

PILOT MOUNTAIN, NORTH CAROLINA

STRUCTURAL DESIGN ENCLOSED BUILDING

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

25 June 2019 Revision 1 M&A Project No. 18315S/19179S

Prepared for:

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

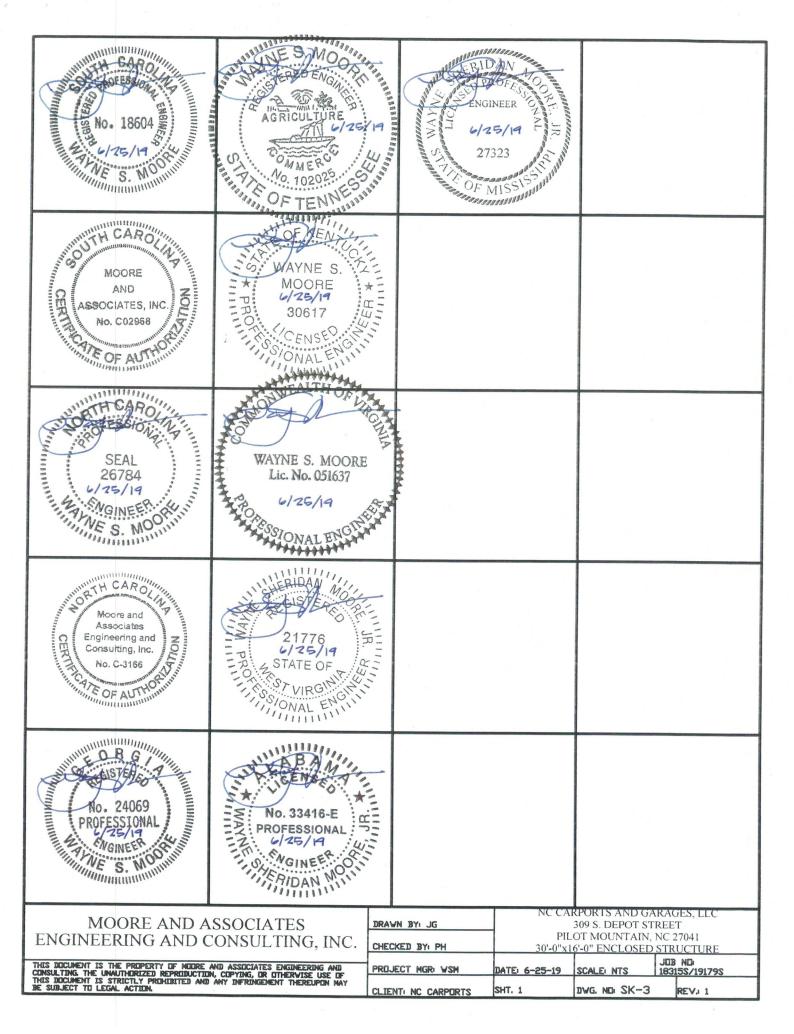
Prepared by:

Moore and Associates Engineering and Consulting, Inc.

