STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

October 4, 2013

Melanie Howlett
HPC Wireless Services
22 Shelter Rock Lane, Building C
Danbury, CT 06810

RE: **EM-SPRINT-034-130920** – Sprint Spectrum, L.P. notice of intent to modify an existing telecommunications facility located at 41 Padanaram Road, Danbury, Connecticut.

Dear Ms. Howlett:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with the Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter;
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;
- The loading changes recommended in the Structural Analysis Report prepared by GPD Group dated May 2, 2013 and stamped by John Kabak, shall be implemented; and
- Within 45 days following completion of the antenna installation, Sprint shall provide documentation certified by a professional engineer that its installation complied with the recommendations of the structural analysis.

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated September 19, 2013. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base,

consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Melanie A. Bachman
Acting Executive Director

MAB/CDM/cm

c: The Honorable Mark D. Boughton, Mayor, City of Danbury
Dennis Elpern, City Planner, City of Danbury
Crown Castle

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

August 10, 2015

Camille M. Mulligan
Alcatel-Lucent
1 Robbins Road
Westford, MA 01886

RE: **Compliance Extension Request**

EM-SPRINT-008-130130	93 Old Amity Road	Bethany
EM-SPRINT-009-131008	8 Sky Edge Drive	Bethel
EM-SPRINT-017-131008	371 Terryville Avenue	Bristol
EM-SPRINT-018-130322	39 Carmen Hill Road	Brookfield
EM-SPRINT-033-130920	179 Shunpike Road	Cromwell
EM-SPRINT-034-130920	41 Padanaram Road	Danbury
EM-SPRINT-069-130409	246 East Franklin Street	Danielson
EM-SPRINT-035-130322	126 Ledge Road	Darien
EM-SPRINT-043-130311	310 Prestige Park Road	East Hartford
EM-SPRINT-047-131008	232 South Main Street	East Windsor
EM-SPRINT-051-130606	280 Morehouse Drive	Fairfield
EM-SPRINT-052-130606	45 Maple Ridge Road	Farmington
EM-SPRINT-057-120122	363 Riversville Road	Greenwich
EM-SPRINT-057-131127	9 Sound Shore Dr., a/k/a 12 Sound Shore Drive	Greenwich
EM-SPRINT-059-130819	99 Briar Road	Groton
EM-SPRINT-062-130509	Talmadge Road	Hamden
EM-SPRINT-068-121226	136 Bulls Bridge Road	Kent
EM-SPRINT-076-130819	135 New Road	Madison
EM-SPRINT-077-130828	Olcott Street a/k/a 250 Olcott Street	Manchester
EM-SPRINT-080-131024	21 West Peak Drive	Meriden
EM-SPRINT-081-130716	1 Service Road	Middlebury
EM-SPRINT-084-130124	528 Wheeler's Farm Rd.	Milford
EM-SPRINT-091-130606	302 Ball Pond Road	New Fairfield
EM-SPRINT-095-131008	26 Washinton Street	New London
EM-SPRINT-097-131008	8 Ferris Road	Newtown
EM-SPRINT-097-131129	201 South Main St.	Newtown
EM-SPRINT-103-121226	173/177 West Rocks Road	Norwalk
EM-SPRINT-104-131112	2 Hinkley Hill Road	Norwich
EM-SPRINT-108-130215	20 Great Oak Road	Oxford
EM-SPRINT-108-130401	133 Coppermine Road	Oxford
EM-SPRINT-108-130712	338 Oxford Road	Oxford
EM-SPRINT-119-130314	47 Inwood Road	Rocky Hill

EM-SPRINT-119-130819	52 New Britain Avenue	Rocky Hill
EM-SPRINT-120-130828	Lower County Road a/k/a 35 Lower County Road	Roxbury
EM-SPRINT-126-130325	219 Nells Rock Road	Shelton
EM-SPRINT-126-130515	70 Platt Road	Shelton
EM-SPRINT-128-131112	22 Wintonbury Road (aka 49a and 53 Wintonbury Road)	Simsbury
EM-SPRINT-130-130531	1432 Old Waterbury Road	Southbury
EM-SPRINT-135-130128	69 Guinea Road	Stamford
EM-SPRINT-135-131112	366 Old Long Ridge Road	Stamford
EM-SPRINT-143-130712	350 Burr Mountain Road	Torrington
EM-SPRINT-151-131209	184 Garden Circle	Waterbury
EM-SPRINT-155-130828	345 North Main Street a/k/a 333 North Main Street	West Hartford
EM-SPRINT-157-130701	56 Norfield Road	Weston
EM-SPRINT-164-130920	Windsor Avenue a/k/a 494 Windsor Avenue	Windsor
EM-SPRINT-NEXTEL-166-130116	164 County Road	Wolcott

Dear Ms. Mulligan:

The Connecticut Siting Council (Council) is in receipt of your letter dated August 10, 2015, submitted on behalf of Sprint, requesting an extension of time to submit notices of completion of construction and associated post modification inspection reports for the above-referenced exempt modifications that were approved in 2013.

Please be advised that Council approval of these exempt modifications has expired. Therefore, any additional changes to these facilities will require explicit notice to the Council pursuant to Regulations of Connecticut State Agencies Section 16-50j-73 and a filing fee.

Thank you for your attention to this matter.

Sincerely,

Melanie A. Bachman
Acting Executive Director

MAB/cm

1 Robbins Road
Westford, MA 01886

August 10, 2015

State of Connecticut
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: CSC compliance extension (Sprint)

Carriann Mulcahy,

Thank you for taking my call this morning. Attached is the list of sites which would require extension and due to staff changes I am unsure if these have been addressed with formal request to the Siting Council.

Can you please advise if you have received? If not – will you please accept as formal request for extension as these are investigated for closure?

Sincerely,

EM/TS #	Address	Town	Council Additional Conditions	Notice of Completion Received	Decision Date	CSC Extension Granted
EM-SPRINT-148-140116	1605 Durham Hill Road	Wallingford	Yes		2/7/2014	
EM-SPRINT-049-140124	188 Moody Road	Enfield	Yes		2/14/2014	
EM-SPRINT-132-140124	151 Sand Hill Road	South Windsor	Yes		2/14/2014	
EM-SPRINT-011-140127	1021 Blue Hills Avenue	Bloomfield	Yes		2/14/2014	
EM-SPRINT-044-140127	60 Commerce Street	East Haven	Yes		2/14/2014	
EM-SPRINT-093-140127	389 Forbes Avenue	New Haven	Yes		2/14/2014	
EM-SPRINT-131-140124	705 Andrews Street	Southington	No		2/14/2014	
EM-SPRINT-144-140124	100 Quarry Road (aka 200 Quarry Road)	Trumbull	No		2/14/2014	
EM-SPRINT-056-140207	15 North Granby Road	Granby	Yes		2/21/2014	
EM-SPRINT-088-140218	37 Peach Orchard Road	Naugatuck	Yes		3/7/2014	

EM/TS #	Address	Town	Council Additional Conditions	Compliance with Council Additional Conditions Received	Notice of Completion Received	Decision Date
EM-SPRINT-008-130130	93 Old Amity Road	Bethany	Yes	No	No	2/20/2013
EM-SPRINT-009-131008	8 Sky Edge Drive	Bethel	Yes	No	No	10/25/2013
EM-SPRINT-NEXTEL-014-130313	150 North Main Street	Branford	Yes	No	No	4/5/2013
EM-SPRINT-017-131008	371 Terryville Avenue	Bristol	Yes	No	No	10/25/2013
EM-SPRINT-018-130322	39 Carmen Hill Road	Brookfield	Yes	No	No	4/5/2013
EM-SPRINT-NEXTEL-025-130313	1119 Summit Road	Cheshire	Yes	No	No	4/5/2013
EM-SPRINT-033-130920	179 Shunpike Road	Cromwell	Yes	No	No	10/4/2013
EM-SPRINT-034-130920	41 Padanaram Road	Danbury	Yes	No	No	10/4/2013
EM-SPRINT-069-130409	246 East Franklin Street	Danielson	Yes	No	No	4/26/2013
EM-SPRINT-035-130322	126 Ledge Road	Darien	Yes	No	No	4/5/2013
EM-SPRINT-043-130311	310 Prestige Park Road	East Hartford	Yes	No	No	4/5/2013
EM-SPRINT-047-131008	232 South Main Street	East Windsor	Yes	No	No	10/25/2013
EM-SPRINT-NEXTEL-049-130201	4 Oliver Road	Enfield	Yes	No	No	3/1/2013
EM-SPRINT-051-130606	280 Morehouse Drive	Fairfield	Yes	No	No	6/28/2013
EM-SPRINT-052-130606	45 Maple Ridge Road	Farmington	N/A	N/A	No	6/28/2013
EM-SPRINT-057-120122	363 Riversville Road	Greenwich	Yes	No	No	2/14/2013
EM-SPRINT-057-131127	9 Sound Shore Dr., a/k/a 12 Sound Shore Drive	Greenwich	N/A	N/A	No	12/16/2013
EM-SPRINT-059-130819	99 Briar Road	Groton	Yes	No	No	9/6/2013
EM-SPRINT-062-130509	Talmadge Road	Hamden	Yes	No	No	5/24/2013
EM-SPRINT-068-121226	136 Bulls Bridge Road	Kent	Yes	No	No	1/11/2013
EM-SPRINT-076-130819	135 New Road	Madison	Yes	No	No	9/6/2013
EM-SPRINT-077-130828	Olcott Street a/k/a 250 Olcott Street	Manchester	Yes	No	No	9/13/2013
EM-SPRINT-080-131024	21 West Peak Drive	Meriden	Yes	No	No	11/8/2013
EM-SPRINT-081-130716	1 Service Road	Middlebury	Yes	No	No	8/2/2013
EM-SPRINT-084-130124	528 Wheeler's Farm Rd.	Milford	Yes	No	No	2/13/2013
EM-SPRINT-086-130306	71 Moxley Hill Road	Montville	Yes	No	No	4/10/2013
EM-SPRINT-091-130606	302 Ball Pond Road	New Fairfield	N/A	N/A	No	6/28/2013
EM-SPRINT-NEXTEL-092-130313	115 Industrial Park Access Road	New Hartford	Yes	No	No	4/5/2013
EM-SPRINT-095-131008	26 Washinton Street	New London	Yes	No	No	10/25/2013
EM-SPRINT-097-131008	8 Ferris Road	Newtown	Yes	No	No	10/25/2013
EM-SPRINT-097-131129	201 South Main St.	Newtown	Yes	No	No	12/16/2013
EM-SPRINT-103-121226	173/177 West Rocks Road	Norwalk	Yes	No	No	1/11/2013
EM-SPRINT-104-131112	2 Hinkley Hill Road	Norwich	N/A	N/A	No	11/29/2013
EM-SPRINT-108-130215	20 Great Oak Road	Oxford	Yes	No	No	3/1/2013

