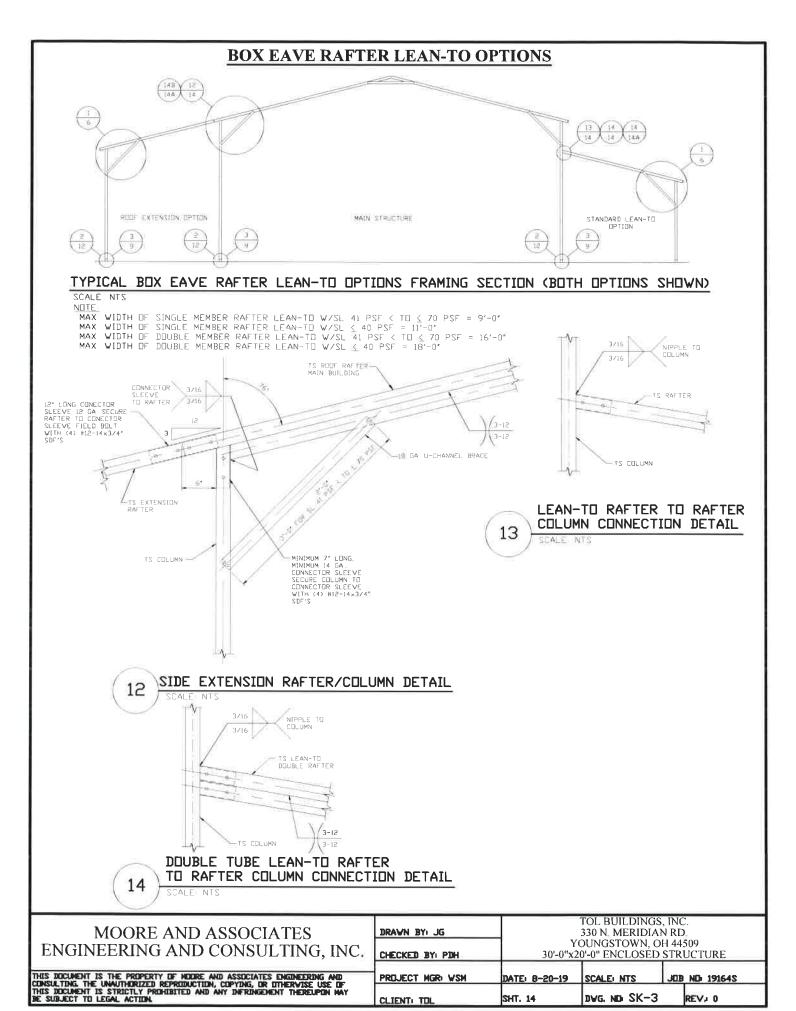
COLLAR TIE CONNECTION DETAIL 12B SCALE NTS

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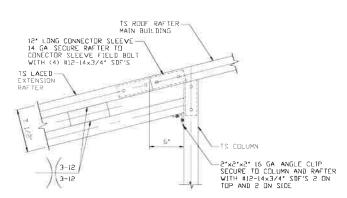
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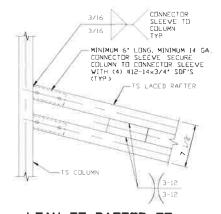
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BOX EAVE RAFTER LEAN-TO OPTIONS



SIDE EXTENSION RAFTER/COLUMN DETAIL FOR SPAN 16'-0" < L < 24'-0" 14B



LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR SPAN 16'-0" < L < 24'-0" 14D

2'x2'x2' 16 GA ANGLE CLIP SECURE TO COLUMN AND RAFTER WITH #12-14x3/4' SDF'S 2 ON TOP AND 2 ON SIDE IS LACED RAFTER TS COLUMN 3-12

LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR SPAN 16'-0" < L < 24'-0" 14C

