ESSEX COUNTY
OFFICE OF THE MANAGER

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Daniel L. Palmer
County Manager

Linda M. Wolf
Purchasing Agent

TO: All Bidders

FROM: Linda Wolf, CPA, Purchasing Agent

DATE: January 26, 2015

SUBJECT: Addendum #1 TERRY MOUNTAIN TOWER INVENTORY

This Addendum, issued to bid document holders of record, indicates changes to the bid documents for the *TERRY MOUNTAIN TOWER INVENTORY* Bid Opening February 11, 2015.

Please see attached Structural Analysis and Newly Implement Equipment list for your reference.

END OF ADDENDUM # 1

Stainless LLC

REPORT 145307

DATE: 11/24/2013

RIGOROUS STRUCTURAL ANALYSIS

FOR A 760' G-7 GUYED TOWER

PLATTSBURGH, NY

PREPARED BY: AP

CHECKED BY: GAF

APPROVED: GAF 11/22/13

11/22/13

PROFESSIONAL ENGINEER

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of New York

Print Name: Gregg A. Fehrman

Signature:

Date 11/22/13 License # 089953

Date	Pages	Remarks

Rev.	Date	Description

SECTION PAGE

APPENDIX

PROFESSIONAL ENGINEER
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of New York

Print Name: Gregg A. Fehrman

Signature:

Date 11/27/13 License # 089953

Rev.	Date	Description

A. AUTHORIZATION/PURPOSE

As authorized by Linda Wolf of Essex County, NY, a structural analysis was performed to investigate the adequacy of a 760' G-7 guyed tower on Terry Mountain, 1159 Peasleeville Road in Clinton County, NY to support specified equipment.

B. TOWER HISTORY

The tower was originally designed and furnished in 1962 by Stainless, Inc. The tower was designed in accordance with EIA specifications for a wind load of 50 psf with no ice to support the following equipment:

1. One (1) top mounted RCA TF-6BM TV antenna, fed by two (2) 3-1/8" rigid coax.
2. One (1) 8' x 12' reflector at the 800' level.
3. One (1) side mounted RCA TF-3EM TV antenna at the 400' level.
4. One (1) lighting system with circuits including deicer circuits contained within one (1) 2" conduit for the full height of the tower.
5. One (1) inside climbing ladder for the full height of the tower.

❖ In 1997, the tower was modified by Stainless, Inc. per Report 145303. The modifications consisted of the following:

a. Replaced existing guys as follows:

Guy level	Existing guy	New guy
4	1" EHS	1-1/16" A586 Grade 1
2	7/8" EHS	1" EHS
1	3/4" EHS	1" EHS

b. Adjusted initial tensions at all guy levels.

c. Installed additional horizontal braces at the midpoints of the following bays:

Location	No. of bays
758.8' – 833.8'	9
10.0' – 108.8'	12

d. Replaced existing diagonals with new, higher capacity members at the following diagonal bracing panels:

Location	No. of bays
692.1' – 708.8'	2
317.1' – 325.4'	1
125.4' – 150.4'	3

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- In December 2010, the tower was analyzed by North Woods Engineering of Saranac Lake, NY for a wind speed of 70 mph with no ice, and 61 mph with 1/2" of radial ice in accordance with ANSI/TIA/EIA 222-F. The analysis concluded that the tower was inadequate to meet the 222-F Code and tower modifications were recommended. The modifications and proposed equipment were not installed.
- In February 2012, the tower was modified by Stainless LLC per Report 145305. The modifications consisted of the following:

  a. Reduced overall height of tower to the 760' level.
  b. Adjusted initial tensions at all guy levels.
  c. Replaced existing diagonal braces with new, higher capacity members at the following bays:

Location	No. of bays
650.4' – 692.1'	5

  d. Replaced existing horizontal braces with new, higher capacity members at the following levels:

Location	No. of levels
658.8' – 683.8'	4

- Stainless LLC has no record of any other modifications to the tower. If there have been other modifications, Stainless LLC should be notified in order to include these modifications in the analysis.

