
WARNING
BEWARE OF
SNAKES
1257930
Federal Communications
Commission Antenna Structure
Registration Number
1257930

ENSIGN PEAK UT

SALT LAKE COUNTY, UT

SITE ADDRESS:
501 E 1900 N
SALT LAKE CITY, UT 84103

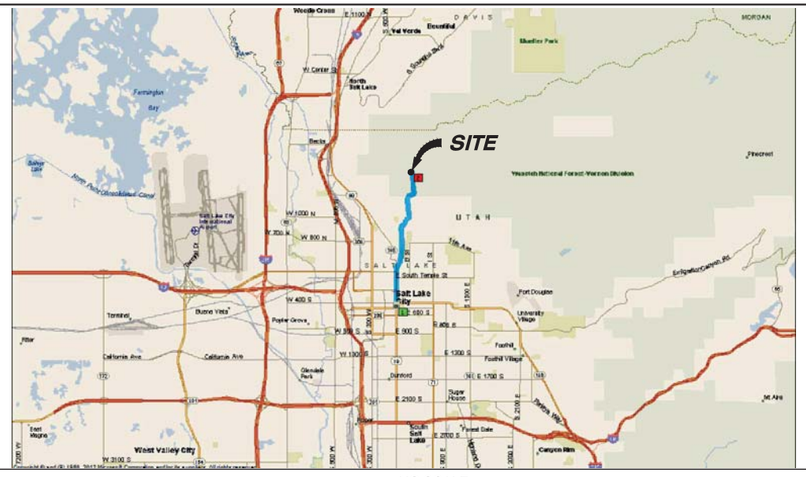
PROPOSED 100' S4TL SELF-SUPPORT TOWER

CONSTRUCTION DOCUMENTS

PROJECT SUMMARY

SITE NAME:	ENSIGN PEAK UT
SITE NUMBER:	552264
PARCEL ID.:	09192000010000
SITE ADDRESS:	501 E 1900 N SALT LAKE CITY, UT 84103
JURISDICTION:	SALT LAKE COUNTY, UT
PROPERTY OWNER:	BUREAU OF LAND MANAGEMENT, UTAH 440 W. 200 S, STE 500 SALT LAKE CITY, UT 84101 PHONE: 1(801)-539-4010
NAD83	
LATITUDE: LONGITUDE:	40°48'25.50"N (40.80708333°)± -111°52'52.14"W (111.881150°)±
APPLICANT:	SABRE INDUSTRIES
CONTACT:	ALLEN KINNEY (404) 824-5975 7101 SOUTHBRIDGE DR. SIOUX CITY, IA 51102-0658
CO-APPLICANT:	N/A
OCCUPANCY TYPE:	UNMANNED
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION

LOCATION MAP



NO SCALE

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
GN-1	GENERAL NOTES AND LEGEND
GN-2	GENERAL NOTES
1	SURVEY
C-1	OVERALL SITE PLAN
C-1.2	ENLARGED LAYOUT PLAN
C-2	PROPOSED IMPROVEMENTS PLAN
C-3	TOWER ELEVATION
C-3.2	TOWER LIGHTING DETAILS
C-4	SIGNAGE DETAILS
C-5	ENGINEERING DETAILS
C-6	WAVE GUIDE BRIDGE DETAILS
C-7	CONCRETE PAD DETAILS
E-1	GENERAL ELECTRICAL NOTES AND SYMBOLS
G-1	GROUNDING PLAN
G-2	GROUNDING DETAILS
ATTACHMENT	TOWER GROUNDING PLAN
ATTACHMENT	TOWER STRUCTURAL DESIGN REPORT

DESIGN INFORMATION

A&E FIRM:	B+T GROUP 1717 S. BOULDER, SUITE 300 TULSA, OK 74119 MIKE A. SPEEDIE, PE (918) 587-4630	ELECTRIC PROVIDER:	T.B.D. XXX-XXX-XXXX
SURVEYOR:	STONECYPHER SURVEYING INC. 1225 NW 16TH AVENUE GAINESVILLE, FL 32601 PH. (352) 379-0948	TELCO PROVIDER:	T.B.D.

DRIVING DIRECTIONS

DEPART CITY HALL, 451 S STATE ST, SALT LAKE CITY, UT 84111 [451 S STATE ST, SALT LAKE CITY, UT 84111] ON US-89 [S STATE ST] (NORTH) 153 YDS
KEEP STRAIGHT ONTO UT-186 [S STATE ST] 0.6 MI
KEEP STRAIGHT ONTO UT-186 [N STATE ST] 0.3 MI
TURN RIGHT (EAST) ONTO N EAST CAPITOL ST [E CAPITOL ST] 0.2 MI
ROAD NAME CHANGES TO N EAST CAPITOL BLVD [E CAPITOL BLVD] 1.4 MI
ROAD NAME CHANGES TO OAK FOREST RD 0.3 MI
TURN LEFT (NORTH) ONTO LOCAL ROAD(S) 0.6 MI
ARRIVE 40.80708°N 111.88123°W

A/E DOCUMENT REVIEW STATUS

TITLE	SIGNATURE	DATE
SABRE PROP:		
SABRE MGR.:		
INTERCONNECT:		
SABRE MGR.:		
PROPERTY OWNER:		

STATUS CODE:		
1		ACCEPTED: WITH OR NO COMMENTS, CONSTRUCTION MAY PROCEED
2		NOT ACCEPTED: RESOLVE COMMENTS AND RESUBMIT

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND MAY IMPOSE CHANGES OR MODIFICATIONS.

CODE COMPLIANCE

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

CODE TYPE	CODE
BUILDING/DWELLING	IBC 2021 AMENDED
STRUCTURAL	IBC 2021 AMENDED
MECHANICAL	IMC 2021 AMENDED
ELECTRICAL	NFPA 70, 2020 AMENDED
TIA	TIA-??
WIND SPEED	109 MPH

PROJECT DESCRIPTION

THE PROPOSED PROJECT INCLUDES:
- CONSTRUCT (1) NEW 100' S4TL SELF-SUPPORT TOWER.
- CONSTRUCT NEW 18' x 10' SHELTER.
- INSTALL POWER UTILITIES & NEW GROUNDING SYSTEM

DO NOT SCALE DRAWINGS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 11X17. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SEE SHEET GN-1 & GN-2 FOR ADDITIONAL CONSTRUCTION NOTES

CALL UTAH ONE CALL
(800) 662-4111
CALL 3 WORKING DAYS
BEFORE YOU DIG!

B+T GRP

Sabre Industries
INNOVATION DELIVERED

ENSIGN PEAK UT
SALT LAKE COUNTY
501 E 1900 N
SALT LAKE CITY, UT 84103
PROPOSED 100' S4TL SELF-SUPPORT TOWER

PROJECT NO: G0175136.001.01
CHECKED BY: DLS

ISSUED FOR:

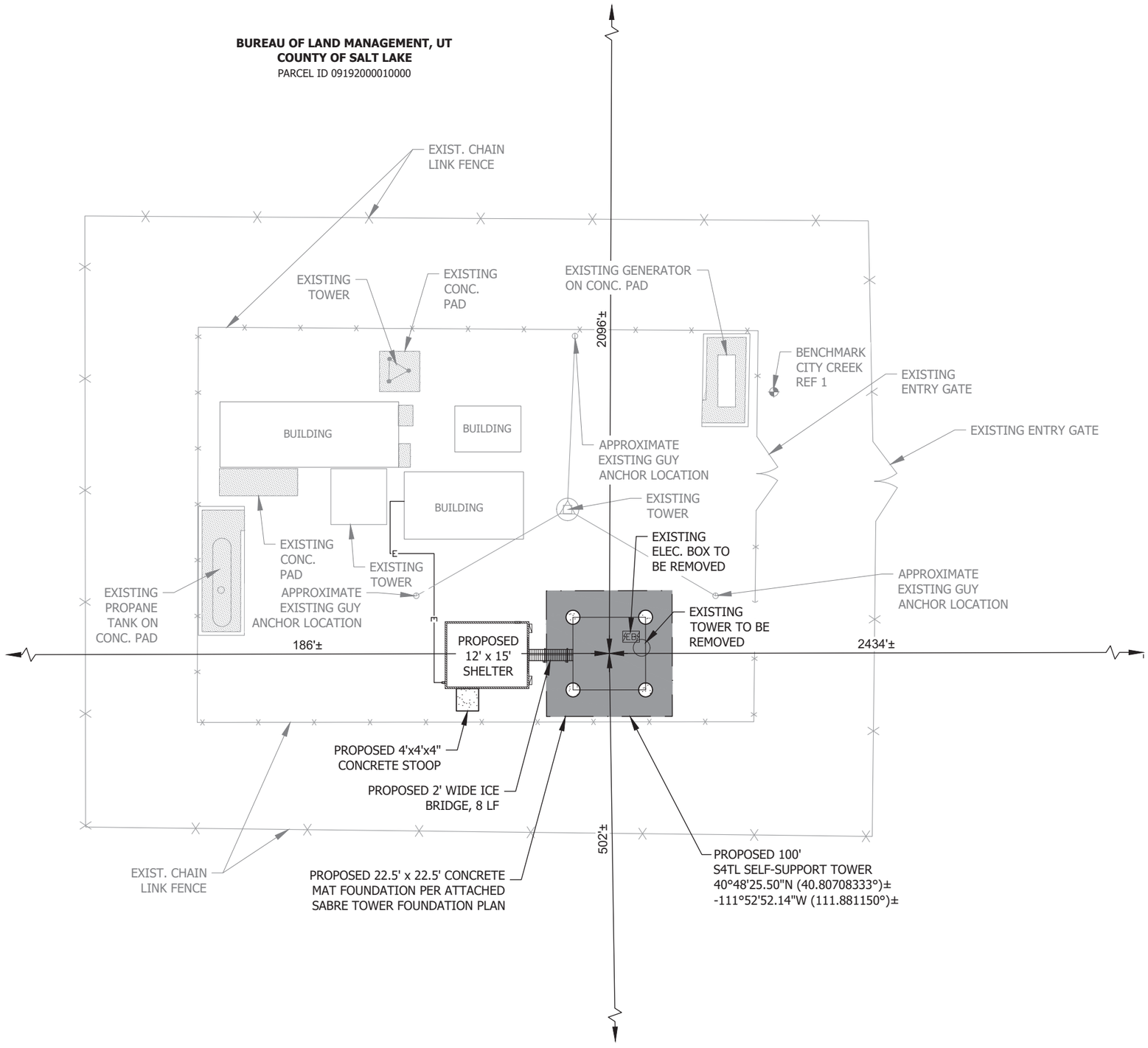
REV	DATE	DRWN	DESCRIPTION
B	04/01/25	MAS	PRELIMINARY
C	04/25/25	YX	PRELIMINARY
0	05/01/25	MAS	SUBMITTAL

B&T ENGINEERING, INC.

PROFESSIONAL ENGINEER
No. 12525901-2202
PETER D. SMITH
STATE OF UTAH

TITLE SHEET

SHEET NUMBER:
T-1



1 OVERALL SITE PLAN
SCALE: 0' 10' 20' 30' 40' 1"=20'

N

NOTES:

1. SEE LEGEND, ABBREVIATIONS & GENERAL NOTES ON SHEETS GN-1 AND GN-2.
2. EXISTING FEATURES SHOWN HEREON ARE BASED ON SURVEY PROVIDED BY SALT LAKE CITY CORPORATION PUBLIC SERVICES SURVEY DEPARTMENT. CAD FILE DATED JULY 30, 2024.
3. PROPOSED 100' S4TL SELF-SUPPORT TOWER. CENTER OF TOWER:

   LATITUDE: 40°48'25.50"N (40.80708333°)±
   LONGITUDE: -111°52'52.14"W (111.881150°)±
   GROUND ELEVATION: 6150.2'± NAVD 88
4. THE PERPENDICULAR DISTANCES FROM CENTER OF PROPOSED TOWER TO PARENT TRACT BOUNDARY LINES ARE AS FOLLOWS:

NORTH	2096'±
SOUTH	502'±
EAST	2434'±
WEST	186'±

THE HERON DESCRIBED TOWER SITE PARCEL APPEARS TO LIE IN FLOOD ZONE "X" BASED ON THE FEDERAL EMERGENCY MANAGEMENT ACT FIRM, COMMUNITY PANEL MAP NUMBER 49035C0142G DATED SEPTEMBER 25, 2009. BASED FLOOD ELEVATION DETERMINED TO BE 10.0' NAVD 88.

CALL UTAH ONE CALL
(800) 662-4111
CALL 3 WORKING DAYS
BEFORE YOU DIG!

B+T GRP

Sabre Industries
INNOVATION DELIVERED

ENSIGN PEAK UT
SALT LAKE COUNTY
501 E 1900 N
SALT LAKE CITY, UT 84103
PROPOSED 100' S4TL SELF-SUPPORT TOWER

PROJECT NO:	G0175136.001.01
CHECKED BY:	DLS

ISSUED FOR:

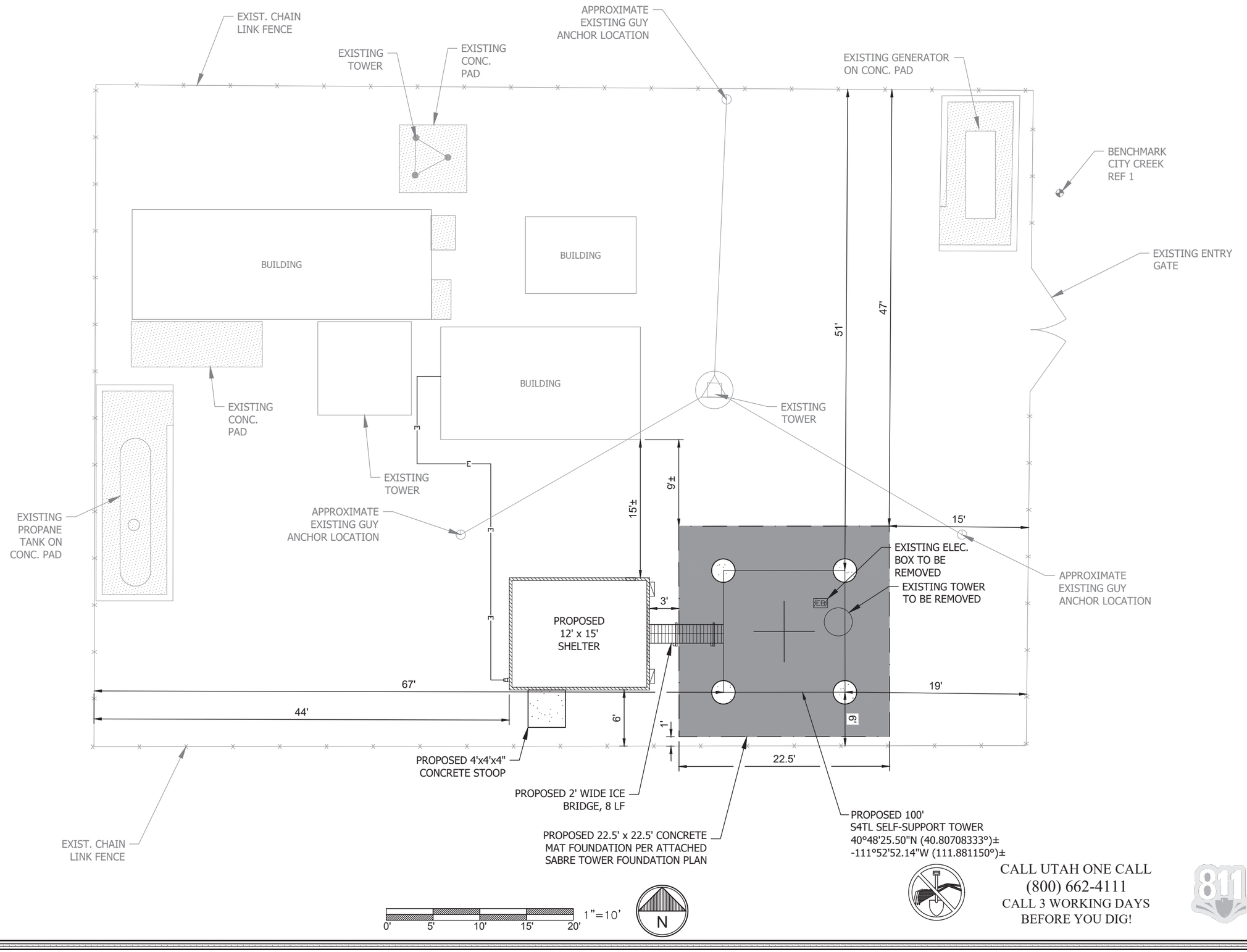
REV	DATE	DRWN	DESCRIPTION
B	04/01/25	MAS	PRELIMINARY
C	04/25/25	YX	PRELIMINARY
0	05/01/25	MAS	SUBMITTAL

B&T ENGINEERING, INC.

