TUBULAR BUILDING SYSTEMS

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

COLUMBIA COUNTY BUILDING DEPARTMENT
Received for FILE COPY
Code Compliance
PLANS EXAMINER

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

MOORE AND ASSOCIATES
ENGINEERING AND CONSULTING

WAYNE S. MOORE
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No 57170
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PROFESSIONAL ENGINEER

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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			
	PROJECT MGR: WSM	DATE: 7-29-21	SCALE: NTS	JOB NO: 16022S/ 17300S/20352S
	CLIENT: TBS	SHT. 1	DWG. NO: SK-3	REV.: 6

DRAWING INDEX

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	CLIENT: TBS	SHT. 2	DWG. NO: SK-3	REV.: 6

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 SPECIFICATIONS APPLICABLE TO [illegible] GAUGE METAL PANELS FASTENED DIRECTLY TO 2 1/2" x 2 1/2" - 14 GAUGE TUBE STEEL [illegible] FRAMING MEMBERS. FOR VERTICAL PANELS, 29 GAUGE METAL PANELS SHALL BE FASTENED TO 18 GAUGE HAT CHANNELS UNLESS OTHERWISE NOTED

10 AVERAGE FASTENER SPACING ON CENTERS ALONG RAFTERS OR PURLINS AND POSTS INTERIOR [illegible] 9" [illegible] 6" (MAX)

11 FASTENERS CONSIST OF #12-14x3/4" SELF DRILLING FASTENER (SDF), USE CONTROL SEAL WASHER WITH [illegible] FASTENERS SPECIFICATIONS APPLICABLE ONLY FOR MEAN ROOF HEIGHT OF [illegible] FEET OR LESS AND ROOF SLOPES OF 14° (3:12 PITCH) OR LESS SPACING REQUIREMENTS FOR [illegible] RIDGE OF GABLE AND/OR SLOPES MAY VARY [illegible] THAN [illegible] REQUIRE USE OF JOINT SEALANT

12 STANDARD ANCHORS SHALL BE INSTALLED THROUGH BASE RAIL WITHIN [illegible] OF EACH COLUMN

13 STANDARD GROUND AND [illegible] SHALL CONSIST OF #4 REBAR W/WELDED NUT [illegible] IN SUITABLE SOIL CONDITIONS MAY BE USED FOR LOW [illegible] MPH NOMINAL WIND SPEEDS ONLY. OPTIONAL ANCHORAGE MAY BE USED IN SUITABLE SOILS AND MUST BE USED IN UNSUITABLE SOILS AS NEEDED. COORDINATE WITH LOCAL CODES/ORDINANCES REGARDING MINIMUM LENGTH FOR FROST DEPTH PROTECTION

14 WIND FORCES GOVERN OVER SEISMIC FORCES. SEISMIC PARAMETERS ANALYZED ARE:

SOIL SITE CLASS D

RISK CATEGORY I

R = 3.25 | I = 1.0

S_{DS} = 1.522 g | V = [illegible]W

S_{D1} = 1.839 g

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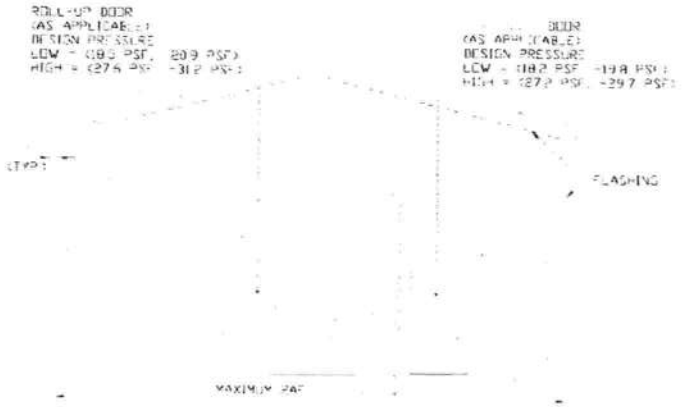
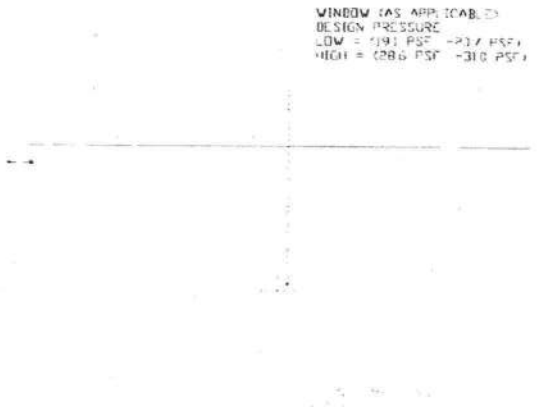
BOX EAVE FRAME RAFTER ENCLOSED BUILDING



TYPICAL END ELEVATION

SCALE: NTS



TYPICAL SIDE ELEVATION

BOW FRAME RAFTER ENCLOSED BUILDING

TYPICAL END ELEVATION

TYPICAL SIDE ELEVATION

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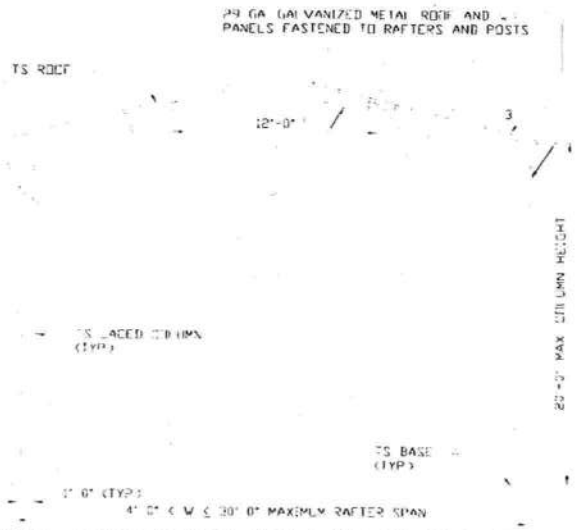

TYPICAL RAFTER/COLUMN END FRAME SECTION

TYPICAL RAFTER/COLUMN END FRAME SECTION

SCALE: NTS

TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

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SCALE: NTS

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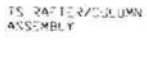

TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

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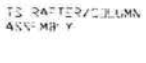
TYPICAL RAFTER/COLUMN END FRAME SECTION
SCALE NTS

