11544

From: Elaine Gunnell
Sent: Thursday, April 12, 2018 12:59 PM
To: Roxanne St. Germain
Subject: Caribou Mountain Structural Inspection
Attachments: 17510_TEM_Caribou Mountain_Structural Inspection_11APRIL18.pdf

For incoming.

Elaine Gunnell, Dipl.M.A., AOMC
Municipal Clerk
The Corporation of the Municipality of Temagami
7 Lakeshore Drive, P.O. Box 220
Temagami, ON P0H 2H0
Phone: 705-569-3421 ext 208
Email: clerk@temagami.ca

File ☑ Incoming ☐ Other
Mayor ☐
Council ☑ ~~I~~ ☐ ~~A~~
CAO ☐
Building ☐
Finance ☐ S ☐ C
Ec Dev ☐ S ☐ C
Parks & Rec ☑ S ☑ C
Planning ☐ S ☐ C
Public Wks ☑ ~~S~~ ☐ ~~C~~
PPP ☐
Social Services ☐
☐ _____
☐ _____

From: Shawn Hoffmeyer [mailto:shoffmeyer@p-sec.ca]
Sent: Wednesday, April 11, 2018 1:04 PM
To: Elaine Gunnell <clerk@temagami.ca>
Subject: RE: follow up on purchase order from Municipality of Temagami

Hi Elaine,

Attached is the completed report for the structural inspection of the tower.

Overall we did not find any members that had experienced a significant loss of material, in fact we only found the one diagonal that had a very minor loss and is still within a reasonable value.

Recommendations beyond the general repairs from the previous inspection include repairing the (2) diagonals that appear to have split and the (1) support rail connection that looks to have been a previous repair where the welds have cracked.

There are also (2) platform balusters that have cracked and should be replaced.

While on site we investigated possible causes for the cracked platform balusters and it appears that the saddles that attach the balusters to the rail are warped and water has been able enter the baluster. This occurs at multiple locations throughout the tower so we recommend either welding to seal these or drilling weep holes to allow any water to drain out.

Lastly, based on how the inner tower appears to be constructed there should really be no way for water to enter most of the member, but since there are (2) diagonals that appear to have cracked and there are members throughout the tower that have weep holes we would recommend drilling weep holes on all continuous HSS members to prevent any future water build up.

If you have any questions or need further clarification on anything please let me know.

Thanks,

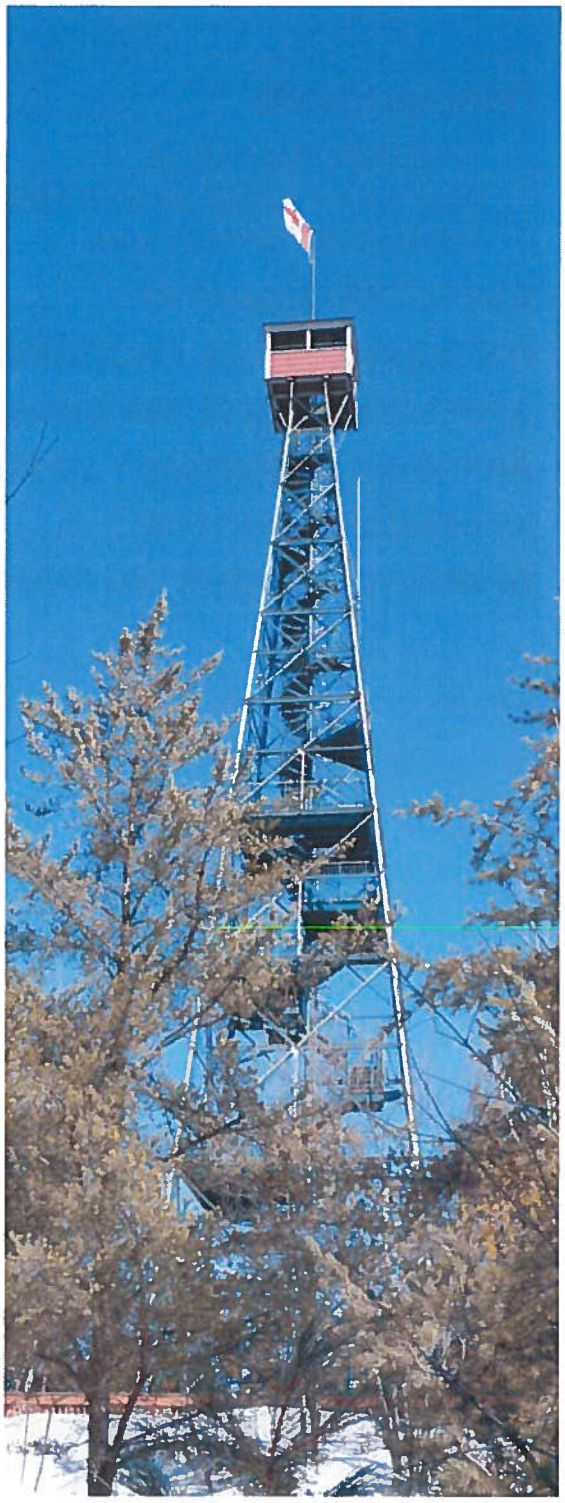
Shawn

Shawn Hoffmeyer | P.E, P.Eng

Office: 519-885-3806 | Direct: 519-885-3981, ext. 206 | Cell: 519-498-4705 | Fax: 519-884-3806 | Toll Free: 866-750-3806
198-55 Northfield Drive East, Waterloo, Ontario N2K 3T6 | Email: *shoffmeyer@p-sec.ca*
Pier Structural Engineering Corp. | ***www.p-sec.ca***

