

# STRUCTURAL DESIGN

# PARTIALLY ENCLOSED (UTILITY) BUILDING EXPOSURE B

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

29 July 2021 Revision 3 M&A Project No. 16154S/17300S/20352S

Prepared for:

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

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

Wayne S Moore Date: 2022.09.12





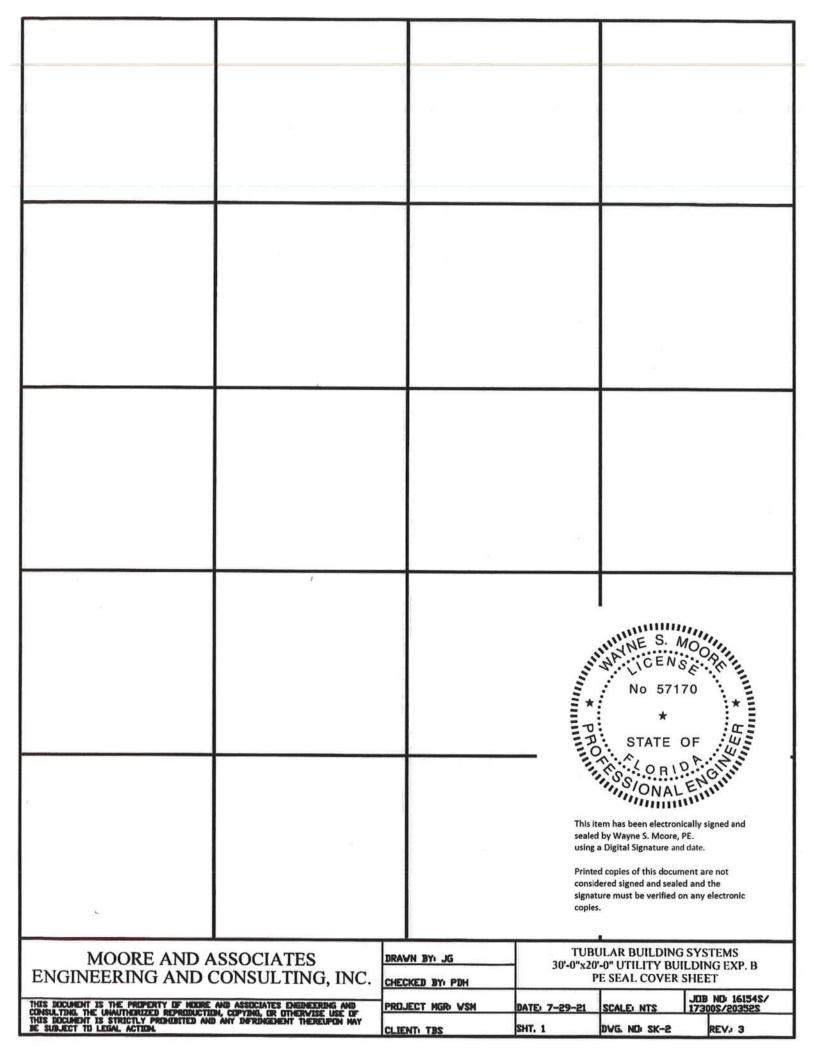
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| SHEET |     | VERTICAL SLIDING WINDOW DETAIL   |
|       |     |  |



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SHEET 21 STRIP FOOTING OPTION

#### INSTALLATION NOTES AND SPECIFICATIONS

- 1 DESIGN IS FOR A MAXIMUM 30'-0' WIDE x 20'-0' EAVE HEIGHT PARTIALLY ENCLOSED UTILITY 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

= 15 b2t

- C) SROUND SNOW LOAD = 10 PSF
- TOO DIE TOOLSTAR MUMIXAM (HOM 801 DT 18 DEEPS DRING) HOW CALL DT 601 DEEPS DRIVE TABLE TO TOOLSTAR THE TOOLST
- 5 HIGH ULTIMATE WIND SPEED 141 TO 170 MPH (NOMINAL WIND SPEED 109 TO 132 MPH): MAXIMUM RAFTER/POST AND END POST SPACING = 40 FEET
- 5 END WALL COLUMNS (POSTS) AND SIDE WALL COLUMNS ARE EQUIVALENT IN SIZE AND SPACING CONLESS NOTED OTHERWISE)

#### 7 RISK CATEGORY 1

- 8 WIND EXPOSURE CATEGORY B
- 9 SPECIFICATIONS APPLICABLE TO 29 GAUGE METAL PANELS FASTENED DIRECTLY TO 2 1/2" × 2 1/2" 14 GAUGE TUBE STEEL (TS) FRAMING MEMBERS FOR VERTICAL PANELS, 29 GAUGE METAL PANELS SHALL BE FASTENED TO 18 GAUGE HAT CHANNELS (UNLESS OTHERWISE NOTED)
- 10 AVERAGE FASTENER SPACING DN-CENTERS ALONG RAFTERS OR PURLINS, AND POSTS, INTERIOR = 9° OR END = 6° (MAX)
- 11 FASTENERS CONSIST OF #12-14x3/4\* SELF-DRILLING FASTENER (SDF), USE CONTROL 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 ROOF SLOPES LESS THAN 3:12 REQUIRE USE OF JOINT SEALANT
- 12 STANDARD ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL WITHIN 6' OF EACH COLUMN
- 13 STANDARD GROUND ANCHORS (SDIL NAILS) CONSIST OF #4 REBAR W/WELDED NUT x 30° LDNG IN SUITABLE SDIL CONDITIONS MAY BE USED FOR LDW ( ≤ 108 MPH NOMINAL) WIND SPEEDS DNLY OPTIONAL ANCHORAGE MAY BE USED IN SUITABLE SDILS AND MUST BE USED IN UNSUITABLE SDILS AS NOTED COORDINATE WITH LDCAL CODES/ORDINANCES REGARDING MINIMUM LENGTH FOR FROST DEPTH PROTECTION
- 14 WIND FORCES GOVERN OVER SEISMIC FORCES SEISMIC PARAMETERS ANALYZED ARE:

SUIL SITE CLASS = D RISK CATEGORY I

R= 325

 $I_{C} = 1.0$ 

Sps= 1522 g

V= CsW

g 9880 = m2



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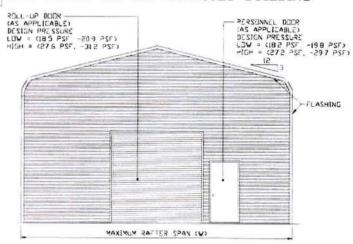
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# BOX EAVE FRAME RAFTER ENCLOSED BUILDING RDLL-UP DOOR (AS APPLICABLE) DESIGN PRESSURE LOW = (185 PSF, -209 PSF) HIGH = (276 PSF -312 PSF) WINDOW (AS APPLICABLE) DESIGN PRESSURE LOW = (191 PSF -20.7 PSF) HIGH = (286 PSF -31.0 PSF) PERSONNEL DOOR (AS APPLICABLE) DESIGN PRESSURE LOW = (18.2 PSF HIGH = (27.2 PSF -199 PSF) 12 FLASHING MAXIMUM RAFTER SPAN (W) LENGTH VARIES DEPENDING ON NUMBER AND SPACING OF RAFTERS TYPICAL SIDE ELEVATION

