



## **STRUCTURAL DESIGN**

## **ENCLOSED BUILDING**

**MAXIMUM 24'- 0" WIDE X 17'- 0" EAVE HEIGHT-  
BOX EAVE FRAME AND BOW FRAME**

**9 August 2019  
Revision 0  
M&A Project No. 19105S**

**Prepared for:**

**Carport Central, Inc.  
737 South Main Street  
Mount Airy, NC 27030**

**Prepared by:**

**Moore and Associates Engineering and Consulting, Inc.**

**1009 East Avenue  
North Augusta, SC 29841**

**401 S. Main Street, Suite 200  
Mount Airy, NC 27030**



**MOORE AND ASSOCIATES  
ENGINEERING AND CONSULTING**

		<p>I HAVE RESEARCHED THIS CHAPTER AND THE LOUISIANA STATE UNIFORM CONSTRUCTION CODE AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, THESE DRAWINGS ARE IN COMPLIANCE THEREWITH. I TAKE FULL RESPONSIBILITY FOR THE CONTENTS OF THESE PLANS.</p>	

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ENGINEERING AND CONSULTING, INC.

DRAWN BY: LT  
CHECKED BY: PDH  
PROJECT MGR: WSM  
DATE: 8-9-19  
SCALE: NTS  
JOB NO: 1910SS

CARPOT CENTRAL, INC.  
737 SOUTH MAIN STREET  
MOUNT AIRY, NC 27030  
24'-0" x 17'-0" ENCLOSED STRUCTURE

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CLIENT: CC  
SHT. 1  
DWG. NO: SK-3  
REV: 0



	<p><b>Professional Certification.</b> I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 49744, Expiration Date <u>6/6/20</u></p>		

<p><b>MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.</b></p>	<p><b>DRAWN BY:</b> LT <b>CHECKED BY:</b> PDH</p>	<p>CARPORT CENTRAL, INC. 737 SOUTH MAIN STREET MOUNT AIRY, NC 27030 24'-0" x 17'-0" ENCLOSED STRUCTURE</p>
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		<p><b>SCALE:</b> NTS <b>DWG. NO.:</b> SK-3 <b>JOB NO.:</b> 191055 <b>REV.:</b> 0</p>

**INSTALLATION NOTES AND SPECIFICATIONS**

- 1 DESIGN IS FOR MAXIMUM 24'-0" WIDE x 17'-0" EAVE HEIGHT ENCLOSED STRUCTURES
- 2 DESIGN WAS DONE IN ACCORDANCE WITH THE 2018 NORTH CAROLINA BUILDING CODE, 2017 FLORIDA BUILDING CODE (FBC) 6TH EDITION, 2006 INTERNATIONAL BUILDING CODE (IBC), 2009 IBC, 2012 IBC, 2015 IBC, AND 2018 IBC
- 3 DESIGN LOADS ARE AS FOLLOWS:
  - A) DEAD LOAD = 15 PSF
  - B) LIVE LOAD = 12 PSF
  - C) GROUND SNOW LOAD = 37 PSF AT 5'-0" O.C. SPACING  
= 41 PSF AT 4'-0" O.C. SPACING