1009 East Avenue North Augusta, SC 29841

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





DRAWING INDEX

- 1		
	SHEET 1	PE SEAL COVER SHEET
	SHEET 2	DRAWING INDEX
	SHEET 3A	INSTALLATION NOTES AND SPECIFICATIONS
	SHEET 3B	TYPICAL SIDE AND END ELEVATIONS
	SHEET 3C	TYPICAL SIDE AND END ELEVATIONS
	SHEET 4	TYPICAL RAFTER/COLUMN FRAME AND SIDE FRAMING SECTION (BOX EAVE STRUCTURE)
	SHEET 4A	TYPICAL RAFTER/COLUMN FRAME AND SIDE FRAMING SECTION (BOX EAVE STRUCTURE)
	SHEET 4B	TYPICAL RAFTER/COLUMN FRAME AND SIDE FRAMING SECTION (BOW EAVE STRUCTURE)
	SHEET 4C	TYPICAL RAFTER/COLUMN FRAME AND SIDE FRAMING SECTION (BOW EAVE STRUCTURE)
ALTERNATION OF THE PERSON	SHEET 5	COLUMN CONNECTION DETAILS (BOX EAVE STRUCTURE)
	SHEET 6	COLUMN CONNECTION DETAILS (BOW EAVE STRUCTURE)
20150000000	SHEET 7	BASE RAIL ANCHORAGE OPTIONS
100000000000000000000000000000000000000	SHEET 7A	BASE RAIL ANCHORAGE OPTIONS
TO STREET, ST.	SHEET 8	TYPICAL END WALL AND SIDE WALL FRAMING SECTIONS
DESCRIPTION OF THE PERSON OF T	SHEET 8A	TYPICAL END WALL AND SIDE WALL FRAMING SECTIONS
MATTER STATES	SHEET 9	CONNECTION DETAILS
Mary September	SHEET 10	CONNECTION DETAILS
B00100100100	SHEET 10A	CONNECTION DETAILS
MODEL SON	SHEET 11	LEAN-TO OPTIONS
STATE	SHEET 11A	LEAN-TO OPTIONS
CONTRACTOR OF THE PERSON	SHEET 12	VERTICAL ROOF/SIDING OPTION END AND SIDE ELEVATION AND SECTION
THE REAL PROPERTY.	SHEET 12A	VERTICAL ROOF/SIDING OPTION END AND SIDE ELEVATION AND SECTION
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DRAWN BY: JG		309 S. DEPOT ST OT MOUNTAIN.		
CHECKED BY: PH		6'-0" ENCLOSED		
PROJECT MGR: WSM	DATE: 6-25-19	SCALE: NTS	JOB NO: 18315S/19179S	
CLIENT: NC CAPPIDITS	SHT. 2	DWG. NO SK-3	REV. 1	

INSTALLATION NOTES AND SPECIFICATIONS

- 1. DESIGN IS FOR MAXIMUM 30'-0" WIDE \times 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 AND 2015 IBC.
- 3. DESIGN LOADS ARE AS FOLLOWS:

A) DEAD LOAD

= 1.5 PSF

B) LIVE LOAD

= 12 PSF

- = 35 PSF
- C) GROUND SNOW LOAD
 - = 30 PSF (W < 24'-0" WITH U-CHANNEL COLLAR TIE)
- 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. FASTENER'S 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.
- 13. STANDARD GROUND ANCHORS (SOIL 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

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

R = 3.25

 $I_E = 1.0$

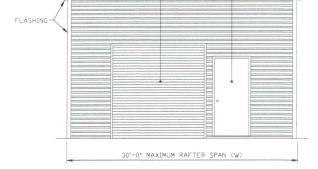
 $S_{DS} = 2.039$

V= CsW

S_{D1}= 1.258

CLIENT: NC CARPORTS	SHT. 3A	DWG. ND: SK-3		REV.i 1	
PROJECT MGR: WSM	DATE: 6-25-19	SCALE: NTS	JOB 1831	ND: 15S/19179S	
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DRAWN BY: JG		RPORTS AND GA 309 S. DEPOT ST	REE	Т	
	NCCAL	SPUBLE AND GA	RAC.	TEC III	

BOX EAVE FRAME RAFTER STRUCTURE WINDOW (AS APPLICABLE) --FLASHING LENGTH VARIES DEPENDING ON NUMBER AND SPACING OF RAFTERS



TYPICAL SIDE ELEVATION SCALE: NTS

TYPICAL END ELEVATION SCALE: NTS

PERSONNEL DOOR (AS APPLICABLE)

ROLL-UP DOOR --(AS APPLICABLE)

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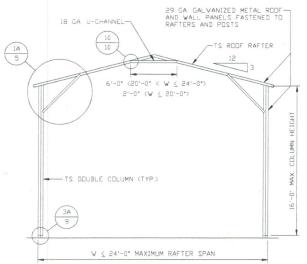
	B. Dates Committee	RPORTS AND GA		
DRAWN BY: JG		309 S. DEPOT ST	REE'	T
	PIL	OT MOUNTAIN,	NC 2	27041
CHECKED BY: PH	30'-0"x1	6'-0" ENCLOSED	STR	UCTURE
PROJECT MGR: WSM	DATE: 6-25-19	SCALE: NTS		ND: 15S/19179S
CLIENT: NC CARPORTS	SHT. 3B	DWG. NO SK-3		REV. 1