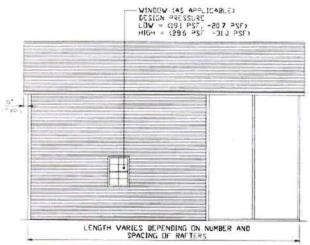
SCALE NTS

# TYPICAL END ELEVATION

## BOW FRAME RAFTER ENCLOSED BUILDING



#### TYPICAL SCALE NTS END ELEVATION



#### **TYPICAL** SIDE ELEVATION

No 57170

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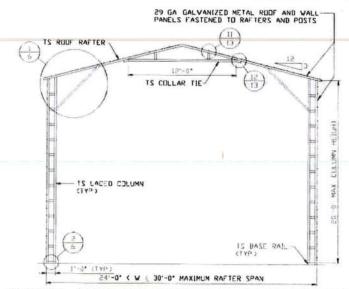
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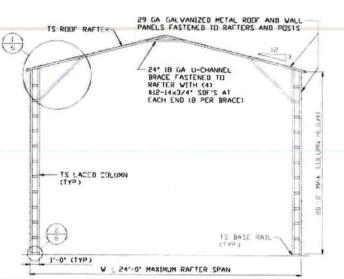
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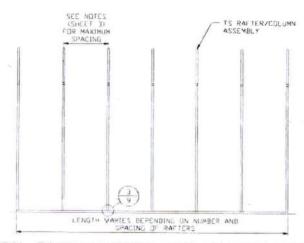
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# TYPICAL RAFTER/COLUMN END FRAME SECTION



TYPICAL RAFTER/COLUMN END FRAME SECTION



TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

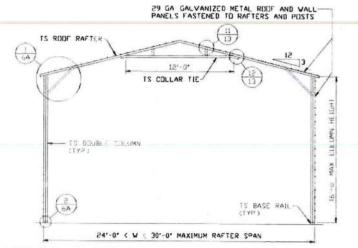


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29 GA GALVANIZED METAL RODF AND WALL
PANELS FASTENED TO RAFTERS AND POSTS

24' 18 GA U-CHANNEL
BRACE FASTENED TO
RAFTER VITH (4)
112-143/34' SDF'S AT
EACH END (8 PER BRACE)

TS DOUBLE COLUMN
(TYP)

V ( 24'-0' MAXIMUM RAFTER SPAN

TYPICAL RAFTER/COLUMN END FRAME SECTION

TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE

SEE NOTES
(SHEET 3)
FOR MAXIMUM
SPACING

LENGTH VARIES DEPENDING ON NUMBER AND
SPACING OF RATTERS

TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

No 57170

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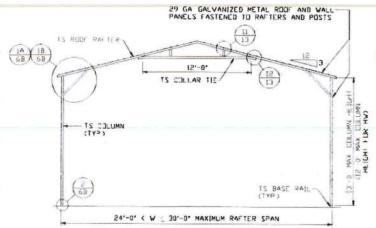
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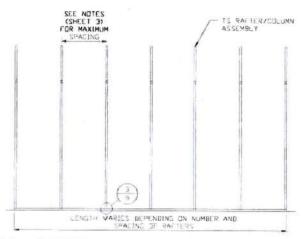


# S9 GA GALVANIZED METAL ROOF AND VALL PARELS FASTENED TO RAFTERS AND POSTS TS ROOF RAFTER 24' 18 GA U-CHANNEL BRACE FASTENED TO RAFTER VIT-4 (A) TO RIZ-14X3/4' SDF'S AT EACH END (8 SER BRACE) TS COLUMN (TYP) TS BASE RAIL V & 24'-0' MAXIMUM RAFTER SPAN

# TYPICAL RAFTER/COLUMN END FRAME SECTION

TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE: NTS



# TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

SCALE NTS

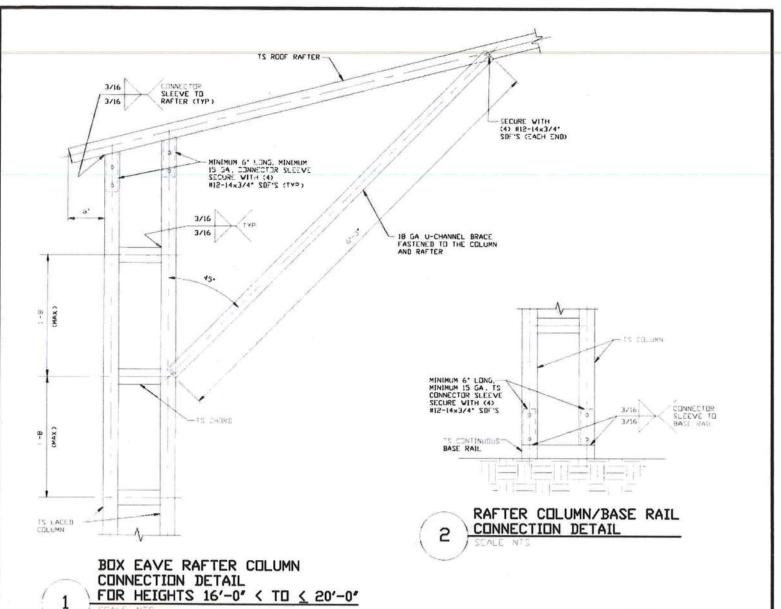


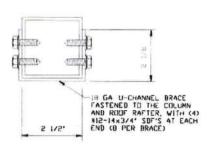
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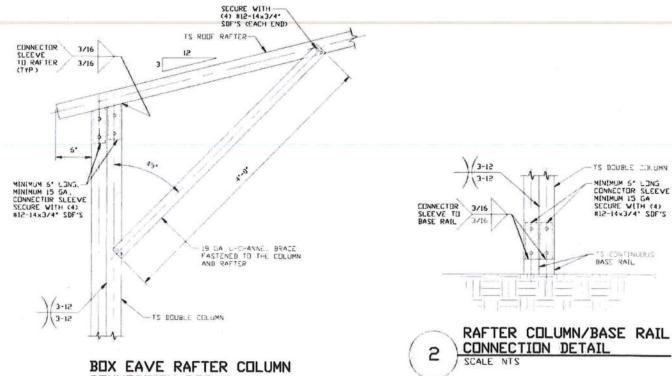