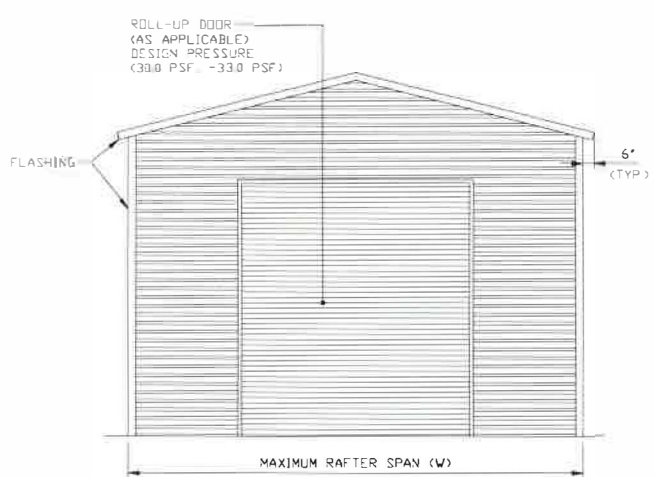
NOTE: UNBALANCED SNOW LOADS DUE TO DRIFTING HAVE NOT BEEN EVALUATED
- 4 ULTIMATE WIND SPEED 105 TO 127 MPH (NOMINAL WIND SPEED 82 TO 99 MPH)  
MAXIMUM RAFTER/COLUMN AND END COLUMN SPACING = 50 FEET
- 5 ULTIMATE WIND SPEED 105 TO 140 MPH (NOMINAL WIND SPEED 82 TO 108 MPH)  
MAXIMUM RAFTER/COLUMN AND END COLUMN SPACING = 40 FEET
- 6 END WALL COLUMNS (POSTS) ARE SIMILAR TO SIDE WALL POSTS IN SIZE AND SPACING UNLESS NOTED OTHERWISE
- 7 RISK CATEGORY I
- 8 WIND EXPOSURE CATEGORY B
- 9 SPECIFICATIONS APPLICABLE TO 29 GAUGE METAL PANELS FASTENED DIRECTLY TO 2 1/4" x 2 1/4" - 14 GAUGE TUBE STEEL (TS) FRAMING MEMBERS (UNLESS NOTED OTHERWISE)
- 10 AVERAGE FASTENER SPACING ON-CENTERS ALONG RAFTERS OR HAT CHANNELS, AND COLUMNS (INTERIOR OR END) = 8 INCHES
- 11 FASTENERS CONSIST OF #12-14x3/4" (UNLESS OTHERWISE NOTED) SELF-DRILLING FASTENER (SDF), USE CONTRA SEAL WASHER WITH EXTERIOR FASTENERS. SPECIFICATIONS APPLICABLE ONLY FOR MEAN ROOF HEIGHT OF 20 FEET OR LESS, AND ROOF SLOPES OF 14" (3:12) PITCH OR LESS. SPACING REQUIREMENTS FOR OTHER ROOF HEIGHTS AND/OR SLOPES MAY VARY.
- 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 x 36" LONG. SOIL NAILS MAY BE USED FOR MAXIMUM WIND V = 145 MPH AND IN SUITABLE SOIL CONDITIONS. OPTIONAL ANCHORAGE MAY BE USED IN UNSUITABLE SOILS AND MUST BE USED FOR WIND V > 145 MPH AND/OR IN UNSUITABLE SOILS AS NOTED
- 14 WIND FORCES GOVERN OVER SEISMIC FORCES. SEISMIC PARAMETERS ANALYZED ARE:  
SOIL SITE CLASS = D  
RISK CATEGORY I/II/III  
R = 3.25      I<sub>E</sub> = 1.0  
S<sub>DS</sub> = 2.039 g      V = C<sub>s</sub>W  
S<sub>D1</sub> = 1.258 g
- 14 DOOR AND WINDOW PRESSURES APPLICABLE TO THE STATE OF FLORIDA

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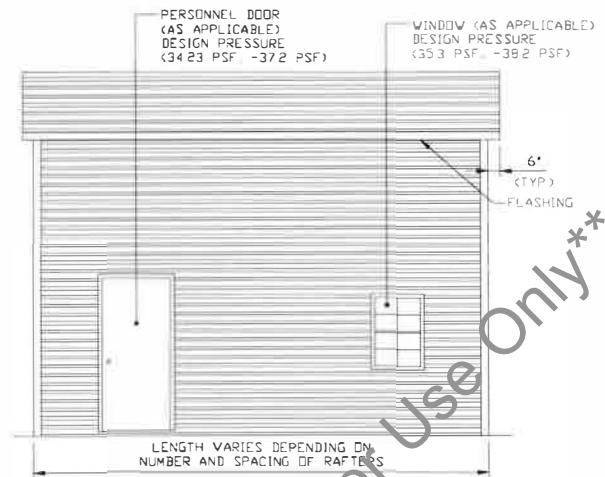
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	CLIENT: CC	SHT. 3	DWG. NO: SK-3	REV: 0