PROFESSIONAL ENGINEER
No. 12525901-2202
PETER D. SMITH
STATE OF UTAH

OVERALL SITE PLAN

SHEET NUMBER:
C-1



CALL UTAH ONE CALL
(800) 662-4111
CALL 3 WORKING DAYS BEFORE YOU DIG!

B+T GRP

Sabre Industries
INNOVATION DELIVERED

ENSIGN PEAK UT

SALT LAKE COUNTY
501 E 1900 N
SALT LAKE CITY, UT 84103

PROPOSED 100' S4TL SELF-SUPPORT TOWER

PROJECT NO:	G0175136.001.01
CHECKED BY:	DLS

ISSUED FOR:

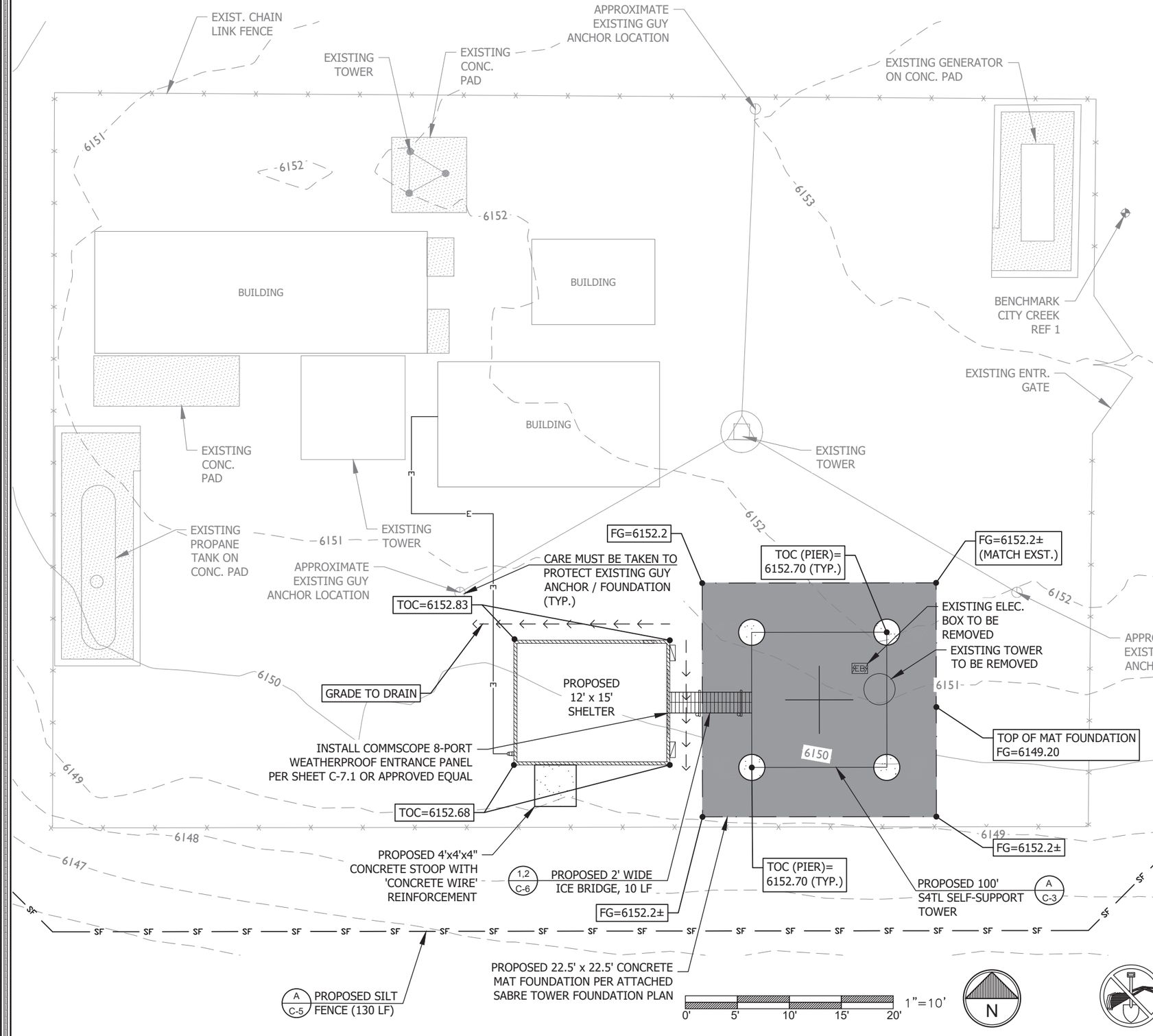
REV	DATE	DRWN	DESCRIPTION
B	04/01/25	MAS	PRELIMINARY
C	04/25/25	YX	PRELIMINARY
0	05/01/25	MAS	SUBMITTAL

B&T ENGINEERING, INC.

PROFESSIONAL ENGINEER
No. 12525901-2202
PETER D. SMITH
STATE OF UTAH

ENLARGED LAYOUT PLAN

SHEET NUMBER:
C-1.2



NOTES:

1. SEE LEGEND, ABBREVIATIONS & GENERAL NOTES ON SHEETS GN–1 & GN–2.
2. EXISTING FEATURES SHOWN HEREON ARE BASED ON SURVEY PROVIDE BY SALT LAKE CITY CORPORATION PUBLIC SERVICES SURVEY DEPARTMENT. CAD FILE DATED JULY 30, 2024.
3. THE CONTRACTOR SHALL FIELD–VERIFY THE LOCATION OF ALL EXISTING ABOVE GROUND AND UNDERGROUND IMPROVEMENTS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY NECESSARY RELOCATION OR REPAIR OF EXISTING IMPROVEMENTS DUE TO DAMAGE CAUSED DURING CONSTRUCTION.
5. CONTRACTOR SHALL VERIFY ELECTRIC DEMARC WITH UTILITY PROVIDER PRIOR TO BIDDING.
6. ALL CHAIN–LINK FENCING AND FENCE POSTS SHALL BE GALVANIZED STEEL.
7. CONTRACTOR SHALL VERIFY ALL CONDUIT AND WIRE SIZES WITH LOCAL POWER PROVIDER BEFORE BIDDING.
8. ALL DISTURBED AREAS NOT RECEIVING GRAVEL SURFACE TO BE MULCHED AND SEEDED PER DETAIL SHEET C–8.
9. INSTALL UNDERGROUND ELEC. AS REQUIRED IN (1) 4" SCH. 40 PVC CONDUIT. INSTALL IN ACCORDANCE WITH OSHA AND ALL APPLICABLE CODES. QUANTITY PER PLANS.
10. CONTRACTOR SHALL COORDINATE THE INSTALLATION OF NEW POWER WITH THE LOCAL UTILITY PROVIDER.
11. CONTRACTOR SHALL CONFIRM THE PROPOSED TOWER FOUNDATION PAD AND TOP OF PIER ELEVATIONS RELATIVE TO FINISHED GRADE WITH STRUCTURAL ENGINEER PRIOR TO CONSTRUCTION.
12. ALL DISTURBED SURFACE SOILS SHALL BE COVERED WITH 6" OF COARSE AGGREGATE PER SHEET C–5 DETAIL 1 FOR EROSION CONTROL AND SLOPE STABILIZATION.

THE CONTRACTOR SHALL VISIT THE SITE BEFORE BIDDING ON THE WORK CONTAINED WITHIN THIS DESIGN PACKAGE. DISCREPANCIES AND OMISSIONS SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION PRIOR TO BIDDING.

LEGEND

6150	EXISTING MAJOR CONTOUR
6149	EXISTING MINOR CONTOUR
FG=6150.8	FINISHED GRADE ELEVATION
TOC=6151.00	TOP OF CONCRETE ELEVATION

CALL UTAH ONE CALL
(800) 662-4111
CALL 3 WORKING DAYS
BEFORE YOU DIG!

B+T GRP

Sabre Industries
INNOVATION DELIVERED

ENSIGN PEAK UT

SALT LAKE COUNTY
501 E 1900 N
SALT LAKE CITY, UT 84103

PROPOSED 100' S4TL SELF-SUPPORT TOWER

PROJECT NO:	G0175136.001.01
CHECKED BY:	DLS

ISSUED FOR:

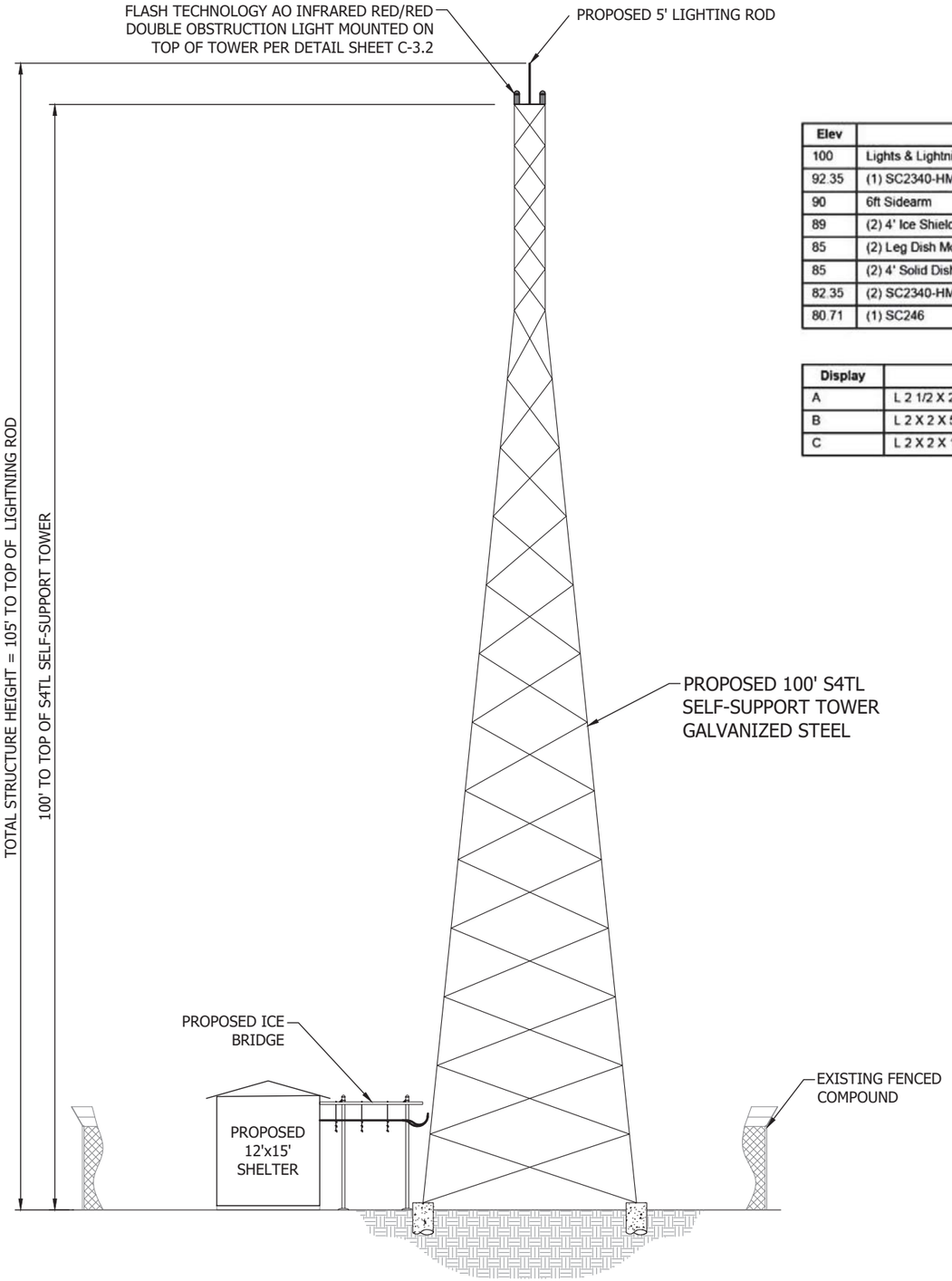
REV	DATE	DRWN	DESCRIPTION
B	04/01/25	MAS	PRELIMINARY
C	04/25/25	YX	PRELIMINARY
0	05/01/25	MAS	SUBMITTAL

B&T ENGINEERING, INC.

PROFESSIONAL ENGINEER
No. 12525901-2202
PETER D. SMITH
STATE OF UTAH

PROPOSED IMPROVEMENTS PLAN

SHEET NUMBER:
C-2



S4TL SELF-SUPPORT TOWER 1

N.T.S.

Designed Appurtenance Loading

Elev	Description	Tx-Line
100	Lights & Lightning Rod	(1) 1 (not on ladder)
92.35	(1) SC2340-HMBSNF	(1) 7/8"
90	6ft Sidearm	
89	(2) 4' Ice Shield	
85	(2) Leg Dish Mount	
85	(2) 4' Solid Dish	(2) EW63
82.35	(2) SC2340-HMBSNF	(2) 7/8"
80.71	(1) SC246	(1) 7/8"

Elev	Description	Tx-Line
80	(2) 6ft Sidearms	
80	(1) SD214-SF2P2LDF(D00)	(1) 7/8"
70	6ft Sidearm	
70	6ft Sidearm	
60	(3) Flush Mount	
60	(3) PMP 450i	(3) Cat 5
40	Flush Mount	
40	(1) SY307	(1) 7/8"

Material List

Display	Value
A	L 2 1/2 X 2 1/2 X 1/4
B	L 2 X 2 X 5/16
C	L 2 X 2 X 1/4

Display	Value
D	L 2 X 2 X 3/16
E	L 3 1/2 X 3 1/2 X 1/4
F	L 2 1/2 X 2 1/2 X 3/16

B+T GRP

Sabre Industries
INNOVATION DELIVERED

ENSIGN PEAK UT
SALT LAKE COUNTY
501 E 1900 N
SALT LAKE CITY, UT 84103
PROPOSED 100' S4TL SELF-SUPPORT TOWER

PROJECT NO:	G0175136.001.01
CHECKED BY:	DLS

ISSUED FOR:

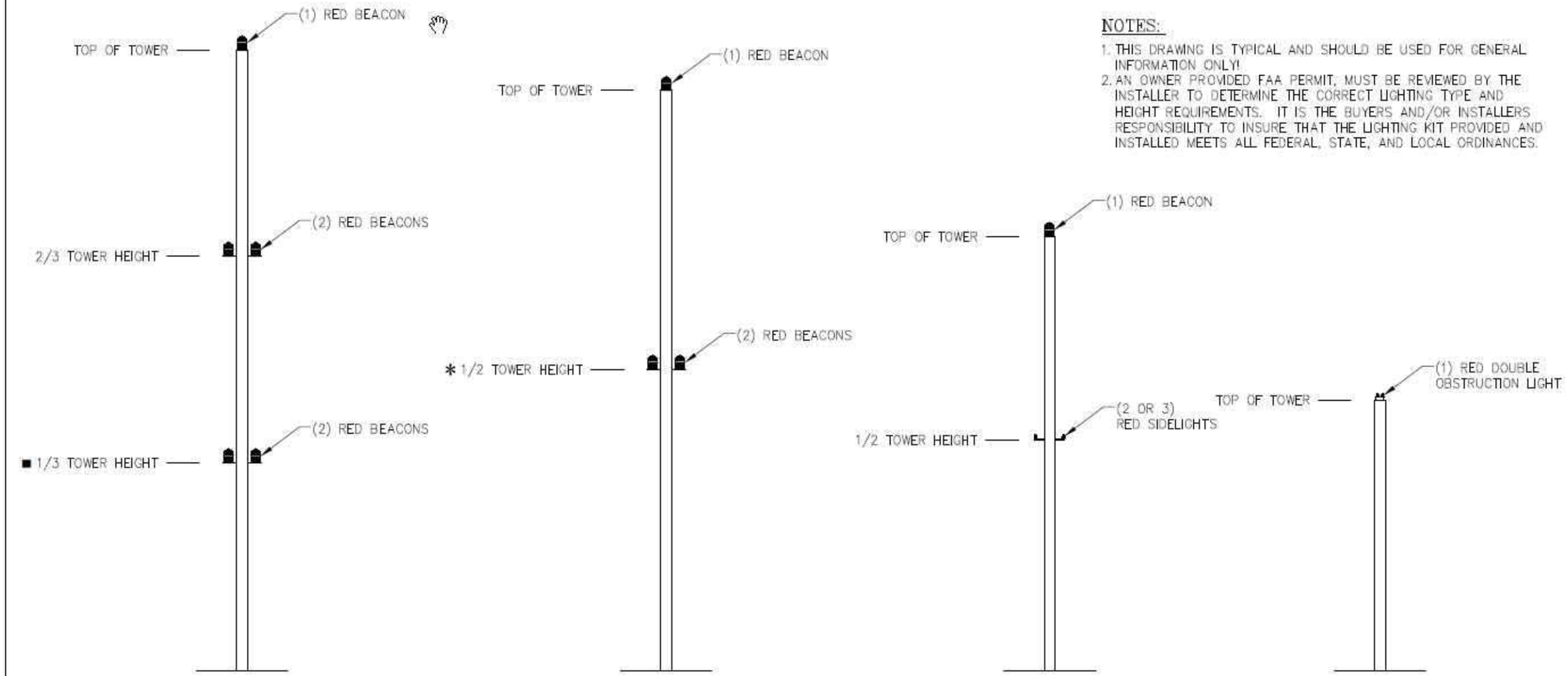
REV	DATE	DRWN	DESCRIPTION
B	04/01/25	MAS	PRELIMINARY
C	04/25/25	YX	PRELIMINARY
0	05/01/25	MAS	SUBMITTAL

B&T ENGINEERING, INC.

