

STRUCTURAL DESIGN
ENCLOSED BUILDING
EXPOSURE B

**MAXIMUM 30'-0" WIDE X 20'-0" EAVE HEIGHT- BOX EAVE
 FRAME AND BOW FRAME**

29 July 2021

Revision 6

M&A Project No. 16022S/17300S/20352S

Prepared for:

Tubular Building Systems, LLC
 631 SE Industrial Circle
 Lake City, Florida 32025

Prepared by:

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MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.	DRAWN BY: JG	TUBULAR BUILDING SYSTEMS 30'-0"x20'-0" ENCLOSED BUILDING EXP. B PE SEAL COVER SHEET			
	CHECKED BY: PDH				
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	CLIENT: TBS	SHT. 1	DWG. NO: SK-3	REV: 6	

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**FLUTAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30" x 40" x 20" x 40" ENCLOSED BUILDING EXP. II**

DATE: 7-29-21

SCALE: NTS

JOB NO: 16022S/

17300S/20352S

SHT. 2

DWG. NO: SK-3

REV: 6

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INSTALLATION NOTES AND SPECIFICATIONS

1. DESIGN IS FOR A MAXIMUM 30'-0" WIDE X 20'-0" EAVE HEIGHT ENCLOSED STRUCTURES.
2. DESIGN WAS DONE IN ACCORDANCE WITH THE 2020 FLORIDA BUILDING CODE (FBC) 7TH EDITION, 2012 INTERNATIONAL BUILDING CODE (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 = 10 PSF
4. LOW ULTIMATE WIND SPEED 105 TO 140 MPH (NOMINAL WIND SPEED 81 TO 108 MPH) MAXIMUM RAFTER/POST AND END POST SPACING = 5.0 FEET
5. HIGH ULTIMATE WIND SPEED 141 TO 170 MPH (NOMINAL WIND SPEED 109 TO 132 MPH) MAXIMUM RAFTER/POST AND END POST SPACING = 4.0 FEET
6. END WALL COLUMNS (POSTS) AND SIDE WALL COLUMNS ARE EQUIVALENT IN SIZE AND SPACING UNLESS NOTED OTHERWISE.
7. RISK CATEGORY I.
8. WIND EXPOSURE CATEGORY B.
9. SPECIFICATION AND LABEL FOR CORRUGATED METAL PANELS FASTENED DIRECTLY TO STEEL FRAMING: 14 GAUGE THIN STEEL STUD FRAMING MEMBERS FOR VERTICAL PANELS. 22 GAUGE METAL PANELS SHALL BE FASTENED TO 1 1/2" WIDE RAIL CHANNELS UNLESS OTHERWISE NOTED.
10. AVERAGE LATERAL LOADS IN CENTERS ALONG RAFTER/POSTS, COLUMNS, AND POST INTERSPACES SHALL BE 0.5 KIP (MAX).
11. FASTENERS: MINIMUM OF 12-14x1/4" OR 1/2" DRILLING FASTENERS (NAILS, BOLTS, CONCRETE BOLTS, WOODS WITH EXISTING FASTENERS). SPECIFICATIONS APPLY TO ALL JOINTS FOR MEAN RAIL TO RAIL OR RAIL TO COLUMN AND POST TO POST OR RAIL TO POST TO POST. SPACING REQUIREMENTS FOR PANELS OF CORRUGATED METAL PANELS MAY VARY BASED ON MANUFACTURER'S RECOMMENDATIONS.
12. STANDARD ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL WITHIN 4" OF EACH COLUMN.
13. STANDARD GROUND ANCHORS SHALL CONSIST OF #4 REBAR W/ WELDED END X 32" LONG IN A MINIMUM 12" CONCRETE. MAY BE USED FOR LOW TO MEDIUM NOMINAL WIND SPEEDS ONLY. OPTIONAL ANCHORAGE MAY BE USED IN SUITABLE SOILS AND MUST BE USED IN UNDESIRABLE SOILS AND/OR COORDINATE WITH LOCAL JURISDICTIONS REGARDING MINIMUM LENGTH FOR EMBEDMENT.
14. WIND UPLIFT: EVALUATED OVER SEISMIC FORCES. SEISMIC PARAMETERS ANALYZED ARE:
 SOIL SITE CLASS: D
 RISK CATEGORY: I
 R: 3.00 I: 1.0
 S_{SDS}: 1.502 g V: 0.75
 S_{0.2}: 0.839 g



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TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0" X 20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

SHT. 3

SCALE: NTS

DWG. NO: SK-3

JOB NO: 16022S/
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BOX EAVE FRAME RAFTER ENCLOSED BUILDING

ROLL-UP DOOR
(AS APPLICABLE)
DESIGN PRESSURE
LOW = 180 PSF, 209 PSF
HIGH = 127.8 PSF, 131.2 PSF

DOOR
(AS APPLICABLE)
DESIGN PRESSURE
LOW = 180 PSF, 199 PSF
HIGH = 127.8 PSF, 129.7 PSF

WINDOW (AS APPLICABLE)
DESIGN PRESSURE
LOW = 191 PSF, 217 PSF
HIGH = 128.6 PSF, 131.0 PSF



TYPICAL END ELEVATION

SCALE: NTS

TYPICAL SIDE ELEVATION

BOW FRAME RAFTER ENCLOSED BUILDING

ROLL-UP DOOR
(AS APPLICABLE)
DESIGN PRESSURE
LOW = 180 PSF, 209 PSF
HIGH = 127.8 PSF, 131.2 PSF

DOOR
(AS APPLICABLE)
DESIGN PRESSURE
LOW = 180 PSF, 199 PSF
HIGH = 127.8 PSF, 129.7 PSF



TYPICAL END ELEVATION

WINDOW (AS APPLICABLE)
DESIGN PRESSURE
LOW = 191 PSF, 217 PSF
HIGH = 128.6 PSF, 131.0 PSF

TYPICAL SIDE ELEVATION



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TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0"X20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

SHT. 4

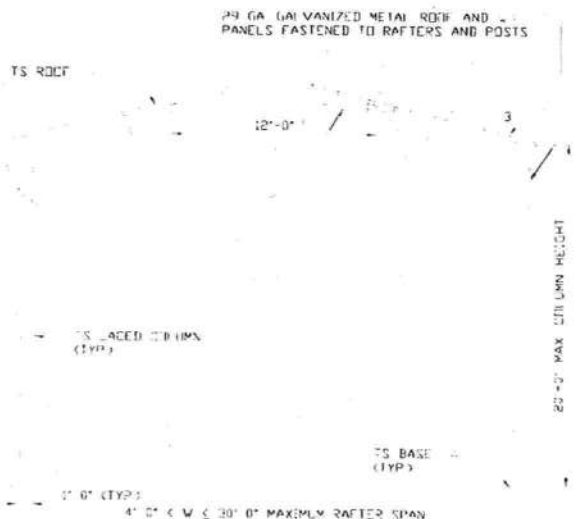
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TYPICAL RAFTER/COLUMN END FRAME SECTION

NOTES
1. SEE T.B.
2. FOR MAXIMUM
SPACING

TS RAFTER/COLUMN
ASSEMBLY



TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE: NTS

TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION



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TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0" x 20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

SCALE: NTS

JOB NO: 16022S/
17300S/20352S

SHT. 5

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REV: 6

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29 GA GALVANIZED METAL ROOF AND WALL
PANELS FASTENED TO RAFTERS AND POSTS