EM-SPRINT-108-130401	133 Coppermine Road	Oxford	Yes	No	No	4/19/2013
EM-SPRINT-108-130712	338 Oxford Road	Oxford	Yes	No	No	7/26/2013
EM-SPRINT-109-130506	47-51 Unity Street	Plainfield	Yes	No	No	5/24/2013
EM-SPRINT-119-130314	47 Inwood Road	Rocky Hill	Yes	No	No	4/5/2013
EM-SPRINT-119-130819	52 New Britain Avenue	Rocky Hill	Yes	No	No	9/6/2013
EM-SPRINT-120-130828	Lower County Road a/k/a 35 Lower County Road	Roxbury	Yes	No	No	9/13/2013
EM-SPRINT-126-130325	219 Nells Rock Road	Shelton	Yes	No	No	4/15/2013
EM-SPRINT-126-130515	70 Platt Road	Shelton	Yes	No	No	5/31/2013
EM-SPRINT-128-131112	22 Wintonbury Road (aka 49a and 53 Wintonbury Road)	Simsbury	Yes	No	No	11/29/2013
EM-SPRINT-130-130531	1432 Old Waterbury Road	Southbury	Yes	No	No	6/21/2013
EM-SPRINT-135-130128	69 Guinea Road	Stamford	Yes	No	No	2/20/2013
EM-SPRINT-135-131112	366 Old Long Ridge Road	Stamford	Yes	No	No	11/29/2013
EM-SPRINT-143-130712	350 Burr Mountain Road	Torrington	Yes	No	No	7/26/2013
EM-SPRINT-151-131209	184 Garden Circle	Waterbury	N/A	N/A	No	1/21/2014
EM-SPRINT-155-130828	345 North Main Street a/k/a 333 North Main Street	West Hartford	Yes	No	No	9/13/2013
EM-SPRINT-157-130701	56 Norfield Road	Weston	Yes	No	No	7/22/2013
EM-SPRINT-164-130920	Windsor Avenue a/k/a 494 Windsor Avenue	Windsor	N/A	N/A	No	10/4/2013
EM-SPRINT-NEXTEL-166-130116	164 County Road	Wolcott	Yes	No	No	2/14/2013
EM-SPRINT-NEXTEL-167-130222	1116 Johnson Road	Woodbridge	Yes	No	No	3/18/2013

HPC Wireless Services
22 Shelter Rock Lane.
Building C
Danbury, CT, 06810
P.: 203.797.1112

HPC
WIRELESS SERVICES

September 19, 2013

VIA OVERNIGHT COURIER

Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051
Attn: Ms. Melanie Bachman, Acting Executive Director

Re: Sprint Spectrum, L.P. –Exempt Modification
41 Padanaram Road, (aka Padanaram Road) Danbury, Connecticut

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of Sprint Spectrum, L.P. ("Sprint"). Sprint is undertaking modifications to certain existing sites in its Connecticut system in order to implement updated technology. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction that constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the Mayor of the City of Danbury.

Sprint plans to modify the existing wireless communications facility owned by T-Mobile and located at 41 Padanaram Road, (aka Padanaram Road) Danbury (coordinates 41°-25'-08.1" N, 73°-27'-43" W). Attached are plan and elevation drawings depicting the planned changes, and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration. Also included is a power density report reflecting the modification to Sprint's operations at the site.

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. Sprint will remove the existing six (6) CMDA antennas and add three (3) dual-band panel LTE antennas mounted to the existing pipe masts, at a centerline height of approximately 70'. Sprint will also install six (6) RRHs (remote radio heads) on existing pipe masts behind the LTE antennas, also at a centerline height of approximately 70'. Sprint will also install three (3) hybriflex cables along the existing coaxial cable run, and will remove the coaxial cable. The proposed modifications will not extend the height of

the approximately 80' structure.

2. Sprint will also replace two (2) existing cabinets with similar cabinets and add an additional cabinet, all on the existing Concrete Pad. Sprint will also add a fiber/power distribution box mounted on new unistruts within one of the proposed cabinets. The existing GPS antenna will be replaced by another GPS antenna. These changes will have no effect on the site boundaries.

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more. The incremental effect of the proposed changes will be negligible.

4. The changes to the facility will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site. As indicated on the attached report prepared by EBI Consulting, Sprint's operations at the site will result in a power density of approximately 67.373%; the combined site operations will result in a total power density of approximately 77.583%.

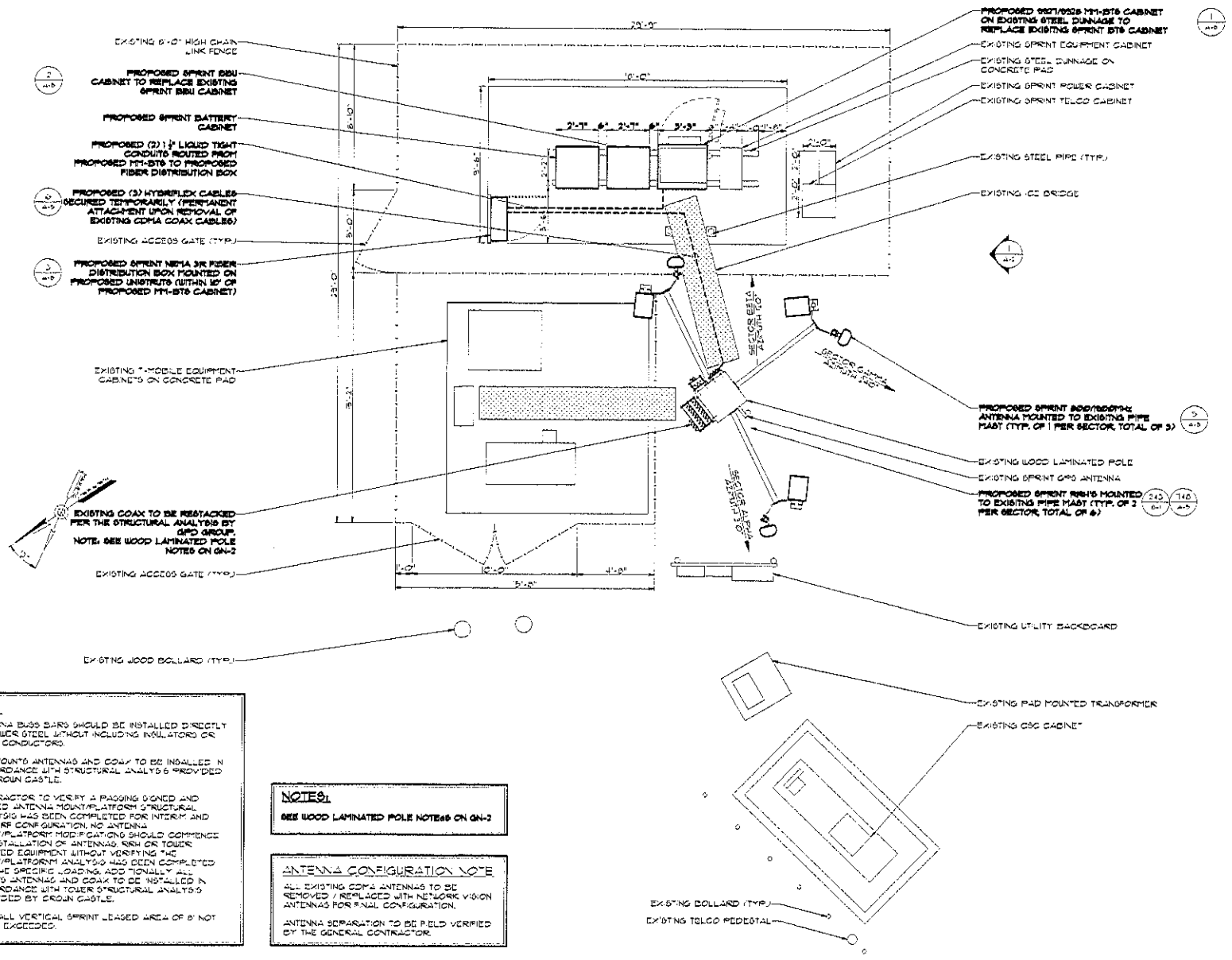
Please contact me by phone at (203) 610-1071 or by e-mail at mjhowlett@optonline.net with questions concerning this matter. Thank you for your consideration.