Send files (up to 1GB) to us using our dropbox (http://dropbox.p-sec.ca/)

Structural Inspection Report



Caribou Mountain Tower

Temagami, Ontario

30.5m Self Support

Pier Structural Engineering Corp.
198-55 Northfield Drive East
Waterloo, ON N2K 3T6

P-SEC Project Number 17510

April 11, 2018

TABLE OF CONTENTS

OBSERVATIONS

SITE INFORMATION

SITE:

Site Name	Caribou Mountain Tower

SITE LOCATION:

Address	170 Jack Guppy Way Temagami, Ontario
Coordinates	47.05821° N 79.77325° W
Elevation (ASL)	396.0m

INSPECTION INFORMATION

Date of Inspection	March 21-22, 2017	**Report by**	Shawn Hoffmeyer
Weather	Sun and Cloud	**Reviewed by**	
Temperature	-8°C	**Inspectors**	Mike Deyo
Site Conditions	Clear		Shawn Hoffmeyer

TOWER INFORMATION

TOWER:

Manufacturer	Unknown
Series Number	Unknown
Project Number	Unknown
Tower Height	30.5m
Tower Type	Self-Support
Construction	Knock Down
Face Width	6.71m (at base)
Leg A Azimuth	50° MN

TOWER LIGHTING:

Elevation	N/A
Type	N/A
Manufacturer, Model	N/A
Elevation	N/A
Type	N/A
Manufacturer, Model	N/A

CLIMBING FACILITIES:

Type	Stairs
Location	Inside Tower
Safety Rail	N/A

EXECUTIVE SUMMARY

At the request of Elaine Gunnell of the Municipality of Temagami, P-SEC has carried out a structural field review of this tower site. This structural field review is to be read in conjunction with the maintenance inspection report dated September 14, 2017, P-SEC job number 16413 Rev 2

Our work included the following:

- Visual inspection of structural members and connections
- Visual inspection of platforms and walkways
- Measurement of member thickness throughout the tower at various locations
- At select locations of rust a measurement was taken with the rust present, the rust was then gently removed and a second reading taken. Once completed the area was coated with zinc rich paint and then green paint to prevent further rust in the interim.

It is important to note that this report does not comment on the structural conformance of the tower to the CSA-S31-13 standard or other applicable codes, only the structural condition of the members that can be reasonably ascertained by visual inspection and use of measurement devices.

A summarized list of deficiencies and categorized recommendations, remedial work performed on site, antenna chart, typical photos and sampling procedures are located on the following pages.

Original design drawings have not been provided as such the design thickness of the members is unknown. Based on the consistency of the measurements for all members throughout the height of the tower, design thickness has been assumed and has been recorded in Appendix B.

From the results of the measurements taken and a review of the consistency of these measurements, there we no locations of significant material loss found during this investigation.

DEFICIENCIES AND RECOMMENDATIONS

Our terms of reference do not include analytical review of this structure for conformance with the strength requirements of CSA S37-13 or other pertinent CSA Standards.

Summary of Outstanding Deficiencies and Items Requiring Further Attention As Noted In Report:

DEFICIENCY & RECOMMENDATION
Deficiency #1- At an elevation of 23.5m on face DA on leg D side near the center the top section of the diagonal has started to split at a corner. **Recommendation-** Grind off rust down to sound metal and repair member by adding weld. Ensure weld if ground flush before applying cold galvanizing.
Deficiency #2- At an elevation of 22.5m on face AB on leg B side near the leg the bottom section of the diagonal has started to split at a corner. **Recommendation-** Grind off rust down to sound metal and repair member by adding weld. Ensure weld if ground flush before applying cold galvanizing.
Deficiency #3- At an elevation of 24.7m from leg B to the curved support there is a small portion of rectangular HSS that has cracked/poor welds. This appears to possibly have been a previous fix not properly welded. **Recommendation-** Remove poor welds and re-weld rectangular HSS at both ends.
Deficiency #4- At an elevation of 6.71m inside face DA near leg D there is a handrail baluster that is fractured. **Recommendation-** Replace baluster.
Deficiency #5- At an elevation of 6.71m inside face CD near the center of the face there is a handrail baluster that has just started to fracture. **Recommendation-** Replace baluster.
Deficiency #6- At multiple locations on the tower the handrail saddle at the top of the posts has separated from the post creating a gap where water can enter. **Recommendation-** Re-weld the saddle to the posts or install a weep hole at the bottom of the posts to prevent water buildup.
Deficiency #7- Weep holes have not been installed on the majority of the members throughout the tower. **Recommendation-** Based on the presence of (2) diagonal members that appear to have split installing weep holes at the bottom end of all continuous HSS members should be considered.

Deficiency #1

At an elevation of 23.5m on face DA on leg D side near the center the top section of the diagonal has started to split at a corner.

Recommendation

Grind off rust down to sound metal and repair member by adding weld. Ensure weld if ground flush before applying cold galvanizing.

Deficiency #2

At an elevation of 22.5m on face AB on leg B side near the leg the bottom section of the diagonal has started to split at a corner.

Recommendation

Grind off rust down to sound metal and repair member by adding weld. Ensure weld if ground flush before applying cold galvanizing.

Deficiency #3

At an elevation of 24.7m from leg B to the curved support there is a small portion of rectangular HSS that has cracked/poor welds. This appears to possibly have been a previous fix not properly welded.

