



## STRUCTURAL DESIGN

## ENCLOSED BUILDING

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

19 May 2022

Revision 1

M&A Project No. 19105S/21401S

Prepared for:

**Carport Central, Inc.  
1018 Rockford 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**



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		<p><b>CLIENT:</b> CC</p>	<p><b>SHT.</b> 1A</p>	<p><b>DWG. NO:</b> SK-3</p>	<p><b>REV.:</b> 1</p>	

# DRAWING INDEX

SHEET 1	PE SEAL COVER SHEET (1 OF 3)
SHEET 1A	PE SEAL COVER SHEET (2 OF 3)
SHEET 1B	PE SEAL COVER SHEET (3 OF 3)
SHEET 2	DRAWING INDEX
SHEET 3	INSTALLATION NOTES AND SPECIFICATIONS
SHEET 3A	LIST OF APPLICABLE BUILDING CODES
SHEET 4	TYPICAL END AND SIDE ELEVATIONS
SHEET 5	TYPICAL RAFTER/COLUMN AND SIDE FRAMING SECTION (BOX EAVE RAFTER)
SHEET 5A	TYPICAL RAFTER/COLUMN AND SIDE FRAMING SECTION (BOX EAVE RAFTER)
SHEET 6	COLUMN CONNECTION DETAILS (BOX EAVE RAFTER)
SHEET 7	TYPICAL RAFTER/COLUMN AND SIDE FRAMING SECTION (BOW RAFTER)
SHEET 7A	TYPICAL RAFTER/COLUMN AND SIDE FRAMING SECTION (BOW RAFTER)
SHEET 8	COLUMN CONNECTION DETAILS (BOW RAFTER)
SHEET 9	BASE RAIL ANCHORAGE OPTIONS
SHEET 9A	BASE RAIL ANCHORAGE OPTIONS
SHEET 10	TYPICAL END WALL AND SIDE WALL FRAMING SECTIONS (BOX EAVE RAFTER)
SHEET 11	TYPICAL END WALL AND SIDE WALL FRAMING SECTIONS (BOW RAFTER)
SHEET 12	CONNECTION DETAILS
SHEET 13	CONNECTION DETAILS
SHEET 14	LEAN-TO OPTIONS (BOX EAVE RAFTER)
SHEET 14A	LEAN-TO OPTIONS (BOX EAVE RAFTER)
SHEET 15	LEAN-TO OPTIONS (BOW RAFTER)
SHEET 16	BOX EAVE RAFTER VERTICAL PANEL OPTION
SHEET 17	OPTIONAL BASE RAIL ON GRADE
SHEET 18	OPTIONAL BASE RAIL ON TIMBER BEAM
SHEET 19	OPTIONAL BASE RAIL ON TIMBER BEAM WITH SOIL NAIL
SHEET 20	OPTIONAL CONCRETE STRIP FOOTING
SHEET 21	SIDE WALL AND END WALL HEADER OPTIONS

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	CLIENT: CC	SHT. 2	DWG. NO: SK-3	REV: 1