PROFESSIONAL ENGINEER
No. 12525901-2202
PETER D. SMITH
STATE OF UTAH

TOWER ELEVATION

SHEET NUMBER:
C-3



NOTES:

1. THIS DRAWING IS TYPICAL AND SHOULD BE USED FOR GENERAL INFORMATION ONLY!
2. AN OWNER PROVIDED FAA PERMIT, MUST BE REVIEWED BY THE INSTALLER TO DETERMINE THE CORRECT LIGHTING TYPE AND HEIGHT REQUIREMENTS. IT IS THE BUYERS AND/OR INSTALLERS RESPONSIBILITY TO INSURE THAT THE LIGHTING KIT PROVIDED AND INSTALLED MEETS ALL FEDERAL, STATE, AND LOCAL ORDINANCES.

✱ 1/2 TOWER HEIGHT BUT NOT LOWER THAN 200 FT.

■ 1/3 TOWER HEIGHT BUT NOT LOWER THAN 200 FT.

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS INCLUDE FINISHES AND ARE IN INCHES
TOLERANCES: FRACTIONS ± 1/16" ANGLES ± 1/2 DEG. DECIMALS ± .010"
MATERIAL:
TOLERANCES DO NOT APPLY TO RAW MATERIAL

REV	DATE	DRW	CHK	DESCRIPTION

Sabre Industries
INNOVATION DELIVERED

A–SERIES LIGHT SYSTEM
(FAA/FCC SPECS. AC70/7460–1M)

		SIZE	DRAWING NO.	REV
DATE	11/05/24	B	9031960	0
DRAWN BY	KTW		SCALE None	PAGE 1 OF 1
CHECKED BY	WTK			

B+T GRP

Sabre Industries
INNOVATION DELIVERED

ENSIGN PEAK UT
SALT LAKE COUNTY
501 E 1900 N
SALT LAKE CITY, UT 84103
PROPOSED 100' S4TL SELF-SUPPORT TOWER

PROJECT NO:	G0175136.001.01
CHECKED BY:	DLS

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
B	04/01/25	MAS	PRELIMINARY
C	04/25/25	YX	PRELIMINARY
0	05/01/25	MAS	SUBMITTAL

B&T ENGINEERING, INC.

PROFESSIONAL ENGINEER
No. 12525901-2202
PETER D. SMITH
STATE OF UTAH

TOWER LIGHTING DETAILS

SHEET NUMBER:
C-3.2

THIS SHEET PROVIDED BY CLIENT AND IS SHOWN FOR REFERENCE ONLY

NOTES:

1. SIGNS SHALL BE FABRICATED FROM CORROSION RESISTANT PRESSED METAL, AND PAINTED WITH LONG LASTING UV RESISTANT COATINGS.

2. SIGNS (EXCEPT WHERE NOTED OTHERWISE) SHALL BE MOUNTED TO THE TOWER, GATE AND FENCE USING A MINIMUM OF 9 GAUGE ALUMINUM WIRE, HOG RINGS (AS UTILIZED IN FENCE INSTALLATIONS) OR BRACKETS WHERE NECESSARY. BRACKETS SHALL BE OF SIMILAR METAL AS THE STRUCTURE TO AVOID GALVANIC CORROSION.

3. ADDITIONAL E911 ADDRESS SIGNS ARE REQUIRED AT EACH ACCESS ROAD GATE LEADING TO THE COMPOUND AS WELL AS ON THE COMPOUND GATE ITSELF.

4. ADDITIONAL FCC REGISTRATION # SIGNS ARE REQUIRED AT EACH ACCESS ROAD GATE LEADING TO THE COMPOUND AS WELL AS ON THE COMPOUND GATE ITSELF. SIGN SHALL MEASURE (20" LONG x 4" TALL). THE LETTERS SHALL BE 1" AND THE NUMBERS SHALL BE 2".

5. RECOMMENDED SOURCES FOR OBTAINING SIGNAGE:

   ST. CLAIR SIGNS
   3184 WADE HAMPTON BOULEVARD
   TAYLORS, SC 29687
   (864) 244-0040

   RF EXPOSURE SIGNS
   RICHARD TELL ASSOCIATES
   3433 RINGSTAR ROAD, SUITE 3
   NORTH LAS VEGAS, NV 89030
   (702) 645-3338

   EXCEL SIGN & DECAL
   1509 NORTH MILPITAS BLVD.
   MILPITAS, CA 95035
   (408) 942-8881

6. NO ADVERTISING SIGNS INCLUDING COMMERCIAL, ADVERTISING, LOGOS, POLITICAL SIGNS, FLYERS, FLAGS OR BANNERS WHETHER OR NOT POSTED TEMPORARILY, SHALL BE PERMITTED ARE WARNING, DANGER, OR OTHER SIGNS DESIGNED TO MAINTAIN PUBLIC SAFETY.

ATTENTION

THE SITE SHALL ONLY CONTAIN SIGNAGE AS MANDATED BY THE FCC.

1'-8"

4"

FCC TOWER REGISTRATION NO.:
1257930

(4) WHITE BACKGROUND WITH BLACK LETTERING
QUANTITY: (2)
TO BE MOUNTED ON: COMPOUND ACCESS GATE
ACCESS DRIVE GATE
(SEE NOTE 4)

NOTE:
NUMBER SHOWN IS GENERIC, CONTRACT CONSTRUCTION MANAGER FOR ACTUAL FCC TOWER REG. #.

1'-6"

1'-0"

Sabre Industries™
INNOVATION DELIVERED

IN CASE OF EMERGENCY
CALL: (866) 254-3707

SITE DESIGNATION: 552264

EMERGENCY SIGN
(RED METAL W/ WHITE LETTERING)

3'-0"

2'-0"

Sabre Industries™
INNOVATION DELIVERED

SITE NAME: ENSIGN PEAK UT
SITE ID: 552264

501 E 1900 N
SALT LAKE CITY, UT 84103 ← CONTRACTOR SHALL VERIFY ADDRESS PRIOR TO ORDERING SIGNAGE.

FOR LEASE INFORMATION
CALL: ###-###-####

24 HOUR EMERGENCY SERVICE ← RED LETTERS (ALL OTHERS BLACK)
CALL: ###-###-#### ← CONTRACTOR TO COORDINATE NUMBERS (TYP)

11"

8½"

NOTICE

RF Controlled Area Beyond This Point

Radio fequency ("RF") emissions may exceed FCC Standards for general public exposure. Only authorized workers permitted to enter.

For your safety:
Obey all posted signs.
Maintain minimums distance of 7 feet from all antennas.
Do not step in front of antennas.

For further information, please call ###-###-#### and reference Site Number: 552264 ← CONTRACTOR TO COORDINATE NUMBERS (TYP)

RF NOTICE SIGN
(WHITE METAL SIGN W/BLACK LETTERING)

TYPICAL SIGNS AND SPECIFICATIONS

SCALE: N.T.S.

B+T GRP

Sabre Industries™
INNOVATION DELIVERED

ENSIGN PEAK UT
SALT LAKE COUNTY
501 E 1900 N
SALT LAKE CITY, UT 84103
PROPOSED 100' S4TL SELF-SUPPORT TOWER

PROJECT NO:	G0175136.001.01
CHECKED BY:	DLS

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
B	04/01/25	MAS	PRELIMINARY
C	04/25/25	YX	PRELIMINARY
0	05/01/25	MAS	SUBMITTAL

B&T ENGINEERING, INC.

PROFESSIONAL ENGINEER
No. 12525901-2202
PETER D. SMITH
STATE OF UTAH

SIGNAGE DETAILS

SHEET NUMBER:
C-4

Sabre Industries™
INNOVATION DELIVERED

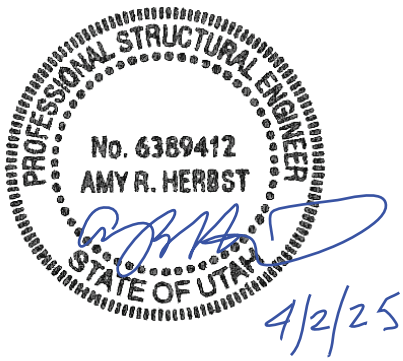
Structural Design Report

100' S4TL Self-Supporting Tower
Site: Ensign Peak, UT

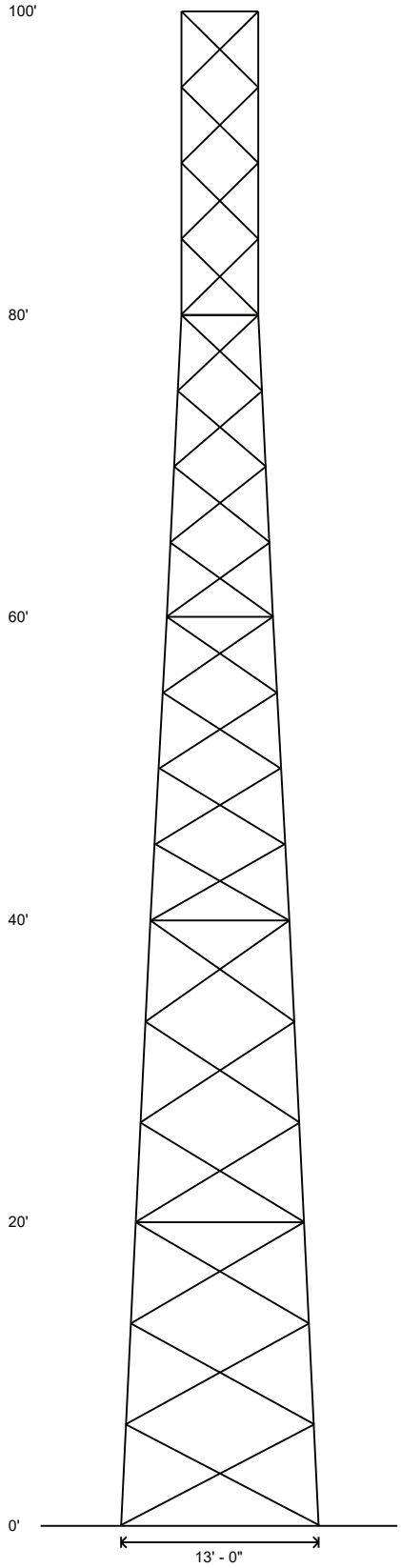
Prepared for: SALT LAKE CITY IMS
by: Sabre Industries ™

Job Number: 552264
Revision B

April 2, 2025



Legs	4.500 OD X .337		4.000 OD X .226		3.500 OD X .216	2.875 OD X .203		2.375 OD X .154	
Diagonals	L 2 1/2 X 2 1/2 X 3/16		L 2 X 2 X 3/16		L 2 X 2 X 1/8				
Horizontals	NONE	A	NONE	B	NONE	NONE	D	NONE	D
Internals	NONE	L 4 X 4 X 1/4	NONE	E	NONE	NONE	F	NONE	F
Brace Bolts	(1) 5/8"								
Top Face Width	11'		9'		7'	5'			
Panel Count/Height	6 @ 6.6667'					12 @ 5'			
Section Weight	2870		1998		1595	1270		1005	



Design Criteria - ANSI/TIA-222-H

Wind Speed (No Ice)	109 mph
Wind Speed (Ice)	40 mph
Design Ice Thickness	0.25 in
Risk Category	III
Exposure Category	C
Topographic Factor Procedure	Method 2 (Rigorous)
Topographic Feature	Ridge
Crest Height	1870 ft
Length of Topographic Feature	2138 ft
Horizontal Distance from Structure to Crest	0 ft
Ground Elevation	6152 ft
Seismic Importance Factor, Ie	1.25
0.2-sec Spectral Response, Ss	1.419 g
1-sec Spectral Response, S1	0.526 g
Site Class	D (DEFAULT)
Seismic Design Category	D
Basic Seismic Force-Resisting System	Telecommunication Tower (Truss: Steel)

Base Reactions - Wind/Ice

Total Foundation		Individual Footing	
Shear (kips)	38.43	Shear (kips)	14.97
Axial (kips)	15.84	Compression (kips)	122
Moment (ft-kips)	2179	Uplift (kips)	115

Base Reactions - Seismic

Total Foundation		Individual Footing	
Shear (kips)	7.48	Shear (kips)	3.62
Axial (kips)	22.7	Compression (kips)	35
Moment (ft-kips)	539	Uplift (kips)	27

Notes

1) All legs are A500 (50 ksi Min. Yield).
2) All braces are A572 Grade 50.
3) All brace bolts are A325-X.
4) The tower model is S4TL.
5) Transmission lines are to be attached to 15 hole waveguide ladders.
6) Azimuths are relative (not based on true north).
7) Foundation loads shown are maximums.
8) All unequal angles are oriented with the short leg vertical.
9) Weights shown are estimates. Final weights may vary.
10) This tower design and, if applicable, the foundation design(s) shown on the following page(s) also meet or exceed the requirements of the 2021 International Building Code.
11) Tower Rating: 98.27%
12) Use single internal bracing pattern at 20', 40', 60', 80', and 100'.
13) This structure has been designed with a 50% increase in antenna and line loading.
14) No grout is required under the base plates.