TS ROOF RAIL

TS ROOF RAFTER

29 GA GALVANIZED METAL ROOF AND WALL
PANELS FASTENED TO RAFTERS AND POSTS

24" 18 GA U-CHANNEL
BRACE FASTENED TO
RAFTER WITH (4)
#12-14x3/4" BOLTS AT
EACH END (8 PER BRACE)

TS BASE RAIL
(17')

TS BASE RAIL
(17')

24' 0" < W ≤ 30'-0" MAXIMUM RAFTER SPAN

W < 24'-0" MAXIMUM RAFTER SPAN

TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE: NTS

TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE: NTS

TS RAFTER/COLUMN
ASSEMBLY

TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION



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TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0" x 20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

SCALE: NTS

SHT. 5A

DWG. NO: SK-3

JOB NO: 16022S/
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PANELS FASTENED TO RAFTERS AND POSTS

29 GA GALVANIZED METAL ROOF AND WALL
PANELS FASTENED TO RAFTERS AND POSTS

24" 18 GA J-CHANNEL
BRACE FASTENED TO
RAFTER WITH (4)
#12-14x2 1/4" BOLTS AT
EACH END (3 PER BRACE)

12'-0" MAX COLUMN
HEIGHT FOR HW

12'-0" MAX COLUMN
HEIGHT FOR HW

TS BASE RAIL
(TYP)

TS BASE RAIL
(TYP)

24" 3" x 1/2" x 30" 0" MAXIMUM RAFTER SPAN

24" 3" x 1/2" x 30" 0" MAXIMUM RAFTER SPAN

TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE: NTS

TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE: NTS

TS RAFTER/COLUMN
ANCHOR

TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION



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TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0"x20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

SCALE: NTS

JOB NO: 16022S/
17300S/20352S

SHT. 5B

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CONNECTOR
SLEEVE
TO RAFTER
(TYP.) 3/16

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

MINIMUM 5' LONG
MINIMUM 15 GA.
CONNECTOR SLEEVE
SECURE WITH (4)
#12-14x3/4" SDP'S

CONNECTOR
SLEEVE TO
BASE RAIL 3/16

MINIMUM 5' LONG
CONNECTOR SLEEVE
MINIMUM 15 GA.
SECURE WITH (4)
#12-14x3/4" SDP'S

TO CONTINUOUS
BASE RAIL

BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 13'-0" < TO ≤ 16'-0"

COLUMN HEIGHTS 12'-0" < TO < 15'-0" FOR HIGH WIND

2 RAFTER COLUMN/BASE RAIL CONNECTION DETAIL

SCALE: NTS

BRACE SECTION



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CLIENT: TBS

TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0"x20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

SCALE: NTS

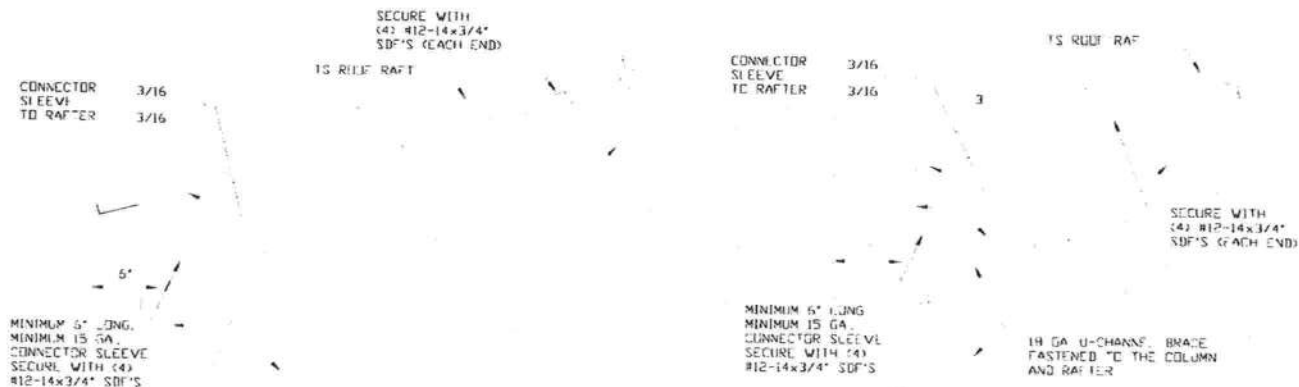
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17300S/20352S

SHT. 6A

DWG. NO: SK-3

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

TS 2 1/4"x2 1/4"x14 GA
REINFORCING SECURE WITH
#12-14x3/4" SDF'S 2" BY 12"
MAX ON BOTH SIDES OF
COLUMN

TS 2 1/4"x2 1/4"x14 GA
COLUMN INSERT

18 GA U-CHESS BRACE
FASTENED TO THE COLUMN
AND RUFF RAFTER WITH (4)
#12-14x3/4" SDF'S AT EACH
END (8 PER BRACE)

BRACE SECTION

1A
BOX EAVE RAFTER COLUMN
CONNECTION DETAIL
FOR HEIGHTS 10'-0" < TO < 13'-0"

SLEEVE TO
BASE RAIL 3/16

MINIMUM 6" LONG
CONNECTOR SLEEVE
MINIMUM 15 GA.
SECURE WITH (4)
#12-14x3/4" SDF'S
TS CONTINUOUS
BASE RAIL

2
RAFTER COLUMN/BASE RAIL
CONNECTION DETAIL



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PROJECT MGR: VSM

CLIENT: TBS

TURBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
TALLAHASSEE, FLORIDA 32305
3040"X2040" ENCLOSED BUILDING EXH. B

DATE: 7-29-21

SCALE: NTS

JOB NO: 16022S/
17300S/20352S

SHT. 6B

DWG. NO: SK-3

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29 GA GALVANIZED METAL ROOF AND WALL
PANELS FASTENED TO RAFTERS AND POSTS

TS ROOF RAFTER

29 GA GALVANIZED METAL ROOF AND WALL
PANELS FASTENED TO RAFTERS AND POSTS

24" 18 GA U CHANNEL
BRACE FASTENED TO
RAFTER WITH 24"
R12-14x3/4" SDPS AT
EACH END (8 PER BRACE)

TS DOUBLE COLUMN
(TYP)

TS BASE RAIL
(TYP)

TS BASE
(TYP)

24'-0" W x 30'-0" MAXIMUM RAFTER SPAN

W x 24'-0" MAXIMUM RAFTER SPAN

TYPICAL RAFTER/COLUMN END FRAME SECTION

TYPICAL RAFTER/COLUMN END FRAME SECTION

TS RAFTER/COLUMN
ASSEMBLY

TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION



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TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0"x20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

SCALE: NTS

SHT. 7

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PANELS FASTENED TO RAFTERS AND POSTS

29 GA GALVANIZED METAL ROOF AND WALL
PANELS FASTENED TO RAFTERS AND POSTS

1S COLLAR

24" 18 GA J CHANNEL
BRACE FASTENED TO
RAFTER WITH (4)
#12-14x3/4" BOLTS AT
EACH END (8 PER BRACE)

1S COLUMN
(TYP)

1S COLUMN
(TYP)

1S HANG RAIL
(TYP)

24" 2" W x 30" 2" MAXIMUM RAFTER SPAN

24" 2" W x 30" 2" MAXIMUM RAFTER SPAN

TYPICAL RAFTER/COLUMN END FRAME SECTION

TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE: NTS

1S RAFTER/COLUMN
ASSEMBLY

TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION



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TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0" x 20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

