

PILOT MOUNTAIN, NORTH CAROLINA

#### STRUCTURAL DESIGN ENCLOSED BUILDING

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

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

Prepared for:

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

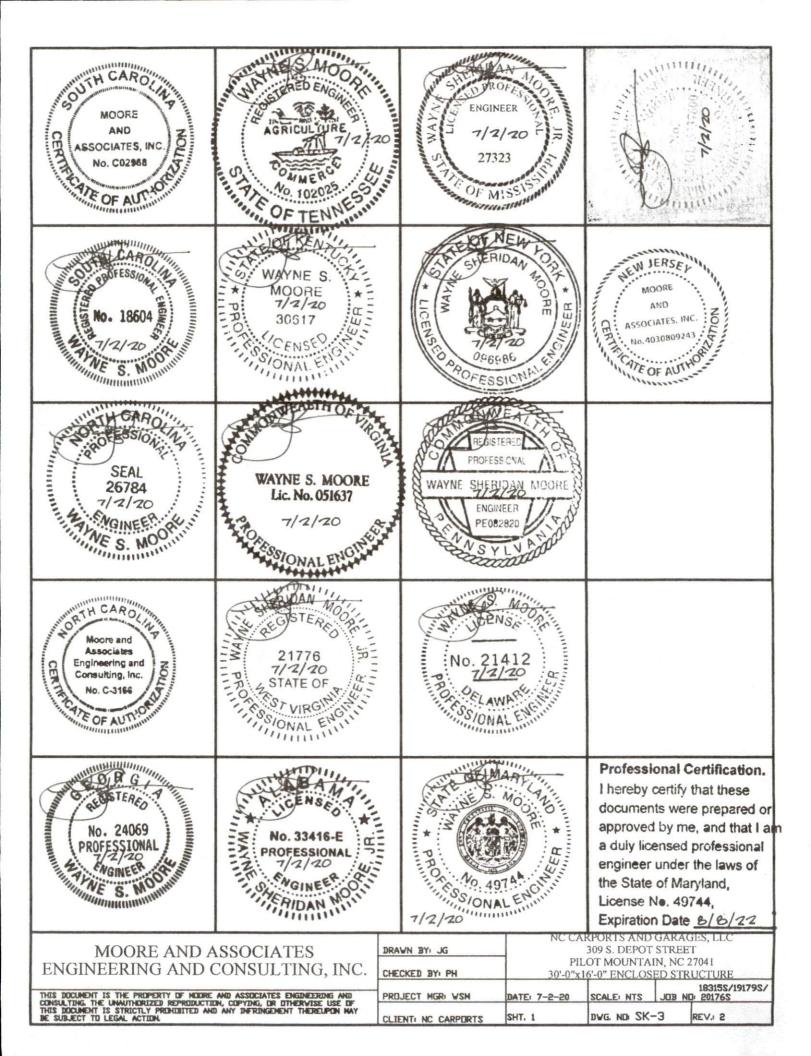
Prepared by:

Moore and Associates Engineering and Consulting, Inc.

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





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ENCINEEDING AND CONGULTING INC	CHECKED BY: PH	PILOT MOUNTAIN, NC 27041 30'-0"x16'-0" ENCLOSED STRUCTURE			
MOORE AND ASSOCIATES	DRAWN BY: JG	NC CARPORTS AND GARAGES, LLC 309 S. DEPOT STREET			

#### 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 (V<sub>ULT</sub>) 105 TO 145 MPH (NOMINAL WIND SPEED 82 TO 112 MPH).
- 5. MAXIMUM RAFTER/COLUMN AND END COLUMN SPACING = 50 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 #12-14×3/4" 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.
- 13. STANDARD GROUND ANCHORS (SUIL NAILS) CONSIST OF #4 REBAR W/WELDED NUT 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 SUITABLE SOILS AS NOTED.
- 14. WIND FORCES GOVERN OVER SEISMIC FORCES. SEISMIC PARAMETERS ANALYZED ARE:

SOIL SITE CLASS = D RISK CATEGORY I

R = 3.25  $I_E = 1.0$   $V = C_S W$ 

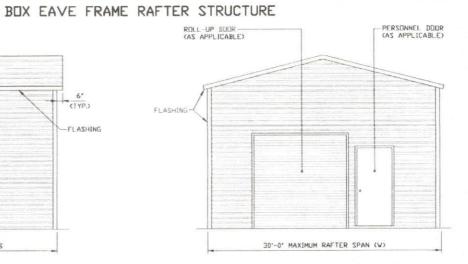
 $S_{Di} = 1.258$ 

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# VINDOV (AS APPLICABLE) LENGTH VARIES DEPENDING ON NUMBER AND SPACING OF RAFTERS