Sabre Industries
INNOVATION DELIVERED

Sabre Industries
7101 Southbridge Drive
P.O. Box 658
Sioux City, IA 51102-0658
Phone: (712) 258-6690
Fax: (712) 279-0814

Job:	**552264B**
Customer:	SALT LAKE CITY IMS
Site Name:	Ensign Peak, UT
Description:	100' S4TL
Date:	4/2/2025 By: ARH

Designed Appurtenance Loading

Elev	Description	Tx-Line
100	Lights & Lightning Rod	(1) 1 (not on ladder)
92.35	(1) SC2340-HMBSNF	(1) 7/8"
90	6ft Sidearm	
89	(2) 4' Ice Shield	
85	(2) Leg Dish Mount	
85	(2) 4' Solid Dish	(2) EW63
82.35	(2) SC2340-HMBSNF	(2) 7/8"
80.71	(1) SC246	(1) 7/8"

Elev	Description	Tx-Line
80	(2) 6ft Sidearms	
80	(1) SD214-SF2P2LDF(D00)	(1) 7/8"
70	6ft Sidearm	
70	6ft Sidearm	
60	(3) Flush Mount	
60	(3) PMP 450i	(3) Cat 5
40	Flush Mount	
40	(1) SY307	(1) 7/8"

Material List

Display	Value
A	L 2 1/2 X 2 1/2 X 1/4
B	L 2 X 2 X 5/16
C	L 2 X 2 X 1/4

Display	Value
D	L 2 X 2 X 3/16
E	L 3 1/2 X 3 1/2 X 1/4
F	L 2 1/2 X 2 1/2 X 3/16

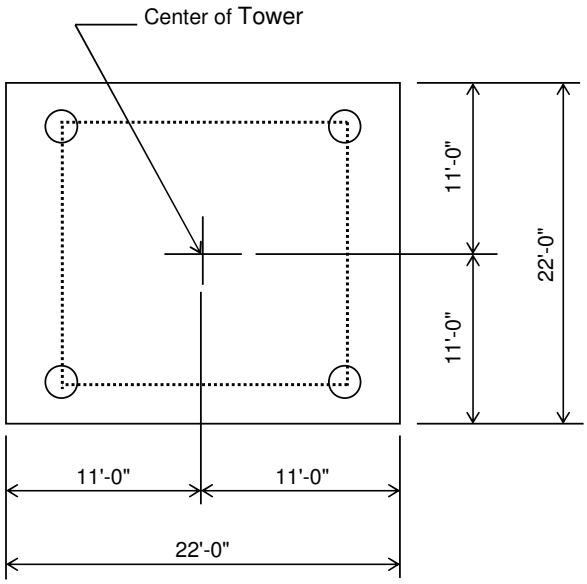
Sabre Industries
INNOVATION DELIVERED

Sabre Industries
7101 Southbridge Drive
P.O. Box 658
Sioux City, IA 51102-0658
Phone: (712) 258-6690
Fax: (712) 279-0814

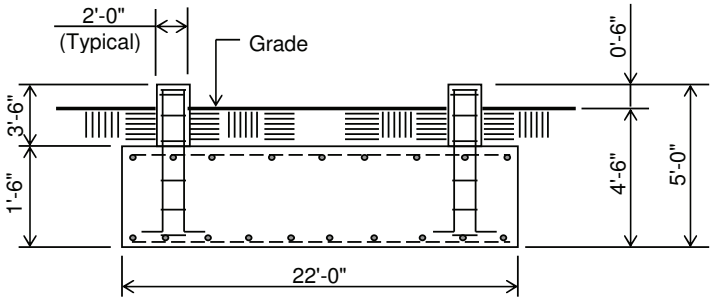
Job:	**552264B**
Customer:	SALT LAKE CITY IMS
Site Name:	Ensign Peak, UT
Description:	100' S4TL
Date:	4/2/2025 By: ARH

No.: 552264
Date: 04/02/2025
By: ARH
Revision B

Customer: SALT LAKE CITY IMS
Site: Ensign Peak, UT
100 ft. Model S4TL Self Supporting Tower



PLAN VIEW



ELEVATION VIEW

(28.5 cu. yds.)
(1 REQD.; NOT TO SCALE)

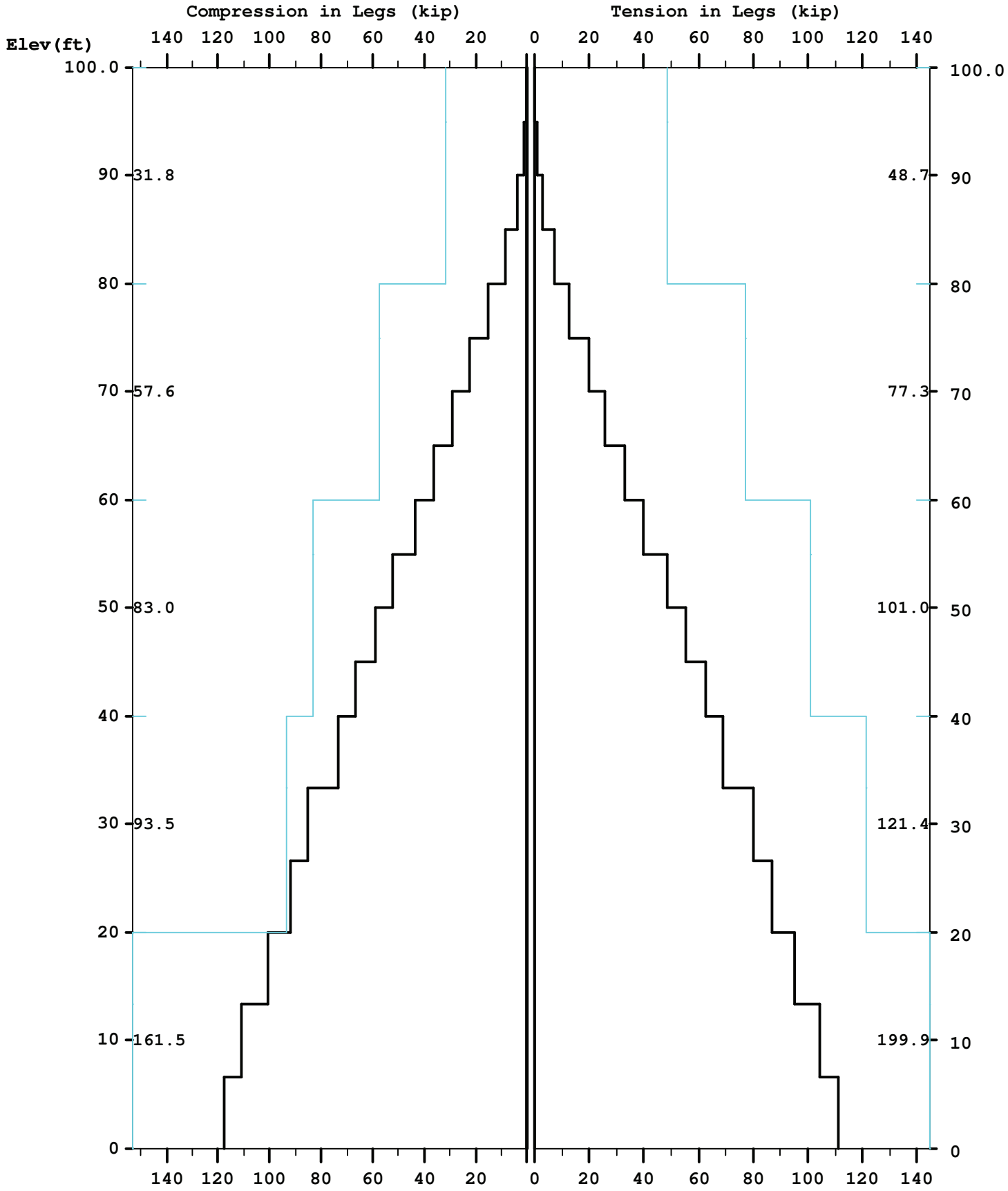
Notes:

1) Concrete shall have a minimum 28-day compressive strength of 4,500 psi, in accordance with ACI 318-14.
2) Rebar to conform to ASTM specification A615 Grade 60.
3) All rebar to have a minimum of 3" concrete cover.
4) All exposed concrete corners to be chamfered 3/4".
5) The foundation design is based on the geotechnical report by GSH, job no. 4054-02-25, dated Marcy 18, 2025 and the Addendum no. 1, dated March 28, 2025.
6) See the geotechnical report for compaction requirements, if specified.
7) 3' of soil cover is required over the entire area of the foundation slab.
8) The bottom anchor bolt template shall be positioned as closely as possible to the bottom of the anchor bolts.
9) Tie overlaps shall be staggered with a nominal 180° separation.

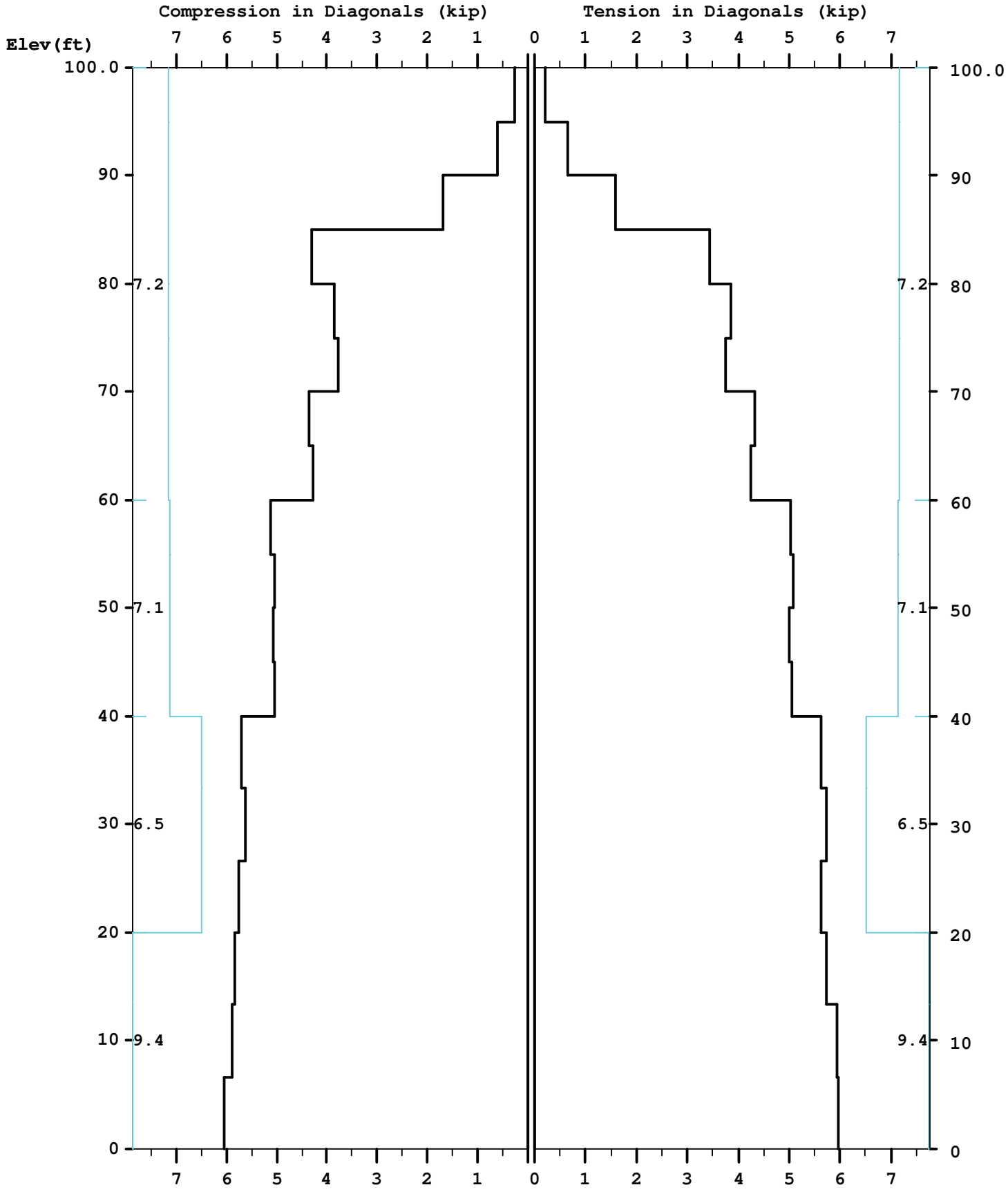
Rebar Schedule per Mat and per Pier	
Pier	(8) #8 vertical rebar w/ hooks at bottom w/ #4 rebar ties, two (2) within top 5" of pier then 4" C/C
Mat	(38) #5 horizontal rebar evenly spaced each way top and bottom. (152 total)
Anchor Bolts per Leg	
(4) 1" dia. x 51" F1554-105 on a 8" B.C. w/ 7" max. projection above concrete.	

7101 Southbridge Dr - P.O. Box 658 - Sioux City, IA 51102-0658 - Phone 712.258.6690 - Fax 712.258.8250

Maximum

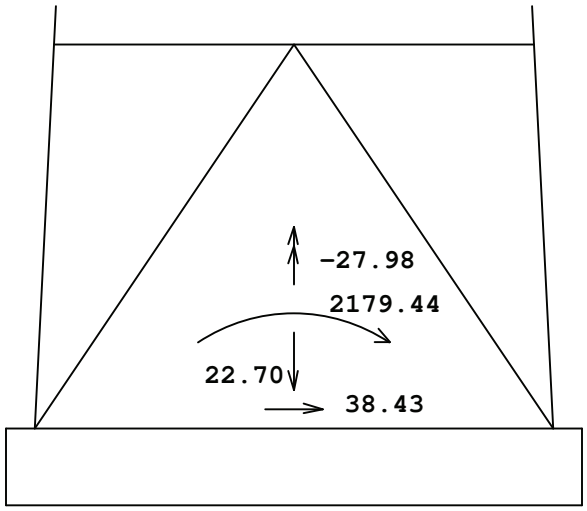

Compression in Legs (kip)
Tension in Legs (kip)
Elev(ft)
140 120 100 80 60 40 20 0 20 40 60 80 100 120 140
100.0
90
80
70
60
50
40
30
20
10
0
31.8
57.6
83.0
93.5
161.5
48.7
77.3
101.0
121.4
199.9

Maximum

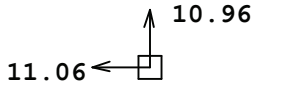

Compression in Diagonals (kip)
Tension in Diagonals (kip)
Elev(ft)
7 6 5 4 3 2 1 0 1 2 3 4 5 6 7
100.0
90
80
70
60
50
40
30
20
10
0
7.2
7.1
6.5
9.4

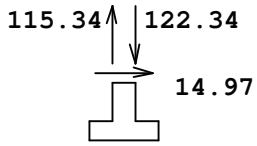
Maximum

TOTAL FOUNDATION LOADS (kip, ft-kip)



INDIVIDUAL FOOTING LOADS (kip)





MAST GEOMETRY (ft)

PANEL TYPE	NO.OF LEGS	ELEV.AT BOTTOM	ELEV.AT TOP	F.W..AT BOTTOM	F.W..AT TOP	TYPICAL PANEL HEIGHT
X	4	95.00	100.00	5.00	5.00	5.00
X	4	80.00	95.00	5.00	5.00	5.00
X	4	75.00	80.00	5.50	5.00	5.00
X	4	60.00	75.00	7.00	5.50	5.00
X	4	55.00	60.00	7.50	7.00	5.00
X	4	40.00	55.00	9.00	7.50	5.00
X	4	33.33	40.00	9.67	9.00	6.67
X	4	20.00	33.33	11.00	9.67	6.66
X	4	13.33	20.00	11.67	11.00	6.67
X	4	0.00	13.33	13.00	11.67	6.66

MEMBER PROPERTIES

MEMBER TYPE	BOTTOM ELEV ft	TOP ELEV ft	X-SECTN AREA in.sq	RADIUS OF GYRAT in	ELASTIC MODULUS ksi	THERMAL EXPANSN /deg
LE	80.00	100.00	1.075	0.787	29000.	0.0000117
LE	60.00	80.00	1.704	0.787	29000.	0.0000117
LE	40.00	60.00	2.228	0.787	29000.	0.0000117
LE	20.00	40.00	2.680	0.787	29000.	0.0000117
LE	0.00	20.00	4.407	0.787	29000.	0.0000117
DI	40.00	100.00	0.484	0.626	29000.	0.0000117
DI	20.00	40.00	0.715	0.626	29000.	0.0000117
DI	0.00	20.00	0.902	0.626	29000.	0.0000117
HO	95.00	100.00	0.715	0.617	29000.	0.0000117
HO	75.00	80.00	0.715	0.617	29000.	0.0000117
HO	55.00	60.00	0.938	0.617	29000.	0.0000117
HO	33.33	40.00	1.152	0.617	29000.	0.0000117
HO	13.33	20.00	1.188	0.617	29000.	0.0000117
BR	95.00	100.00	0.902	0.778	29000.	0.0000117
BR	75.00	80.00	0.902	0.778	29000.	0.0000117
BR	55.00	60.00	1.188	0.778	29000.	0.0000117
BR	33.33	40.00	1.688	0.778	29000.	0.0000117
BR	13.33	20.00	1.938	0.778	29000.	0.0000117

FACTORED MEMBER RESISTANCES

BOTTOM ELEV	TOP ELEV	LEGS		DIAGONALS		HORIZONTALS		INT BRACING	
		COMP	TENS	COMP	TENS	COMP	TENS	COMP	TENS
ft	ft	kip	kip	kip	kip	kip	kip	kip	kip

95.0	100.0	31.84	48.70	7.16	7.16	10.74	10.74	10.81	10.81
80.0	95.0	31.84	48.70	7.16	7.16	0.00	0.00	0.00	0.00
75.0	80.0	57.62	77.27	7.16	7.16	10.74	10.74	10.81	10.81
60.0	75.0	57.62	77.27	7.16	7.16	0.00	0.00	0.00	0.00
55.0	60.0	83.04	100.98	7.13	7.13	7.52	7.52	8.71	8.71
40.0	55.0	83.04	100.98	7.13	7.13	0.00	0.00	0.00	0.00
33.3	40.0	93.52	121.37	6.51	6.51	5.37	5.37	14.57	14.57
20.0	33.3	93.52	121.37	6.51	6.51	0.00	0.00	0.00	0.00
13.3	20.0	161.47	199.92	9.45	9.45	5.50	5.50	14.86	14.86
0.0	13.3	161.47	199.92	9.45	9.45	0.00	0.00	0.00	0.00

