

PILOT MOUNTAIN, NORTH CAROLINA

STRUCTURAL DESIGN **ENCLOSED BUILDING**

MAXIMUM 30'-0" WIDE X 16'-0" EAVE HEIGHT- BOX EAVE **FRAME**

2 July 2020 **Revision 2** M&A Project No. 18315S/19179S/20176S

Prepared for:

NC Carports and Garages, LLC 309 S. Depot Street Pilot Mountain, NC 27041

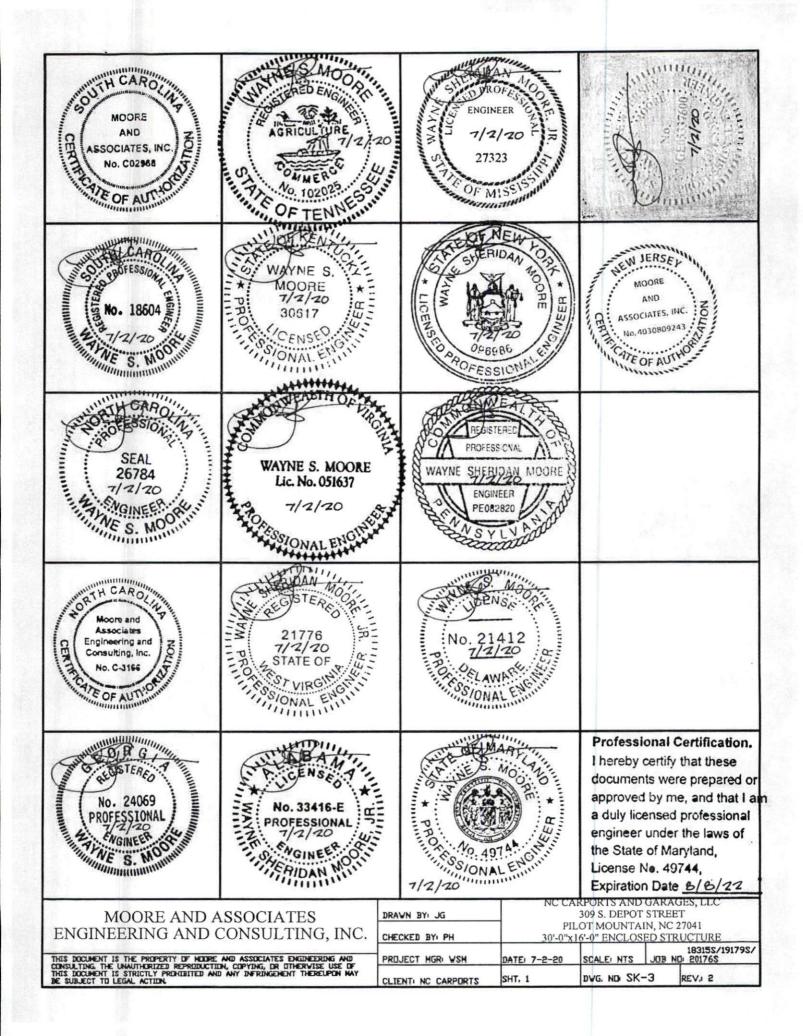
Prepared by:

Moore and Associates Engineering and Consulting, Inc.

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	DRAWN BYI JG	309 S. DEPOT STREET				
	CHECKED BY: PH	PILOT MOUNTAIN, NC 27041 30'-0"x16'-0" ENCLOSED STRUCTURE				
	PROJECT HGR: WSM	DATE: 7-2-20	SCALE: NTS	JOB N	18315S/19179S/ ID 20176S	
	CLIENT: NC CARPORTS	SHT. 2	DVG. NO SK	-3	REV.i 2	

INSTALLATION NOTES AND SPECIFICATIONS

- I. DESIGN IS FOR MAXIMUM 30'-0' WIDE x 16'-0' EAVE HEIGHT ENCLOSED STRUCTURES.
- 2. DESIGN WAS DONE IN ACCORDANCE WITH THE 2018 NORTH CAROLINA BUILDING CODE, 2009 INTERNATIONAL BUILDING CODE (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 = 35 PSF

= 30 PSF (W & 24'-0' WITH U-CHANNEL COLLAR TIE)