TYPICAL SIDE ELEVATION
SCALE: NTS



TYPICAL END ELEVATION
SCALE: NTS

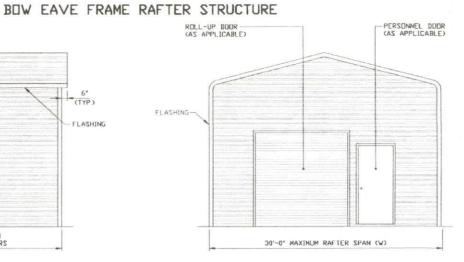
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# DIW EAVE FRA VINDOV (AS APPLICABLE) 6' (TYP) FLASHING LENGTH VARIES DEPENDING DIN NUMBER AND SPACING DE RAFTERS

TYPICAL SIDE ELEVATION
SCALE: NTS

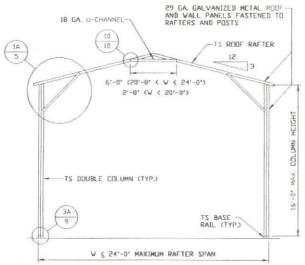


TYPICAL END ELEVATION
SCALE: NTS

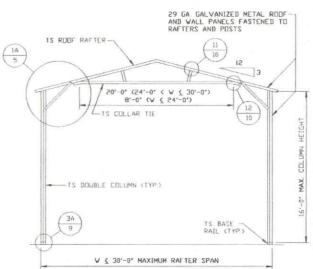
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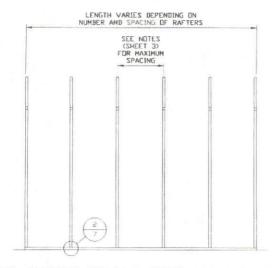
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TYPICAL RAFTER/COLUMN FRAME SECTION SCALE: NTS



TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS

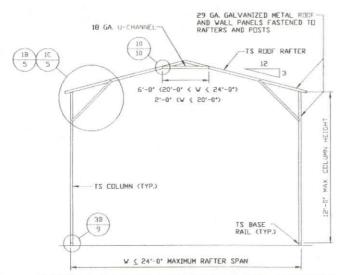


TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION
SCALE: NTS

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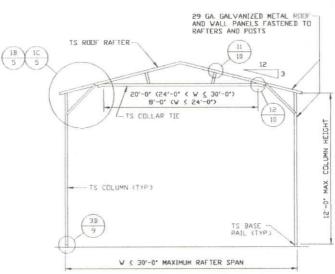
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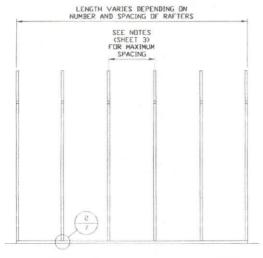


#### TYPICAL RAFTER/COLUMN FRAME SECTION

SCALE: NTS



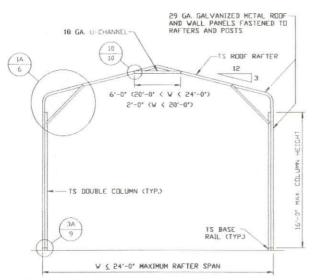
TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

SCALE: NTS

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TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS

29 GA. GALVANIZED METAL RODF
AND VALL PANELS FASTENED TO
RAFTERS AND POSTS

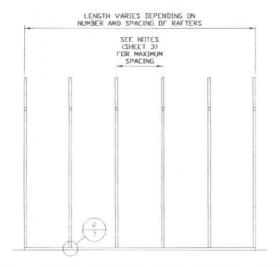
TS RODF RAFTER

11
10
12
20'-0' (24'-0' ( V ( 30'-0'))
8'-0' (V ( 24'-0'))
12
TS COLLAR TIE

TS BASE
RAIL (TYP.)

