



# Dukes County Sheriff's Office

## MVPSCS

*(Martha's Vineyard Public Safety Communications System)*



### **MVPSCS COMMUNICATIONS FINANCIAL ADVISORY BOARD**

#### **Regular Meeting Agenda**

December 17, 2019

12:00 p.m.

Conference Room

Dukes County Sheriff's Office Administrative Offices

9 Flight Path, Vineyard Haven, MA 02568

1. Public Comment
2. Approval of Minutes – N/A
3. New Business
  - Review of Board's Operations
  - Review of Maintenance Orders # 1-2 for FY 2020, as recommended by the MVPSCS Public Safety Communications Advisory Board at its November 26, 2019 meeting
  - Review of Maintenance Order # 1 for FY 2021, as recommended by the MVPSCS Public Safety Communications Advisory Board at its November 26, 2019 meeting
4. Old Business
  - N/A
5. Next Meeting

Posted: December 10, 2019  
Dukes County Sheriff's Office



# Dukes County Sheriff's Office

## MVPSCS

(Martha's Vineyard Public Safety Communications System)



### MAINTENANCE ORDERS #1-2

#### PHASE 1B – FY2020

#### MVPSCS COMMUNICATIONS FINANCIAL ADVISORY BOARD

For the Board's review and approval, attached are the following Maintenance Orders for the Martha's Vineyard Public Safety Radio System, pursuant to the Cooperative Agreement for Emergency Communications and Dispatch Services ("Agreement") between Dukes County Sheriff's Office and Towns of Aquinnah, Chilmark, Edgartown, Oak Bluffs, Tisbury and West Tisbury:

- Order # 1 – Existing Tower Modification and Reinforcement \$ 124,341.00
- Order # 2 – Service Monitor / Analyzer \$ 30,045.00

Total FY20 Expenditures to date **\$ 154,386.00**

In addition, another potential fiscal liability may need to be covered in order to place the new equipment on the Verizon owned tower at 60 Pennywise Path in Edgartown. This lease, currently in negotiation with Verizon for a lower annual amount and escalation clause, calls for the first year lease payment of \$66,213.43.

- Order # 3 – Potential Verizon Tower Space Lease \$ 66,213.43

Total FY20 Projected Expenditures **\$ 220,599.43**

MCPSCS Public Safety Communications Advisory Board recommended to forward Orders #1-2 to Communications Financial Board at its November 26, 2019 meeting. The Financial Advisory Board is requested to review and approve Maintenance Orders # 1-2 at this time; and forward its recommendation to each Town, pursuant to the Section 3(b)(iii) of the Agreement.



# Dukes County Sheriff's Office

## MVPSCS

(Martha's Vineyard Public Safety Communications System)



# MAINTENANCE ORDER #1

## EXISTING TOWER MODIFICATION AND REINFORCMENT

### PHASE 1B – FY2020

#### MVPSCS COMMUNICATIONS FINANCIAL ADVISORY BOARD

#### Summary:

As the Communications System upgrade project progresses several items have been identified as ineligible maintenance and development costs under the Commonwealths Executive Office of Public Safety development grant terms. The first instance of this for review by the MVPSCS Public Safety Communications and Financial Advisory Boards are two tower modification projects at the DCR Fire Tower and Dukes County Regional Emergency Communications Center.

In Phase 1A of the MVPSCS upgrades, these two sites were identified by professional engineers as incapable of supporting all necessary equipment to be attached to them (IE antennas, coax, and microwave dishes). Therefore, engineering studies were conducted on behalf of Motorola Solutions and their subcontractors to remedy the structural issues at these towers to support the system moving forward. Relatively minimal efforts are needed to accomplish this goal; however, they do require professional services to be contracted and documented to ensure compliancy with Class III ANSI/TIA-222-G standards (exhibit B). In essence, the cross members of the lattice towers and hardware that attaches them to each leg of the tower need to be replaced with higher grade steel (exhibit A).

Attached with this order is all supporting documentation for this necessary portion of the system wide upgrades to the Public Safety Communications System. Services and equipment for this project would be procured under the pricing, terms and conditions of the Massachusetts statewide technology contract ITT57.

DCR Tower Modification	\$ 63,821.00
RECC Tower Modification	<u>\$ 60,520.00</u>
<b>TOTAL:</b>	<b>\$ 124,341.00</b>



# Dukes County Sheriff's Office

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(Martha's Vineyard Public Safety Communications System)



### DCR Tower Modification Cost

**ARCHITECTURAL & ENGINEERING SERVICES** \$ 3,900.00

Provide a Third Party Tower Reinforcement Verification Investigation and Assessment, after tower modifications have been completed, to confirm the tower modifications were done correctly in accordance with the engineered structural modification design

**SITE DEVELOPMENT** \$ 59,921.00

Mobilization and demobilization of crews  
Per Tower Reinforcement Design dated 8/29/19: Remove existing cross members from 0' to 33' on existing DCR Fire tower; Supply and install new L2.5 x 3/16" cross members from 0' to 33'; Fabricate, drill and cold galvanize as needed; and Supply and install galvanized A325 bolts and hardware.  
Additional cost for housing and ferries to perform work  
Prevailing Wage Adder

**Total** \$ 63,821.00



# Dukes County Sheriff's Office

## MVPSCS

(Martha's Vineyard Public Safety Communications System)



### RECC Tower Modification Cost

#### ARCHITECTURAL & ENGINEERING SERVICES

Permit Preparation for a co-locate site (excludes environmental permitting) \$7,207.00

Permitting submission, coordination and expediting for a co-locate site (excludes environmental permitting)

Costs of local permits (zoning, electrical, building etc.), and procurement of information necessary for filing

Provide a Third Party Tower Reinforcement Verification Investigation and Assessment, after tower modifications have been completed, to confirm the tower modifications were done correctly in accordance with the engineered structural modification design

#### SITE DEVELOPMENT

Utility coordination and inspections required for site work (Construction, electrical etc.) \$53,313.00

Mobilization and demobilization of crews

Per Tower Reinforcement Design dated 7/25/19: Remove existing cross members from 40' - 60' on existing RECC tower; Supply and install new L2 x 3/16" cross members from 40' - 60'; Fabricate, drill and cold galvanize as needed; and Supply and install galvanized A325 bolts and hardware.

Additional cost for housing and ferries to perform work

Prevailing Wage Adder

**Total \$60,520.00**



August 29, 2019

Pyramid Network Services, LLC  
 6615 Towpath Road  
 East Syracuse, NY 13057

Attn: Rob McCabe  
 Re: 60' Self-Supporting Fire Tower, West Tisbury, Massachusetts

Dear Rob,

All-Points Technology Corporation, P.C. (APT) performed a condition assessment and structural analysis of the 60' self-supporting fire tower located in West Tisbury, Massachusetts for equipment changes proposed by Dukes County/Motorola. Our analysis found reinforcement was required for the tower to meet the current structural building code.

Reinforcement design was conducted in accordance with the Massachusetts State Building Code and TIA-222, revision G, *Structural Standard for Antenna Supporting Structures and Antennas* using a 3-second gust wind speed of 120-mph with no ice and 40-mph with 3/4" radial ice for the following loading (proposed equipment shown in **bold** text):

Antenna	Location	Elev.	Mount	Coax.
8' omnidirectional whip	A	70'	12' x 2-3/8" pipe	1-1/4"
3' ground plane omni	A	69'	3' sidearm	3/8"
8' omnidirectional whip	N face	68'	4' x 2-3/8" pipe on cabin	1-1/4"
(2) 12' omnidirectional whips	C, D	67'	10' x 2-3/8" pipe	1-1/4"
<b>DS1F06F36U</b>	<b>B</b>	<b>65'</b>	<b>6' sidearm</b>	<b>7/8"</b>
<del>20' omnidirectional whip</del>	<del>B</del>	<del>65'</del>	<del>8' x 2-3/8" pipe</del>	<del>1-1/4"</del>
5' omnidirectional whip	C	65'	Sector mount	7/8"
20' 8-bay dipole	D	63'	On sector mount below	7/8"
<b>SC3-W60A dish</b>	<b>S face</b>	<b>60'</b>	<b>5' x 4-1/2" pipe on leg</b>	<b>EW63</b>
(6) V7C-665, (3) X7C-665 & (3) MG D3-800T panels	N, E, W	60'	(3) 12' sector mounts	(18) 1-5/8"
6' grid dish	C	58'	4' x 2-3/8" pipe on leg	7/8"
<b>SC3-W60A dish</b>	<b>B</b>	<b>55'</b>	<b>3' sidearm</b>	<b>EW63</b>
3' omnidirectional whip (inactive)	D	50'	3' sidearm	None
1' square panel	S face	48'	8' x 2-3/8" pipe on horiz. brace	1" conduit
12' 4-bay dipole, single dipole	A	48'	3' sidearm	7/8"
4' omnidirectional whip	B	46'	2' sidearm	3/8"
2' ground plane omni (broken)	D	43'	On horiz. brace	1/2"
1' square panel with 8" x 8" amp. box	N face	42'	8' x 2-3/8" pipe on horiz. brace	1" conduit
GPS	A	27'	5' x 1" pipe on leg	1/2"

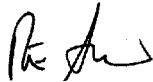
\* Elevations represent centerline of dishes and panels and bottom elevations of whips and dipoles.

The tower was observed to be in sound condition. Previous structural upgrade of the tower was evident, as angle steel reinforcement was observed to be installed on the tower legs from 13'-4" to elevation 33'-4", and the tower foundations had angle steel knee braces embedded in relatively new concrete and attached to the tower legs. Specific details of the original foundations and the foundation reinforcement were not available to APT, therefore conclusive evaluation of their adequacy could not be performed.

The attached reinforcement drawing depicts required modifications to support the proposed antenna changes. Completion of the attached modifications will result in a tower structure meeting the requirements of the Massachusetts State Building Code with Dukes County-Motorola's proposed equipment changes.