Respectfully yours,

Melanie J. Howlett

Attachments

cc: Honorable Mark D. Baughton, Mayor, City of Danbury
Robert J. Kaufman (underlying property owner)



NOTES:

- ANTENNA MOUNT BARS SHOULD BE INSTALLED DIRECTLY TO TOWER STEEL WITHOUT INCLUDING INSULATORS OR DOWN CONDUCTORS.
- ALL MOUNTS ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE.
- CONTRACTOR TO VERIFY A PASSING SIGNED AND SEALED ANTENNA MOUNT/PLATFORM STRUCTURAL ANALYSIS HAS BEEN COMPLETED FOR INTERIM AND FINAL RF CONFIGURATION. NO ANTENNA MOUNT/PLATFORM MODIFICATIONS SHOULD COMMENCE OR INSTALLATION OF ANTENNAS, RRH OR TOWER MOUNTED EQUIPMENT WITHOUT VERIFYING THE MOUNT/PLATFORM ANALYSIS HAS BEEN COMPLETED FOR THE SPECIFIC LOADING, AND FINALLY ALL MOUNTS ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH TOWER STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE.
- OVERALL VERTICAL SPRINT LEASED AREA OF 8' NOT TO BE EXCEEDED.

NOTES:

SEE WOOD LAMINATED POLE NOTES ON GN-2

ANTENNA CONFIGURATION NOTE

ALL EXISTING CDMA ANTENNAS TO BE REMOVED / REPLACED WITH NETWORK VISION ANTENNAS FOR FINAL CONFIGURATION.

ANTENNA SEPARATION TO BE FIELD VERIFIED BY THE GENERAL CONTRACTOR.

1 COMPOUND PLAN

SCALE: 3/8" = 1'-0"

Sprint
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
P: 800-357-7641

Alcatel·Lucent
600-700 MOUNTAIN AVE
MURRAY HILL, NJ 07974

Salient ARCHITECTS, LLC
New Jersey Office:
6 East Palisade Avenue
Englewood, NJ 07631
P: 201-567-0082 - F: 201-567-9566

NOT FOR CONSTRUCTION

PAUL DIONFEDDO P.E.
CT # 19650

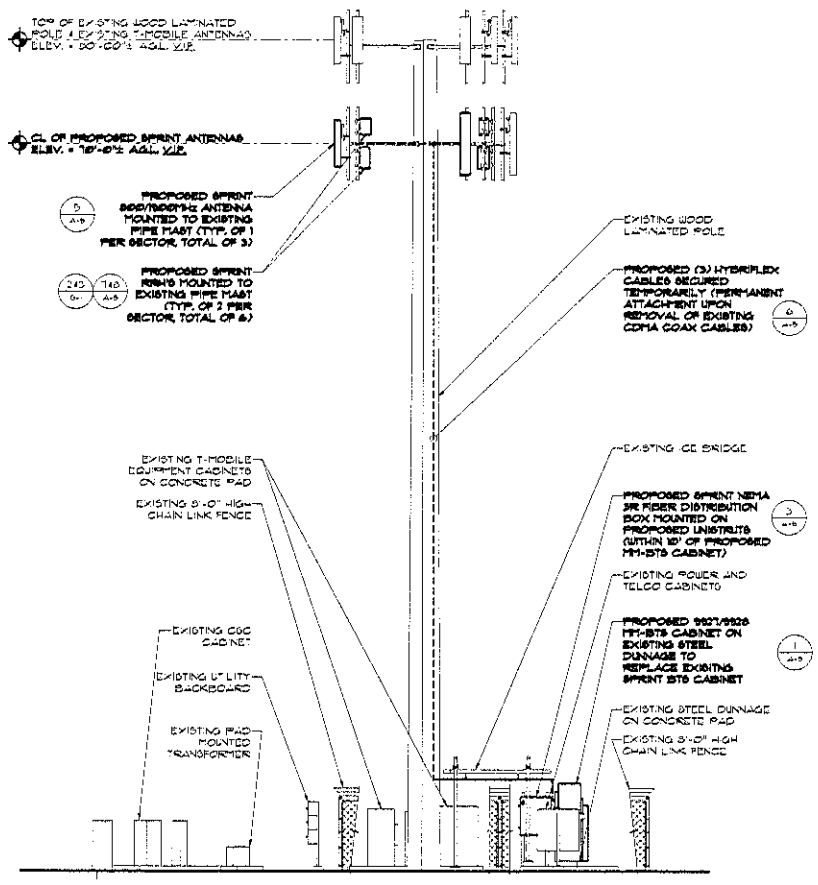
SUBMITTALS

NO	DATE	DESCRIPTION	BY
1	05/31/13	PRELIMINARY	AD
2	09/31/13	AS PER CLIENT COMMENT	PB
3	04/30/15	ISSUED AS FINAL	PB

SITE NUMBER:
CT33XC093
SITE NAME:
T-MOBILE CO-LO
(CROWN BU# 823531)
SITE ADDRESS:
41 PADANARAM ROAD
DANBURY, CT 06811

SHEET TITLE:
COMPOUND PLAN

SALIENT PROJ. NO: CT33XC093
DATE:
CHECKED BY: AD
SHEET NO: A-1



1 SOUTH ELEVATION

SCALE: 3/8" = 1'-0"

ANTENNA CONFIGURATION NOTE

ALL EXISTING CDMA ANTENNAS TO BE REMOVED / REPLACED WITH NETWORK VISION ANTENNAS FOR FINAL CONFIGURATION.

ANTENNA SEPARATION TO BE FIELD VERIFIED BY THE GENERAL CONTRACTOR.

ANTENNA BUG BAFFLE SHOULD BE INSTALLED DIRECTLY TO TOWER STEEL WITHOUT INCLUDING INSULATORS OR DOWN CONDUCTORS.

NOTES:

SEE WOOD LAMINATED POLE NOTES ON GN-2

Sprint

1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
P: 800-357-7641

Alcatel·Lucent

600-700 MOUNTAIN AVE
MURRAY HILL, NJ 07974

Salient ARCHITECTS, LLC

New Jersey Office:
5 East Palisade Avenue
Englewood, NJ 07631
T: 201-567-0058 ~ F: 201-567-0658