BOW EAVE FRAME RAFTER STRUCTURE WINDOW (AS APPLICABLE) -PERSONNEL DOOR (AS APPLICABLE) 6° (TYP.) FLASHING--FLASHING LENGTH VARIES DEPENDING ON NUMBER AND SPACING OF RAFTERS 30'-0' MAXIMUM RAFTER SPAN (W)

TYPICAL SIDE ELEVATION
SCALE: NTS

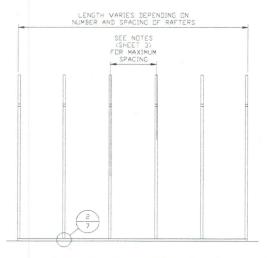
TYPICAL END ELEVATION SCALE: NTS

MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.	DRAWN BY: JG	PIL	RPORTS AND GA 309 S. DEPOT STI OT MOUNTAIN, I 6'-0" ENCLOSED	REET NC 27041
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TYPICAL RAFTER/COLUMN FRAME SECTION

SCALE: NTS



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

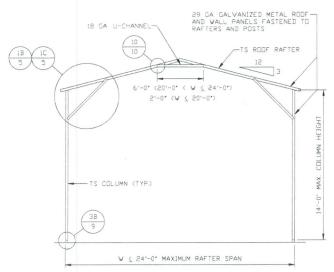
	29 GA. GALVANIZED METAL ROOF— AND WALL PANELS FASTENED TO RAFTERS AND POSTS
TS ROOF RAFTER 20'-0' (24'-0' < w \(\) TS COLLAR TIE	24'-0")
TS DOUBLE COLUMN (TYP.)	MÁX. CDLUMN HEIGHT
3A 9	16'-0' P
W ≤ 30'-0" MAXIMUM	RAFTER SPAN

TYPICAL RAFTER/COLUMN FRAME SECTION

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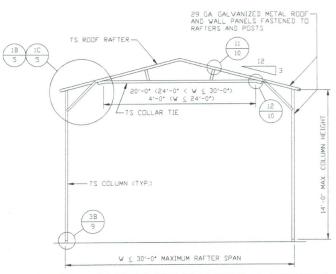
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	PIL	OT MOUNTAIN,	NC 27041			
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CLIENT: NC CARPORTS	SHT. 4	DWG. NO SK-3	REV. 1			



TYPICAL RAFTER/COLUMN FRAME SECTION

SCALE: NIS



TYPICAL RAFTER/COLUMN FRAME SECTION

LENGTH VARIES DEPENDING ON NUMBER AND SPACING OF RAFTERS

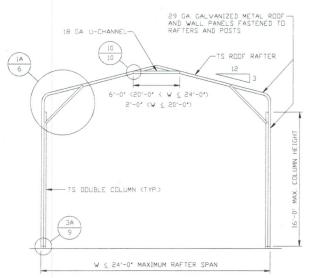
SEE NOTES
(SHEET 3)
FOR MAXIMUM
SPACING

TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

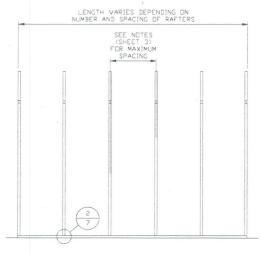
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	CLIENT: NC CARPORTS	SHT. 4A	DAC' NO 2K-3		REV.: 1		



TYPICAL RAFTER/COLUMN FRAME SECTION SCALE: NTS



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

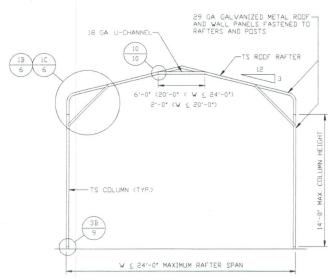
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	29 GA GALVANIZED METAL ROOF— AND WALL PANELS FASTENED TO RAFTERS AND POSTS
	10
TS DOUBLE COLUMN (TYP)	16'-0" MAX. COLUMN HETGHT
W ≤ 30'-0" MAXIN	MUM RAFTER SPAN