==========

* Only 4 condition(s) shown in full
* Some wind loads may have been derived from full-scale wind tunnel testing

==========

LOADING CONDITION A ==========

109 mph wind with no ice. Wind Azimuth: 0° (1.2 D + 1.0 Wo)

MAST LOADING

LOAD TYPE	ELEV	APPLY..LOAD..AT RADIUS	AZI	LOAD AZI	.....FORCES..... HORIZ	DOWN	.....MOMENTS..... VERTICAL	TORSNAL
	ft	ft			kip	kip	ft-kip	ft-kip
C	100.0	0.00	0.0	0.0	0.17	0.18	0.00	0.00
C	97.5	0.00	0.0	0.0	0.03	0.00	0.00	0.00
C	92.5	0.00	0.0	0.0	0.03	0.00	0.00	0.00
C	92.3	0.00	0.0	0.0	0.10	0.01	0.00	0.00
C	90.0	0.00	0.0	0.0	1.05	0.54	0.00	0.00
C	89.0	0.00	0.0	0.0	0.74	1.44	0.00	0.00
C	82.5	0.00	0.0	0.0	0.03	0.00	0.00	0.00
C	82.3	0.00	0.0	0.0	0.20	0.01	0.00	0.00
C	80.7	0.00	0.0	0.0	0.50	0.08	0.00	0.00
C	80.0	0.00	0.0	0.0	0.80	0.11	0.00	0.00
C	80.0	0.00	0.0	0.0	2.06	1.08	0.00	0.00
C	72.5	0.00	0.0	0.0	0.03	0.00	0.00	0.00
C	70.0	0.00	0.0	0.0	1.02	0.54	0.00	0.00
C	70.0	0.00	0.0	0.0	1.02	0.54	0.00	0.00
C	62.5	0.00	0.0	0.0	0.03	0.00	0.00	0.00
C	60.0	0.00	0.0	0.0	0.88	0.12	0.00	0.00
C	60.0	0.00	0.0	0.0	0.88	0.12	0.00	0.00
C	60.0	0.00	0.0	0.0	0.88	0.12	0.00	0.00
C	52.5	0.00	0.0	0.0	0.03	0.00	0.00	0.00
C	42.5	0.00	0.0	0.0	0.03	0.00	0.00	0.00
C	40.0	0.00	0.0	0.0	0.32	0.10	0.00	0.00
C	36.7	0.00	0.0	0.0	0.03	0.00	0.00	0.00
C	30.0	0.00	0.0	0.0	0.03	0.00	0.00	0.00
C	23.4	0.00	0.0	0.0	0.02	0.00	0.00	0.00
C	16.7	0.00	0.0	0.0	0.02	0.00	0.00	0.00
C	10.1	0.00	0.0	0.0	0.02	0.00	0.00	0.00
C	3.3	0.00	0.0	0.0	0.02	0.00	0.00	0.00
D	100.0	0.00	36.2	0.0	0.18	0.07	0.01	0.01

D	95.0	0.00	36.2	0.0	0.18	0.07	0.01	0.01
D	95.0	0.00	36.2	0.0	0.14	0.05	0.01	0.01
D	90.0	0.00	36.2	0.0	0.14	0.05	0.01	0.01
D	90.0	0.00	6.3	0.0	0.17	0.06	0.03	-0.01
D	85.0	0.00	6.3	0.0	0.17	0.06	0.03	-0.01
D	85.0	0.00	4.1	0.0	0.19	0.06	0.03	-0.03
D	80.0	0.00	4.1	0.0	0.19	0.06	0.03	-0.03
D	80.0	0.00	2.0	0.0	0.24	0.09	0.04	-0.04
D	75.0	0.00	2.0	0.0	0.24	0.09	0.04	-0.04
D	75.0	0.00	2.0	0.0	0.22	0.07	0.04	-0.04
D	70.0	0.00	2.0	0.0	0.22	0.07	0.04	-0.04
D	70.0	0.00	0.5	0.0	0.23	0.07	0.05	-0.04
D	60.0	0.00	0.5	0.0	0.24	0.07	0.05	-0.04
D	60.0	0.00	0.2	0.0	0.29	0.12	0.06	-0.05
D	55.0	0.00	0.2	0.0	0.29	0.12	0.06	-0.05
D	55.0	0.00	0.1	0.0	0.25	0.09	0.06	-0.04
D	40.0	0.00	0.1	0.0	0.25	0.09	0.06	-0.04
D	40.0	0.00	359.8	0.0	0.29	0.16	0.08	-0.05
D	33.3	0.00	359.8	0.0	0.29	0.16	0.08	-0.05
D	33.3	0.00	359.8	0.0	0.24	0.11	0.08	-0.04
D	20.0	0.00	359.8	0.0	0.23	0.11	0.08	-0.04
D	20.0	0.00	359.8	0.0	0.30	0.22	0.09	-0.04
D	13.3	0.00	359.8	0.0	0.30	0.22	0.09	-0.04
D	13.3	0.00	359.8	0.0	0.25	0.15	0.09	-0.04
D	0.0	0.00	359.8	0.0	0.26	0.16	0.10	-0.04

ANTENNA LOADING
==========

.....ANTENNA.....			ATTACHMENT		.....ANTENNA FORCES.....			
TYPE	ELEV	AZI	RAD	AZI	AXIAL	SHEAR	GRAVITY	TORSION
	ft		ft		kip	kip	kip	ft-kip
STD	85.0	0.0	5.0	45.0	1.78	0.00	0.14	0.00
STD	85.0	180.0	5.0	225.0	-1.21	0.00	0.14	0.00

==========
LOADING CONDITION I ==========

109 mph wind with no ice. Wind Azimuth: 0° (0.9 D + 1.0 Wo)

MAST LOADING
==========

LOAD	ELEV	APPLY..LOAD..AT		LOAD	......FORCES......		......MOMENTS......	
TYPE		RADIUS	AZI	AZI	HORIZ	DOWN	VERTICAL	TORSNAL
	ft	ft			kip	kip	ft-kip	ft-kip
C	100.0	0.00	0.0	0.0	0.17	0.14	0.00	0.00
C	97.5	0.00	0.0	0.0	0.03	0.00	0.00	0.00
C	92.5	0.00	0.0	0.0	0.03	0.00	0.00	0.00
C	92.3	0.00	0.0	0.0	0.10	0.00	0.00	0.00
C	90.0	0.00	0.0	0.0	1.05	0.41	0.00	0.00
C	89.0	0.00	0.0	0.0	0.74	1.08	0.00	0.00
C	82.5	0.00	0.0	0.0	0.03	0.00	0.00	0.00
C	82.3	0.00	0.0	0.0	0.20	0.01	0.00	0.00
C	80.7	0.00	0.0	0.0	0.50	0.06	0.00	0.00
C	80.0	0.00	0.0	0.0	0.80	0.09	0.00	0.00
C	80.0	0.00	0.0	0.0	2.06	0.81	0.00	0.00

C	72.5	0.00	0.0	0.0	0.03	0.00	0.00	0.00
C	70.0	0.00	0.0	0.0	1.02	0.41	0.00	0.00
C	70.0	0.00	0.0	0.0	1.02	0.41	0.00	0.00
C	62.5	0.00	0.0	0.0	0.03	0.00	0.00	0.00
C	60.0	0.00	0.0	0.0	0.88	0.09	0.00	0.00
C	60.0	0.00	0.0	0.0	0.88	0.09	0.00	0.00
C	60.0	0.00	0.0	0.0	0.88	0.09	0.00	0.00
C	52.5	0.00	0.0	0.0	0.03	0.00	0.00	0.00
C	42.5	0.00	0.0	0.0	0.03	0.00	0.00	0.00
C	40.0	0.00	0.0	0.0	0.32	0.07	0.00	0.00
C	36.7	0.00	0.0	0.0	0.03	0.00	0.00	0.00
C	30.0	0.00	0.0	0.0	0.03	0.00	0.00	0.00
C	23.4	0.00	0.0	0.0	0.02	0.00	0.00	0.00
C	16.7	0.00	0.0	0.0	0.02	0.00	0.00	0.00
C	10.1	0.00	0.0	0.0	0.02	0.00	0.00	0.00
C	3.3	0.00	0.0	0.0	0.02	0.00	0.00	0.00
D	100.0	0.00	36.2	0.0	0.18	0.05	0.01	0.01
D	95.0	0.00	36.2	0.0	0.18	0.05	0.01	0.01
D	95.0	0.00	36.2	0.0	0.14	0.04	0.01	0.01
D	90.0	0.00	36.2	0.0	0.14	0.04	0.01	0.01
D	90.0	0.00	6.3	0.0	0.17	0.04	0.02	-0.01
D	85.0	0.00	6.3	0.0	0.17	0.04	0.02	-0.01
D	85.0	0.00	4.1	0.0	0.19	0.04	0.02	-0.03
D	80.0	0.00	4.1	0.0	0.19	0.04	0.02	-0.03
D	80.0	0.00	2.0	0.0	0.24	0.07	0.03	-0.04
D	75.0	0.00	2.0	0.0	0.24	0.07	0.03	-0.04
D	75.0	0.00	2.0	0.0	0.22	0.05	0.03	-0.04
D	70.0	0.00	2.0	0.0	0.22	0.05	0.03	-0.04
D	70.0	0.00	0.5	0.0	0.23	0.05	0.04	-0.04
D	60.0	0.00	0.5	0.0	0.24	0.06	0.04	-0.04
D	60.0	0.00	0.2	0.0	0.29	0.09	0.04	-0.05
D	55.0	0.00	0.2	0.0	0.29	0.09	0.04	-0.05
D	55.0	0.00	0.1	0.0	0.25	0.06	0.05	-0.04
D	40.0	0.00	0.1	0.0	0.25	0.07	0.05	-0.04
D	40.0	0.00	359.8	0.0	0.29	0.12	0.06	-0.05
D	33.3	0.00	359.8	0.0	0.29	0.12	0.06	-0.05
D	33.3	0.00	359.8	0.0	0.24	0.08	0.06	-0.04
D	20.0	0.00	359.8	0.0	0.23	0.08	0.06	-0.04
D	20.0	0.00	359.8	0.0	0.30	0.16	0.07	-0.04
D	13.3	0.00	359.8	0.0	0.30	0.16	0.07	-0.04
D	13.3	0.00	359.8	0.0	0.25	0.11	0.07	-0.04
D	0.0	0.00	359.8	0.0	0.26	0.12	0.07	-0.04

ANTENNA LOADING
==========

.....ANTENNA.....			ATTACHMENT		.....ANTENNA FORCES.....			
TYPE	ELEV	AZI	RAD	AZI	AXIAL	SHEAR	GRAVITY	TORSION
	ft		ft		kip	kip	kip	ft-kip
STD	85.0	0.0	5.0	45.0	1.78	0.00	0.10	0.00
STD	85.0	180.0	5.0	225.0	-1.21	0.00	0.10	0.00

==========
LOADING CONDITION Q ==========

Seismic - Azimuth: 0° (1.2 D + 1.0 Ev + 1.0 Eh)

MAST LOADING
============

LOAD TYPE	ELEV	APPLY..LOAD..AT RADIUS	AZI	LOAD AZI	......FORCES...... HORIZ	DOWN	......MOMENTS...... VERTICAL	TORSNAL
	ft	ft			kip	kip	ft-kip	ft-kip
C	100.0	0.00	0.0	0.0	0.13	0.21	0.00	0.00
C	98.7	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	98.7	0.00	0.0	0.0	0.01	0.01	0.00	0.00
C	97.5	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	95.0	0.00	0.0	0.0	0.02	0.03	0.00	0.00
C	95.0	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	92.5	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	92.3	0.00	0.0	0.0	0.00	0.01	0.00	0.00
C	91.2	0.00	0.0	0.0	0.01	0.01	0.00	0.00
C	91.2	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	90.0	0.00	0.0	0.0	0.34	0.64	0.00	0.00
C	90.0	0.00	0.0	0.0	0.77	1.43	0.00	0.00
C	89.5	0.00	0.0	0.0	0.00	0.01	0.00	0.00
C	89.5	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	89.5	0.00	0.0	0.0	0.00	0.01	0.00	0.00
C	89.0	0.00	0.0	0.0	0.91	1.71	0.00	0.00
C	87.0	0.00	0.0	0.0	0.01	0.02	0.00	0.00
C	87.0	0.00	0.0	0.0	0.02	0.03	0.00	0.00
C	87.0	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	85.0	0.00	0.0	0.0	0.27	0.54	0.00	0.00
C	85.0	0.00	0.0	0.0	0.27	0.54	0.00	0.00
C	85.0	0.00	0.0	0.0	0.05	0.11	0.00	0.00
C	85.0	0.00	0.0	0.0	0.05	0.11	0.00	0.00
C	85.0	0.00	0.0	0.0	0.32	0.64	0.00	0.00
C	85.0	0.00	0.0	0.0	0.32	0.64	0.00	0.00
C	83.7	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	83.7	0.00	0.0	0.0	0.01	0.01	0.00	0.00
C	83.7	0.00	0.0	0.0	0.01	0.02	0.00	0.00
C	82.5	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	82.3	0.00	0.0	0.0	0.01	0.01	0.00	0.00
C	81.2	0.00	0.0	0.0	0.01	0.01	0.00	0.00
C	81.2	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	81.2	0.00	0.0	0.0	0.01	0.02	0.00	0.00
C	80.7	0.00	0.0	0.0	0.05	0.09	0.00	0.00
C	80.0	0.00	0.0	0.0	0.06	0.13	0.00	0.00
C	80.0	0.00	0.0	0.0	0.61	1.28	0.00	0.00
C	76.2	0.00	0.0	0.0	0.02	0.04	0.00	0.00
C	76.2	0.00	0.0	0.0	0.00	0.01	0.00	0.00
C	76.2	0.00	0.0	0.0	0.04	0.08	0.00	0.00
C	72.5	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	71.2	0.00	0.0	0.0	0.01	0.03	0.00	0.00
C	71.2	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	71.2	0.00	0.0	0.0	0.01	0.01	0.00	0.00
C	70.0	0.00	0.0	0.0	0.27	0.64	0.00	0.00
C	70.0	0.00	0.0	0.0	0.27	0.64	0.00	0.00
C	70.0	0.00	0.0	0.0	0.75	1.81	0.00	0.00
C	66.2	0.00	0.0	0.0	0.02	0.04	0.00	0.00
C	66.2	0.00	0.0	0.0	0.00	0.01	0.00	0.00
C	66.2	0.00	0.0	0.0	0.04	0.09	0.00	0.00
C	62.5	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	61.2	0.00	0.0	0.0	0.01	0.01	0.00	0.00
C	61.2	0.00	0.0	0.0	0.01	0.03	0.00	0.00
C	61.2	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	60.0	0.00	0.0	0.0	0.05	0.14	0.00	0.00