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

- 4. 3-SECOND GUST ULTIMATE WIND SPEED (VULT) 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. SIDEWALL COLUMNS AND ENDWALL COLUMNS ARE SIMILAR IN SIZE, 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) = 9 INCHES.
- 11. 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 16 FEET OR LESS, AND ROOF SLOPES OF 14* (3:12 PITCH) OR LESS SPACING REQUIREMENTS FOR OTHER ROOF HEIGHTS AND/OR SLOPES MAY VARY.
- 12. ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL WITHIN 6° OF EACH COLUMN.
- SPEEDS > 145 MPH AND/OR IN SUITABLE SDILS AS NOTED.
- 14. WIND FORCES GOVERN OVER SEISMIC FORCES. SEISMIC PARAMETERS ANALYZED ARE:

SDIL SITE CLASS = D RISK CATEGORY I

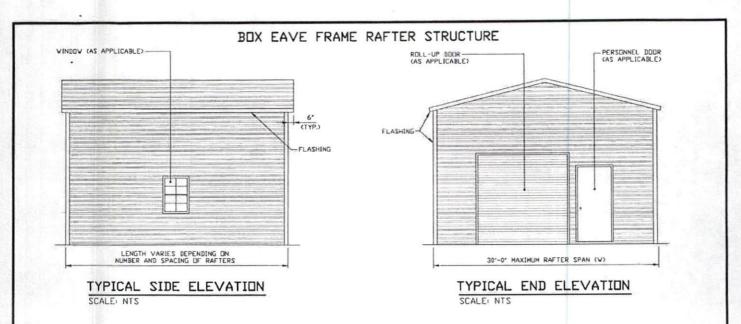
R= 3.25 $I_E = 1.0$ Sps= 2.039 V= C₂W

Spi= 1.258

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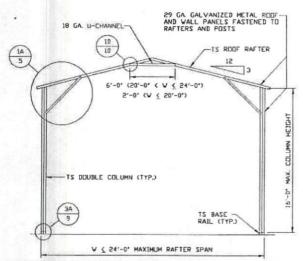
18315S/19179S/ ND 20176S

BOW EAVE FRAME RAFTER STRUCTURE VINDOV (AS APPLICABLE) -PERSONNEL DOOR (AS APPLICABLE) ROLL-UP DOOR ---FLASHING-LENGTH VARIES DEPENDING ON NUMBER AND SPACING OF RAFTERS 30'-0' MAXIMUM RAFTER SPAN (V)

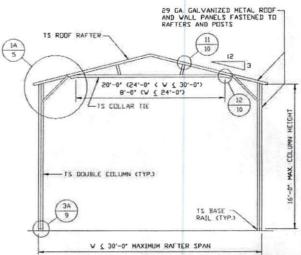
TYPICAL SIDE ELEVATION SCALE: NTS

TYPICAL END ELEVATION
SCALE: NTS

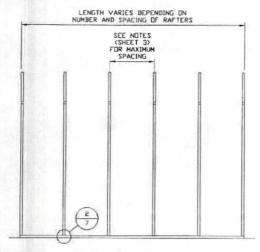
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TYPICAL RAFTER/COLUMN FRAME SECTION

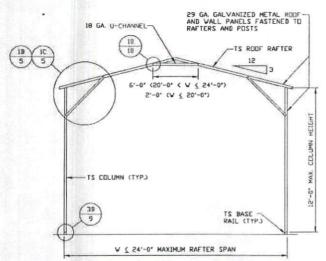


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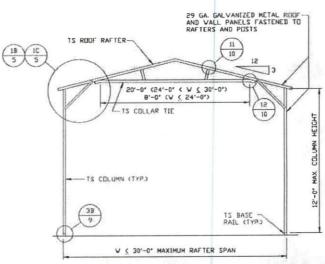


TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION SCALE: NTS

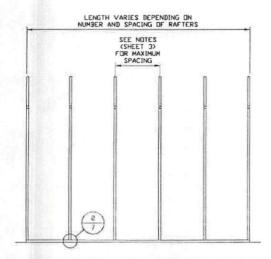
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TYPICAL RAFTER/COLUMN FRAME SECTION SCALE: NTS



TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS

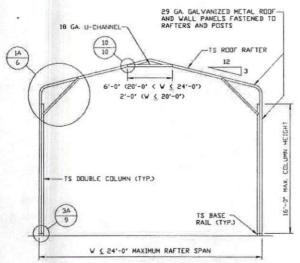


TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION SCALE: NTS

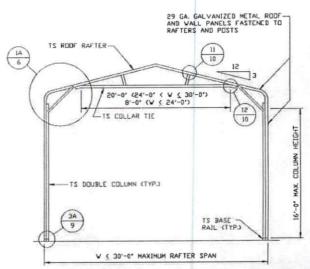
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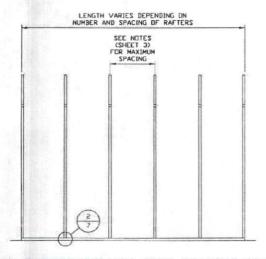
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TYPICAL RAFTER/COLUMN FRAME SECTION



