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

April 19, 2013

Jennifer Young Gaudet
HPC Wireless Services
46 Mill Plain Road, Floor 2
Danbury, CT 06811

RE: **EM-SPRINT-046-130402** – Sprint Spectrum, L.P. notice of intent to modify an existing telecommunications facility located at 206 Everett Road, Easton, Connecticut.

Dear Ms. Gaudet:

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 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; and
- 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 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 April 1, 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,

LRoberts

Linda Roberts
Executive Director

LR/CDM/cm

c: The Honorable Thomas A. Herrmann, First Selectman, Town of Easton
Robert Maquat, Planning & Zoning Official, Town of Easton

EM-SPRINT-046-130402

HPC Wireless Services
46 Mill Plain Rd.
Floor 2
Danbury, CT, 06811
P.: 203.797.1112

HPC WIRELESS SERVICES

ORIGINAL

April 1, 2013

VIA OVERNIGHT COURIER

Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051
Attn: Ms. Linda Roberts, Executive Director

Re: Sprint Spectrum, L.P. – exempt modification
206 Everett Road, Easton, Connecticut

Dear Ms. Roberts:

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 First Selectman of the Town of Easton.

Sprint plans to modify the existing wireless communications facility owned by SBA (formerly owned by Nextel) and located at 206 Everett Road in the Town of Easton (coordinates 41°-17'-25.22", 73°-16'-58"). Attached are a compound plan and elevation 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 replace six (6) existing CDMA antennas with three (3) dual-pole CDMA antennas and three (3) dual-band panel antennas at the existing center line of approximately 158'. Six (6) RRHs (remote radio heads) will be mounted to the pole below the antennas. Sprint will also install three (3) hybriflex cables along the existing

coaxial cable run. After an interim period of up to one year, the three CDMA antennas and the existing coaxial cable will be removed. The proposed modifications will not extend the height of the approximately 158' structure.

2. The proposed changes will not extend the site boundaries. Sprint will replace two (2) existing cabinets, add one cabinet and add a fiber distribution box on an H-frame on the concrete pad. 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 standards 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 9.685%; the combined site operations will result in a total power density of approximately 60.685%.

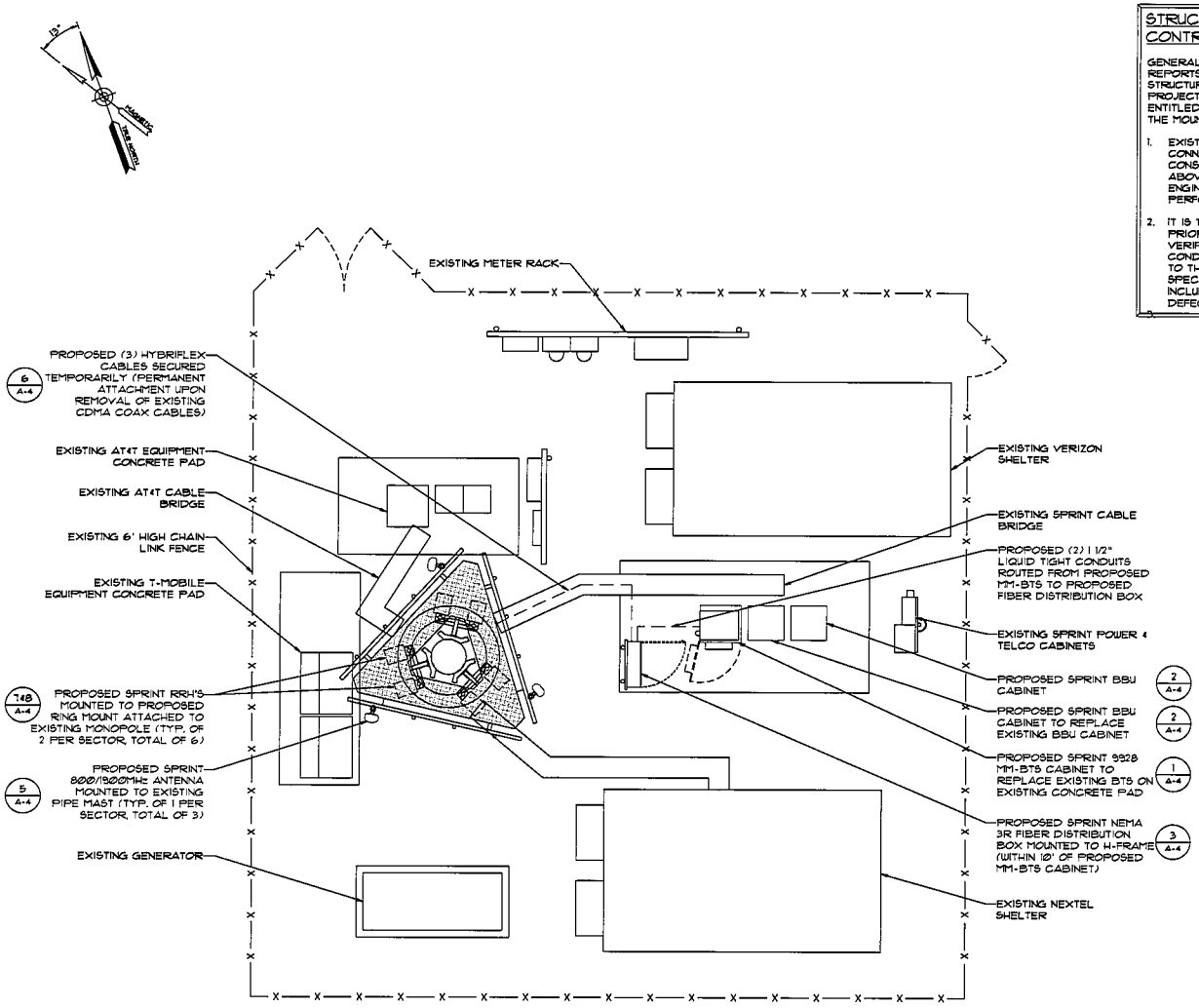
Please feel free to contact me by phone at (860) 798-7454 or by e-mail at jgaudet@hpcwireless.com with questions concerning this matter. Thank you for your consideration.

Respectfully yours,

Jennifer Young Gaudet (BAG)

Jennifer Young Gaudet

cc: Honorable Thomas A. Hermann, First Selectman, Town of Easton
Alfred Barney (underlying property owner)



STRUCTURAL VERIFICATION BY GENERAL CONTRACTOR

GENERAL CONTRACTOR TO REFER TO THE STRUCTURAL ANALYSIS REPORTS PREPARED BY VERTICAL SOLUTIONS ENTITLED "RIGOROUS STRUCTURAL ANALYSIS" DATED 01/16/2013, VERTICAL SOLUTIONS PROJECT NO.: 130023 (FOR THE TOWER) AND BY SALIENT ASSOCIATES ENTITLED "STRUCTURAL ASSESSMENT LETTER" DATED 3/26/2013 (FOR THE MOUNTS).

1. EXISTING ANTENNA MOUNT ASSEMBLY MEMBER SIZES AND CONNECTIONS ARE ASSUMED TO BE AS SHOWN ON THE ORIGINAL CONSTRUCTION DOCUMENTS. GENERAL CONTRACTOR TO VERIFY THE ABOVE IN THE FIELD AND REPORT ANY VARIANCES TO THE ENGINEER OF RECORD PRIOR TO ANY INSTALLATION WORK BEING PERFORMED.
2. IT IS THE GENERAL CONTRACTOR'S/INSTALLER'S RESPONSIBILITY PRIOR TO INSTALLATION OF THE EQUIPMENT TO INSPECT AND VERIFY THAT THE EXISTING ANTENNA MOUNT ASSEMBLY IS IN GOOD CONDITION, IN GOOD WORKING ORDER AND INSTALLED ACCORDING TO THE MANUFACTURER'S ASSEMBLY DRAWINGS AND SPECIFICATIONS. IF ANY COMPONENTS ARE FOUND TO BE DEFECTIVE, INCLUDING MISSING OR LOOSE BOLTS/ANCHORS, REPORT SUCH DEFECTS IMMEDIATELY PRIOR TO INSTALLATION.

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 = 1/4" = 1'-0"

Sprint VISION
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:
8 East Palisade Avenue
Englewood, NJ 07631
P: 201-567-0032 ~ F: 201-567-9556

PAUL CIONFREDDO P.E.
CT # 13866

SUBMITTALS

NO	DATE	DESCRIPTION	BY
1	4/3/12	PRELIMINARY	NAS
2	5/1/12	AS PER CLIENT COMMENTS	PS
3	06/20/12	REVISED PER COMMENTS	NAS
4	01/25/13	ISSUED AS FINAL	AD

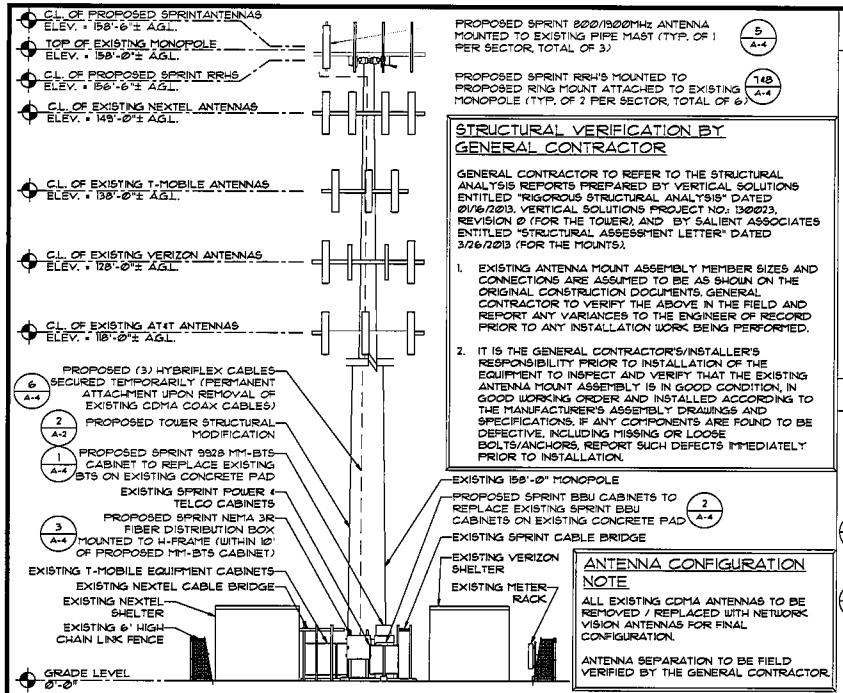
SITE NUMBER:
CT03XC362

SITE NAME:
EASTON / NEXTEL

SITE ADDRESS:
206 EVERETT ROAD
EASTON, CT 06612

SHEET TITLE:
COMPOUND PLAN

SALIENT PROJ. NO: CT03XC362
DATE:
CHECKED BY: ADC
SHEET NO: A-1



PROPOSED SPRINT 800/1900MHz ANTENNA MOUNTED TO EXISTING PIPE MAST (TYP. OF 1 PER SECTOR, TOTAL OF 3) (5 / A-4)