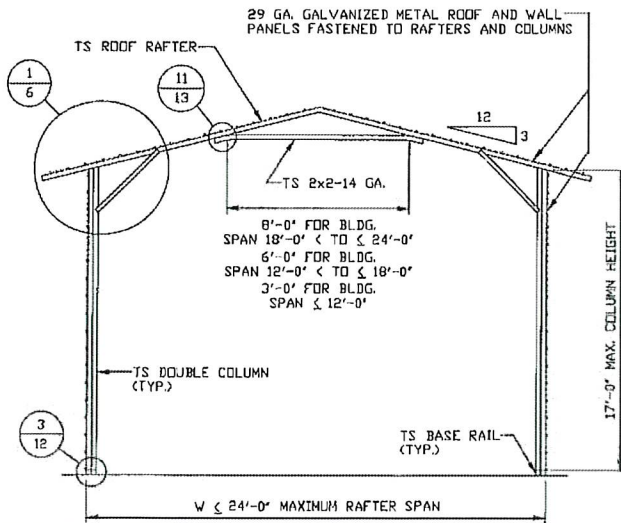
**LIST OF APPLICABLE BUILDING CODES**

- 2021 INTERNATIONAL BUILDING CODE (IBC 2021)
- 2018 INTERNATIONAL BUILDING CODE (IBC 2018)
- 2015 INTERNATIONAL BUILDING CODE (IBC 2015)
- 2012 INTERNATIONAL BUILDING CODE (IBC 2012)
- 2009 INTERNATIONAL BUILDING CODE (IBC 2009)
- 2006 INTERNATIONAL BUILDING CODE (IBC 2006)
- BUILDING CODE 2021 OF ALABAMA  
(ADOPTS THE IBC 2021 WITHOUT AMENDMENTS)  
(IBC 2015, IBC 2018, IBC 2021 (DEPENDENT UPON LOCAL JURISDICTION))
- ARKANSAS FIRE PREVENTION CODE, VOL. II BUILDING  
(ADOPTS THE IBC 2012 WITH AMENDMENTS)
- BUILDING CODE 2021 OF COLORADO  
(ADOPTS THE IBC 2021 WITH AMENDMENTS)  
(IBC 2012, IBC 2015, IBC 2018, IBC 2021  
(DEPENDENT UPON LOCAL JURISDICTION))
- 2015 IBC PORTION OF THE 2018 CT STATE BUILDING CODE  
(ADOPTS THE IBC 2015 WITH AMENDMENTS)
- DELAWARE BUILDING CODE  
(IBC 2012, IBC 2015, IBC 2018 (DEPENDENT  
UPON LOCAL JURISDICTION))
- 2020 FLORIDA BUILDING CODE, 7TH EDITION  
(ADOPTS THE IBC 2018 WITH AMENDMENTS)
- GEORGIA STATE MINIMUM STANDARD BUILDING CODE  
(ADOPTS THE IBC 2018 WITH AMENDMENTS)
- BUILDING CODE 2018 OF IDAHO  
(ADOPTS THE IBC 2018 WITH AMENDMENTS)
- INDIANA BUILDING CODE, 2014 EDITION  
(ADOPTS THE IBC 2012 WITH AMENDMENTS)
- BUILDING CODE 2015 OF IOWA  
(ADOPTS THE IBC 2015 WITH AMENDMENTS)
- BUILDING CODE 2018 OF KANSAS  
(ADOPTS THE IBC 2018 WITH AMENDMENTS)
- 2018 KENTUCKY BUILDING CODE  
(ADOPTS THE IBC 2015 WITH AMENDMENTS)
- BUILDING CODE 2015 OF LOUISIANA  
(ADOPTS THE IBC 2015 WITH AMENDMENTS)
- BUILDING CODE 2018 OF MARYLAND  
(ADOPTS THE IBC 2018 WITH AMENDMENTS)
- MA STATE BUILDING CODE, 9TH E.D., BASE VOLUME  
(ADOPTS THE IBC 2015 WITH AMENDMENTS)
- 2015 MICHIGAN BUILDING CODE  
(ADOPTS THE IBC 2015 WITH AMENDMENTS)
- BUILDING CODE 2018 OF MISSISSIPPI  
(ADOPTS THE IBC 2018 WITHOUT AMENDMENTS)  
(IBC 2012, IBC 2015 AND IBC 2018  
(DEPENDENT UPON LOCAL JURISDICTION))
- BUILDING CODE 2018 OF MISSOURI  
(ADOPTS THE IBC 2018 WITHOUT AMENDMENTS)  
(IBC 2006, IBC 2009, IBC 2012, IBC 2015, IBC 2018  
(DEPENDENT UPON LOCAL JURISDICTION))
- BUILDING CODE 2018 OF NEBRASKA  
(ADOPTS THE IBC 2018 WITH AMENDMENTS)
- BUILDING CODE 2018 OF NEW JERSEY  
(ADOPTS THE IBC 2018 WITH AMENDMENTS)
- 2015 NEW MEXICO COMMERCIAL BUILDING CODE  
(ADOPTS THE IBC 2015 WITH AMENDMENTS)
- 2020 BUILDING CODE OF NEW YORK STATE  
(ADOPTS THE IBC 2018 WITH AMENDMENTS)  
NYC BUILDING CODE 2014  
(ADOPTS THE IBC 2009 WITH AMENDMENTS)
- 2018 NORTH CAROLINA BUILDING CODE  
(ADOPTS THE IBC 2015 WITH AMENDMENTS)
- OHIO BUILDING CODE 2017  
(ADOPTS THE IBC 2015 WITH AMENDMENTS)
- BUILDING CODE 2018 OF OKLAHOMA  
(ADOPTS THE IBC 2018 WITH AMENDMENTS)
- BUILDING CODE 2018 OF PENNSYLVANIA  
(ADOPTS THE IBC 2018 WITH AMENDMENTS)  
PHILADELPHIA BUILDING CODE  
(ADOPTS THE IBC 2018 WITH AMENDMENTS)
- 2022 RHODE ISLAND BUILDING CODE  
(ADOPTS THE IBC 2018 WITH AMENDMENTS)
- 2018 SOUTH CAROLINA BUILDING CODE  
(ADOPTS THE IBC 2018 WITH AMENDMENTS)
- BUILDING CODE 2012 OF TENNESSEE  
(ADOPTS THE IBC 2015 WITH AMENDMENTS)  
BUILDING CODE 2018 OF NASHVILLE AND DAVIDSON  
COUNTY (ADOPTS THE IBC 2018 WITH AMENDMENTS)
- BUILDING CODE OF THE TEXAS INDUSTRIALIZED  
HOUSING AND BUILDINGS PROGRAM  
(ADOPTS THE IBC 2015 WITH AMENDMENTS)  
BUILDING CODE 2021 OF AUSTIN (ADOPTS THE IBC  
2021 WITH AMENDMENTS)  
DALLAS BUILDING CODE (ADOPTS THE IBC 2015  
WITH AMENDMENTS)  
(IBC 2006, IBC 2009, IBC 2012, IBC 2015, IBC 2018,  
IBC 2021 (DEPENDENT UPON LOCAL JURISDICTION))
- 2018 VIRGINIA CONSTRUCTION CODE  
(ADOPTS THE IBC 2018 WITH AMENDMENTS)
- BUILDING CODE 2015 OF WEST VIRGINIA  
(ADOPTS THE IBC 2015 WITH AMENDMENTS)
- BUILDING CODE 2015 OF WISCONSIN  
(ADOPTS THE IBC 2015 WITH AMENDMENTS)

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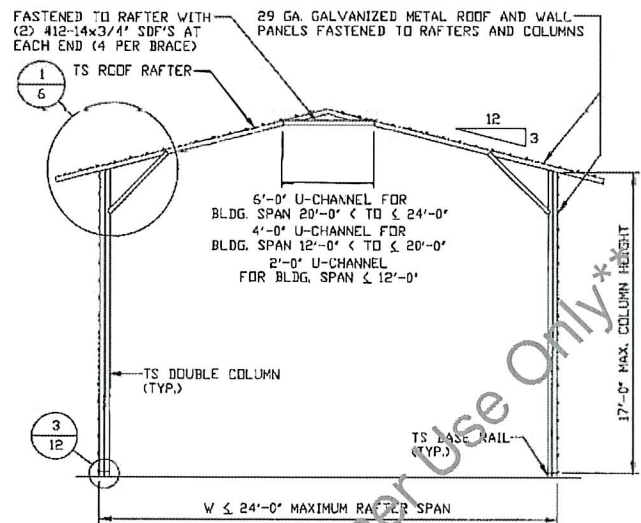
<b>DRAWN BY:</b> LT	CARPORT CENTRAL, INC. 1018 ROCKFORD STREET MOUNT AIRY, NC 27030 24'-0"x17'-0" ENCLOSED STRUCTURE		
<b>CHECKED BY:</b> PDH			
<b>PROJECT MGR:</b> VSM	<b>DATE:</b> 5-19-22	<b>SCALE:</b> NTS	<b>JOB NO:</b> 1910SS/21401S
<b>CLIENT:</b> CC	<b>SHT.</b> 3A	<b>DWG. NO:</b> SK-3	<b>REV:</b> 1

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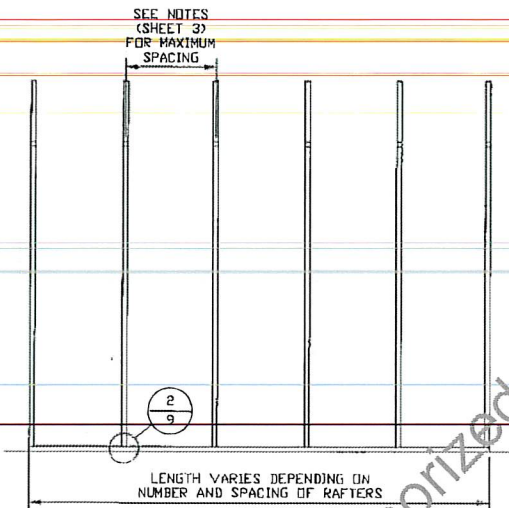
**TYPICAL RAFTER/COLUMN FRAME SECTION**

SCALE: NTS



**TYPICAL RAFTER/COLUMN FRAME SECTION**

SCALE: NTS



**TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION**

SCALE: NTS

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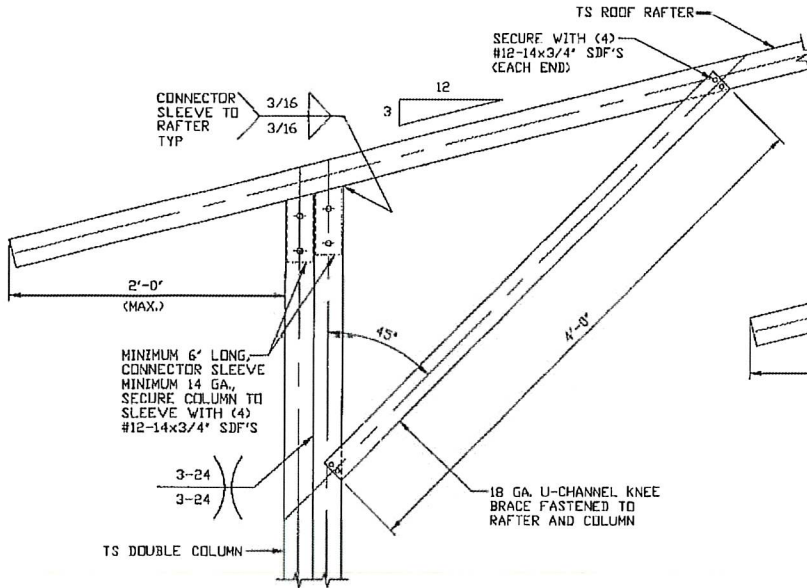
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DWG. NO: SK-3