V ( 30'-0' MAXIMUM RAFTER SPAN

TYPICAL RAFTER/COLUMN FRAME SECTION

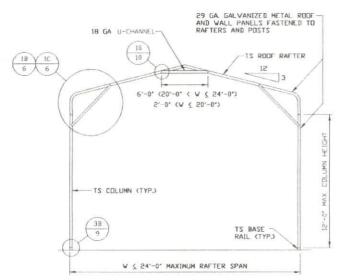


TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION SCALE: NTS

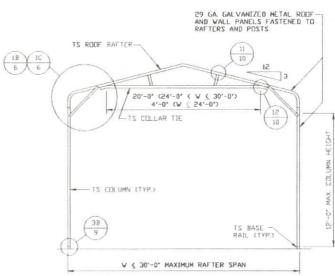
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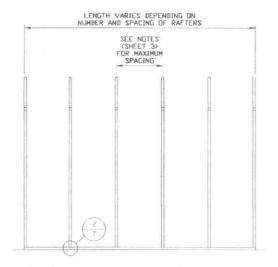
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TYPICAL RAFTER/COLUMN FRAME SECTION
SCALE: NTS



TYPICAL RAFTER/COLUMN FRAME SECTION

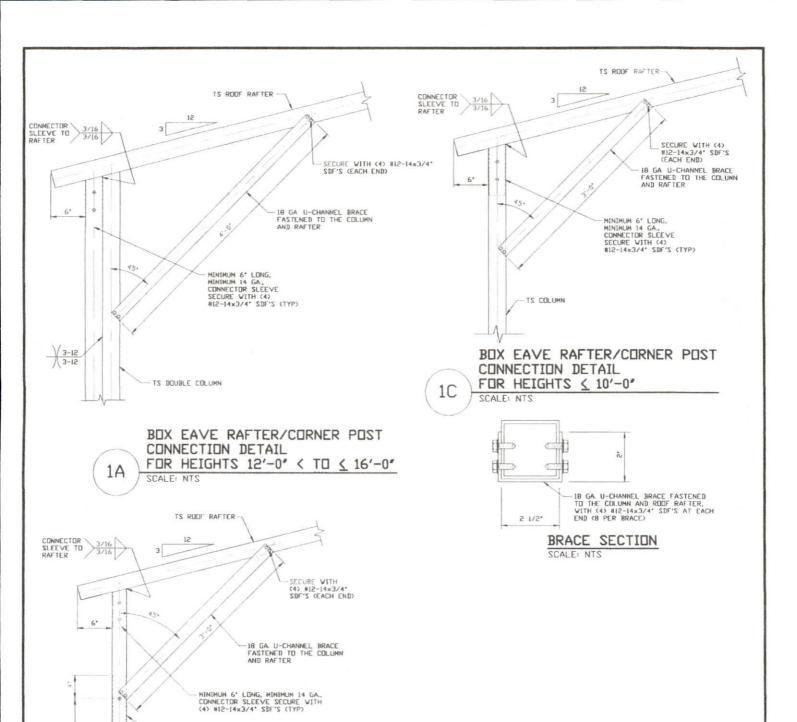


TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION SCALE: NTS

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BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL

FOR HEIGHTS 10'-0' < TO < 12'-0'

SCALE: NTS

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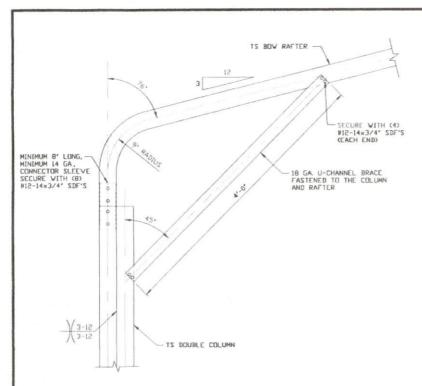
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TS COLUMN

TS 2 1/4x2 1/4-14 GA.
REINFORCING SECURE
WITH #12-14x3/4" SDF'S
@ MAX 6" D.C. DN BOTH
SIDES OF COLUMN

9

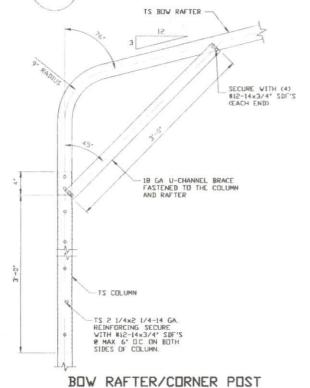
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BOX EAVE RAFTER/CORNER POST CONNECTION DETAIL