PROPOSED SPRINT RRH'S MOUNTED TO PROPOSED RING MOUNT ATTACHED TO EXISTING MONOPOLE (TYP. OF 2 PER SECTOR, TOTAL OF 6) (14B / A-4)

STRUCTURAL VERIFICATION BY GENERAL CONTRACTOR

GENERAL CONTRACTOR TO REFER TO THE STRUCTURAL ANALYSIS REPORTS PREPARED BY VERTICAL SOLUTIONS ENTITLED "RIGOROUS STRUCTURAL ANALYSIS" DATED 01/16/2013, VERTICAL SOLUTIONS PROJECT NO.: 130023, REVISION 0 (FOR THE TOWER), AND BY SALIENT ASSOCIATES ENTITLED "STRUCTURAL ASSESSMENT LETTER" DATED 3/26/2013 (FOR THE MOUNTS).

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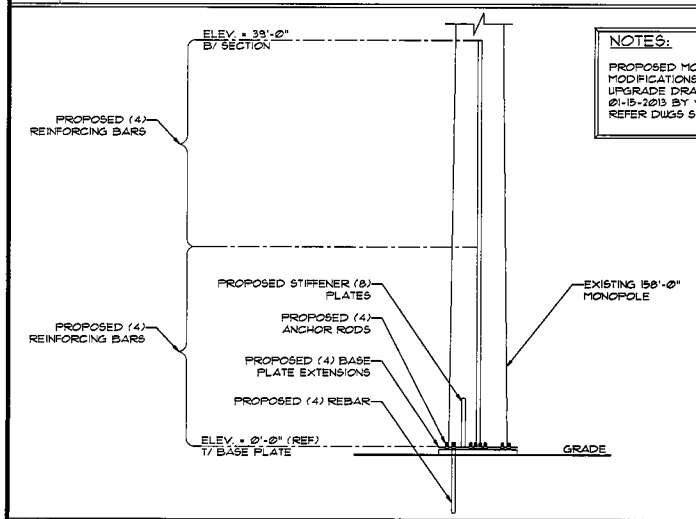
ANTENNA SEPARATION TO BE FIELD VERIFIED BY THE GENERAL CONTRACTOR.

1 NORTHEAST ELEVATION

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



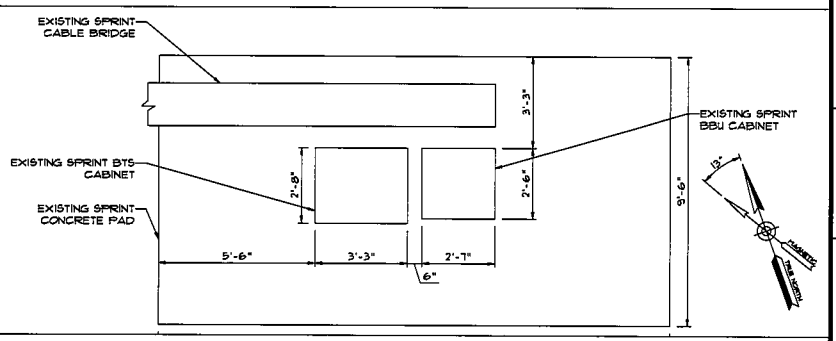
NOTES:

PROPOSED MONOPOLE STRUCTURAL MODIFICATIONS AS PER STRUCTURAL UPGRADE DRAWINGS DATED 01-15-2013 BY VERTICAL SOLUTIONS. REFER DWGS S-1 TO S-4

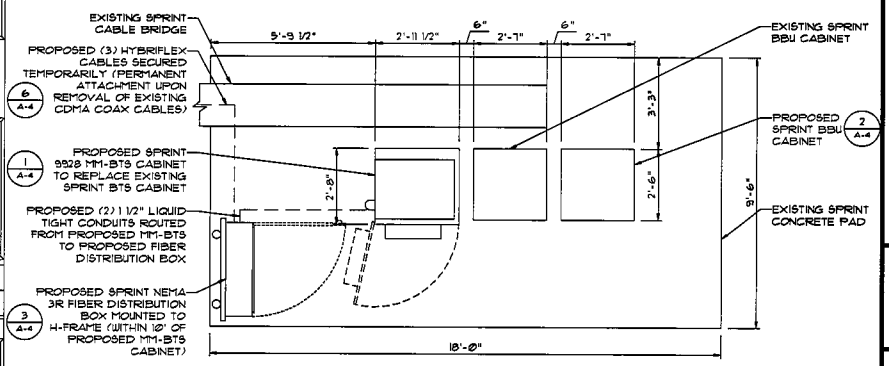
2 TOWER STRUCTURAL MODIFICATIONS

SCALE = 3/16" = 1'-0"

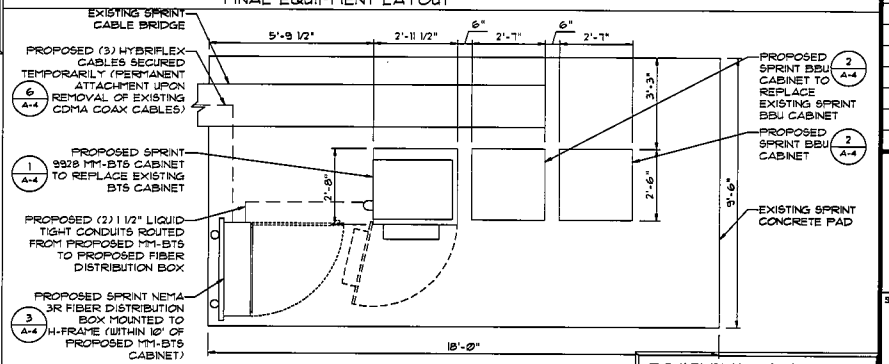
EXISTING EQUIPMENT LAYOUT



INTERIM EQUIPMENT LAYOUT



FINAL EQUIPMENT LAYOUT



EQUIPMENT CABINET CONFIGURATION

EXISTING LAYOUT: 2 CABINETS
PROPOSED LAYOUT: 3 CABINETS

3 ENLARGED EQUIPMENT CABINET LAYOUT

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

Sprint VISION
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:
8 East Palisade Avenue
Englewood, NJ 07631
P: 201-567-0032 – P: 201-567-9556

PAUL GIONFRIDDO P.E.
CT # 13685

SUBMITTALS

NO	DATE	DESCRIPTION	BY
1	4/13/12	PRELIMINARY	NAS
2	9/11/12	AS PER CLIENT COMMENTS	FS
3	09/26/12	REVISED PER COMMENTS	NAS
4	01/25/13	ISSUED AS FINAL	AD

SITE NUMBER: CT03XC362

SITE NAME: EASTON / NEXTEL

SITE ADDRESS: 206 EVERETT ROAD EASTON, CT 06612

SHEET TITLE: ELEVATION & ENLARGED EQUIPMENT CABINET LAYOUT

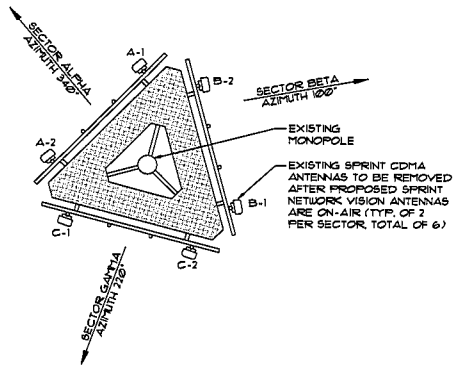
SALIENT PROJ. NO: CT03XC362

DATE:

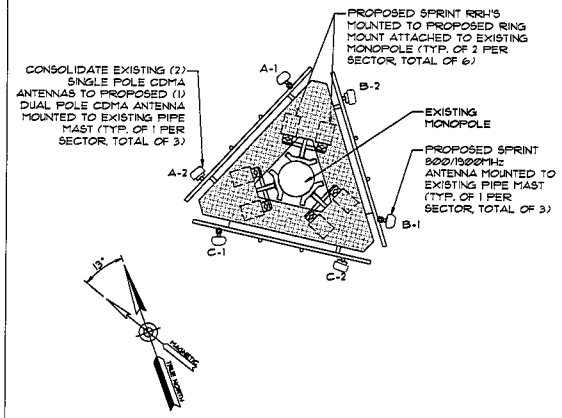
CHECKED BY: ADC

SHEET NO: A-2

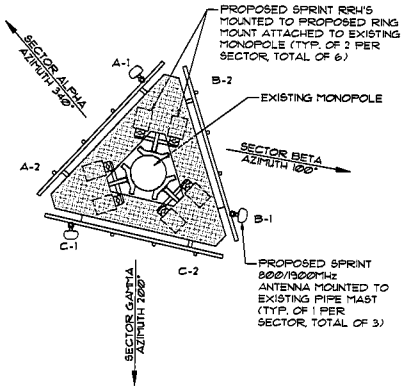
EXISTING ANTENNA PLAN



INTERIM ANTENNA PLAN



FINAL ANTENNA PLAN



1 ANTENNA SCENARIO

SCALE = N.T.S.