**BOX EAVE FRAME RAFTER STRUCTURE**

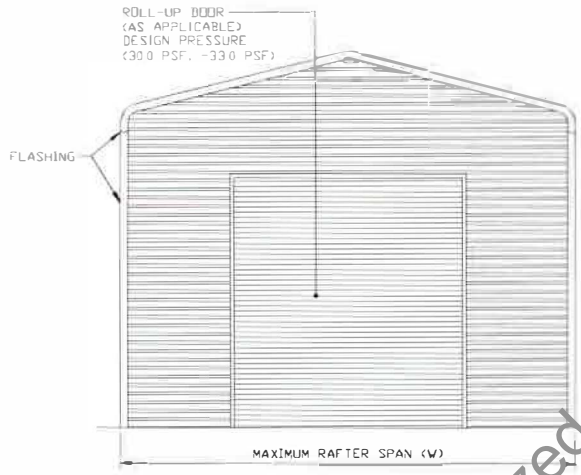


**TYPICAL END ELEVATION-HORIZONTAL ROOF**  
SCALE: NTS

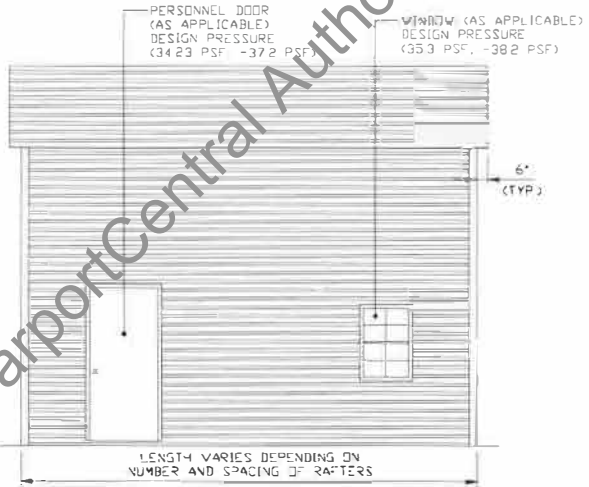


**TYPICAL SIDE ELEVATION-HORIZONTAL ROOF**  
SCALE: NTS

**BOW FRAME RAFTER STRUCTURE**



**TYPICAL END ELEVATION**  
SCALE: NTS



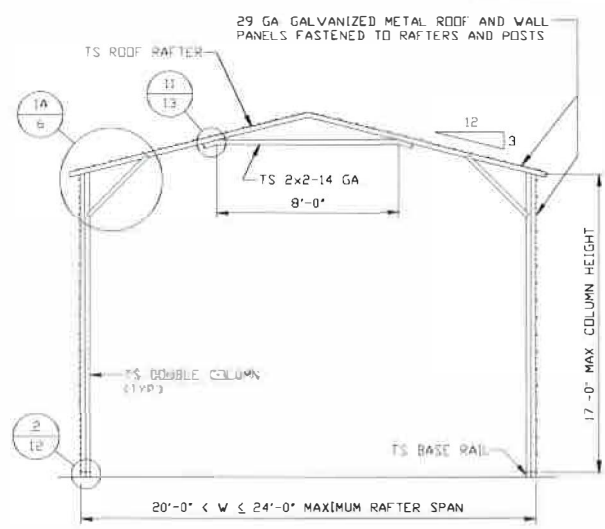
**TYPICAL SIDE ELEVATION**  
SCALE: NTS

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<b>CLIENT:</b> CC	<b>SHT.</b> 4	<b>DWG. NO:</b> SK-3	<b>REV:</b> 0

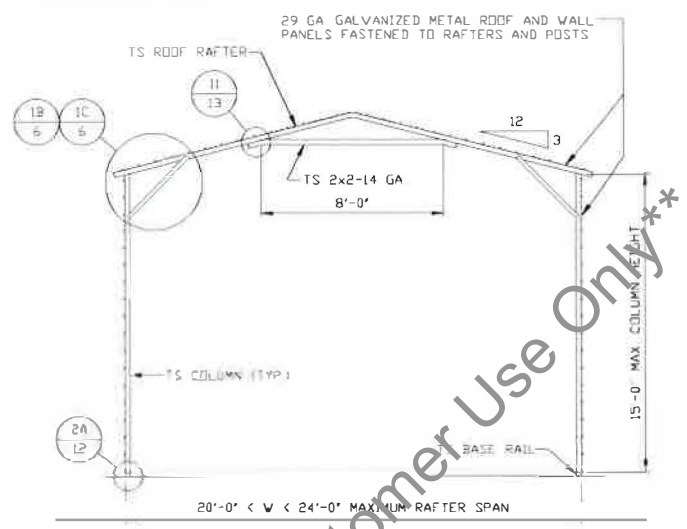
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**20'-0" < W ≤ 24'-0" SPAN**



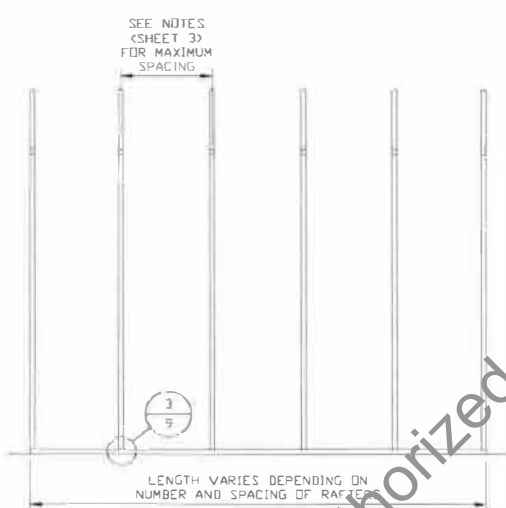
**TYPICAL RAFTER/COLUMN END FRAME SECTION**