NOT FOR CONSTRUCTION

PAUL MONFREDO P.E.
CT # 18908

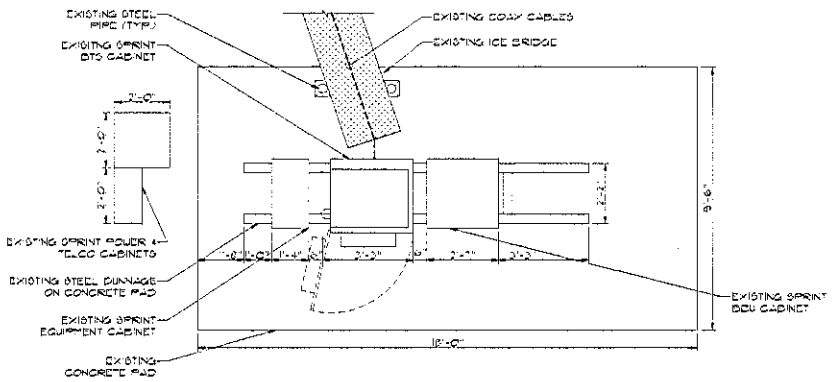
SUBMITTALS

NO	DATE	DESCRIPTION	BY
1	09/21/12	PRELIMINARY	AD
2	05/31/13	AS PER CLIENT COMMENT	PS
3	06/26/13	ISSUED AS FINAL	PS

SITE NUMBER:
CT33XC093
SITE NAME:
T-MOBILE CO-LO
(CROWN BU# 823531)
SITE ADDRESS:
41 PADANARAM ROAD
DANBURY, CT 06811

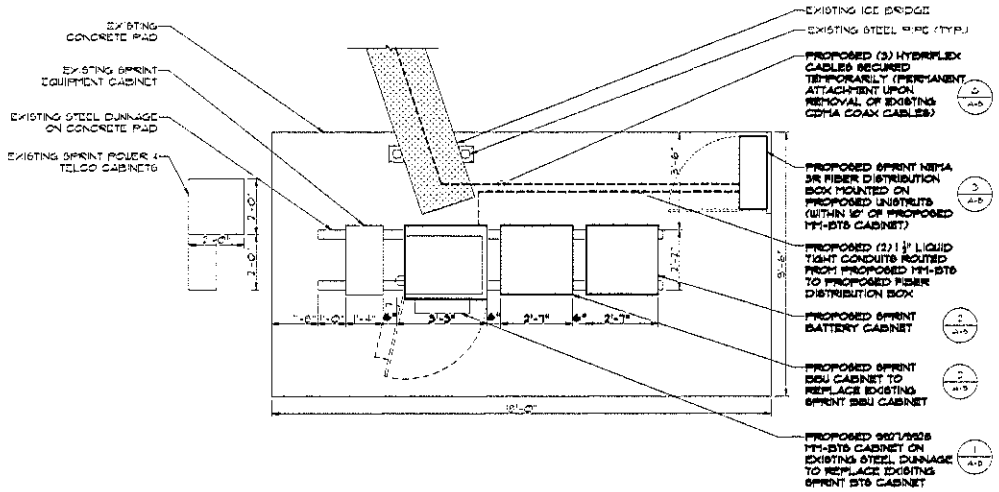
SHEET TITLE:
ELEVATION

SALIENT PROJ. NO: CT33XC093
DATE:
CHECKED BY: AD
SHEET NO: A-2



1 EXISITNG EQUIPMENT CABINET LAYOUT

SCALE: 1/2" = 1'-0"



EQUIPMENT CABINET CONFIGURATION

EXISTING LAYOUT: 3 CABINETS
PROPOSED LAYOUT: 4 CABINETS

3 FINAL EQUIPMENT CABINET LAYOUT

SCALE: 1/2" = 1'-0"

Sprint
1 INTERNATIONAL BLVD, SUITE 600
MAHWAH, NJ 07495
P: 800-357-7641

Alcatel·Lucent
600-700 MOUNTAIN AVE
MURRAY HILL, NJ 07974

Salient ARCHITECTS, LLC
New Jersey Office:
8 East Palisade Avenue
Englewood, NJ 07631
P: 201-567-0028 - F: 201-567-9556

NOT FOR CONSTRUCTION

PAUL DIONFRIDDO P.E.
CT # 28880

SUBMITTALS

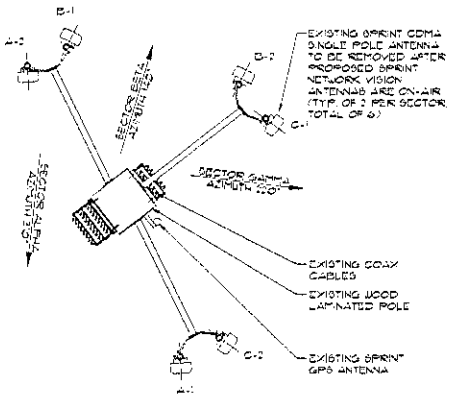
NO	DATE	DESCRIPTION	BY
1	09/21/12	PRELIMINARY	AD
2	09/21/12	AS PER CLIENT COMMENT	PS
3	09/26/12	ISSUED AS FINAL	PS

SITE NUMBER:
CT33XC093
SITE NAME:
T-MOBILE CO-LO
(CROWN BU# 823531)
SITE ADDRESS:
41 PADANARAM ROAD
DANBURY, CT 06811

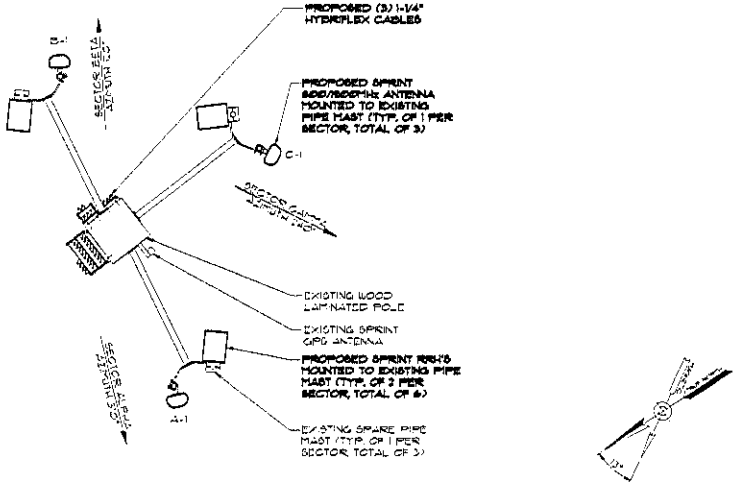
SHEET TITLE:
ENLARGED EQUIPMENT CABINET SCENARIO

SALIENT PROJ. NO: CT33XC093
DATE:
CHECKED BY: AD
SHEET NO: A-3

EXISTING ANTENNA PLAN



FINAL ANTENNA PLAN



1 ANTENNA SCENARIO

SCALE = 3/8" = 1' - 0"

	POSITION	ANTENNA STATUS	FREQUENCY (MHz)	ANTENNA MAKE	ANTENNA MODEL	AZIMUTHS EXISTING (FOR REFERENCE)	AZIMUTHS PROPOSED	MECHANICAL DOWN TILT	ELECTRICAL DOWN TILT	RAD CENTER (AGL)	*HYBRIFLEX CABLE LENGTH (FT.)	RRH MODEL	TOP COAX JUMPER SIZE (IN.)	*TOP COAX JUMPER LENGTH (FT.)	TOP COAX JUMPER MAKE	TOP COAX JUMPER MODEL	COMBINER	*COMBINER JUMPER LENGTH (FT.)	ANTENNA COLOR CODING
ALPHA	A-1	PROPOSED	800/1900	POWERWAVE	P4D-16-XLPP-RR-A	310°	310°	0°	0°	110'-0"	85	(1) 800MHz 2X50U	1/2	10	RFS	(2) LCF12-50J	--	--	TBD
								0°	0°			(1) 1900MHz 4X45 65MHz	1/2	10	RFS	(4) LCF12-50J	--	--	
BETA	B-1	PROPOSED	800/1900	RFS	APXV8ETM18-C-A20	140°	120°	0°	-8°	110'-0"	85	(1) 800MHz 2X50U	1/2	10	RFS	(2) LCF12-50J	--	--	TBD
								0°	-2°			(1) 1900MHz 4X45 65MHz	1/2	10	RFS	(4) LCF12-50J	--	--	
GAMMA	C-1	PROPOSED	800/1900	RFS	APXV8ERR18-C-A20	220°	240°	0°	0°	110'-0"	85	(1) 800MHz 2X50U	1/2	10	RFS	(2) LCF12-50J	--	--	TBD
								0°	0°			(1) 1900MHz 4X45 65MHz	1/2	10	RFS	(4) LCF12-50J	--	--	

* CONTRACTOR TO FIELD VERIFY ALL CABLE/JUMPER LENGTHS AGAINST CURRENT B.O.M.

2 RF SYSTEM SCHEDULE

SCALE = N.T.S.

Sprint
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
P: 800-357-7641

Alcatel·Lucent
600-700 MOUNTAIN AVE
MURRAY HILL, NJ 07974

Salient
ARCHITECTS, LLC
New Jersey Office:
6 East Palisade Avenue
Englewood, NJ 07631
P: 201-567-0058 - F: 201-567-0066

PAUL DIONYSIOU P.E.
CT # 18080

NOT FOR CONSTRUCTION

SUBMITTALS

NO	DATE	DESCRIPTION	BY
1	03/01/12	PRELIMINARY	AD
2	04/01/12	AS PER CLIENT COMMENT	PD
3	04/30/12	ISSUED AS FINAL	PD

SITE NUMBER:
CT33XC093
SITE NAME:
T-MOBILE CO-LO
(CROWN BU# 823531)
SITE ADDRESS:
41 PADANARAM ROAD
DANBURY, CT 06811

SHEET TITLE:
ANTENNA SCENARIO AND RF SYSTEM SCHEDULE

SALIENT PROJ. NO: CT33XC093
DATE:
CHECKED BY: AD
SHEET NO: A-4

Date: **May 2, 2013**

Andrew Bazinet
Crown Castle
46 Broadway
Albany, NY 12204
(585) 899-3442

GPD Group
520 South Main Street, Suite 2531
Akron, OH 44311
(614) 859-1607
dpalkovic@gpdgroup.com