C	60.0	0.00	0.0	0.0	0.05	0.14	0.00	0.00
C	60.0	0.00	0.0	0.0	0.05	0.14	0.00	0.00
C	56.2	0.00	0.0	0.0	0.01	0.04	0.00	0.00
C	56.2	0.00	0.0	0.0	0.00	0.01	0.00	0.00
C	56.2	0.00	0.0	0.0	0.03	0.10	0.00	0.00
C	52.5	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	50.0	0.00	0.0	0.0	0.68	2.28	0.00	0.00
C	47.5	0.00	0.0	0.0	0.02	0.06	0.00	0.00
C	47.5	0.00	0.0	0.0	0.04	0.13	0.00	0.00
C	47.5	0.00	0.0	0.0	0.00	0.01	0.00	0.00
C	42.5	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	41.2	0.00	0.0	0.0	0.00	0.01	0.00	0.00
C	41.2	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	41.2	0.00	0.0	0.0	0.01	0.03	0.00	0.00
C	40.0	0.00	0.0	0.0	0.03	0.12	0.00	0.00
C	38.4	0.00	0.0	0.0	0.00	0.02	0.00	0.00
C	38.4	0.00	0.0	0.0	0.01	0.04	0.00	0.00
C	38.4	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	36.7	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	33.4	0.00	0.0	0.0	0.01	0.04	0.00	0.00
C	33.4	0.00	0.0	0.0	0.02	0.09	0.00	0.00
C	33.4	0.00	0.0	0.0	0.00	0.01	0.00	0.00
C	30.0	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	30.0	0.00	0.0	0.0	0.51	2.85	0.00	0.00
C	26.7	0.00	0.0	0.0	0.01	0.09	0.00	0.00
C	26.7	0.00	0.0	0.0	0.01	0.04	0.00	0.00
C	26.7	0.00	0.0	0.0	0.00	0.01	0.00	0.00
C	23.4	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	21.7	0.00	0.0	0.0	0.01	0.05	0.00	0.00
C	21.7	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	21.7	0.00	0.0	0.0	0.00	0.02	0.00	0.00
C	18.4	0.00	0.0	0.0	0.00	0.02	0.00	0.00
C	18.4	0.00	0.0	0.0	0.00	0.04	0.00	0.00
C	18.4	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	16.7	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	13.4	0.00	0.0	0.0	0.00	0.04	0.00	0.00
C	13.4	0.00	0.0	0.0	0.01	0.09	0.00	0.00
C	13.4	0.00	0.0	0.0	0.00	0.01	0.00	0.00
C	10.1	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	10.0	0.00	0.0	0.0	0.24	4.10	0.00	0.00
C	6.7	0.00	0.0	0.0	0.00	0.04	0.00	0.00
C	6.7	0.00	0.0	0.0	0.00	0.01	0.00	0.00
C	6.7	0.00	0.0	0.0	0.00	0.09	0.00	0.00
C	3.3	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	1.7	0.00	0.0	0.0	0.00	0.02	0.00	0.00
C	1.7	0.00	0.0	0.0	0.00	0.05	0.00	0.00
C	1.7	0.00	0.0	0.0	0.00	0.00	0.00	0.00
D	100.0	0.00	180.0	180.0	0.00	0.00	0.00	0.00
D	0.0	0.00	180.0	180.0	0.00	0.00	0.00	0.00

ANTENNA LOADING
==========

.....ANTENNA.....			ATTACHMENT		.....ANTENNA FORCES.....			
TYPE	ELEV	AZI	RAD	AZI	AXIAL	SHEAR	GRAVITY	TORSION
	ft		ft		kip	kip	kip	ft-kip
STD	85.0	0.0	5.0	45.0	0.00	0.00	0.00	0.00
STD	85.0	180.0	5.0	225.0	0.00	0.00	0.00	0.00

LOADING CONDITION S

Seismic - Azimuth: 0° (0.9 D - 1.0 Ev + 1.0 Eh)

MAST LOADING

LOAD TYPE	ELEV ft	APPLY..LOAD..AT RADIUS ft	AZI	LOAD AZI	.....FORCES..... HORIZ kip	DOWN kip	.....MOMENTS..... VERTICAL ft-kip	TORSNAL ft-kip
C	100.0	0.00	0.0	0.0	0.13	0.10	0.00	0.00
C	98.7	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	98.7	0.00	0.0	0.0	0.01	0.01	0.00	0.00
C	97.5	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	95.0	0.00	0.0	0.0	0.02	0.01	0.00	0.00
C	95.0	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	92.5	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	92.3	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	91.2	0.00	0.0	0.0	0.01	0.01	0.00	0.00
C	91.2	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	90.0	0.00	0.0	0.0	0.34	0.30	0.00	0.00
C	90.0	0.00	0.0	0.0	0.77	0.68	0.00	0.00
C	89.5	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	89.5	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	89.5	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	89.0	0.00	0.0	0.0	0.91	0.81	0.00	0.00
C	87.0	0.00	0.0	0.0	0.01	0.01	0.00	0.00
C	87.0	0.00	0.0	0.0	0.02	0.01	0.00	0.00
C	87.0	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	85.0	0.00	0.0	0.0	0.27	0.25	0.00	0.00
C	85.0	0.00	0.0	0.0	0.27	0.25	0.00	0.00
C	85.0	0.00	0.0	0.0	0.05	0.05	0.00	0.00
C	85.0	0.00	0.0	0.0	0.05	0.05	0.00	0.00
C	85.0	0.00	0.0	0.0	0.32	0.30	0.00	0.00
C	85.0	0.00	0.0	0.0	0.32	0.30	0.00	0.00
C	83.7	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	83.7	0.00	0.0	0.0	0.01	0.01	0.00	0.00
C	83.7	0.00	0.0	0.0	0.01	0.01	0.00	0.00
C	82.5	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	82.3	0.00	0.0	0.0	0.01	0.01	0.00	0.00
C	81.2	0.00	0.0	0.0	0.01	0.01	0.00	0.00
C	81.2	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	81.2	0.00	0.0	0.0	0.01	0.01	0.00	0.00
C	80.7	0.00	0.0	0.0	0.05	0.04	0.00	0.00
C	80.0	0.00	0.0	0.0	0.06	0.06	0.00	0.00
C	80.0	0.00	0.0	0.0	0.61	0.61	0.00	0.00
C	76.2	0.00	0.0	0.0	0.02	0.02	0.00	0.00
C	76.2	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	76.2	0.00	0.0	0.0	0.04	0.04	0.00	0.00
C	72.5	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	71.2	0.00	0.0	0.0	0.01	0.01	0.00	0.00
C	71.2	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	71.2	0.00	0.0	0.0	0.01	0.01	0.00	0.00
C	70.0	0.00	0.0	0.0	0.27	0.30	0.00	0.00
C	70.0	0.00	0.0	0.0	0.27	0.30	0.00	0.00
C	70.0	0.00	0.0	0.0	0.75	0.85	0.00	0.00
C	66.2	0.00	0.0	0.0	0.02	0.02	0.00	0.00

C	66.2	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	66.2	0.00	0.0	0.0	0.04	0.04	0.00	0.00
C	62.5	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	61.2	0.00	0.0	0.0	0.01	0.01	0.00	0.00
C	61.2	0.00	0.0	0.0	0.01	0.01	0.00	0.00
C	61.2	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	60.0	0.00	0.0	0.0	0.05	0.07	0.00	0.00
C	60.0	0.00	0.0	0.0	0.05	0.07	0.00	0.00
C	60.0	0.00	0.0	0.0	0.05	0.07	0.00	0.00
C	56.2	0.00	0.0	0.0	0.01	0.02	0.00	0.00
C	56.2	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	56.2	0.00	0.0	0.0	0.03	0.05	0.00	0.00
C	52.5	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	50.0	0.00	0.0	0.0	0.68	1.07	0.00	0.00
C	47.5	0.00	0.0	0.0	0.02	0.03	0.00	0.00
C	47.5	0.00	0.0	0.0	0.04	0.06	0.00	0.00
C	47.5	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	42.5	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	41.2	0.00	0.0	0.0	0.00	0.01	0.00	0.00
C	41.2	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	41.2	0.00	0.0	0.0	0.01	0.02	0.00	0.00
C	40.0	0.00	0.0	0.0	0.03	0.06	0.00	0.00
C	38.4	0.00	0.0	0.0	0.00	0.01	0.00	0.00
C	38.4	0.00	0.0	0.0	0.01	0.02	0.00	0.00
C	38.4	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	36.7	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	33.4	0.00	0.0	0.0	0.01	0.02	0.00	0.00
C	33.4	0.00	0.0	0.0	0.02	0.04	0.00	0.00
C	33.4	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	30.0	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	30.0	0.00	0.0	0.0	0.51	1.34	0.00	0.00
C	26.7	0.00	0.0	0.0	0.01	0.04	0.00	0.00
C	26.7	0.00	0.0	0.0	0.01	0.02	0.00	0.00
C	26.7	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	23.4	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	21.7	0.00	0.0	0.0	0.01	0.02	0.00	0.00
C	21.7	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	21.7	0.00	0.0	0.0	0.00	0.01	0.00	0.00
C	18.4	0.00	0.0	0.0	0.00	0.01	0.00	0.00
C	18.4	0.00	0.0	0.0	0.00	0.02	0.00	0.00
C	18.4	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	16.7	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	13.4	0.00	0.0	0.0	0.00	0.02	0.00	0.00
C	13.4	0.00	0.0	0.0	0.01	0.04	0.00	0.00
C	13.4	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	10.1	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	10.0	0.00	0.0	0.0	0.24	1.93	0.00	0.00
C	6.7	0.00	0.0	0.0	0.00	0.02	0.00	0.00
C	6.7	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	6.7	0.00	0.0	0.0	0.00	0.04	0.00	0.00
C	3.3	0.00	0.0	0.0	0.00	0.00	0.00	0.00
C	1.7	0.00	0.0	0.0	0.00	0.01	0.00	0.00
C	1.7	0.00	0.0	0.0	0.00	0.02	0.00	0.00
C	1.7	0.00	0.0	0.0	0.00	0.00	0.00	0.00
D	100.0	0.00	180.0	180.0	0.00	0.00	0.00	0.00
D	0.0	0.00	180.0	180.0	0.00	0.00	0.00	0.00

ANTENNA LOADING
==========

.....ANTENNA.....			ATTACHMENT		..........ANTENNA FORCES.....			
TYPE	ELEV	AZI	RAD	AZI	AXIAL	SHEAR	GRAVITY	TORSION
	ft		ft		kip	kip	kip	ft-kip
STD	85.0	0.0	5.0	45.0	0.00	0.00	0.00	0.00
STD	85.0	180.0	5.0	225.0	0.00	0.00	0.00	0.00

==========

MAXIMUM ANTENNA AND REFLECTOR ROTATIONS:

==========

ELEV	AZI	TYPE	.....BEAM DEFLECTIONS (deg).....			
ft	deg	*	ROLL	YAW	PITCH	TOTAL
85.0	0.0	STD	-0.564 E	0.084 J	0.472 C	0.472 G
85.0	180.0	STD	0.564 E	0.084 J	-0.472 C	0.472 G

MAXIMUM TENSION IN MAST MEMBERS (kip)

==========

ELEV	LEGS	DIAG	HORIZ	BRACE
ft				
100.0	----------		0.07 E	0.02 Q
	0.12 P	0.21 N		
95.0	----------		0.07 F	0.00 H
	0.99 P	0.66 E		
90.0	----------		0.11 N	0.00 P
	2.86 J	1.59 I		
85.0	----------		0.11 F	0.00 H
	7.46 J	3.44 M		
80.0	----------		0.83 D	0.48 D
	12.46 J	3.85 I		
75.0	----------		0.20 E	0.00 D
	19.79 N	3.74 A		
70.0	----------		0.01 N	0.00 L
	25.94 N	4.32 I		
65.0	----------		0.17 E	0.00 Q
	33.13 L	4.25 A		
60.0	----------		0.66 A	0.12 D
	39.94 L	5.04 I		
55.0	----------		0.21 E	0.00 R
	48.45 L	5.08 A		
50.0	----------		0.01 M	0.00 J
	55.14 L	5.01 I		
45.0	----------		0.16 E	0.00 R
	62.56 L	5.05 A		
40.0	----------		1.18 A	0.04 Q
	69.08 L	5.63 J		
33.3	----------		0.15 A	0.00 Q
	80.10 P	5.72 A		
26.7	----------		0.13 E	0.00 Q
	86.72 P	5.62 I		
20.0	----------		2.10 E	0.12 R
	95.12 P	5.73 I		
13.3	----------		0.06 A	0.00 Q
	104.47 L	5.95 A		
6.7	----------		0.08 E	0.00 Q
	111.13 L	5.96 I		
0.0	----------		0.00 A	0.00 A

MAXIMUM COMPRESSION IN MAST MEMBERS (kip)
==

ELEV ft	LEGS	DIAG	HORIZ	BRACE
100.0	----------	----------	-0.05 I	0.00 A
	-0.21 D	-0.26 B		
95.0	----------	----------	-0.10 J	0.00 P
	-1.39 D	-0.60 I		
90.0	----------	----------	-0.07 A	0.00 H
	-3.92 F	-1.67 E		
85.0	----------	----------	-0.16 J	0.00 P
	-8.32 F	-4.30 A		
80.0	----------	----------	-0.55 I	-0.26 L
	-15.02 H	-3.86 A		
75.0	----------	----------	-0.16 M	0.00 L
	-22.45 H	-3.77 I		
70.0	----------	----------	-0.02 A	0.00 D
	-29.05 H	-4.34 A		
65.0	----------	----------	-0.15 I	0.00 A
	-36.40 F	-4.27 I		
60.0	----------	----------	-0.64 I	-0.09 L
	-43.37 F	-5.13 A		
55.0	----------	----------	-0.19 M	0.00 A
	-52.29 F	-5.04 I		
50.0	----------	----------	-0.01 B	0.00 Q
	-59.09 B	-5.07 A		
45.0	----------	----------	-0.14 M	0.00 A
	-66.79 F	-5.03 I		
40.0	----------	----------	-1.14 M	0.00 A
	-73.50 B	-5.72 A		
33.3	----------	----------	-0.14 I	0.00 A
	-85.19 B	-5.62 I		
26.7	----------	----------	-0.12 M	0.00 A
	-91.90 B	-5.75 A		
20.0	----------	----------	-2.02 I	0.00 A
	-100.80 B	-5.84 A		
13.3	----------	----------	-0.06 M	0.00 A
	-110.87 B	-5.88 I		
6.7	----------	----------	-0.07 I	0.00 A
	-117.84 B	-6.06 A		
0.0	----------	----------	0.00 A	0.00 A

FORCE/RESISTANCE RATIO IN LEGS
==============================

MAST ELEV ft	-- LEG COMPRESSION - MAX COMP	COMP RESIST	FORCE/ RESIST RATIO	---- LEG TENSION --- MAX TENS	TENS RESIST	FORCE/ RESIST RATIO
100.00	----------					
	0.21	31.84	0.01	0.12	48.70	0.00

95.00						
	1.39	31.84	0.04	0.99	48.70	0.02
90.00						
	3.92	31.84	0.12	2.86	48.70	0.06
85.00						
	8.32	31.84	0.26	7.46	48.70	0.15
80.00						
	15.02	57.62	0.26	12.46	77.27	0.16
75.00						
	22.45	57.62	0.39	19.79	77.27	0.26
70.00						
	29.05	57.62	0.50	25.94	77.27	0.34
65.00						
	36.40	57.62	0.63	33.13	77.27	0.43
60.00						
	43.37	83.04	0.52	39.94	100.98	0.40
55.00						
	52.29	83.04	0.63	48.45	100.98	0.48
50.00						
	59.09	83.04	0.71	55.14	100.98	0.55
45.00						
	66.79	83.04	0.80	62.56	100.98	0.62
40.00						
	73.50	93.52	0.79	69.08	121.37	0.57
33.33						
	85.19	93.52	0.91	80.10	121.37	0.66
26.67						
	91.90	93.52	0.98	86.72	121.37	0.71
20.00						
	100.80	161.47	0.62	95.12	199.92	0.48
13.33						
	110.87	161.47	0.69	104.47	199.92	0.52
6.66						
	117.84	161.47	0.73	111.13	199.92	0.56
0.00						

FORCE/RESISTANCE RATIO IN DIAGONALS
==========

MAST ELEV ft	- DIAG COMPRESSION - MAX COMP	COMP RESIST	FORCE/ RESIST RATIO	--- DIAG TENSION -- MAX TENS	TENS RESIST	FORCE/ RESIST RATIO
100.00						
	0.26	7.16	0.04	0.21	7.16	0.03
95.00						
	0.60	7.16	0.08	0.66	7.16	0.09
90.00						
	1.67	7.16	0.23	1.59	7.16	0.22
85.00						
	4.30	7.16	0.60	3.44	7.16	0.48
80.00						
	3.86	7.16	0.54	3.85	7.16	0.54
75.00						
	3.77	7.16	0.53	3.74	7.16	0.52
70.00						
	4.34	7.16	0.61	4.32	7.16	0.60
65.00						
	4.27	7.16	0.60	4.25	7.16	0.59
60.00						

```
          5.13    7.13    0.72    5.04    7.13    0.71
 55.00 ----------------------------------------------
          5.04    7.13    0.71    5.08    7.13    0.71
 50.00 ----------------------------------------------
          5.07    7.13    0.71    5.01    7.13    0.70
 45.00 ----------------------------------------------
          5.03    7.13    0.71    5.05    7.13    0.71
 40.00 ----------------------------------------------
          5.72    6.51    0.88    5.63    6.51    0.87
 33.33 ----------------------------------------------
          5.62    6.51    0.86    5.72    6.51    0.88
 26.67 ----------------------------------------------
          5.75    6.51    0.88    5.62    6.51    0.86
 20.00 ----------------------------------------------
          5.84    9.45    0.62    5.73    9.45    0.61
 13.33 ----------------------------------------------
          5.88    9.45    0.62    5.95    9.45    0.63
  6.66 ----------------------------------------------
          6.06    9.45    0.64    5.96    9.45    0.63
  0.00 ----------------------------------------------

MAXIMUM INDIVIDUAL FOUNDATION LOADS: (kip)
==========================================

    --------------LOAD---COMPONENTS-------------         TOTAL
    NORTH          EAST          DOWN        UPLIFT        SHEAR

    10.96 D     -11.06 B     122.34 B    -115.34 L      14.97 B


MAXIMUM TOTAL LOADS ON FOUNDATION : (kip & kip-ft)
==================================================

  ------HORIZONTAL-----     DOWN       ---------OVERTURNING--------- TORSION
  NORTH    EAST   TOTAL                NORTH        EAST        TOTAL
               @ 223.0                                       @  42.0

   37.7   -31.8    38.4    22.7      2171.9     -1827.6      2179.4   -28.0
     E       C       B       Q           E           C           F       B


================================================================================


================================================================================
Latticed Tower Analysis (Unguyed)           (c)2024 Guymast Inc. 416-736-7453
Processed under license at:

Sabre Towers and Poles                          on:  2 apr 2025  at: 16:59:05
================================================================================




********************************************************************************
*************************  Service Load Condition  *****************************
********************************************************************************


================================================================================
```