CHECKED BY: PDH	YOUNGSTOWN, OH 44509 30'-0"x20'-0" ENCLOSED STRUCTURE				
PROJECT MGR: WSM	DATE: 8-20-19	SCALE: NTS	JOB NO 19164		
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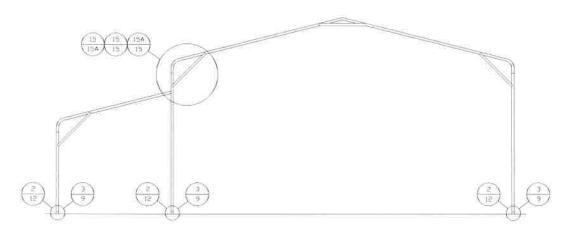
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330 N. MERIDIAN RD.

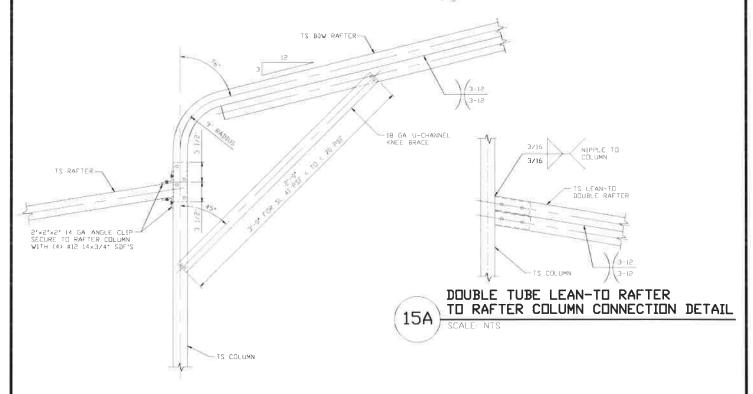
JOB NO 19164S

BOW RAFTER LEAN-TO OPTION



TYPICAL BOW RAFTER LEAN-TO OPTION FRAMING SECTION

SCALE NTS MAX WIDTH OF SINGLE MEMBER RAFTER LEAN-TO W/SL 41 PSF < TO < 70 PSF = 9'-0' MAX WIDTH OF SINGLE MEMBER RAFTER LEAN-TO W/SL < 40 PSF = 11'-0' MAX WIDTH OF DOUBLE MEMBER RAFTER LEAN-TO W/SL 41 PSF < TO < 70 PSF = 16'-0' MAX WIDTH OF DOUBLE MEMBER RAFTER LEAN-TO W/SL 41 PSF < TO < 70 PSF = 16'-0' MAX WIDTH OF DOUBLE MEMBER RAFTER LEAN-TO W/SL < 40 PSF = 18'-0'



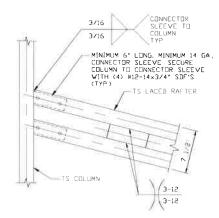
LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL 15 SCALE: NTS

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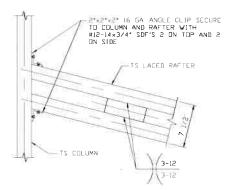
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DRAWN BY: JG		TOL BUILDING	AŃ RE).	

BOW RAFTER LEAN-TO OPTION



LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR SPAN 16'-0" < L \(24'-0" \)



LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR SPAN 16'-0' < L \(24'-0' \)

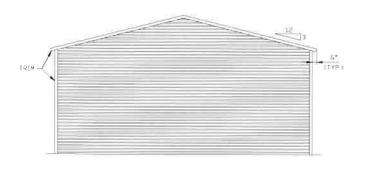
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DRAWN BY: JG	4	330 N. MERIDIAN	
		DUNGSTOWN, OI	
CHECKED BY: PDH	30'-0"x20	0'-0" ENCLOSED	STRUCTURE
PROJECT MGR: VSM	DATE: 8-20-19	SCALE: NTS	JDB ND 19164S
CLIENT: TOL	SHT. 15A	DVG. NO SK-3	REV. 0

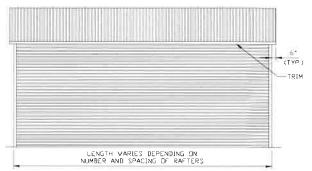
TOL BUILDINGS, INC.