TYPICAL RAFTER/COLUMN END FRAME SECTION
SCALE NTS



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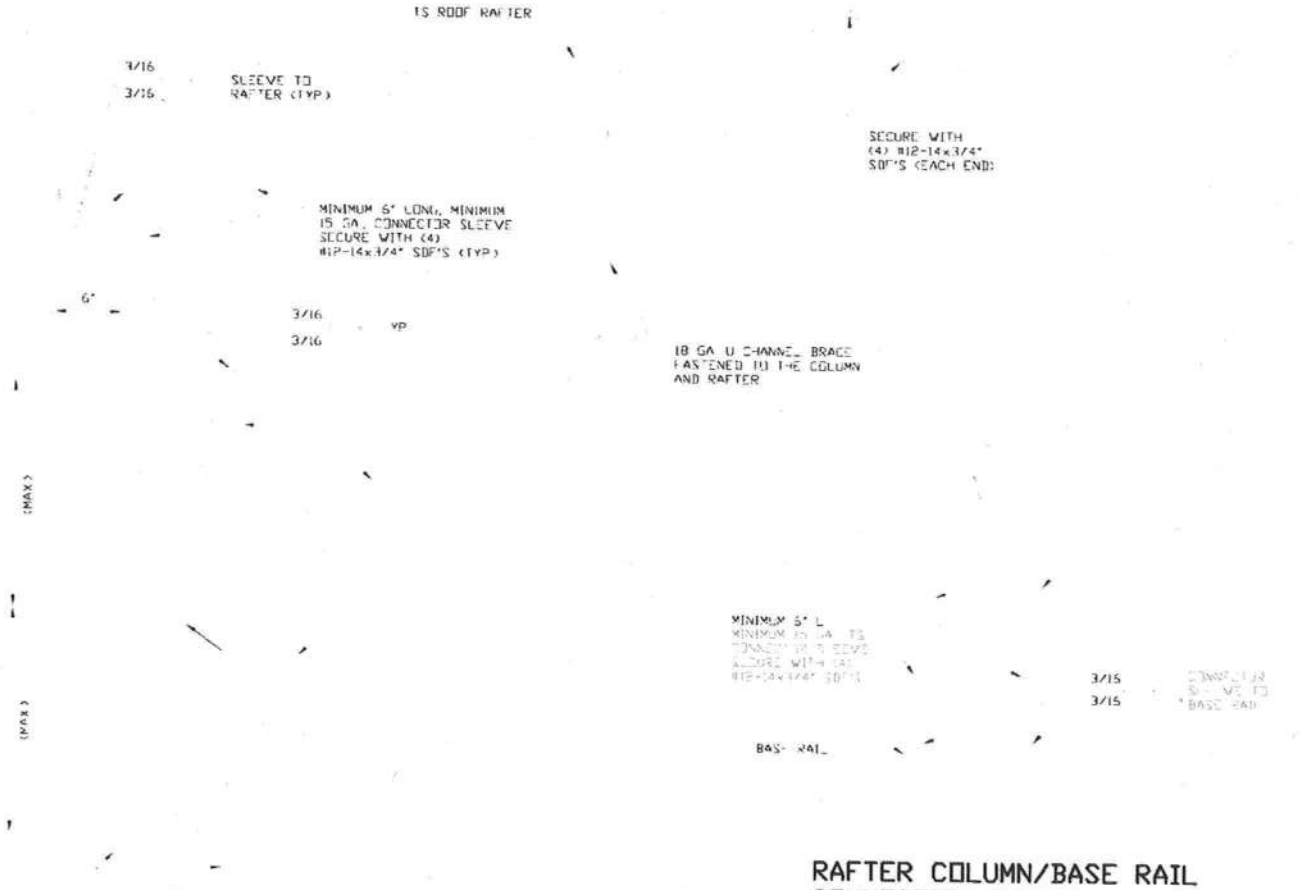

1 BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 16'-0" < TO ≤ 20'-0"

2 RAFTER COLUMN/BASE RAIL CONNECTION DETAIL

BRACE SECTION
SCALE: NTS

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

COLUMN HEIGHTS 12'-0" < TO < 13'-0" FOR HIGH WIND

2 RAFTER COLUMN/BASE RAIL CONNECTION DETAIL

SCALE: NTS

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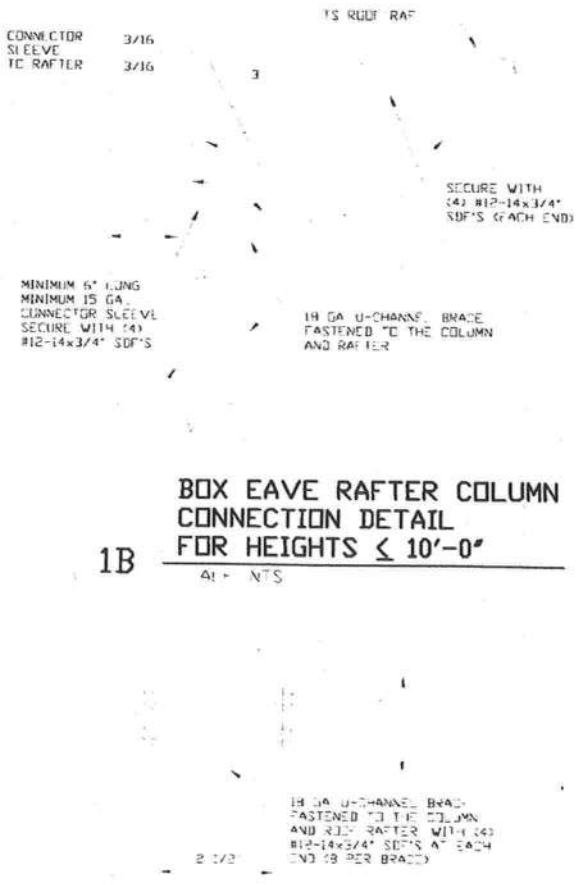
1A BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 10'-0" < TO ≤ 13'-0"



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

ALL NTS

BRACE SECTION

2 RAFTER COLUMN/BASE RAIL CONNECTION DETAIL

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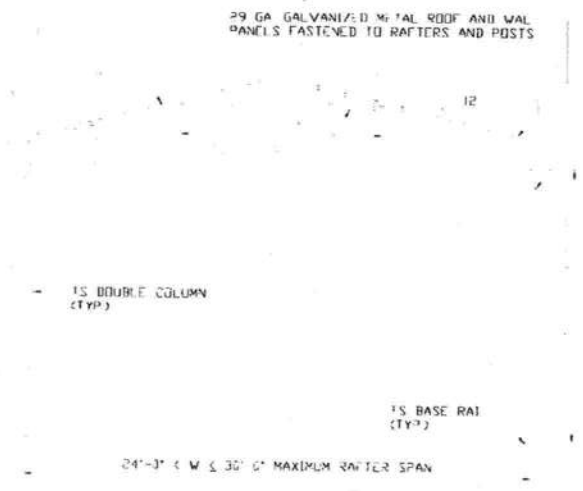