Recommendation

Remove poor welds and re-weld rectangular HSS at both ends.

Deficiency **#4**

At an elevation of 6.71m inside face DA near leg D there is a handrail baluster that is fractured.

Recommendation

Replace baluster.

Deficiency **#5**

At an elevation of 6.71m inside face CD near the center of the face there is a handrail baluster that has just started to fracture.

Recommendation

Replace baluster.

Deficiency **#6**

At multiple locations on the tower the handrail saddle at the top of the posts has separated from the post creating a gap where water can enter.

Recommendation

Re-weld the saddle to the posts or install a weep hole at the bottom of the posts to prevent water buildup.

Deficiency **#7**

Weep holes have not been installed on the majority of the members throughout the tower.

Recommendation

Based on the presence of (2) diagonal members that appear to have split installing weep holes at the bottom end of all continuous HSS members should be considered.

Example of installed weep hole

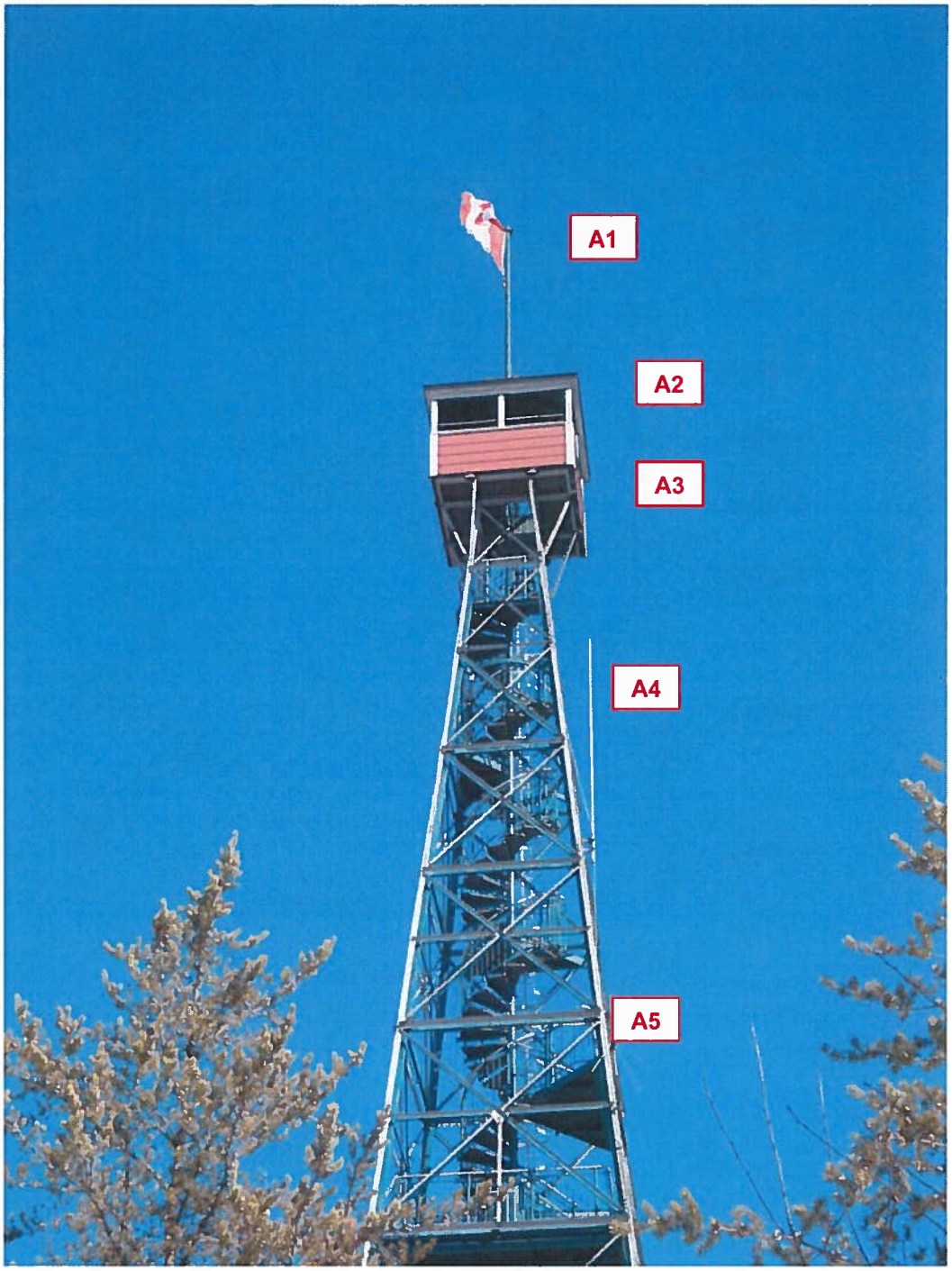
Example of installed weep hole

Appendix A: Antenna Chart, Photos & Tower Profile

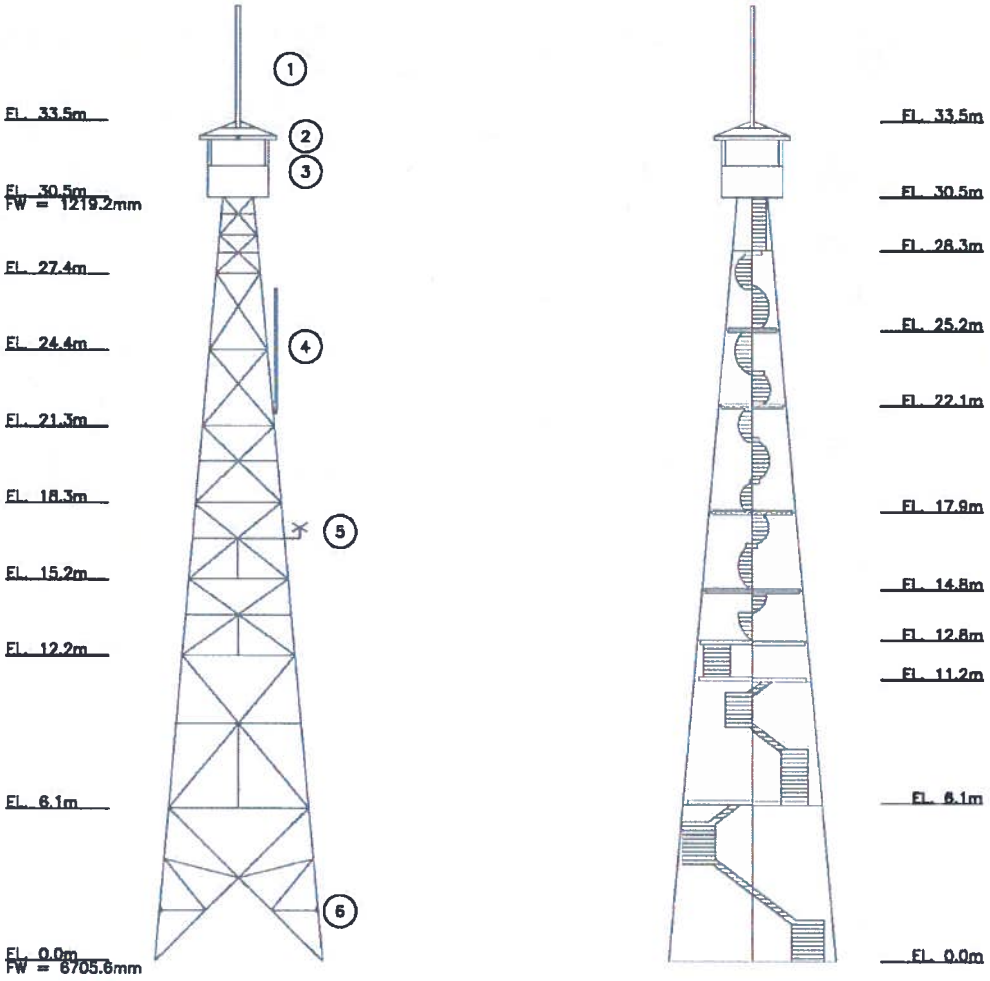
ANTENNA CHART