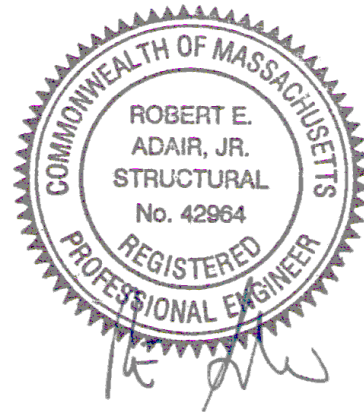
Please feel free to contact me if you have any questions.

Sincerely,  
**All-Points Technology Corporation, P.C.**



Robert E. Adair, P.E.  
Principal

MA2341481 West Tisbury reinf ltr 8-29-19.doc



<b>tnxTower</b>  <b>All-Points Technology Corp.,</b> <b>P.C.</b> 116 Grandview Road Conway, NH 03818 Phone: (603) 496-5853 FAX: (603) 447-2124	<b>Job</b> 60' Fire Tower	<b>Page</b> 1 of 1
	<b>Project</b> MA2341481 West Tisbury reinf. design	<b>Date</b> 17:06:17 08/29/19
	<b>Client</b> Dukes County/Motorola	<b>Designed by</b> Rob Adair

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$\phi P_{allow}$ lb	% Capacity	Pass Fail	
T1	60 - 53.3333	Leg	L3 1/2x3 1/2x5/16	2	-7946.73	33104.80	24.0	Pass	
		Diagonal	L2 1/2x2 1/2x3/16	13	-4250.77	6514.63	65.2	Pass	
		Top Girt	L3x3x3/16	7	-276.41	11457.40	2.4	Pass	
T2	53.3333 - 46.6666	Leg	L3 1/2x3 1/2x5/16	22	-8475.03	33104.80	25.6	Pass	
		Diagonal	L2 1/2x2 1/2x3/16	30	-4255.42	5571.35	76.4	Pass	
		Top Girt	L3x3x3/16	9	-257.26	18893.40	1.4	Pass	
T3	46.6666 - 39.9999	Redund Vert Bracing	L2 1/2x2 1/2x3/16	31	269.08	29224.80	1.6 (b)	Pass	
		Leg	L3 1/2x3 1/2x5/16	38	-13114.30	33104.80	39.6	Pass	
		Diagonal	L2 1/2x2 1/2x3/16	49	-4510.11	5571.35	81.0	Pass	
T4	39.9999 - 33.3332	Top Girt	L3x3x3/16	43	-1046.97	16831.60	6.2	Pass	
		Leg	L3 1/2x3 1/2x5/16	58	-13228.10	33104.80	40.0	Pass	
		Diagonal	L2 1/2x2 1/2x3/16	66	-4510.47	4764.67	94.7	Pass	
T5	33.3332 - 26.6665	Top Girt	L3 1/2x3 1/2x1/4	45	-138.42	29002.70	0.6	Pass	
		Redund Vert Bracing	L2 1/2x2 1/2x3/16	67	317.75	29224.80	1.1	Pass	
		Leg	L3.5 x 5/16 with L2.5 x 3/8	74	-20838.80	92415.80	22.5	Pass	
T6	26.6665 - 19.9998	Diagonal	2L2 1/2x2 1/2x3/16	83	-4864.83	23441.90	20.8	Pass	
		Top Girt	L3 1/2x3 1/2x1/4	79	-1915.18	26139.30	7.3	Pass	
		Leg	L3.5 x 5/16 with L2.5 x 3/8	94	-21010.10	92415.80	22.7	Pass	
T7	19.9998 - 13.3332	Diagonal	2L2 1/2x2 1/2x3/16	98	-5180.10	20684.10	25.0	Pass	
		Top Girt	L3 1/2x3 1/2x1/4	90	-204.02	23940.40	0.9	Pass	
		Redund Vert Bracing	L2 1/2x2 1/2x3/16	103	332.01	29224.80	1.1	Pass	
T8	13.3332 - 6.6666	Leg	L3.5 x 5/16 with L2.5 x 3/8	110	-31475.40	92416.60	34.1	Pass	
		Diagonal	2L2 1/2x2 1/2x3/16	121	-4749.22	20684.30	23.0	Pass	
		Top Girt	L3 1/2x3 1/2x1/4	115	-1157.40	21260.70	5.4	Pass	
T9	6.6666 - 0	Leg	L3.5 x 5/16 with L2.5 x 3/8	142	-36094.50	92416.60	39.1	Pass	
		Diagonal	2L2 1/2x2 1/2x3/16	152	-5225.90	16493.10	31.7	Pass	
		Top Girt	L3 1/2x3 1/2x1/4	146	-3979.66	16678.90	23.9	Pass	
							27.3 (b)		
							Summary		
							Leg (T9)	89.7	Pass
							Diagonal (T4)	94.7	Pass
							Top Girt (T8)	32.1	Pass
							Redund Vert Bracing (T6)	1.1	Pass
							Bolt Checks	89.7	Pass
							<b>RATING =</b>	<b>94.7</b>	<b>Pass</b>

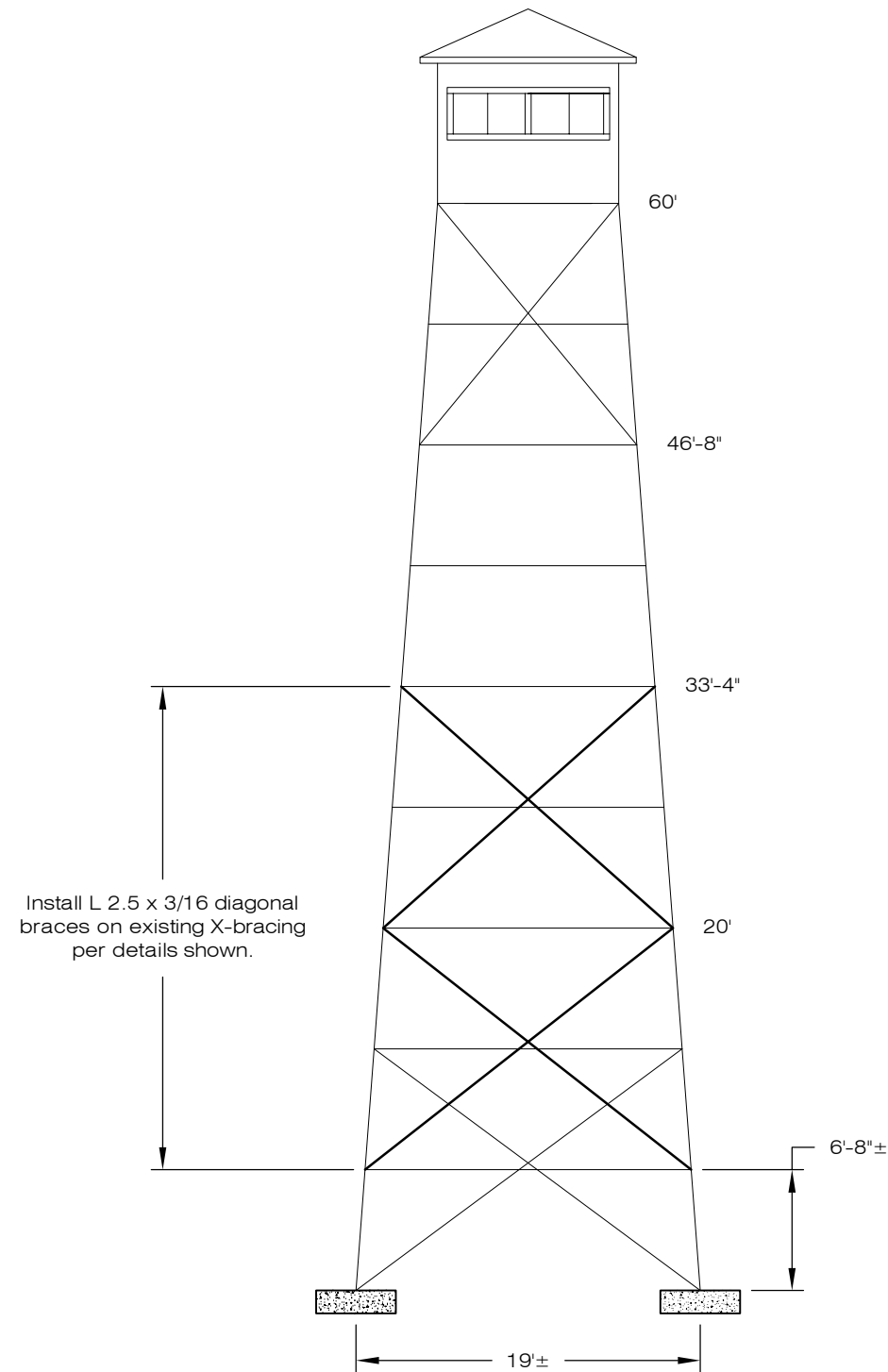


**GENERAL NOTES:**

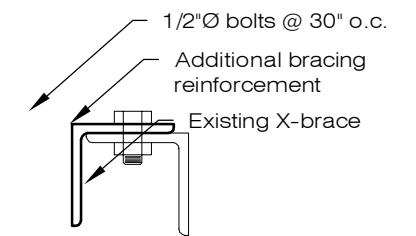
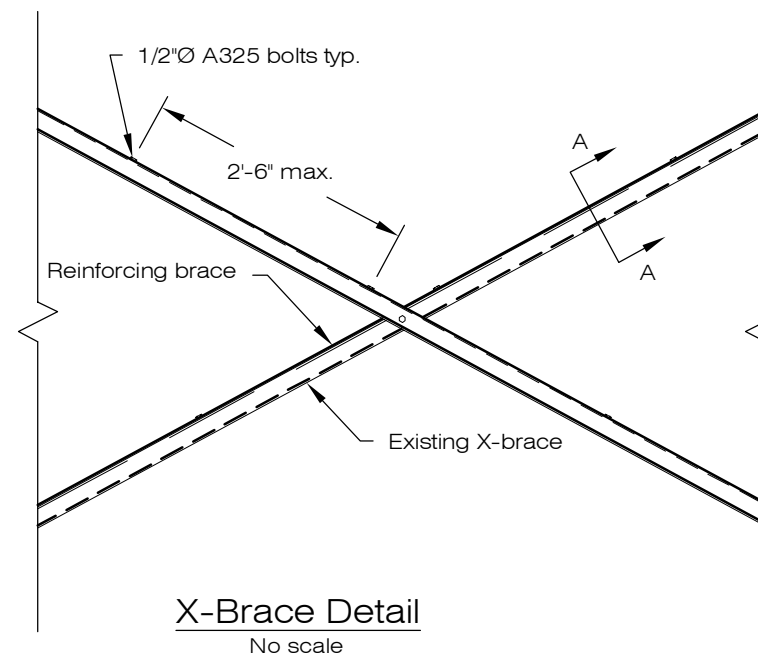
1. Reinforcement design based on structural analysis by All-Points Technology Corporation.
2. Verify dimensions and existing conditions prior to fabrication. Bring any discrepancies to the attention of the Engineer before proceeding with the affected portion of the work.
3. Coordinate work to minimize disruption of existing facilities. Work may require temporary relocation of mounts/hangers.
4. Establish procedures for protection of excavations, existing structures, and utilities prior to commencing work.
5. Design assumes competent and qualified personnel will be performing the work.
6. Work should be accomplished in light or no wind conditions (<15 mph).