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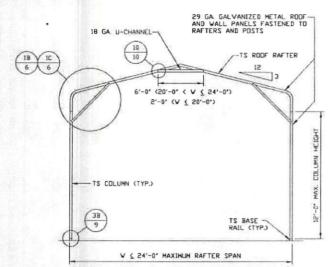


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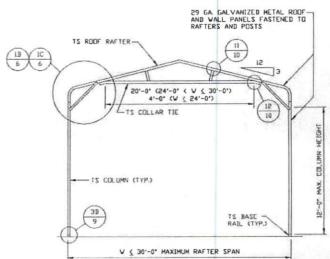
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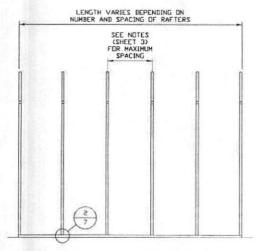
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TYPICAL RAFTER/COLUMN FRAME SECTION



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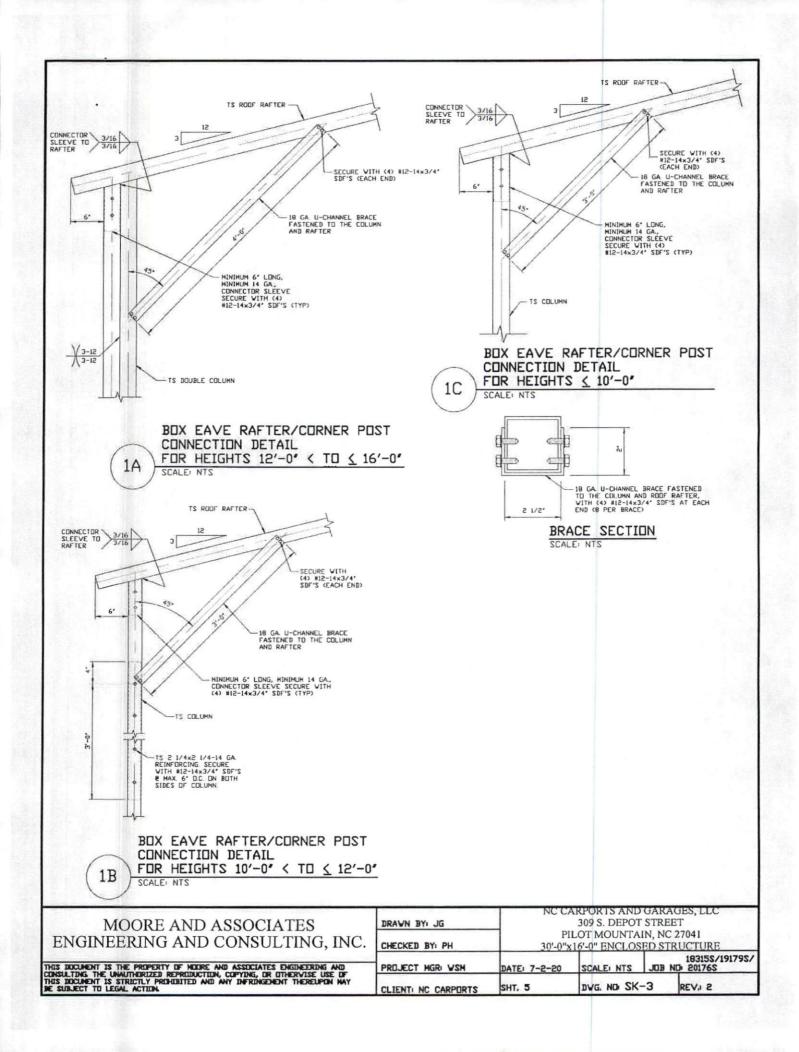


