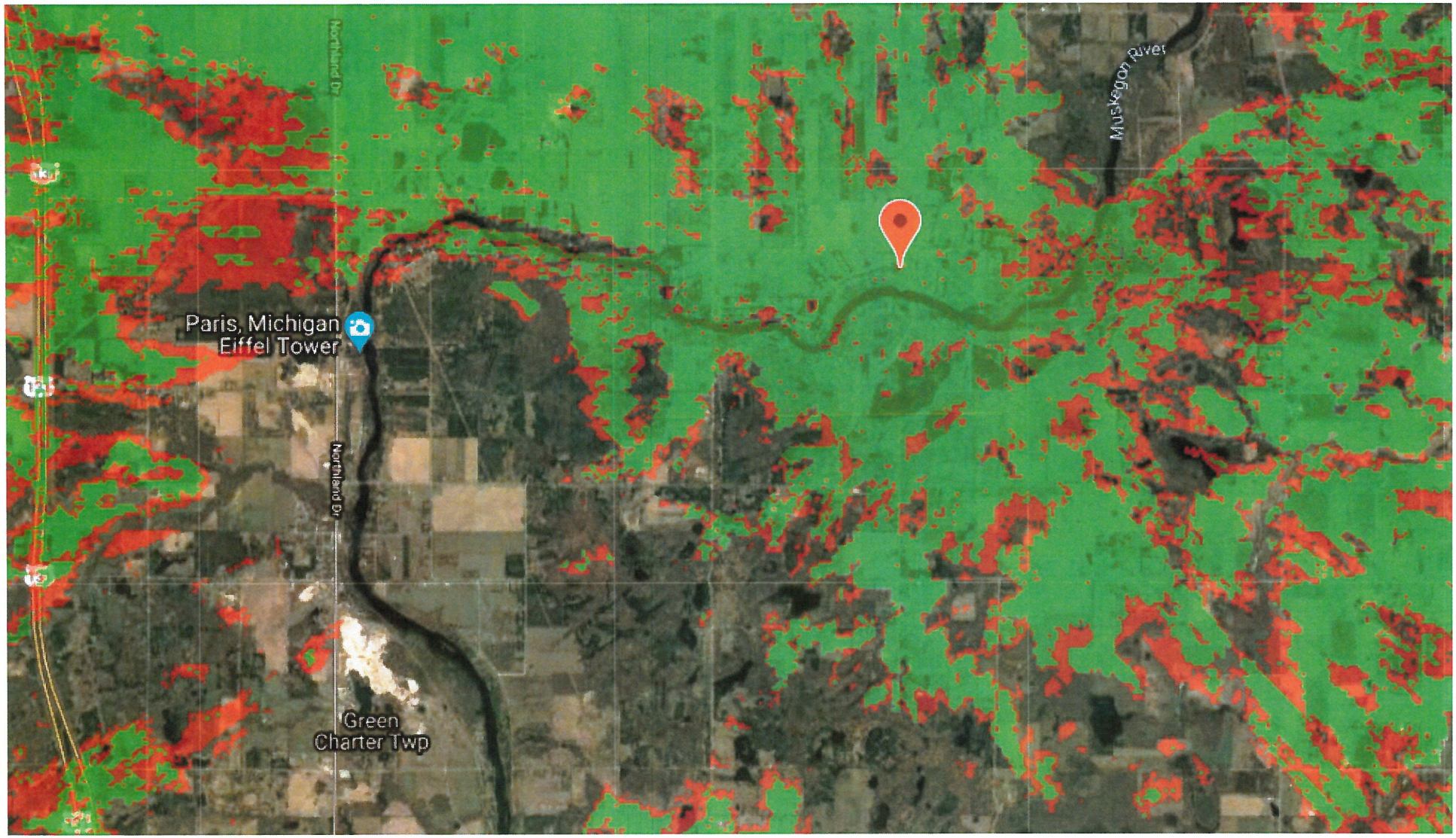
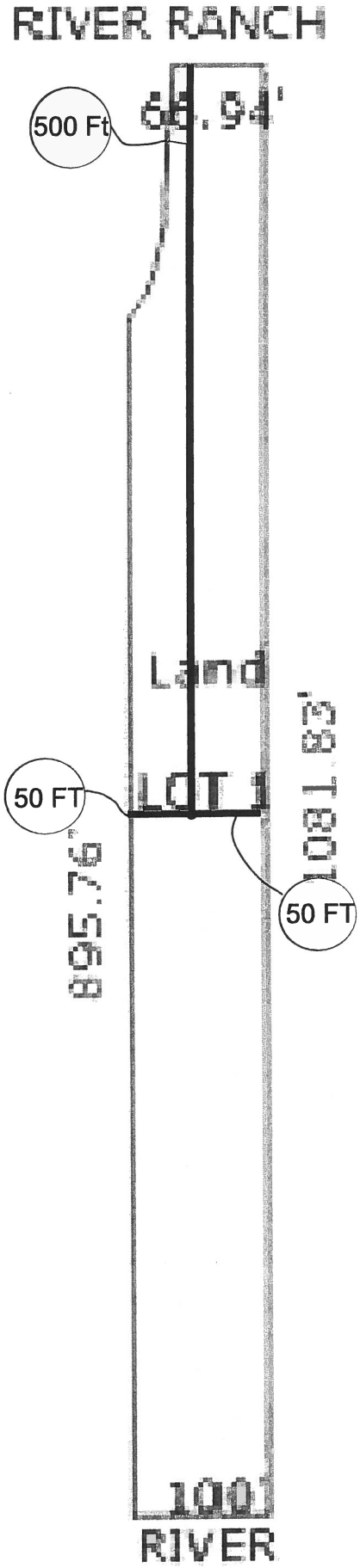