TYPICAL RAFTER/COLUMN FRAME SECTION



TYPICAL RAFTER/COLUMN FRAME SECTION

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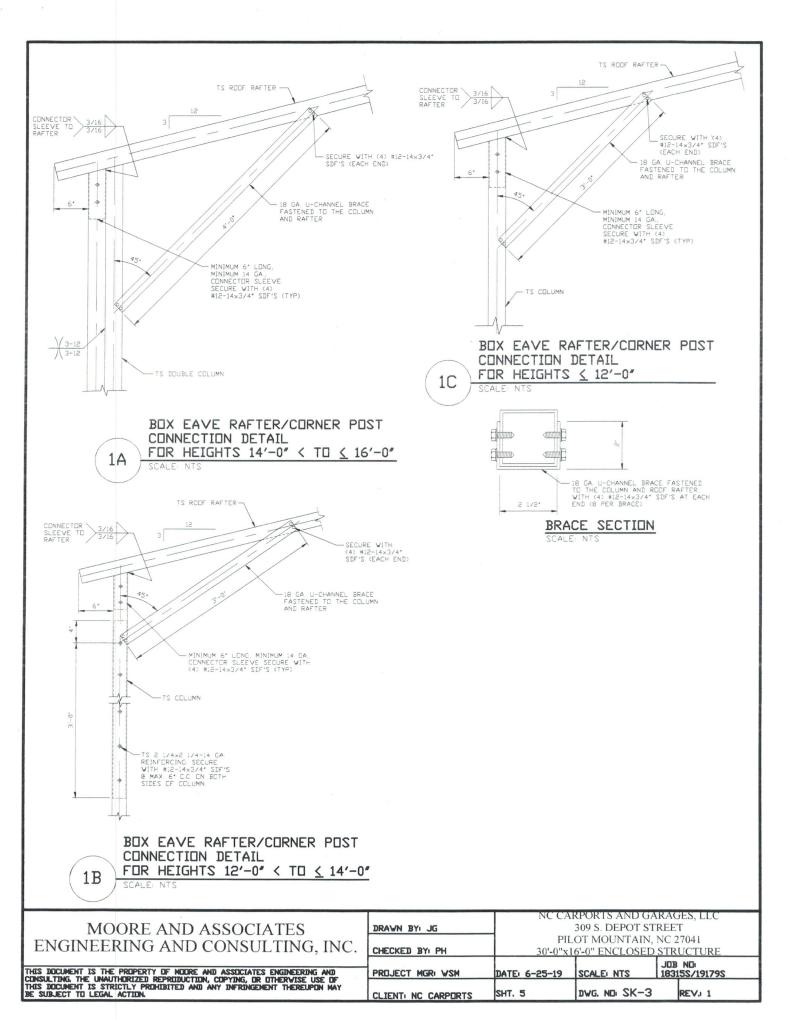
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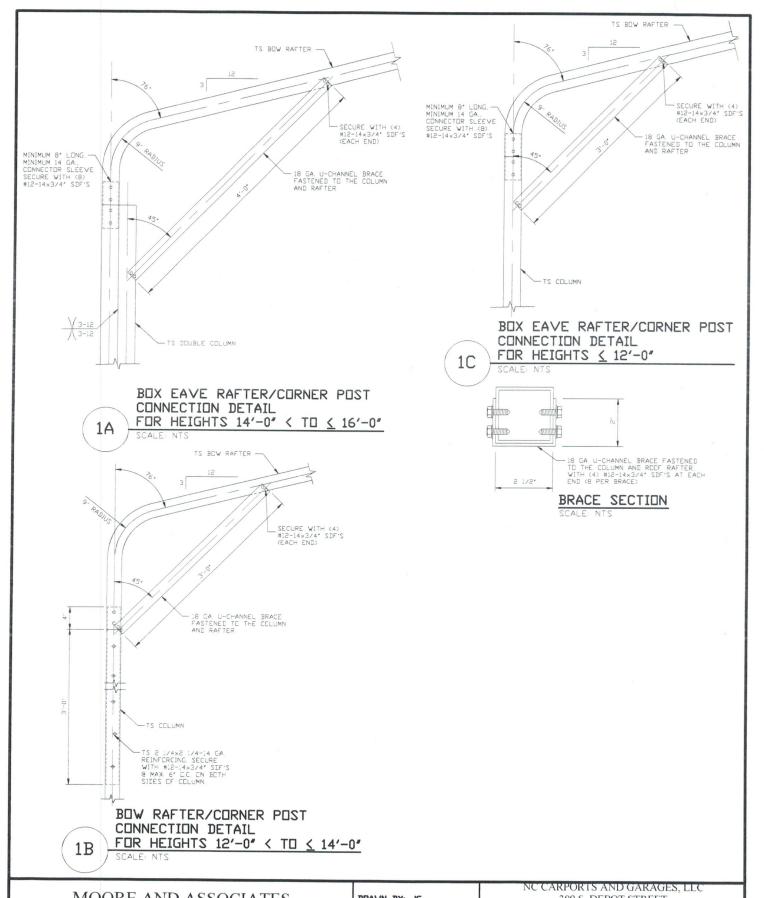
SEE NOTES (SHEET 3)
FOR MAXIMUM SPACING

TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION
SCALE NTS

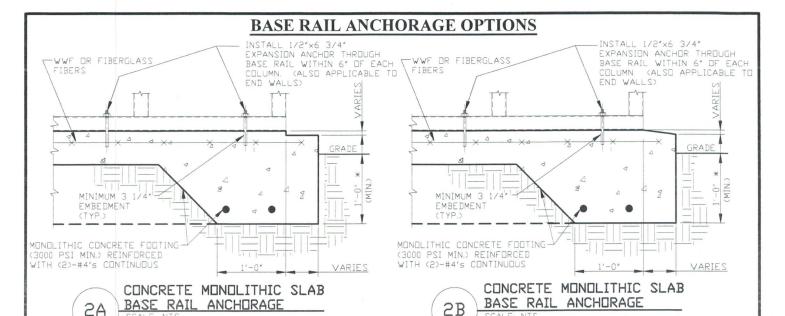
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GENERAL NOTES

NOTE: CONCRETE MONDLITHIC SLAB DESIGN BASED ON MINIMUM SOIL BEARING CAPACITY OF 1.500 PSF

MINIMUM ANCHOR EDGE DISTANCE IS 4".
* COORDINATE WITH LOCAL CODES/ORD.

CONCRETE

LL HAVE A MINIMUM SPECIFIED COMPRESSIVE 3,000 PSI AT 28 DAYS.

COVER OVER REINFORCING STEEL:

FOR FOUNDATIONS, MINIMUM CONCRETE COVER OVER REINFORCING BARS SHALL BE PER ACI-318:

3" IN FOUNDATIONS WHERE THE CONCRETE IS CAST AGAINST AND PERMANENTLY IN CONTACT WITH THE EARTH OR EXPOSED TO THE EARTH OR WEATHER, AND 1 1/2" ELSEWHERE.

REINFORCING STEEL:

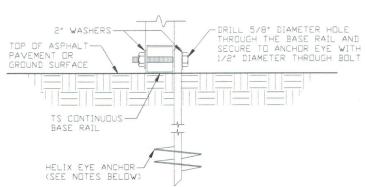
THE TURNDOWN REINFORCING STEEL SHALL BE ASTM A615 GRADE 60. THE SLAB REINFORCEMENT SHALL BE WELDED WIRE FABRIC MEETING ASTM A185 OR FIBERGLASS FIBER REINFORCEMENT.

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

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

HELIX ANCHOR NOTES:

- FOR VERY DENSE AND/OR CEMENTED SANDS, COARSE GRAVEL AND COBBLES, CALICHE, PRELOADED SILTS AND CLAYS, USE-MINIMUM (2) 4" HELICES WITH MINIMUM 30" EMBEDMENT OR SINGLE 6" HELIX WITH MINIMUM 50" EMBEDMENT
- USE MINIMUM (2) 4" HELICES WITH MINIMUM 30° EMBEDMENT OR SINGLE 6° HELIX WITH MINIMUM SC° 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" EMBELMENT
- 4 FOR LODSE TO MEDIUM DENSE SANDS, FIRM TO STIFF CLAYS AND SILTS ALLUVIAL FILL, USE MINIMUM (2) 6' HELICES WITH MINIMUM 50" EMBERMENT
- 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.



MINIMUM ANCHOR EDGE DISTANCE IS 4".