C. CONDITIONS INVESTIGATED

The analysis was performed for the tower supporting equipment based upon the following sources:

- Stainless LLC Report 145305, dated 2/24/2012, with details of tower modifications.
- Stainless LLC Report 145306 dated 10/23/2013.
- Email from Ed Deetscreek of Stainless LLC to Travis LePage of Federal Engineering, Inc., dated 11/7/2013, confirming tower equipment
- Emails from Travis LePage to Ed Deetscreek, dated 11/2/2013, 11/4/2013 and 11/7/2013, with details of tower equipment and 222-F standard for the analysis.

1. One (1) RFS DA10-59A 10' high performance dish antenna with **proposed** ice shield, azimuth 169.1 degrees, at the 650' level, fed by one (1) EW60. (Essex County Emergency)
2. One (1) RFS DA8-59A 8' high performance dish antenna with **proposed** ice shield, azimuth 169.1 degrees, at the 620' level, fed by one (1) EW60. (Essex County Emergency)
3. One (1) Bogner BCR10 antenna at the 318' level, fed by one (1) 1-5/8" heliax.
4. One (1) Bogner BCR10 antenna at the 300' level, fed by one (1) 1-5/8" heliax.

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5. One (1) RFS PAD6-59B 6' standard dish antenna with **proposed** ice shield, azimuth 60.8 degrees, at the 275' level, fed by one (1) EW52. (Shared NYSEG)
6. One (1) Celwave PD10017 antenna at the 260' level, fed by one (1) 7/8" heliax.
7. One (1) 6' standard dish antenna with radome with **proposed** ice shield, azimuth zero degrees (estimated from photos), at the 240' level, fed by one (1) 1-5/8" heliax.
8. One (1) RFS DA8-59A 8' high performance dish antenna with **proposed** ice shield, azimuth 234.4 degrees, at the 226' level, fed by one (1) EW60. (Essex County Emergency)
9. One (1) ice shield at the 85' level.
10. One (1) 10' standard dish antenna at the 75' level, azimuth 210 degrees (estimated from photos), fed by one (1) EW63.
11. One (1) RFS PAD6-65B 6' standard dish antenna with **proposed** ice shield, azimuth 215.6 degrees, at the 43' level, fed by one (1) EW65. (Essex County Emergency)
12. One (1) support conduit to the 650' level.
13. One (1) support conduit to the 226' level.
14. One (1) lighting system with circuits contained within one (1) 2" conduit for the full height of the tower.
15. One (1) inside climbing ladder with safety cable for the full height of the tower.
16. One (1) unused 4-1/16" rigid coax and one (1) unused 3-1/8" rigid coax from the 692.1' level to 760' level.

The tower cross section was based upon Stainless LLC Report 145306 dated 10/23/2013. The locations of the transmission lines are shown on Page A-2 of this Report. Deviating from the line locations as shown may invalidate the results of this analysis.

D. LOADS AND STRESSES

The analysis was performed using a basic wind speed of 70 mph with no ice, and 31 mph with 1" of uniform radial ice. The no ice load case was calculated and applied in accordance with the provisions of ANSI/TIA/EIA Standard 222-F, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, effective March 29, 1996. The ice load case was calculated in accordance with the provisions of ANSI/TIA 222-G. ANSI/TIA 222-G is based upon latest research which has shown that ice thickness increases along the height of the tower, but is associated with lower concurrent wind speeds.

Allowable unit stresses and minimum safety factors used to evaluate the adequacy of the structure were in accordance with ANSI/TIA/EIA Standard 222-F.

Based upon the local topography of the tower site, it was determined that there are no wind speed-up effects on the tower.

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Foundations were evaluated based upon the Geotechnical Investigation Report dated 9/30/2011 prepared by TECTONIC Engineering & Surveying Consultants, P.C. of Mountainville, NY.