SHT. 7A

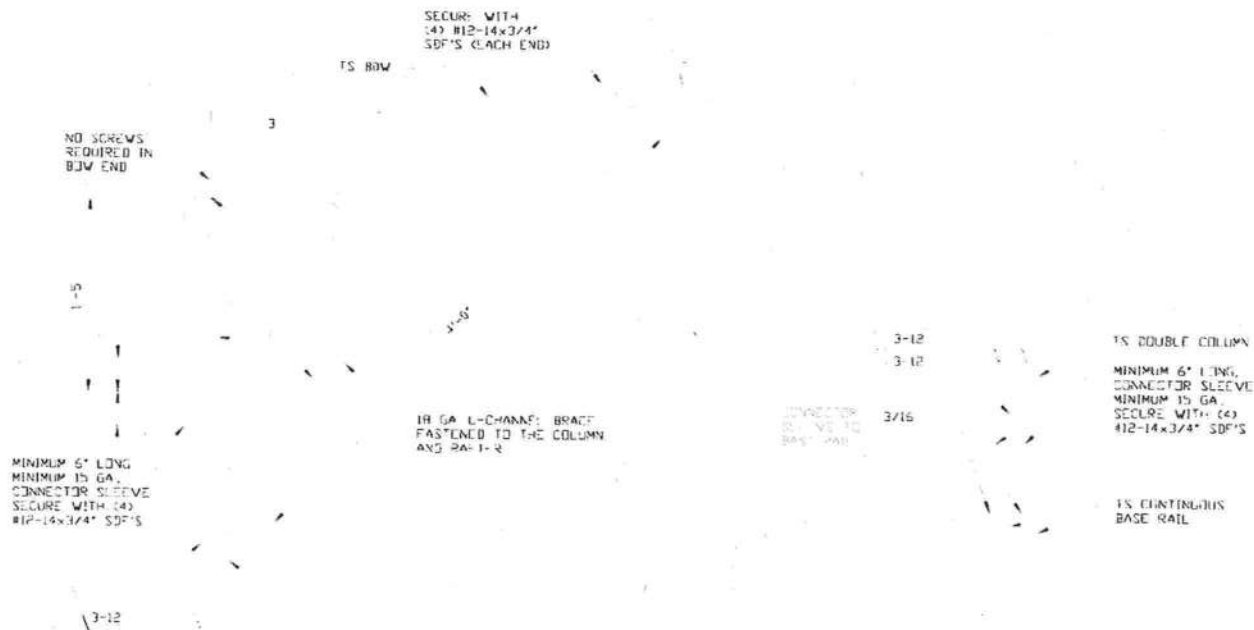
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**BOX EAVE RAFTER COLUMN
CONNECTION DETAIL
FOR HEIGHTS 13'-0" < TO ≤ 16'-0"**

1

SCALE: NTS

DATE: 7-29-21

BRACE SECTION

SCALE: 1/2" = 1'-0"

**2 RAFTER COLUMN/BASE RAIL
CONNECTION DETAIL**

2



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**TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0"x20'-0" ENCLOSED BUILDING EXP. B**

DATE: 7-29-21

SHT. 8

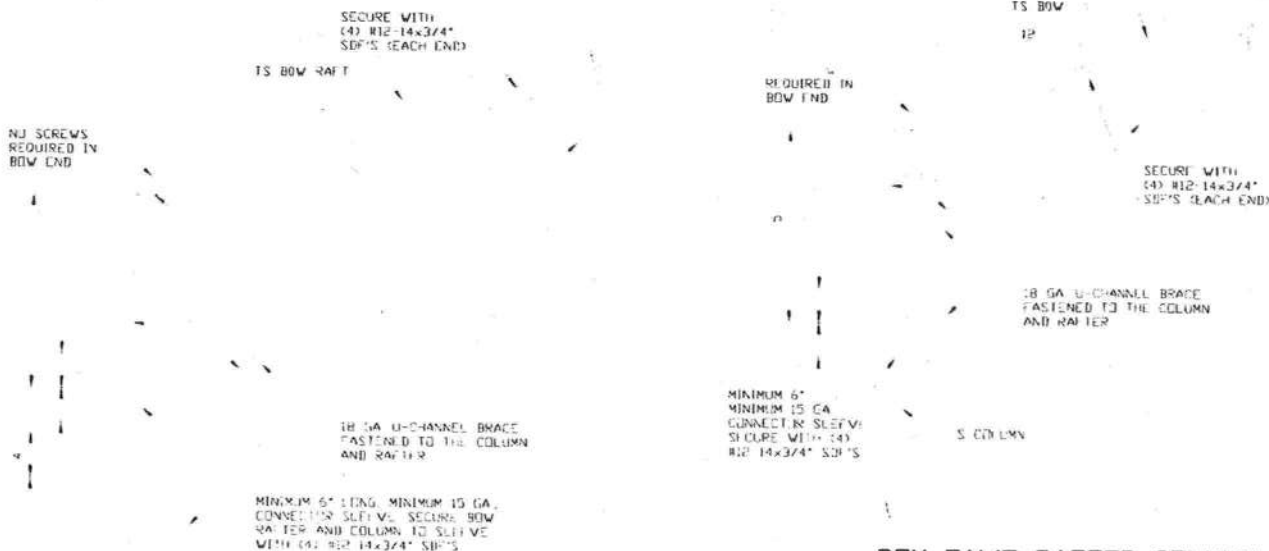
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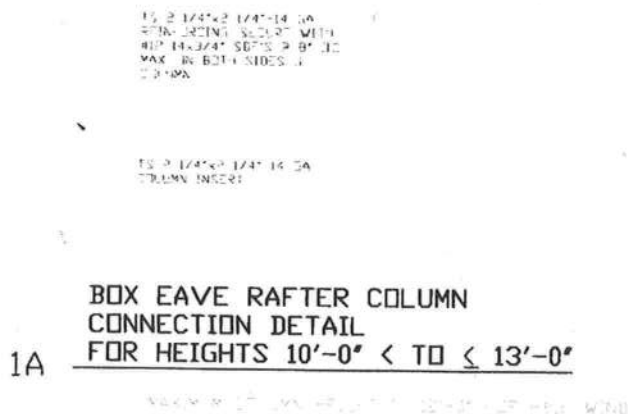
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1B BOX EAVE RAFTER COLUMN
CONNECTION DETAIL
FOR HEIGHTS $\leq 10'-0"$



1A BOX EAVE RAFTER COLUMN
CONNECTION DETAIL
FOR HEIGHTS $10'-0" < TO \leq 13'-0"$

BRACE SECTION



2 RAFTER COLUMN/BASE RAIL
CONNECTION DETAIL
SCALE: NTS



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FLUOR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
TALLAHASSEE, FLORIDA 32305
30'-0" x 20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