BOX EAVE RAFTER VERTICAL ROOF OPTION



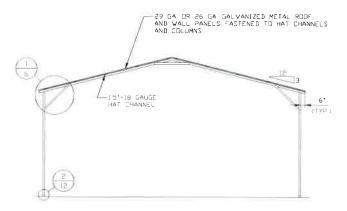
TYPICAL END ELEVATION-VERTICAL ROOF

SCALE! NTS



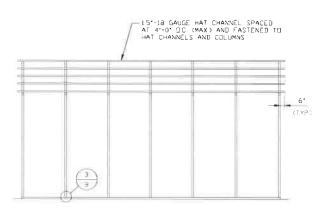
TYPICAL SIDE ELEVATION-VERTICAL ROOF OPTION

SCALE NTS



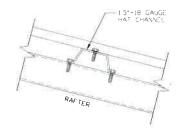
TYPICAL SECTION-VERTICAL ROOF

SCALE NTS



TYPICAL FRAMING SECTION-VERTICAL ROOF OPTION

SCALE NTS



ROOF PANEL ATTACHMENT

(ALTERNATE FOR VERTICAL ROOF PANELS)
SCALE NTS

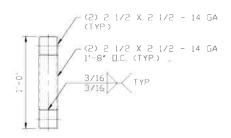
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DRAWN BY: JG	TOL BUILDINGS, INC. 330 N. MERIDIAN RD.				
CHECKED BY: PDH	YOUNGSTOWN, OH 44509 30'-0"x20'-0" ENCLOSED STRUCTURE				
PROJECT MGR: VSM	DATE: 8-20-19	SCALE: NTS	JOB	ND 19164S	
CLIENT: TOL	SHT. 16	DWG. NO SK-3		REV.i 0	

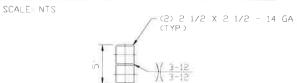
OPTIONAL HEADER

41 PSF < T□ < 70 PSF



NOTAL FED SNR WALL BEED





HEADER DETAIL FOR END WALL DOOR OPENINGS 14'-0' < LENGTH < 20'-0'

SCALE: NTS



(2) 2 1/2 X 2 1/2 - 14 GA (TYP)

HEADER DETAIL FOR SIDE WALL DOOR OPENINGS & 8'-0'

SCALE NTS

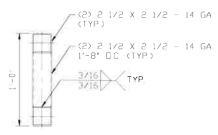
HEADER DETAIL FOR END WALL DOOR OPENINGS & 14'-0'

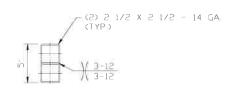
SCALE: NTS

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MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.	DRAWN BY: JG CHECKED BY: PDH	TOL BUILDINGS, INC. 330 N. MERIDIAN RD. YOUNGSTOWN, OH 44509 30'-0"x20'-0" ENCLOSED STRUCTURE		

OPTIONAL HEADER

< 40 PSF





HEADER DETAIL FOR SIDE WALL DOOR OPENINGS 11'-0" < LENGTH < 18'-0"

SCALE: NTS

HEADER DETAIL FOR SIDE WALL DOOR OPENINGS < 11'-0"

SCALE: NTS

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CLIENT: TDL	SHT. 18	DWG. ND: SK-3		REV. 0		
PROJECT MGR: VSM	DATE: 8-20-19	SCALE: NTS	JOB	ND 19164S		
CHECKED BY: PDH		YOUNGSTOWN, OH 44509 30'-0"x20'-0" ENCLOSED STRUCTURE				
DRAWN BY: JG	TOL BUILDINGS, INC 330 N. MERIDIAN RD.					