* COORDINATE WITH LOCAL CODES/ORD

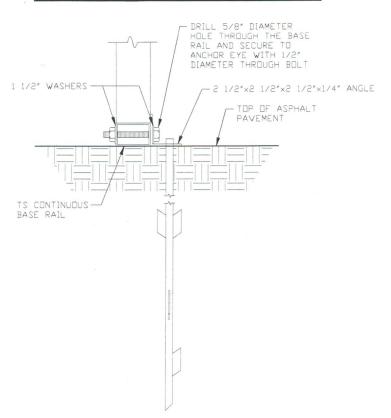
GROUND BASE HELIX ANCHORAGE (CAN BE USED FOR ASPHALT)

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BASE RAIL ANCHORAGE OPTIONS

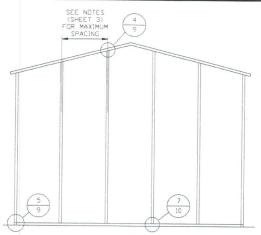


ASPHALT BASE ANCHORAGE

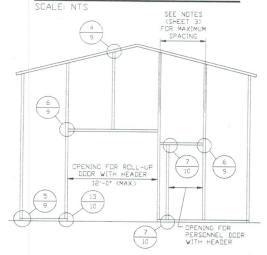
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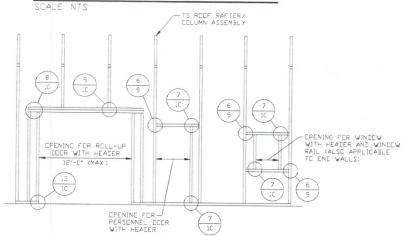
BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION



TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

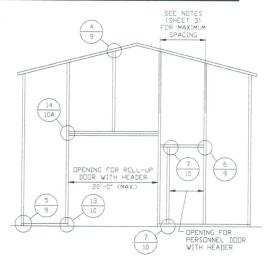


TYPICAL BOX EAVE RAFTER
SIDE WALL OPENINGS FRAMING SECTION

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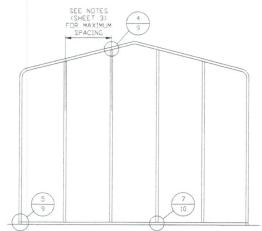
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309 S. DEPOT STREET PILOT MOUNTAIN, NC 27041								

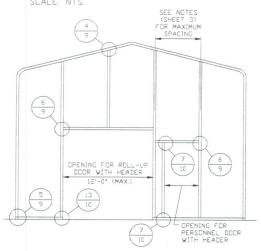


TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

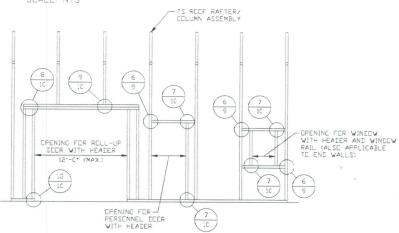
BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



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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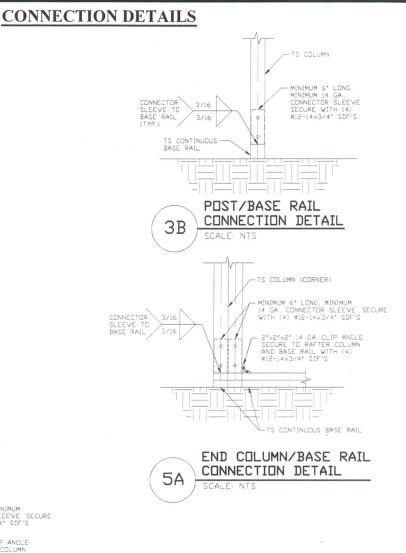
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CLIENT: NC CARPORTS	SHT. 8A	DWG. NO: SK-3		REV.i 1						

SEE NOTES (SHEET 3) FOR MAXIMUM SPACING OPENING FOR ROLL-UP DOOR WITH HEADER 20'-0' (MAX.) TO OPENING FOR PERSONNEL DOOR WITH HEADER OPENING FOR PERSONNEL DOOR WITH HEADER

TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

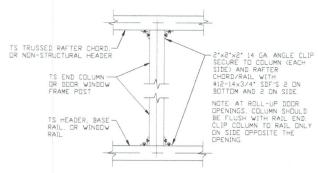
MINIMUM 6' LONG, MINIMUM 14 GA., CONNECTOR SLEEVE SECURE WITH (4) #12-14×3/4' SDF'S CONNECTOR SLEEVE TO BASE RAIL (TYP.) TS CONTINUOUS -POST/BASE RAIL CONNECTION DETAIL 3A SCALE: NTS TS ROOF RAFTER 2"x2"x2" 14 GA. ANGLE CLIP SECURE TO COLUMN AND RAFTER WITH #12-14x3/4" SDF'S 2 ON TOP AND 2 ON SIDE TS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



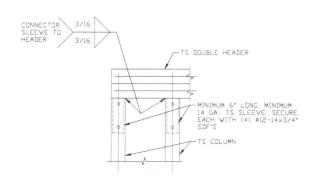


MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.	DRAWN BY: JG	PIL	NC CARPORTS AND GARAGES, LLC 309 S. DEPOT STREET PILOT MOUNTAIN, NC 27041 30'-0"x16'-0" ENCLOSED STRUCTURE			
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CONNECTION DETAILS

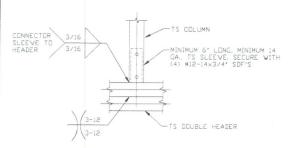


COLUMN TO HEADER, BASE RAIL, OR WINDOW RAIL CONNECTION DETAIL 7

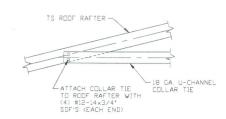


DOUBLE HEADER/COLUMN CONNECTION DETAIL 8

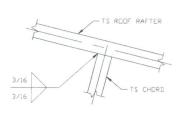
11



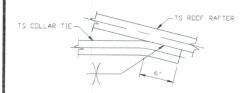
COLUMN/DOUBLE HEADER CONNECTION DETAIL 9



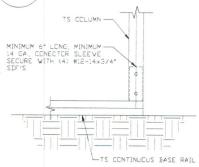
COLLAR TIE CONNECTION DETAIL 10



RAFTER TO CHORD CONNECTION DETAIL



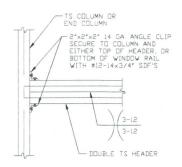
COLLAR TIE CONNECTION DETAIL 12



MINIMUM 6' LENG, MINIMUM 4 6A, CENCETER SLEEVE SECURE WITH (4) #12-14x3/4"
TS CENTINUEUS EASE RAIL
COLUMN/BASE RAIL CONNECTION DETAIL SCALE: NTS

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CONNECTION DETAILS



DOUBLE HEADER TO COLUMN CONNECTION DETAIL

SCALE: NTS

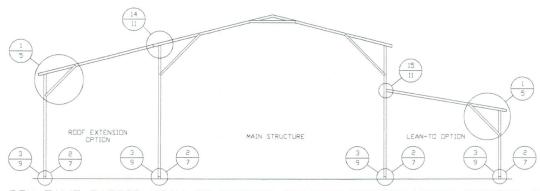
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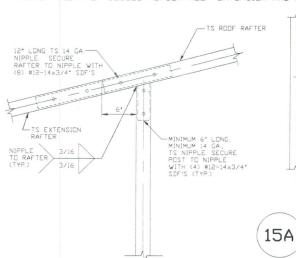
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CHECKED BY: PH	30'-0"x1	6'-0" ENCLOSED	STR	UCTURE					
PREJECT MGR: WSM	DATE: 6-25-19	SCALE: NTS		ND: 15S/19179S					
CLIENTI NC CARPORTS	SHT. 10A	DWG. ND: SK-3		REV. 1					





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

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'



NIPPLE TO MINIMUM 6" LONG, MINIMUM 14 GA., TS NIPPLE. SECURE RAFTER TO NIPPLE WITH (4) #12-14x3/4" SDF'S -TS COLUMN

RAFTER POST

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

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

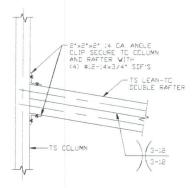
LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL FOR WIDTHS < 12'-0"