TYPICAL RAFTER/COLUMN END FRAME SECTION

TYPICAL RAFTER/COLUMN END FRAME SECTION

TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

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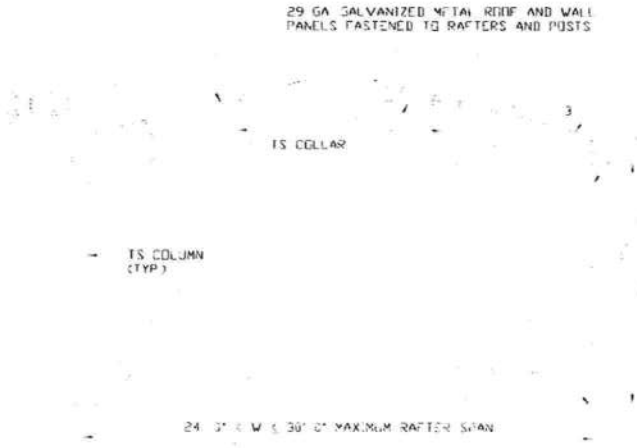

TYPICAL RAFTER/COLUMN END FRAME SECTION

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TYPICAL RAFTER/COLUMN END FRAME SECTION

TYPICAL RAFTER/COLUMN SIDE FRAMING SECTION

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

1 SCALE: NTS

2 RAFTER COLUMN/BASE RAIL
CONNECTION DETAIL

BRACE SECTION

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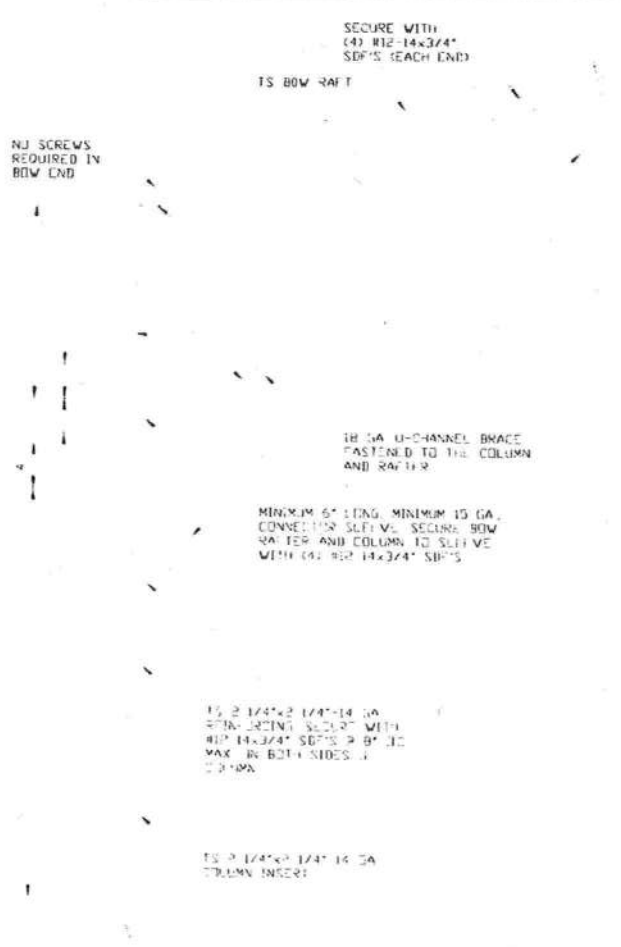
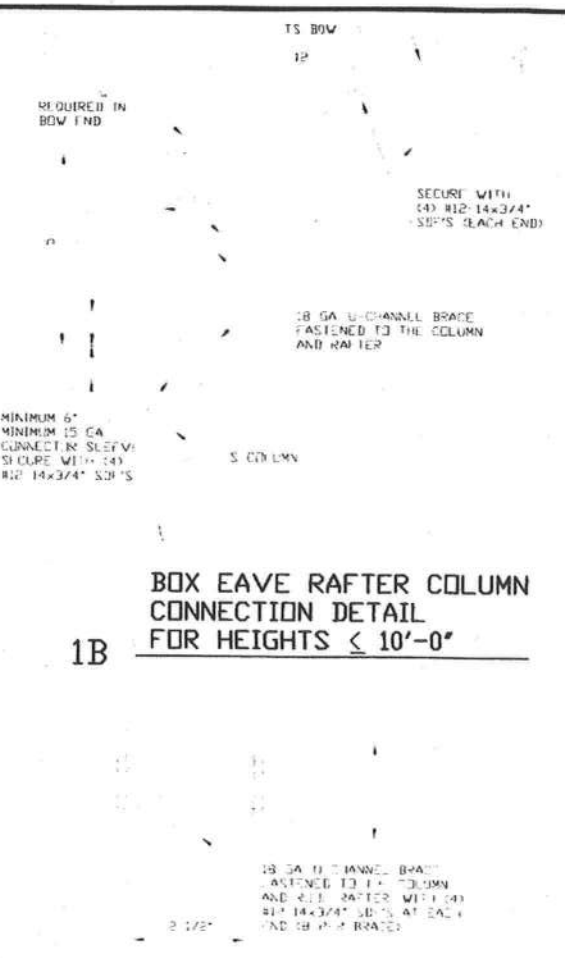


1A BOX EAVE RAFTER COLUMN CONNECTION DETAIL FOR HEIGHTS 10'-0" < TO ≤ 13'-0"