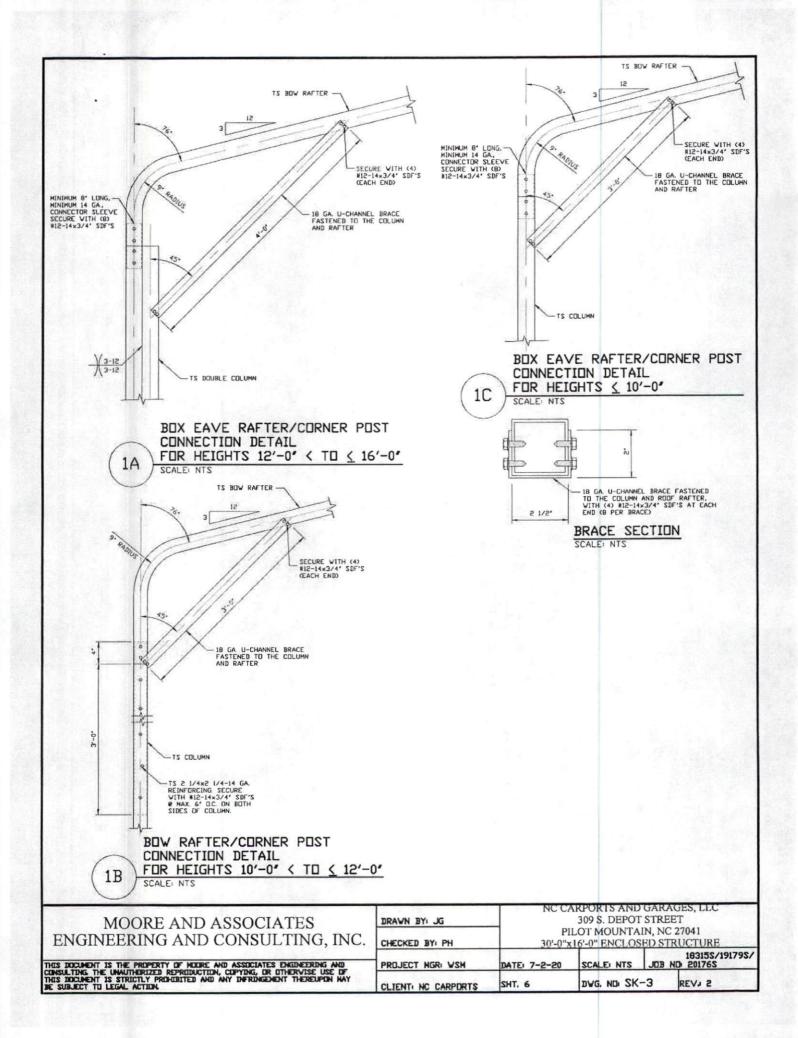
TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION SCALE: NTS

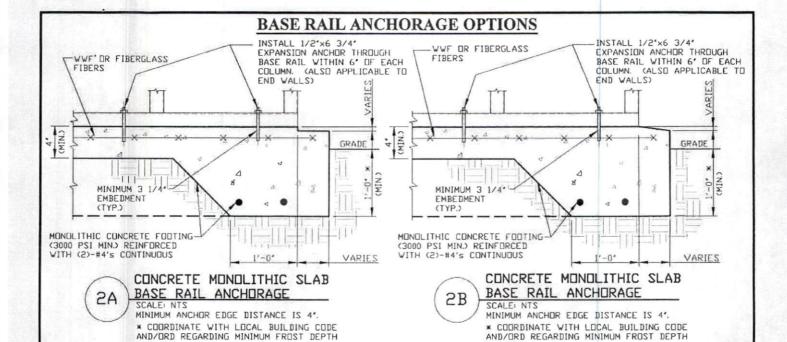
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GENERAL NOTES

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 I 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

1. REINFORCEMENT IS BENT COLD.

2. THE DIAMETER OF THE BEND, MEASURED ON THE INSIDE OF THE BAR, IS NOT LESS THAN SIX-BAR DIAMETERS.

3. REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE SHALL NOT

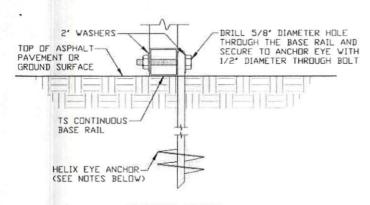
BE FIELD BENT.

HELIX ANCHOR NOTES:

- 1. FOR VERY DENSE AND/OR CEMENTED SANDS, COARSE GRAVEL AND COBBLES, CALICHE, PRELOADED SILTS AND CLAYS, USE MINIMUM (2) 4' HELICES WITH MINIMUM 30' EMBEDMENT OR SINGLE 6' HELIX WITH MINIMUM 50' EMBEDMENT
- 2. FOR CORAL USE MINIMUM (2) 4' HELICES WITH MINIMUM 30' EMBEDMENT OR SINGLE 6' HELIX WITH MINIMUM 50' EMBEDMENT.
- 3. FOR MEDIUM DENSE COARSE SANDS, SANDY GRAVELS, VERY STIFF SILTS, AND CLAYS USE MINIMUM (2) 4' HELICES WITH MINIMUM 30 INCH EMBEDMENT OR SINGLE 6' HELIX WITH MINIMUM 50' EMBEDMENT.
- 4. FOR 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.