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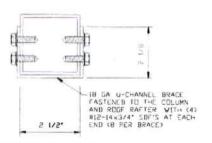


BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 13'-0' < TO <u>⟨</u> 16'-0'

SCALE NIS

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NOTE: COLUMN HEIGHTS 12'-0" ( TO & 16'-0" FOR HIGH WIND

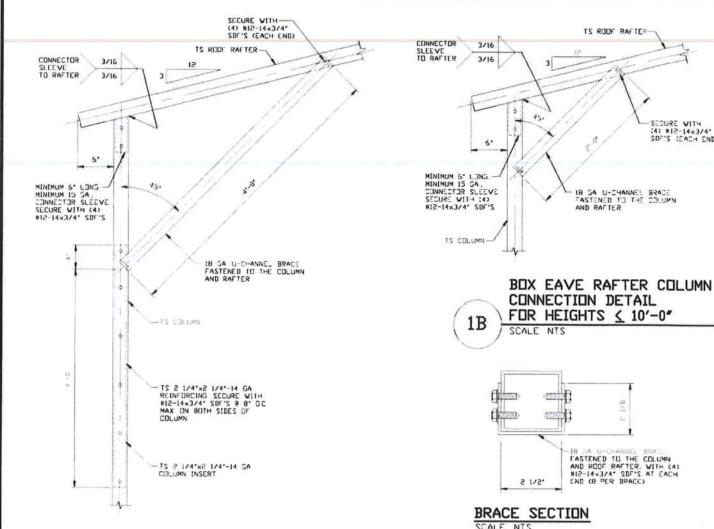


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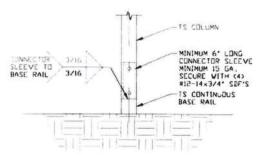
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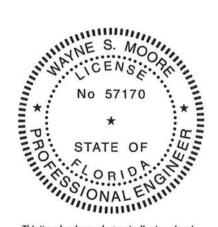
BOX EAVE RAFTER COLUMN CONNECTION DETAIL FDR HEIGHTS 10'-0" < T□ ≤ 13'-0"

SCALE NTS NOTE MAXIMUM COLUMN HEIGHT IS 12'-0' FOR HIGH WIND



1A

RAFTER COLUMN/BASE RAIL CONNECTION DETAIL SCALE NTS



TS ROOF RAFTER

SECURE VITH (4) #12-[4x3/4\* SDF'S (EACH END)

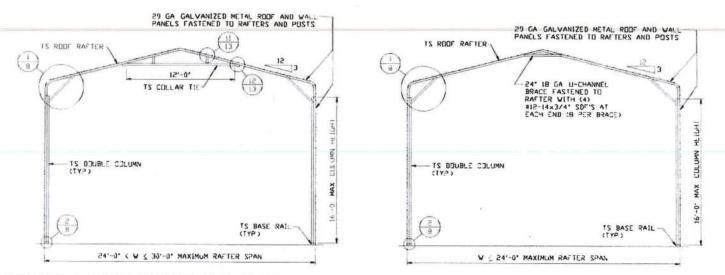
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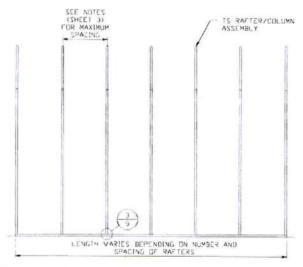
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### TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE NTS

TYPICAL RAFTER/COLUMN END FRAME SECTION
SCALE: NTS



## TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

SCALE NTS

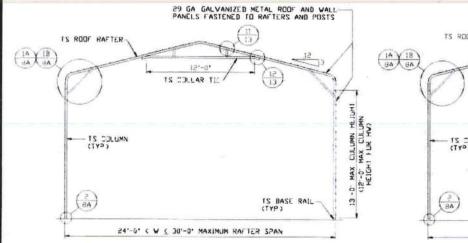


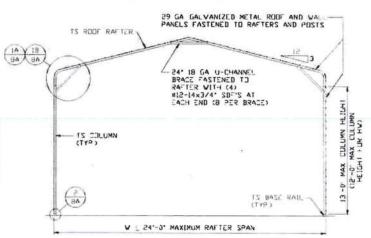
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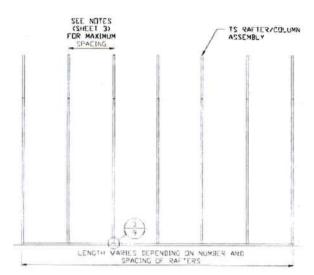
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# TYPICAL RAFTER/COLUMN END FRAME SECTION

TYPICAL RAFTER/COLUMN END FRAME SECTION SCALE NTS



# TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

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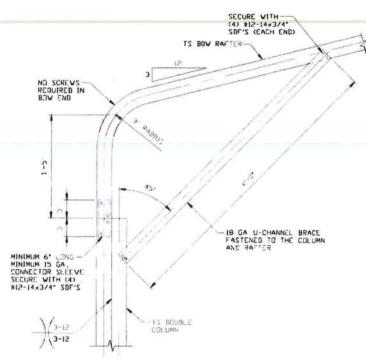
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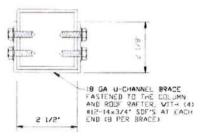
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|-----------------|-------------|---|--|--|--|
|                 | LA          | 631 SE INDUSTRIAL CIRCLE LAKE CITY, FLORIDA 32025 30'-0"x20'-0" UTILITY BUILDING EXP. B |  |  |  |
| DRAWN BY: JG    | Victoria de | TUBULAR BUILDING SYSTEMS  |  |  |  |