SCALE: NTS

SHT. 8A

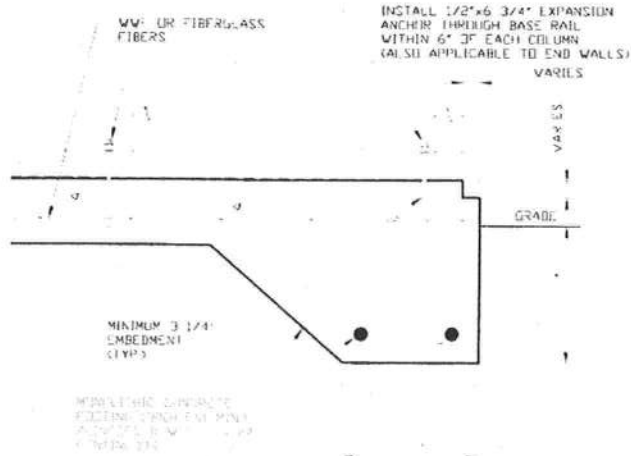
DWG. NO: SK-3

JOB NO: 16022S/
17300S/20352S

REV: 6

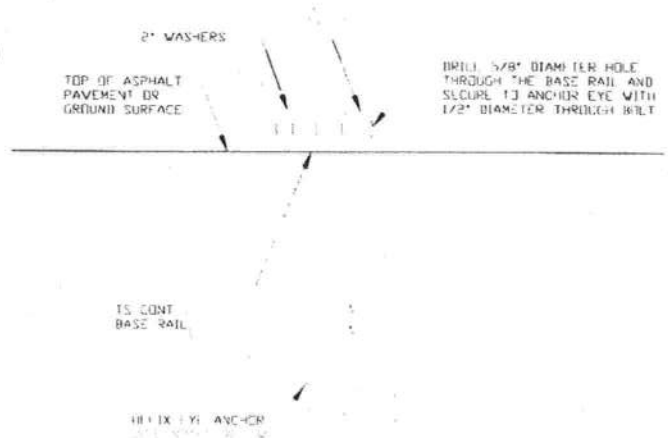
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BASE RAIL ANCHORAGE OPTIONS FOR LOW AND HIGH WIND SPEED



**3A CONCRETE MONOLITHIC SLAB
BASE RAIL ANCHORAGE**

MINIMUM 3" (1/4" EMBEDMENT (TYP))
MINIMUM 3" (1/4" EMBEDMENT (TYP))
MINIMUM 3" (1/4" EMBEDMENT (TYP))



3B GROUND BASE HELIX ANCHORAGE

MINIMUM 3" (1/4" EMBEDMENT (TYP))
MINIMUM 3" (1/4" EMBEDMENT (TYP))
MINIMUM 3" (1/4" EMBEDMENT (TYP))

GENERAL NOTES

NOTE: CONCRETE MONOLITHIC SLAB DESIGN ON MINIMUM SOIL BEARING CAPACITY OF 1500 PSF

CONCRETE

CONCRETE SHALL HAVE A MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS

COVER OVER REINFORCING STEEL

FOR FOUNDATIONS, MINIMUM CONCRETE COVER OVER REINFORCING BARS SHALL BE PER ACI 308

3 INCHES 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 INCHES ELSEWHERE

REINFORCING STEEL

THE TURNDOWN REINFORCING STEEL SHALL BE ASTM A615 (GRADE 60) THE SLAB REINFORCEMENT SHALL BE WELDED WIRE FABRIC MEETING ASTM A183 OR FIBERGLASS FIBER REINFORCEMENT

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

- 1 REINFORCEMENT IS BENT COB
- 2 THE DIAMETER OF THE BEND MEASURED ON THE INSIDE OF THE BEND, 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 GRAVELS AND COBBLES (A-1) USE MINIMUM (2) 4" HELICES WITH MINIMUM 30 INCH EMBEDMENT
- 2 FOR COARSE TO MEDIUM DENSE SANDS, SANDY GRAVELS, VERY STIFF SILTS, AND CLAYS USE MINIMUM (2) 4" HELICES WITH MINIMUM 30 INCH EMBEDMENT
- 3 FOR MEDIUM DENSE COARSE SANDS, SANDY GRAVELS, VERY STIFF SILTS, AND CLAYS USE MINIMUM (2) 4" HELICES WITH MINIMUM 30 INCH EMBEDMENT
- 4 FOR FINE TO MEDIUM DENSE SANDS, FIRM TO STIFF CLAYS AND SILTS ALLUVIAL FILL USE MINIMUM (2) 6" HELICES WITH MINIMUM 50 INCH EMBEDMENT
- 5 FOR VERY LOOSE TO MEDIUM DENSE SANDS, FIRM TO STIFFER CLAYS AND SILTS, ALLUVIAL FILL USE MINIMUM (2) 8" HELICES WITH MINIMUM 60 INCH EMBEDMENT



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CHECKED BY: PDH

PROJECT MGR: WSM

CLIENT: TBS

TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0"X20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

SHT. 9

SCALE: NTS

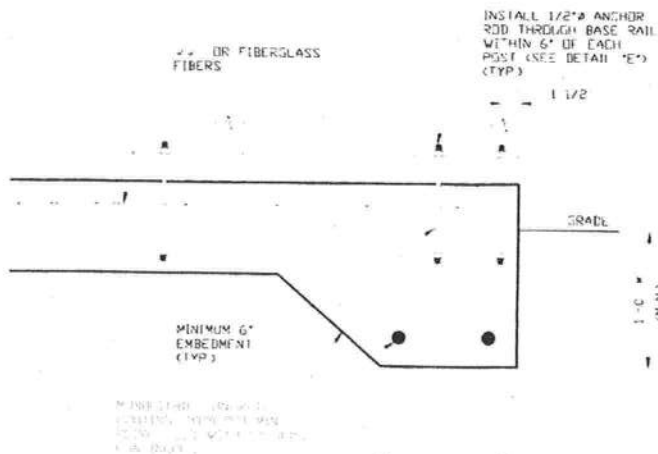
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JOB NO: 16022S/
17300S/20352S

REV: 6

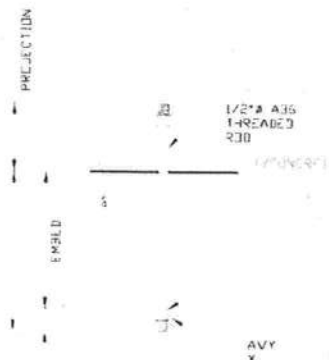
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OPTIONAL FOUNDATION ANCHORAGE FOR LOW AND HIGH WIND SPEED



3C CONCRETE MONOLITHIC SLAB
BASE RAIL ANCHORAGE

MINIMUM ANCHOR ROD DISTANCE IS 1 1/2"
* COORDINATE WITH 3/4" DIA. ANCHOR ROD
PROVIDING MINIMUM EMBEDMENT



3D ANCHOR ROD THROUGH BASE
RAIL DETAIL

GENERAL NOTES

NOTE: CONCRETE MONOLITHIC SLAB DESIGN 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 INCHES 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 INCHES ELSEWHERE.

REINFORCING STEEL:

THE TURNDOWN REINFORCING STEEL SHALL BE ASTM A615 GRADE 60. THE SLAB REINFORCEMENT SHALL BE WELDED WIRE FABRIC MEETING ASTM A665 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.