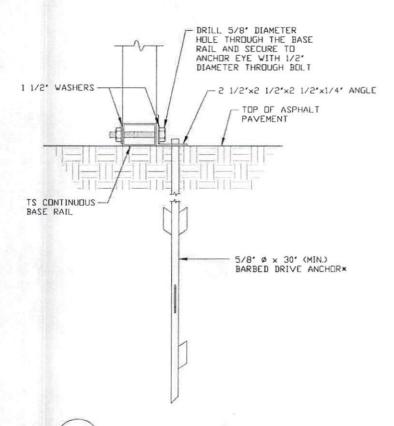
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BASE RAIL ANCHORAGE OPTIONS



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

* COORDINATE WITH LOCAL BUILDING CODE AND/ORD REGARDING MINIMUM FROST DEPTH (LENGTH).



2D ASPHALT BASE ANCHORAGE

SCALE NIS

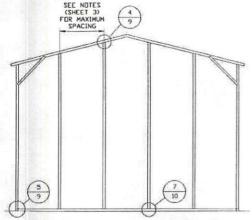
➤ COORDINATE WITH LOCAL BUILDING CODE
AND/ORD REGARDING MINIMUM FROST DEPTH
(I FNGTH)

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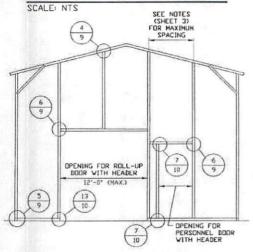
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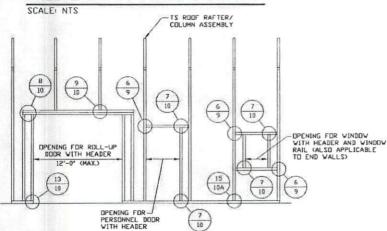
BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION



TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION



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

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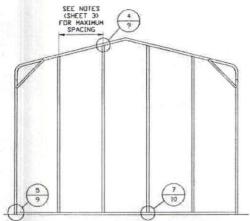
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	9	SEE NOTES (SHEET 3) FOR MAXIMUM SPACING	
14			
104		R	
5 9	OPENING FOR ROLL-UP DOOR VITH HEADER 20'-0' (MAX.)	10	(6 9)
D	7 10	DPENIN PERSON VITH H	NEL DOOR

TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

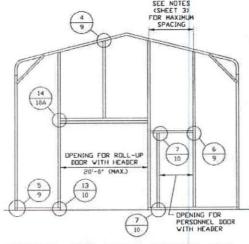
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BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



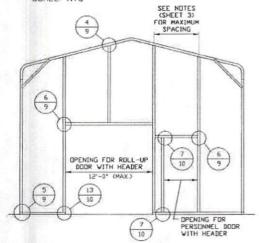
TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION

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TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

SCALE: NTS



TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

SCALEI NTS

TS ROOF RAFTER/
CULUMN ASSEMBLY

DPENING FOR POLL-UP
DOOR VITH HEADER
12'-0' (MAX.)

DPENING FOR POLL-UP
PERSONNEL DOOR
VITH HEADER
19'-0' (MAX.)

DPENING FOR VINDOV
RAIL (ALSO APPLICABLE
TO END VALLS)