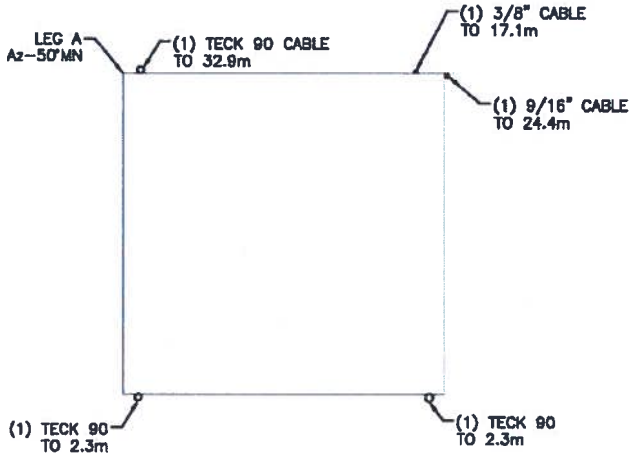
Antenna	Elevation (m)	Type	Equipment at Antenna Elevation	Location	Azimuth* (deg) MN	Tx Line	Owner
1	33.5	Flag Pole	--	--	--	--	TEM
2	32.9	(1) Electrical Outlet	--	Face AD	--	(1) Teck 90	
3	30.5	Covered Cupola	--	--	--	--	
4	24.4	16' Omni Antenna	--	Leg B	--	(1) 9/16"	
5	17.1	4-Prong Omni	--	Leg B	185	(1) 3/8"	
6	2.3	(4) Electrical Outlets	(2) Junction Boxes	A/B/C/D	--	(2) Teck 90	

** The azimuths are ±10°*



Antennas


1
2
3
4
5
6
El. 33.5m
El. 30.5m
FW = 1219.2mm
El. 27.4m
El. 24.4m
El. 21.3m
El. 18.3m
El. 15.2m
El. 12.2m
El. 6.1m
El. 0.0m
FW = 6705.6mm
El. 33.5m
El. 30.5m
El. 26.3m
El. 25.2m
El. 22.1m
El. 17.9m
El. 14.8m
El. 12.8m
El. 11.2m
El. 6.1m
El. 0.0m


LEG A
Az=50°MN
(1) TECK 90 CABLE
TO 32.9m
(1) 3/8" CABLE
TO 17.1m
(1) 9/16" CABLE
TO 24.4m
(1) TECK 90
TO 2.3m
(1) TECK 90
TO 2.3m

Appendix B: Summary of Measurements

Temagami Fire Tower Thickness Gauge Measurements Summary
March 21 and 22, 2018

Center support pipe was 5.563" ODx0.258" (0.241) and was measured throughout the height of the structure, measurements were all 0.235.
Based on the consistency of the measurements member thickness has been assumed with design thickness in brackets
All measurement are in inches