JOB NO: 191035/21401S

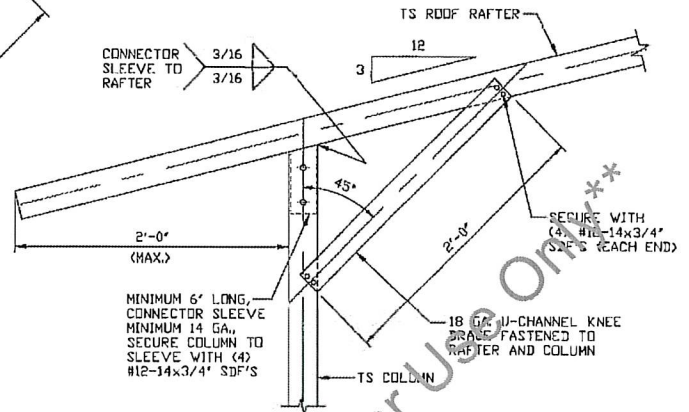
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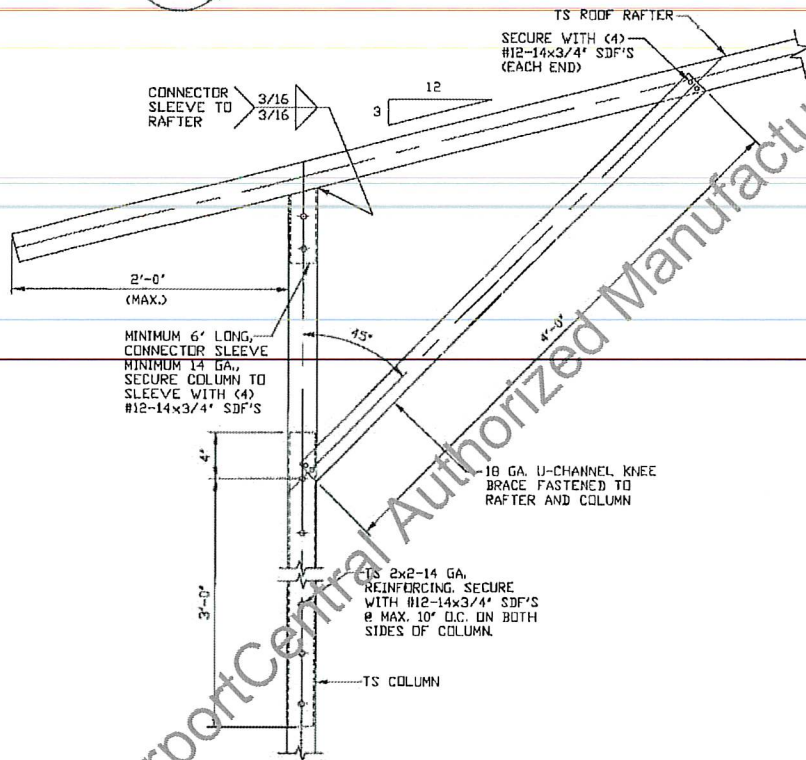
**1**  
**BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 12'-0" < TO <= 17'-0"**

SCALE: NTS



**1B**  
**BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS <= 10'-0"**

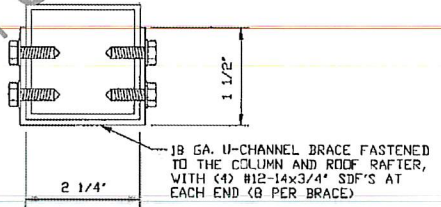
SCALE: NTS



**1A**  
**BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 10'-0" < TO <= 12'-0"**

SCALE: NTS

NOTE: MAX. COLUMN HEIGHT IS 14'-0" FOR WIND SPEED 114 MPH @ 5'-0" O.C. SPACING.  
 NOTE: MAX. COLUMN HEIGHT IS 15'-0" FOR WIND SPEED 112 MPH @ 4'-0" O.C. SPACING.



**BRACE SECTION**

SCALE: NTS

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**DATE: 5-19-22**

**SHT. 6**

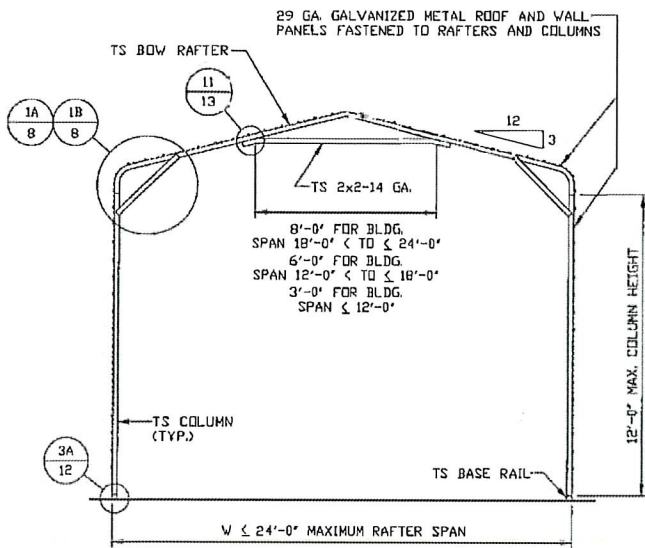
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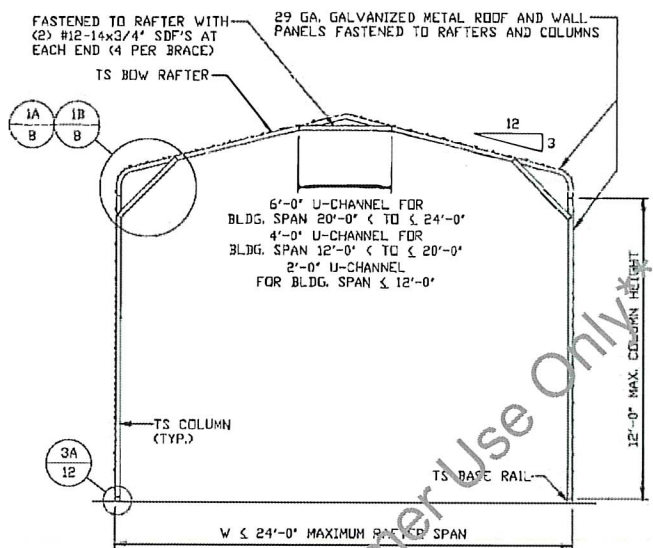
**JOB NO: 191055/21401S**