FOR HEIGHTS 12'-0' < TO < 16'-0'

SCALE NTS



CONNECTION DETAIL
FOR HEIGHTS 10'-0" < TO \( \subseteq 12'-0" \)
SCALE: NTS

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TS BUW RAFTER

TS COLUMN

CONNECTION DETAIL

SCALE: NTS

2 1/2"

FOR HEIGHTS ≤ 10'-0'

BOX EAVE RAFTER/CORNER POST

18 GA. U-CHANNEL BRACE FASTENED TO THE COLUMN AND ROOF RAFTER, WITH (4) #12-14×3/4' SDF'S AT EACH END (8 PER BRACE)

BRACE SECTION

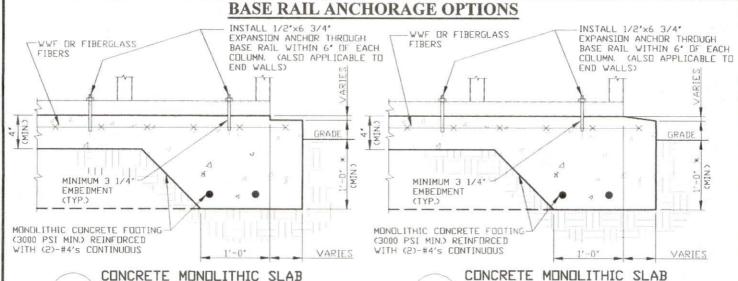
SCALE: NTS

MINIMUM B' LONG.— HINIMUM 14 GA., CONNECTOR SLEEVE SECURE WITH (B) #12-14x3/4' SDF'S

1C

SECURE WITH (4) #12-14x3/4" SDF'S (EACH END)

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



**SB** 

24

#### BASE RAIL ANCHORAGE

SCALE: NTS MINIMUM ANCHOR EDGE DISTANCE IS 4' \* COORDINATE WITH LOCAL BUILDING CODE AND/ORD REGARDING MINIMUM FROST DEPTH (LENGTH)

#### 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:

- 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, 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
- 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.

## BASE RAIL ANCHORAGE

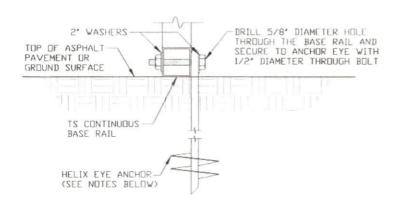
STALF: NTS MINIMUM ANCHOR EDGE DISTANCE IS 4". \* COORDINATE WITH LOCAL BUILDING CODE AND/ORD REGARDING MINIMUM FROST DEPTH (I FNGTH).

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#### BASE RAIL ANCHORAGE OPTIONS

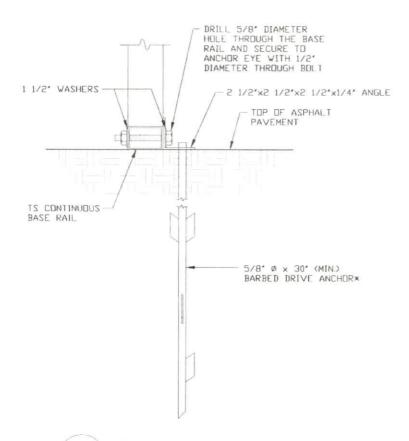


### 2C

#### GROUND BASE HELIX ANCHORAGE

SCALE: NTS (CAN BE USED FOR ASPHALT)

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



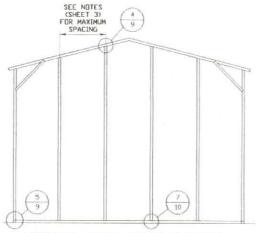
#### SD

#### ASPHALT BASE ANCHORAGE

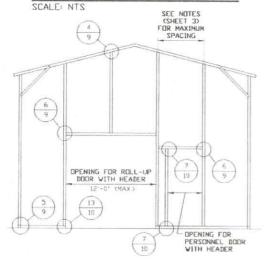
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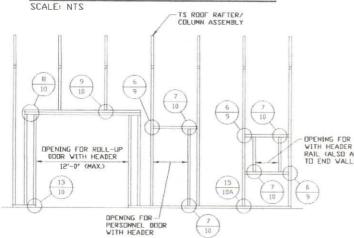
#### BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



#### TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION



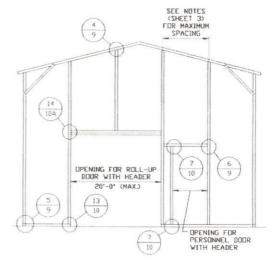
#### TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION



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

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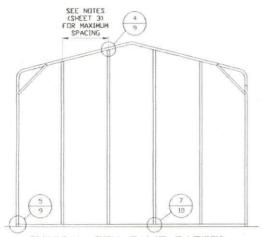
#### TYPICAL BUX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

SCALE: NTS

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

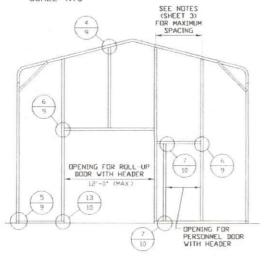
NC CARPORTS AND GARAGES, LLC DRAWN BY: JG 309 S. DEPOT STREET PILOT MOUNTAIN, NC 27041 CHECKED BY: PH 30'-0"x16'-0" ENCLOSED STRUCTURE 18315\$/19179\$/ PROJECT MGRI WSM DATE: 7-2-20 SCALE: NTS 201765 SHT. B DWG. NO SK-3 REV. 2 CLIENTI NC CARPORTS

#### BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS

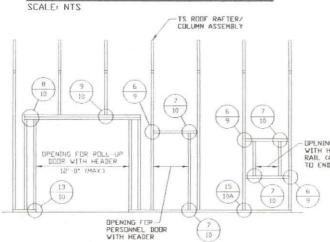


TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION

SCALE: NTS



TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION



TYPICAL BOX EAVE RAFTER
SIDE WALL OPENINGS FRAMING SECTION

SCALE: NTS

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T	4 9	(SHEET 3) FOR MAXIMUM SPACING	
14 10A			
	OPENING FOR ROLL-UP BOOK VITH HEADER 20'-0" (MAX.)	7 10	6 9
9	7	PERSO	NG FOR INNEL DOOR HEADER

SEE MUTES

TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

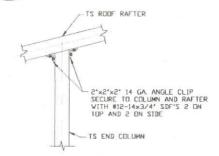
SCALE: NTS

DPENING FOR VINDOV VITH HEADER AND VINDOV RAIL (ALSO APPLICABLE TO END WALLS)

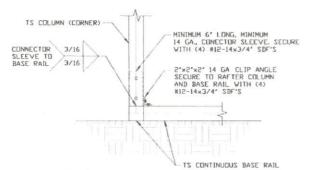
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CHECKED BY: PH	PILOT MOUNTAIN, NC 27041 30'-0"x16'-0" ENCLOSED STRUCTURE					
PROJECT MGR: WSM	DATE: 7-2-20	SCALE: NTS	JEB N	10315S/19179S/ D 20176S		
CLIENTI NC CARPURTS	SHT. BA	DWG. NO: SK	-3	REV. 2		

# CONNECTOR SLEEVE TO BASE RAIL 3/16 TS DOUBLE COLUMN MINIMUM 14 GA., CONNECTOR SLEEVE SECURE WITH (4) #12-14x3/4' SBF'S TS CONTINUOUS BASE RAIL

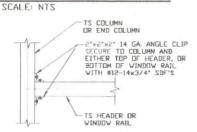
# POST/BASE RAIL CONNECTION DETAIL SCALE: NTS



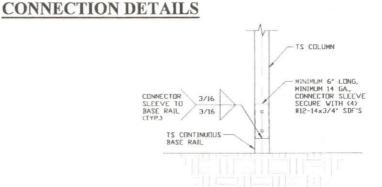
# 4 CONNECTION DETAIL SCALE NTS



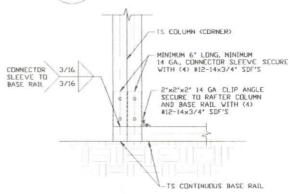
# 5B SCALE NIS



COLUMN OR WINDOW RAIL TO POST CONNECTION DETAIL SCALE: NTS







# SCALE: NTS END COLUMN/BASE RAIL CONNECTION DETAIL

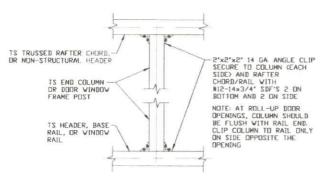
# MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.