**BRACING INSTALLATION NOTES:**

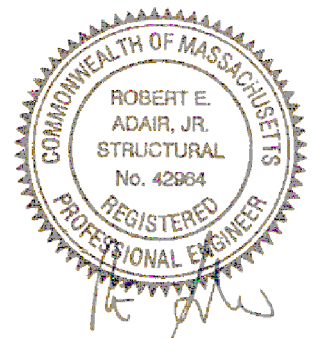
1. Bracing reinforcement to be installed on two X-braced sections from elevation 6'-8" to elevation 33'-4".
2. New braces shall be ASTM A36 steel and hot-dipped galvanized per ASTM A123.
3. Bracing bolts shall be 1/2"Ø galvanized ASTM A325 bolts. Provide pal nut or lock washer. Anco nuts are not permitted.
4. Spray a minimum of two coats of cold galvanizing on all field cut or drilled surfaces.
5. Work shown is typical for four tower faces.




**Tower Elevation**  
Scale: 1" = 10'



**Brace Section A-A**  
No scale



 <b>ALL-POINTS</b> TECHNOLOGY CORPORATION 116 GRANDVIEW ROAD CONWAY, NH 03818 (603) 496-5853	<b>TOWER REINFORCEMENT</b>		Pyramid Network Services 6615 Towpath Road East Syracuse, NY 13057	<b>60' FIRE TOWER</b> WEST TISBURY, MA
	SHEET: 1 OF 1			
	SCALE: AS NOTED	DRAWN BY: AMA		
	DATE: 29 AUG 2019	APT JOB #MA2341481		



July 25, 2019

Pyramid Network Services, LLC  
 6615 Towpath Road  
 East Syracuse, NY 13057

Attn: Rob McCabe  
 Re: 95' Self-Supporting Tower, West Tisbury, MA  
 Site: RECC

Dear Rob,

All-Points Technology Corporation, P.C. performed a structural analysis of the 95' self-supporting tower located at 9 Flight Path Road in West Tisbury, Massachusetts for antenna and associated equipment changes proposed by Dukes County/Motorola.

APT's structural analysis, dated May 23, 2019, found the tower required reinforcement to accommodate the proposed equipment. Reinforcement design was conducted in accordance with the Massachusetts State Building Code and TIA-222, revision G, *Structural Standard for Antenna Supporting Structures and Antennas* using a 3-second gust wind speed of 155-mph (ultimate) with no ice and 40-mph with 3/4" radial ice. Reinforcement design was conducted for the following antenna inventory (proposed equipment shown in **bold** text):

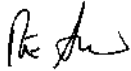
Antenna	Leg	Elev.	Mount	Coax.
Lightning rod w/ camera	A	100'	10' x 2-3/8" pipe extension	-
8" x 6" camera	A	98'	On above pipe extension	1/4"
<b>DS1F06F36U-D omnidirectional whip</b>	A	95'	<b>6' sidearm</b>	<b>7/8"</b>
(2) 20' x 2-1/2" omnidirectional whips	B, C	85'	(2) 6' x 2-3/8" sidearms w/ 10' x 1-7/8" stabilizers	(2) 1/2"
<b>ANT790F2, ANT150F2 omnidirectional whips</b>	B, C	80'	<b>(2) 6' sidearms</b>	<b>(2) 1/2"</b>
30" high-performance dish, 12" x 10" x 3" panel	A	80', 78'	4' x 4-1/2" pipe on leg	3/8"
5' x 2-1/2" omnidirectional whip, 8' x 3" omnidirectional whip (inverted)	A	76', 75'	6' x 2-3/8" sidearm w/ 10' x 1-7/8" stabilizer	7/8", 1/2"
<b>DS1F06F36U-D omnidirectional whip,</b> <b>SC3-W60A high-performance dish</b>	A	70'	<b>6' sidearm,</b> <b>Pipe on leg</b>	<b>7/8",</b> <b>EW63</b>
(2) 20' x 2-1/2" omnidirectional whips	B, C	65'	(2) 6' x 2-3/8" sidearms w/ 10' x 1-7/8" stabilizers	7/8", 1/2"
<b>ANT790F2, ANT150F2 omnidirectional whips</b>	A, C	60'	<b>(2) 6' sidearms</b>	<b>(2) 1/2"</b>

<b>SC3-W60A high-performance dish</b>	B	55'	<b>Pipe on leg</b>	<b>EW63</b>
20' x 2-1/2" omnidirectional whip	B	46'	6' x 2-3/8" sidearm w/ 10' x 1-7/8" stabilizer	1/2"
Brace for wire feed	A	12'	3' L1-3/4" x 1/8" angle	N.A.
Vacant mount	C	5'	5' x 1" vertical on bracing	N.A.

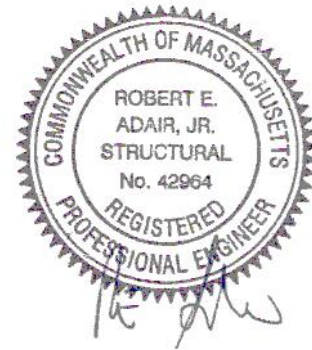
The attached drawing shows bracing replacements required to support the proposed equipment changes. Completion of the attached modifications will result in a tower structure suitable for installation of Dukes County/Motorola's proposed equipment.

Please feel free to call if you have any questions.

Sincerely,  
**All-Points Technology Corporation, P.C.**



Robert E. Adair, P.E.  
Principal



MA2341491 RECC APT reinf ltr 7-25-19

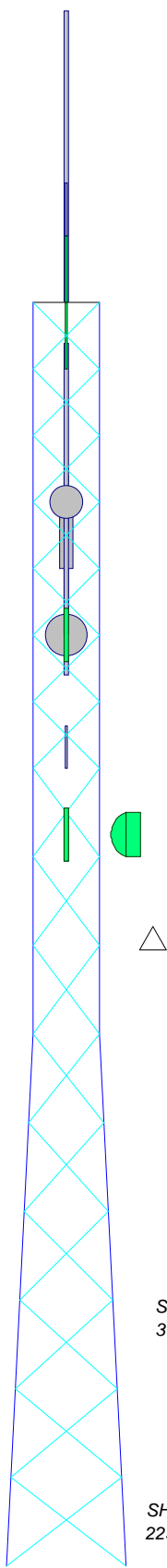
**DESIGNED APPURTENANCE LOADING**

TYPE	ELEVATION	TYPE	ELEVATION
Generic Lightning Rod 4' copper	95	DS1F06F36U-D	70
8" fisheye camera	95	6' sidearm	70
10'x2 3/8" Pipe Mount	95	4'x4 1/2" Pipe Mount	70
DS1F06F36U-D	95	RFS SC3-W60A HP dish	70
6' sidearm	95	10'x1 7/8" sidearm stabilizer	65
10'x1 7/8" sidearm stabilizer	85	20' x 2.5" omni whip	65
20' x 2.5" omni whip	85	10'x1 7/8" sidearm stabilizer	65
6' sidearm	85	6' sidearm	65
10'x1 7/8" sidearm stabilizer	85	20' x 2.5" omni whip	65
20' x 2.5" omni whip	85	6' sidearm	65
6' sidearm	85	Telewave ANT150F2	60
4'x4 1/2" Pipe Mount	82 - 78	6' sidearm	60
Telewave ANT150F2	80	Telewave ANT790F2	60
6' sidearm	80	6' sidearm	60
Telewave ANT790F2	80	4'x4 1/2" Pipe Mount	55
6' sidearm	80	RFS SC3-W60A HP dish	55
2.5' HP dish	80	6' sidearm	46
12" x 10" x 3" panel	78	10'x1 7/8" sidearm stabilizer	46
5' x 2.5" omni whip	76	20' x 2" omni whip	46
6' sidearm	76 - 75	3' L1-3/4 x 1/8" angle	12
8' x 3" omni whip	75	5' x 1" vertical	5
10'x1 7/8" sidearm stabilizer	75		

**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

Section	T1	T2	T3	T4	T5
Legs	ROHN 2.5 STD	ROHN 4 STD	ROHN 4 STD	ROHN 5 STD	ROHN 5 STD
Leg Grade		A572-50	A572-50	A572-50	A572-50
Diagonals	L2x2x1/8	L2x2x1/8	L2x2x1/8	L2x2x3/16	L2x2x3/16
Diagonal Grade		A36	A36	A36	A36
Top Girts	L2x2x1/8	N.A.	N.A.	N.A.	N.A.
Face Width (ft)	5	7 @ 5	7	9 @ 6.66667	9
# Panels @ (ft)		640.2	1063.6	1336.3	1402.5
Weight (lb)	505.4				4948.0