ALPHA	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
	A-1	PROPOSED	800/1900	RFS	APXVSPP18-C-A20	340°	340°	0°	-7°	158'-6"	180	(1) 800MHz	1/2	10	RFS	(2) LCF12-50J	--	--	TBD
								0°	-2°			(1) 1900MHz	1/2	10	RFS	(4) LCF12-50J	--	--	
	A-2	FUTURE	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

BETA	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
	B-1	PROPOSED	800/1900	RFS	APXVSPP18-C-A20	100°	120°	0°	-1°	158'-6"	180	(1) 800MHz	1/2	10	RFS	(2) LCF12-50J	--	--	TBD
								0°	0°			(1) 1900MHz	1/2	10	RFS	(4) LCF12-50J	--	--	
	B-2	FUTURE	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

GAMMA	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
	C-1	PROPOSED	800/1900	RFS	APXVSPP18-C-A20	220°	200°	0°	0°	158'-6"	180	(1) 800MHz	1/2	10	RFS	(2) LCF12-50J	--	--	TBD
								0°	0°			(1) 1900MHz	1/2	10	RFS	(4) LCF12-50J	--	--	
	C-2	FUTURE	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD

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

2 RF SYSTEM SCHEDULE

SCALE = N.T.S.

Sprint VISION
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:
3 East Palisade Avenue
Englewood, NJ 07631
P: 201-567-0032 – F: 201-567-9556

PAUL GIONFRIDDO P.E.
CT # 13868

SUBMITTALS

NO	DATE	DESCRIPTION	BY
1	4/13/12	PRELIMINARY	NAS
2	5/11/12	AS PER CLIENT COMMENTS	PS
3	06/26/12	REVISED PER COMMENTS	NAS
4	01/25/13	ISSUED AS FINAL	AD

SITE NUMBER: CT03XC362
SITE NAME: EASTON / NEXTEL
SITE ADDRESS: 206 EVERETT ROAD EASTON, CT 06612

SHEET TITLE: ANTENNA SCENARIO AND RF SYSTEM SCHEDULE

SALIENT PROJ. NO: CT03XC362
DATE:
CHECKED BY: ADC
SHEET NO: A-3

PASS
(Shaft, 100% Capacity)

January 16, 2013

Mr. Dwayne Lyerly
SBA Communications Corporation
5900 Broken Sound Parkway NW
Boca Raton, FL 33487
(919) 557- 0555

Vertical Solutions, Inc.
PO Box 579
Holly Springs, NC 27540
(888) 321-6167
operations@verticalsolutions-inc.com

Subject	**Rigorous Structural Analysis**
Carrier Designation	**Sprint/Nextel, Reconfiguration - Overlap** **Site Number: CT03XC362** **Site Name: N/A**
SBA Designation	**Site Number: CT46131-A** **Site Name: Easton-Everetts Road**
Engineering Firm Designation	**Vertical Solutions Project: 130023, Revision 0**
Site Data	**206 Everett Rd, Easton, Fairfield County, CT 06612** **Latitude: N41° 17' 25.20" ± Longitude: W073° 16' 57.60" ±** **Elevation: 429 ft±,** **158-ft Self Supporting Pole Structure (Monopole)**

Dear Mr. Lyerly,

To your request, we present our structural analysis.

Our work indicates that with the proposed appurtenance configuration, the tower and foundation **will** satisfy the structural strength requirements of ANSI/TIA-222-F-1996, *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures* (industry standard) and the *2005 Connecticut State Building Code* (local building code) for:

- 85-mph fastest mile basic wind speed
- 74-mph fastest mile basic wind speed with 1/2-in radial ice

All equipment and modifications proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We trust you find our work satisfactory. Please do not hesitate to call should you have any questions.

Sincerely,

Kingsley C. Igboanugo, P.E.
Civil Engineer

Reviewed by: JHW

STATE OF CONNECTICUT
MICHAEL L. LASSITER
No. 25064
LICENSED
PROFESSIONAL ENGINEER

01/16/2013

Michael L. Lassiter, S.E., P.E., C.W.I.
Structural Engineer, Civil Engineer, Certified Weld Inspector
& President
CT License No. 25064

Table 1: Existing, Proposed and Reserved Appurtenance Configuration

Elevation (AGL, ft)	Carrier	Mount	Equipment	Coax	Location[1]
158.5	Sprint/Nextel [Existing]	LP Platform[2]	(6) Decibel DB980F90E-M	(6) 1 5/8	Inside
	Sprint/Nextel [Overlap]		**(3) APXVSPP18-C-A20**	**(3) 1 1/4 HB114-1-08U4-M5J**	
156.5		**Collar Bracket**	**(3) ALU 1900 MHz RRH (25 MHz)** **(3) ALU 800 MHz RRH (with Notch Filter)** **(6) RFS 1900 MHz ACU-A20-N RET** **(3) RFS 800 MHz ACU-A20-N RET**		**Inside**
149	Sprint/Nextel	LP Platform	(12) DB844H90E-XY	(12) 1 1/4	Inside
138	T-Mobile	LP Platform	(9) EMS RR90-17-02DP (6) TMAs	(18) 1 1/4	Inside
128	Verizon	LP Platform	(3) Swedcom SLCP 2x6014 (3) Antel BXA-171063/12 BF (6) RFS Diplexers (6) Decibel DB846F65ZAXY	(12) 1 5/8	Outside
118	AT&T	LP Platform	(3) Powerwave P65-16-XLH-RR (6) Powerwave 7770 (6) Powerwave LGP21401 (3) Powerwave TT19-08BP111-001 (6) Ericsson RRUS-11 (1) Raycap DC6-48-60-18-8F	(12) 1 1/4 (1) 3/8 (2) 5/8 DC	Inside
75	Sprint/Nextel	Pipe and Chain	(1) GPS	(1) 1/2	Inside

1. See coax configuration plan, QP-P for coax locations.
2. Platform mounted at 158-ft.

Table 3: Tower Structure Results, Percent Capacity Utilized

Elevation (ft)	Shaft	Result	Connections	Result
158 to 123	53	O.K.	60	O. K.
123 to 79	86	O.K.	-	-
79 to 39	96	O.K.	-	-
39 to 0	**100**	O.K.	85	O. K.

Table 4: Foundation Results, Percent Capacity Utilized

Component	Design	Analysis	Percent Utilized	Result
Soil	22.5-ft caisson	22.5-ft caisson	100	O.K.
Structure	41.44 in^2	39.78 in^2	96	O.K.

Attachments:

- Project History
- Coax configuration
- Program input and output – wind
- Base Plate and anchor rod calculations
- Flange Plate calculations
- Foundation calculations
- Tower Improvement Design Drawings [Construction]

Project History

VSi Project #: 130023, Revision 0
SBA Site Id: CT46131-A
SBA Site Name: Easton-Everetts Rd

Design Documents					
Structure	**Issued Date**	**Document ID**	**Issued By**	**Issued To**	**Description**
CT46131-A	3/29/1999	242265_v1_CT2007_Easton-Everetts_Rd_Environmental_First_Search_Report_03-29-99.pdf	DataMap Technology Corporation	ATC Associates Inc.	Site Information Report
CT46131-A	4/12/1999	242277_v1_CT2007_Easton-Everetts_Rd_Phase_I_Assessment_04-12-99.pdf	VATC	Nextel	Environmental Site Assessment
CT46131-A	7/1/1999	242268_v1_CT2007_Easton-Everetts_Rd_NEPA_07-01-99.pdf	VATC	Nextel	NEPA Report
CT46131-A	8/9/1999	242245_CT2007 Easton-Everetts Rd AWS Collocation Application.pdf	AT&T	Nextel	Co-location Tenant Application
CT46131-A	10/15/1999	242281_CT2007 Easton-Everetts Rd Tower and Foundation Design Calculations - 10-15-1999.pdf	Engineered Endeavors Inc.	Nextel	Tower and Foundation Design Calculations
CT46131-A	3/30/2000	20000330_GEO_CT2007.pdf	Tectonic Enigneering & Surveying Consultants	Nextel	Geotechnical Investigation
CT46131-A	7/25/2000	242271_CT2007 Easton-Everetts Rd Nextel RAD Center Ownership Record 07-25-00.pdf	Nextel		Nextel Ownership Records
CT46131-A	9/25/2002	242318_CT2007 Easton-Everetts Rd T-Mobile Site License Agreement 09-25-02.pdf	Nextel	T-Mobile	Site Lease Agreement
CT46131-A	11/20/2002	197400_CT2007 Easton-Everetts Rd AWS Site Agreement 11-20-02.pdf	Nextel	AT&T	Site Lease Agreement
CT46131-A	11/20/2002	197408_CT2007 Easton-Everetts Rd AWS Site Lease Agreement 11-20-02.pdf	Nextel	AT&T	Site Lease Agreement
CT46131-A	11/20/2002	242296_CT2007 Easton-Everetts Rd AWS Site Lease Agreement 11-20-02.pdf	Nextel	AT&T	Site Lease Agreement
CT46131-A	12/19/2002	20021219_SAR_CT2007.pdf	Paul J. Ford	PennSummit Tubular	Structural Analysis
CT46131-A	12/19/2002	20021219_SAR(2)_CT2007.pdf	Paul J. Ford	PennSummit Tubular	Structural Analysis
CT46131-A	12/19/2002	705214_CT2007 Easton-everetts Rd _PJF_Tower Design Drawing and Calculations_20021219.pdf	Paul J. Ford	PennSummit Tubular	Tower Design Drawings
CT46131-A	12/19/2002	705215_CT2007 Easton-everetts Rd _PJF_Foundation Drawing and Calculations_20021219.pdf	Paul J. Ford	PennSummit Tubular	Foundation Design Drawings
CT46131-A	2/12/2003	242290_CT2007 Easton-Everetts Rd AWS Rent Commencement Letter 02-12-03.pdf	Nextel	AT&T	Commencement Notice