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Sprint PCS* Co-Locate (Final Loading)**	
	Carrier Site Number:	CT33XC093
Crown Castle Designation:	**Crown Castle BU Number:**	823531
	Crown Castle Site Name:	CT896/M&M Concrete Pole
	Crown Castle JDE Job Number:	224904
	Crown Castle Work Order Number:	606399
	Crown Castle Application Number:	180028 Rev. 4
Engineering Firm Designation:	**GPD Group Project Number:**	2013775.823531.03
Site Data:	**41 Padanaram Rd, Danbury, Fairfield County, CT** **Latitude *41° 25' 8.1"*, Longitude *-73° 27' 43"*** **80 Foot – E-LAM Wood Monopole Tower**	

Dear Andrew Bazinet,

GPD Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 542953, in accordance with application 180028, revision 4.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

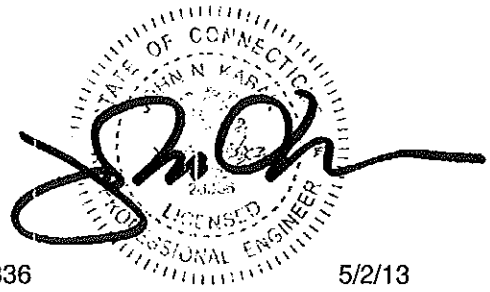
LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity***
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

***The structure has sufficient capacity once the loading changes described in the Recommendations section of this report are completed.**

The analysis has been performed in accordance with the ASCE7-05 standard, the 2005 NDS, and the 2005 Connecticut Building Code based upon a wind speed of 95 mph 3-second gust, exposure category C with topographic category 1 and crest height of 0 feet.

We at *GPD Group* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:



John N. Kabak, P.E.
Connecticut #: PEN.0028336 5/2/13

TABLE OF CONTENTS

1) INTRODUCTION

The existing 80 ft wood monopole has a rectangular cross section and is comprised of laminated sections of Southern Yellow Pine. The pole tapers from a 26.25" x 25.26" base section to a 26.25" x 12" section at the top. The structure consists of a single solid mast that is a total length of 93.5 ft with the lower 13.5 ft embedded into the ground.

This tower is a 80 ft Monopole tower designed by LAMINATED WOOD SYSTEMS, INC. in 2005. The tower was originally designed for a wind speed of 90 mph per ASCE 7-02.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of ASCE 7-05 and the 2005 Connecticut Building Code using a 3-second gust wind speed of 95 mph with no ice, exposure category C with topographic category 1 and crest height of 0 feet.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
70.0	70.0	3	Alcatel Lucent	1900MHz RRH	3	1-1/4	1
		3	Alcatel Lucent	800MHZ RRH			
		1	Powerwave Technologies	P40-16-XLPP-RR-A			
		2	RFS Celwave	APXVSPP18-C-A20			

Notes:
1) See Appendix B for the proposed coax layout.

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
80.0	80.0	3	Ericsson	KRY 112 144/1	1	1-5/8	1
		3	Ericsson	ERICSSON AIR 21 B2A B4P			
		3	Ericsson	ERICSSON AIR 21 B4A B2P			
		1		Side Arm Mount [SO 702-3]	12	1-5/8	
70.0	70.0	1	Andrew	HBX-4517DS-VTM	12	1-5/8	2
		2	Andrew	HBX-6517DS-R2M			
		3	Decibel	978F65T2E-M			
		1	Powerwave Technologies	LGP186nn			
		1		Side Arm Mount [SO 702-3]			

Notes:
1) Reserved equipment.
2) Equipment to be removed.

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
80	80			Antenna Loading (29.4 ft^2)		
70	70			Antenna Loading (29.4 ft^2)		
40	40			Antenna Loading (20.0 ft^2)		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	EBI Job #: 61051632, dated 7/27/05	3529191	CCISITES
4-TOWER MANUFACTURER DRAWINGS	E-LAM Site #: CT-11-896A, dated 9/26/05	3529192	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	GPD Job #: 2013775.823531.02, dated 4/23/13	3806247	CCISITES

3.1) Analysis Method

Microsoft Excel was used to create a model of the tower and calculate stresses for various loading cases in accordance with ASCE 7-05 and NDS 2005. Selected output from the analysis is included in Appendix A..

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads.
5) Mount sizes, weights, and manufacturers are best estimates based on photos provided and determined without the benefit of a site visit by GPD.
6) All member connections and foundation steel reinforcing are assumed designed to meet or exceed the load carrying capacity of the connected member and surrounding soils respectively unless otherwise specified in this report.
7) All equipment model numbers, quantities, and centerline elevations are as provided in the CCI CAD package dated 4/17/13 with any adjustments as noted below.

This analysis may be affected if any assumptions are not valid or have been made in error. GPD Group should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Monopole Tower		100.0	Pass
1	Base Foundation Soil Interaction		92.1	Pass

Structure Rating (max from all components) =	100.0%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The tower and foundation have sufficient capacity to carry the existing, reserved, and proposed loading. In order for the results of this analysis to be considered valid the loading modification listed below must be completed.

Loading Changes:

1) Coax to 80 ft shall be restacked for a final configuration of (1) row of (8) on the NW side of the pole and (5) coax installed in a 2-on-3 configuration on the NE side of the pole as shown in Appendix B.
2) The reserved KRY 112 144/1 units at 80 ft shall be installed behind the reserved antennas.

No structural modifications are required at this time, provided that the above listed changes are implemented.

5) DISCLAIMER OF WARRANTIES

GPD GROUP has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD GROUP in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no other loads are applied. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

GPD GROUP does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD GROUP provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

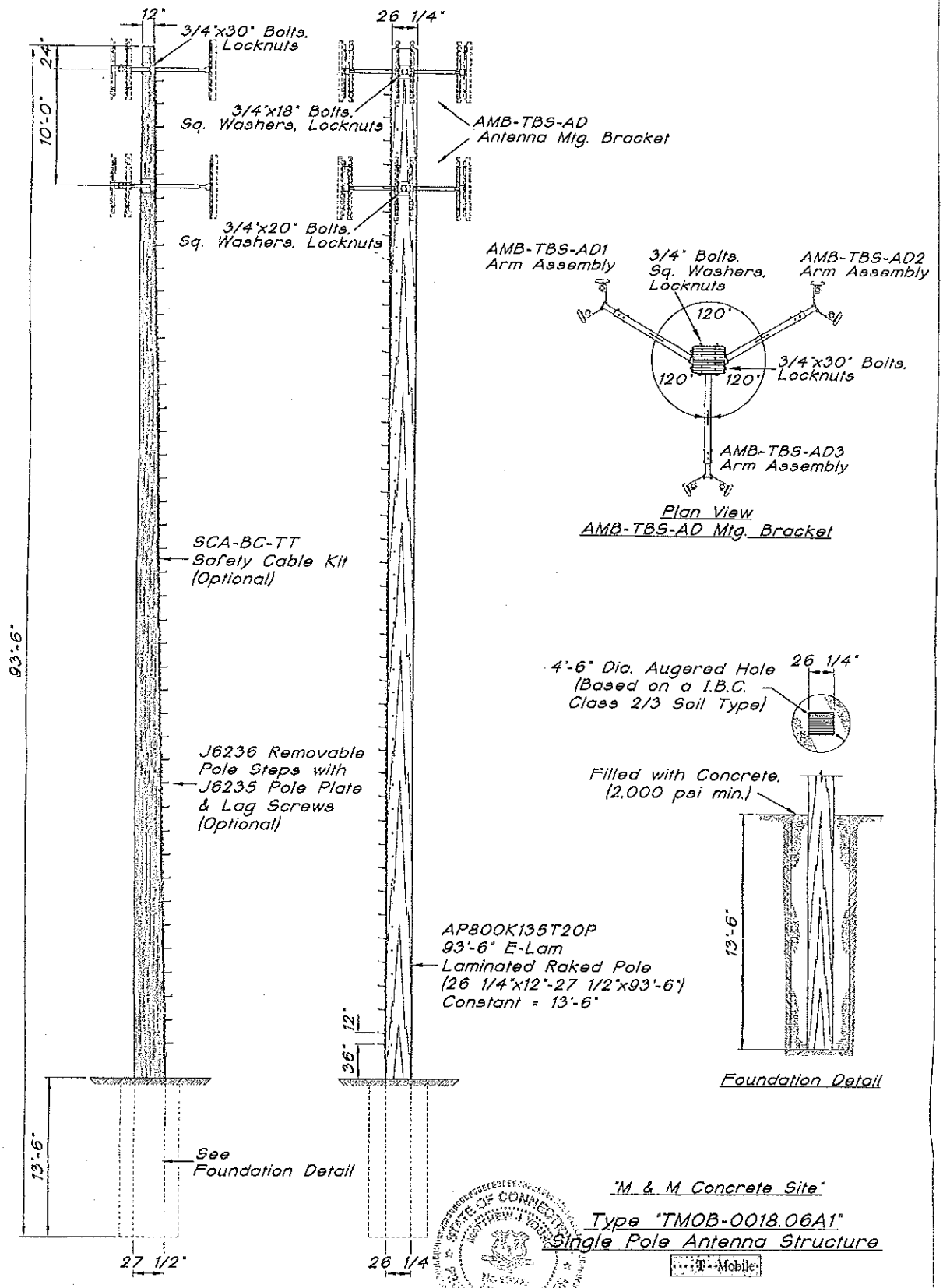
The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD GROUP, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

GPD GROUP makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD GROUP will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD GROUP pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

TOWER DRAWING AND LOADING



Plan View
AMB-TBS-AD Mtg. Bracket

Foundation Detail

"M & M Concrete Site"

Type "TMOB-0018.06A1"
Single Pole Antenna Structure

T-Mobile

NO.	REVISION	DATE	CK.
1		9-26-05	

ACAD DWG. FILE: TMOB1806A1

Laminated Wood Systems, Inc.