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

BRACE SECTION

2 RAFTER COLUMN/BASE RAIL CONNECTION DETAIL
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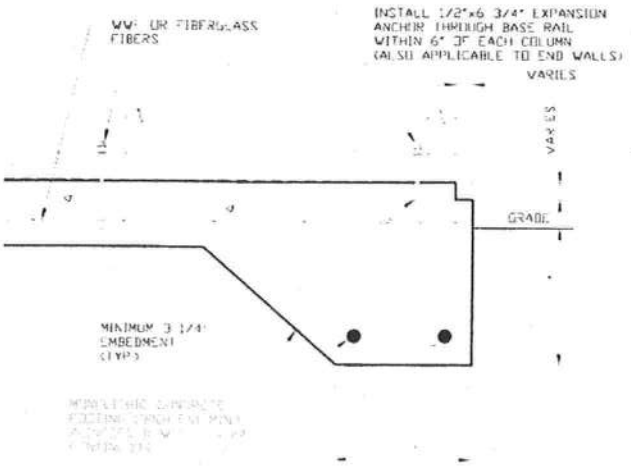
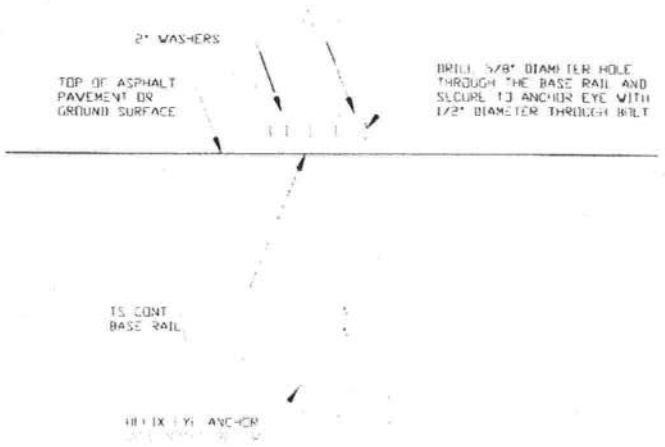
BASE RAIL ANCHORAGE OPTIONS FOR LOW AND HIGH WIND SPEED



3A CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE



3B GROUND BASE HELIX ANCHORAGE

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 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

HELIX ANCHOR NOTES:

1. FOR VERY DENSE AND/OR CEMENTED SANDS, COARSE GRAVEL AND COBBLES, OR DENSE PRE-DRILLED SILTS AND CLAYS USE MINIMUM (2) 4" HELICES WITH MINIMUM 30 INCH EMBEDMENT
2. FOR CORAL 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 LOOSE 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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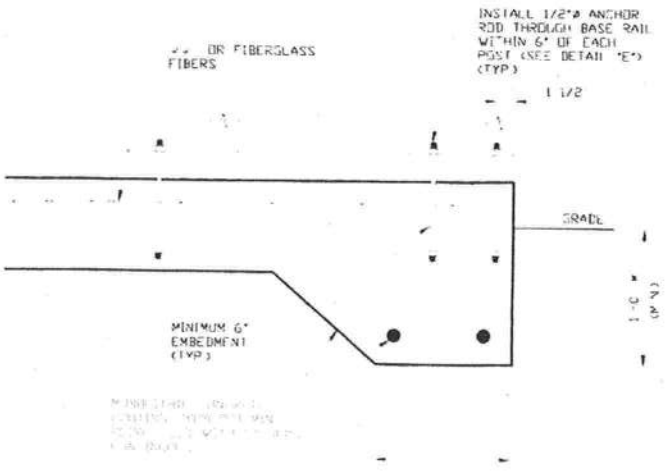
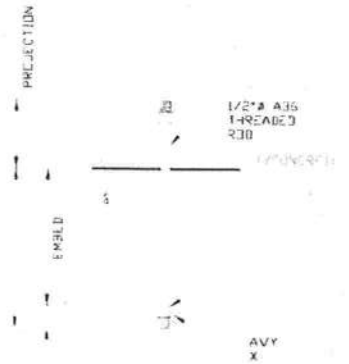
OPTIONAL FOUNDATION ANCHORAGE FOR LOW AND HIGH WIND SPEED



3C CONCRETE MONOLITHIC SLAB BASE RAIL ANCHORAGE



3D ANCHOR ROD THROUGH BASE RAIL DETAIL
ALL NTS

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 A185 OR 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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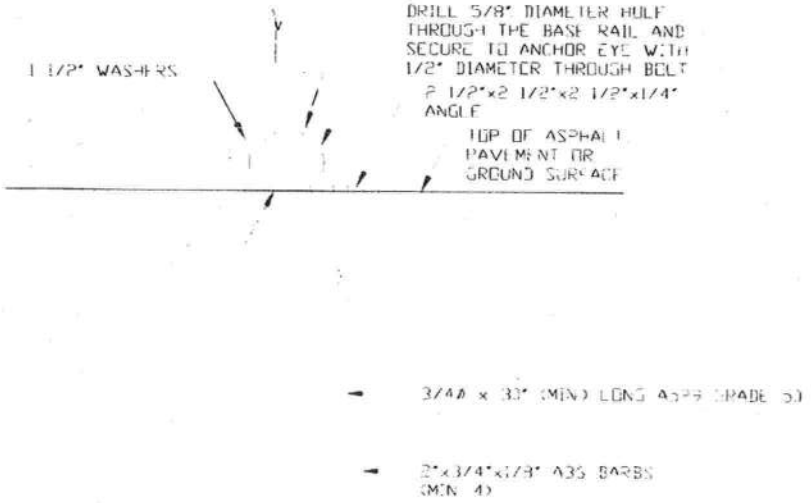
	PROJECT MGR: WSM	DATE: 7-29-21	SCALE: NTS	JOB NO: 16022S/ 17300S/20352S
	CLIENT: TBS	SHT. 9A	DWG. NO: SK-3	REV.: 6