CLIENT: TBS SHT. 7A DVG. ND: SK-2 REV.: 3



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

SCALE NTS NOTE COLUMN HEIGHTS 12'-0" < TO < 16'-0" FOR HIGH WIND



# BRACE SECTION

1

CONNECTOR 3/16

CONNECTOR 3/16

SLEEVE TO BASE RAIL

3/16

3/16

3/16

3/16

3/16

3/16

3/16

3/16

3/16

3/16

3/16

3/16

3/16

3/16

3/16

3/16

3/16

3/16

3/16

2 RAFTER COLUMN/BASE RAIL
2 CONNECTION DETAIL



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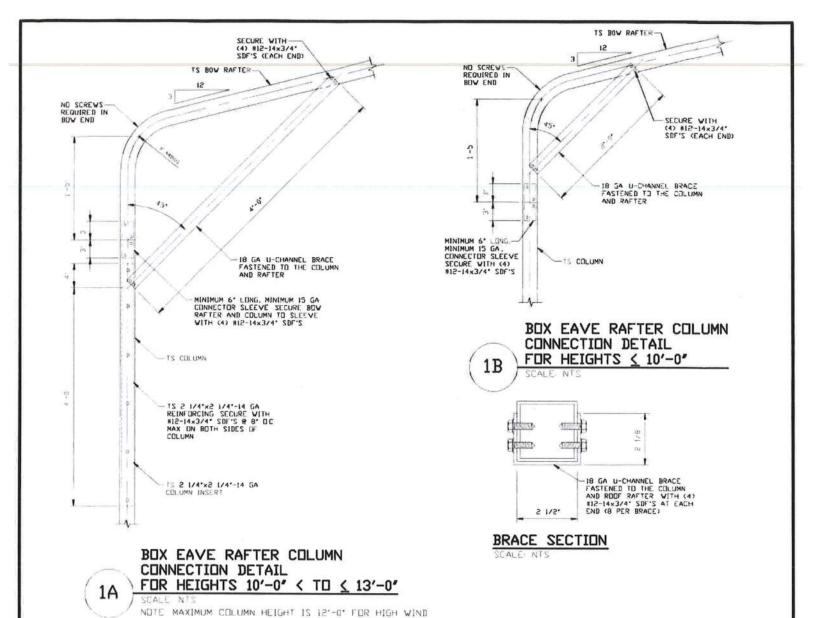
DRAWN BY: JG CHECKED BY: PDH TUBULAR BUILDING SYSTEMS 631 SE INDUSTRIAL CIRCLE LAKE CITY, FLORIDA 32025 30'-0"x20'-0" UTILITY BUILDING EXP. B

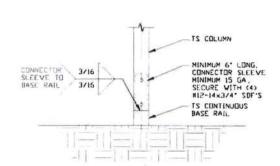
PROJECT MGRI VSM DATE: 7-29-21

SCALE: NTS

JDB ND: 16154S/ 17300S/20352S REV.: 3

CLIENT: TBS SHT. 8 DVG. ND: SK-2









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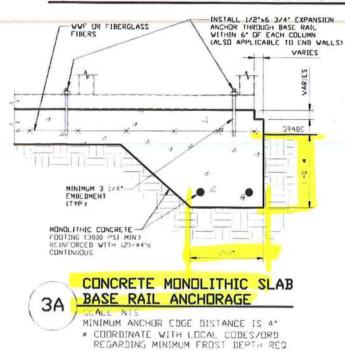
# BASE RAIL ANCHORAGE OPTIONS FOR LOW AND HIGH WIND SPEED

2" WASHERS

TS CONTINUOUS
BASE RAIL

HELIX EYE ANCHOR-

TOP OF ASPHALT
PAVEMENT OR
GROUND SURFACE



## 3R GROUND BASE HELIX ANCHORAGE

BRILL 5/8' DIAMETER HOLE THROUGH THE BASE RAIL AND SECURE TO ANCHOR EYE WITH L/2' DIAMETER THROUGH BOLT

SCALE NTS
(CAN BE USED FOR ASPHALT)
\* COURDINATE WITH LOCAL CODES/ORD
REGARDING MINIMUM FROST DEPTH REO

#### **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 ACT-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:

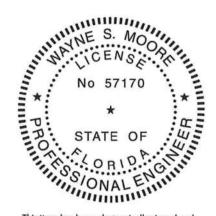
THE TURNDOWN REINFORCING STEEL SHALL BE ASTM AGIS GRADE 50 THE SLAB REINFORCEMENT SHALL BE WELDED WIRE FABRIC MEETING ASTM A185 OR FIBERGLASS FIBER REINFORCEMENT

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

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

#### HELIX ANCHOR NOTES

- FOR VERY DENSE AND/OR CEMENTED SANDS, CHARSE GRAVEL AND CHBBLES CALICHE PRELIADED SILTS AND CLAYS USE MINIMUM (2) 4' HELICES WITH MINIMUM 30 INCH EMBEDMENT
- FOR CORAL USE MINIMUM (2) 4' HELICES WITH MINIMUM 30 INCH
- FOR MEDIUM DENSE COARSE SANDS, SANDY GRAVELS VERY
  STIFF SILTS, AND CLAYS USE MINIMUM (2) 4' HELICES WITH
  MINIMUM 30 INCH EMBEDMENT
- 4 FOR LOUSE 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 LOSE TO MEDIUM DENSE SANDS, FIRM TO STIFFER CLAYS AND SILTS, ALLUVIAL FILL USE MINIMUM (2) 8' HELICES WITH MINIMUM 60 INCH EMBEDMENT



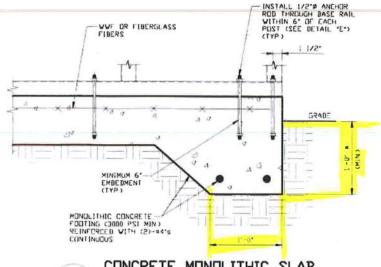
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| PROJECT MGR: VSM | DATE: 7-29-21   | SCALE: NTS   |  | 00S/20352S |  |  |
| CI TENTI TRO     | 9 .тнг  | DVG. NO SK-2 |  | REV. 3     |  |  |

# OPTIONAL FOUNDATION ANCHORAGE FOR LOW AND HIGH WIND SPEED



3C

CONCRETE MONOLITHIC SLAB **ANCHORAGE** BASE RAIL

SCALE NTS MINIMUM ANCHOR EDGE DISTANCE IS 1 1/2. \* COURDINATE WITH LOCAL CODESZORD REGARDING MINIMUM FROST DEPTH REQ

## GENERAL NOTES

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

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 ACT-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 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

ON 175.9 439 175.9 439 TYCONCRETE EMBED 1/8 HEAVY HEX NUT

ANCHOR ROD THROUGH BASE RAIL DETAIL



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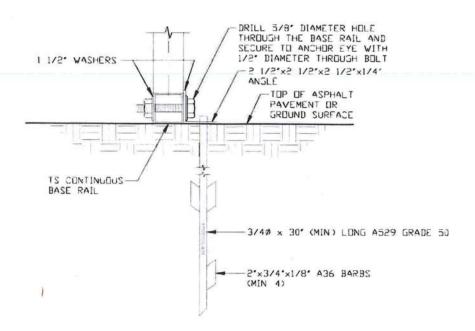
TUBULAR BUILDING SYSTEMS 631 SE INDUSTRIAL CIRCLE LAKE CITY, FLORIDA 32025 30'-0"x20'-0" UTILITY BUILDING EXP. B

PROJECT MGR: WSM DATE: 7-29-21 SHT. 9A DWG. NO SK-2 CLIENT: TBS

JOB NO 16154S/ SCALE: NTS

17300S/20352S REV. 3

# BASE RAIL ANCHORAGE OPTION



ASPHALT BASE ANCHORAGE (HP 9 BARBED DRIVE ANCHOR)