E-LAM

P.O. BOX 386, SEWARD, NE 68434 1-800-949-ELAM

DRAWN	DATE	DWG. NO.
D. Policky	9-20-05	TMOB-0018.06A1

WOOD POLE ANALYSIS
Wind Calculations
823531 CT896/M&M Concrete Pole
2013775.823531.03

Wind Loading	ASCE 7-05		I	1
Strength Design	2005 NDS		G	1.1
Wind Speed	95	mph		
Pole Shape	Rectangular			
Pole Density	0.036	kcf		
Exposure Category	C			
Pole Height	80	ft		
Zg	900	ft		
α	9.5			
Kzmin	0.85			

TOWER (Transverse) (X-X Axis)

Z (ft)	Section Height (ft)	Section Width (in)	Cross Sectional Area (in^2)	AG * 1.05 (ft^2)	Kd	Kzt	Kz	qz (lb/ft^2)	Cf	Force (kips)	Moment (kip-ft)	Weight (kips)
75.00	10.00	26.25	340.43	22.97	0.90	1.00	1.19	24.77	2.00	1.252	93.88	0.851
65.00	10.00	26.25	391.29	22.97	0.90	1.00	1.16	24.04	2.00	1.215	78.94	0.978
55.00	10.00	26.25	442.15	22.97	0.90	1.00	1.12	23.20	2.00	1.173	64.49	1.105
45.00	10.00	26.25	493.01	22.97	0.90	1.00	1.07	22.24	2.00	1.124	50.58	1.233
35.00	10.00	26.25	543.87	22.97	0.90	1.00	1.01	21.10	2.00	1.066	37.31	1.360
25.00	10.00	26.25	594.73	22.97	0.90	1.00	0.95	19.66	2.00	0.993	24.83	1.487
15.00	10.00	26.25	645.59	22.97	0.90	1.00	0.85	17.67	2.00	0.893	13.40	1.614
5.00	10.00	26.25	696.45	22.97	0.90	1.00	0.85	17.67	2.00	0.893	4.47	1.741
									Sub Total	8.61	367.90	10.37

TOWER (Longitudinal) (Y-Y Axis)

Z (ft)	Section Height (ft)	Section Width (in)	Cross Sectional Area (in^2)	AG * 1.05 (ft^2)	Kd	Kzt	Kz	qz (lb/ft^2)	Cf	Force (kips)	Moment (kip-ft)	Weight (kips)
75.00	10.00	12.9688	340.43	11.35	0.90	1.00	1.19	24.77	2.00	0.618	46.38	0.851
65.00	10.00	14.9063	391.29	13.04	0.90	1.00	1.16	24.04	2.00	0.690	44.83	0.978
55.00	10.00	16.8438	442.15	14.74	0.90	1.00	1.12	23.20	2.00	0.752	41.38	1.105
45.00	10.00	18.7813	493.01	16.43	0.90	1.00	1.07	22.24	2.00	0.804	36.19	1.233
35.00	10.00	20.7188	543.87	18.13	0.90	1.00	1.01	21.10	2.00	0.841	29.45	1.360
25.00	10.00	22.6563	594.73	19.82	0.90	1.00	0.95	19.66	2.00	0.857	21.43	1.487
15.00	10.00	24.5938	645.59	21.52	0.90	1.00	0.85	17.67	2.00	0.837	12.55	1.614
5.00	10.00	26.5313	696.45	23.21	0.90	1.00	0.85	17.67	2.00	0.903	4.51	1.741
									Sub Total	6.30	236.73	10.37

APPURTENANCES (Transverse) (X-X Axis)

	Z (ft)	CfAf (ft^2)	Kd	Kzt	Kz	qz (lb/ft^2)	Cf	Force (kips)	Moment (kip-ft)	Weight (kips)
Side Arm Mount [SO 702-3]	80.00	3.22	0.90	1.00	1.21	25.11	1.00	0.089	7.11	0.0810
(3) ERICSSON AIR 21 B2A B4P	80.00	17.40	0.90	1.00	1.21	25.11	1.00	0.481	38.46	0.3120
(3) ERICSSON AIR 21 B4A B2P	80.00	17.40	0.90	1.00	1.21	25.11	1.00	0.481	38.46	0.3120
(3) KRY 112 144/1	80.00	0.28	0.90	1.00	1.21	25.11	1.00	0.008	0.62	0.0330
Side Arm Mount [SO 702-3]	70.00	3.22	0.90	1.00	1.17	24.41	1.00	0.086	6.05	0.0810
(1) P40-16-XLPP-RR-A	70.00	9.25	0.90	1.00	1.17	24.41	1.00	0.249	17.40	0.0700
(2) APXVSPP18-C-A20	70.00	14.01	0.90	1.00	1.17	24.41	1.00	0.376	26.34	0.1600
(3) 1900MHz RRH	70.00	10.06	0.90	1.00	1.17	24.41	1.00	0.270	18.92	0.1200
(3) 800MHZ RRH	70.00	6.84	0.90	1.00	1.17	24.41	1.00	0.184	12.85	0.1500
							Sub Total	2.22	166.21	1.32

APPURTENANCES (Longitudinal) (Y-Y Axis)

	Z (ft)	CfAf (ft^2)	Kd	Kzt	Kz	qz (lb/ft^2)	Cf	Force (kips)	Moment (kip-ft)	Weight (kips)
Side Arm Mount [SO 702-3]	80.00	3.22	0.90	1.00	1.21	25.11	1.00	0.089	7.11	0.0810
(3) ERICSSON AIR 21 B2A B4P	80.00	17.40	0.90	1.00	1.21	25.11	1.00	0.481	38.46	0.3120
(3) ERICSSON AIR 21 B4A B2P	80.00	17.40	0.90	1.00	1.21	25.11	1.00	0.481	38.46	0.3120
(3) KRY 112 144/1	80.00	0.28	0.90	1.00	1.21	25.11	1.00	0.008	0.62	0.0330
Side Arm Mount [SO 702-3]	70.00	3.22	0.90	1.00	1.17	24.41	1.00	0.086	6.05	0.0810
(1) P40-16-XLPP-RR-A	70.00	9.25	0.90	1.00	1.17	24.41	1.00	0.249	17.40	0.0700
(2) APXVSPP18-C-A20	70.00	14.01	0.90	1.00	1.17	24.41	1.00	0.376	26.34	0.1600
(3) 1900MHz RRH	70.00	10.06	0.90	1.00	1.17	24.41	1.00	0.270	18.92	0.1200
(3) 800MHZ RRH	70.00	6.84	0.90	1.00	1.17	24.41	1.00	0.184	12.85	0.1500
							Sub Total	2.22	166.21	1.32

COAX (Transverse) (X-X Axis)

	Z (ft)	Af (ft^2)	Kd	Kzt	Kz	qz (lb/ft^2)	Cf	Force (kips)	Moment (kip-ft)	Weight (kips)
(5) 1-5/8"	75.00	3.30	0.90	1.00	1.19	24.77	1.20	0.108	8.09	0.1090
(5) 1-5/8", (3) 1-1/4"	65.00	3.30	0.90	1.00	1.16	24.04	1.20	0.105	6.81	0.1480
(5) 1-5/8", (3) 1-1/4"	55.00	3.30	0.90	1.00	1.12	23.20	1.20	0.101	5.56	0.1480
(5) 1-5/8", (3) 1-1/4"	45.00	3.30	0.90	1.00	1.07	22.24	1.20	0.097	4.36	0.1480
(5) 1-5/8", (3) 1-1/4"	35.00	3.30	0.90	1.00	1.01	21.10	1.20	0.092	3.22	0.1480
(5) 1-5/8", (3) 1-1/4"	25.00	3.30	0.90	1.00	0.95	19.66	1.20	0.086	2.14	0.1480
(5) 1-5/8", (3) 1-1/4"	15.00	3.30	0.90	1.00	0.85	17.67	1.20	0.077	1.15	0.1480
(5) 1-5/8", (3) 1-1/4"	9.00	0.66	0.90	1.00	0.85	17.67	1.20	0.015	0.14	0.0380
							Sub Total	**0.68**	**31.47**	**1.04**