Design Documents					
Structure	**Issued Date**	**Document ID**	**Issued By**	**Issued To**	**Description**
CT46131-A	2/12/2003	840480_CT2007 Easton-everetts Rd AT&T Rent Comm Notice.pdf	Nextel	AT&T	Commencement Notice
CT46131-A	4/8/2003	242314_CT2007 Easton-Everetts Rd T-Mobile Rent Commencement Letter 04-08-03.pdf	Nextel	T-Mobile	Commencement Notice
CT46131-A	4/17/2003	183244_CT2007 Easton-Everetts Rd Sprint Site Construction Drawings Nextel Sign Off 04-17-03.pdf	Natcomm, LLC	Sprint	Construction Drawings
CT46131-A	7/31/2003	183246_CT2007 Easton-Everetts Rd Sprint Site License Agreement 07-31-03.pdf	Nextel	Sprint	Site Lease Agreement
CT46131-A	7/31/2003	242306_CT2007 Easton-Everetts Rd Sprint MOL 07-31-03.pdf	Nextel	Sprint	Site Lease Agreement
CT46131-A	9/24/2003	242304_CT2007 Easton-Everetts Rd Sprint Commencement Letter 09-24-03.pdf	Nextel	Sprint	Commencement Notice
CT46131-A	12/31/2007	197419_CT2007 Easton-Everetts Rd Verizon Wireless Collocation Application 12-31-07.pdf	Sprint		Co-location Tenant Application
CT46131-A	6/16/2008	242259_CT2007 Easton-Everetts Rd Cingular Tower Loading Form 06-16-08.pdf	Cingular Wireless	Sprint	Tower Loading Form
CT46131-A	7/9/2008	20080709_SAR_CT2007.pdf	Semaan Engineering Solutions	Sprint Sites USA	Structural Analysis
CT46131-A	9/2/2008	20080902_SAR_CT2007.pdf	Semaan Engineering Solutions	Sprint	Structural Analysis
CT46131-A	9/23/2008	711882_CT2007 Easton-everetts Rd SLA.pdf	TowerCo	Sprint	Site Lease Agreement
CT46131-A	9/30/2008	197418_CT2007 Easton-Everetts Rd Verizon Collocation Application 09-30-08.pdf	Sprint		Co-location Tenant Application
CT46131-A	10/15/2008	20081015_SAR_CT2007.pdf	Semaan Engineering Solutions	Sprint	Structural Analysis
CT46131-A	11/1/2008	719727_CT2007 Easton-everetts Rd SiteMaster Inspection Report.pdf	SiteMaster	TowerCo	Tower Inspection Report
CT46131-A	11/3/2008	505052_CT2007 Easton-Everetts Rd - New Cingular - 1st Amendment.pdf	TowerCo	New Cingular	Amendment SLA
CT46131-A	11/6/2008	20081106_SAR_CT2007.pdf	Semaan Engineering Solutions	Sprint	Structural Analysis
CT46131-A	3/27/2009	696838_CT2007 Easton-everetts Rd T-Mobile 1st Amd Rent Comm Letter.pdf	TowerCo	T-Mobile	Commencement Notice
CT46131-A	4/1/2009	714946_CT2007 Easton-everetts Rd Tower Profile.pdf	TowerCo		Tower Profile Drawing
CT46131-A	4/9/2009	703185_v1_CT2007_Easton-everetts_Rd__Easton-	Martin & Associates	Towerco	NEPA Report

Design Documents					
Structure	**Issued Date**	**Document ID**	**Issued By**	**Issued To**	**Description**
		Everetts_Road_NEPA_Review_04-09-09.pdf			
CT46131-A	4/14/2009	708804_CT2007 Easton-everetts Rd Site Plan.pdf	TowerCo		Site Plan
CT46131-A	4/20/2009	701718_CT2007 Easton-everetts Rd Verizon SLA Fully Executed.pdf	TowerCo	Verizon	Site Lease Agreement
CT46131-A	5/7/2009	705681_CT2007 Easton-everetts Rd _Vertical_Structural Analysis_Verizon_Colocation_20090507.pdf	Vertical Solutions	TowerCo	Structural Analysis Report
CT46131-A	5/18/2009	716947_CT2007 Easton-everetts Rd Verizon Rent Comm Letter.pdf	TowerCo	Verizon	Commencement Notice
CT46131-A	10/7/2009	758767_CT2007 Easton-everetts Rd AT&T Overpayment Reimbursement.pdf	TowerCo		Overpayment Reimbursement
CT46131-A	5/18/2011	840369_CT2007 Easton-everetts Rd _Vertical_Structural Analysis_AT&T_Reconfiguration_20110518.pdf	Vertical Solutions	TowerCo	Structural Analysis Report
CT46131-A	7/5/2011	843370_CT2007 Easton-everetts Rd 2nd Amendment - New Cingular Wireless.pdf	TowerCo	New Cingular	Amendment SLA
CT46131-A	8/10/2011	846649_CT2007 Easton-everetts Rd AT&T 2nd Amendment Rent Comm Notice.pdf	TowerCo	New Cingular	Amendment SLA
CT46131-A	12/1/2011	BXA-171063-12BF-EDIN-X.pdf	Amphenol Antel		Antenna/Hardware Information
CT46131-A	12/1/2011	DB846F65ZAXY.pdf	Andrew		Antenna/Hardware Information
CT46131-A	12/1/2011	TowerCo Easton.doc	Verizon	TowerCo	Reconfiguration Tenant Application
CT46131-A	12/2/2011	CT2007 SA Loading.xls	TowerCo	Vertical Solutions	SA Loading
CT46131-A	12/12/2011	CT2007 SA Loading(1).xls	TowerCo	Vertical Solutions	SA Loading
CT46131-A	12/12/2011	TowerCo Easton(1).doc	Verizon	TowerCo	Reconfiguration Tenant Application
CT46131-A	1/5/2012	859636_CT2007 Easton-everetts Rd Verizon 1st Amendment.pdf	TowerCo	Cellco	Amendment SLA
CT46131-A	1/9/2012	857519_CT2007 Easton-everetts Rd _Vertical_Structural Analysis_Verizon_Reconfiguration_20120109.pdf	Vertical Solutions	TowerCo	Structural Analysis Report
CT46131-A	1/19/2012	860382_CT2007 Easton-everetts Rd Verizon 1st Amendment Rent Commencement Notice.pdf	TowerCo	Verizon	Amendment SLA
CT46131-A	5/22/2012	NV_CT03XC362_5-22-12 Collo App CT2007 Sprint Reconfiguration	Sprint	TowerCo	Reconfiguration Tenant

Design Documents					
Structure	**Issued Date**	**Document ID**	**Issued By**	**Issued To**	**Description**
		Application.doc			Application
CT46131-A	5/23/2012	CT2007-SprintNetworkVision-SA+Loading-20120523.xls	TowerCo	Vertical Solutions	SA Loading
CT46131-A	9/10/2012	242311_CT2007 Easton-Everetts Rd T-Mobile CD-s 09-10-02.pdf	OnAir	VoiceStream	Construction Drawings
CT46131-A	6/28/2012	20120628_SAR_CT2007.pdf	Vertical Solutions	TowerCo	Structural Analysis Report

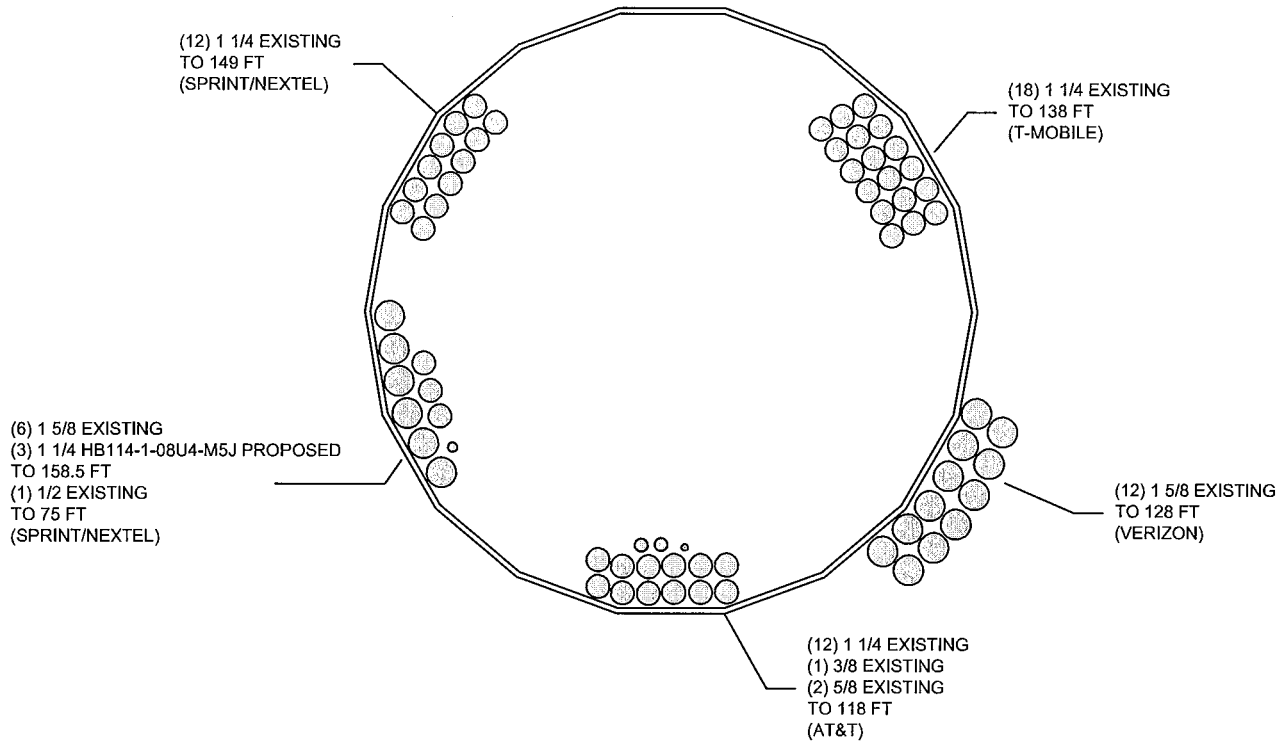
Table Note:

Files name format YYYYMMDD-XXX-ZZZZZZ.pdf

Where:

YYYYMMDD = Year, Month, Day published/issued
XXX=file describer
ZZZZZZ=SBA Site ID

A(INSIDE) = 1237.42 SQ IN
A (COAX) = 107.24 SQ IN
FILL RATIO = 9%



COAX CONFIGURATION PLAN AT 75-FT

SCALE: 1" = 1'-0"

PROJECT INFORMATION:

EASTON-EVERETTS RD
CT46131-A

206 EVERETT ROAD
EASTON, CT 06612
(FAIRFIELD COUNTY)

REV	DATE:	Issued For:
0	01-14-13	SBA

DRAWN BY: KCI | CHECKED BY: JHW

SHEET NUMBER: **QP-P**

REVISION: 0

VSI #: 130023

PLANS PREPARED FOR:

SBA

5900 Broken Sound Pkwy NW
Boca Raton, FL 33487
Office (919) 557-0555

PLANS PREPARED BY:

vertical solutions

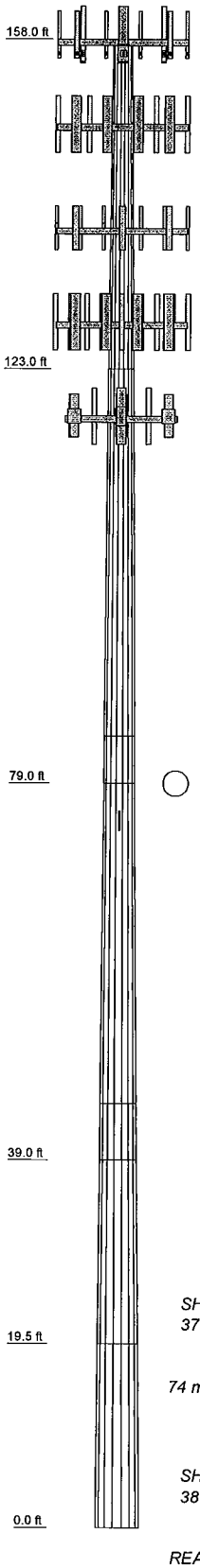
2002 Production Drive
Apex, NC 27539
Office: (888) 321-6167
Fax: (919) 321-1768

Fill Ratio

			Group 1			Group 2			Group 3			Group 4			Group 5			Group 6			Group 7			Group 8			Group 9			A_{LA}		FR	Result
Section Letter	Elevation (ft)	Section #	#	Nominal Diameter (in)	Area (in^2)	#	Nominal Diameter (in)	Area (in^2)	#	Nominal Diameter (in)	Area (in^2)	#	Nominal Diameter (in)	Area (in^2)	#	Nominal Diameter (in)	Area (in^2)	#	Nominal Diameter (in)	Area (in^2)	#	Nominal Diameter (in)	Area (in^2)	#	Nominal Diameter (in)	Area (in^2)	#	Nominal Diameter (in)	Area (in^2)	(in^2)			
G	158.5	1	6	1-5/8	18.47	3	1-1/4	5.81																						24.28	436.73	6%	O.K.
F	156.5	1	6	1-5/8	18.47	3	1-1/4	5.81																						24.28	452.00	5%	O.K.
E	149	1	6	1-5/8	18.47	3	1-1/4	5.81	12	1-1/4	23.23																			47.51	511.56	9%	O.K.
D	138	1	6	1-5/8	18.47	3	1-1/4	5.81	12	1-1/4	23.23	18	1-1/4	34.85																82.36	605.59	14%	O.K.
C	128	1	6	1-5/8	18.47	3	1-1/4	5.81	12	1-1/4	23.23	18	1-1/4	34.85	0	1-5/8	0.00													82.36	697.95	12%	O.K.
B	118	2	6	1-5/8	18.47	3	1-1/4	5.81	12	1-1/4	23.23	18	1-1/4	34.85	0	1-5/8	0.00	12	1-1/4	23.23	1	3/8	0.15	2	5/8	1.19				106.93	787.47	14%	O.K.
A	75	3	6	1-5/8	18.47	3	1-1/4	5.81	12	1-1/4	23.23	18	1-1/4	34.85	0	1-5/8	0.00	12	1-1/4	23.23	1	3/8	0.15	2	5/8	1.19	1	1/2	0.31	107.24	1237.42	9%	O.K.
Carrier			Sprint									T-Mobile			Verizon (Outside)						AT&T						Sprint			Max =		14% O.K.	

Section	1	2	3	4	5
Length (ft)	35.00	44.00	45.00	25.50	19.50
Number of Sides	18	18	18	18	18
Thickness (in)	0.2188	0.3125	0.3750	0.4978	0.5200
Socket Length (ft)		5.00	6.00		
Top Dia (in)	24.0000	31.1120	38.4120	45.5859	52.2700
Bot Dia (in)	31.1120	40.0530	47.5550	52.2700	56.2300
Grade	A572-65			A572-50	
Weight (K)	2.3	5.2	7.8	6.6	5.9

27.8



AXIAL
62 K
SHEAR
37 K
MOMENT
4098 kip-ft
TORQUE 3 kip-ft
74 mph WIND - 0.7500 in ICE
AXIAL
45 K
SHEAR
38 K
MOMENT
4141 kip-ft
TORQUE 2 kip-ft
REACTIONS - 85 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) DB980F90E-M w/Mount Pipe (Sprint)	158.5	(3) EMS RR90-17-02DP w/MP (TMobile)	138
(2) DB980F90E-M w/Mount Pipe (Sprint)	158.5	(2) Decibel DB846F65ZAXY w/MP (Verizon)	128
(2) DB980F90E-M w/Mount Pipe (Sprint)	158.5	(2) Decibel DB846F65ZAXY w/MP (Verizon)	128
RFS APXVSPP18-C-A20 w/ Mount Pipe (Sprint)	158.5	(2) RFS Diplexers (Verizon)	128
		(2) RFS Diplexers (Verizon)	128
RFS APXVSPP18-C-A20 w/ Mount Pipe (Sprint)	158.5	(2) RFS Diplexers (Verizon)	128
RFS APXVSPP18-C-A20 w/ Mount Pipe (Sprint)	158.5	PiROD 15' Low Profile Platform (Verizon)	128
PiROD 15' Low Profile Platform (Sprint)	158	Swedcom SLCP 2x6014 w/MP (Verizon)	128
ALU 1900 MHz (25 MHz) (Sprint)	156.5	Swedcom SLCP 2x6014 w/MP (Verizon)	128
ALU 1900 MHz (25 MHz) (Sprint)	156.5	Swedcom SLCP 2x6014 w/MP (Verizon)	128
ALU 1900 MHz (25 MHz) (Sprint)	156.5	Antel BXA-171063/12 BF w/MP (Verizon)	128
ALU 800 MHz (Sprint)	156.5	Antel BXA-171063/12 BF w/MP (Verizon)	128
ALU 800 MHz (Sprint)	156.5	Antel BXA-171063/12 BF w/MP (Verizon)	128
ALU 800 MHz (Sprint)	156.5	(2) Decibel DB846F65ZAXY w/MP (Verizon)	128
ALU External Notch Filter (Sprint)	156.5	(2) 7770.00 (ATI)	118
ALU External Notch Filter (Sprint)	156.5	(2) Powerwave LGP21401 (ATI)	118
ALU External Notch Filter (Sprint)	156.5	(2) Powerwave LGP21401 (ATI)	118
800 ACU-A20-N (Sprint)	156.5	(2) Powerwave LGP21401 (ATI)	118
800 ACU-A20-N (Sprint)	156.5	Powerwave TT19-08BP111-001 (ATI)	118
800 ACU-A20-N (Sprint)	156.5	PiROD 15' Low Profile Platform (ATI)	118
(2) 1900 ACU-A20-N (Sprint)	156.5	Powerwave P65-16-XLH-RR w/ MP (ATI)	118
(2) 1900 ACU-A20-N (Sprint)	156.5	Powerwave P65-16-XLH-RR w/ MP (ATI)	118
(2) 1900 ACU-A20-N (Sprint)	156.5	Powerwave P65-16-XLH-RR w/ MP (ATI)	118
Collar Bracket Assembly (Sprint)	156.5	(2) 7770.00 (ATI)	118
(4) DB844H90E-XY w/Mount Pipe (Sprint)	149	(2) 7770.00 (ATI)	118
PiROD 15' Low Profile Platform (Sprint)	149	Powerwave TT19-08BP111-001 (ATI)	118
(4) DB844H90E-XY w/Mount Pipe (Sprint)	149	Powerwave TT19-08BP111-001 (ATI)	118
(4) DB844H90E-XY w/Mount Pipe (Sprint)	149	(2) Ericsson RRUS-11 (ATI)	118
PiROD 15' Low Profile Platform (TMobile)	138	(2) Ericsson RRUS-11 (ATI)	118
(2) TMA (TMobile)	138	(2) Ericsson RRUS-11 (ATI)	118
(2) TMA (TMobile)	138	Raycap DC6-48-60-18-8F (ATI)	118
(2) TMA (TMobile)	138	Pipe_Chain (Sprint)	75
(3) EMS RR90-17-02DP w/MP (TMobile)	138	GPS (Sprint)	75
(3) EMS RR90-17-02DP w/MP (TMobile)	138		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	A572-50	50 ksi	65 ksi

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.75 in ice.
4. Deflections are based upon a 60 mph wind.
5. TOWER RATING: 99.7%

vertical solutions
Execute and Deliver

Vertical Solutions Inc
2002 Production Drive
Apex, NC 27539
Phone: (888) 321-6167
FAX: (919) 321-1768

Job: *CT46131-A*			
Project: *130023*			
Client: SBA	Drawn by: Kingsley	App'd:	
Code: TIA/EIA-222-F	Date: 01/15/13	Scale: NTS	
Path: L:\2013\0023_Easton-everetts Rd\Task 1\Models\1-Overlap\CT46131-A.er		Dwg No. E-1	

tnxTower	Job	Page
	CT46131-A	1 of 10
Vertical Solutions Inc 2002 Production Drive Apex, NC 27539 Phone: (888) 321-6167 FAX: (919) 321-1768	Project 130023	Date 10:37:20 01/15/13
	Client SBA	Designed by Kingsley

Tower Input Data

There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Treat Feedline Bundles As Cylinder
	Consider Moments - Horizontals		Assume Legs Pinned		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Calculate Redundant Bracing Forces
	Use Moment Magnification		Use Clear Spans For Wind Area		Ignore Redundant Members in FEA
√	Use Code Stress Ratios		Use Clear Spans For KL/r		SR Leg Bolts Resist Compression
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		All Leg Panels Have Same Allowable
	Escalate Ice	√	Bypass Mast Stability Checks		Offset Girt At Foundation
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Consider Feedline Torque
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Include Angle Block Shear Check
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Poles
	Leg Bolts Are At Top Of Section		SR Members Have Cut Ends		Include Shear-Torsion Interaction
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Always Use Sub-Critical Flow
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Use Top Mounted Sockets
	Add IBC .6D+W Combination				