SCALE: NTS



**TYPICAL RAFTER/COLUMN END FRAME SECTION**

SCALE: NTS

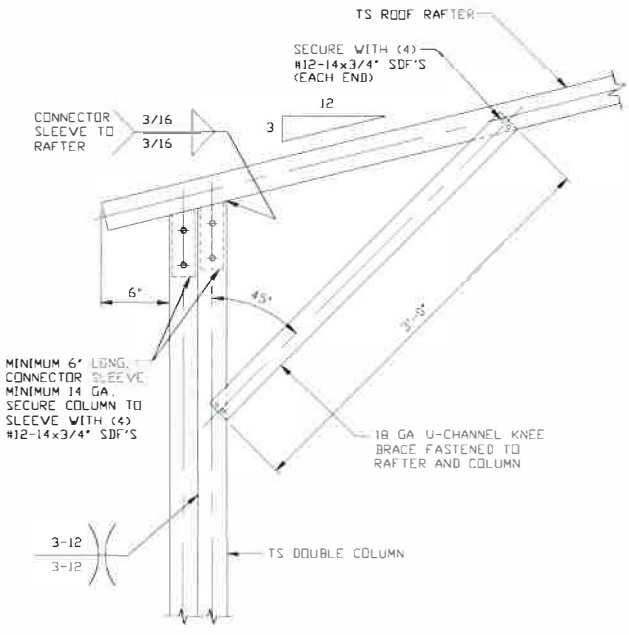


**TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION**

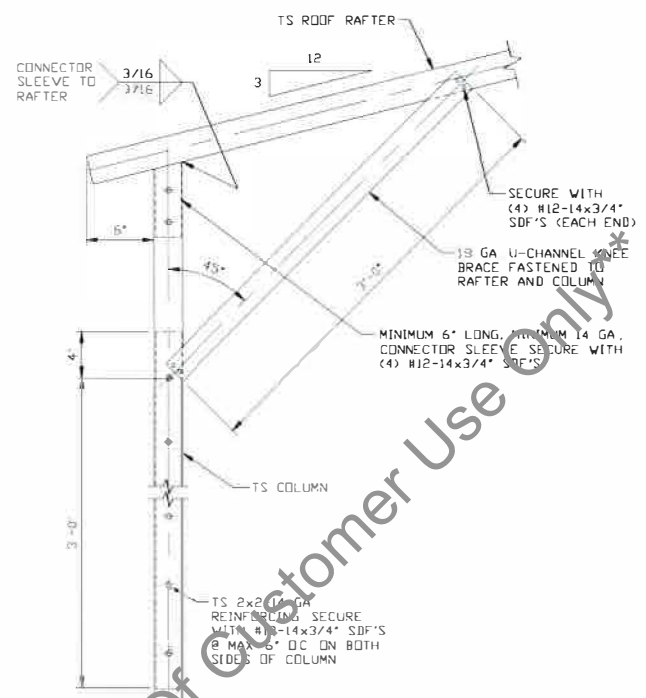
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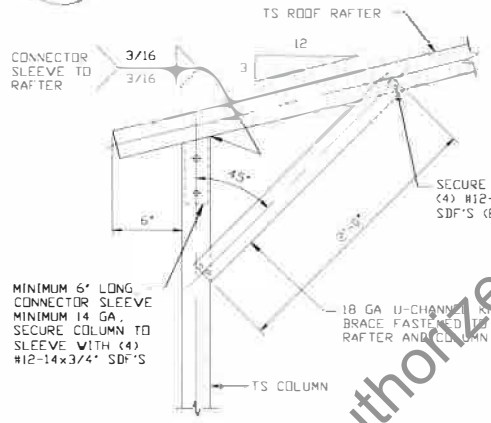
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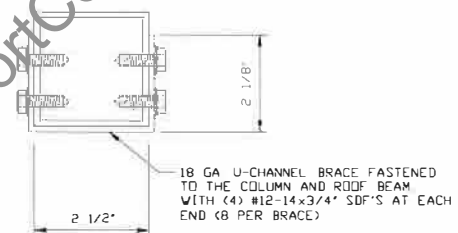
**1A**  
BOX EAVE RAFTER COLUMN  
CONNECTION DETAIL FOR  
HEIGHTS 15'-0" < TO <= 17'-0"  
SCALE: NTS