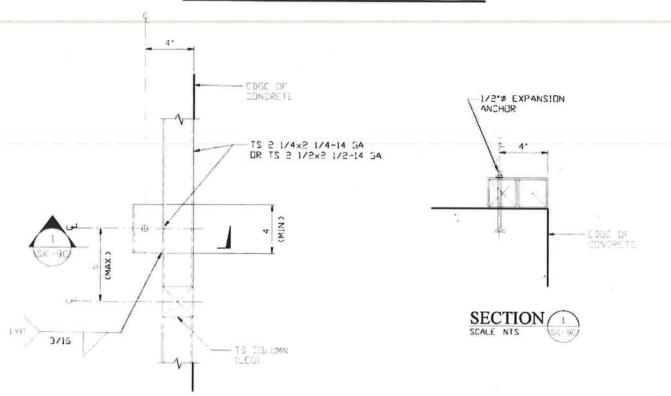
SCALE NTS (CAN BE USED FOR ASPHALT) \* COORDINATE WITH LOCAL CODES/ORD REGARDING MINIMUM FROST DEPTH REO



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# **BASE RAIL ANCHORAGE OPTIONS**



TYPICAL ANCHOR DETAIL WHEN BASE RAIL IS NEAR EDGE OF CONCRETE

SCALE NTS



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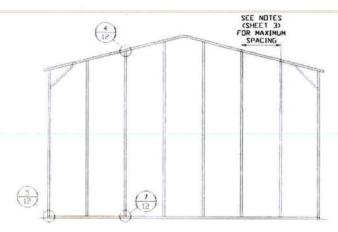
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TUBULAR BUILDING SYSTEMS 631 SE INDUSTRIAL CIRCLE LAKE CITY, FLORIDA 32025 30'-0"x20'-0" UTILITY BUILDING EXP. B

PROJECT MGR: VSM DATE: 7-29-21 SCALE: NTS JOB ND: 16154S/
17300S/20352S

CLIENT: TBS SHT. 9C DVG. ND: SK-2 REV.: 3

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

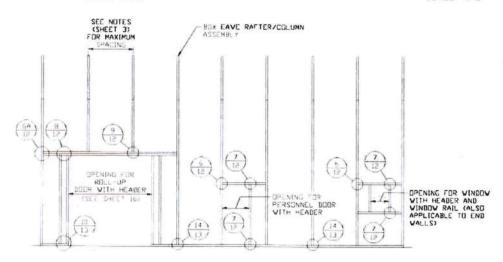


# TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION SCALE: NTS

TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

DDD+ WITH +EADS 032+ WITH +EADS (\$22 \$4821 16)

(12)



# TYPICAL BOX EAVE RAFTER SIDE WALL OPENINGS FRAMING SECTION

SCALE NIS



SEE NOTES (SHEET 3) FOR MAXIMUM SPACING

> DENING FOR PERSONNEL DOOR VITH HEADER

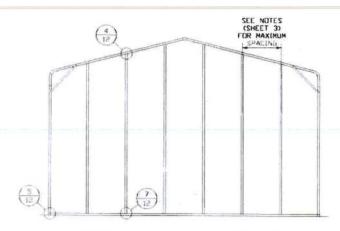
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|------------------|---|--------------|--|---------------------------|--|
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# **BOW RAFTER END WALL AND SIDE WALL OPENINGS**



# TYPICAL BOX EAVE RAFTER END WALL FRAMING SECTION

SEE NOTES
(SHEET 3)
FOR MAXIMUM
SPACING

DPENING FOR
ROLL-UP
STEENING FOR
ROLL-UP
(SEE SHEET 16)

7
PERSONNEL DOOR
VITH HEADER

TYPICAL BOX EAVE RAFTER END WALL OPENINGS FRAMING SECTION

SEE NOTES
(SHEET 3)
FOR MAXIRUM
SPACING

DPENING FOR
POLL - DOTO WITH HEADER
ASSEMBLY

ASSEMBLY

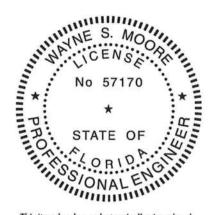
BUX EAVE RAFTER/COLUMN
ASSEMBLY

ASSEMBLY

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

# TYPICAL BOX EAVE RAFTER SIDE WALL OPENINGS FRAMING SECTION

SCALE NTS



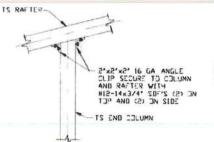
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| DRAWN BY: JG     | 631 SE INDUSTRIAL CIRCLE  |              |                                  |  |

## **CONNECTION DETAILS**



TS COLUMN (CORNER) MINIMUM 6' LONG, MINIMUM 15 GA. TS CONNECTOR SLEEVE SECURE VITH (4) B12-14×3/4' SDF'S 2'x2'x2' 16 GA CLIP ANGLE SECURE TO RAFTER COLUMN AND BASE RAIL W/(4) H12-14x3/4' SDF'S CONNECTOR SLEEVE TO BASE RAIL 3/16 3/15 TS CONTINUOUS BASE RAIL

TS COLUMN OR END COLUMN 2'x2'x2' 16 GA ANGLE CLIP SECURE TO COLUMN AND EITHER TOP OF HEADER, OR BOTTOM OF VINDOV RAIL WITH BI2-14x3/4' SDF'S SE SEGNER 2T WINDOW RAIL

END COLUMN/RAFTER CONNECTION DETAIL

END COLUMN/BASE RAIL CONNECTION DETAIL

TRUSSED RAFTER CHORD

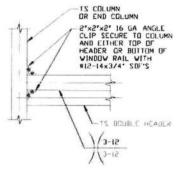
2'x2'x2' 16 GA ANGLE CLIP SECURE TO COLUMN (EACH SIDE) AND RAFTER CHORD/RAIL

(2) ON BOTTOM AND (2) ON SIDE

NOTE: AT ROLL-UP DOOR
OPENINGS, POST SHOULD
BE FLUSH WITH RAIL
END CLIP POST TO
RAIL ONLY ON SIDE
OPPOSITE THE OPENING

HEADER OR WINDOW RAIL TO COLUMN CONNECTION DETAIL

6



COLUMN TO HEADER, DOUBLE HEADER BASE RAIL, OR TO COLUMN WINDOW RAIL CONNECTION DETAIL SCALE NTS

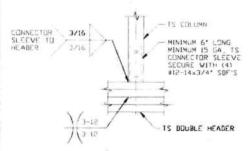
TS END COLUMN-OR DOGR VINDOV FRAME POST

IS HEADER RAIL. OR VINDOV

SLEEVE TO HEADER 3/16 3-12 3/16 MINIMUM 6' LONG MINIMUM 15 GA. TS CONNECTOR SLEEVE SECURE EACH WITH (4) NIZ-14×3/4' SDF'S S COLUMN