E. METHOD OF ANALYSIS

The analysis was performed using Stainless LLC's Beam-Column Analysis Program, a computer operation which idealizes the tower as a continuous beam-column on non-linear, elastic supports (guys) subject to simultaneous transverse (wind) and axial (dead, ice and vertical components of guy tensions) loads.

F. RESULTS

The results of the analysis show no overstresses in any tower member or its foundations.

G. CONCLUSIONS AND RECOMMENDATIONS

Based on the preceding results, the following conclusions may be drawn:

1. The tower with equipment as specified in Section C is adequate to achieve a basic wind speed of 70 mph with no ice and 31 mph with 1" of uniform radial ice in accordance with ANSI/TIA/EIA 222-F.
2. The following assumptions have been made to complete the analysis:
   - The welded connection between the anchor head plate and the four grouted anchor rods is adequate to develop the resultant load from the attached guy wires. Weld strength is taken as 70 ksi.
   - The horizontal lateral thrust from the anchors is resisted totally by the passive strength of the rock shear keys and base friction, while the grouted anchor rods resist the uplift force.
   - The yield strength of the grouted anchor rods is 36 ksi.
   - The bond between the grout and anchor rods is adequate to develop the full tensile strength of the rods.
3. The welded connection between the anchor plate and the four grouted anchor rods could not be checked due to lack of original fabrication details. However, assuming a minimal 3/16" weld, the length of weld needed was determined to be only about 4-3/4" per rod which is fairly short. Secondly, the calculated resultant load at the inner anchors is less than the tensile strength of the rods. Connections are usually designed to develop the full strength of the member(s) connected to them. Hence it can reasonably be concluded that the welds are sufficient to resist the calculated resultant load. Lastly, the guy foundations have performed well over the years since initial installation in 1962 with no documented record of any distress. Based on these reasons, Stainless LLC is of the opinion that the head plate connections are adequate.

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The actual bond strength of the original grout is unknown. However, the Precast/Prestressed Concrete Institute (PCI) Manual recommends a value of 1.2 ksi for the ultimate bond stress between rebar and grout irrespective of the type of grout used. Conservatively using half of this value and neglecting the top 2' of grouted length, the bond was determined to be adequate to develop the tensile strength of the rods, assuming a common steel yield strength of 36 ksi.

H. PROVISIONS OF ANALYSIS

The analysis performed and the conclusions contained herein are based on the assumption that the tower has been properly installed and maintained, including, but not limited to the following:

1. Proper alignment and plumbness.
2. Correct guy tensions.
3. Correct bolt tightness.
4. No significant deterioration or damage to any component.

Furthermore, the information and conclusions contained in this Report were determined by application of the current "state-of-the-arts" engineering and analysis procedures and formulae, and Stainless LLC assumes no obligations to revise any of the information or conclusions contained in this Report in the event that such engineering and analysis procedures and formulae are hereafter modified or revised. In addition, under no circumstances will Stainless LLC have any obligation or responsibility whatsoever for or on account of consequential or incidental damages sustained by any person, firm or organization as a result of any information or conclusions contained in the Report, and the maximum liability of Stainless LLC, if any, pursuant to this Report shall be limited to the total funds actually received by Stainless LLC for preparation of this Report.

Customer has requested Stainless LLC to prepare and submit to Customer an engineering analysis with respect to the Subject Tower and has further requested Stainless LLC to make appropriate recommendations regarding suggested structural modifications and changes to the Subject Tower. In making such request of Stainless LLC, Customer has informed Stainless LLC that Customer will make a determination as to whether or not to implement any of the changes or modifications which may be suggested by Stainless LLC and that Customer will have any such changes or modifications made by riggers, erectors and other subcontractors of Customer's choice.