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

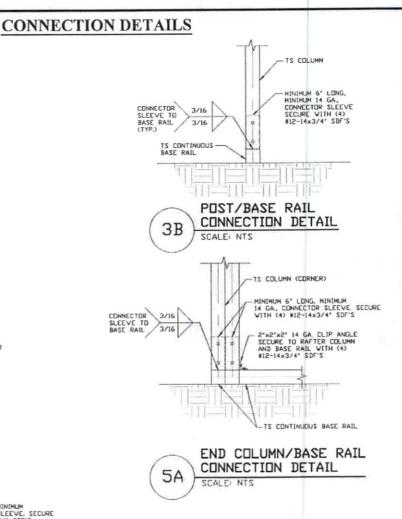
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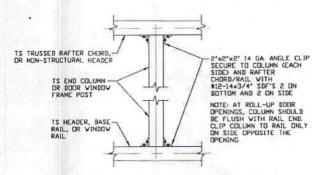
TS DOUBLE COLUMN MINIMUM 6' LDNG, MINIMUM 14 GA., CONNECTOR SLEEVE SECURE VITH (4) H12-14x3/4' SDF'S CONNECTOR SLEEVE TO BASE RAIL (TYP.) 3/16 3/16 TS CONTINUOUS BASE RAIL POST/BASE RAIL CONNECTION DETAIL 3A SCALE: NTS TS ROOF RAFTER 2'x2'x2' 14 GA. ANGLE CLIP SECURE TO COLUMN AND RAFTER WITH #12-14x3/4' SDF'S 2 DN TOP AND 2 ON SIDE TS END COLUMN END COLUMN/RAFTER CONNECTION DETAIL SCALE: NTS TS COLUMN (CORNER) MINIMUM 6' LONG, MINIMUM 14 GA., CONECTOR SLEEVE. SECURE VITH (4) #12-14x3/4' SDF'S CONNECTOR SLEEVE TO BASE RAIL 3/16 2'x2'x2' 14 GA CLIP ANGLE SECURE TO RAFTER COLUMN AND BASE RAIL WITH (4) H12-14x3/4' SDF'S TS CONTINUOUS BASE RAIL END COLUMN/BASE RAIL CONNECTION DETAIL **5B** SCALE: NTS TS COLUMN OR END COLUMN -2:x2'x2' 14 GA. ANGLE CLIP SECURE TO COLUMN AND EITHER TOP OF HEADER, OR BOTTOM OF VINDOW RAIL VITH #12-14x3/4' SDF'S TS HEADER OR COLUMN OR WINDOW RAIL TO POST CONNECTION DETAIL 6

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NC CARPORTS AND GARAGES, LLC 309 S. DEPOT STREET DRAWN BYI JG PILOT MOUNTAIN, NC 27041 ENGINEERING AND CONSULTING, INC. CHECKED BY PH 30'-0"x16'-0" ENCLOSED STRUCTURE 18315\$/19179\$/ THIS DOCUMENT IS THE PROPERTY OF MODRE AND ASSOCIATES ENGINEERING AND CONSULTING. THE UNAUTHORIZED REPRODUCTION, COPYING, OR OTHERVISE USE OF THIS DOCUMENT IS STRICTLY PROHIBITED AND ANY INFRINGEMENT THEREUPON MAY BE SUBJECT TO LEGAL, ACTION. SCALE: NTS PROJECT MGRI VSM JOB NO 20176S DATE: 7-2-20 DVG. NO SK-3 REVJ 2 SHT. 9 CLIENTI NC CARPORTS

CONNECTION DETAILS



CONNECTOR 3/16
SLEEVE TO HEADER

15 DOUBLE HEADER

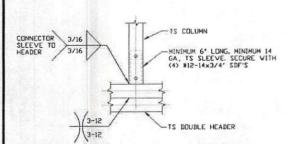
15 DOUBLE HEADER

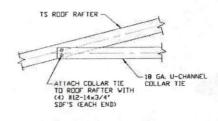
MINIMUM 6' LDNG, MINIMUM 14 GA. 15 SLEEVE. SECURE EACH VITH (4) #12-14x3/4'

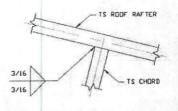
TS COLUMN

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

8 DOUBLE HEADER/COLUMN
CONNECTION DETAIL
SCALE: NTS



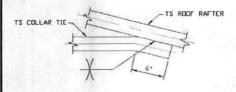




COLUMN/DOUBLE HEADER
CONNECTION DETAIL
SCALE: NTS

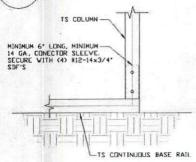
10 COLLAR TIE CONNECTION DETAIL

RAFTER TO CHORD CONNECTION DETAIL
SCALE NTS



9

12 COLLAR TIE CONNECTION DETAIL
SCALE: NTS



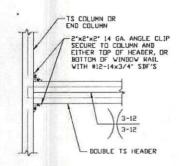
COLUMN/BASE RAIL
CONNECTION DETAIL
SCALE: NTS

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-	<u> </u>	NC CZ	ARPORTS AND	GARA	GES, LLC		
	DRAWN BYI JG	309 S. DEPOT STREET					
The second secon	CHECKED BY: PH	PILOT MOUNTAIN, NC 27041 30'-0"x16'-0" ENCLOSED STRUCTURE					
	PROJECT NGR: WSM	DATE: 7-2-20			18315S/19179S/ ND 20176S		
	CLIENT: NC CARPORTS	SHT. 10	DVG, ND SK-3		REVJ 2		