CONNECTION DETAIL

DOUBLE HEADER/COLUMN CONNECTION DETAIL 8



9

COLUMN/DOUBLE HEADER CONNECTION DETAIL

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PROJECT MGR: WSM

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17300\$/20352\$

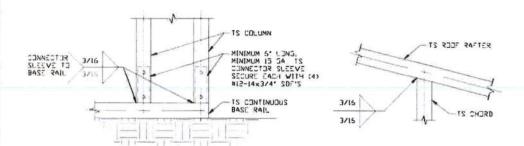
REV. 3

SCALE: NTS

SHT. 12 DWG. ND SK-2 CLIENT: TBS

DATE: 7-29-21

# **CONNECTION DETAILS**



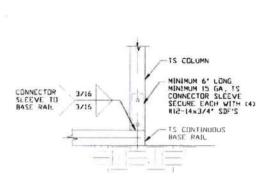
TS SOULAR THE

10 COLUMN/BASE RAIL CONNECTION DETAIL

RAFTER TO CHORD CONNECTION DETAIL

SCALE- NIS

12 COLLAR TIE CONNECTION DETAIL



TS TRUSSED RAFTER CHORD, OR HEADER

TS END COLUMN
OR DOOR WINDOW
FRAME POST

TS END COLUMN
OR MINIMUM 15 GA, TS COMNECTOR
SLEEVE SECURE
EACH WITH (4)
8:2-14x3/4' SDF'S

RAIL, OR WINDOW

13 CONNECTION DETAIL

COLUMN TO HEADER,
BASE RAIL
CONNECTION DETAIL
SCALE: NTS



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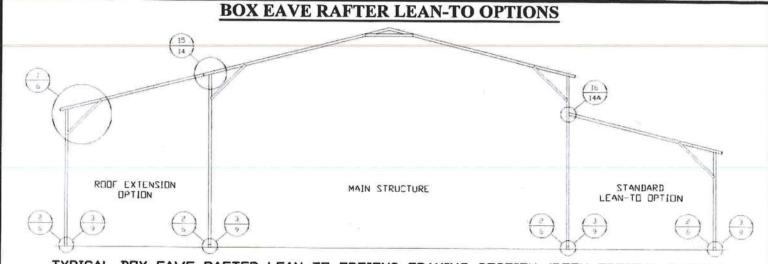
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TUBULAR BUILDING SYSTEMS
631 SE INDUSTRIAL CIRCLE
LAKE CITY, FLORIDA 32025
CHECKED BY PDH 30'-0"x20'-0" UTILITY BUILDING EXP. B

PROJECT MGR: VSM DATE: 7-29-21 SCALE: NTS 17300S/20352S

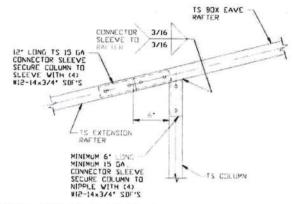
CLIENTI TBS SHT. 13 DVG. NO SK-2 REV. 3



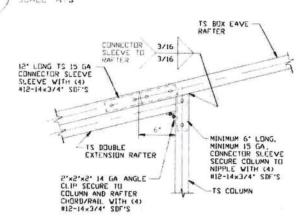
# TYPICAL BOX EAVE RAFTER LEAN-TO OPTIONS FRAMING SECTION (BOTH OPTIONS SHOWN)

MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE LACED COLUMNS FOR EAVE HEIGHTS 16'-0' ( TO \( \) 20'-0' MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE DOUBLE COLUMNS FOR MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR EAVE HEIGHTS 10'-0' ( TO \( \) 13'-0' (12'-0' FOR HGH WIND) (WITH 4'-4' INSERT)

MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR EAVE HEIGHTS \( \) 10'-0' ( TO \( \) 13'-0' (12'-0' FOR HGH WIND) WHEN LEAN-TO'S ARE ADDED



# SIDE EXTENSION RAFTER/COLUMN DETAIL FOR RAFTER SPANS < 15'-0'



SIDE EXTENSION RAFTER/COLUMN DETAIL FOR RAFTER SPANS 15'-0' < TO & 24'-0'



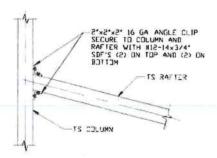
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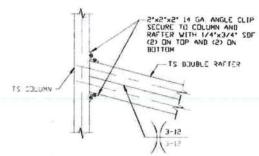
| DRAWN BY: JG<br>CHECKED BY: PDH | TUBULAR BUILDING SYSTEMS 631 SE INDUSTRIAL CIRCLE LAKE CITY, FLORIDA 32025 30'-0"x20'-0" UTILITY BUILDING EXP. B |              |                                  |  |  |
|---------------------------------|--|--------------|----------------------------------|--|--|
| PROJECT MGR: WSM                | DATE: 7-29-21  | SCALE: NTS   | JOB NO: 16154S/<br>17300S/20352S |  |  |
| CLIENT: TBS                     | SHT. 14  | DVG. NO SK-2 | REV. 3                           |  |  |

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



LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL

FOR RAFTER SPANS & 15'-0'



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

16A) SCALE NT



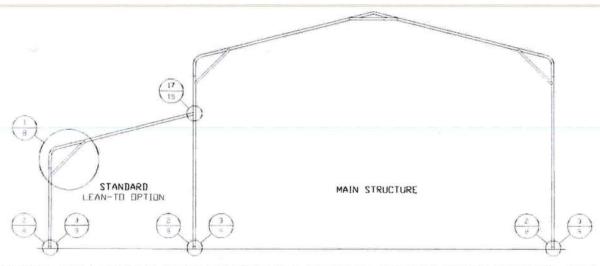
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|------------------|--|-------------|--|------------------------------|
| CHECKED BY: PDH  |  |             |  |                              |
| PROJECT MGR: VSM | DATE: 7-29-21  | SCALE: NTS  |  | B ND: 16154S/<br>100S/20352S |
| CLIENT, TRO      | SHT. 14A   | DVG ND SK-2 |  | PEV. 3                       |

## **BOW RAFTER LEAN-TO OPTIONS**



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

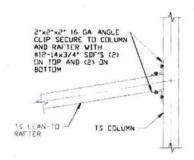
SCALE, NTS

MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE DOUBLE COLUMNS FOR 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 BE SINGLE COLUMNS FOR EAVE HEIGHTS 10'-0' < TO < 13'-0' (12'-0' FOR HIGH WIND) (WITH 4'-4' INSERT)

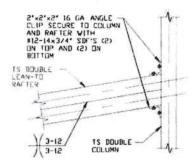
MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR

EAVE HEIGHTS & 10'-0'