Customer hereby agrees and acknowledges that Stainless LLC shall have no liability whatsoever to Customer or to others for any work or services performed by any persons other than Stainless LLC in connection with the implementation of any structural changes or modifications recommended by Stainless LLC including but not limited to any services rendered for Customer or for others by riggers, erectors or other subcontractors. Customer

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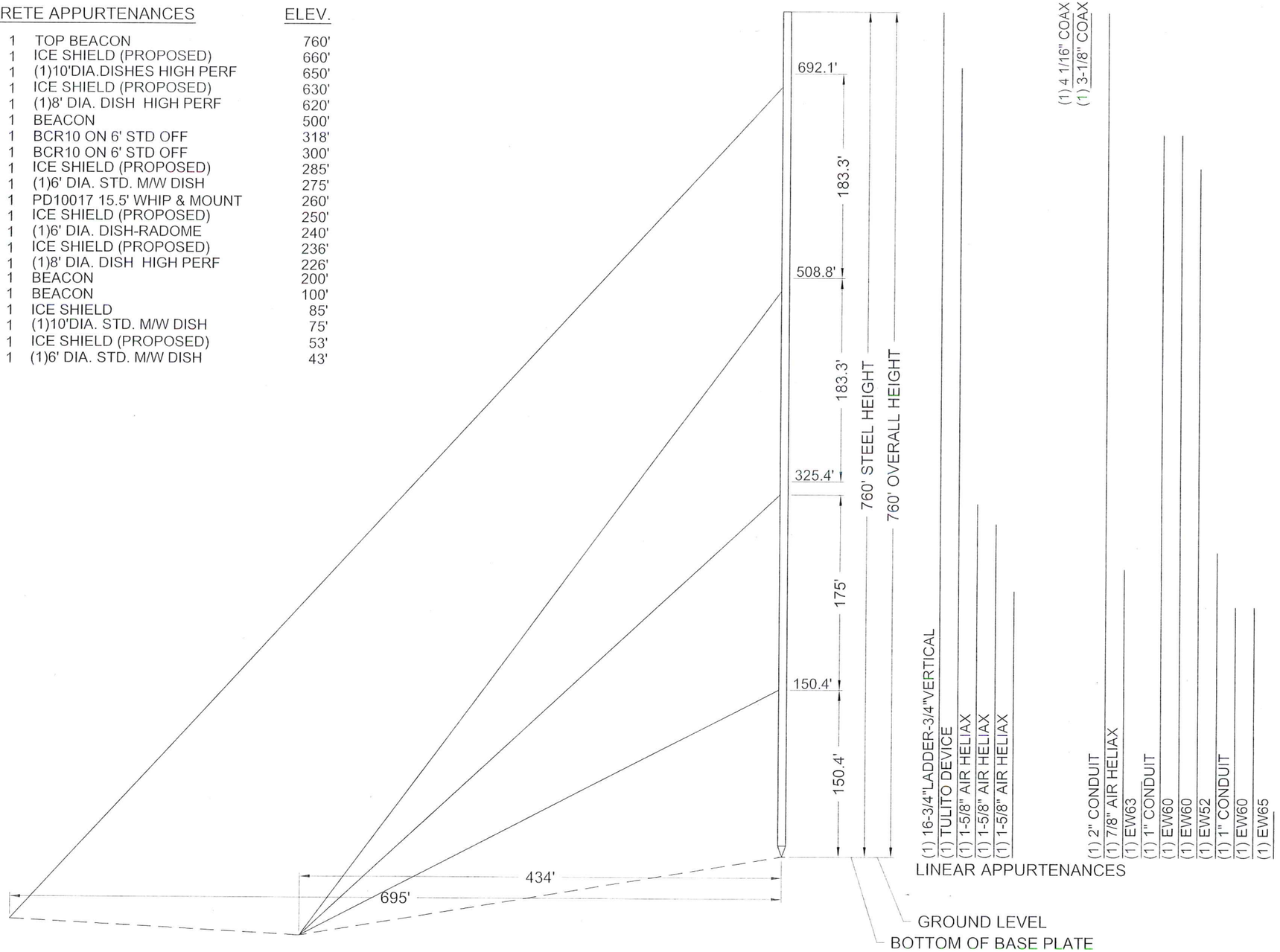
acknowledges and agrees that any riggers, erectors or subcontractors retained or employed by Customer shall be solely responsible to Customer and to others for the quality of work performed by them and that Stainless LLC shall have no liability or responsibility whatsoever as a result of any negligence or breach of contract by any such rigger, erector or subcontractor.