CONNECTION DETAILS



DOUBLE HEADER TO COLUMN CONNECTION DETAIL

TS TRUSSED RAFTER CHORD,-OR NON-STRUCTURAL HEADER TS END COLUMN -OR DOOR VINDOV FRAME POST -MINIMUM 6' LDNG, MINIMUM 14 GA., TS SLEEVE. SECURE WITH (4) #12-14x3/4' SDF'S

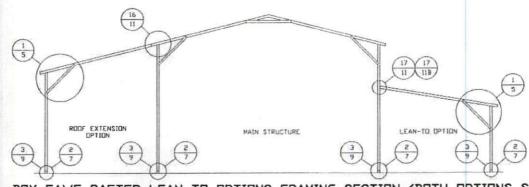
COLUMN TO HEADER OR BASE RAIL CONNECTION DETAIL SCALE: NTS

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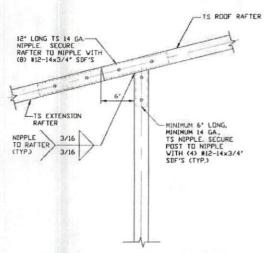
A STATE OF THE STA	NC CARPORTS AND GARAGES, LLC					
DRAWN BY: JG	309 S. DEPOT STREET PILOT MOUNTAIN, NC 27041 30'-0"x16'-0" ENCLOSED STRUCTURE					
CHECKED BY: PH						
PROJECT MGR: WSM	DATE: 7-2-20	SCALE: NTS		183155/191795/		
CLIENT: NC CARPORTS	SHT. 10A	DVG. ND: SK	-3	REV. 2		

BOX EAVE RAFTER LEAN-TO OPTIONS



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

SCALE: NTS
MAXIMUM VIDTH OF SINGLE MEMBER ROOF EXTENSION AND LEAN-TO OPTION IS 12'-0'.
MAXIMUM VIDTH OF DOUBLE MEMBER ROOF EXTENSION AND LEAN-TO OPTION IS 16'-0'.



3/16 NIPPLE TO COLUMN

3/16 NIPPLE TO COLUMN

MINIMUM 6' LONG, MINIMUM 14 GA.,
TS NIPPLE SECURE RAFTER TO
NIPPLE VITH (4) B12-14x3/4' SDF'S

TS LEAN-TO
RAFTER

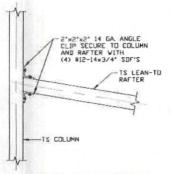
TS COLUMN

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

ROOF EXTENSION RAFTER/CORNER POST DETAIL FOR WIDTHS ≤ 12'-0'

SCALE NTS

16



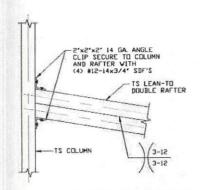
LEAN-TO RAFTER
TO RAFTER POST
CONNECTION DETAIL
FOR WIDTHS ≤ 12'-0'
SCALE: NTS

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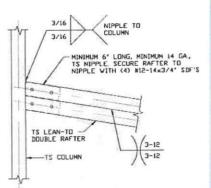
	CLIENTI NC CARPORTS	SHT. 11	DVG. ND SK	-3	REV. 2	
-	PROJECT MGRI VSM	DATE: 7-2-20	SCALE: NTS	JEIB N	18315S/19179S/ D 20176S	
	CHECKED BY: PH	PILOT MOUNTAIN, NC 27041 30'-0"x16'-0" ENCLOSED STRUCTURE				
	DRAWN BY: JG					

BOX EAVE RAFTER LEAN-TO OPTIONS



LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL FOR WIDTHS 12'-0' < T□ < 16'-0' 17C

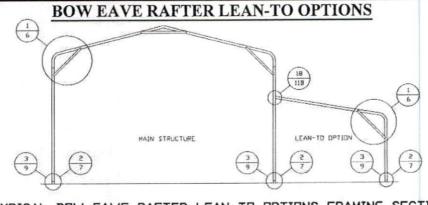
SCALE: NTS



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

17D SCALE: NTS

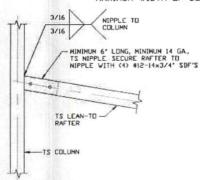
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THIS TOCHMENT IS THE PROPERTY OF HOUSE AND ASSOCIATES ENGINEERING AND	PROJECT MGRI VSM	DATE: 7-2-20	SCALE: NTS	JOB N	18315S/19179S/ D 20176S	
ENGINEERING AND CONSULTING, INC.	CHECKED BY: PH	PILOT MOUNTAIN, NC 27041 30'-0"x16'-0" ENCLOSED STRUCTURE				
MOORE AND ASSOCIATES	DRAVN BYI JG	309 S. DEPOT STREET				