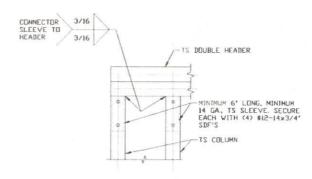
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PROJECT MGR: VSM	DATE: 7-2-20	SCALE: NTS	JOB N	18315S/19179S/ Di 20176S	
CLIENT: NC CARPERTS	SHT. 9	DWG. ND. SK	-3	REV. 2	

#### **CONNECTION DETAILS**

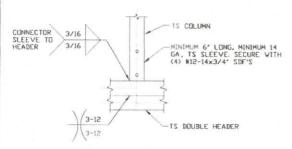


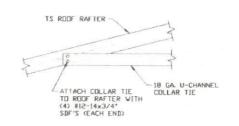


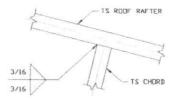
7 COLUMN TO HEADER, BASE RAIL, OR WINDOW RAIL CONNECTION DETAIL

SCALE: NTS

8 DOUBLE HEADER/COLUMN
CONNECTION DETAIL
SCALE NTS



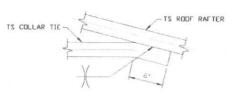




COLUMN/DOUBLE HEADER
CONNECTION DETAIL

10 COLLAR TIE CONNECTION DETAIL

11 RAFTER TO CHORD CONNECTION DETAIL
SCALE NTS

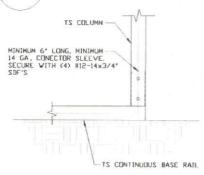


9

12

13

COLLAR TIE CONNECTION DETAIL SCALE: NTS



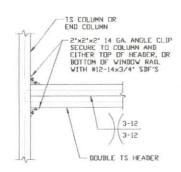
COLUMN/BASE RAIL CONNECTION DETAIL SCALE: NTS

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	CHECKED BY: PH	PILOT MOUNTAIN, NC 27041 30'-0"x16'-0" ENCLOSED STRUCTURE				
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	CLIENT: NC CARPORTS	SHT. 10	DWG. ND: SK	-3	REV. 2	

#### **CONNECTION DETAILS**



DOUBLE HEADER
TO COLUMN
CONNECTION DETAIL
SCALE: NTS

14

TS TRUSSED RAFTER CHORD.

OR NON-STRUCTURAL HEADER

TS END COLUMN
OR DOOR WINDOV
FRAME POST

TS HEADER OR
BASE RAIL

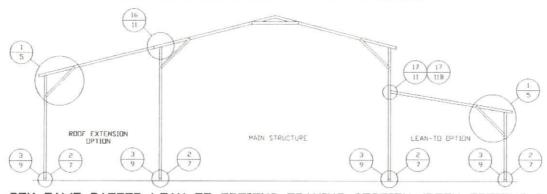
COLUMN TO HEADER OR BASE RAIL CONNECTION DETAIL SCALE: NTS

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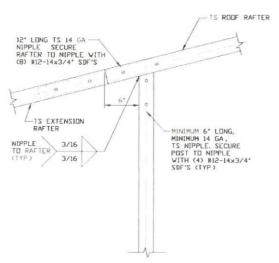
	DRAWN BY: JG	309 S. DEPOT STREET PILOT MOUNTAIN, NC 27041			
	CHECKED BY: PH	and the second s		UCTURE	
_	PROJECT MGR: WSM	DATE: 7-2-20	SCALE: NTS	JOB N	18315S/19179S/ D 20176S
	CLIENT: NC CARPORTS	SHT. 10A	DWG. ND: SK	-3	REV. 2

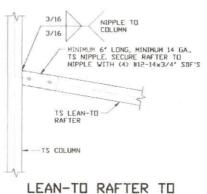
#### **BOX EAVE RAFTER LEAN-TO OPTIONS**



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

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





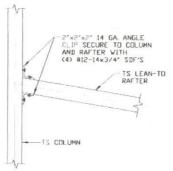
LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL FOR WIDTHS & 12'-0"

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

SCALE: NTS

17B

16



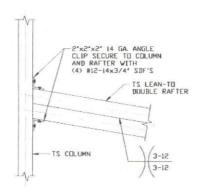
LEAN-TO RAFTER
TO RAFTER POST
CONNECTION DETAIL
FOR WIDTHS 
\$\( \) 12'-0'