DISCRETE APPURTENANCES

			ELEV.
1.	1	TOP BEACON	760'
2.	1	ICE SHIELD (PROPOSED)	660'
3.	1	(1)10'DIA.DISHES HIGH PERF	650'
4.	1	ICE SHIELD (PROPOSED)	630'
5.	1	(1)8' DIA. DISH HIGH PERF	620'
6.	1	BEACON	500'
7.	1	BCR10 ON 6' STD OFF	318'
8.	1	BCR10 ON 6' STD OFF	300'
9.	1	ICE SHIELD (PROPOSED)	285'
10.	1	(1)6' DIA. STD. M/W DISH	275'
11.	1	PD10017 15.5' WHIP & MOUNT	260'
12.	1	ICE SHIELD (PROPOSED)	250'
13.	1	(1)6' DIA. DISH-RADOME	240'
14.	1	ICE SHIELD (PROPOSED)	236'
15.	1	(1)8' DIA. DISH HIGH PERF	226'
16.	1	BEACON	200'
17.	1	BEACON	100'
18.	1	ICE SHIELD	85'
19.	1	(1)10'DIA. STD. M/W DISH	75'
20.	1	ICE SHIELD (PROPOSED)	53'
21.	1	(1)6' DIA. STD. M/W DISH	43'



TOWER TYPE: G-70
STD: ANSI/TIA/EIA 222-F
LOAD CASE(S)
70 MPH BASIC WIND SPEED WITH NO ICE
31 MPH BASIC WIND SPEED WITH 1" UNIFORM ICE