Section 1

Leg A		Leg B		Leg C		Leg D	
3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291	
Max Reading	0.3	Max Reading	0.3	Max Reading	0.3	Max Reading	0.305
Min Reading	0.285	Min Reading	0.285	Min Reading	0.285	Min Reading	0.285
Avg Reading	0.29	Avg Reading	0.29	Avg Reading	0.29	Avg Reading	0.295
Main Diagonals Face AB		Main Diagonals Face BC		Main Diagonals Face CD		Main Diagonals Face DA	
2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)	
Max Reading	0.235	Max Reading	0.235	Max Reading	0.235	Max Reading	0.24
Min Reading	0.225	Min Reading	0.225	Min Reading	0.23	Min Reading	0.23
Avg Reading	0.23	Avg Reading	0.23	Avg Reading	0.233	Avg Reading	0.235
Top Horizontal Face AB		Top Horizontal Face BC		Top Horizontal Face CD		Top Horizontal Face DA	
2.5"x2.5"x1/4" HSS (0.233)		2.5"x2.5"x1/4" HSS (0.233)		2.5"x2.5"x1/4" HSS (0.233)		2.5"x2.5"x1/4" HSS (0.233)	
Max Reading	0.235	Max Reading	0.23	Max Reading	0.235	Max Reading	0.235
Min Reading	0.225	Min Reading	0.225	Min Reading	0.225	Min Reading	0.225
Avg Reading	0.233	Avg Reading	0.23	Avg Reading	0.233	Avg Reading	0.23
Inner Support Bracing Face CD only (approx 3ft down from top of panel)							
2.5"x2.5"x1/4" HSS (0.233)							
Max Reading	0.235						
Min Reading	0.23						
Avg Reading	0.232						
Mid-Horizontal Face AB		Mid-Horizontal Face BC		Mid-Horizontal Face CD		Mid-Horizontal Face DA	
2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)	
Max Reading	0.235	Max Reading	0.23	Max Reading	0.235	Max Reading	0.235
Min Reading	0.225	Min Reading	0.225	Min Reading	0.225	Min Reading	0.23
Avg Reading	0.23	Avg Reading	0.23	Avg Reading	0.23	Avg Reading	0.233
Secondary Horizontal Face AB		Secondary Horizontal Face BC		Secondary Horizontal Face CD		Secondary Horizontal Face	
2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)	
Max Reading	0.235	Max Reading	0.235	Max Reading	0.23	Max Reading	0.235
Min Reading	0.23	Min Reading	0.23	Min Reading	0.225	Min Reading	0.23
Avg Reading	0.233	Avg Reading	0.233	Avg Reading	0.23	Avg Reading	0.233
Secondary Diagonal Face AB		Secondary Diagonal Face BC		Secondary Diagonal Face CD		Secondary Diagonal Face D	
2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)	
Max Reading	0.235	Max Reading	0.235	Max Reading	0.23	Max Reading	0.235
Min Reading	0.23	Min Reading	0.23	Min Reading	0.23	Min Reading	0.23
Avg Reading	0.233	Avg Reading	0.233	Avg Reading	0.23	Avg Reading	0.233

Section 2

Leg A		Leg B		Leg C		Leg D	
3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291	
Max Reading	0.305	Max Reading	0.3	Max Reading	0.295	Max Reading	0.305
Min Reading	0.29	Min Reading	0.295	Min Reading	0.29	Min Reading	0.29
Avg Reading	0.295	Avg Reading	0.29	Avg Reading	0.293	Avg Reading	0.295
Main Diagonals Face AB		Main Diagonals Face BC		Main Diagonals Face CD		Main Diagonals Face DA	
2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)	
Max Reading	0.23	Max Reading	0.235	Max Reading	0.23	Max Reading	0.235
Min Reading	0.225	Min Reading	0.23	Min Reading	0.225	Min Reading	0.23
Avg Reading	0.228	Avg Reading	0.233	Avg Reading	0.228	Avg Reading	0.234
Top Horizontal Face AB		Top Horizontal Face BC		Top Horizontal Face CD		Top Horizontal Face DA	
2.5"x2.5"x1/4" HSS (0.233)		2.5"x2.5"x1/4" HSS (0.233)		2.5"x2.5"x1/4" HSS (0.233)		2.5"x2.5"x1/4" HSS (0.233)	
Max Reading	0.23	Max Reading	0.23	Max Reading	0.235	Max Reading	0.24
Min Reading	0.225	Min Reading	0.23	Min Reading	0.225	Min Reading	0.23
Avg Reading	0.227	Avg Reading	0.23	Avg Reading	0.23	Avg Reading	0.235
Inner Support Bracing Face CD only (approx 3ft down from top of panel)							
3.5"x2"x1/4" HSS (0.233)							
Max Reading	0.235						
Min Reading	0.23						
Avg Reading	0.233						
Mid-Horizontal Face AB		Mid-Horizontal Face BC		Mid-Horizontal Face CD		Mid-Horizontal Face DA	
2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)	
Max Reading	0.235	Max Reading	0.23	Max Reading	0.235	Max Reading	0.23
Min Reading	0.225	Min Reading	0.225	Min Reading	0.225	Min Reading	0.225
Avg Reading	0.23	Avg Reading	0.227	Avg Reading	0.23	Avg Reading	0.228
		Vertical Member Face BC				Vertical Member Face DA	
		2"x2"x1/4" HSS (0.233)				2"x2"x1/4" HSS (0.233)	
		Max Reading	0.235			Max Reading	0.235
		Min Reading	0.225			Min Reading	0.23
		Avg Reading	0.23			Avg Reading	0.231