**1B**  
BOX EAVE RAFTER COLUMN  
CONNECTION DETAIL FOR  
HEIGHTS 12'-0" < TO <= 15'-0"  
SCALE: NTS



**1C**  
BOX EAVE RAFTER COLUMN  
CONNECTION DETAIL FOR  
HEIGHTS < 12'-0"  
SCALE: NTS



**BRACE SECTION**  
SCALE: NTS

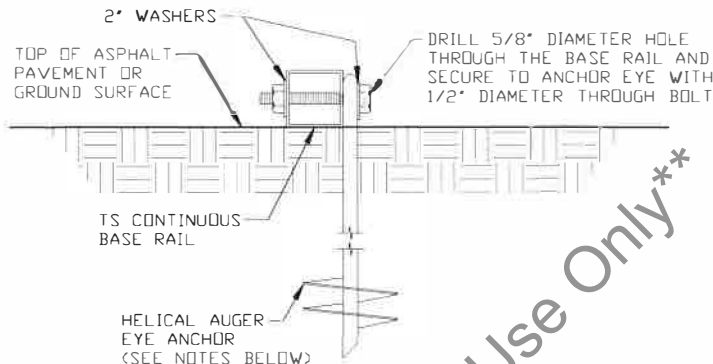
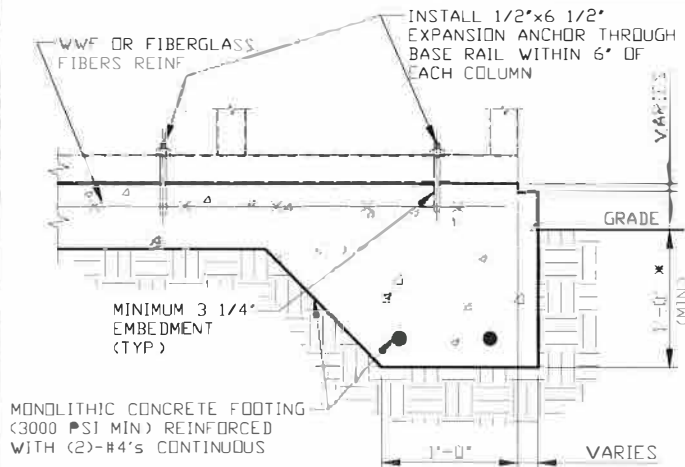
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737 SOUTH MAIN STREET  
MOUNT AIRY, NC 27030  
24'-0" x 17'-0" ENCLOSED STRUCTURE  
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JOB NO: 191055  
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DWG. NO: SK-3  
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**BASE RAIL ANCHORAGE OPTIONS**



**3A CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE**  
SCALE: NTS  
MINIMUM ANCHOR EDGE DISTANCE IS 4"  
\* COORDINATE WITH LOCAL CODES/ORD

**3B HELICAL AUGER ANCHORAGE**  
SCALE: NTS (CAN BE USED FOR ASPHALT)

**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 DIAMETER.
- 3 REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE FIELD BENT.

**HELICAL AUGER 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 LOOSE 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 50" EMBEDMENT

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CLIENT: CC

CARPOT CENTRAL, INC.  
737 SOUTH MAIN STREET  
MOUNT AIRY, NC 27030  
24'-0" x 17'-0" ENCLOSED STRUCTURE

DATE: 8-9-19

SHT. 9

SCALE: NTS

DWG. NO: SK-3

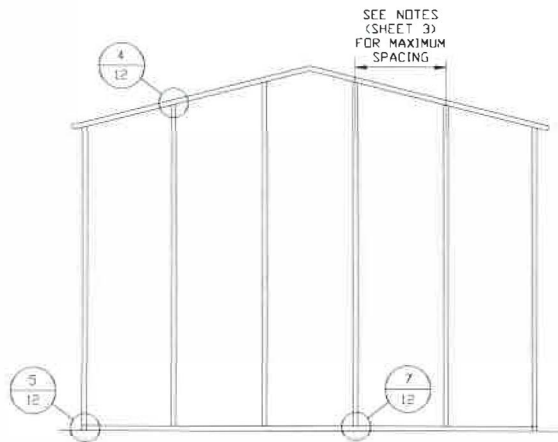
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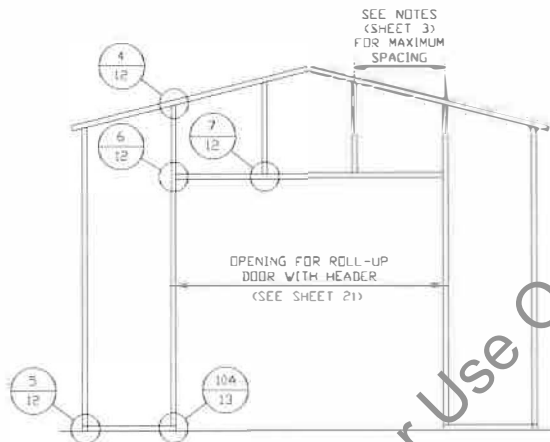


**BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS**



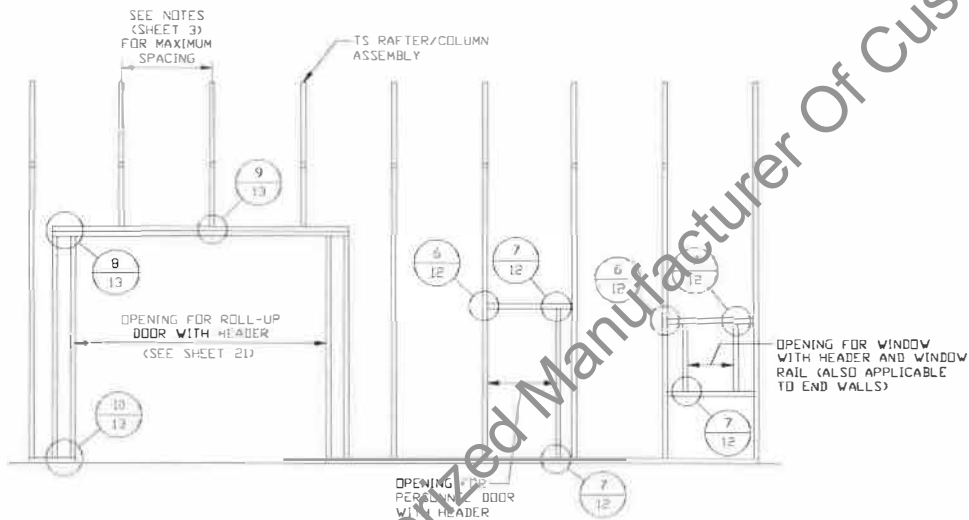
**TYPICAL BOX EAVE RAFTER  
END WALL FRAMING SECTION**

SCALE: NTS



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

SCALE: NTS



**TYPICAL BOX EAVE RAFTER  
SIDE WALL OPENINGS FRAMING SECTION**

SCALE: NTS

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24'-0" x 17'-0" ENCLOSED STRUCTURE

**DATE: 8-9-19**

**SHT. 10**

**SCALE: NTS**

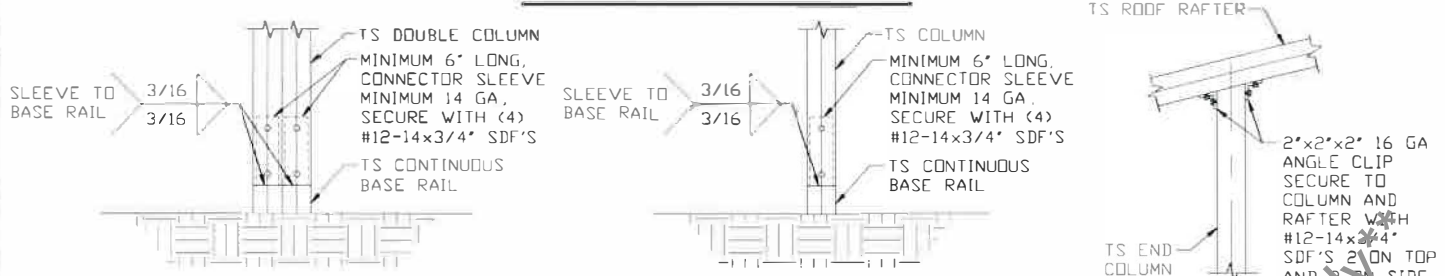
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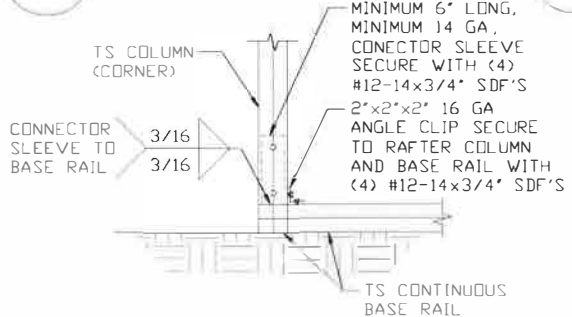
**CONNECTION DETAILS**