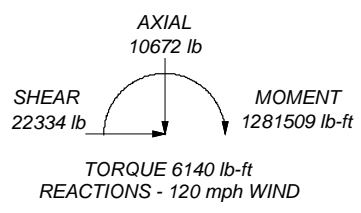
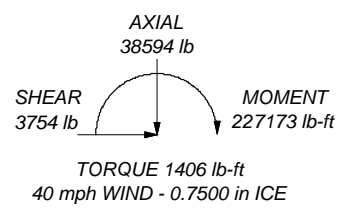


ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:

DOWN: 167968 lb  
SHEAR: 14636 lb

UPLIFT: -156195 lb  
SHEAR: 13734 lb



<b>All-Points Technology</b> 116 Grandview Rd. Conway, NH 03018 Phone: (603) 496-5853 FAX: (603) 447-2124	Job: <b>95' Self-Supporting Tower</b>
	Project: <b>MA2341491 RECC reinf.</b>
	Client: <b>Pyramid Network Services, LLC</b>
	Code: <b>TIA-222-G</b>
	Path: <small>C:\Users\juser\Documents\0661 US Cellular\Pyramid Network Services, LLC\MA2341491 RECC\MA2341491 RECC.dwg</small>
Drawn by: <b>REA</b>	App'd:
Date: <b>07/25/19</b>	Scale: <b>NTS</b>
Dwg No. <b>E-1</b>	

<b>tnxTower</b>  <b>All-Points Technology</b> 116 Grandview Rd. Conway, NH 03018 Phone: (603) 496-5853 FAX: (603) 447-2124	<b>Job</b>	95' Self-Supporting Tower	<b>Page</b>	1 of 1
	<b>Project</b>	MA2341491 RECC reinf.	<b>Date</b>	09:50:31 07/25/19
	<b>Client</b>	Pyramid Network Services, LLC	<b>Designed by</b>	REA

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$\phi P_{allow}$ lb	% Capacity	Pass Fail	
<b>T1</b>	<b>95 - 80</b>	<b>Leg</b> Diagonal	<b>ROHN 2.5 STD</b> L2x2x1/8	<b>3</b>	<b>-8529.48</b>	<b>57192.30</b>	<b>14.9</b>	<b>Pass</b>	
				10	-1950.96	8968.45	21.8	Pass	
<b>T2</b>	<b>80 - 60</b>	<b>Leg</b> Diagonal	<b>ROHN 2.5 STD</b> L2x2x1/8	6	-199.76	5299.51	3.8	Pass	
				30	-5488.14	8968.45	61.2	Pass	
<b>T3</b>	<b>60 - 40</b>	<b>Leg</b> Diagonal	<b>ROHN 4 STD</b> L2x2x3/16	54	<b>-104165.00</b>	<b>116316.00</b>	<b>89.6</b>	<b>Pass</b>	
				58	-9453.12	11215.30	84.3	Pass	
<b>T4</b>	<b>40 - 20</b>	<b>Leg</b> Diagonal	<b>ROHN 5 STD</b> L2x2x3/16	<b>75</b>	<b>-140187.00</b>	<b>169372.00</b>	<b>82.8</b>	<b>Pass</b>	
<b>T5</b>	<b>20 - 0</b>	<b>Leg</b> Diagonal	<b>ROHN 5 STD</b> L2x2x3/16	<b>96</b>	<b>-163451.00</b>	<b>169372.00</b>	<b>96.5</b>	<b>Pass</b>	
							Summary		
							Leg (T5)	96.5	Pass
							Diagonal (T3)	94.9	Pass
							Top Girt (T1)	3.8	Pass
							Bolt Checks	94.9	Pass
							<b>RATING =</b>	<b>96.5</b>	<b>Pass</b>

**All-Points Technology Corp., P.C.**

116 Grandview Road  
Conway, NH 03818  
(603) 496-5853

Client: **Pyramid Network Services, LLC**  
Job: **West Tisbury, MA**  
Calculated By: **R. Adair**

Site: **RECC**  
Job No.: **MA2341491**  
Date: **25-Jul-19**

**Program assumes:**

Mat is square in plan view.  
Water table is below bottom of mat.  
Unit weight of concrete = 150 pcf  
Unit weight of soil = 100 pcf  
Self-supporting tower with 3 piers

**Information to be provided:**

Pier is round or square in plan dimension ("R" or "S")	Shape =	R
OTM = Overturning Moment to be resisted	OTM =	1282 ft-kips
H = Height from ground surface to top of mat (if buried)	H =	3.0 ft.
P <sub>M</sub> = Projection of pier above mat	P <sub>M</sub> =	3.5 ft.
y = Thickness of mat	y =	1.50 ft.
x = Width of mat	x =	18.00 ft.
d = Diameter of round pier	d =	2.5 ft.
S = Size of tension bars	S =	7

Mass of tower and appurtenances (below)

**Results:**

<u>Component</u>	<u>Mass</u>	<u>Moment Arm</u>	<u>Moment Resist.</u>
Pier	2.6 kips	9 ft.	23.2 ft-kips
Overburden	116.2 kips	9 ft.	1046.0 ft-kips
Mat	72.9 kips	9 ft.	656.1 ft-kips

Overturning Moment Resistance = 1725.27 ft-kips  
Factor of Safety = 1.35  
Concrete Quantity = 19.9 c.y.

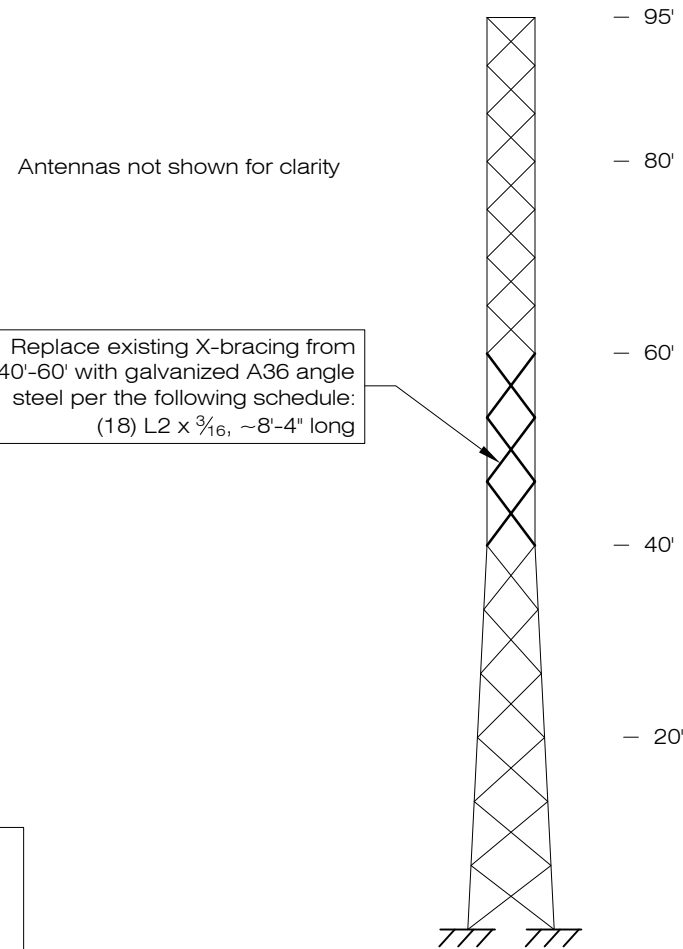
SATISFACTORY

GENERAL NOTES:

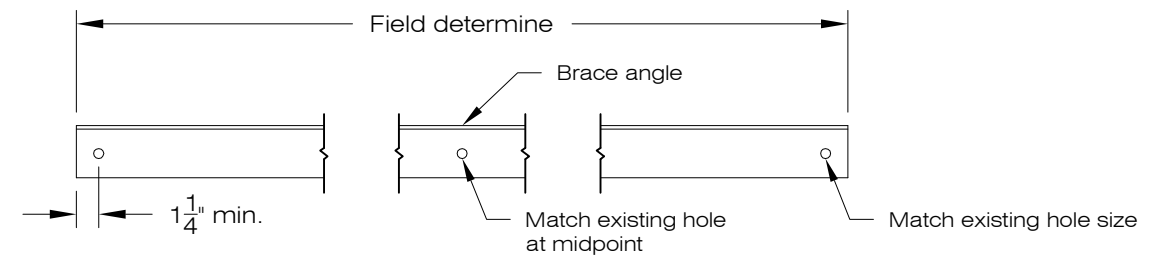
1. Reinforcement based on structural analysis by All-Points Technology dated 23 May 2019, File No. MA2341491.
2. Verify dimensions and existing conditions prior to fabrication. Bring discrepancies to the attention of the Engineer before proceeding with the affected portion of the work.
3. Work is to be accomplished on an existing in-service tower. Coordinate work to minimize disruption of existing facilities.
4. Design assumes experienced, competent and qualified personnel will be performing the work.
5. Work shown is typical for three tower faces and may require temporary relocation of utilities/hangers.
6. Work to be accomplished on one bracing bay at a time in light (<15 mph) wind conditions. Provide shoring or temporary bracing as required to complete the work.
7. Details shown are considered typical for all similar conditions unless otherwise noted.

STRUCTURAL STEEL:

1. All structural steel work shall conform to the requirements of the American Institute of Steel Construction (AISC) and all applicable building codes.
2. Structural steel angles to be ASTM A36 steel.
3. All bolts shall be ASTM Grade A325, hot-dip galvanized per ASTM D153. Do not re-use existing bolts.
4. All bolts shall have galvanized lock washer or pal nut.
5. Bolts shall be tightened using the "turn of the nut" method as specified by AISC.
6. Hot-dip galvanize angles per ASTM D123 after fabrication.
7. Apply a minimum of two coats of cold galvanizing to any field cut, welded, or drilled surfaces.