Section 3

Leg A		Leg B		Leg C		Leg D	
3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291	
Max Reading	0.315	Max Reading	0.3	Max Reading	0.315	Max Reading	0.305
Min Reading	0.295	Min Reading	0.29	Min Reading	0.3	Min Reading	0.295
Avg Reading	0.305	Avg Reading	0.295	Avg Reading	0.305	Avg Reading	0.3
Main Diagonals Face AB		Main Diagonals Face BC		Main Diagonals Face CD		Main Diagonals Face DA	
2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)	
Max Reading	0.23	Max Reading	0.235	Max Reading	0.235	Max Reading	0.235
Min Reading	0.225	Min Reading	0.225	Min Reading	0.23	Min Reading	0.23
Avg Reading	0.228	Avg Reading	0.23	Avg Reading	0.233	Avg Reading	0.232
Top Horizontal Face AB		Top Horizontal Face BC		Top Horizontal Face CD		Top Horizontal Face DA	
2.5"x2.5"x1/4" HSS (0.233)		2.5"x2.5"x1/4" HSS (0.233)		2.5"x2.5"x1/4" HSS (0.233)		2.5"x2.5"x1/4" HSS (0.233)	
Max Reading	0.235	Max Reading	0.23	Max Reading	0.235	Max Reading	0.235
Min Reading	0.23	Min Reading	0.225	Min Reading	0.23	Min Reading	0.23
Avg Reading	0.233	Avg Reading	0.228	Avg Reading	0.232	Avg Reading	0.232
Mid-Horizontal Face AB		Mid-Horizontal Face BC		Mid-Horizontal Face CD		Mid-Horizontal Face DA	
2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)		2"x2"x1/4" HSS (0.233)	
Max Reading	0.235	Max Reading	0.23	Max Reading	0.235	Max Reading	0.23
Min Reading	0.23	Min Reading	0.225	Min Reading	0.225	Min Reading	0.22
Avg Reading	0.233	Avg Reading	0.227	Avg Reading	0.23	Avg Reading	0.225
		Vertical Member Face BC				Vertical Member Face DA	
		2"x2"x1/4" HSS (0.233)				2"x2"x1/4" HSS (0.233)	
		Max Reading	0.23			Max Reading	0.235
		Min Reading	0.225			Min Reading	0.23
		Avg Reading	0.228			Avg Reading	0.231

Section 4

Leg A		Leg B		Leg C		Leg D	
3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291	
Max Reading	0.3	Max Reading	0.3	Max Reading	0.29	Max Reading	0.295
Min Reading	0.295	Min Reading	0.29	Min Reading	0.285	Min Reading	0.29
Avg Reading	0.298	Avg Reading	0.295	Avg Reading	0.288	Avg Reading	0.292
Main Diagonals Face AB		Main Diagonals Face BC		Main Diagonals Face CD		Main Diagonals Face DA	
1.5"x1.5"x3/16" HSS (0.174)		1.5"x1.5"x3/16" HSS (0.174)		1.5"x1.5"x3/16" HSS (0.174)		1.5"x1.5"x3/16" HSS (0.174	
Max Reading	0.175	Max Reading	0.175	Max Reading	0.175	Max Reading	0.18
Min Reading	0.17	Min Reading	0.17	Min Reading	0.17	Min Reading	0.17
Avg Reading	0.173	Avg Reading	0.172	Avg Reading	0.174	Avg Reading	0.175
Top Horizontal Face AB		Top Horizontal Face BC		Top Horizontal Face CD		Top Horizontal Face DA	
2.5"x2.5"x1/4" HSS (0.233)		2.5"x2.5"x1/4" HSS (0.233)		2.5"x2.5"x1/4" HSS (0.233)		2.5"x2.5"x1/4" HSS (0.233)	
Max Reading	0.235	Max Reading	0.23	Max Reading	0.235	Max Reading	0.23
Min Reading	0.225	Min Reading	0.225	Min Reading	0.23	Min Reading	0.225
Avg Reading	0.23	Avg Reading	0.226	Avg Reading	0.232	Avg Reading	0.227
Mid-Horizontal Face AB		Mid-Horizontal Face BC		Mid-Horizontal Face CD		Mid-Horizontal Face DA	
1.5"x1.5"x3/16" HSS (0.174)		1.5"x1.5"x3/16" HSS (0.174)		1.5"x1.5"x3/16" HSS (0.174)		1.5"x1.5"x3/16" HSS (0.174	
Max Reading	0.175	Max Reading	0.175	Max Reading	0.18	Max Reading	0.18
Min Reading	0.17	Min Reading	0.17	Min Reading	0.17	Min Reading	0.17
Avg Reading	0.172	Avg Reading	0.173	Avg Reading	0.175	Avg Reading	0.175