**REV: 1**

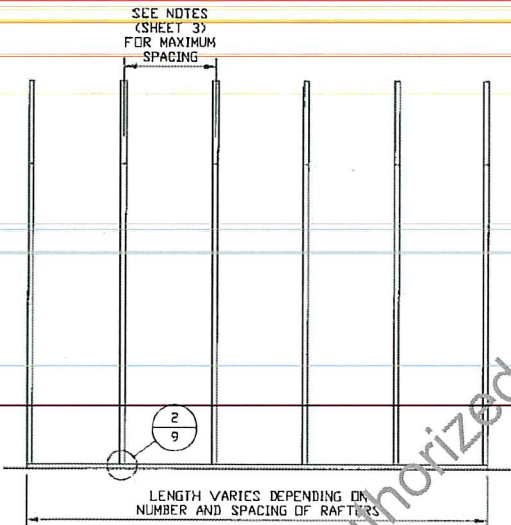
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**TYPICAL RAFTER/COLUMN FRAME SECTION**  
SCALE: NTS



**TYPICAL RAFTER/COLUMN FRAME SECTION**  
SCALE: NTS



**TYPICAL RAFTER/COLUMN FRAMING SIDE SECTION**  
SCALE: NTS

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1018 ROCKFORD STREET  
MOUNT AIRY, NC 27030**

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

**DATE: 5-19-22**

**SHT. 7A**

**SCALE: NTS**

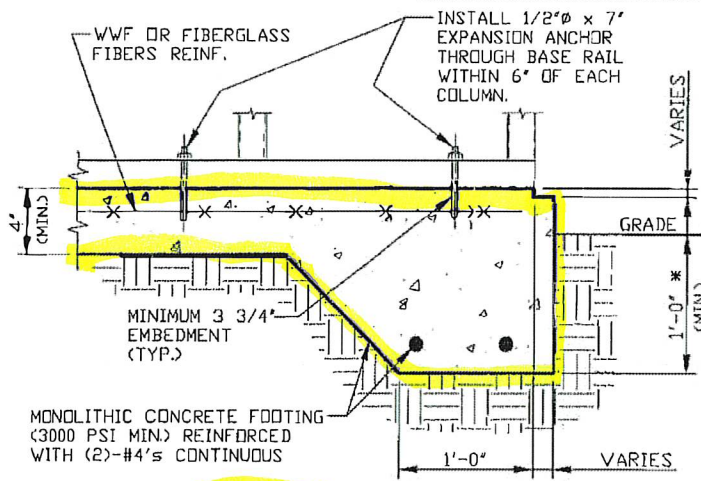
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**JOB NO:  
191056/21401S**

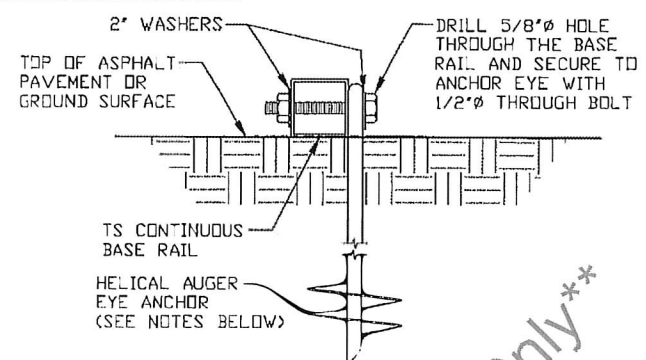
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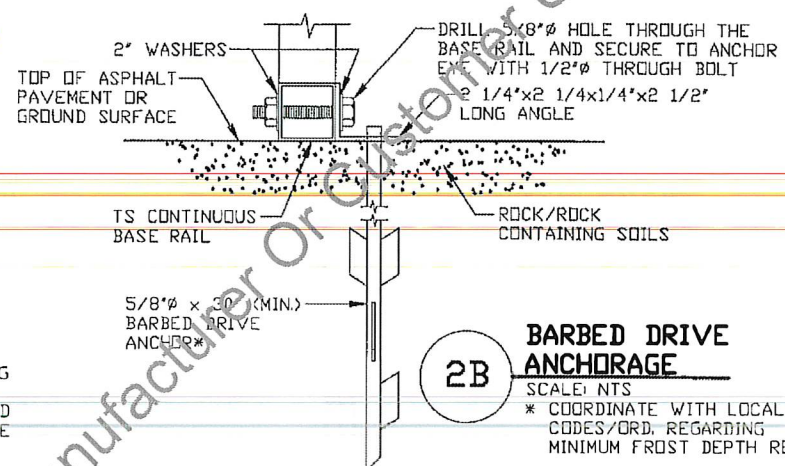
### BASE RAIL ANCHORAGE OPTIONS



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



**2A HELICAL AUGER ANCHORAGE**  
 SCALE: NTS (CAN BE USED FOR ASPHALT)



**2B BARBED DRIVE ANCHORAGE**  
 SCALE: NTS  
 \* COORDINATE WITH LOCAL CODES/ORD. REGARDING MINIMUM FROST DEPTH REQ.

### 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.

#### 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 60' EMBEDMENT.

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SCALE: NTS

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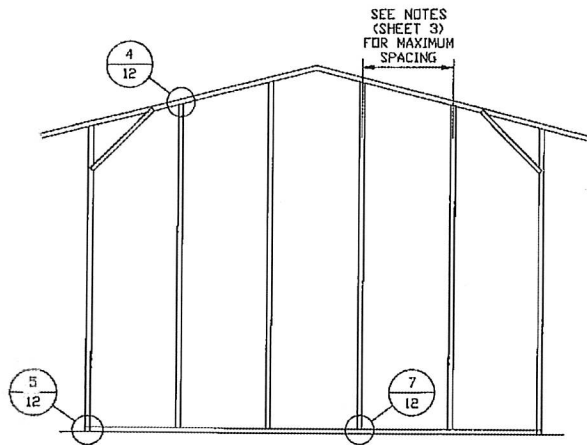
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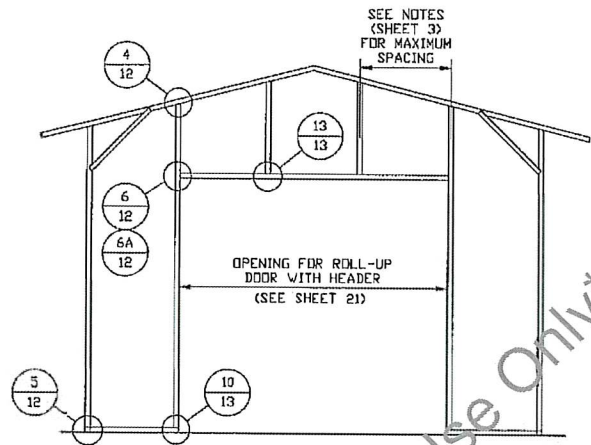


### BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS



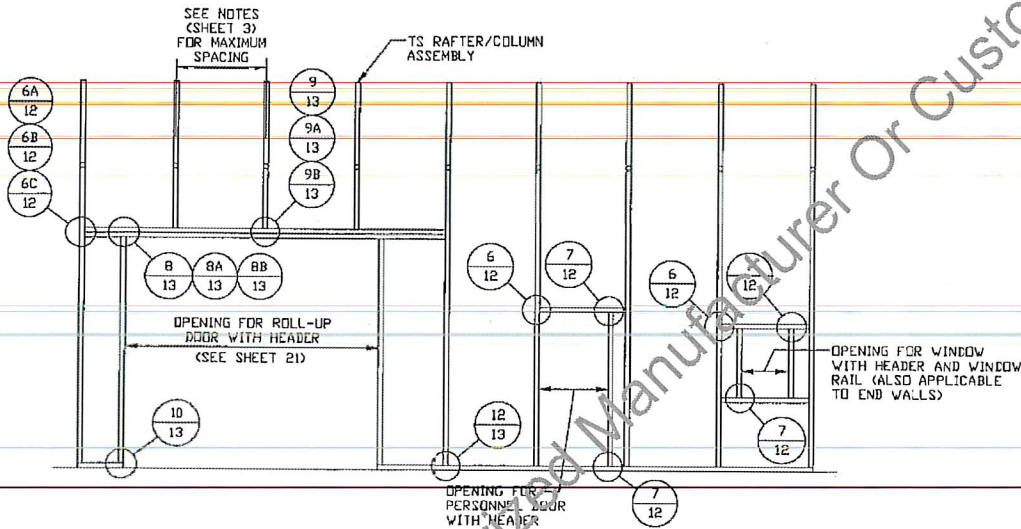
**TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION**

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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SCALE: NTS

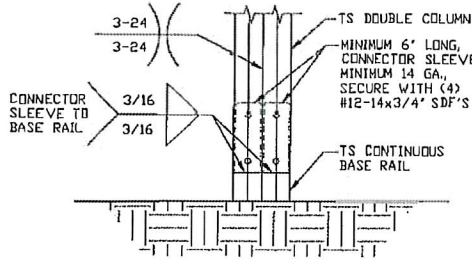
DWG. NO: SK-3

JOB NO: 1910SS/21401S

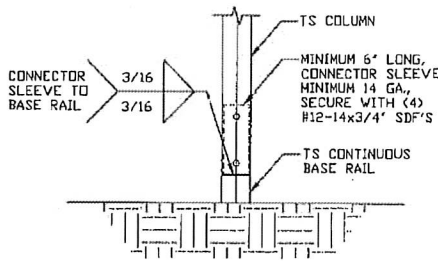
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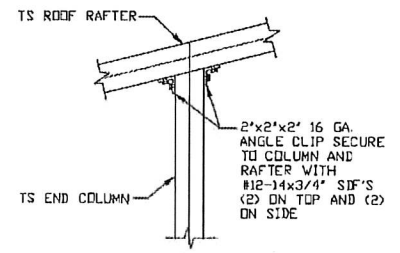
**CONNECTION DETAILS**



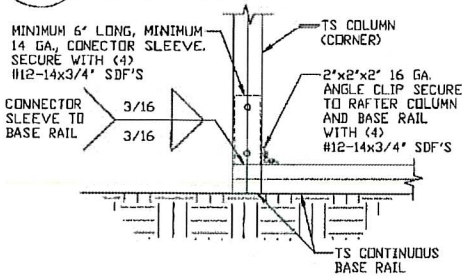
**3 RAFTER COLUMN/BASE RAIL CONNECTION DETAIL**  
SCALE: NTS



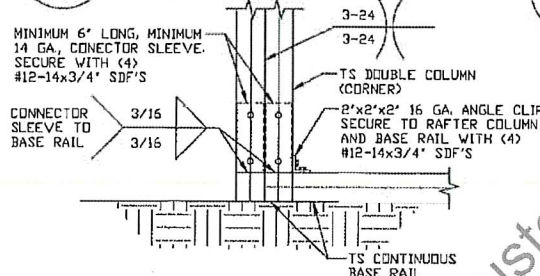
**3A RAFTER COLUMN/BASE RAIL CONNECTION DETAIL**  
SCALE: NTS



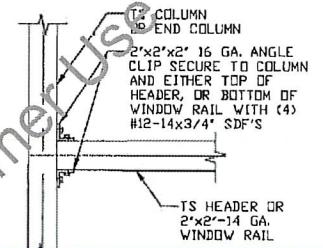
**4 END COLUMN/RAFTER CONNECTION DETAIL**  
SCALE: NTS



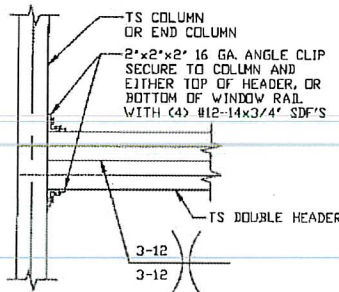
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SCALE: NTS



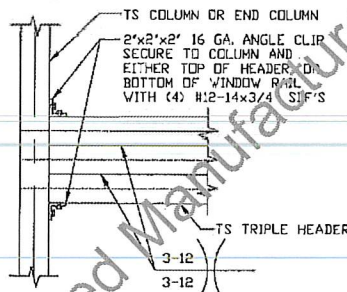
**5A END COLUMN/BASE RAIL CONNECTION DETAIL**  
SCALE: NTS



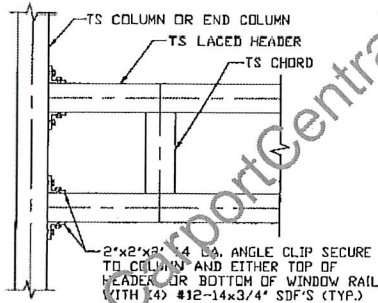
**6 COLUMN OR WINDOW RAIL TO POST CONNECTION DETAIL**  
SCALE: NTS



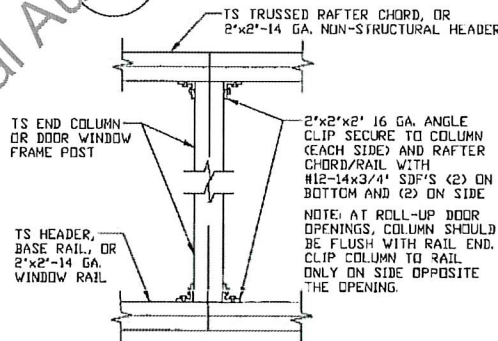
**6A DOUBLE HEADER TO COLUMN CONNECTION DETAIL**  
SCALE: NTS



**6B TRIPLE HEADER TO COLUMN CONNECTION DETAIL**  
SCALE: NTS



**6C LACED HEADER TO COLUMN CONNECTION DETAIL**  
SCALE: NTS



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

**MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.**

DRAWN BY: LT

CHECKED BY: PDH

PROJECT MGR: WSH

CLIENT: CC

CARPORT CENTRAL, INC.  
1018 ROCKFORD STREET  
MOUNT AIRY, NC 27030

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

DATE: 5-19-22

SHT. 12

SCALE: NTS

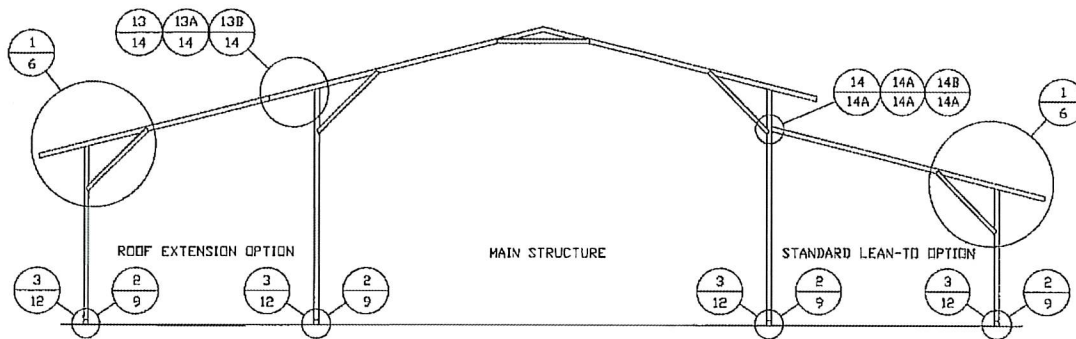
DWG. NO: SK-3

JOB NO: 1910SS/E1401S

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**BOX EAVE RAFTER LEAN-TO OPTIONS**