Tower Elevation  
Scale: 1" = 20'



Brace Detail  
No Scale



 116 GRANDVIEW ROAD CONWAY, NH 03818 PHONE: (603) 496-5853 FAX: (603) 447-2124 www.allpointstech.com	<b>TOWER REINFORCEMENT</b>		PYRAMID NETWORK SERVICES, LLC  6615 TOWPATH ROAD EAST SYRACUSE, NY 13057	<b>SITE: RECC</b>
	SHEET: 1 OF 1			95' SELF-SUPPORTING TOWER WEST TISBURY, MASSACHUSETT
	SCALE: AS NOTED	DRAWN BY: TPA		
DATE: 25 JUL 19	APT JOB #MA2341491			



# Classification of Tower Structures per ANSI/TIA-222-G, IBC and ASCE 7



## Preface

Application of ANSI/TIA-222-G structure classes to communication tower design and analysis is frequently misapprehended. Risk categorization established within ASCE 7 and IBC are historically related to building occupancy among other factors has inconsistent correlation to communication tower use and function. Furthermore, the comprehensive application of Class III categorization to communication towers with the intention of increasing the reliability of wireless networks during emergency situations frequently fails to achieve the desired result and does not match the intent of the ANSI/TIA-222 Standard, as accepted by the IBC.

This white paper explains structure classification relationships between ANSI/TIA-222-G, *Structural Standard for Antenna Supporting Structures and Antennas*, the *International Building Code*, and ASCE 7, *Minimum Design Loads for Buildings and Other Structures*. It identifies the variables involved in structure classification and further defines how those requirements are to be applied per requirements with ANSI/TIA-222-G.

## Definition of Structure Class – ANSI/TIA-222-G

The definition of Structure Class, per ANSI/TIA-222-G, with additional commentary by the authors, is provided below:

ANSI/TIA-222-G Definitions:

### Structure Class I:

Structures that due to height, use or location represent a low hazard to human life and damage to property in the event of a failure and/or used for services that are

CONTINUED ON PAGE 46

Authors: **Bryan Lanier, P.E., S.E., C.W.I.** (Senior Manager, Operations Engineering – American Tower Corporation), **William Garrett, PE, SECB**, (Chief Engineer – American Tower Corporation). The members of the PAN Advisory Group who are involved in the writing and researching each PAN topic include: **John Erichsen Principal EET PE**, Chairman TIA committee TR 14), **Scott Kisting** (Senior Vice President – MUTI-Sabre Industries Telecom Services), **Richard Cullum** (Program Manager – Crown Castle), **Jeremy Buckles** (Safety and Compliance Officer – International, SBA Communications Corporation), **Craig Snyder** (President, Sioux Falls Tower & Communications), and **Stephanie Brewer** (Compliance Coordinator – MUTI-Sabre Industries Telecom Services).



optional and/or where a delay in returning the services would be acceptable.

Section A.2.2 further defines Class I structures: Structures used for services that are optional or where a delay in returning the services would be acceptable such as: residential wireless and conventional two-way radio communications; television, radio and scanner reception; wireless cable; amateur and CB radio communications.

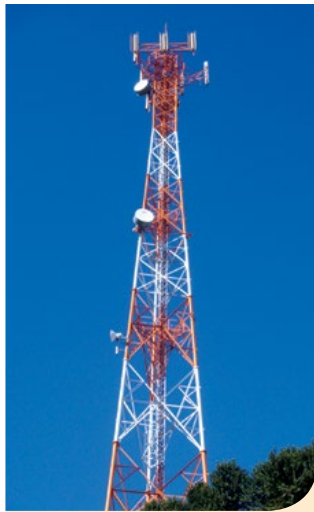
*Commentary: Failure of the structure defined as Structure Class I typically only affects the owner, although services provided may affect other users. Human life is essentially not at risk and the public well-being is largely unaffected by the tower failure.*

### Structure Class II:

Structures that due to height, use or location, represent a significant hazard to human life and/or damage to property in the event of failure and/or used for services that may be provided by other means.

ANSI/TIA-222-G, Addendum 2 Annex A Section A.2.2 further defines Class II structures based on reliability criteria: Structures used for services that may be provided by other means such as: commercial wireless communications; television and radio broadcasting; cellular, PCS, CATV, and microwave communications.

*Commentary: Failure of a structure defined as Structure Class II presents significant hazard to human life and/or property if a tower fails. Significant with respect to human life means failure of the structure could result in injury or casualties, but it's very limited in practicality or*



Nextel Cellsite in Cuiritiba, South of Brazil  
230 Ft (70M) triangular self-support tower

Photographer: Paulo Abreu, Seccional Brasil S/A



Guy tower constructed by Mercury Communications, Inc.

Photographer: Trisha Fribis, Mercury Communications Inc.

exposure to more than a few individuals (e.g. Significant with respect to property means property surrounding the tower could be damaged or destroyed. With respect to reliability, the phrase "Used for services that may be provided by other means" signifies redundancy exists within the network to support temporary loss of service due to a specific site. This redundancy is present in almost all public wireless service, including E911 networks.

### Structure Class III:

Structures that due to height, use or location represent a substantial hazard to human life and/or damage to property in the event of failure and/or used primarily for essential communications.

ANSI/TIA-222-G, Addendum 2 Annex A Section A.2.2 further defines Class III structures based on reliability criteria: Structures used primarily for essential communications such as civil or national defense, emergency, rescue, or disaster operations, military and navigation facilities.

*Commentary: With respect to reliability, Class III structures represent towers for which the owner/provider cannot tolerate any loss of the network/signal, due to either types of services provided or zero redundancy existing in the network. Beyond zero redundancy, failure could also potentially impact other services, such as power, water, transportation, etc. that are considered essential to human life. Finally, Structure Class III can be quantified when a high risk to life/safety exists in the event of a failure of the structure. The risk is exemplified when the public venue is not mobile (e.g. hospital, school, large public emergency gathering facility).*

### Definition of Risk Category – ASCE 7-10 & IBC

The ASCE 7 Standard, *Minimum Design Loads for Buildings and Other Structures* provides the basis for structural load calculation for both TIA-222 and the International Building Code. The most recent published edition is ASCE 7-10, which dictates classification of buildings and other structures by assignment of a Risk Category. ASCE7-10 provides four Risk Categories (I, II, III, IV), with each higher number placing greater significance of risk to the public. The Risk Categories are generally based on the risk to human life, health, and



Monopole with cloud East St. Louis, Illinois

Photographer: Steve Jones, US Tower Services, Inc.

welfare associated with damage or failure by nature of occupancy or use. Once Risk Category is established, importance factors are to be applied based on ASCE 7-10, Table 1.5-2. These importance factors are included in the derivation of design loads for flood, wind, snow, earthquake, and ice applied to the structure during design and analysis. The different Risk Categories can be paraphrased/commented as follows:

**Risk Category I:** Failure results in low hazard to the public.

**Risk Category II:** Structures that do not fall within Risk Categories I, III and IV.

**Risk Category III:** Failure results in a substantial risk to the public. These structures can be thought of as being needed during times of emergency (e.g. hospitals, police stations, water treatment facilities) or supporting large population centers (e.g. malls, schools). Failure, while creating significant problems to the public, can be remediated. These structures can be considered as an essential facility.

**Risk Category IV:** Failure results in substantial hazard to the public. Failure of these structures typically means

harm to the public extends well beyond the site of the failure. Often remediation cannot be completed due to the nature of the failure (e.g. nuclear facility). Failure of these structures also typically ensures failure of additional multiple systems critical to the public (e.g. loss of power results in loss of water and transportation). These structures can be considered as an essential facility.

Previous versions of the ACSE-7 used a parameter called Occupancy Category to define the appropriate risk category of a building or other structure. Occupancy Category, as used within the building codes, relates primarily to issues associated with life, safety, and fire protection across a number of building systems, like electrical, mechanical, etc. This use has caused some confusion as Risk Category's purpose is to appropriately derive the expected reoccurrence of environmental loads (wind, earthquake, ice, etc.) and the risks associated with structural failure.

Chapter 16 of the International Building Code addresses Risk Category within section 1604.5. The section is brief and relies on interpretation of the nature of occupancy in order to assign the appropriate risk cate-

CONTINUED ON NEXT PAGE

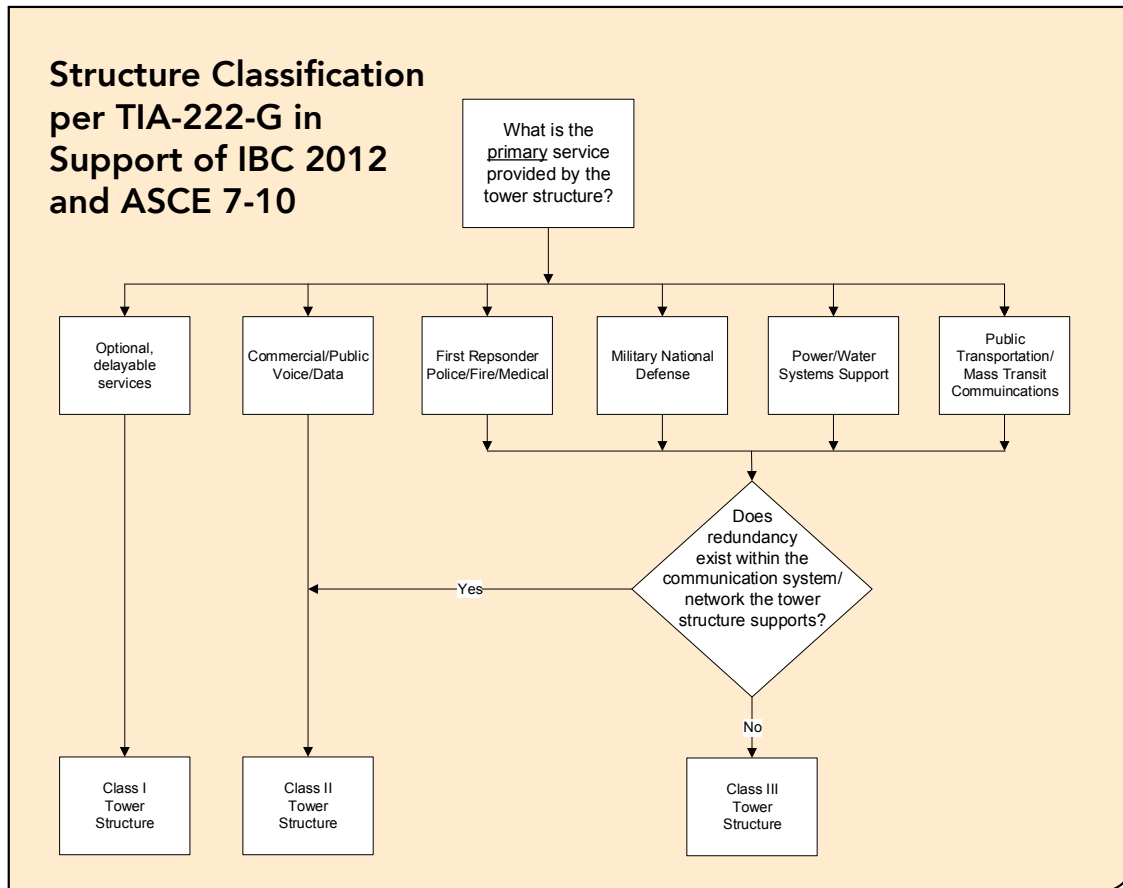
gory for design and analysis. IBC risk categories closely parallel ASCE 7-10. IBC further includes certain specific building types, contents, and occupancies within its risk category definitions for the sake of direct examples. Wireless telecommunication towers are not listed within Class III or Class IV Risk Categories.