Section 5

Leg A		Leg B		Leg C		Leg D	
3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291	
Max Reading	0.295	Max Reading	0.29	Max Reading	0.3	Max Reading	0.3
Min Reading	0.285	Min Reading	0.285	Min Reading	0.29	Min Reading	0.295
Avg Reading	0.29	Avg Reading	0.288	Avg Reading	0.295	Avg Reading	0.292
Main Diagonals Face AB		Main Diagonals Face BC		Main Diagonals Face CD		Main Diagonals Face DA	
1.5"x1.5"x3/16" HSS (0.174)		1.5"x1.5"x3/16" HSS (0.174)		1.5"x1.5"x3/16" HSS (0.174)		1.5"x1.5"x3/16" HSS (0.174	
Max Reading	0.175	Max Reading	0.18	Max Reading	0.175	Max Reading	0.18
Min Reading	0.17	Min Reading	0.17	Min Reading	0.165	Min Reading	0.17
Avg Reading	0.171	Avg Reading	0.175	Avg Reading	0.17	Avg Reading	0.175
Top Horizontal Face AB		Top Horizontal Face BC		Top Horizontal Face CD		Top Horizontal Face DA	
2.5"x2.5"x1/4" HSS (0.233)		2.5"x2.5"x1/4" HSS (0.233)		2.5"x2.5"x1/4" HSS (0.233)		2.5"x2.5"x1/4" HSS (0.233)	
Max Reading	0.235	Max Reading	0.235	Max Reading	0.235	Max Reading	0.23
Min Reading	0.225	Min Reading	0.225	Min Reading	0.23	Min Reading	0.225
Avg Reading	0.23	Avg Reading	0.23	Avg Reading	0.233	Avg Reading	0.227
Mid-Horizontal Face AB		Mid-Horizontal Face BC		Mid-Horizontal Face CD		Mid-Horizontal Face DA	
1.5"x1.5"x3/16" HSS (0.174)		1.5"x1.5"x3/16" HSS (0.174)		1.5"x1.5"x3/16" HSS (0.174)		1.5"x1.5"x3/16" HSS (0.174	
Max Reading	0.175	Max Reading	0.17	Max Reading	0.18	Max Reading	0.175
Min Reading	0.17	Min Reading	0.17	Min Reading	0.17	Min Reading	0.17
Avg Reading	0.172	Avg Reading	0.17	Avg Reading	0.175	Avg Reading	0.172

Section 6

Leg A		Leg B		Leg C		Leg D	
3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291	
Max Reading	0.295	Max Reading	0.3	Max Reading	0.3	Max Reading	0.295
Min Reading	0.295	Min Reading	0.29	Min Reading	0.3	Min Reading	0.29
Avg Reading	0.295	Avg Reading	0.295	Avg Reading	0.3	Avg Reading	0.293
Main Diagonals Face AB		Main Diagonals Face BC		Main Diagonals Face CD		Main Diagonals Face DA	
1.5"x1.5"x3/16" HSS (0.174)		1.5"x1.5"x3/16" HSS (0.174)		1.5"x1.5"x3/16" HSS (0.174)		1.5"x1.5"x3/16" HSS (0.174	
Max Reading	0.175	Max Reading	0.175	Max Reading	0.17	Max Reading	0.175
Min Reading	* 0.155	Min Reading	0.17	Min Reading	0.17	Min Reading	* 0.165
Avg Reading	0.165	Avg Reading	0.172	Avg Reading	0.175	Avg Reading	0.17
* measure at locations of split members							
Top Horizontal Face AB		Top Horizontal Face BC		Top Horizontal Face CD		Top Horizontal Face DA	
2.5"x2.5"x1/4" HSS (0.233)		2.5"x2.5"x1/4" HSS (0.233)		2.5"x2.5"x1/4" HSS (0.233)		2.5"x2.5"x1/4" HSS (0.233)	
Max Reading	0.23	Max Reading	0.235	Max Reading	0.23	Max Reading	0.23
Min Reading	0.225	Min Reading	0.225	Min Reading	0.23	Min Reading	0.225
Avg Reading	0.228	Avg Reading	0.23	Avg Reading	0.23	Avg Reading	0.227
4"x2"x1/8" Curved Rectangular HSS at top of section (0.116)							
Max Reading	0.12						
Min Reading	0.11						
Avg Reading	0.115						

Section 7							
Leg A		Leg B		Leg C		Leg D	
3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291)		3.5"x3.5"x5/16" HSS (0.291	
Max Reading	0.305	Max Reading	0.3	Max Reading	0.29	Max Reading	0.29
Min Reading	0.295	Min Reading	0.29	Min Reading	0.285	Min Reading	0.295
Avg Reading	0.3	Avg Reading	0.295	Avg Reading	0.287	Avg Reading	0.292
Main Diagonals Face AB		Main Diagonals Face BC		Main Diagonals Face CD		Main Diagonals Face DA	
1.5"x1.5"x3/16" HSS (0.174)		1.5"x1.5"x3/16" HSS (0.174)		1.5"x1.5"x3/16" HSS (0.174)		1.5"x1.5"x3/16" HSS (0.174	
Max Reading	0.17	Max Reading	0.175	Max Reading	0.175	Max Reading	0.175
Min Reading	0.17	Min Reading	0.17	Min Reading	0.165	Min Reading	0.17
Avg Reading	0.17	Avg Reading	0.173	Avg Reading	0.17	Avg Reading	0.177
4"x2"x1/8" Curved Rectangular HSS at top of section (0.116)							
Max Reading	0.12						
Min Reading	0.11						
Avg Reading	0.115						