KNEE BRACES MUST BE 4'-0' (5'-0' FOR HIGH WIND) WHEN LEAN-TO'S ARE ADDED



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



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

SCALE NTS



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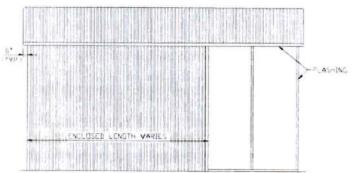
| DRAWN BY: JG     |   | TUBULAR BUILDING SYSTEMS<br>631 SE INDUSTRIAL CIRCLE |  |                           |  |
|------------------|---|--|--|---------------------------|--|
| CHECKED BY: PDH  | LAKE CITY, FLORIDA 32025<br>30'-0"x20'-0" UTILITY BUILDING EXP. B |  |  |                           |  |
| PROJECT MGR: VSM | DATE: 7-29-21   | SCALE: NTS   |  | ND: 16154S/<br>00S/20352S |  |
| CLIENT: TBS      | SHT. 15   | DWG. NO: SK-2  |  | REV. 3                    |  |

# TYPICAL END ELEVATION 29 GA GALVANIZED METAL RODF AND WALL PARELS FASTERED TO HAT CHANNELS AND GIRTS 127 127 127-18 GAUGE HAT CHANNEL TYPICAL SECTION VERTICAL

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

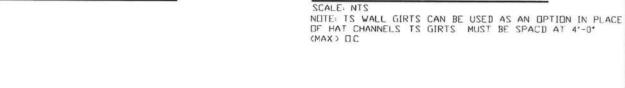
# TYPICAL END ELEVATION VERTICAL ROOF/SIDING OPTION

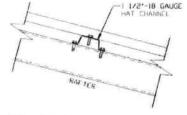
SCALE: NTS



## TYPICAL SIDE ELEVATION VERTICAL ROOF/SIDING OPTION

SCALE NTS





## ROOF PANEL ATTACHMENT

(ALTERNATE FOR VERTICAL ROOF PANELS) SCALE: NTS



1 1/2'-18 GAUGE HAT CHANNEL SPACED AT 4'-0' D.C AND FASTENED TO EACH RAFTER WITH (2) #12-14x3/4' SDF'S

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|-----------------|--|--|--|--|--|
|                 | LAKE CITY, FLORIDA 32025                             |  |  |  |  |
| DRAWN BY: JG    | TUBULAR BUILDING SYSTEMS<br>631 SE INDUSTRIAL CIRCLE |  |  |  |  |

ROOF/SIDING OPTION

TYPICAL FRAMING SECTION

VERTICAL ROOF/SIDING OPTION

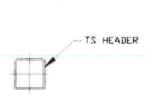
SCALE: NTS

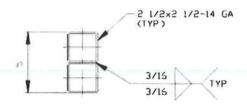
SEE NOTES
(SHEET 3)
FOR MAXIMUM

PROJECT MGR: VSM DATE: 7-29-21 SCALE: NTS 17300S/20352S

CLIENT: TBS SHT. 16 DVG. ND: SK-2 REV.: 3

## SIDE WALL HEADER OPTIONS





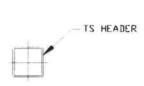
HEADER DETAIL FOR DOOR OPENINGS ≤ 10'-0"

SCALE NTS

HEADER DETAIL FOR DOOR OPENINGS 10'-0" < LENGTH ≤ 15'-0"

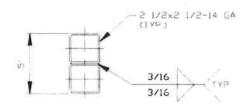
SCALE NIS

# END WALL HEADER OPTIONS



HEADER DETAIL FOR DOOR OPENINGS ≤ 12'-0"

SCALE NIS



HEADER DETAIL FOR DOOR OPENINGS 12'-0" < LENGTH ≤ 15'-0"

SCALE NTS



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| CHECKED BY PDH |

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

PROJECT MGR: WSM DATE: 7-29-21

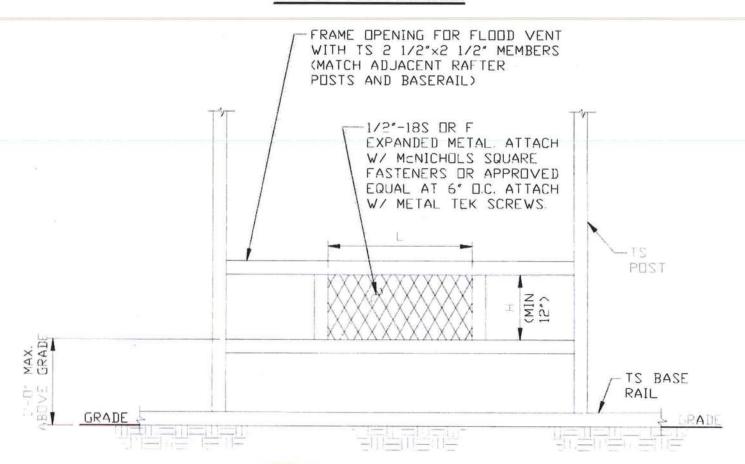
CLIENT: TBS SHT. 17

SCALE: NTS 173

JDB ND 16154S/ 17300S/20352S REV. 3

7 DWG. NO: SK-2

# FLOOD VENT DETAIL



TYPICAL FLOOD VENT DETAIL

MINIMUM VENT SPACE REQUIRED = 1 SQ INCH OF OPEN VENT AREA PER SQ. FOOT OF BUILDING AREA

SCALE NTS

- THERE SHALL BE A MINIMUM OF TWO OPENINGS ON DIFFERENT SIDES FOR EACH ENCLOSED BUILDING
- 3 APPLY 13 FACTOR WHEN CALCULATING TOTAL OPEN AREA WHEN USING 1/2"-18G4 S OR F EXPANDED METAL
- 4 TOTAL OPEN AREA OF VENT = LxH(MIN 12\*)
- 5 FLOOD VENT DETAIL COMPLIES WITH FEMAINFIP
- 6 PREFABRICATED FLOOD VENTS MEETING THE REQUIREMENTS OF FEMA/NIFIP MAY BE USED



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

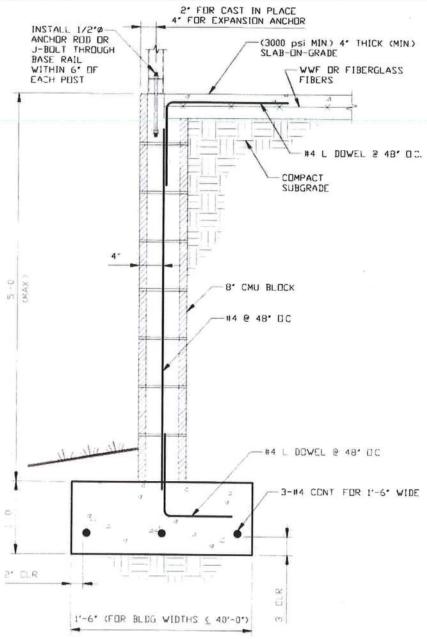
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 DATE: 7-29-21