IBC recognizes that unique structures require specific design and performance criteria. This criterion includes unique application of risk categorization. Telecommunication and broadcast towers are specifically addressed as unique structures within IBC Chapter 35 Referenced Standards and within Section 3108. Section 3108 states specifically that telecommunication and broadcast towers shall be designed and constructed in accordance with the provisions of ANSI/TIA-222.

**Application of Structure Class to Towers**

Appropriate application of Structure Class I is typically simple to evaluate and is rarely controversial. The misinterpretation primarily occurs with the misapplication of Structure Class III in place of Structure Class II. ANSI/TIA-222-G references the term “essential communications” within Table 2-1 and A.2.2. This reference is to establish a link between ASCE-7 and IBC Risk Category III and IV “essential facility” criteria and structure classification definitions within the ANSI/TIA-222-G

Standard. “Essential communications” are defined within ANSI/TIA-222-G Annex A, A.2.2 as structures used primarily in support of civil or national defense, emergency, rescue or disaster operations, military and navigation facilities. On occasion, interpretations have been made based on the terms “emergency” and “rescue” in the above definition as validation of Class III requirements for wireless telecommunication towers, as the expectation is typical personal communication use of a mobile wireless device may be used during an emergency or rescue event, thus mandating the need for the higher classification. This is not the intent of the Standard. To properly apply the correct Structure Class per ANSI/TIA-222-G the term “primarily” must be defined and weighed against the number of lives at risk, as well as purpose and redundancy of the structure, wireless equipment installed, or the network design supported. “Primarily” within the definition above is used to define structures that support wireless telecommunication systems with limited or zero redundancy and hence place large numbers of lives at risk in the event of a failure. It also defines structures whose purpose for installation is to support wireless services used primarily by emergency service providers, military, navigational or mass transit. ANSI/TIA-222-G addresses redundancy of in Table 2-1. The terminology “used for services that may be provided by other means” is the



defined difference between essential communications or Class III structures with limited or zero redundancy and Class II structures that deliver inherent redundancy.

### Conclusion

Structure Class definitions have been incorporated into the ANSI/TIA-222 Standard to provide accurate and reasonable classification of tower structures. The IBC specifically recognizes the ANSI/TIA-222 Standard as the guideline for communication tower design and analysis and fundamentally accepts the ANSI/TIA-222 structure classification as the basis required for telecommunication and broadcast towers. Use of the ANSI/TIA-222-G definitions allows for more appropriate application of assessing risk, when considering factors like public safety, service and network redundancy.

Inherent redundancy exists in the vast majority of wireless tower supported networks, including networks that support emergency services such as E911. Because of this redundancy, application of higher structure classes to individual towers typically has little effect on the resiliency of overall network performance. Although a significant total of the population may be potentially (or "be" here) impacted by the loss of service of a wireless provider, the loss of an individual wireless site does not consistently compromise the entire wireless network, nor eliminate the service provided in a specific location. Therefore, the potential impact to the public typically is actually very small, as opposed to what might initially be estimated.

Higher structure classes may be warranted when the failure of the tower implies significant physical consequences to the surrounding area, affects essential services, such as water, power, transportation, etc. or when loss of specific wireless service at a location significantly compromises the overall network or eliminates designated emergency service in a specific geographic location.

In effort to truly enhance the reliability of a wireless site in these scenarios, strengthening of all aspects of the wireless network, including individual antennas, mounts and connections, coax or fiber lines (backhaul for data), back-up power, water intrusion resiliency, and radio cabinet design is likely appropriate. Instituting a Structure Class III requirement only on the tower structure would likely result in a non to minimal improvement in reliability in comparison to the expectation of overall improved network performance and reliability. ■



# Dukes County Sheriff's Office

## MVPSCS

(Martha's Vineyard Public Safety Communications System)



### MAINTENANCE ORDER #2 FREEDOM R8100 SERVICE MONITOR/ANALYZER PHASE 1B – FY2020

#### MVPSCS COMMUNICATIONS FINANCIAL ADVISORY BOARD

##### Summary:

In order to properly identify and remedy potential issues both in the current and future system it is necessary to utilize a **communications system service monitor**. A *service monitor* provides a plethora of tools for a communications technician in a single unit. In the past, many technicians would have to use several stationary units set up in a clean environment to accurately test and repair system components. This typically required key components of the system to be taken out of service for extended periods of time. With advancements in radio frequency technology tools that once required a full shop are now condensed into a single portable unit.

While several key maintenance items and repairs will be covered under a blanket agreement with Motorola Solutions, it is necessary for Martha's Vineyard to have self-sustainable capabilities to provide immediate maintenance and repair of the public safety communications system. This will also allow for the auditing of maintenance components provided by outside contractors to ensure system compliance with both local and federal regulations.

Starting on page 2 is an outline with further detail on what exactly a service monitor provides. If you would like further explanation or to see a demonstration of the use of this piece of equipment please contact Deputy Gould at 508-696-7862.

Freedom R8100 Communications System Analyzer

**\$30,045**

*Note this maintenance monitor was purchased in September 2019 to take advantage of the limited time \$5,000.00 APCO Show discount.*



# Dukes County Sheriff's Office

## MVPSCS

(Martha's Vineyard Public Safety Communications System)



### FREEDOM R8100 SERVICE MONITOR/ANALYZER



#### Key Features:

- Antenna sweep
  - Verifies antenna is tuned and operating within its specification
- Cable Fault Detection
  - Checks coax cable for any signal loss and gives the location on the cable that may be compromised
- Transmitter and Receiver alignment
  - Tests, Verifies, and realigns (retunes) the transmitter and receiver of both infrastructure and portable/mobile radios
    - This allows for us to quickly identify and remedy any potential system-wide issues and will prolong the service life of radio equipment
- Spectrum Analyzer and signal tracking generator
  - Testing and tuning of radio filters and associated systems
  - Capable of locating and mitigating interference issues from outside sources
  - System coverage testing and verification
- Advanced multi-meter
  - Gives detailed technical information regarding power systems and helps trouble shoot potential issues with both DC and AC supply components







**STEPHANIE TEIXEIRA**

Transaction Manager – Verizon Account  
Global Workplace Solutions

508 – 851 - 4636

Stephanie.teixeira@verizon.com

CBRE, Inc.  
Transaction Management  
Corporate Real Estate Services

**Sent via Email**

October 11<sup>th</sup>, 2019

Rob McCabe  
Pyramid Network Services, LLC  
11 River Road  
Glenmont, NY 12077

Re: Dukes County Sheriff's Office  
60 Pennywise Path, Edgartown, MA 02359

Dear Rob:

In response to the recent application for a new License Agreement between Verizon New England Inc. (Licensor) and Dukes County Sheriff's Office (Licensee) at 60 Pennywise Path, Edgartown, Massachusetts, I am pleased to submit the following proposal:

- Ground Space:** approximately 240 square feet for a Prefabricated Shelter with Indoor Propane Fueled Generator together with (1) 1,000 Gallon LP Tank
- Tower Space:** (1) DB Spectra DS1F06F36U-D TX Antenna @ 150', (1) DB Spectra DS1F06F36U-D RX Antenna @ 178', (1) RFS SC3-W100A Microwave Dish (11MGHZ) @ 100', (1) RFS SC3-W100A Microwave Dish (11MGHZ) @ 140', (1) Commscope AVA5-50 Coax Line @ 178', (1) Commscope AVA5-50 Coax Line @ 150', (1) Commscope EW63 Elliptical Line @ 100', (1) Commscope EW63 Elliptical Line @ 140', and (1) 600 Box Outdoor Unit for Connection @ 10'.
- License Term:** Estimated to be five (5) Years commencing on September 1<sup>st</sup>, 2020 and expiring August 31<sup>st</sup>, 2025.
- Base Rent:** \$66,213.48 annually: \$5,517.79 monthly for the first year of the initial term. Thereafter, rent will escalate 5% annually on the anniversary date until the expiration of the License.