Appendix C: Photos

Tower Profile B

Tower Profile AD

Tower Profile CD

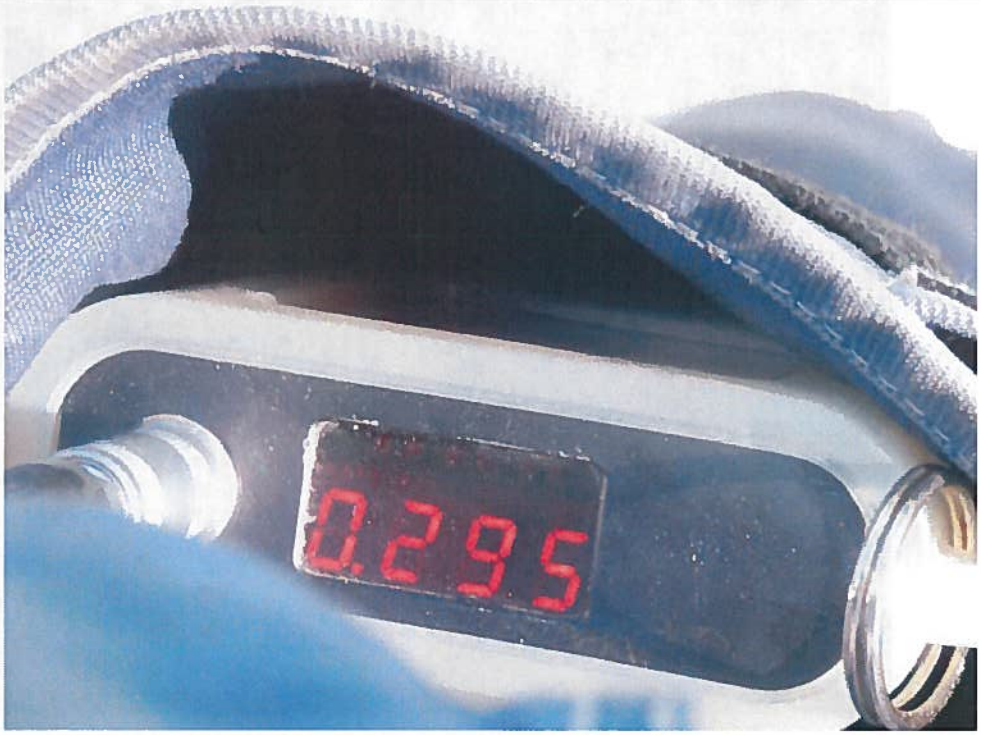
Site Layout

Site Layout

Measurement Sample

Measurement Sample

Measurement Sample



Measurement Sample

Measurement Sample

Measurement Sample

Measurement Sample

Measurement Sample

Measurement Sample

Measurement Sample

Measurement Sample

Measurement Sample

Measurement Sample

Measurement Sample

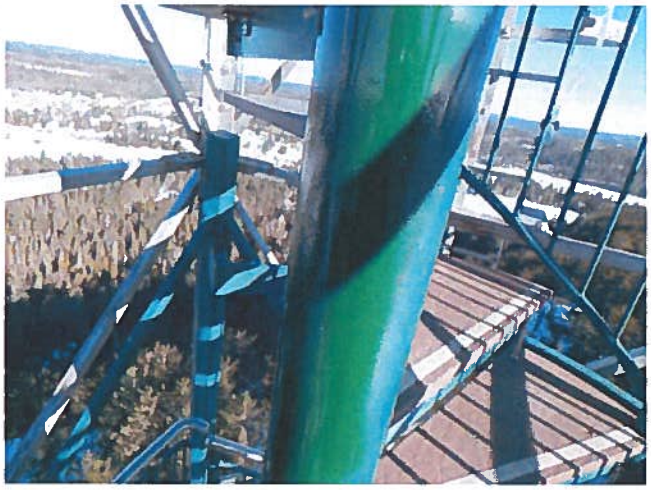
Area of rust on leg member where a measurement was taken, typical reading between 0.295 and 0.285. Measurement was 0.295.

Rust was removed and a second measurement taken, measurement was 0.29. No significant loss of material has occurred.

Location coated with zinc rich paint and then green paint to prevent further rust in the interim

Area of rust on leg member where a measurement was taken, typical reading 0.235. Measurement was 0.235.

Rust was removed and a second measurement taken, measurement was 0.235. No loss of material has occurred.



Location coated with zinc rich paint and then green paint to prevent further rust in the interim

Appendix D: Sampling Procedures

Sampling Procedures
Overall Structure
Recorded height, azimuth, diameter, location of attachments (antennas, transmission lines etc.).
Structural Members
Sampled for bent, missing, and damaged members.
Sampled member sizes for conformance to available drawings.
Measured member thickness throughout structure height
Connections
Randomly Sampled a sample of connections for loose and missing bolts, short bolts, cracked welds.
Sampled connection sizes for conformance to available drawings.
Antennas
Recorded type, elevation, location on structure, azimuth and transmission line(s) of all antennas.
Recorded mounting details of new antennas, including members, connections and hardware.
Sampled antennas and mounts for damaged and missing members, loose and missing bolts, cracked welds.
Transmission Lines and Conduit
Recorded type, top elevation and location on structure of all transmission lines.
Sampled transmission lines for damage, loose and missing support clamps and hangers, loose and missing grounding straps.
Sampled electrical conduit for damaged, loose or missing support clamps, loose and damaged junction boxes.
Sampled taped connections for clean, dry and properly installed junctions.
Lighting
Sampled light fixtures for broken and loose globes and fittings, burnt out light bulbs.
Ladders, Safety Devices, Platforms and Rails
Sampled safety cable for continuity, obstructions, loose and missing connections.
Sampled general condition of fall arrest system.
Sample ladder construction for conformance to S37-01 requirements.
Painting
Sampled for peeling, cuts, blisters, flaking, rust, fading.