BASE RAIL ANCHORAGE OPTION



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

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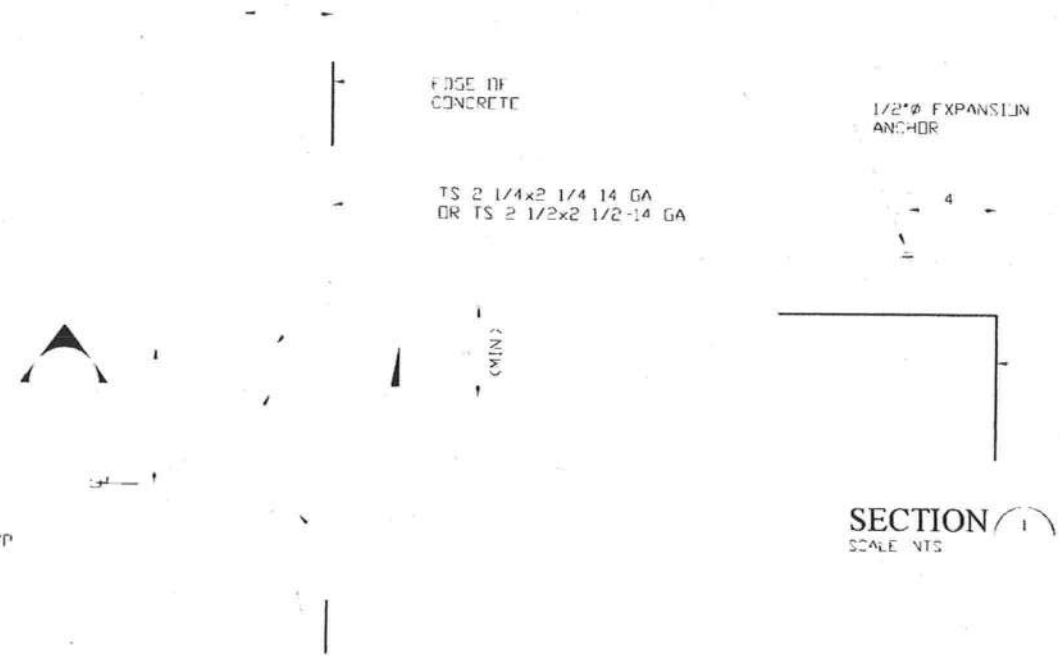
	CLIENT: TBS	SHT. 9B	DWG. NO: SK-3	REV.: 6

BASE RAIL ANCHORAGE OPTIONS



TYPICAL ANCHOR DETAIL WHEN BASE RAIL IS NEAR EDGE OF CONCRETE

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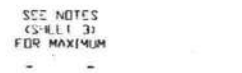
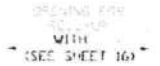
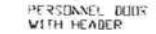
BOX EAVE RAFTER END WALL AND SIDE WALL OPENINGS

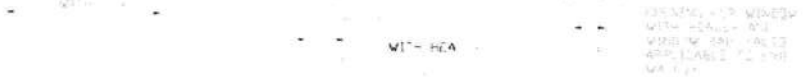






TYPICAL BOX EAVE RAFTER
END WALL FRAMING SECTION

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



TYPICAL BOX EAVE RAFTER SIDE
WALL OPENINGS FRAMING SECTION

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	CLIENT: TBS	SHT. 10	DWG. NO: SK-3	REV.: 6

BOW RAFTER END WALL AND SIDE WALL OPENINGS

TYPICAL BOX EAVE RAFTER
END WALL FRAMING SECTION

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

TYPICAL BOX EAVE RAFTER SIDE
WALL OPENINGS FRAMING SECTION

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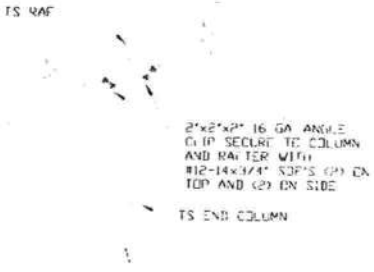
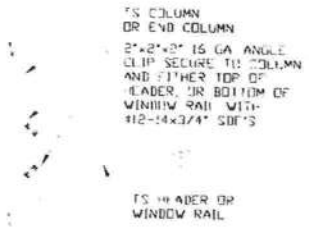
	CLIENT: TBS	SHT. 11	DWG. NO: SK-3	REV.: 6

CONNECTION DETAILS



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:

6A DOUBLE HEADER TO COLUMN CONNECTION DETAIL
SCALE:

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

8 DOUBLE HEADER/COLUMN CONNECTION DETAIL
N

9 COLUMN/DOUBLE HEADER CONNECTION DETAIL
SCALE: NTS

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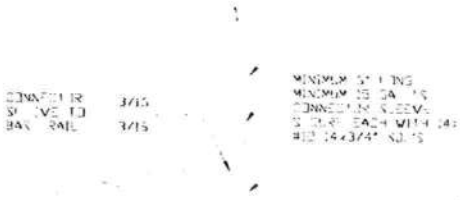
	CLIENT: TBS	SHT. 12	DWG. NO: SK-3	REV: 6

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: NT

14 COLUMN TO HEADER, BASE RAIL CONNECTION DETAIL
N

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	CLIENT: TBS	SHT. 13	DWG. NO: SK-3	REV.: 6

BOX EAVE RAFTER LEAN-TO OPTIONS

ROOF EXTENSION OPTION

MAIN STRUCTURE

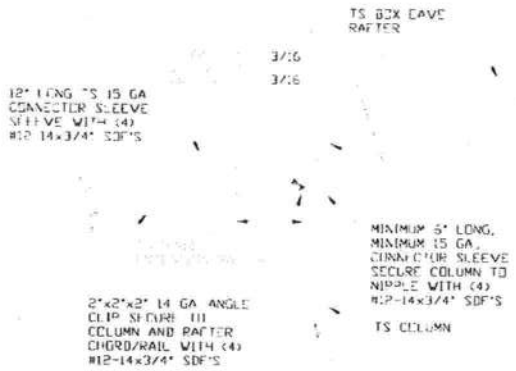
STANDARD LEAN-TO OPTION

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 16'-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 < 16' 0"
MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO
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
EAVE HEIGHTS < 10'-0"
KNEE BRACES MUST BE 4'-0" (3'-0" FOR HIGH WIND) WHEN LEAN-TO'S ARE ADDED

15 SIDE EXTENSION RAFTER/COLUMN DETAIL FOR RAFTER SPANS ≤ 15'-0"
N



15A SIDE EXTENSION RAFTER/COLUMN DETAIL FOR RAFTER SPANS 15'-0" < TO ≤ 24'-0"
SCA

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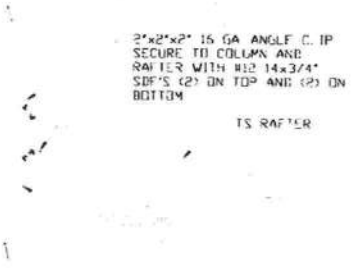
	CLIENT: TBS	SHT. 14	DWG. NO: SK-3	REV.: 6

BOX EAVE RAFTER LEAN-TO OPTIONS



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

16A LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR RAFTER SPANS 15'-0" < TO ≤ 24'-0"

SCALE: NTS

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	CLIENT: TBS	SHT. 14A	DWG. NO: SK-3	REV.: 6