Base Rent Schedule:

Year	Start Date	End Date	Monthly	Annually
1	9/1/2020	8/31/2021	\$ 5,517.79	\$ 66,213.43
2	9/1/2021	8/31/2022	\$ 5,793.68	\$ 69,524.10
3	9/1/2022	8/31/2023	\$ 6,083.36	\$ 73,000.31
4	9/1/2023	8/31/2024	\$ 6,387.53	\$ 76,650.32
5	9/1/2024	8/31/2025	\$ 6,706.90	\$ 80,482.84
6	9/1/2025	8/31/2026	\$ 7,042.25	\$ 84,506.98
7	9/1/2026	8/31/2027	\$ 7,394.36	\$ 88,732.33
8	9/1/2027	8/31/2028	\$ 7,764.08	\$ 93,168.95
9	9/1/2028	8/31/2029	\$ 8,152.28	\$ 97,827.40
10	9/1/2029	8/31/2030	\$ 8,559.90	\$ 102,718.77
11	9/1/2030	8/31/2031	\$ 8,987.89	\$ 107,854.70
12	9/1/2031	8/31/2032	\$ 9,437.29	\$ 113,247.44
13	9/1/2032	8/31/2033	\$ 9,909.15	\$ 118,909.81
14	9/1/2033	8/31/2034	\$ 10,404.61	\$ 124,855.30
15	9/1/2034	8/31/2035	\$ 10,924.84	\$ 131,098.07
16	9/1/2035	8/31/2036	\$ 11,471.08	\$ 137,652.97
17	9/1/2036	8/31/2037	\$ 12,044.63	\$ 144,535.62
18	9/1/2037	8/31/2038	\$ 12,646.87	\$ 151,762.40
19	9/1/2038	8/31/2039	\$ 13,279.21	\$ 159,350.52
20	9/1/2039	8/31/2040	\$ 13,943.17	\$ 167,318.04

Renewal Option:

Three (3) options to renew the License for five (5) Years each, 15 renewal years. Rent for the extended terms shall increase 5% over the rent in last year of the previous terms and annually thereafter on the anniversary date until the expiration of the License. The 5% escalations shall continue through each option period.

Rent & Notice Address:

All rent payments made by Licensee to Licensor shall be sent to Licensor at Verizon Global Real Estate, Attn: License Administration, 7701 East Telecom Parkway, Mail Code: FLTDSB1W, Temple Terrace, FL 33637.

Access:

Specific access arrangements shall be made in accordance with the security procedures for the Location specified from time to time in writing, by Licensor, or may be made at the following telephone number: 1-888-696-3973. In addition, as of the date hereof, specific

access arrangements may be made through Licensor's property manager for the Location, Jeffery Coaston (telephone: (617) – 696 – 4020; email [jeffery.coaston@verizon.com](mailto:jeffery.coaston@verizon.com)) or by contacting 1 – 888 – 696 – 3973.).

No initial installation of, or changes in, Licensee's Equipment or the location thereof (collectively referred to herein as a "Licensee Improvement") may be made without Licensor's prior written consent. In addition, Licensee shall give Licensor 48 hours' prior notice by telephone or electronic mail prior to performing any Licensee Improvement. In the event Licensee does not obtain Licensor's prior consent to any Licensee Improvement or does not give such notice prior to performing a Licensee Improvement, Licensee shall reimburse Licensor for any costs and expenses incurred by Licensor in connection with (i) investigating the Licensee Improvement, (ii) repairing any structural damage to the tower or other damage caused by the Licensee Improvement, and/or (iii) removing and/or relocating any Licensee's Equipment resulting from such Licensee Improvement.

Alterations; Liens:

Licensee acknowledges that there are multiple carriers with equipment at this Location and that any future alterations or modifications for which Licensee may seek approval pursuant to this Section shall be subject to any alterations or modifications for other carriers at this Location then under consideration by Licensor or in the process of being permitted and installed by such other carrier, and any delay resulting therefrom shall not be deemed to be unreasonable.

Licensee Notices:

Licensee to confirm up to date mailing and notice address(es).

Lighting of Antennas:

If, because of Licensee's Equipment, any laws or regulations of the Federal Aviation Administration, Federal Communications Commission or any other relevant governmental agency or body require or recommend that Licensee's Equipment, improvements, and/or the Location be lit, painted in a particular color, and/or marked, Licensee, or Licensor on Licensee's behalf, shall install and maintain, at Licensee's sole cost and expense, such lighting, painting and markings. Licensee acknowledges that Licensor has provided Licensee with a copy of FCC Form 854R (Antenna Structure Registration) pursuant to 47 CFR 17.4(f).

Climbing Path Restrictions:

No antennas are to be installed in the safety/climbing path and all antennas should be attached to an outrigger or extension arm to insure antennas are kept away from the safety/climbing paths. Any equipment in the safety/climbing path shall be removed by Licensee

at the request of Licensor at Licensee's sole cost and expense. No cables should be attached on or near the safety/climbing path. Any cables in the safety/climbing path shall be removed by Licensee at the request of Licensor at Licensee's sole cost and expense.

**Grounding:** All of Licensee's Equipment located on the tower must be grounded and TX lines must be securely fastened to the tower.

**Equipment Labeling:** Licensee shall permanently label each piece of Licensee's equipment to enable Licensor to identify such equipment as Licensee's. Without limiting the foregoing, each antenna installed by Licensee pursuant to this Agreement or the License must be identified by a metal tag fastened securely to its bracket on the Tower, each transmission line installed by Licensee pursuant to this Agreement or the License is to be tagged where it first attaches to the Tower, and any hut or other structure installed by Licensee pursuant to this Agreement or the License shall have affixed to it a sign identifying Licensee as its owner.

#### Structural Analysis – Condition Assessment and Required Work:

As a condition of the approval for the License Agreement, Licensee is required and obligated to complete work as outlined in the Structural Analysis completed All-Points Technology Corporation on May 20<sup>th</sup>, 2019. This includes:

- **Bracing:** Bracing members are comprised of angle steel and appeared to be in generally sound condition. Connections were visually observed to the maximum extent practicable. However, only one member of X-bracing from 155'-160' was observed to be replaced as detailed in reinforcement drawings previously prepared by APT. The remaining members of X-bracing should be replaced as soon as possible. Additionally, a loose bottom end bolt of the replaced X-brace was observed on the northeast tower face at 155'. This should be replaced as soon as possible, not just tightened. Finally, X-bracing from 50'-55' was previously observed to be significantly rusted and APT recommended its replacement in the aforementioned reinforcement drawings. This has not been completed, and should be done so promptly.
- **Splice Connections:** Connections were checked by hand for tightness at climbing leg splice locations. Splice bolts were observed to be missing from multiple splice locations. These should be replaced promptly.
- **Guy Cables and Hardware:** Guy cables appeared to be in good condition. Torque arms and attachment hardware were in

sound condition. However, APT noticed a loose bolt at the bottom of the torque arm brace at 160'. This bolt should be replaced, not simply tightened.

Miscellaneous:

**Licensee to confirm full legal name of entity, along with supporting documents of such; identify and provide name of Licensee signatory and title along with supporting documents of such.**

This letter is intended only as an expression of the terms and conditions under which the parties would be willing to enter into a formal agreement. CBRE has no authority to enter into binding agreements on behalf of Verizon. This letter shall not be construed to be binding upon the parties until such time as a mutually agreed upon agreement is executed by both parties.

Please forward your written response to this proposal to my attention at your earliest convenience. Should you have any questions or would like to discuss this proposal, please do not hesitate to call me at 508 – 851 – 4636.

I look forward to hearing from you.

Sincerely,

*Stephanie Teixeira*

Stephanie Teixeira  
Transaction Manager



# Dukes County Sheriff's Office

## MVPSCS

(Martha's Vineyard Public Safety Communications System)



### FY 2021 Maintenance Costs Budget Request MVPSCS COMMUNICATIONS FINANCIAL ADVISORY BOARD

The preliminary projection for the FY 2021 maintenance costs for the upgraded public safety radio system (Maintenance Order #1) includes the known costs of the Motorola Essential Plus Warranty Service and System Upgrade Agreement II Lifecycle Management Plan. The warranty covers the Land Mobile Radio Infrastructure, Aviat Microwave and Networking Equipment, and Consoles. Specifically, the warranty service provides: tech support, dispatch, 24x7 on-site, yearly preventative maintenance, infrastructure replacement with advanced repair and SUS. The lifecycle management plan keeps the system up to date from a hardware and software perspective, with updates taking place every two years.

FY21 Essential Plus Warranty Service	\$ 59,223.00
FY21 System Upgrade Agreement II	<u>\$ 47,833.00</u>
<b>TOTAL:</b>	<b>\$ 107,056.00</b>

The following is a multi-year projection of the above maintenance costs for FY21-FY25:

Maintenance Costs	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
Essential Plus Warranty	59,223.00	60,443.00	61,699.00	62,993.00	64,326.00
System Upgrade Agreement II	47,833.00	49,013.00	50,228.00	51,480.00	53,129.00
Total Projected Warranty / Upgrade Costs	<u>107,056.00</u>	<u>109,456.00</u>	<u>111,927.00</u>	<u>114,473.00</u>	<u>117,455.00</u>

Other maintenance and development costs of the upgraded public safety radio system, which are not covered by the State 911 development grant funds, are being identified in detail, based on the actual implementation of Phase 2 of the system upgrades / replacement. **For FY21 budgeting purposes, the estimate not to exceed \$300,000 is requested to be approved by the MVPSCS Communications Financial Advisory Board**, as follows. This is also the November 26, 2019 recommendation of the MVPSCS Public Safety Communications Advisory Board.