PREPARED BY	AP
CHECKED BY	
ENGINEER REVIEW	
PROJECT NUMBER	145307
DRAWING NUMBER	A-1
11/25/2013	

REV	BY	DATE	D.CK	DATE	E.CK	DATE
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REVISION DESCRIPTION

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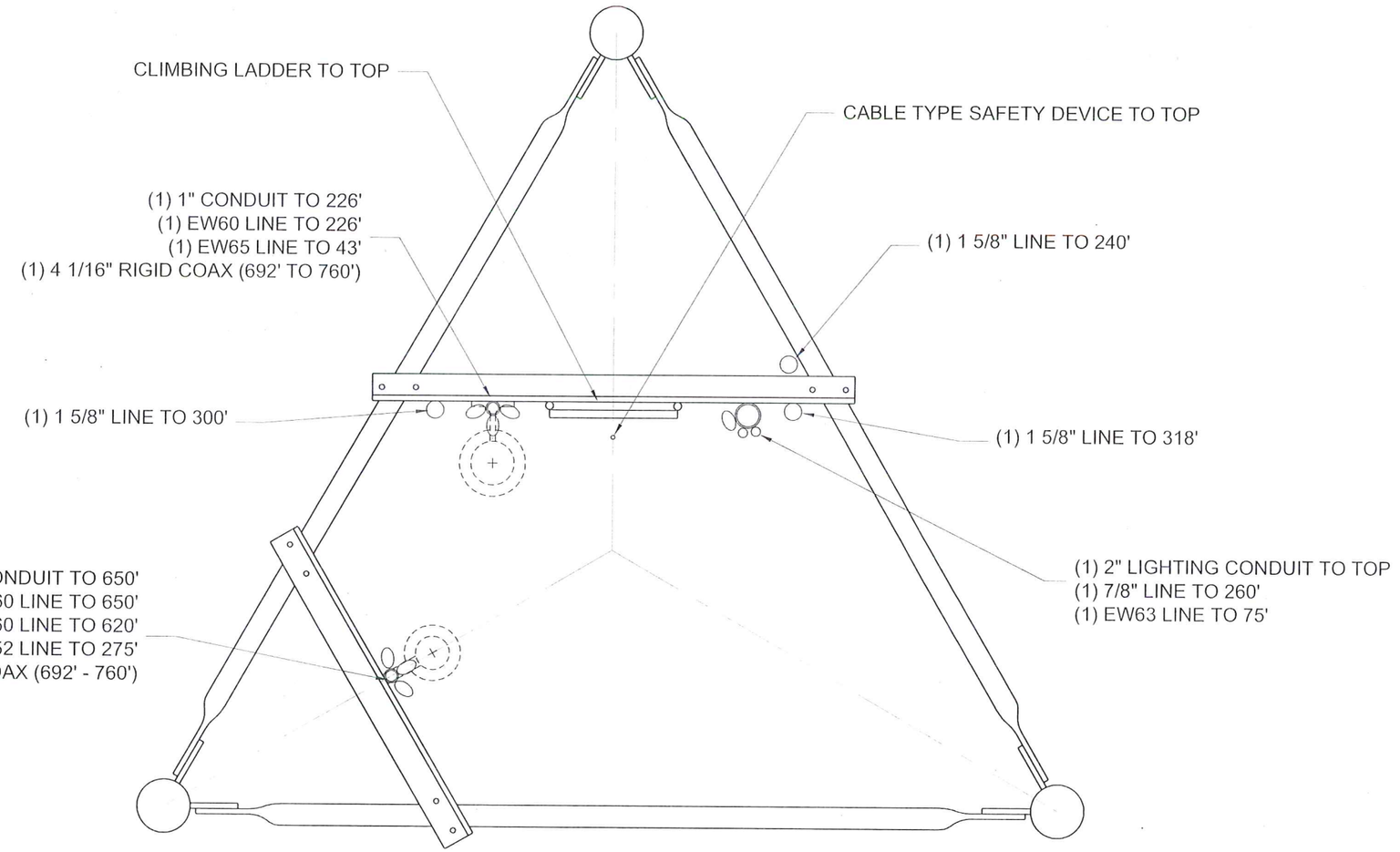
Stainless LLC
100 West Main Street, Suite 400
Lansdale, PA 19446

GENERAL ARRANGEMENT

PLATTSBURGH, NY



PREPARED BY	AP
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ENGINEER REVIEW	
PROJECT NUMBER	145307
DRAWING NUMBER	A-2

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Stainless LLC
100 West Main Street, Suite 400
Lansdale, PA 19446

LINEAR APPURTENANCES
PLATTSBURGH, NY

Terry Mountain, NY
Newly Implemented Equipment

Hop #	Transmit Site Name	Receive Site Name	Main or Space Antenna	Radio Type	Frequency Band GHz	Feeder Length Feet	Antenna Type	Radome Type	Feeder Type	Antenna Size Feet	FCC Radio Identifier	FCC Emission Type	Azimuth degrees
1	Terry	Pisgah	MAIN	MDR-8706E-150	6.175	260	DA8-59A	COMPLAN	E-60	8	MDR-8706E-150	30M0D7W	234.5
2	Terry	Little Whiteface	MAIN	MDR-8706E-50	6.7	75	PAD6-65B	FIBERGLASS	E-65	6	MDR-8706E-50	10M0D7W	215.6
11	Terry	Belfry #3	MAIN	MDR-8706E-150	6.175	680	DA10-59A	COMPLAN	E60	10	MDR-8706E-150	30M0D7W	169.1
11	Terry	Belfry #3	SPACE	MDR-8706E-150	6.175	650	DA8-59A	COMPLAN	E60	8	MDR-8706E-150	30M0D7W	169.1