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	CHECKED BY: PH	30'-0"x16'-0" ENCLOSED STRUCTURE				
-	PROJECT MGR: VSM	DATE: 7-2-20	SCALE: NTS	18315S/1917 JOB NO 20176S		
	CLIENT: NC CARPORTS	SHT. 11	DVG. NO SK-3		REV. 2	

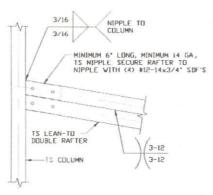
#### **BOX EAVE RAFTER LEAN-TO OPTIONS**



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

SCALE: NTS

17C



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

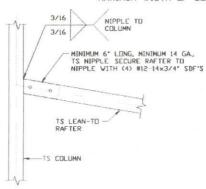
17D SCALE

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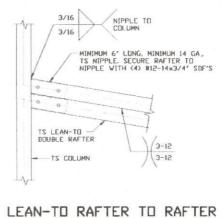
# BOW EAVE RAFTER LEAN-TO OPTIONS 118 MAIN STRUCTURE LEAN-TO DPTHO

#### TYPICAL BOW EAVE RAFTER LEAN-TO OPTIONS FRAMING SECTION

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



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



POST CONNECTION DETAIL

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

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

FOR WIDTHS 12'-0" < T□ < 16'-0" 18C SCALE: NTS

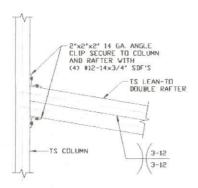
18A SCALE: NTS

18D

SCALE: NTS

18B

SCALE: NTS



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

MOORE AND ASSOCIATES

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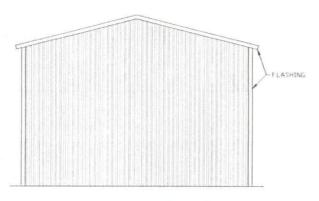
DRAWN BY: JG

NC CARPORTS AND GARAGES, LLC 309 S. DEPOT STREET PILOT MOUNTAIN, NC 27041 30'-0"x16'-0" ENCLOSED STRUCTURE

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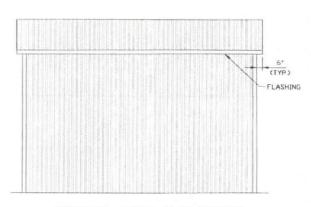
CHECKED BY PH 18315\$/19179\$/ PROJECT MGRI WSM DATE: 7-2-20 SCALE: NTS ND 20176S SHT. 11B DVG. ND: SK-3 REV. 2 CLIENT: NC CARPORTS

#### BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



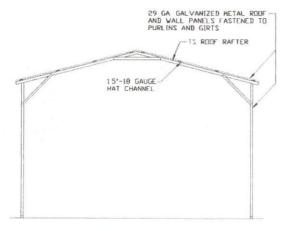
# TYPICAL END ELEVATION VERTICAL ROOF/SIDING

SCALE: NTS



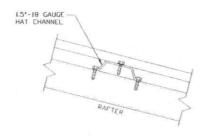
# TYPICAL SIDE ELEVATION VERTICAL ROOF/SIDING

SCALE: NTS



TYPICAL SECTION
VERTICAL ROOF/SIDING OPTION

SCALE: NTS



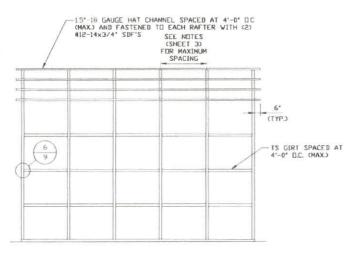
PANEL ATTACHMENT
(ALTERNATE FOR VERTICAL ROOF PANELS)
SCALE: NTS

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PROJECT MGR: WSM	DATE: 7-2-20	SCALE: NTS	JOB N	18315S/19179S/ ID: 20176S	
CLIENT: NC CARPORTS	SHT. 12	DWG. 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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	CLIENT: NC CARPORTS	SHT. 12A	DWG. ND SK	-3	REV. 2	
	PROJECT MGR: VSM	DATE: 7-2-20	SCALE: NTS	JOB N	18315\$/19179\$/ D 20176\$	
	CHECKED BY: PH	PILOT MOUNTAIN, NC 27041 30'-0"x16'-0" ENCLOSED STRUCTURE				
	DRAWN BY: JG	NC CARPORTS AND GARAGES, LLC 309 S. DEPOT STREET				