COAX (Longitudinal) (Y-Y Axis)

	Z (ft)	Af (ft^2)	Kd	Kzt	Kz	qz (lb/ft^2)	Cf	Force (kips)	Moment (kip-ft)	Weight (kips)
(8) 1-5/8"	75.00	1.65	0.90	1.00	1.19	24.77	1.20	0.054	4.05	0.1090
(8) 1-5/8"	65.00	1.65	0.90	1.00	1.16	24.04	1.20	0.052	3.40	0.1480
(8) 1-5/8"	55.00	1.65	0.90	1.00	1.12	23.20	1.20	0.051	2.78	0.1480
(8) 1-5/8"	45.00	1.65	0.90	1.00	1.07	22.24	1.20	0.048	2.18	0.1480
(8) 1-5/8"	35.00	1.65	0.90	1.00	1.01	21.10	1.20	0.046	1.61	0.1480
(8) 1-5/8"	25.00	1.65	0.90	1.00	0.95	19.66	1.20	0.043	1.07	0.1480
(8) 1-5/8"	15.00	1.65	0.90	1.00	0.85	17.67	1.20	0.038	0.58	0.1480
(8) 1-5/8"	9.00	0.33	0.90	1.00	0.85	17.67	1.20	0.008	0.07	0.0380
							Sub Total	**0.34**	**15.73**	**1.04**

Transverse

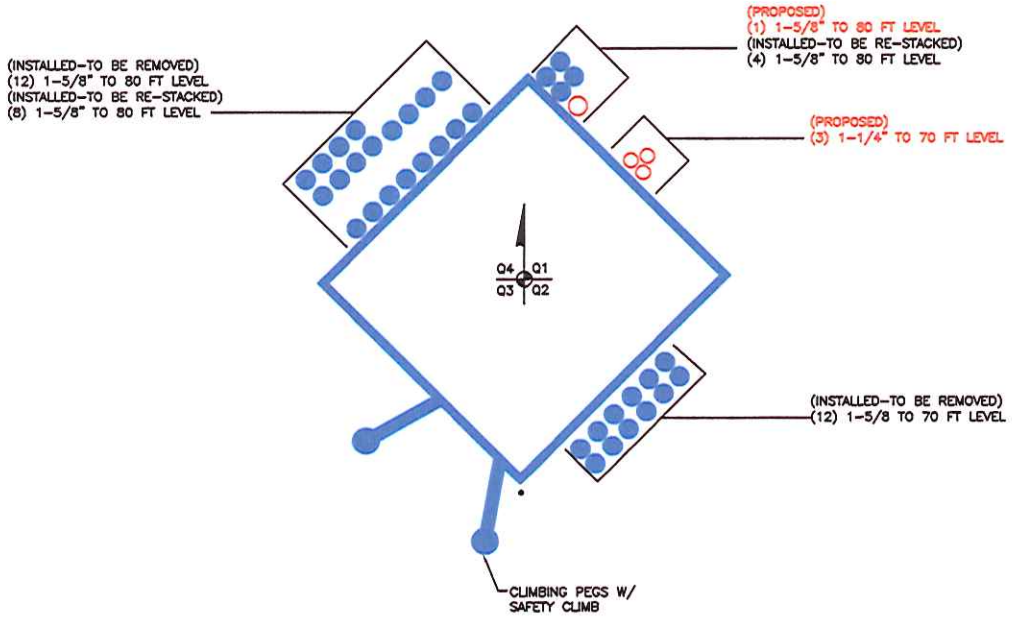
Moment (kip-ft)	Axial (kips)	Shear (kips)	Elevation
565.58	12.72	11.51	0ft

Longitudinal

Moment (kip-ft)	Axial (kips)	Shear (kips)	Elevation
418.67	12.72	8.87	0ft

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 823531 TOWER ID: C_BASELEVEL

BASE LEVEL DRAWING	1" = 1'-0"	1

APPENDIX C

ADDITIONAL CALCULATIONS

WOOD POLE ANALYSIS
Stress Calculations - Wind Loading
823531 CT896/M&M Concrete Pole
2013775.823531.03

Design Code	2005 NDS								
Species	Southern Yellow Pine								
Class	24F-V5 5B		C_D	1.6	2.3.2		$C_{M\ (Fb)}$	0.8	5.1.5
$F_{c\perp}$	740 psi		C_t	1.0	2.3.3		$C_{M\ (Ft)}$	0.8	5.1.5
F_t	1150 psi		C_{fu}	0.92	5B		$C_{M\ (Fv)}$	0.875	5.1.6
F_c	1650 psi		C_c	1.0	5.3.8		$C_{M\ (Fc\perp)}$	0.53	5.1.7
Load perpendicular to wide faces of laminations			C_b	1.0	3.10.4		$C_{M\ (Fc)}$	0.73	5.1.8
F_{bx}	2400 psi		x	20	5.3.6		$C_{M\ (E\ and\ Emin)}$	0.833	5.1.9
F_{vx}	300 psi		c	0.9	3.7.1		F_{by}'	2240 psi	
E_x	1700000 psi						F_{bx}'	3072 psi	
E_{xmin}	880000 psi						F_t'	1472 psi	
Load parallel to wide faces of laminations							F_{vy}'	364 psi	
F_{by}	1750 psi		Pole Depth (Base of foundation)	27.5	in		F_{vx}'	420 psi	
F_{vy}	260 psi		Pole Depth (Ground)	27.5	in		$F_{c\perp}'$	392.2 psi	
E_y	1500000 psi		Pole Depth (Splice)	n/a	in		F_c'	1927.2 psi	
E_{ymin}	780000 psi		Pole Depth (Top)	12	in		E_y'	1249500 psi	
			Pole Width	26.25	in		E_{ymin}'	649740 psi	
							E_x'	1416100 psi	
							E_{xmin}'	733040 psi	

Base - Load perpendicular to wide face of laminations			**Base - Load parallel to wide face of laminations**		
b	26.25	in	b	27.50	in
d	27.50	in	d	26.25	in
l_u	80.00	ft	l_u	80.00	ft
$l_{e\ (Bending)}$	147.20	ft	$l_{e\ (Bending)}$	147.20	ft
A	721.88	in^2	A	721.88	in^2
I	45493.16	in^4	I	41451.42	in^4
S	3308.59	in^3	S	3158.20	in^3
R_B	8.40		R_B	7.83	
F_{bxE}	12478.02	psi	F_{byE}	12716.51	psi
C_L	0.98	3.3.3	C_L	1.00	3.3.3
C_V	0.827	C5.3.6	C_V	1.00	C5.3.6
$l_{e\ (Compression)}$	168.00	ft	$l_{e\ (Compression)}$	168.00	ft
F_{cE}	112.12	psi	F_{cE}	90.55	psi
C_P	0.06	3.7	C_P	0.05	3.7
F_{bx}'	2540.38	psi	F_{by}'	2053.41	psi
F_c'	111.44	psi	F_c'	90.11	psi

Stress Analysis

Load Perpendicular to Wide Face of Laminations - Base

Moment (k-ft)	Axial (k)	Shear (k)	f_c (psi)	f_c/F_c'	f_b (psi)	f_b/F_b'	Interaction	Rating
565.58	12.72	11.51	17.62	0.158	2051.32	0.807	0.98	98.3%

Load Parallel to Wide Face of Laminations - Base

Moment (k-ft)	Axial (k)	Shear (k)	f_c (psi)	f_c/F_c'	f_b (psi)	f_b/F_b'	Interaction	Rating
418.67	12.72	8.87	17.62	0.196	1590.81	0.775	1.00	100.0%

WOOD POLE ANALYSIS

Stress Calculations - Wind Loading - Embedded Pole Check

823531 CT896/M&M Concrete Pole

2013775.823531.03

Design Code	2005 NDS							
Species	Southern Yellow Pine		C_D	1.6	2.3.2	$C_{M\ (Fb)}$	0.8	5.1.5
Class	24F-V5 5B		C_t	1.0	2.3.3	$C_{M\ (Ft)}$	0.8	5.1.5
$F_{c\perp}$	740 psi		C_{fu}	0.92	5B	$C_{M\ (Fv)}$	0.875	5.1.6
F_t	1150 psi		C_c	1.0	5.3.8	$C_{M\ (Fc\perp)}$	0.53	5.1.7
F_c	1650 psi		C_b	1.0	3.10.4	$C_{M\ (Fc)}$	0.73	5.1.8
Load perpendicular to wide faces of laminations			x	20	5.3.6	$C_{M\ (E\ and\ Emin)}$	0.833	5.1.9
F_{bx}	2400 psi		c	0.9	3.7.1	F_{by}'	2240 psi	
F_{vx}	300 psi					F_{bx}'	3072 psi	
E_x	1700000 psi					F_t'	1472 psi	
E_{xmin}	880000 psi					F_{vy}'	364 psi	
Load parallel to wide faces of laminations						F_{vx}'	420 psi	
F_{by}	1750 psi		Pole Depth (Base of foundation)	27.5	in	$F_{c\perp}'$	392.2 psi	
F_{vy}	260 psi		Pole Depth (Ground)	27.5	in	F_c'	1927.2 psi	
E_y	1500000 psi		Pole Depth (Splice)	n/a	in	E_y'	1249500 psi	
E_{ymin}	780000 psi		Pole Depth (Top)	12	in	E_{ymin}'	649740 psi	
			Pole Width	26.25	in	E_x'	1416100 psi	
						E_{xmin}'	733040 psi	