Not To Exceed Maintenance Costs	FY 2021
Motorola Essentials+ Service Package	\$ 59,223.00
Motorola System Upgrade Agreement II	\$ 47,833.00
Warranty and Upgrades Exclusions	\$ 16,058.40
Hardened Sites Generator Maintenance	\$ 15,000.00
Hardened Sites Generator Utilities   Fuel	\$ 4,500.00
Grant Ineligible Development Costs	\$ 23,361.93
Development Contingencies Reserve	\$ 81,632.85
RECC Maintenance Projections	\$ 52,390.83
Total Projected Maintenance Costs	<u>\$ 300,000.00</u>

50% Equal Share	50% Call Volume	FY 2021
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Aquinnah	9.62%	\$ 28,857.50
Chilmark	11.65%	\$ 34,962.50
Edgartown	22.09%	\$ 66,282.50
Oak Bluffs	23.08%	\$ 69,237.50
Tisbury	19.84%	\$ 59,532.50
West Tisbury	13.71%	\$ 41,127.50

Total Maintenance Costs	<u>\$ 300,000.00</u>
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# System Maintenance Costs

Grant Ineligible Development, Maintenance and Management Items – FY 2021

- **Motorola Essentials+ Service Package**
  - \$59,223.00
- **Motorola System Upgrade Agreement II**
  - Lifecycle Management Plan
  - \$47,833.00
- **Service Package and System Upgrade Exclusions**
  - Passive equipment such as feed line, antenna's, combining equipment, and dehydrators; UPS and UPS Batteries and Tower Climbing personnel expenses, if necessary.
  - Maintenance costs of towers, shelters, HVAC, or site generators.
  - \$16,058.40



**MOTOROLA**



# System Maintenance Costs

Grant Ineligible Development, Maintenance and Management Items – FY 2021

- **Hardened Sites Generator Maintenance**
  - Annual maintenance agreements for 3 sites
  - \$15,000.00
- **Hardened Sites Generator Utilities | Fuel**
  - Annual utility cost estimates for 3 sites
  - \$4,500.00
- **Grant Ineligible Development Costs**
  - Legal costs
  - Permitting costs
  - Wireless vendor tower position fees
  - \$23,361.93



**MOTOROLA**



# System Maintenance Costs

Grant Ineligible Development, Maintenance and Management Items – FY 2021

- **Reserve for Site Development Contingencies**

- Tower structural enhancements if Structural Analysis fails at Pennywise, RECC, Peaked Hill, or the DCR tower.
- If at Oak Bluffs during the Phase I environmental assessment, Motorola discovers hazardous soils, and site needs remediation to soil or additional testing.
- If any of the sites require non-typical grounding upgrades.
- If there are any utility fees required for any sites other than RECC and DCR tower, as Motorola is using existing shelters, etc.
- The Path surveys are based on paper path studies only, which were accounted for in Motorola's Tower design. Once the physical path surveys are completed, the design will be finalized and updated based on that.
- Re-programming cost of existing Kenwood mobile and portable radios
- **\$81,632.85** (10% of Phases 1b and 2 Site Development Costs)



**MOTOROLA**





# System Maintenance Costs

Grant Ineligible Development, Maintenance and Management Items – FY 2021

- **RECC Maintenance Costs**
  - Equipment Purchases - \$16,413.00
  - Equipment Lease – Maintain & Repair - \$10,437.00
  - Infrastructure - \$25,540.83
  - **Total - \$52,390.83**
- **Total FY 2021 Maintenance Costs - \$300,000.00**



**MOTOROLA**





# **ESSENTIAL SERVICES FOR ASTRO<sup>®</sup> 25 SYSTEMS**

## SUPPORT WHEN YOU NEED IT

When the unpredictable happens to your network, get access to technical support teams and resources for troubleshooting and maintenance with Essential Services. Choose from two levels of support.

### **ESSENTIAL**

#### **SUPPORT FOR YOUR TECHNICIANS WHEN NEEDED**

Get the help you need, anytime, with 24x7x365 access to Motorola Solutions system technologists to help troubleshoot and resolve network issues.

#### **MINIMIZE SERVICE DISRUPTION**

Our network hardware repair covers all Motorola Solutions-manufactured equipment and select third-party vendors. Factory-trained and certified technicians troubleshoot, analyze, test and repair your equipment at our centralized facility. You will experience expert, high-quality, reliable support for rapid turnaround. Timely and accurate diagnosis and repair assures that all equipment you send to us is returned to factory specifications.

#### **MITIGATE CYBERSECURITY THREATS**

To help you maintain operational integrity of your network and minimize cybersecurity risk, we provide the latest security updates pre-tested in our dedicated system test lab running the same software version as your network to ensure no service disruption. Once validated, you can download and install at your convenience.

### **ESSENTIAL PLUS**

#### **ADDED FIELD SERVICES TO MINIMIZE NETWORK DOWNTIME**

In addition to Essential Services, Essential Plus provides a higher level of support to help minimize unexpected downtime and quickly respond to network issues by engaging Motorola Solutions field services.

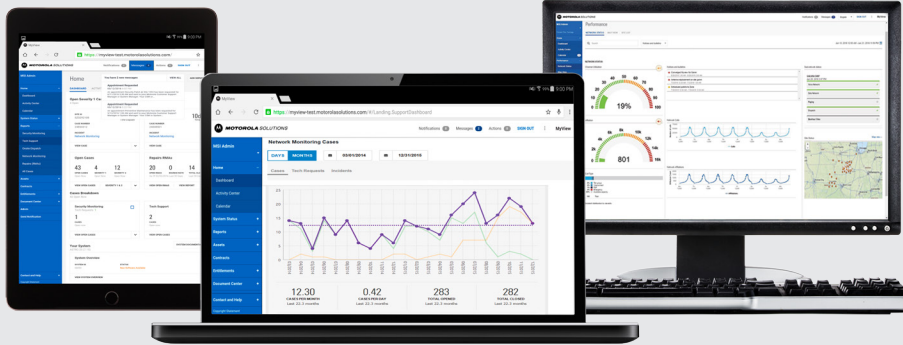
Whether your communications network needs routine maintenance or one of your towers has suffered a damaging lightning strike, you want a reliable service response and restoral process. With Essential Plus, you have access to our team of support professionals who know how to get the job done.

Your system response and restoration process begins immediately with one phone call. We will dispatch a local field technician to the affected site to help restore operations. Case management and escalation procedures are in place to ensure your contracted response times are met.

To help extend the useful life of your equipment, we will conduct annual preventive maintenance of your infrastructure to continually meet original manufacturer's specifications. Routine test and alignment helps improve efficiency and minimize total cost of ownership.



# MYVIEW PORTAL



## FOR VISIBILITY TO CRITICAL SYSTEM AND SERVICES INFORMATION

Essential Services include access to MyView Portal for network and service delivery information to help make smarter, faster and more proactive decisions to keep your network running smoothly and effectively.

### KEY FEATURES

- Service Delivery Information
- Historical Reports
- Asset Information

## UNMATCHED SERVICE DELIVERY

### SOLUTIONS SUPPORT CENTER

Our goal is to help you maintain continuous network uptime and availability. With one call to our Solutions Support Center, you have access to our experienced technologists 24x7x365 to help answer your questions and troubleshoot issues. These dedicated professionals have access to documented and repeatable fixes and labs to recreate your conditions for more effective troubleshooting. Rely on one point of coordinated contact for all of your service and repair needs.

### STATE-OF-THE-ART REPAIR DEPOT

Motorola Solutions repair depot enables you to realize economies of scale that only a centralized depot can provide. Our ISO 9001 and TL 9000-certified procedures ensure your equipment is quickly returned to the highest quality standards. We replicate your network in our test labs in order to reproduce and analyze the issue. Trained and certified technicians utilize sophisticated, automated test equipment to analyze, isolate and repair your equipment.

## AT-A-GLANCE

SERVICES	ESSENTIAL	ESSENTIAL PLUS
Annual Preventive Maintenance		
Onsite Support		
Self-Installed Security Patches	■	
Network Hardware Repair		■
24x7x365 Technical Support		■

## ENSURE CONTINUITY. ENHANCE PRODUCTIVITY. REDUCE RISK.



Rely on us to help you achieve your performance targets with the right service level you need for systems, devices and applications. Each package provides a higher level of support, transferring the risk and responsibility to Motorola Solutions.

For more information, visit [www.motorolasolutions.com/services](http://www.motorolasolutions.com/services)



Motorola Solutions, Inc. 500 West Monroe Street, Chicago, IL 60661 U.S.A. [motorolasolutions.com](http://motorolasolutions.com)

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# SYSTEM UPGRADE AGREEMENT

## SYSTEM UPDATES AS A PLANNED OPERATING EXPENSE

A Lifecycle Management plan is essential to establish a predictable budget and to keep your system up-to-date and supporting the advanced capabilities you require. System Upgrade Agreement (SUA) provides a cost-effective method of future-proofing your investment and mitigating the risks of technology obsolescence.

### KEEP YOUR SYSTEM AHEAD OF THE TECHNOLOGY CURVE

As ASTRO® 25 system releases become available, SUA provides one system upgrade at a fixed price in a one or two-year period.

Get the complete package of hardware, software, implementation and change management services required to upgrade your ASTRO 25 system to a currently available system release. All software is analyzed, pre-tested and certified in dedicated test labs to verify that updates are compatible to your system and will not interfere with network functionality.

Maintaining a current readiness posture with your system allows you to be more responsive to new technologies, mitigate the risk of falling behind the technology curve and maximize the lifespan of your system to help meet your needs into the future.

### FUND YOUR UPGRADE FOR LESS

Keeping your system within two years of the current system release ensures you get ongoing support services at the lowest possible cost.

SUA helps deliver the highest level of functionality for your ASTRO 25 system and makes available the most up-to-date features and capabilities at a predictable operating cost.

This gives you the freedom to implement upgrades on your own schedule without having to request budget each time your system requires an update. Realize up to 30% savings compared to individual procurement of system upgrades.\*

### GET THE MOST OUT OF YOUR INVESTMENT

When your system is updated you receive comprehensive training to understand new hardware or software features and changes to user interfaces and system operations. SUA includes on-site implementation training courses, which trains your system operators and technicians to ensure a smooth operational transition and help you get the most return on your technology investment.

\* Rate applies to North America only.

## SERVICE OPTIONS AT-A-GLANCE

Motorola offers two support options to help meet your unique needs and budget.

Coverage	SUA	SUA II
<b>Operating System Security Patches, Anti Virus and Intrusion Detection System Updates</b>	•	•
<b>Major Software Release</b>	annually	once every two years
<b>Certified Hardware Refresh</b>	•	•
<b>Major Hardware and Software Implementation Services</b>	•	•
<b>Base Station Upgrade (Quantar and STR)</b>	Optional with SUA+	Optional with SUA+

**System Upgrade Agreement:** Provides up to one system upgrade per annual contract term.

**System Upgrade Agreement II:** A lower-cost option providing one system release upgrade every two years. Motorola combines the features of two releases into a single upgrade.

For further information about System Upgrade Agreement, contact your Motorola sales representative or visit [www.motorolasolutions.com/lifecyclemanagement](http://www.motorolasolutions.com/lifecyclemanagement)