* Only 1 condition(s) shown in full
* Some wind loads may have been derived from full-scale wind tunnel testing

LOADING CONDITION A

60 mph wind with no ice. Wind Azimuth: 0° (1.0 D + 1.0 Wo)

MAST LOADING

LOAD TYPE	ELEV ft	APPLY..LOAD..AT RADIUS ft	AZI	LOAD AZI	.....FORCES..... HORIZ kip	DOWN kip	.....MOMENTS..... VERTICAL ft-kip	TORSNAL ft-kip
C	100.0	0.00	0.0	0.0	0.05	0.15	0.00	0.00
C	97.5	0.00	0.0	0.0	0.01	0.00	0.00	0.00
C	92.5	0.00	0.0	0.0	0.01	0.00	0.00	0.00
C	92.3	0.00	0.0	0.0	0.03	0.00	0.00	0.00
C	90.0	0.00	0.0	0.0	0.32	0.45	0.00	0.00
C	89.0	0.00	0.0	0.0	0.22	1.20	0.00	0.00
C	82.5	0.00	0.0	0.0	0.01	0.00	0.00	0.00
C	82.3	0.00	0.0	0.0	0.07	0.01	0.00	0.00
C	80.7	0.00	0.0	0.0	0.17	0.07	0.00	0.00
C	80.0	0.00	0.0	0.0	0.24	0.09	0.00	0.00
C	80.0	0.00	0.0	0.0	0.62	0.90	0.00	0.00
C	72.5	0.00	0.0	0.0	0.01	0.00	0.00	0.00
C	70.0	0.00	0.0	0.0	0.32	0.45	0.00	0.00
C	70.0	0.00	0.0	0.0	0.32	0.45	0.00	0.00
C	62.5	0.00	0.0	0.0	0.01	0.00	0.00	0.00
C	60.0	0.00	0.0	0.0	0.27	0.10	0.00	0.00
C	60.0	0.00	0.0	0.0	0.27	0.10	0.00	0.00
C	60.0	0.00	0.0	0.0	0.27	0.10	0.00	0.00
C	52.5	0.00	0.0	0.0	0.01	0.00	0.00	0.00
C	42.5	0.00	0.0	0.0	0.01	0.00	0.00	0.00
C	40.0	0.00	0.0	0.0	0.10	0.08	0.00	0.00
C	36.7	0.00	0.0	0.0	0.01	0.00	0.00	0.00
C	30.0	0.00	0.0	0.0	0.01	0.00	0.00	0.00
C	23.4	0.00	0.0	0.0	0.01	0.00	0.00	0.00
C	16.7	0.00	0.0	0.0	0.01	0.00	0.00	0.00
C	10.1	0.00	0.0	0.0	0.01	0.00	0.00	0.00
C	3.3	0.00	0.0	0.0	0.01	0.00	0.00	0.00
D	100.0	0.00	36.2	0.0	0.05	0.06	0.01	0.00
D	95.0	0.00	36.2	0.0	0.05	0.06	0.01	0.00
D	95.0	0.00	36.2	0.0	0.04	0.04	0.01	0.00
D	90.0	0.00	36.2	0.0	0.04	0.04	0.01	0.00
D	90.0	0.00	6.3	0.0	0.05	0.05	0.02	0.00
D	80.0	0.00	4.1	0.0	0.06	0.05	0.03	-0.01
D	80.0	0.00	2.0	0.0	0.07	0.08	0.03	-0.01
D	75.0	0.00	2.0	0.0	0.07	0.08	0.03	-0.01
D	75.0	0.00	1.6	0.0	0.07	0.06	0.03	-0.01
D	60.0	0.00	0.4	0.0	0.07	0.06	0.04	-0.01
D	60.0	0.00	0.2	0.0	0.09	0.10	0.05	-0.01
D	55.0	0.00	0.2	0.0	0.09	0.10	0.05	-0.01
D	55.0	0.00	0.1	0.0	0.08	0.07	0.05	-0.01
D	40.0	0.00	0.1	0.0	0.08	0.07	0.05	-0.01
D	40.0	0.00	359.8	0.0	0.09	0.13	0.06	-0.01
D	33.3	0.00	359.8	0.0	0.09	0.13	0.06	-0.01

D	33.3	0.00	359.8	0.0	0.07	0.09	0.07	-0.01
D	20.0	0.00	359.8	0.0	0.07	0.09	0.07	-0.01
D	20.0	0.00	359.8	0.0	0.09	0.18	0.08	-0.01
D	13.3	0.00	359.8	0.0	0.09	0.18	0.08	-0.01
D	13.3	0.00	359.8	0.0	0.08	0.13	0.08	-0.01
D	0.0	0.00	359.8	0.0	0.08	0.13	0.08	-0.01

ANTENNA LOADING
==========

.....ANTENNA.....			ATTACHMENT		..........ANTENNA FORCES.....			
TYPE	ELEV	AZI	RAD	AZI	AXIAL	SHEAR	GRAVITY	TORSION
	ft		ft		kip	kip	kip	ft-kip
STD	85.0	0.0	5.0	45.0	0.54	0.00	0.11	0.00
STD	85.0	180.0	5.0	225.0	-0.37	0.00	0.11	0.00

==========

MAXIMUM MAST DISPLACEMENTS:
==========

ELEV	------DEFLECTIONS (ft)-----			--TILTS (DEG)---		TWIST
ft	NORTH	EAST	DOWN	NORTH	EAST	DEG
100.0	0.194 E	0.163 G	0.003 E	0.177 E	0.149 G	-0.026 B
95.0	0.179 E	0.150 G	0.003 E	0.177 E	0.148 G	-0.026 B
90.0	0.163 E	0.137 G	0.002 E	0.176 E	0.148 G	-0.026 B
85.0	0.148 E	0.124 G	0.002 E	0.173 E	0.145 G	-0.026 B
80.0	0.132 E	0.111 G	0.002 E	0.168 E	0.140 G	-0.023 B
75.0	0.117 E	0.099 G	0.002 A	0.162 E	0.136 G	-0.021 B
70.0	0.103 E	0.086 G	0.002 A	0.154 E	0.129 G	-0.019 B
65.0	0.089 E	0.075 G	0.002 A	0.143 E	0.120 G	-0.016 B
60.0	0.076 E	0.064 G	0.002 A	0.131 E	0.110 G	-0.014 B
55.0	0.064 E	0.054 G	0.002 A	0.121 E	0.101 G	-0.013 B
50.0	0.052 E	0.044 G	0.001 A	0.110 E	0.092 G	-0.011 B
45.0	0.042 E	0.036 G	0.001 A	0.096 E	0.081 G	-0.009 B
40.0	0.033 E	0.028 G	0.001 A	0.083 E	0.070 G	-0.007 B
33.3	0.023 E	0.020 G	0.001 A	-0.067 A	0.057 G	-0.006 B
26.7	0.015 E	0.013 G	0.001 A	-0.050 A	0.042 G	-0.004 B
20.0	0.009 E	0.008 G	0.000 A	-0.033 A	0.028 G	-0.003 B
13.3	0.005 E	0.004 G	0.000 A	-0.022 A	0.019 G	-0.002 B
6.7	0.002 E	0.001 G	0.000 A	-0.011 A	0.009 G	-0.001 B
0.0	0.000 A	0.000 A	0.000 A	0.000 A	0.000 A	0.000 A

MAXIMUM ANTENNA AND REFLECTOR ROTATIONS:
==========

ELEV	AZI	TYPE	.....BEAM DEFLECTIONS (deg).....			
ft	deg	*	ROLL	YAW	PITCH	TOTAL
85.0	0.0	STD	-0.173 E	0.026 B	-0.145 G	0.145 G
85.0	180.0	STD	0.173 E	0.026 B	0.145 G	0.145 G

MAXIMUM TENSION IN MAST MEMBERS (kip)
==========

ELEV	LEGS	DIAG	HORIZ	BRACE
ft				

100.0	----------		0.03 E	0.01 G
	0.01 F	0.05 F		
95.0	----------		0.03 F	0.00 D
	0.20 D	0.21 E		
90.0	----------		0.03 B	0.00 H
	0.50 B	0.48 A		
85.0	----------		0.04 F	0.00 H
	1.77 B	1.03 E		
80.0	----------		0.26 H	0.15 D
	3.11 B	1.14 A		
75.0	----------		0.07 A	0.00 D
	5.23 B	1.16 A		
70.0	----------		0.00 A	0.00 D
	6.96 B	1.30 A		
65.0	----------		0.06 E	0.00 D
	9.07 D	1.32 A		
60.0	----------		0.21 E	0.04 D
	11.08 D	1.52 A		
55.0	----------		0.07 E	0.00 H
	13.56 D	1.57 A		
50.0	----------		0.00 E	0.00 A
	15.59 D	1.52 A		
45.0	----------		0.05 E	0.00 H
	17.78 D	1.56 A		
40.0	----------		0.37 A	0.03 D
	19.73 D	1.68 B		
33.3	----------		0.05 E	0.00 D
	22.90 D	1.79 A		
26.7	----------		0.04 A	0.00 D
	24.92 D	1.70 A		
20.0	----------		0.67 E	0.06 D
	27.34 H	1.73 A		
13.3	----------		0.02 A	0.00 D
	29.99 D	1.86 A		
6.7	----------		0.03 A	0.00 D
	31.96 D	1.82 A		
0.0	----------		0.00 A	0.00 A

MAXIMUM COMPRESSION IN MAST MEMBERS (kip)
==========

ELEV ft	LEGS	DIAG	HORIZ	BRACE
100.0	----------		-0.01 E	0.00 A
	-0.09 B	-0.10 B		
95.0	----------		-0.03 B	0.00 H
	-0.53 D	-0.18 A		
90.0	----------		-0.02 A	0.00 H
	-1.54 F	-0.52 E		
85.0	----------		-0.04 B	0.00 H
	-3.01 F	-1.34 A		
80.0	----------		-0.16 E	-0.07 D
	-5.24 H	-1.22 A		
75.0	----------		-0.04 A	0.00 A
	-7.64 H	-1.14 A		

```
     70.0  ----------------------         -0.01 E       0.00 D
             -9.81 H      -1.36 A
     65.0  ----------------------         -0.04 E       0.00 A
            -12.15 F      -1.30 A
     60.0  ----------------------         -0.19 E      -0.02 D
            -14.37 F      -1.60 A
     55.0  ----------------------         -0.05 A       0.00 A
            -17.22 F      -1.53 A
     50.0  ----------------------          0.00 A       0.00 H
            -19.33 F      -1.57 A
     45.0  ----------------------         -0.04 E       0.00 A
            -21.78 F      -1.54 A
     40.0  ----------------------         -0.33 E       0.00 A
            -23.90 F      -1.80 A
     33.3  ----------------------         -0.04 A       0.00 A
            -27.70 F      -1.70 A
     26.7  ----------------------         -0.03 E       0.00 A
            -29.79 F      -1.81 A
     20.0  ----------------------         -0.59 A       0.00 A
            -32.69 F      -1.84 A
     13.3  ----------------------         -0.02 E       0.00 A
            -36.02 F      -1.80 A
      6.7  ----------------------         -0.02 E       0.00 A
            -38.27 H      -1.90 A
      0.0  ----------------------          0.00 A       0.00 A


MAXIMUM INDIVIDUAL FOUNDATION LOADS: (kip)
==========================================

    --------------LOAD---COMPONENTS-------------        TOTAL
    NORTH          EAST          DOWN       UPLIFT        SHEAR

     3.50 D       -3.53 B       39.75 H     -33.16 D       4.78 B


MAXIMUM TOTAL LOADS ON FOUNDATION : (kip & kip-ft)
==================================================

  ------HORIZONTAL-----    DOWN       ---------OVERTURNING--------- TORSION
  NORTH    EAST   TOTAL               NORTH        EAST        TOTAL
               @  43.0                                       @ 317.9

   11.6     9.8    11.8    13.2      -668.4       564.1       671.1    -8.5
     E       G       F       A           A           G           D       B


================================================================================
```

Seismic Load Effects
Equivalent Lateral Force Procedure
ANSI/TIA-222-H

Parameters	
Risk Category	III
R	3.000
S_S	1.419
S_1	0.526
Site Class	D (default)
T_L (sec)	8.000
F_a	1.200
F_v	1.774
S_{MS}	1.703
S_{M1}	0.933
S_{DS}	1.135
S_{D1}	0.622
T_s	0.548
I_e	1.250
Ω	1.500
C_S	0.473
h (ft)	100.00
K_f	4,540
W_a (ft)	8.20
W_o (ft)	13.00
W (kips)	15.941
W_1 (kips)	8.734
W_2 (kips)	0.448
f_1 (Hertz)	3.631
T (sec)	0.275
k_e	1.0000
V_s (kips)	7.540
Seismic Design Category	D

Vertical Distribution of Seismic Forces

Description	h_i (ft.)	w_i (kips)	W_2 (kips)	$w_i h_i^{ke}$	F_{sz} or E_h (kips)	E_V (kips)	1.2 D + 1.0 E_V (kips)	0.9 D - 1.0 E_V (kips)
Antenna Load	100.00	0.1500	0.1500	15.0000	0.1272	0.0340	0.2140	0.1010
Ladder	98.75	0.0100	0.0200	0.9875	0.0084	0.0023	0.0143	0.0067
Ladder/Line	98.75	0.0014	0.0028	0.1383	0.0012	0.0003	0.0020	0.0010
Antenna Load	97.50	0.0010	0.0010	0.0975	0.0008	0.0002	0.0014	0.0007
Ladder	95.00	0.0200	0.0200	1.9000	0.0161	0.0045	0.0285	0.0135
Ladder/Line	95.00	0.0027	0.0027	0.2565	0.0022	0.0006	0.0038	0.0018
Antenna Load	92.50	0.0010	0.0000	0.0925	0.0008	0.0002	0.0014	0.0007
Antenna Load	92.35	0.0045	0.0000	0.4156	0.0035	0.0010	0.0064	0.0030
Ladder	91.25	0.0100	0.0000	0.9125	0.0077	0.0023	0.0143	0.0067
Ladder/Line	91.25	0.0014	0.0000	0.1278	0.0011	0.0003	0.0020	0.0010
Mount Load	90.00	0.4500	0.0000	40.5000	0.3433	0.1022	0.6422	0.3028
Structure - Section 1	90.00	1.0050	0.2513	90.4500	0.7668	0.2281	1.4341	0.6764
Ladder	89.50	0.0040	0.0000	0.3580	0.0030	0.0009	0.0057	0.0027
Ladder/Line	89.50	0.0055	0.0000	0.4922	0.0042	0.0012	0.0078	0.0038
Ladder/Line	89.50	0.0005	0.0000	0.0448	0.0004	0.0001	0.0007	0.0004
Antenna Load	89.00	1.2000	0.0000	106.8000	0.9054	0.2724	1.7124	0.8076
Ladder	87.00	0.0160	0.0000	1.3920	0.0118	0.0036	0.0228	0.0108
Ladder/Line	87.00	0.0222	0.0000	1.9314	0.0164	0.0050	0.0316	0.0150
Ladder/Line	87.00	0.0022	0.0000	0.1914	0.0016	0.0005	0.0031	0.0015
Antenna Load	85.00	0.3750	0.0000	31.8750	0.2702	0.0851	0.5351	0.2524
Antenna Load	85.00	0.3750	0.0000	31.8750	0.2702	0.0851	0.5351	0.2524
Mount Load	85.00	0.0750	0.0000	6.3750	0.0540	0.0170	0.1070	0.0505
Mount Load	85.00	0.0750	0.0000	6.3750	0.0540	0.0170	0.1070	0.0505
Mount/Antenna Load	85.00	0.4500	0.0000	38.2500	0.3243	0.1022	0.6422	0.3028
Mount/Antenna Load	85.00	0.4500	0.0000	38.2500	0.3243	0.1022	0.6422	0.3028
Ladder	83.75	0.0100	0.0000	0.8375	0.0071	0.0023	0.0143	0.0067
Ladder/Line	83.75	0.0164	0.0000	1.3735	0.0116	0.0037	0.0234	0.0111
Ladder/Line	83.75	0.0014	0.0000	0.1172	0.0010	0.0003	0.0020	0.0010
Antenna Load	82.50	0.0010	0.0000	0.0825	0.0007	0.0002	0.0014	0.0007
Antenna Load	82.35	0.0090	0.0000	0.7411	0.0063	0.0020	0.0128	0.0061
Ladder	81.25	0.0100	0.0000	0.8125	0.0069	0.0023	0.0143	0.0067
Ladder/Line	81.25	0.0014	0.0000	0.1138	0.0010	0.0003	0.0020	0.0010
Ladder/Line	81.25	0.0164	0.0000	1.3325	0.0113	0.0037	0.0234	0.0111
Antenna Load	80.71	0.0660	0.0000	5.3269	0.0452	0.0150	0.0942	0.0444
Antenna Load	80.00	0.0945	0.0000	7.5600	0.0641	0.0215	0.1349	0.0636
Mount Load	80.00	0.9000	0.0000	72.0000	0.6104	0.2043	1.2843	0.6057