Base - Load perpendicular to wide face of laminations		**Base - Load parallel to wide face of laminations**	
b	26.25 in	b	27.50 in
d	27.50 in	d	26.25 in
l_u	0.00 ft	l_u	0.00 ft
$l_{e\ (Bending)}$	6.88 ft	$l_{e\ (Bending)}$	6.56 ft
A	721.88 in^2	A	721.88 in^2
I	45493.16 in^4	I	41451.42 in^4
S	3308.59 in^3	S	3158.20 in^3
R_B	1.81	R_B	1.65
F_{bxE}	267165.82 psi	F_{byE}	285237.33 psi
C_L	1.00 3.3.3	C_L	1.00 3.3.3
C_V	0.827 C5.3.6	C_V	1.00 C5.3.6
$l_{e\ (Compression)}$	0.10 ft	$l_{e\ (Compression)}$	0.10 ft
F_{cE}	316448022.92 psi	F_{cE}	255568630.08 psi
C_P	1.00 3.7	C_P	1.00 3.7
F_{bx}'	2540.54 psi	F_{by}'	2053.41 psi
F_c'	1927.20 psi	F_c'	1927.20 psi

Stress Analysis

Load Perpendicular to Wide Face of Laminations - Below Grade

Moment (k-ft)	Axial (k)	Shear (k)	f_c (psi)	f_c/F_c'	f_b (psi)	f_b/F_b'	Interaction	Rating
615.29	13.55	0.00	18.78	0.010	2231.61	0.878	0.88	87.8%

Load Parallel to Wide Face of Laminations - Below Grade

Moment (k-ft)	Axial (k)	Shear (k)	f_c (psi)	f_c/F_c'	f_b (psi)	f_b/F_b'	Interaction	Rating
457.05	13.56	0.00	18.78	0.010	1736.62	0.846	0.85	84.6%

Site Number	823531
Site Name	T896/M&M Concrete Pole

Caisson Analysis

Pier Properties		
Moment	566	kip-ft
Shear	12	kip
Pier Diameter	4.5	ft
Height Above Grade	0.00	ft
Depth Below Grade	13.50	ft
Donut Diameter		ft
Donut Depth		ft

Transverse Direction

Analysis Properties		
TIA Code	G	
Soil Safety Factor	1.33	
Water Table Depth	6.0	ft
Ignored Soil Depth	4.0	ft
Cohesion Based on	PLS Caisson	
Max Soil Capacity	100%	

Soil Properties

Layer	Top of Soil Layer (ft)	Layer Thickness (ft)	Bottom of Soil Layer (ft)	Soil Unit Weight (pcf)	Cohesion (psf)	Friction Angle (degrees)
Soil.Layer	*Soil.Top*	*Soil.Thick*	*Soil.Bottom*	*Soil.Weight*	*Soil.Cohesion*	*Soil.Phi*
1	0.00	13.5	13.50	125		35
2						
3						
4						
5						
6						
7						
8						
9						
10						

Critical Depths Below Grade		
Rotation Axis	9.73	ft
Zero Shear	4.62	ft

Results		
Soil Capacity	92.1%	OK
Max Pier Moment	615	kip-ft

Moment At User Defined Depths Below Grade			
	kip-ft		kip-ft
	kip-ft		kip-ft

V1.0

Site Number	823531
Site Name	T896/M&M Concrete Pole

Caisson Analysis

Pier Properties		
Moment	419	kip-ft
Shear	9	kip
Pier Diameter	4.5	ft
Height Above Grade	0.00	ft
Depth Below Grade	13.50	ft
Donut Diameter		ft
Donut Depth		ft

Longitudinal Direction

Analysis Properties		
TIA Code	G	
Soil Safety Factor	1.33	
Water Table Depth	6.0	ft
Ignored Soil Depth	4.0	ft
Cohesion Based on	PLS Caisson	
Max Soil Capacity	100%	

Soil Properties

Layer	Top of Soil Layer (ft)	Layer Thickness (ft)	Bottom of Soil Layer (ft)	Soil Unit Weight (pcf)	Cohesion (psf)	Friction Angle (degrees)
Soil.Layer	*Soil.Top*	*Soil.Thick*	*Soil.Bottom*	*Soil.Weight*	*Soil.Cohesion*	*Soil.Phi*
1	0.00	13.5	13.50	125		35
2						
3						
4						
5						
6						
7						
8						
9						
10						

Critical Depths Below Grade		
Rotation Axis	9.74	ft
Zero Shear	4.64	ft

Results		
Soil Capacity	68.6%	OK
Max Pier Moment	457	kip-ft

Moment At User Defined Depths Below Grade	
kip-ft	kip-ft
kip-ft	kip-ft

V1.0

EBI Consulting
environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

Sprint Existing Facility

Site ID: CT33XC093

T-Mobile Colo
41 Padanaram Road
Danbury, CT 06811

September 12, 2013

EBI Project Number: 62123467

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

September 12, 2013

Sprint
Attn: RF Engineering Manager
1 International Boulevard, Suite 800
Mahwah, NJ 07495

Re: Emissions Values for Site **CT33XC093 – T-Mobile Colo**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 41 Padanaram Road, Danbury, CT, for the purpose of determining whether the emissions from the proposed Sprint equipment upgrades on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of μW/cm2 calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the cellular band is approximately 567 $\mu W/cm^2$, and the general population exposure limit for the PCS band is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed upgrades to the existing Sprint Wireless antenna facility located at 41 Padanaram Road, Danbury, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario. Actual values seen from this site will be dramatically less than those shown in this report. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all emissions were calculated using the following assumptions:

1) 3 CDMA Carriers (1900 MHz) were considered for each sector of the proposed installation.
2) 1 CDMA Carrier (850 MHz) was considered for each sector of the proposed installation
3) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
4) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.

5) The antennas used in this modeling are the RFS APXVSPP18-C-A20, RFS APXV9ERR18-C-A20 and the Powerwave P40-16-XLPP-RR-A. This is based on feedback from the carrier with regards to anticipated antenna selection. The RFS APXVSPP18-C-A20 has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. The RFS The RFS APXV9ERR18-C-A20 has a 14.9 dBd gain value at its main lobe at 1900 MHz and 11.9 dBd at its main lobe for 850 MHz. has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz.The Powerwave P40-16-XLPP-RR-A has a 15.9 dBd gain value at its main lobe at 1900 MHz and 14.2 dBd at its main lobe for 850 MHz. All `calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario.
6) The antenna mounting height centerline of the proposed antennas is **70 feet** above ground level (AGL)
7) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculation were done with respect to uncontrolled / general public threshold limits

Site ID	CT33XC093 - T-Mobile Colo
Site Addresss	41 Padanaram Road, Danbury, CT 06811
Site Type	Monopole

Sector 1

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Powerwave	P40-16-XLPP-RRA	RRH	1900 MHz	CDMA / LTE	20	3	60	15.6	70	64	1/2 "	0.5	0	1941.5619	170.4109	17.04109%
1a	Powerwave	P40-16-XLPP-RRA	RRH	850 MHz	CDMA / LTE	20	1	20	14.2	70	64	1/2 "	0.5	0	468.84576	41.15059	7.25760%
														Sector total Power Density Value:		24.299%	

Sector 2

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
2a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	15.9	70	64	1/2 "	0.5	0	2080.4211	182.5985	18.25985%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	70	64	1/2 "	0.5	0	389.96892	34.22757	6.03661%
														Sector total Power Density Value:		24.296%	

Sector 3

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
3a	RFS	APXV9ERR18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	14.9	70	64	1/2 "	0.5	0	1652.5372	145.0432	14.50432%
3a	RFS	APXV9ERR18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	11.9	70	64	1/2 "	0.5	0	276.07685	24.23126	4.27359%
														Sector total Power Density Value:		18.778%	

Site Composite MPE %	
Carrier	MPE %
Sprint	67.373%
T-Mobile	7.640%
Clearwire	2.570%
Total Site MPE %	77.583%

EBI Consulting
environmental | engineering | due diligence

Summary

All calculations performed for this analysis yielded results that were well within the allowable limits for general public exposure to RF Emissions.

The anticipated Maximum Composite contributions from the Sprint facility are **67.373% (24.299% from Sector 1, 24.296% from Sector 2 and 18.778% from Sector 3)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **77.583%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803