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'-2" (13'-2" FOR HIGH WIND) < TO ≤ 15'-2"
MAIN BUILDING COLUMNS WITH LEAN-TO OR ROOF EXTENSION ATTACHED ARE REQUIRED TO BE SINGLE COLUMNS FOR EAVE HEIGHTS 13'-2" < TO ≤ 13'-2" (13'-2" 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 ≤ 13'-2"
KNEE BRACES MUST BE 4'-2" (5'-0" FOR HIGH WIND) WHEN LEAN-TO'S ARE ADDED

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

17A LEAN-TO RAFTER TO RAFTER COLUMN CONNECTION DETAIL FOR RAFTER SPANS 15'-0" < TO ≤ 24'-0"

SCALE: NTS

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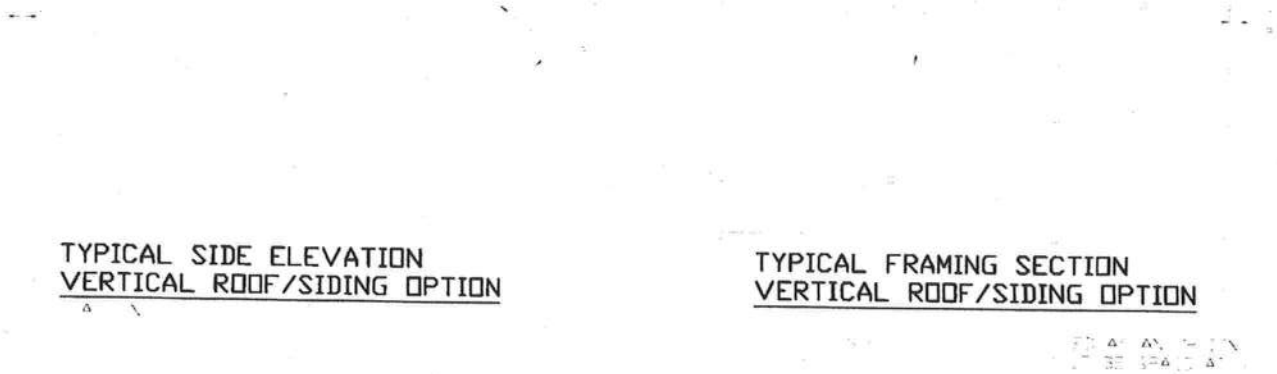
CLIENT: TBS	SHT. 15	DWG. NO: SK-3	REV.: 6

BOX EAVE RAFTER VERTICAL ROOF/SIDING OPTION

TYPICAL END ELEVATION
VERTICAL ROOF/SIDING OPTION
SCALE: NTS

TYPICAL SECTION VERTICAL
ROOF/SIDING OPTION

TYPICAL SIDE ELEVATION
VERTICAL ROOF/SIDING OPTION



TYPICAL FRAMING SECTION
VERTICAL ROOF/SIDING OPTION

ROOF PANEL ATTACHMENT
ALTERNATE FOR VERTICAL ROOF PANELS
SCALE: N.T.S.

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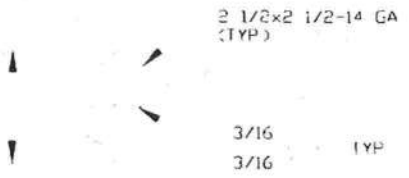
SIDE WALL HEADER OPTIONS

HEADER DETAIL FOR DOOR OPENINGS ≤ 10'-0"



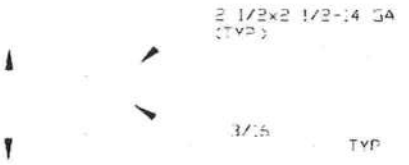
HEADER DETAIL FOR DOOR OPENINGS 10'-0" < LENGTH ≤ 15'-0"

SCALE NTS

END WALL HEADER OPTIONS

HEADER DETAIL FOR DOOR OPENINGS ≤ 12'-0"

SCALE NTS



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

SCALE NTS

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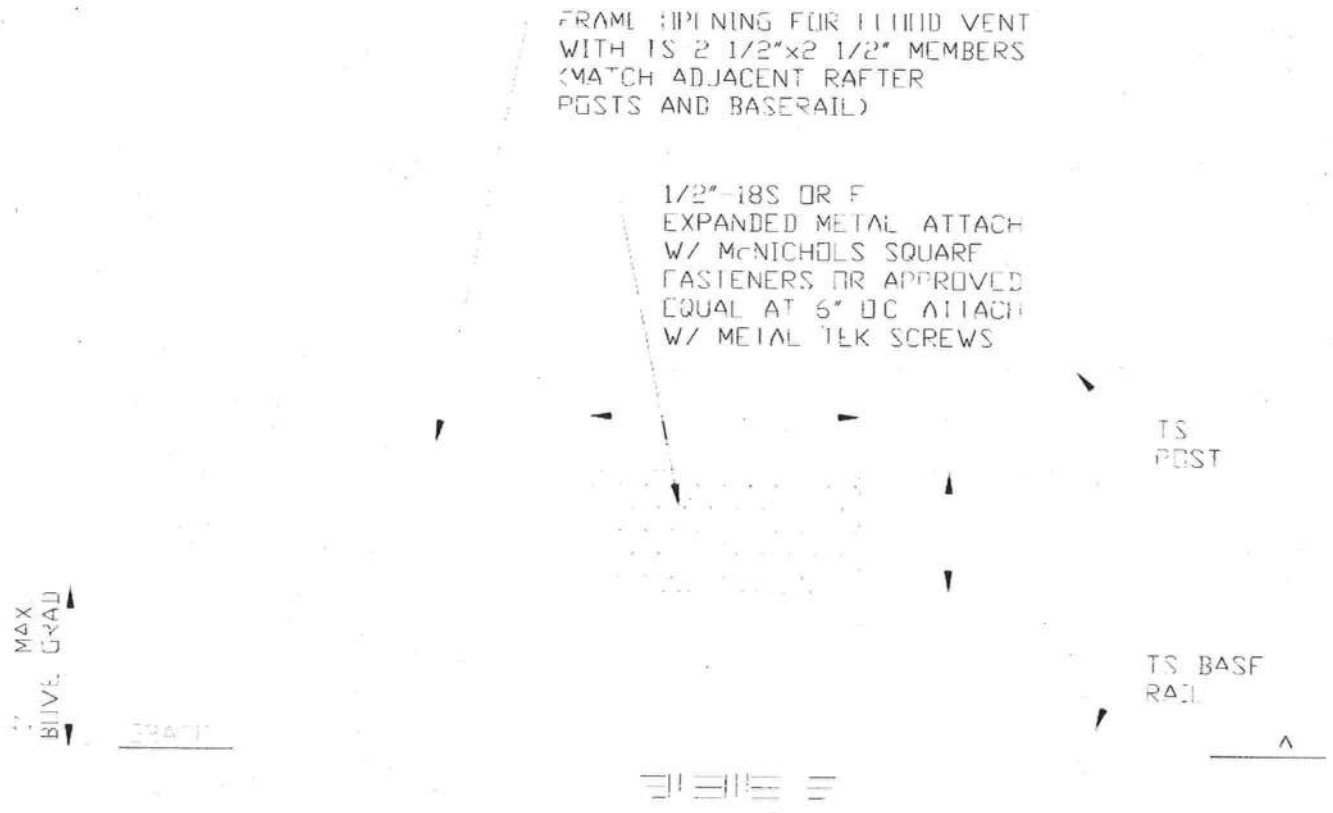
	CLIENT: TBS	SHT. 17	DWG. NO: SK-3	REV.: 6