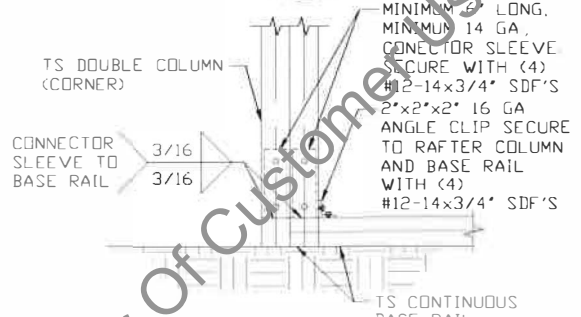
**2**  
**RAFTER COLUMN/  
BASE RAIL  
CONNECTION DETAIL**  
SCALE: NTS

**2A**  
**RAFTER COLUMN/  
BASE RAIL  
CONNECTION DETAIL**  
SCALE: NTS

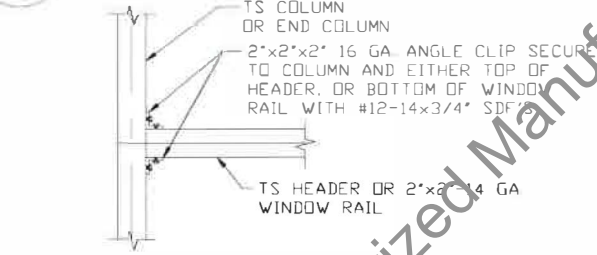
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**END COLUMN/RAFTER  
CONNECTION DETAIL**  
SCALE: NTS



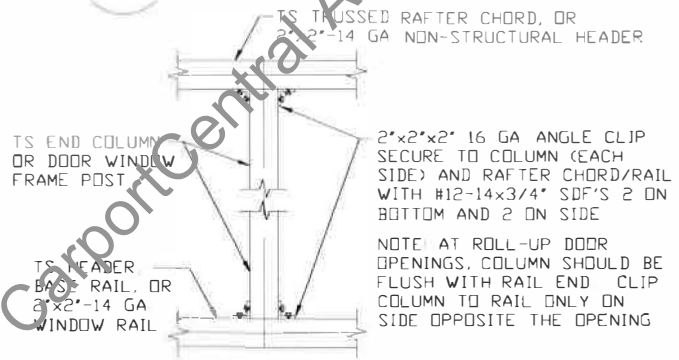
**5**  
**END COLUMN/BASE RAIL  
CONNECTION DETAIL**  
SCALE: NTS



**5A**  
**END COLUMN/BASE RAIL  
CONNECTION DETAIL**  
SCALE: NTS



**6**  
**COLUMN OR WINDOW  
RAIL TO POST  
CONNECTION DETAIL**  
SCALE: NTS



**7**  
**COLUMN TO HEADER, BASE RAIL, OR  
WINDOW RAIL CONNECTION DETAIL**  
SCALE: NTS

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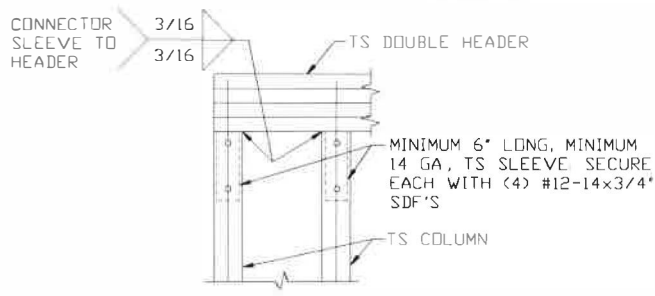
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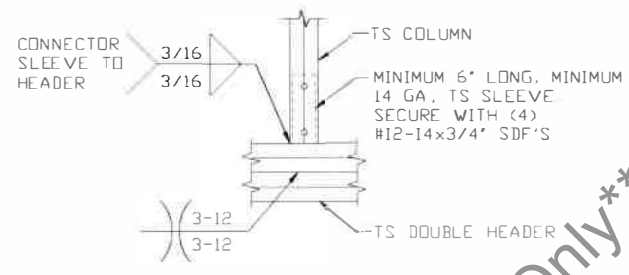
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**CLIENT: CC**      **SHT. 12**      **DWG. NO: SK-3**      **REV: 0**