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TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0"x20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

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JOB NO: 16022S/
17300S/20352S

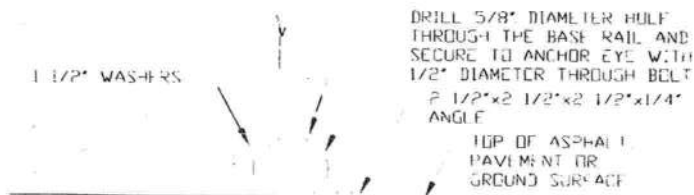
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BASE RAIL ANCHORAGE OPTION



→ 3/4" x 30" (MIN) LONG ANCHOR BOLT

→ 2"x3/4"x1/8" A36 BARBS
(MIN 4)

3E ASPHALT BASE ANCHORAGE (HP 9 BARBED DRIVE ANCHOR)

SCALE: 1" = 1'-0"
PLAN VIEW - TOP OF ASPHALT
SECTION - WITH 10" MIN. THICK
CONCRETE MINIMUM 4'-0" DEEP



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TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
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17300S/20352S

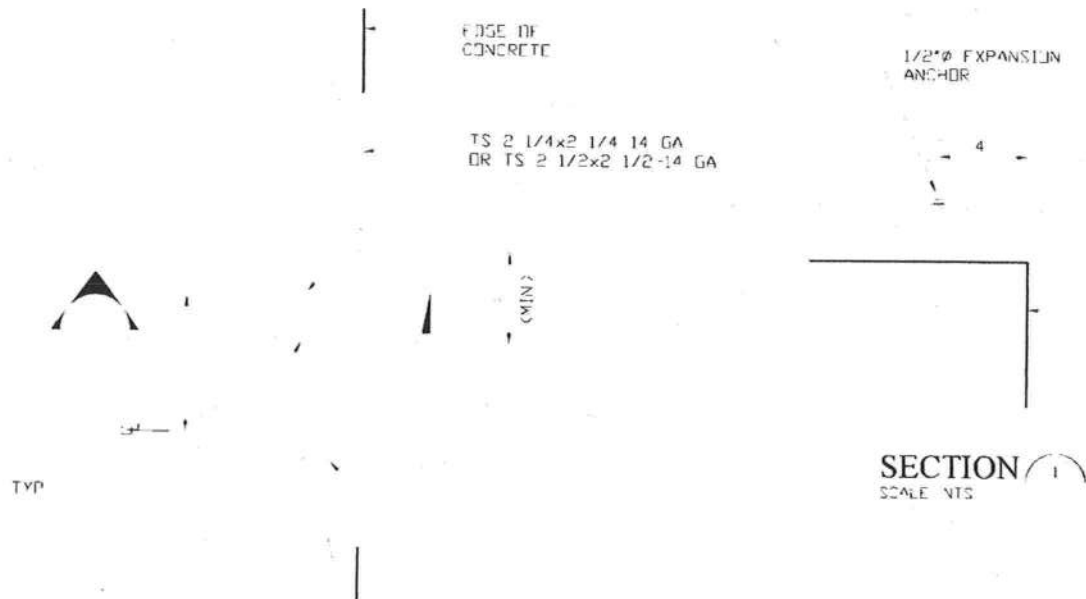
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BASE RAIL ANCHORAGE OPTIONS



TYPICAL ANCHOR DETAIL WHEN BASE
RAIL IS NEAR EDGE OF CONCRETE



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**TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0"x20'-0" ENCLOSED BUILDING EXP. B**

DATE: 7-29-21

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SHT. 9C

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BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS

SEE NOTES
SHEET 33
FOR MAXIMUM

SEE NOTES
SHEET 33
FOR MAXIMUM

OPENING FOR
WITH
(SEE SHEET 16)

PERSONNEL DOOR
WITH HEADER

TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION

SCALE: NTS

SEE NOTES
SHEET 33
FOR MAXIMUM
SPACING

AVE. RAFTER/20' DIM

TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

SCALE: NTS

OPENING FOR WINDOW
WITH HEAD - 8'0"
WINDOW SILL - 2'0"
ASSEMBLED 2'0" x 8'0"
MAX

WITH HEAD

TYPICAL BOX EAVE RAFTER SIDE WALL OPENINGS FRAMING SECTION



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TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0" x 20'-0" ENCLOSED BUILDING EXP. B

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BOW RAFTER END WALL AND SIDE WALL OPENINGS

SEE NOTES
(SHEET 3)
FOR MAXIMUM

SEE NOTES
(SHEET 3)
FOR MAXIMUM

OPENING FOR
BUILT UP

FOR
PERSONNEL DOOR
WITH

TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION

EAVE RAFTER/COLUMN
ASSEMBLY

TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

SCALE: NTS

TYPICAL BOX EAVE RAFTER SIDE WALL OPENINGS FRAMING SECTION



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**TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0"x20'-0" ENCLOSED BUILDING EXP. B**

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SHT. 11

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CONNECTION DETAILS

TS RAF

2"x2"x2" 16 GA ANGLE
CLIP SECURE TO COLUMN
AND RAFTER WITH
#12-14x3/4" SDF'S (2) ON
TOP AND (2) ON SIDE

TS END COLUMN

CONNECTOR
SLEEVE TO
BASE RAIL 3/16

TS COLUMN (CORNER)

MINIMUM 6" LONG, MINIMUM
15 GA TS CONNECTOR
SLEEVE SECURE WITH
(4) #12-14x3/4" SDF'S

2"x2"x2" 16 GA CLIP ANGLE
SECURE TO RAFTER COLUMN
AND BASE RAIL WITH
(4) #12-14x3/4" SDF'S

TS COLUMN
OR END COLUMN

2"x2"x2" 16 GA ANGLE
CLIP SECURE TO COLUMN
AND EITHER TOP OF
HEADER OR BOTTOM OF
WINDOW RAIL WITH
(4) #12-14x3/4" SDF'S

TS RAFTER OR
WINDOW RAIL

TS CONTINUOUS BASE RAIL

4 END COLUMN/RAFTER CONNECTION DETAIL

SCALE: NTS

5 END COLUMN/BASE RAIL CONNECTION DETAIL

SCALE: NTS

6 HEADER OR WINDOW RAIL TO COLUMN CONNECTION DETAIL

SCALE: NTS

TS COLUMN
OR END COLUMN

2"x2"x2" 16 GA ANGLE
CLIP SECURE TO COLUMN
AND EITHER TOP OF
HEADER OR BOTTOM OF
WINDOW RAIL WITH
(4) #12-14x3/4" SDF'S

TS DOUBLE HEADER

TS TRUSSED RAFTER CHORD
OR HEADER

TS END COLUMN
OR BOTTOM WINDOW
RAIL POST

TS RAFTER OR
RAIL OR WINDOW
RAIL

3/16
3/16

CONNECTOR
SLEEVE TO
HEADER

MINIMUM 6" LONG,
MINIMUM 15 GA TS
CONNECTOR SLEEVE
SECURE EACH WITH
(4) #12-14x3/4" SDF'S
TS COLUMN

6A DOUBLE HEADER TO COLUMN CONNECTION DETAIL

SCALE: NTS

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

SCALE: NTS

8 DOUBLE HEADER/COLUMN CONNECTION DETAIL

N

3/16
3/16

MINIMUM 6" LONG,
MINIMUM 15 GA TS
CONNECTOR SLEEVE
SECURE EACH WITH
(4) #12-14x3/4" SDF'S

TS END

TS DOUBLE HEADER

9 COLUMN/DOUBLE HEADER CONNECTION DETAIL

SCALE: NTS



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PROJECT MGR: WSM

CLIENT: TBS

TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0"x20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

SHT. 12

SCALE: NTS

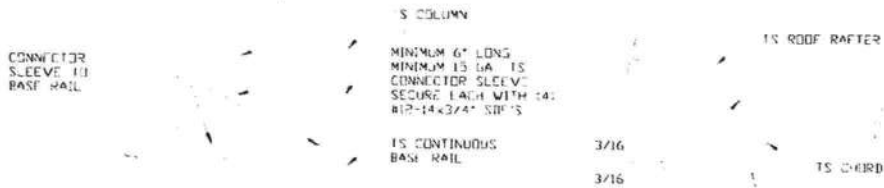
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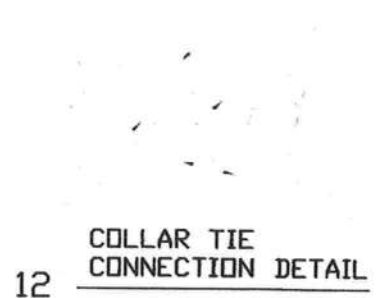
CONNECTION DETAILS