 CLIENT: TBS
 SHT. 18

SCALE: NTS JUB NO: 16154S/ 17300S/20352S DVG, ND: SK-2 REV.: 3

# STAND -ALONE STEM WALL DETAIL



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



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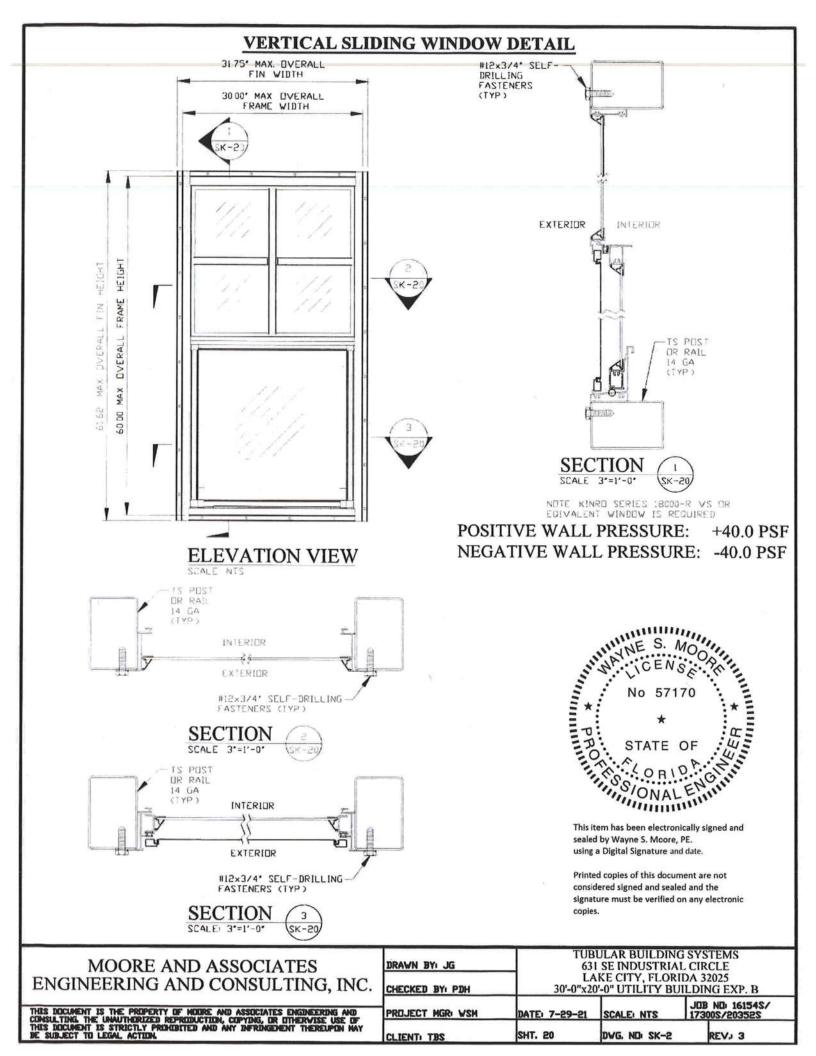
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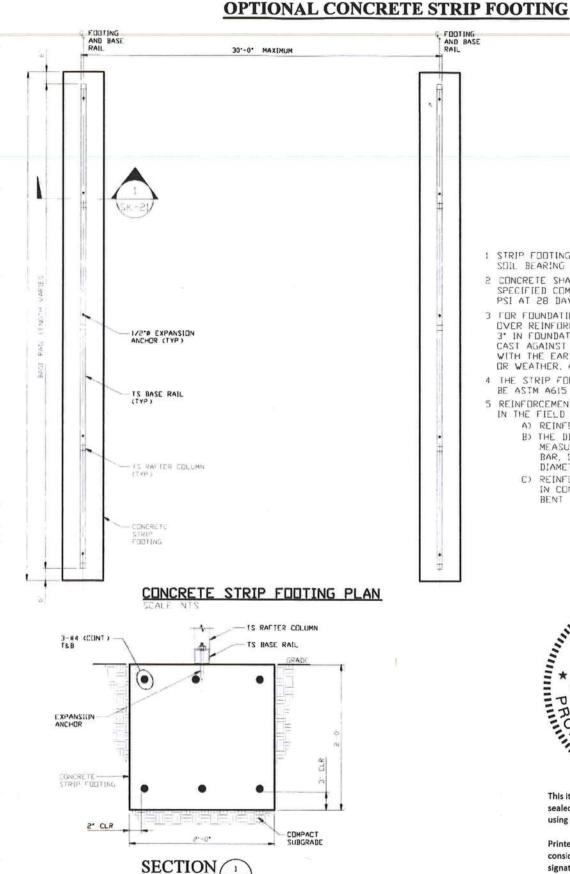
| DRAWN BY: JG    | TUBULAR BUILDING SYSTEMS<br>631 SE INDUSTRIAL CIRCLE              |
|-----------------|---|
| CHECKED BY: PDH | LAKE CITY, FLORIDA 32025<br>30'-0"x20'-0" UTILITY BUILDING EXP. F |
|                 | IPPO AND ACCOUNT  |

JDB ND: 16154S/ 17300S/20352S PROJECT MGRI WSM DATE: 7-29-21 SCALE: NTS

SHT. 19 DWG. ND SK-2 CLIENT: TBS

REV. 3





STRIP FOOTING DESIGN BASED ON MINIMUM SDIL BEARING CAPACITY OF 1,500 PSF

CONCRETE SHALL HAVE A MINIMUM SPECIFIED COMPRESSIVE STRENGTH OF 3,000 2YAU 85 TA 129

3 FOR FOUNDATIONS, MINIMUM CONCRETE COVER DVER REINFORCING BARS SHALL BE PER ACT-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

4 THE STRIP FOOTING REINFORCING STEEL SHALL BE ASTM AGIS GRADE 60

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

A) REINFORCEMENT IS BENT COLD

B) THE DIAMETER OF THE BEND.
MEASURED ON THE INSIDE OF THE
BAR, IS NOT LESS THAN SIX-BAR DIAMETERS

C) REINFORCEMENT PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE FIELD

WANTE S. MOON

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SCALE: NTS

SK-51 \* COORDINATE WITH LOCAL CODES/ORD

> DRAWN BY: JG CHECKED BY: PDH

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

PROJECT MGR: WSM DATE: 7-29-21 SCALE: NTS JOB NO 16154S/ 173008/203528

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SHT. 21 CLIENT: TBS

DWG. ND: SK-2

REV. 3