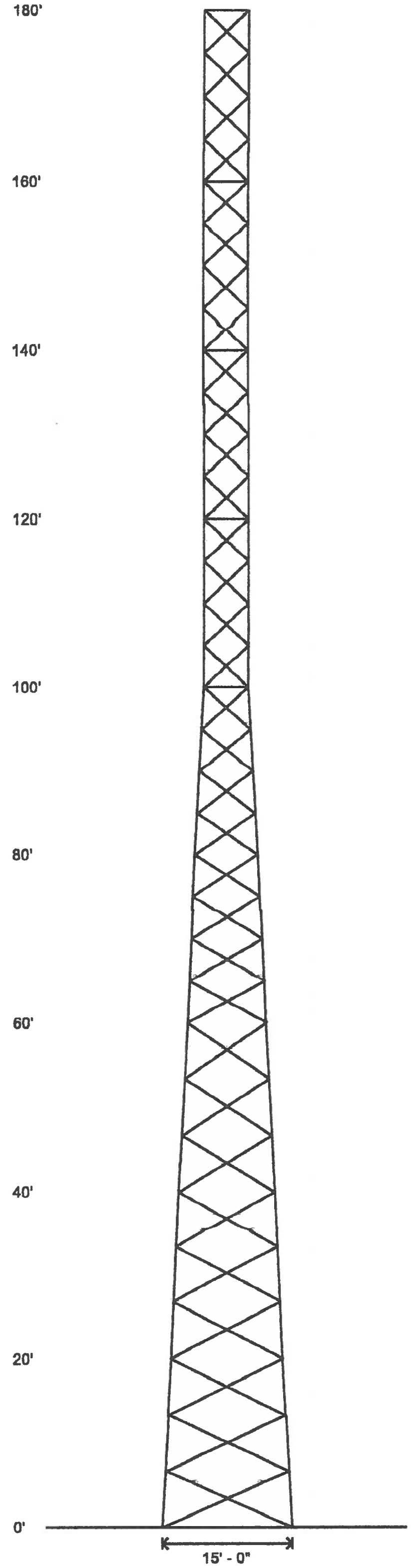