FLOOD VENT DETAIL



TYPICAL FLOOD VENT DETAIL

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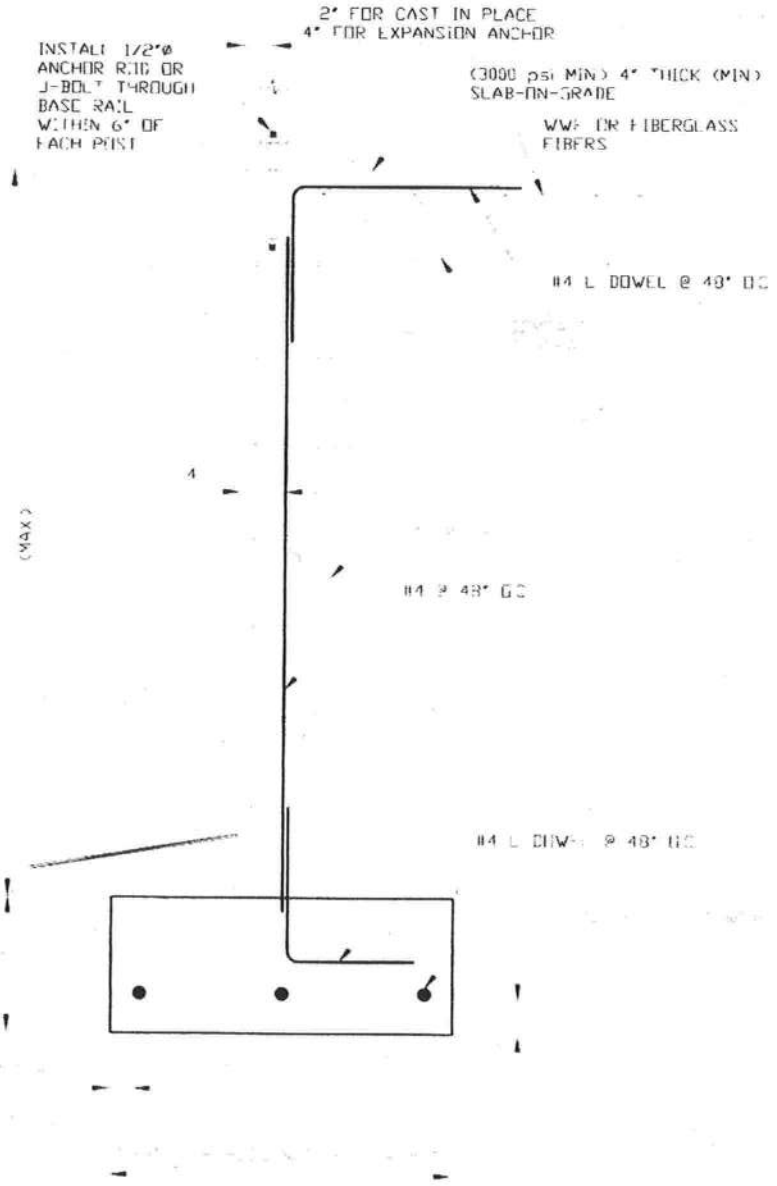
	CLIENT: TBS	SHT. 18	DWG. NO: SK-3	REV.: 6

STAND -ALONE STEM WALL DETAIL



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

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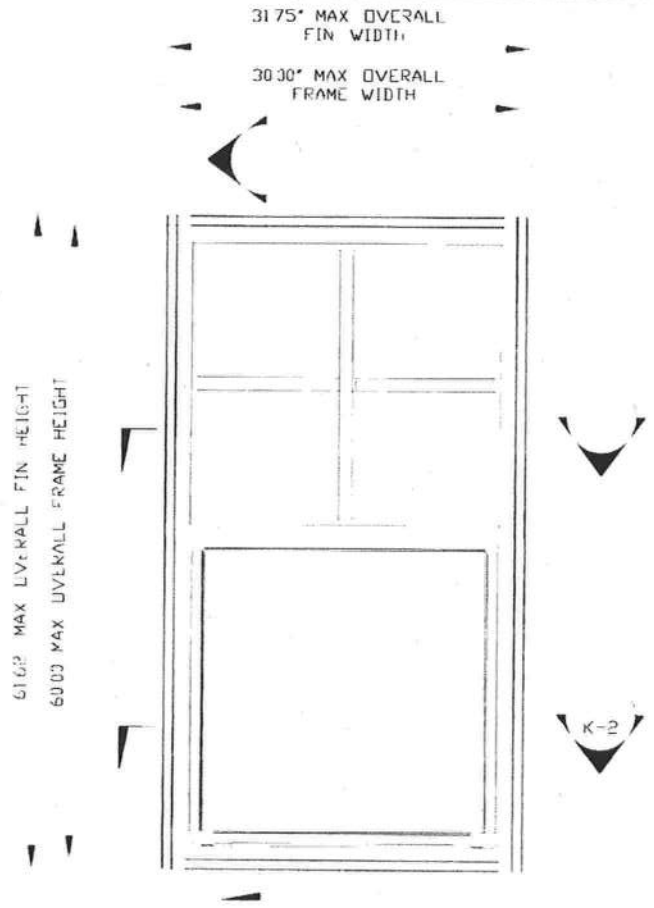
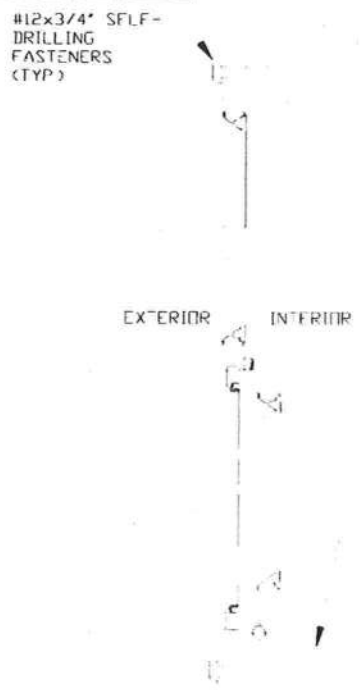
VERTICAL SLIDING WINDOW DETAIL