15B

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

14

15C



VINIMUM 6" LENG, MINIMUM 14 GA. TS NIPPLE, SECURE RAFTER TO NIPPLE WITH (4) #12-14×3/4" SDF'S -TS CELUMN

LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL FOR WIDTHS ≤ 16'-0" SCALE: NTS

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

SCALE: NTS

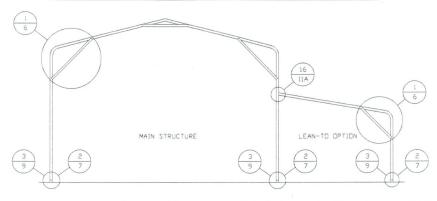
15D

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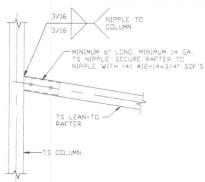
NC CARPORTS AND GARAGES, LLC 309 S. DEPOT STREET DRAWN BY: JG PILOT MOUNTAIN, NC 27041 CHECKED BY PH 30'-0"x16'-0" ENCLOSED STRUCTURE JOB NO: PROJECT MGR: WSM 18315\$/19179\$ DATE: 6-25-19 SCALE: NTS **SHT. 11** DWG. NO SK-3 REV. 1 CLIENT: NC CARPORTS

BOW EAVE RAFTER LEAN-TO OPTIONS



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"



LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL FOR WIDTHS & 12'-0" 2'x2'x2' 14 GA. ANGLE
CLIP SECURE TO COLUMN
AND RAFTER WITH
(4) #12-14x3/4' SDF'S

TS LEAN-TO
RAFTER

TS CCLUMN

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

16A)-

3/16

NIPPLE TO
CCLUMN

3/16

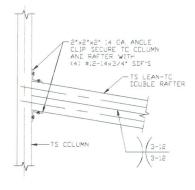
MINIMUM 6' LENG, MINIMUM 14 CA.
TS NIPPLE SECURE RAFTER TO
NIPPLE VITH (4) 4:2-14×3/4" SIF'S

TS LEAN-TO
DEUBLE RAFTER

3-12
3-12
3-12

LEAN-TO RAFTER TO RAFTER POST CONNECTION DETAIL

16C FOR WIDTHS & 16'-0"



LEAN-TO RAFTER
TO RAFTER POST
CONNECTION DETAIL
FOR WIDTHS < 16'-0"
SCALE: NTS

CLIENT: NC CARPERTS

16D

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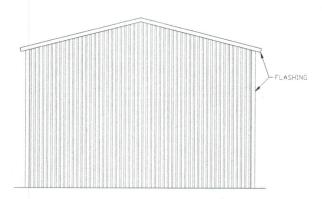
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REV. 1

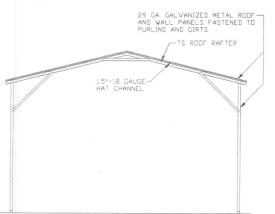
SHT. 11A

BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



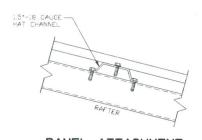
TYPICAL END ELEVATION VERTICAL ROOF/SIDING

SCALE: NTS



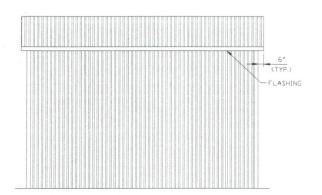
TYPICAL SECTION VERTICAL ROOF/SIDING OPTION

SCALE: NTS



PANEL ATTACHMENT

(ALTERNATE FOR VERTICAL ROOF PANELS)
SCALE: NTS



TYPICAL SIDE ELEVATION VERTICAL ROOF/SIDING

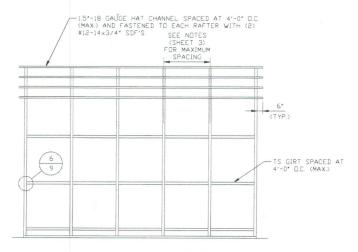
SCALE: NTS

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CLIENT: NC CARPORTS	SHT. 12	DWG. NO SK-3	REV. 1			

BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION



TYPICAL FRAMING SECTION VERTICAL ROOF/SIDING OPTION WITH TS GIRTS

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