Paris, Michigan
Eiffel Tower
Northland Dr
Northland Dr
Green
Charter Twp
Muskegon River


RIVER RANCH
500 Ft
66.94'
Land
LOT 1
50 FT
50 FT
1081.83'
895.76'
100'
RIVER

Rive
01 0
GREE
1799
301.27 ft
.27 ft
274.56 ft

SIZES ARE PRELIMINARY AND MAY CHANGE UPON FINAL DESIGN

Section	Legs	Diagonals	Horizontals	Brace Bolts	Top Face Width	Panel Count/Height	Section Weight
160'–180'	2.375 OD X .154	L 2 X 2 X 1/8	A / NONE		5'	24 @ 5'	721
140'–160'	2.375 OD X .154	L 2 X 2 X 1/8	A / NONE		5'	24 @ 5'	721
120'–140'	2.375 OD X .154	L 2 X 2 X 1/8	A / NONE		5'	24 @ 5'	721
100'–120'	2.875 OD X .203	L 2 X 2 X 1/8	A / NONE / A	(1) 5/8"	5'	24 @ 5'	865
80'–100'	3.500 OD X .216	L 2 X 2 X 1/8	NONE		5'	24 @ 5'	1005
60'–80'	3.500 OD X .216	L 2 X 2 X 1/8	NONE		7'	24 @ 5'	1106
40'–60'	4.000 OD X .226	L 2 1/2 X 2 1/2 X 3/16	NONE		9'	9 @ 6.6667'	1530
20'–40'	4.000 OD X .226	L 2 1/2 X 2 1/2 X 3/16	NONE		11'	9 @ 6.6667'	1628
0'–20'	4.500 OD X .237	L 2 1/2 X 2 1/2 X 3/16	NONE	(1) 3/4"	13'	9 @ 6.6667'	1826



Designed Appurtenance Loading

Elev	Description	Tx-Line
180	(1) 20 SQ FT EPA	(1) 7/8"

Design Criteria - ANSI/TIA-222-G

ASCE 7-16 Ultimate Wind Speed (No Ice)	106 mph
Wind Speed (Ice)	50 mph
Design Ice Thickness	1.50 in
Structure Class	II
Risk Category	II
Exposure Category	C
Topographic Category	1

Base Reactions

Total Foundation		Individual Footing	
Shear (kips)	11.46	Shear (kips)	7.18
Axial (kips)	32.71	Compression (kips)	83
Moment (ft-kips)	1035	Uplift (kips)	68
Torsion (ft-kips)	0.93		

Material List

Display	Value
A	L 2 X 2 X 1/8

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 S3TL Series HD1.
5) Azimuths are relative (not based on true north).
6) Foundation loads shown are maximums.
7) (4) 1" dia. x 51"-long F1554 grade 105 anchor bolts per leg.
8) All unequal angles are oriented with the short leg vertical.
9) Weights shown are estimates. Final weights may vary.

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

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Quote:	22-1189-TJH
Customer:	INTERNET SERVICE INC
Site Name:	Internet Service 180' Tower, MI
Description:	180' S3TL
Date:	7/20/2021 — By: RKR — Page: 1

Sabre Industries™
INNOVATION DELIVERED

July 21, 2021

Steve Wright
Internet Service, Inc.

RE: Internet Service 180' Tower, MI (Sabre proposal# 22-1189-TJH)

Dear Mr. Wright,

Upon receipt of order, we propose to design and supply the above referenced tower for a Basic Wind Speed of 106 mph without ice and 50 mph with 1.5" ice, Risk Category II, Exposure Category C, and Topographic Category 1, in accordance with the Telecommunications Industry Association Standard ANSI/TIA-222-G, "Structural Standard for Antenna Supporting Structures and Antennas".

When designed according to this standard, the wind pressures and steel strength capacities include several safety factors. Therefore, it is highly unlikely that the tower will fail structurally in a wind event where the design wind speed is exceeded within the range of the built-in safety factors.

Should the wind speed increase beyond the capacity of the built-in safety factors, to the point of failure of one or more structural elements, the most likely location of the failure would be within one or more of the tower members in the upper portion. This would result in a buckling failure mode, where the loaded member would bend beyond its elastic limit (beyond the point where the member would return to its original shape upon removal of the wind load).

Therefore, it is likely that the overall effect of such an extreme wind event would be localized buckling of a tower section. Assuming that the wind pressure profile is similar to that used to design the tower, the tower is most likely to buckle at the location of the highest combined stress ratio in the upper portion of the tower. This would result in the portion of the tower above the failure location "folding over" onto the portion of the tower below the failure location. This would effectively result in a fall radius of 50'. *Please note that this letter only applies to the above-referenced tower designed and manufactured by Sabre Industries.*

Sincerely,

STATE OF MICHIGAN
DAVID
HILL
ENGINEER
License No.
6201309409

07/21/21

David Hill, P.E.
Design Engineer II