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	158.00-123.00	35.00	0.00	18	24.0000	31.1120	0.2188	0.8752	A572-65 (65 ksi)
L2	123.00-79.00	44.00	5.00	18	31.1120	40.0530	0.3125	1.2500	A572-65 (65 ksi)
L3	79.00-39.00	45.00	6.00	18	38.4120	47.5550	0.3750	1.5000	A572-65 (65 ksi)
L4	39.00-19.50	25.50	0.00	18	45.5859	52.2700	0.4978	1.9912	A572-50 (50 ksi)
L5	19.50-0.00	19.50		18	52.2700	56.2300	0.5200	2.0800	A572-50 (50 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	24.3702	16.5154	1180.0298	8.4423	12.1920	96.7872	2361.6124	8.2592	3.8389	17.545
	31.5920	21.4544	2586.9044	10.9671	15.8049	163.6774	5177.2127	10.7293	5.0906	23.266
L2	31.5920	30.5493	3661.2163	10.9338	15.8049	231.6508	7327.2502	15.2775	4.9257	15.762
	40.6709	39.4176	7864.9212	14.1079	20.3469	386.5410	15740.1912	19.7125	6.4993	20.798
L3	40.0361	45.2735	8275.4883	13.5031	19.5133	424.0951	16561.8658	22.6411	6.1005	16.268
	48.2886	56.1560	15792.4478	16.7489	24.1579	653.7167	31605.6757	28.0833	7.7097	20.559
L4	47.8862	71.2400	18297.2552	16.0063	23.1577	790.1170	36618.5863	35.6268	7.1470	14.357
	53.0763	81.8010	27700.5968	18.3791	26.5532	1043.2128	55437.6427	40.9083	8.3234	16.72
L5	53.0763	85.4123	28898.7314	18.3713	26.5532	1088.3349	57835.4885	42.7143	8.2843	15.931
	57.0974	91.9482	36053.4801	19.7770	28.5648	1262.1629	72154.4003	45.9829	8.9813	17.272

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 158.00-123.00				1	1	1		
L2 123.00-79.00				1	1	1		
L3 79.00-39.00				1	1	1		
L4 39.00-19.50				1	1	1		
L5 19.50-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
LDF7-50A (1-5/8 FOAM) (Verizon)	C	Surface Ar (CaAa)	128.00 - 0.00	12	6	0.000 0.000	1.9800		0.00

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
LDF7-50A (1-5/8 FOAM) (Sprint)	C	No	Inside Pole	158.00 - 0.00	6	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
HB114-1-08U4-M5J (Sprint)	C	No	Inside Pole	158.00 - 0.00	3	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
LDF6-50A (1-1/4 FOAM) (Sprint)	C	No	Inside Pole	149.00 - 0.00	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
LDF6-50A (1-1/4 FOAM) (TMobile)	C	No	Inside Pole	138.00 - 0.00	18	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
LDF6-50A (1-1/4	C	No	Inside Pole	118.00 - 0.00	12	No Ice	0.00	0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
FOAM)						1/2" Ice	0.00	0.00
(AT&T)						1" Ice	0.00	0.00
LDF2-50A (3/8 FOAM)	C	No	Inside Pole	118.00 - 0.00	1	No Ice	0.00	0.00
(AT&T)						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
5/8 DC	C	No	Inside Pole	118.00 - 0.00	2	No Ice	0.00	0.00
(AT&T)						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
LDF4-50A (1/2 FOAM)	C	No	Inside Pole	75.00 - 0.00	1	No Ice	0.00	0.00
(Sprint)						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	158.00-123.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	5.940	0.000	0.67
L2	123.00-79.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	52.272	0.000	1.93
L3	79.00-39.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	47.520	0.000	1.80
L4	39.00-19.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	23.166	0.000	0.88
L5	19.50-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	23.166	0.000	0.88

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	158.00-123.00	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	12.890	0.000	0.75
L2	123.00-79.00	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	113.432	0.000	2.62
L3	79.00-39.00	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	103.120	0.000	2.43
L4	39.00-19.50	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	50.271	0.000	1.18
L5	19.50-0.00	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	50.271	0.000	1.18

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	158.00-123.00	0.0000	0.3018	0.0000	0.5008
L2	123.00-79.00	0.0000	1.4325	0.0000	1.9702
L3	79.00-39.00	0.0000	1.4803	0.0000	2.1134
L4	39.00-19.50	0.0000	1.5097	0.0000	2.2067
L5	19.50-0.00	0.0000	1.5277	0.0000	2.2662

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) DB980F90E-M w/Mount Pipe	A	From Face	4.00 0.00	0.0000	158.50	No Ice 1/2" Ice	4.37 4.96	3.95 5.04	0.03 0.07
(Sprint)			0.00			1" Ice	5.47	5.85	0.12
(2) DB980F90E-M w/Mount Pipe	B	From Face	4.00 0.00	0.0000	158.50	No Ice 1/2" Ice	4.37 4.96	3.95 5.04	0.03 0.07
(Sprint)			0.00			1" Ice	5.47	5.85	0.12
(2) DB980F90E-M w/Mount Pipe	C	From Face	4.00 0.00	0.0000	158.50	No Ice 1/2" Ice	4.37 4.96	3.95 5.04	0.03 0.07
(Sprint)			0.00			1" Ice	5.47	5.85	0.12
PiROD 15' Low Profile Platform	C	None		0.0000	158.00	No Ice 1/2" Ice	17.30 22.10	17.30 22.10	1.50 2.03
(Sprint) *****						1" Ice	26.90	26.90	2.56
PiROD 15' Low Profile Platform	C	None		0.0000	149.00	No Ice 1/2" Ice	17.30 22.10	17.30 22.10	1.50 2.03
(Sprint)						1" Ice	26.90	26.90	2.56
(4) DB844H90E-XY w/Mount Pipe	A	From Face	4.00 0.00	0.0000	149.00	No Ice 1/2" Ice	3.58 4.20	5.40 6.49	0.04 0.08
(Sprint)			0.00			1" Ice	4.73	7.30	0.13
(4) DB844H90E-XY w/Mount Pipe	B	From Face	4.00 0.00	0.0000	149.00	No Ice 1/2" Ice	3.58 4.20	5.40 6.49	0.04 0.08
(Sprint)			0.00			1" Ice	4.73	7.30	0.13
(4) DB844H90E-XY w/Mount Pipe	C	From Face	4.00 0.00	0.0000	149.00	No Ice 1/2" Ice	3.58 4.20	5.40 6.49	0.04 0.08
(Sprint) *****			0.00			1" Ice	4.73	7.30	0.13
PiROD 15' Low Profile Platform	C	None		0.0000	138.00	No Ice 1/2" Ice	17.30 22.10	17.30 22.10	1.50 2.03
(TMobile)						1" Ice	26.90	26.90	2.56
(2) TMA	A	From Face	4.00 0.00	0.0000	138.00	No Ice 1/2" Ice	0.93 1.07	0.47 0.57	0.02 0.03
(TMobile)			0.00			1" Ice	1.21	0.69	0.03
(2) TMA	B	From Face	4.00 0.00	0.0000	138.00	No Ice 1/2" Ice	0.93 1.07	0.47 0.57	0.02 0.03
(TMobile)			0.00			1" Ice	1.21	0.69	0.03
(2) TMA	C	From Face	4.00	0.0000	138.00	No Ice	0.93	0.47	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(TMobile)			0.00			1/2" Ice	1.07	0.57	0.03
			0.00			1" Ice	1.21	0.69	0.03
(3) EMS RR90-17-02DP	A	From Face	4.00	0.0000	138.00	No Ice	4.59	3.34	0.03
w/MP			0.00			1/2" Ice	5.09	4.11	0.07
(TMobile)			0.00			1" Ice	5.58	4.81	0.11
(3) EMS RR90-17-02DP	B	From Face	4.00	0.0000	138.00	No Ice	4.59	3.34	0.03
w/MP			0.00			1/2" Ice	5.09	4.11	0.07
(TMobile)			0.00			1" Ice	5.58	4.81	0.11
(3) EMS RR90-17-02DP	C	From Face	4.00	0.0000	138.00	No Ice	4.59	3.34	0.03
w/MP			0.00			1/2" Ice	5.09	4.11	0.07
(TMobile)			0.00			1" Ice	5.58	4.81	0.11
*****									
PiROD 15' Low Profile	C	None		0.0000	128.00	No Ice	17.30	17.30	1.50
Platform						1/2" Ice	22.10	22.10	2.03
(Verizon)						1" Ice	26.90	26.90	2.56
Swedcom SLCP 2x6014	A	From Face	4.00	0.0000	128.00	No Ice	7.45	6.95	0.04
w/MP			0.00			1/2" Ice	7.96	7.76	0.10
(Verizon)			0.00			1" Ice	8.47	8.52	0.18
Swedcom SLCP 2x6014	B	From Face	4.00	0.0000	128.00	No Ice	7.45	6.95	0.04
w/MP			0.00			1/2" Ice	7.96	7.76	0.10
(Verizon)			0.00			1" Ice	8.47	8.52	0.18
Swedcom SLCP 2x6014	C	From Face	4.00	0.0000	128.00	No Ice	7.45	6.95	0.04
w/MP			0.00			1/2" Ice	7.96	7.76	0.10
(Verizon)			0.00			1" Ice	8.47	8.52	0.18
Antel BXA-171063/12 BF	A	From Face	4.00	0.0000	128.00	No Ice	4.97	5.23	0.04
w/MP			0.00			1/2" Ice	5.52	6.39	0.08
(Verizon)			0.00			1" Ice	6.04	7.26	0.14
Antel BXA-171063/12 BF	B	From Face	4.00	0.0000	128.00	No Ice	4.97	5.23	0.04
w/MP			0.00			1/2" Ice	5.52	6.39	0.08
(Verizon)			0.00			1" Ice	6.04	7.26	0.14
Antel BXA-171063/12 BF	C	From Face	4.00	0.0000	128.00	No Ice	4.97	5.23	0.04
w/MP			0.00			1/2" Ice	5.52	6.39	0.08
(Verizon)			0.00			1" Ice	6.04	7.26	0.14
(2) Decibel DB846F65ZAXY	A	From Face	2.00	0.0000	128.00	No Ice	7.27	7.82	0.05
w/MP			0.00			1/2" Ice	7.88	9.01	0.11
(Verizon)			0.00			1" Ice	8.48	9.91	0.19
(2) Decibel DB846F65ZAXY	B	From Face	2.00	0.0000	128.00	No Ice	7.27	7.82	0.05
w/MP			0.00			1/2" Ice	7.88	9.01	0.11
(Verizon)			0.00			1" Ice	8.48	9.91	0.19
(2) Decibel DB846F65ZAXY	C	From Face	2.00	0.0000	128.00	No Ice	7.27	7.82	0.05
w/MP			0.00			1/2" Ice	7.88	9.01	0.11
(Verizon)			0.00			1" Ice	8.48	9.91	0.19
(2) RFS Diplexers	A	From Face	2.00	0.0000	128.00	No Ice	1.28	0.31	0.02
(Verizon)			0.00			1/2" Ice	1.44	0.41	0.02
			0.00			1" Ice	1.60	0.52	0.03
(2) RFS Diplexers	B	From Face	2.00	0.0000	128.00	No Ice	1.28	0.31	0.02
(Verizon)			0.00			1/2" Ice	1.44	0.41	0.02
			0.00			1" Ice	1.60	0.52	0.03
(2) RFS Diplexers	C	From Face	2.00	0.0000	128.00	No Ice	1.28	0.31	0.02
(Verizon)			0.00			1/2" Ice	1.44	0.41	0.02
			0.00			1" Ice	1.60	0.52	0.03
****									
PiROD 15' Low Profile	C	None		0.0000	118.00	No Ice	17.30	17.30	1.50
Platform						1/2" Ice	22.10	22.10	2.03
(AT&T)						1" Ice	26.90	26.90	2.56
Powerwave P65-16-XLH-RR	A	From Face	2.00	0.0000	118.00	No Ice	8.64	6.36	0.09
w/ MP			0.00			1/2" Ice	9.29	7.54	0.15