Seismic Load Effects
Equivalent Lateral Force Procedure
ANSI/TIA-222-H

Vertical Distribution of Seismic Forces

Description	h_i (ft.)	w_i (kips)	W_2 (kips)	$w_i h_i^{ke}$	F_{sz} or E_h (kips)	E_V (kips)	1.2 D + 1.0 E_V (kips)	0.9 D - 1.0 E_V (kips)
Ladder	76.25	0.0300	0.0000	2.2875	0.0194	0.0068	0.0428	0.0202
Ladder/Line	76.25	0.0040	0.0000	0.3050	0.0026	0.0009	0.0057	0.0027
Ladder/Line	76.25	0.0573	0.0000	4.3691	0.0370	0.0130	0.0818	0.0386
Antenna Load	72.50	0.0010	0.0000	0.0725	0.0006	0.0002	0.0014	0.0007
Ladder	71.25	0.0100	0.0000	0.7125	0.0060	0.0023	0.0143	0.0067
Ladder/Line	71.25	0.0191	0.0000	1.3609	0.0115	0.0043	0.0272	0.0129
Ladder/Line	71.25	0.0014	0.0000	0.0998	0.0008	0.0003	0.0020	0.0010
Mount Load	70.00	0.4500	0.0000	31.5000	0.2670	0.1022	0.6422	0.3028
Mount Load	70.00	0.4500	0.0000	31.5000	0.2670	0.1022	0.6422	0.3028
Structure - Section 2	70.00	1.2700	0.0000	88.9000	0.7536	0.2883	1.8123	0.8547
Ladder	66.25	0.0300	0.0000	1.9875	0.0168	0.0068	0.0428	0.0202
Ladder/Line	66.25	0.0040	0.0000	0.2650	0.0022	0.0009	0.0057	0.0027
Ladder/Line	66.25	0.0654	0.0000	4.3328	0.0367	0.0148	0.0933	0.0441
Antenna Load	62.50	0.0010	0.0000	0.0625	0.0005	0.0002	0.0014	0.0007
Ladder	61.25	0.0100	0.0000	0.6125	0.0052	0.0023	0.0143	0.0067
Ladder/Line	61.25	0.0014	0.0000	0.0857	0.0007	0.0003	0.0020	0.0010
Ladder/Line	61.25	0.0218	0.0000	1.3352	0.0113	0.0049	0.0311	0.0147
Mount/Antenna Load	60.00	0.0975	0.0000	5.8500	0.0496	0.0221	0.1391	0.0657
Mount/Antenna Load	60.00	0.0975	0.0000	5.8500	0.0496	0.0221	0.1391	0.0657
Mount/Antenna Load	60.00	0.0975	0.0000	5.8500	0.0496	0.0221	0.1391	0.0657
Ladder	56.25	0.0300	0.0000	1.6875	0.0143	0.0068	0.0428	0.0202
Ladder/Line	56.25	0.0040	0.0000	0.2250	0.0019	0.0009	0.0057	0.0027
Ladder/Line	56.25	0.0676	0.0000	3.8025	0.0322	0.0153	0.0964	0.0455
Antenna Load	52.50	0.0010	0.0000	0.0525	0.0004	0.0002	0.0014	0.0007
Structure - Section 3	50.00	1.5950	0.0000	79.7500	0.6761	0.3621	2.2761	1.0734
Ladder	47.50	0.0400	0.0000	1.9000	0.0161	0.0091	0.0571	0.0269
Ladder/Line	47.50	0.0054	0.0000	0.2565	0.0022	0.0012	0.0077	0.0037
Ladder/Line	47.50	0.0902	0.0000	4.2845	0.0363	0.0205	0.1287	0.0607
Antenna Load	42.50	0.0010	0.0000	0.0425	0.0004	0.0002	0.0014	0.0007
Ladder	41.25	0.0100	0.0000	0.4125	0.0035	0.0023	0.0143	0.0067
Ladder/Line	41.25	0.0014	0.0000	0.0578	0.0005	0.0003	0.0020	0.0010
Ladder/Line	41.25	0.0226	0.0000	0.9322	0.0079	0.0051	0.0322	0.0152
Mount/Antenna Load	40.00	0.0825	0.0000	3.3000	0.0280	0.0187	0.1177	0.0556
Ladder	38.38	0.0130	0.0000	0.4989	0.0042	0.0030	0.0186	0.0087
Ladder/Line	38.38	0.0311	0.0000	1.1936	0.0101	0.0071	0.0444	0.0209
Ladder/Line	38.38	0.0018	0.0000	0.0691	0.0006	0.0004	0.0026	0.0012
Antenna Load	36.75	0.0010	0.0000	0.0368	0.0003	0.0002	0.0014	0.0007
Ladder	33.40	0.0268	0.0000	0.8951	0.0076	0.0061	0.0383	0.0180
Ladder/Line	33.40	0.0641	0.0000	2.1409	0.0181	0.0146	0.0915	0.0431
Ladder/Line	33.40	0.0036	0.0000	0.1202	0.0010	0.0008	0.0051	0.0024
Antenna Load	30.05	0.0010	0.0000	0.0300	0.0003	0.0002	0.0014	0.0007

Seismic Load Effects
Equivalent Lateral Force Procedure
ANSI/TIA-222-H

Vertical Distribution of Seismic Forces

Description	h_i (ft.)	w_i (kips)	W_2 (kips)	$w_i h_i^{ke}$	F_{sz} or E_h (kips)	E_V (kips)	1.2 D + 1.0 E_V (kips)	0.9 D - 1.0 E_V (kips)
Structure - Section 4	30.00	1.9980	0.0000	59.9400	0.5081	0.4535	2.8511	1.3447
Ladder	26.70	0.0268	0.0000	0.7156	0.0061	0.0061	0.0383	0.0180
Ladder/Line	26.70	0.0036	0.0000	0.0961	0.0008	0.0008	0.0051	0.0024
Ladder/Line	26.70	0.0641	0.0000	1.7115	0.0145	0.0146	0.0915	0.0431
Antenna Load	23.35	0.0010	0.0000	0.0234	0.0002	0.0002	0.0014	0.0007
Ladder	21.68	0.0134	0.0000	0.2905	0.0025	0.0030	0.0191	0.0091
Ladder/Line	21.68	0.0320	0.0000	0.6938	0.0059	0.0073	0.0457	0.0215
Ladder/Line	21.68	0.0018	0.0000	0.0390	0.0003	0.0004	0.0026	0.0012
Ladder	18.38	0.0130	0.0000	0.2389	0.0020	0.0030	0.0186	0.0087
Ladder/Line	18.38	0.0311	0.0000	0.5716	0.0048	0.0071	0.0444	0.0209
Ladder/Line	18.38	0.0018	0.0000	0.0331	0.0003	0.0004	0.0026	0.0012
Antenna Load	16.75	0.0010	0.0000	0.0168	0.0001	0.0002	0.0014	0.0007
Ladder	13.40	0.0268	0.0000	0.3591	0.0030	0.0061	0.0383	0.0180
Ladder/Line	13.40	0.0641	0.0000	0.8589	0.0073	0.0146	0.0915	0.0431
Ladder/Line	13.40	0.0036	0.0000	0.0482	0.0004	0.0008	0.0051	0.0024
Antenna Load	10.05	0.0010	0.0000	0.0101	0.0001	0.0002	0.0014	0.0007
Structure - Section 5	10.00	2.8700	0.0000	28.7000	0.2433	0.6515	4.0955	1.9315
Ladder	6.70	0.0268	0.0000	0.1796	0.0015	0.0061	0.0383	0.0180
Ladder/Line	6.70	0.0036	0.0000	0.0241	0.0002	0.0008	0.0051	0.0024
Ladder/Line	6.70	0.0641	0.0000	0.4295	0.0036	0.0146	0.0915	0.0431
Antenna Load	3.35	0.0010	0.0000	0.0034	0.0000	0.0002	0.0014	0.0007
Ladder	1.68	0.0134	0.0000	0.0225	0.0002	0.0030	0.0191	0.0091
Ladder/Line	1.68	0.0018	0.0000	0.0030	0.0000	0.0004	0.0026	0.0012
Ladder/Line	1.68	0.0320	0.0000	0.0538	0.0005	0.0073	0.0457	0.0215
	Σ	15.94	0.4478	889.47	7.54	3.62	22.75	10.73

Leg Connection Details												
Bottom Elevation (ft)	Top Elevation (ft)	Pipe Dimensions	Top Splice					Bottom Splice/Base				
			Bolt Qty.	Bolt Dia. (in)	Bolt Circle (in)	Plate Thickness (in)	Plate Dia. (in)	Bolt Qty.	Bolt Dia. (in)	Bolt Circle (in)	Plate Thickness (in)	Plate Dia. (in)
80	100	2.375 OD X .154						4	0.75	6.25	0.75	8.25
60	80	2.875 OD X .203	4	0.75	6.25	0.75	8.25	4	0.75	6.75	1.00	8.75
40	60	3.500 OD X .216	4	0.75	6.75	1.00	8.75	4	0.75	8.25	1.00	10.25
20	40	4.000 OD X .226	4	0.75	8.25	1.00	10.25	4	0.88	8.75	1.00	11.00
0	20	4.500 OD X .337	4	0.88	8.75	1.00	11.00	4	1.00	8.00	1.00	10.50

Diagonal Bracing Connection Details								
Bottom Elevation (ft)	Top Elevation (ft)	Angle Shape	Bolt Qty.	Bolt Dia. (in)	Bolt End Distance (in)	Bolt Spacing (in)	Gage Distance From Heel (in)	Gusset Plate Thickness (in)
80	100	L 2 X 2 X 1/8	1	0.625	1.500		1.125	0.375
60	80	L 2 X 2 X 1/8	1	0.625	1.500		1.125	0.375
40	60	L 2 X 2 X 1/8	1	0.625	1.500		1.125	0.375
20	40	L 2 X 2 X 3/16	1	0.625	1.500		1.125	0.375
0	20	L 2 1/2 X 2 1/2 X 3/16	1	0.625	1.500		1.375	0.375

MAT FOUNDATION DESIGN BY SABRE INDUSTRIES

100' S4TL SALT LAKE CITY IMS Ensign Peak, UT (552264) 2025-04-02 ARH

Overall Loads:			
Factored Moment (ft-kips)	2179.44		
Factored Axial (kips)	15.84		
Factored Shear (kips)	38.43		
Individual Leg Loads:		Tower eccentric from mat (ft)=	0
Factored Uplift (kips)	115.00		
Factored Download (kips)	122.00		
Factored Shear (kips)	15.00		
Width of Tower (ft)	13	Allowable Bearing Pressure (ksf)	**3.00**
Ultimate Bearing Pressure	6.00	Safety Factor	**2.00**
Bearing Φs	0.75		
Bearing Design Strength (ksf)	4.5	Max. Factored Net Bearing Pressure (ksf)	3.91
Water Table Below Grade (ft)	**999**		
Width of Mat (ft)	22	Minimum Mat Width (ft)	17.67
Thickness of Mat (ft)	1.5		
Depth to Bottom of Slab (ft)	4.5		
Bolt Circle Diameter (in)	8		
Effective Anchor Bolt Embedment	41.625		
Diameter of Pier (ft)	2	Minimum Pier Diameter (ft)	2.00
Ht. of Pier Above Ground (ft)	0.5	Equivalent Square b (ft)	1.77
Ht. of Pier Below Ground (ft)	3		
Quantity of Bars in Mat	38		
Bar Diameter in Mat (in)	0.625		
Area of Bars in Mat (in^2)	11.66		
Spacing of Bars in Mat (in)	6.96	Recommended Spacing (in)	6 to 12
Quantity of Bars Pier	8		
Bar Diameter in Pier (in)	1		
Tie Bar Diameter in Pier (in)	0.5		
Spacing of Ties (in)	4		
Area of Bars in Pier (in2)	6.28	Minimum Pier A_s (in^2)	2.26
Spacing of Bars in Pier (in)	6.12	Recommended Spacing (in)	5 to 12
f'c (ksi)	4.5		
fy (ksi)	60		
Unit Wt. of Soil (kcf)	0.11		
Unit Wt. of Concrete (kcf)	0.15		
Volume of Concrete (yd^3)	28.52		

MAT FOUNDATION DESIGN BY SABRE INDUSTRIES (CONTINUED)

Two-Way Shear:

Average d (in)	14.375		
ϕv_c (ksi)	0.201	v_u (ksi)	0.069
$\phi v_c = \phi(2 + 4/\beta_c)f'_c{}^{1/2}$	0.302		
$\phi v_c = \phi(\alpha_s d/b_o+2)f'_c{}^{1/2}$	0.304		
$\phi v_c = \phi 4f'_c{}^{1/2}$	0.201		
Shear perimeter, b_o (in)	142.58		
β_c	1		

Stability:

Overturning Design Strength (ft-k)	2789.9	Factored Overturning Moment (ft-k)	2371.6

One-Way Shear:

ϕV_c (kips)	381.9	V_u (kips)	199.7

Pier Design:

Design Tensile Strength (kips)	339.3	Tu (kips)	115.0

Shear:

ϕ	0.75		
V_c (kips)	30.4		
V_s (kips)	113.1	$V_{s,max}$ (kips)	247.3
ϕV_n (kips)	107.6	V_u (kips)	15.0
Maximum Spacing (in)	9.60	(Only if Shear Ties are Required)	
Actual Hook Development (in)	13.75	Req'd Hook Development l_{dh} (in) - Tension	12.52
		Req'd Hook Development l_{dc} (in) - Compression	13.50

Anchor Bolt Pull-Out:

$N_{ua} / \phi N_n$	0.60	$V_{ua} / \phi V_n$	0.16
Pier Rebar Development Length (in)	35.82	Required Length of Development (in)	26.83

Flexure in Slab:

ϕM_n (ft-kips)	736.0	M_u (ft-kips)	732.12
a (in)	0.69		
Steel Ratio	0.00307		
β_1	0.825		
Maximum Steel Ratio (ρ_t)	0.0197		
Minimum Steel Ratio	0.0018		

Condition	1 is OK, 0 Fails
Minimum Mat Width	1
Maximum Soil Bearing Pressure	1
Pier Area of Steel	1
Pier Shear	1
Two-Way Shear	1
Overturning	1
Anchor Bolt Pull-Out	1
Flexure	1
Steel Ratio	1
Interaction Diagram	1
One-Way Shear	1
Hook Development	1
Minimum Mat Depth	1
Anchor Bolt Punching Shear	1