10 COLUMN/BASE RAIL
CONNECTION DETAIL



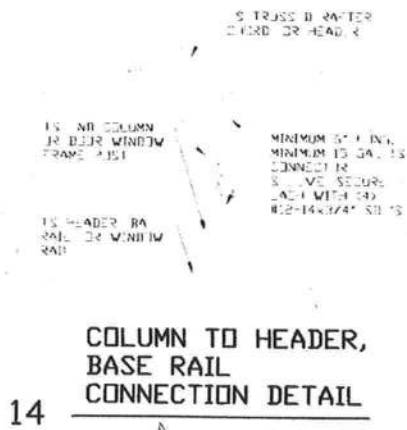
11 RAFTER TO CHORD
CONNECTION DETAIL



12 COLLAR TIE
CONNECTION DETAIL



13 COLUMN/BASE RAIL
CONNECTION DETAIL
SCALE: NTS



14 COLUMN TO HEADER,
BASE RAIL
CONNECTION DETAIL
SCALE: NTS



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TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0"x20'-0" ENCLOSED BUILDING EXP. B

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BOX EAVE RAFTER LEAN-TO OPTIONS

ROOF EXTENSION
OPTION

MAIN STRUCTURE

STANDARD
LEAN-TO OPTION

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

SCALE: NTS

MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO

EAVE HEIGHTS 15'-0" < TO < 20'-0"

MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO

EAVE HEIGHTS 13'-0" (12'-0" FOR HIGH WIND) < TO < 15'-0"

MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO

EAVE HEIGHTS 13'-0" < TO < 12'-0" (12'-0" FOR HIGH WIND) (WITH 4'-4" INSERT)

MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO

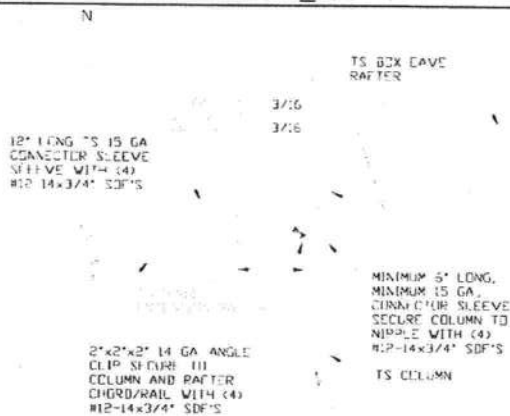
EAVE HEIGHTS < 13'-0"

KNEE BRACES MUST BE 4'-0" (3'-0" FOR HIGH WIND) WHEN LEAN-TOS ARE ADDED



15

SIDE EXTENSION RAFTER/COLUMN DETAIL FOR RAFTER SPANS $\leq 15'-0"$



15A

SIDE EXTENSION RAFTER/COLUMN DETAIL FOR RAFTER SPANS 15'-0" < TO $\leq 24'-0"$



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PROJECT MGR: VSM

CLIENT: TBS

TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0"x20'-0" ENCLOSED BUILDING EXP. B

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SHT. 14

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BOX EAVE RAFTER LEAN-TO OPTIONS

2"x2"x2" 15 GA ANGLE C. IP
SECURE TO COLUMN AND
RAFTER WITH 1/4"x3/4" SDP
SDP'S (2) ON TOP AND (2) ON
BOTTOM

TS RAFTER

TS COLUMN

2"x2" 14 GA ANGLE CLIP
SECURE TO COLUMN AND
RAFTER WITH 1/4"x3/4" SDP
(2) ON TOP AND (2) ON
BOTTOM

3-12
3-12

LEAN-TO RAFTER TO RAFTER
COLUMN CONNECTION DETAIL
FOR RAFTER SPANS $\leq 15'-0"$

16

LEAN-TO RAFTER TO RAFTER
COLUMN CONNECTION DETAIL
FOR RAFTER SPANS
 $15'-0" < \text{TO} \leq 24'-0"$

16A

SCALE NTS



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TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
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SHT. 14A

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BOW RAFTER LEAN-TO OPTIONS

STANDARD

MAIN STRUCTURE

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

NTS

MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE DOUBLE COLUMNS FOR EAVE HEIGHTS 13'-0" TO 19'-0" FOR HIGH WINDS < TO 4 15'-0".
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR EAVE HEIGHTS 13'-0" TO 19'-0" FOR HIGH WINDS (WITH 4'-0" INSERT).
 MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR EAVE HEIGHTS < 13'-0".
 KNEE BRACKETS MUST BE 4" X 8" (5'-0" FOR HIGH WIND) WHEN LEAN-TO'S ARE ADDED.

2"x2"x2" 16 GA ANGLE
 CLIP SECURE TO COLUMN
 AND RAFTER WITH
 #12-14x3/4" SDF'S (2)
 IN TOP AND (2) ON
 BOTTOM

1/8" DOUBLE
 COLUMN

LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR RAFTER SPANS ≤ 15'-0"

17

2"x2"x2" 16 GA ANGLE
 CLIP SECURE TO COLUMN
 AND RAFTER WITH
 #12-14x3/4" SDF'S (2)
 IN TOP AND (2) ON
 BOTTOM

1/8" DOUBLE
 COLUMN

3-12
 3-12

1/8" DOUBLE
 COLUMN

LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR RAFTER SPANS 15'-0" < TO ≤ 24'-0"

17A

SCALE: NTS



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PROJECT MGR: VSM

CLIENT: TBS

TUBULAR BUILDING SYSTEMS
 631 SE INDUSTRIAL CIRCLE
 LAKE CITY, FLORIDA 32025
 30'-0"x20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

SCALE: NTS

JOB NO: 16022S/
 17300S/20352S

SHT. 15

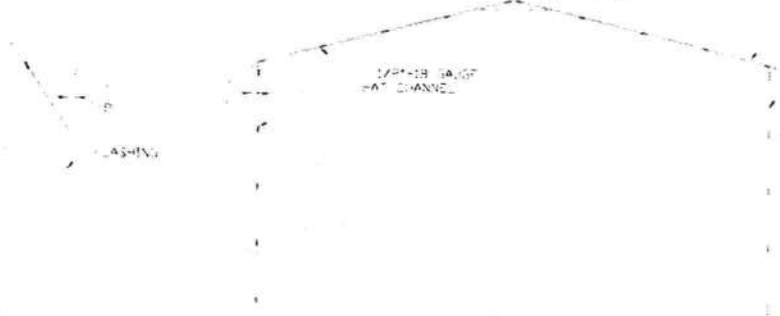
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BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION

2x12 RAFTERS, VERTICAL SIDING AND
WALL PANELS FASTENED TO RAFTERS
CHANNELS AND JOISTS

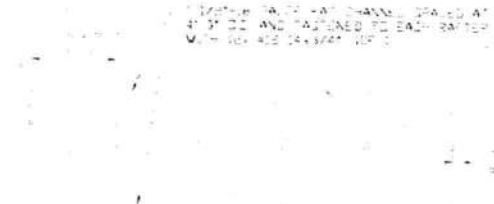


**TYPICAL END ELEVATION
VERTICAL ROOF/SIDING OPTION**

SCALE: NTS

**TYPICAL SECTION VERTICAL
ROOF/SIDING OPTION**

2x12 RAFTERS, VERTICAL SIDING AND
WALL PANELS FASTENED TO RAFTERS
CHANNELS AND JOISTS



**TYPICAL SIDE ELEVATION
VERTICAL ROOF/SIDING OPTION**

SCALE: NTS

**TYPICAL FRAMING SECTION
VERTICAL ROOF/SIDING OPTION**

2x12 RAFTERS, VERTICAL SIDING AND
WALL PANELS FASTENED TO RAFTERS
CHANNELS AND JOISTS



ROOF PANEL ATTACHMENT

ALTERNATE FOR VERTICAL ROOF PANELS
SCALE: NTS

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CHECKED BY: PDH

PROJECT MGR: WSM

CLIENT: TBS

11 BUTLER BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
30'-0"X20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

SHT. 16

SCALE: NTS

DWG. NO: SK-3

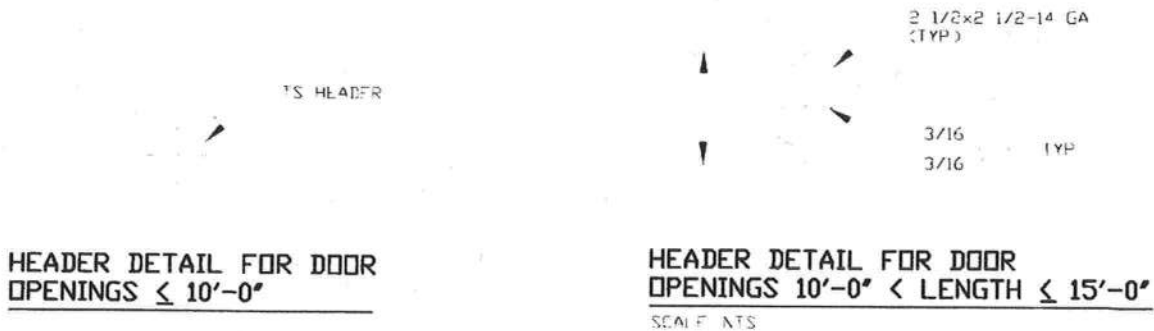
JOB NO: 16022S/

17300S/20352S

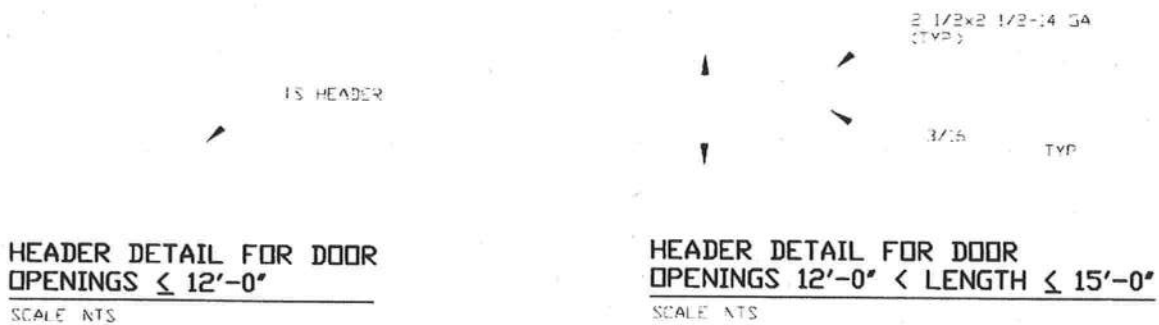
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SIDE WALL HEADER OPTIONS



END WALL HEADER OPTIONS



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TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
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30'-0"x20'-0" ENCLOSED BUILDING EXP. B

DATE: 7-29-21

SCALE: NTS

SHT. 17

DWG. NO: SK-3

JOB NO: 16022S/
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FLOOD VENT DETAIL

FRAME BRACING FOR FLOOD VENT
WITH IS 2 1/2"x2 1/2" MEMBERS
(MATCH ADJACENT RAFTER
POSTS AND BASERAIL)

1/2"-18S OR F
EXPANDED METAL ATTACH
W/ McNICHOLS SQUARE
FASTENERS OR APPROVED
EQUAL AT 6" OC ATTACH
W/ METAL TEK SCREWS

TS
POST

TS BASF
RAIL

MAX.
BLIVE
GRAD

TYPICAL FLOOD VENT DETAIL



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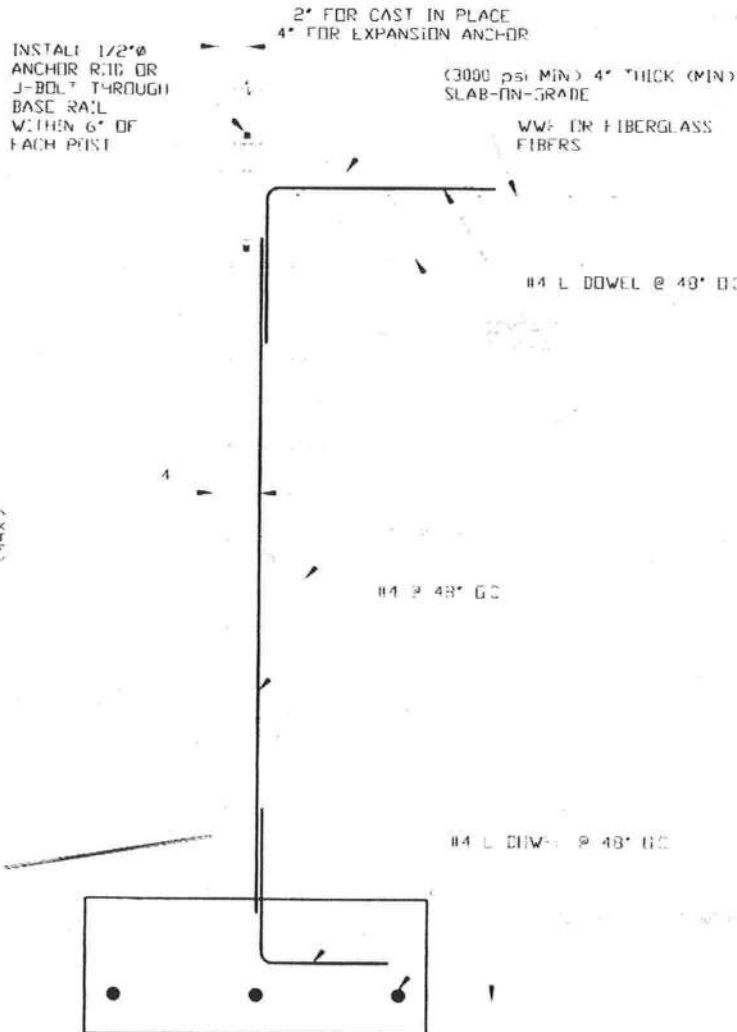
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STAND-ALONE STEM WALL DETAIL