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(AT&T)			0.00			1" Ice	9.91	8.43	0.23
Powerwave P65-16-XLH-RR	B	From Face	2.00	0.0000	118.00	No Ice	8.64	6.36	0.09
w/ MP			0.00			1/2" Ice	9.29	7.54	0.15
(AT&T)			0.00			1" Ice	9.91	8.43	0.23
Powerwave P65-16-XLH-RR	C	From Face	2.00	0.0000	118.00	No Ice	8.64	6.36	0.09
w/ MP			0.00			1/2" Ice	9.29	7.54	0.15
(AT&T)			0.00			1" Ice	9.91	8.43	0.23
(2) 7770.00	A	From Face	2.00	0.0000	118.00	No Ice	5.88	2.93	0.04
(AT&T)			0.00			1/2" Ice	6.31	3.27	0.07
			0.00			1" Ice	6.75	3.63	0.11
(2) 7770.00	B	From Face	2.00	0.0000	118.00	No Ice	5.88	2.93	0.04
(AT&T)			0.00			1/2" Ice	6.31	3.27	0.07
			0.00			1" Ice	6.75	3.63	0.11
(2) 7770.00	C	From Face	2.00	0.0000	118.00	No Ice	5.88	2.93	0.04
(AT&T)			0.00			1/2" Ice	6.31	3.27	0.07
			0.00			1" Ice	6.75	3.63	0.11
(2) Powerwave LGP21401	A	From Face	2.00	0.0000	118.00	No Ice	1.29	0.23	0.01
(AT&T)			0.00			1/2" Ice	1.45	0.31	0.02
			0.00			1" Ice	1.61	0.40	0.03
(2) Powerwave LGP21401	B	From Face	2.00	0.0000	118.00	No Ice	1.29	0.23	0.01
(AT&T)			0.00			1/2" Ice	1.45	0.31	0.02
			0.00			1" Ice	1.61	0.40	0.03
(2) Powerwave LGP21401	C	From Face	2.00	0.0000	118.00	No Ice	1.29	0.23	0.01
(AT&T)			0.00			1/2" Ice	1.45	0.31	0.02
			0.00			1" Ice	1.61	0.40	0.03
Powerwave	A	From Face	2.00	0.0000	118.00	No Ice	0.64	0.52	0.00
TT19-08BP111-001			0.00			1/2" Ice	0.76	0.62	0.01
(AT&T)			0.00			1" Ice	0.88	0.74	0.01
Powerwave	B	From Face	2.00	0.0000	118.00	No Ice	0.64	0.52	0.00
TT19-08BP111-001			0.00			1/2" Ice	0.76	0.62	0.01
(AT&T)			0.00			1" Ice	0.88	0.74	0.01
Powerwave	C	From Face	2.00	0.0000	118.00	No Ice	0.64	0.52	0.00
TT19-08BP111-001			0.00			1/2" Ice	0.76	0.62	0.01
(AT&T)			0.00			1" Ice	0.88	0.74	0.01
(2) Ericsson RRUS-11	A	From Face	2.00	0.0000	118.00	No Ice	2.94	1.59	0.05
(AT&T)			0.00			1/2" Ice	3.17	1.77	0.08
			0.00			1" Ice	3.41	1.96	0.10
(2) Ericsson RRUS-11	B	From Face	2.00	0.0000	118.00	No Ice	2.94	1.59	0.05
(AT&T)			0.00			1/2" Ice	3.17	1.77	0.08
			0.00			1" Ice	3.41	1.96	0.10
(2) Ericsson RRUS-11	C	From Face	2.00	0.0000	118.00	No Ice	2.94	1.59	0.05
(AT&T)			0.00			1/2" Ice	3.17	1.77	0.08
			0.00			1" Ice	3.41	1.96	0.10
Raycap DC6-48-60-18-8F	C	From Face	2.00	0.0000	118.00	No Ice	1.47	1.47	0.02
(AT&T)			0.00			1/2" Ice	1.67	1.67	0.04
			0.00			1" Ice	1.88	1.88	0.06
****									
Pipe & Chain	C	None		0.0000	75.00	No Ice	2.00	2.00	0.35
(Sprint)						1/2" Ice	3.00	3.00	0.53
						1" Ice	4.00	4.00	0.70
GPS	C	From Face	2.00	0.0000	75.00	No Ice	0.30	0.30	0.00
(Sprint)			0.00			1/2" Ice	0.43	0.43	0.00
			0.00			1" Ice	0.58	0.58	0.01
****									
RFS APXVSPP18-C-A20 w/	A	From Face	4.00	0.0000	158.50	No Ice	8.50	6.95	0.08
Mount Pipe			0.00			1/2" Ice	9.15	8.13	0.15
(Sprint)			0.00			1" Ice	9.77	9.02	0.22

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RFS APXVSPP18-C-A20 w/ Mount Pipe (Sprint)	B	From Face	4.00 0.00 0.00	0.0000	158.50	No Ice 1/2" Ice 1" Ice	8.50 9.15 9.77	6.95 8.13 9.02	0.08 0.15 0.22
RFS APXVSPP18-C-A20 w/ Mount Pipe (Sprint)	C	From Face	4.00 0.00 0.00	0.0000	158.50	No Ice 1/2" Ice 1" Ice	8.50 9.15 9.77	6.95 8.13 9.02	0.08 0.15 0.22
ALU 1900 MHz (25 MHz) (Sprint)	A	From Face	4.00 0.00 0.00	0.0000	156.50	No Ice 1/2" Ice 1" Ice	2.91 3.14 3.39	3.80 4.06 4.34	0.09 0.12 0.15
ALU 1900 MHz (25 MHz) (Sprint)	B	From Face	4.00 0.00 0.00	0.0000	156.50	No Ice 1/2" Ice 1" Ice	2.91 3.14 3.39	3.80 4.06 4.34	0.09 0.12 0.15
ALU 1900 MHz (25 MHz) (Sprint)	C	From Face	4.00 0.00 0.00	0.0000	156.50	No Ice 1/2" Ice 1" Ice	2.91 3.14 3.39	3.80 4.06 4.34	0.09 0.12 0.15
ALU 800 MHz (Sprint)	A	From Face	4.00 0.00 0.00	0.0000	156.50	No Ice 1/2" Ice 1" Ice	2.49 2.71 2.93	2.07 2.27 2.48	0.05 0.07 0.10
ALU 800 MHz (Sprint)	B	From Face	4.00 0.00 0.00	0.0000	156.50	No Ice 1/2" Ice 1" Ice	2.49 2.71 2.93	2.07 2.27 2.48	0.05 0.07 0.10
ALU 800 MHz (Sprint)	C	From Face	4.00 0.00 0.00	0.0000	156.50	No Ice 1/2" Ice 1" Ice	2.49 2.71 2.93	2.07 2.27 2.48	0.05 0.07 0.10
ALU External Notch Filter (Sprint)	A	From Face	4.00 0.00 0.00	0.0000	156.50	No Ice 1/2" Ice 1" Ice	0.77 0.89 1.02	0.37 0.46 0.56	0.01 0.02 0.02
ALU External Notch Filter (Sprint)	B	From Face	4.00 0.00 0.00	0.0000	156.50	No Ice 1/2" Ice 1" Ice	0.77 0.89 1.02	0.37 0.46 0.56	0.01 0.02 0.02
ALU External Notch Filter (Sprint)	C	From Face	4.00 0.00 0.00	0.0000	156.50	No Ice 1/2" Ice 1" Ice	0.77 0.89 1.02	0.37 0.46 0.56	0.01 0.02 0.02
800 ACU-A20-N (Sprint)	A	From Face	4.00 0.00 0.00	0.0000	156.50	No Ice 1/2" Ice 1" Ice	0.08 0.12 0.17	0.14 0.19 0.25	0.00 0.00 0.00
800 ACU-A20-N (Sprint)	B	From Face	4.00 0.00 0.00	0.0000	156.50	No Ice 1/2" Ice 1" Ice	0.08 0.12 0.17	0.14 0.19 0.25	0.00 0.00 0.00
800 ACU-A20-N (Sprint)	C	From Face	4.00 0.00 0.00	0.0000	156.50	No Ice 1/2" Ice 1" Ice	0.08 0.12 0.17	0.14 0.19 0.25	0.00 0.00 0.00
(2) 1900 ACU-A20-N (Sprint)	A	From Face	4.00 0.00 0.00	0.0000	156.50	No Ice 1/2" Ice 1" Ice	0.08 0.12 0.17	0.14 0.19 0.25	0.00 0.00 0.00
(2) 1900 ACU-A20-N (Sprint)	B	From Face	4.00 0.00 0.00	0.0000	156.50	No Ice 1/2" Ice 1" Ice	0.08 0.12 0.17	0.14 0.19 0.25	0.00 0.00 0.00
(2) 1900 ACU-A20-N (Sprint)	C	From Face	4.00 0.00 0.00	0.0000	156.50	No Ice 1/2" Ice 1" Ice	0.08 0.12 0.17	0.14 0.19 0.25	0.00 0.00 0.00
Collar Bracket Assembly (Sprint)	C	None		0.0000	156.50	No Ice 1/2" Ice 1" Ice	2.00 3.00 4.00	2.00 3.00 4.00	0.35 0.53 0.70