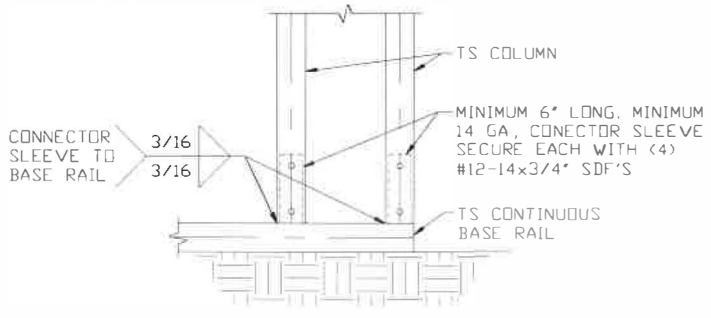
**CONNECTION DETAILS**



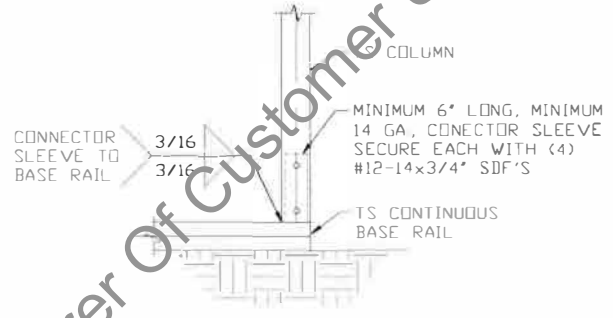
**8**  
**DOUBLE HEADER/COLUMN CONNECTION DETAIL**  
SCALE: NTS



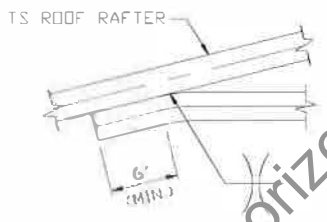
**9**  
**COLUMN/DOUBLE HEADER CONNECTION DETAIL**  
SCALE: NTS



**10**  
**COLUMN/BASE RAIL CONNECTION DETAIL**  
SCALE: NTS



**10A**  
**COLUMN/BASE RAIL CONNECTION DETAIL**  
SCALE: NTS



**11**  
**COLLAR TIE CONNECTION DETAIL**  
SCALE: NTS

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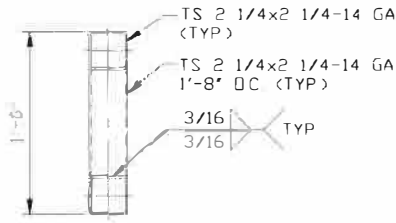
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<b>DATE: 8-9-19</b>	<b>SCALE: NTS</b>	<b>JOB NO: 191055</b>
<b>SHT. 13</b>	<b>DWG. NO: SK-3</b>	<b>REV: 0</b>

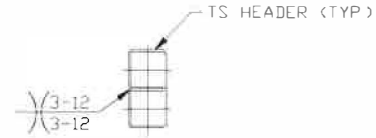


**OPTIONAL HEADER**



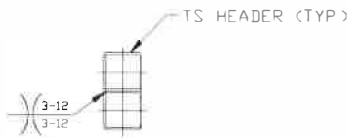
**HEADER DETAIL FOR SIDE WALL DOOR OPENINGS 11'-0" < LENGTH ≤ 20'-0"**

SCALE: NTS



**HEADER DETAIL FOR END WALL DOOR OPENINGS 12'-0" < LENGTH ≤ 20'-0"**

SCALE: NTS



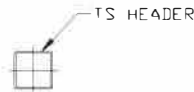
**HEADER DETAIL FOR SIDE WALL DOOR OPENINGS 6'-0" < LENGTH ≤ 11'-0"**

SCALE: NTS



**HEADER DETAIL FOR END WALL DOOR OPENINGS ≤ 12'-0"**

SCALE: NTS



**HEADER DETAIL FOR SIDE WALL DOOR OPENINGS ≤ 6'-0"**

SCALE: NTS

**\*\* Carport Central Authorized Manufacturer of Customer Use Only \*\***

**MOORE AND ASSOCIATES  
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**DRAWN BY: LT**  
**CHECKED BY: PDH**

CARPOT CENTRAL, INC.  
737 SOUTH MAIN STREET  
MOUNT AIRY, NC 27030  
24'-0" x 17'-0" ENCLOSED STRUCTURE

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**PROJECT MGR: WSH**  
**CLIENT: CC**

**DATE: 8-9-19**  
**SHT. 21**

**SCALE: NTS**  
**DWG. NO: SK-3**

**JOB NO: 1910SS**  
**REV: 0**