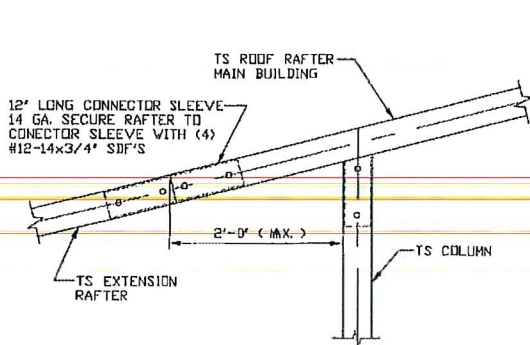


**TYPICAL BOX EAVE RAFTER LEAN-TO OPTIONS FRAMING SECTION (BOTH OPTIONS SHOWN)**

SCALE: NTS

NOTE: REFER TO SHEET 6 FOR COLUMN HEIGHTS.

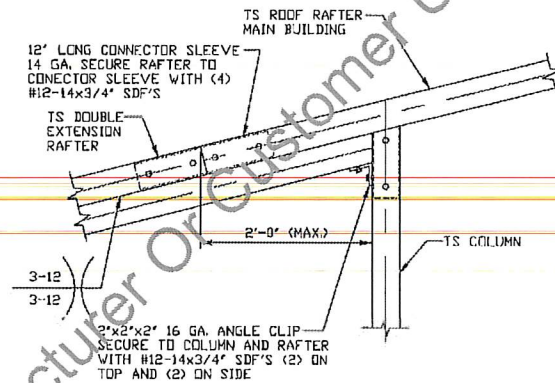
NOTE: LEAN-TO COLUMN SPACING MATCHES MAIN BUILDING COLUMN SPACING.



**13 SIDE EXTENSION RAFTER/COLUMN DETAIL FOR SPAN  $\leq 10'-0''$**

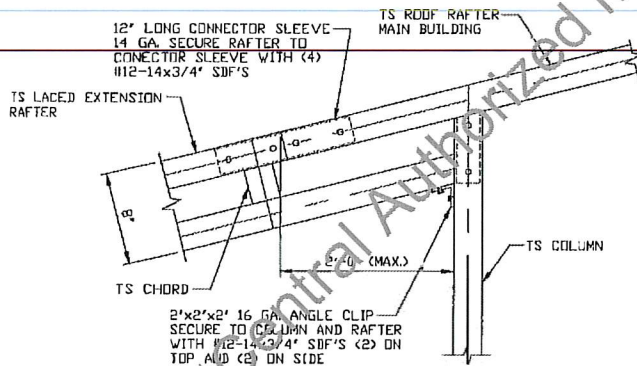
SCALE: NTS

NOTE: MAXIMUM SINGLE TUBE LEAN-TO SPAN IS 12'-0" FOR GROUND SNOW LOAD  $\leq 17$  PSF FOR 5'-0" O.C. AND  $\leq 27$  PSF FOR 4'-0" O.C..



**13A SIDE EXTENSION RAFTER/COLUMN DETAIL FOR SPAN  $10'-0'' < L \leq 16'-0''$**

SCALE: NTS



**13B SIDE EXTENSION RAFTER/COLUMN DETAIL FOR SPAN  $16'-0'' < L \leq 25'-0''$**

SCALE: NTS

**MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.**

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PROJECT MGR: WSH

CLIENT: CC

CARPOT CENTRAL, INC.  
1018 ROCKFORD STREET  
MOUNT AIRY, NC 27030  
24'-0" x 17'-0" ENCLOSED STRUCTURE

DATE: 5-19-22

SHT. 14

SCALE: NTS

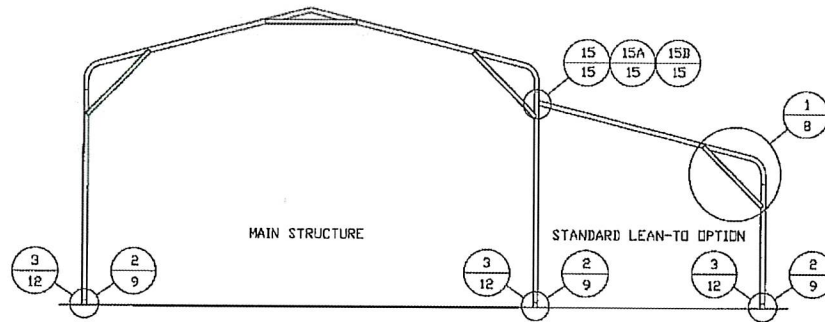
DWG. NO: SK-3

JOB NO: 1910SS/2140IS

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### BOW RAFTER LEAN-TO OPTION

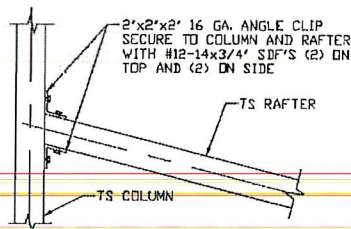


#### TYPICAL BOW RAFTER LEAN-TO OPTION FRAMING SECTION

SCALE: NTS

NOTE: REFER TO SHEET 8 FOR COLUMN HEIGHTS.

NOTE: LEAN-TO COLUMN SPACING MATCHES MAIN BUILDING COLUMN SPACING.

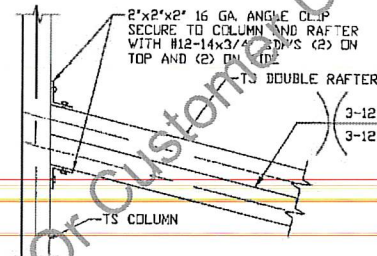


#### LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR SPAN $\leq 10'-0"$

15

SCALE: NTS

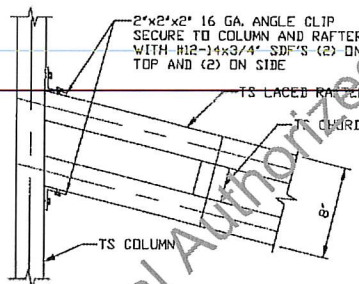
NOTE: MAXIMUM SINGLE TUBE LEAN-TO SPAN  
IS 12'-0" FOR GROUND SNOW LOAD  $\leq 17$  PSF  
FOR 5'-0" O.C. AND  $\leq 27$  PSF FOR 4'-0" O.C.



#### LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR SPAN $10'-0" < L \leq 16'-0"$

15A

SCALE: NTS



#### LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR SPAN $16'-0" < L \leq 25'-0"$

15B

SCALE: NTS

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ENGINEERING AND CONSULTING, INC.