**STAND-ALONE CONCRETE MASONRY UNIT (CMU)
FOUNDATION STEM WALL DETAIL**

ALL NTS



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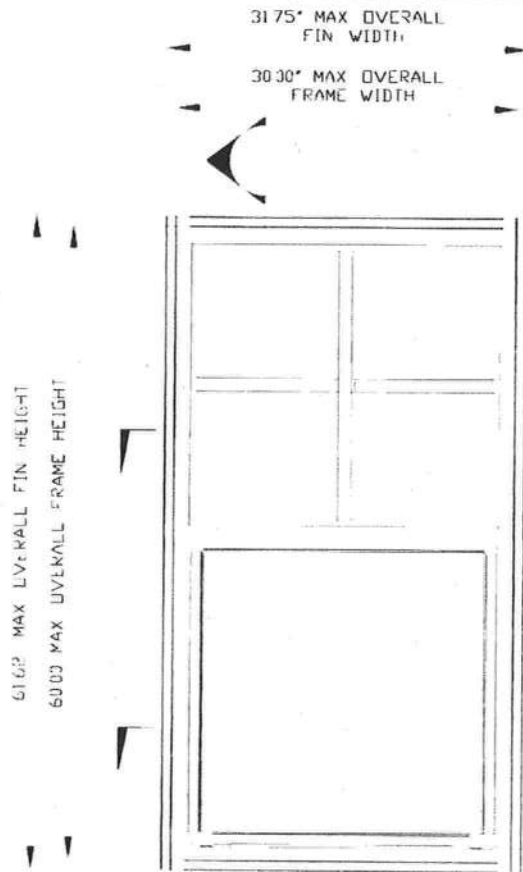
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VERTICAL SLIDING WINDOW DETAIL



ELEVATION VIEW

#12x3/4" SELF-
DRILLING
FASTENERS
(TYP)

EXTERIOR INTERIOR

SECTION
SCALE: 3"=1'-0"

POSITIVE WALL PRESSURE: +40.0 PSF
NEGATIVE WALL PRESSURE: -40.0 PSF

SECTION

1/2" POST
OR RAIL
1/4" CA
(TYP)

EXTERIOR

#12x3/4" SELF-DRILLING
FASTENERS (TYP)

SECTION
SCALE: 3"=1'-0"

3
SK-20



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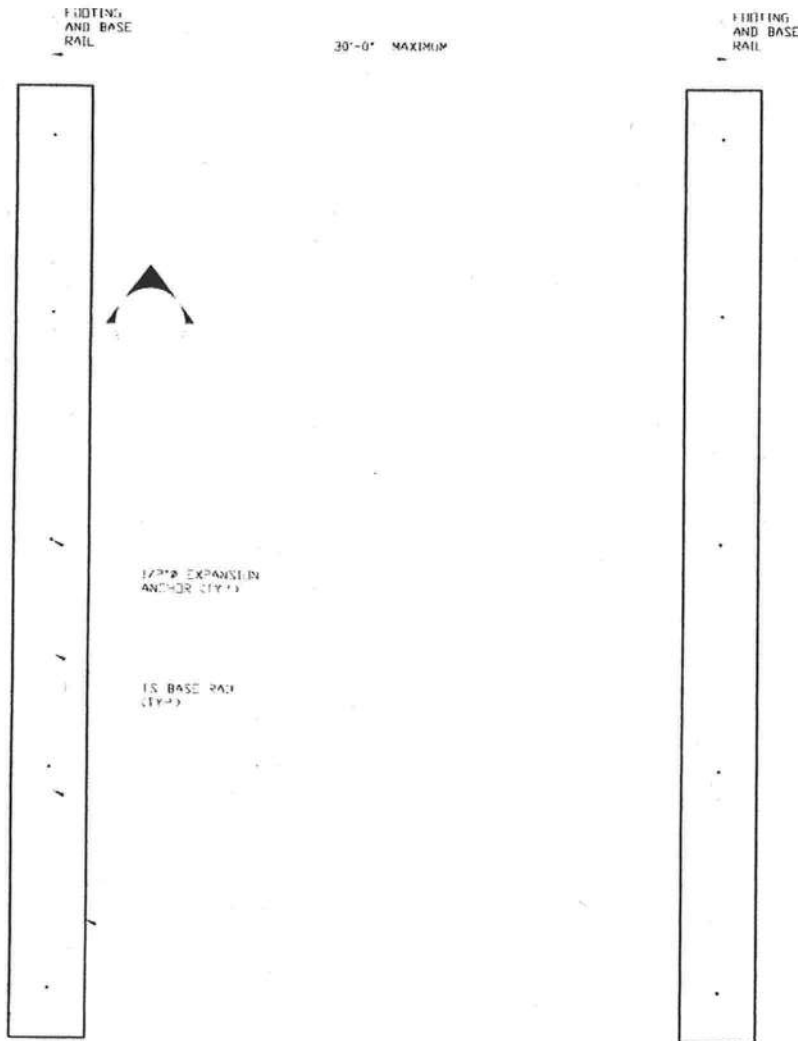
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DWG. NO: SK-3

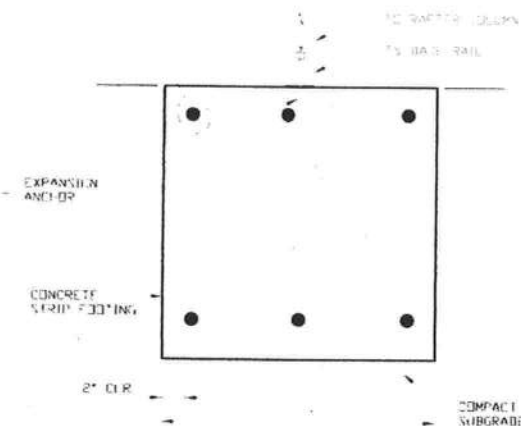
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OPTIONAL CONCRETE STRIP FOOTING



CONCRETE STRIP FOOTING PLAN



SECTION 1
SCALE: NTS (SK-2)

* COORDINATE WITH LOCAL CLIDES/ORD

- 1 STRIP FOOTING DESIGN BASED ON MINIMUM SOIL BEARING CAPACITY OF 1,000 PSF
- 2 CONCRETE SHALL HAVE A MINIMUM SPECIFIC FUNDING STRENGTH OF 3,000 PSI AT 28 DAYS
- 3 FOR FOUNDATIONS INCLUDING CONCRETE JOINTS, JOINTS SHALL BE REINFORCED WITH 8" DIA. BARS AT ALL JOINTS. ALL JOINTS AND REINFORCEMENT SHALL BE WITHIN 10" OF THE FACE OF THE JOINT. THE JOINTS OF WEATHER AND VENT SHALL BE WITHIN 10" OF THE FACE OF THE JOINT.
- 4 THE STRIP FOOTING SHALL BE 30" WIDE AT ALL JOINTS AND SHALL BE 30" WIDE AT ALL JOINTS.
- 5 ALL JOINTS SHALL BE REINFORCED WITH 8" DIA. BARS AT ALL JOINTS. ALL JOINTS AND REINFORCEMENT SHALL BE WITHIN 10" OF THE FACE OF THE JOINT.
- 6 THE STRIP FOOTING SHALL BE 30" WIDE AT ALL JOINTS AND SHALL BE 30" WIDE AT ALL JOINTS.
- 7 THE STRIP FOOTING SHALL BE 30" WIDE AT ALL JOINTS AND SHALL BE 30" WIDE AT ALL JOINTS.
- 8 THE STRIP FOOTING SHALL BE 30" WIDE AT ALL JOINTS AND SHALL BE 30" WIDE AT ALL JOINTS.
- 9 THE STRIP FOOTING SHALL BE 30" WIDE AT ALL JOINTS AND SHALL BE 30" WIDE AT ALL JOINTS.
- 10 THE STRIP FOOTING SHALL BE 30" WIDE AT ALL JOINTS AND SHALL BE 30" WIDE AT ALL JOINTS.



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