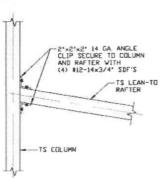
TYPICAL BOW EAVE RAFTER LEAN-TO OPTIONS FRAMING SECTION

SCALE: NTS
MAXIMUM WIDTH OF SINGLE MEMBER LEAN-TO OPTION IS 12'-0'.
MAXIMUM WIDTH OF DOUBLE MEMBER LEAN-TO OPTION IS 16'-0'

18B

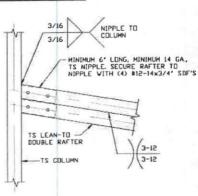


LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL FOR WIDTHS ≤ 12'-0' SCALE: NTS



LEAN-TO RAFTER
TO RAFTER POST
CONNECTION DETAIL
FOR WIDTHS

SCALE: NTS



LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL FOR WIDTHS

12'-0' < TO < 16'-0'

SCALE: NTS

(18C

2'x2'x2' 14 GA. ANGLE
CLIP SECURE TO COLUMN
AND RAFTER VITH
(4) #12-14x3/4' SDF'S

TS LEAN-TO
DOUBLE RAFTER

3-12

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

18D SCALE: NTS

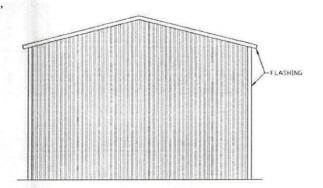
18A

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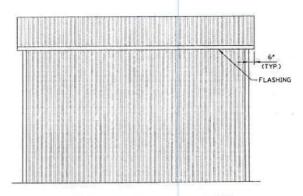
CLIENTI NC CARPORTS	SHT. 11B	DVG. ND SK	-3	REV. 2	
PROJECT HGR: VSM	DATE: 7-2-20	SCALE: NTS	JOB	18315S/19179S/ ND: 20176S	
CHECKED BY: PH	PILOT MOUNTAIN, NC 27041 30'-0"x16'-0" ENCLOSED STRUCTURE				
DRAWN BY: JG	NC CARPORTS AND GARAGES, LLC 309 \$. DEPOT STREET				

BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



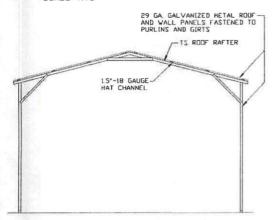
TYPICAL END ELEVATION VERTICAL ROOF/SIDING

SCALE: NTS



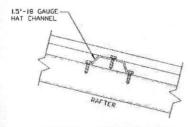
TYPICAL SIDE ELEVATION VERTICAL ROOF/SIDING

SCALE: NTS



TYPICAL SECTION
VERTICAL ROOF/SIDING OPTION

SCALE: NTS



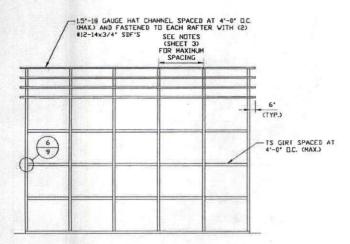
PANEL ATTACHMENT
(ALTERNATE FOR VERTICAL ROOF PANELS)
SCALE: NTS

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CHECKED BY: PH	30'-0"x16'-0" ENCLOSED STRUCTURE				
PROJECT MGR: VSM	DATE: 7-2-20	SCALE) NTS	JOB	18315S/19179S/ ND 20176S	
CLIENTI NC CARPORTS	SHT. 12	DVG. NO SK	-3	REV. 2	

BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



TYPICAL FRAMING SECTION VERTICAL ROOF/SIDING OPTION WITH TS GIRTS

SCALE: NTS

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THE POSTERIOR TO THE RESPECTATIVE PER LEGISLE AND ASSESSMENT PROPERTY AND	PROJECT MGR: VSM	2475. 7. 2. 20	SCALE: NTS	JOB NO 20176S		
ENGREEPING AND CONGULTING DIC	CHECKED BY: PH	PILOT MOUNTAIN, NC 27041 30'-0"x16'-0" ENCLOSED STRUCTURE				
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