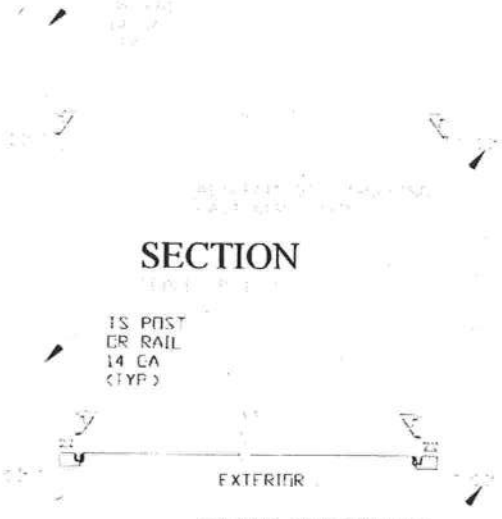


ELEVATION VIEW



SECTION
SCALE 3"=1'-0"

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



SECTION
SCALE: 3"=1' 0"
3
SK-20

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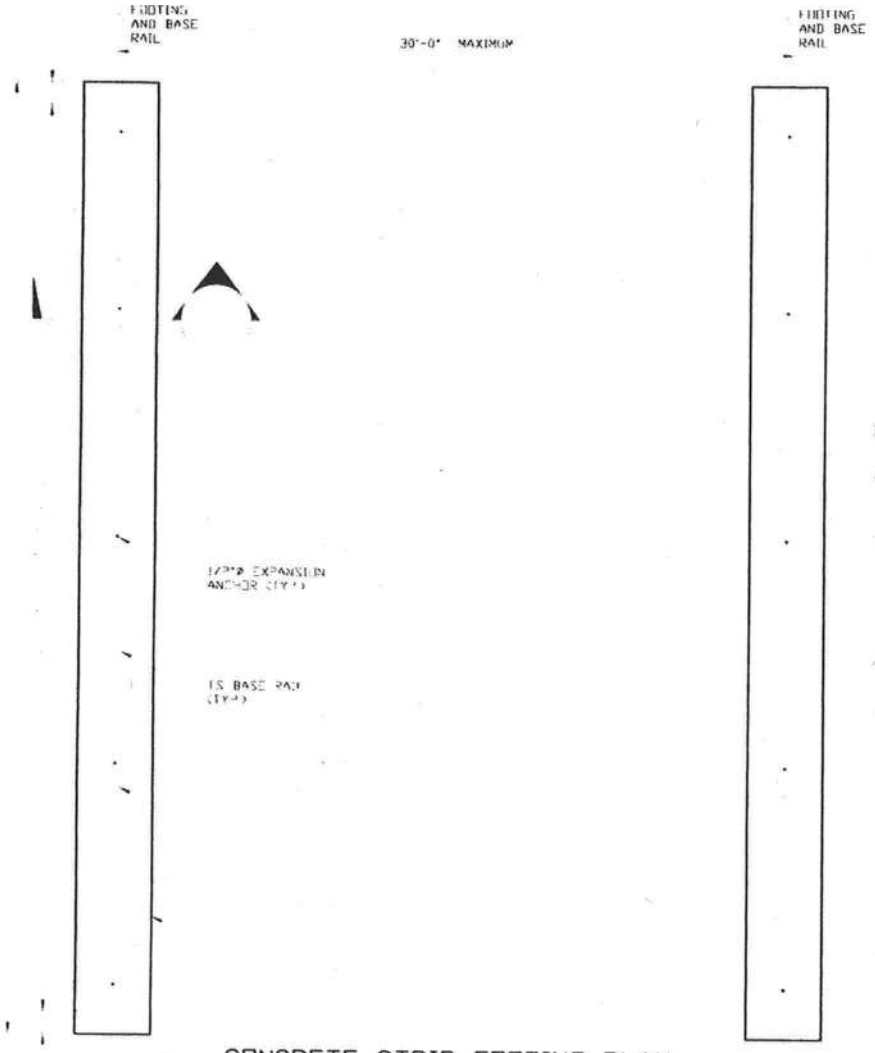
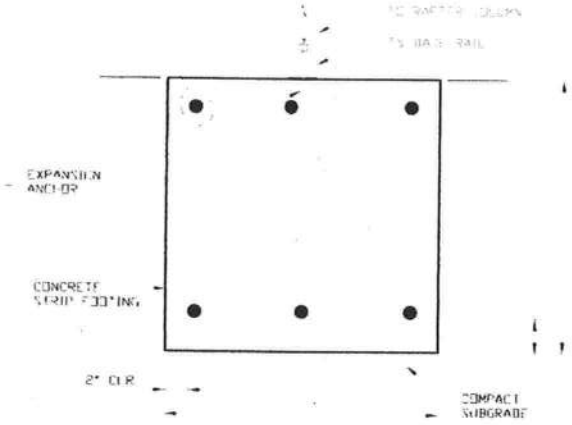
OPTIONAL CONCRETE STRIP FOOTING



CONCRETE STRIP FOOTING PLAN



SECTION 1 SK-21
SCALE: NTS

* COORDINATE WITH LOCAL CODES/ORD

WAYNE S. MOORE
LICENSE
No 57170
STATE OF FLORIDA
PROFESSIONAL ENGINEER

This item has been electronically signed and sealed by Wayne S. Moore, PE. using a Digital Signature and date.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

MOORE AND ASSOCIATES ENGINEERING AND CONSULTING, INC.	DRAWN BY: JG	TUBULAR BUILDING SYSTEMS 631 SE INDUSTRIAL CIRCLE LAKE CITY, FLORIDA 32025 30'-0"x20'-0" ENCLOSED BUILDING EXP. B		
	CHECKED BY: PDH			
	PROJECT MGR: WSM	DATE: 7-29-21	SCALE: NTS	JOB NO: 16022S/ 17300S/20352S
	CLIENT: TBS	SHT. 21	DWG. NO: SK-3	REV.: 6