DRAWN BY: LT

CHECKED BY: PDH

PROJECT MGR: WSM

CLIENT: CC

CARPORT CENTRAL, INC.  
1018 ROCKFORD STREET  
MOUNT AIRY, NC 27030

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

DATE: 5-19-22

SHT. 15

SCALE: NTS

DWG. NO: SK-3

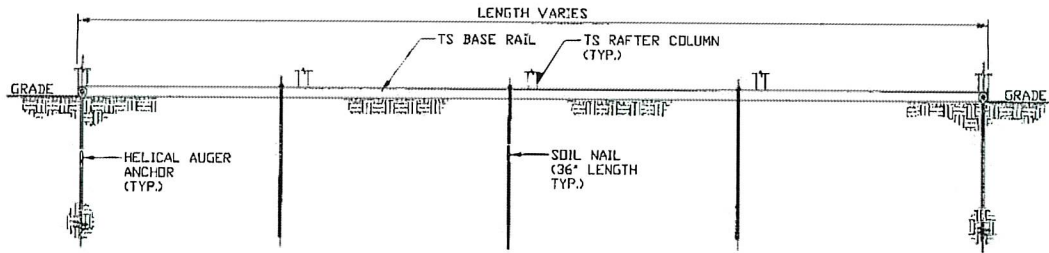
JOB NO:

191055/21401S

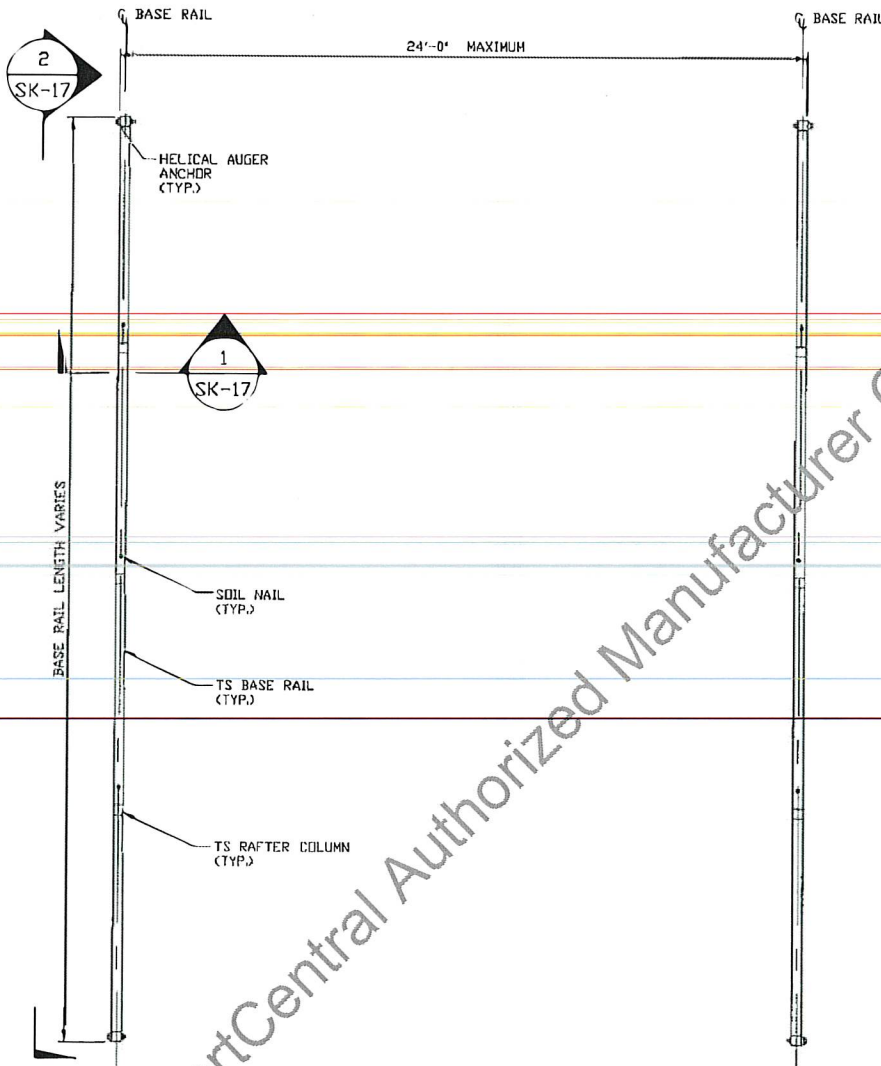
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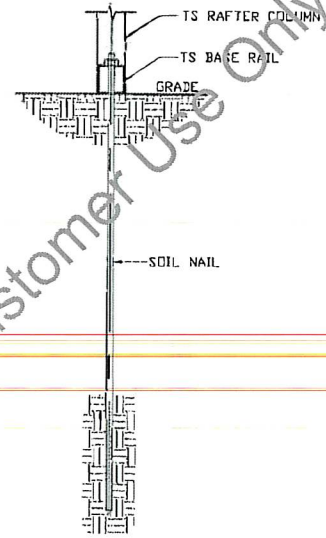
**OPTIONAL BASE RAIL ON GRADE APPLICATION**



SECTION 2  
SCALE: NTS  
SK-17



**BASE RAIL PLAN**  
SCALE: NTS



SECTION 1  
SCALE: NTS  
SK-17

**HELIX ANCHOR**

SIDE LENGTH	SPACING
VARIABLES	EVERY 3RD COLUMN

NOTES:  
1. INSTALLATION OF ANCHORS ALSO APPLY TO END WALLS.

**MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.**

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PROJECT MGR: WSM

CLIENT: CC

CARPORT CENTRAL, INC.  
1018 ROCKFORD STREET  
MOUNT AIRY, NC 27030

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

DATE: 5-19-22

SHT. 17

SCALE: NTS

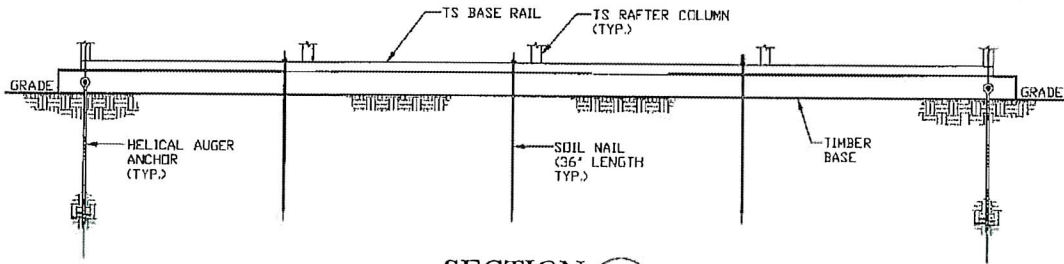
DWG. NO: SK-3

JOB NO: 1910SS/21401S

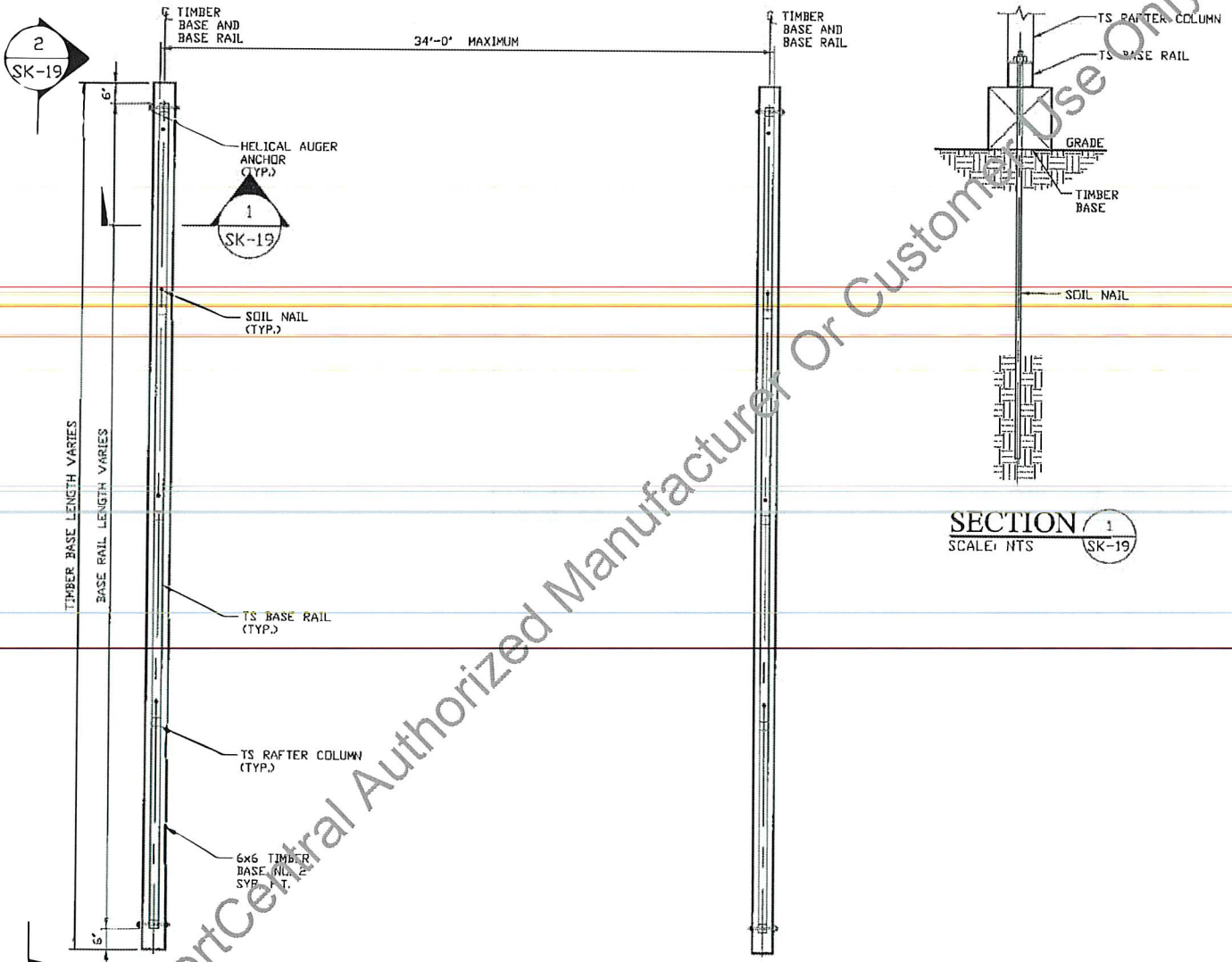
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**OPTIONAL BASE RAIL ON TIMBER BEAM WITH SOIL NAIL**



**SECTION 2**  
SCALE: NTS (SK-19)



**SECTION 1**  
SCALE: NTS (SK-19)

**TIMBER FOOTING PLAN**  
SCALE: NTS

HELIX ANCHOR	
SIDE LENGTH	SPACING
VARIABLES	EVERY 3RD COLUMN

NOTES:  
1. INSTALLATION OF ANCHORS ALSO APPLY TO END WALLS.

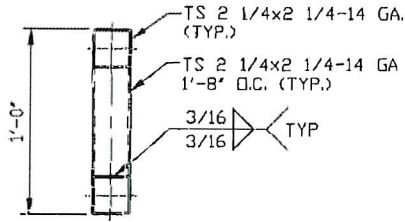
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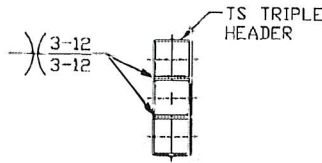
<b>DRAWN BY:</b> LT	CARPORT CENTRAL, INC. 1018 ROCKFORD STREET MOUNT AIRY, NC 27030 24'-0" x 17'-0" ENCLOSED STRUCTURE		
<b>CHECKED BY:</b> PDH	<b>PROJECT MGR:</b> WSH	<b>DATE:</b> 5-19-22	<b>SCALE:</b> NTS
<b>CLIENT:</b> CC	<b>SHT:</b> 19	<b>DWG. NO.:</b> SK-3	<b>JOB NO.:</b> 191055/21401S <b>REV.:</b> 1

### SIDE WALL HEADER OPTIONS

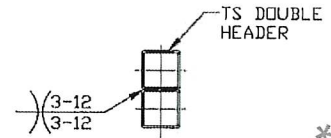
NOTE: HEADER DESIGN DOES NOT TAKE IN TO ACCOUNT ADDITIONAL ROOF LOADING FROM ATTACHED LEAN-TO STRUCTURES.



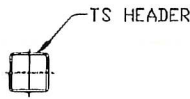
**HEADER DETAIL FOR  
DOOR OPENINGS  
16'-0" < LENGTH ≤ 20'-0"**  
SCALE: NTS



**HEADER DETAIL FOR  
DOOR OPENINGS  
11'-0" < LENGTH ≤ 16'-0"**  
SCALE: NTS



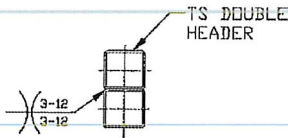
**HEADER DETAIL FOR  
DOOR OPENINGS  
7'-0" < LENGTH ≤ 11'-0"**  
SCALE: NTS



**HEADER DETAIL FOR  
DOOR OPENINGS < 7'-0"**  
SCALE: NTS

NOTE: MAXIMUM SINGLE TUBE HEADER SPAN  
IS 6'-0" FOR 4'-0" O.C. SPACING.

### END WALL HEADER OPTIONS



**HEADER DETAIL FOR  
DOOR OPENINGS  
12'-0" < LENGTH ≤ 20'-0"**  
SCALE: NTS



**HEADER DETAIL FOR  
DOOR OPENINGS < 12'-0"**  
SCALE: NTS

**MOORE AND ASSOCIATES  
ENGINEERING AND CONSULTING, INC.**

DRAWN BY: LT

CHECKED BY: PDH

PROJECT MGR: WSM

CLIENT: CC

CARPORT CENTRAL, INC.  
1018 ROCKFORD STREET  
MOUNT AIRY, NC 27030  
24'-0" x 17'-0" ENCLOSED STRUCTURE

DATE: 5-19-22

SHT. 21

SCALE: NTS

DWG. NO: SK-3

JOB NO:  
191055/21401S

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