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice
15	Dead+Wind 0 deg+Ice
16	Dead+Wind 30 deg+Ice
17	Dead+Wind 60 deg+Ice
18	Dead+Wind 90 deg+Ice
19	Dead+Wind 120 deg+Ice
20	Dead+Wind 150 deg+Ice
21	Dead+Wind 180 deg+Ice
22	Dead+Wind 210 deg+Ice
23	Dead+Wind 240 deg+Ice
24	Dead+Wind 270 deg+Ice
25	Dead+Wind 300 deg+Ice
26	Dead+Wind 330 deg+Ice
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	158 - 123	50.543	32	2.8166	0.0021
L2	123 - 79	30.712	32	2.4783	0.0020
L3	84 - 39	13.578	32	1.6401	0.0013
L4	45 - 19.5	3.595	32	0.7467	0.0006
L5	19.5 - 0	0.657	32	0.3232	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
158.50	(2) DB980F90E-M w/Mount Pipe	32	50.543	2.8166	0.0021	22016
158.00	PiROD 15' Low Profile Platform	32	50.543	2.8166	0.0021	22016
156.50	ALU 1900 MHz (25 MHz)	32	49.659	2.8062	0.0021	22016
149.00	PiROD 15' Low Profile Platform	32	45.256	2.7529	0.0021	12231
138.00	PiROD 15' Low Profile Platform	32	38.910	2.6607	0.0021	5503
128.00	PiROD 15' Low Profile Platform	32	33.367	2.5487	0.0021	3667
118.00	PiROD 15' Low Profile Platform	32	28.151	2.3965	0.0020	3019
75.00	Pipe & Chain	32	10.641	1.4177	0.0011	2477

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	158 - 123	101.137	8	5.6378	0.0059
L2	123 - 79	61.479	8	4.9614	0.0056
L3	84 - 39	27.192	8	3.2847	0.0037
L4	45 - 19.5	7.202	9	1.4960	0.0016
L5	19.5 - 0	1.316	9	0.6475	0.0007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
158.50	(2) DB980F90E-M w/Mount Pipe	8	101.137	5.6378	0.0059	11160
158.00	PiROD 15' Low Profile Platform	8	101.137	5.6378	0.0059	11160
156.50	ALU 1900 MHz (25 MHz)	8	99.371	5.6171	0.0059	11160
149.00	PiROD 15' Low Profile Platform	8	90.565	5.5105	0.0059	6199
138.00	PiROD 15' Low Profile Platform	8	77.875	5.3261	0.0058	2787
128.00	PiROD 15' Low Profile Platform	8	66.790	5.1022	0.0057	1856
118.00	PiROD 15' Low Profile Platform	8	56.355	4.7979	0.0054	1525
75.00	Pipe & Chain	8	21.312	2.8394	0.0032	1242

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	158 - 123 (1)	TP31.112x24x0.2188	35.00	0.00	0.0	39.000	21.4544	-18.14	836.72	0.022
L2	123 - 79 (2)	TP40.053x31.112x0.3125	44.00	0.00	0.0	39.000	38.4098	-18.77	1497.98	0.013

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L3	79 - 39 (3)	TP47.555x38.412x0.375	45.00	0.00	0.0	39.000	54.7050	-28.89	2133.50	0.014
L4	39 - 19.5 (4)	TP52.27x45.5859x0.4978	25.50	0.00	0.0	30.000	81.8010	-38.27	2454.03	0.016
L5	19.5 - 0 (5)	TP56.23x52.27x0.52	19.50	0.00	0.0	30.000	91.9482	-45.44	2758.45	0.016

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	158 - 123 (1)	TP31.112x24x0.2188	364.13	-26.696	39.000	0.685	0.00	0.000	39.000	0.000
L2	123 - 79 (2)	TP40.053x31.112x0.3125	1345.01	-43.984	39.000	1.128	0.00	0.000	39.000	0.000
L3	79 - 39 (3)	TP47.555x38.412x0.375	2542.75	-49.195	39.000	1.261	0.00	0.000	39.000	0.000
L4	39 - 19.5 (4)	TP52.27x45.5859x0.4978	3422.07	-39.364	30.000	1.312	0.00	0.000	30.000	0.000
L5	19.5 - 0 (5)	TP56.23x52.27x0.52	4141.21	-39.373	30.000	1.312	0.00	0.000	30.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	158 - 123 (1)	TP31.112x24x0.2188	0.022	0.685	0.000	0.706 ✔	1.333	H1-3 ✔
L2	123 - 79 (2)	TP40.053x31.112x0.3125	0.013	1.128	0.000	1.140 ✔	1.333	H1-3 ✔
L3	79 - 39 (3)	TP47.555x38.412x0.375	0.014	1.261	0.000	1.275 ✔	1.333	H1-3 ✔
L4	39 - 19.5 (4)	TP52.27x45.5859x0.4978	0.016	1.312	0.000	1.328 ✔	1.333	H1-3 ✔
L5	19.5 - 0 (5)	TP56.23x52.27x0.52	0.016	1.312	0.000	1.329 ✔	1.333	H1-3 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	158 - 123	Pole	TP31.112x24x0.2188	1	-18.14	1115.35	53.0	Pass
L2	123 - 79	Pole	TP40.053x31.112x0.3125	2	-18.77	1996.81	85.5	Pass
L3	79 - 39	Pole	TP47.555x38.412x0.375	3	-28.89	2843.96	95.6	Pass
L4	39 - 19.5	Pole	TP52.27x45.5859x0.4978	4	-38.27	3271.22	99.6	Pass
L5	19.5 - 0	Pole	TP56.23x52.27x0.52	5	-45.44	3677.01	99.7	Pass
							Summary	
						Pole (L5)	99.7	Pass
						RATING =	**99.7**	**Pass**

Design	0

	Initials	Date
Produced By:	KCI	1/14/2013
Checked By:	AVF	1/14/2013

SELF-SUPPORTING POLE STRUCTURE REINFORCEMENT DESIGN, TIA-222-F

VSi Job #	130023	
Client Site Name:	Easton-Everetts Road	
Client Site Number:	CT2007	
Analysis Company:	Vertical Solutions	
Analysis Date:	01/14/2013	
Hole Size Allowance:	0.0625	inches
Allowable Stress Increase	133%	
Design Percentage	100%	
	133%	

vertical solutions

Pole Geometry									CT2007	130023
Section #	Sides # (12,16,18,0)	Elevation (ft) TOP	Elevation (ft) BOTTOM	Dia Across Flats (in) TOP	Dia Across Flats (in) BOTTOM	Splice (ft)	Thickness (in)	Material Specification	Taper (in/ft)	Length (ft)
1	18	45.0	0.0	45.59	54.73	0.00	0.3750	A572-65	0.203	45.00

vertical solutions

					Bar Width (in)	Bar Thickness (in)	Bar Length (in)	OS Number	Flat Width	Bar K (0.80<K<1.00)	Bar r (in)	Bar Material Specification	OS Diameter (in)	OS Sleeve Diameter (in)	Hole Diameter (in)	OS Spacing (in)	OS Vail (kip)	r_{max}	r_b Pole	r_t	r_t Gross	rt Net	r_{bx}	r_p Bar	r_p Pole	r_v	L_{model} (in)	L_{clear} (in)	t Model (in)	F_y Model (ksi)	I Model (in^4)	MOI total (in^4)	r_i	CT2007 D_c Model (in)	130023 t_c Model (in)
D	39	2764.73	1	4	7.00	1.5	12	12	7.45	1.00	0.433	A572-50	0.787	1.14	1.22	3	20.9	92%	55%	73%	67%	90%	34%	16%	47%	92%	11	50	0.54	42	23295	27279	85%	48.31	0.64
C	19.5	3485.22	1	4	7.00	1.5	24	14	8.13	1.00	0.433	A572-50	0.787	1.14	1.22	3	20.9	100%	61%	96%	74%	100%	33%	15%	45%	88%	13	58	0.54	42	29587	33531	88%	52.27	0.54
B	19.5	3485.22	1	4	7.63	1.5	24	14	8.13	1.00	0.433	A572-50	0.787	1.14	1.22	3	20.9	94%	59%	93%	71%	94%	34%	16%	47%	92%	13	58	0.54	42	29587	34837	85%	52.27	0.54
A	0	4167.86	1	4	7.63	1.5	24	14	8.82	1.00	0.433	A572-50	0.787	1.14	1.22	3	20.9	100%	62%	99%	76%	100%	36%	17%	50%	98%	14	59	0.54	42	36920	42165	88%	56.23	0.54

vertical solutions

Job No.: 130023
Date: 01/14/2013
Calculated by: KCI

SELF-SUPPORTING POLE STRUCTURE REINFORCEMENT BOLTED SPLICE DESIGN, TIA-222-G-F

Input - Reinforcing Bar Properties

CONSTANTS:
$E \equiv 29000 \cdot ksi$

$b_{bar} := 7.00 \cdot in$ = width of reinforcement

$t_{bar} := 1.5 \cdot in$ = thickness of reinforcement

$F_{yBar} := 50 \cdot ksi$ = specified minimum yield stress of reinforcement

$F_{uBar} := 65 \cdot ksi$ = specified minimum tensile stress of reinforcement

$ASI := 133\%$ = allowable stress increase

$A_{gBar} := b_{bar} \cdot t_{bar}$ $A_{gBar} = 10.50 \cdot in^2$

Input - Splice & TB's Properties

$d := 20 \cdot mm$ = diameter of ONESIDE AJAX bolts

$d_{sleeve} := 29 \cdot mm$ = outside diameter of sleeve for ONESIDE AJAX bolts

$d_{hole} := 31 \cdot mm$ = diameter of hole for ONESIDE AJAX bolts

$n := 14$ = number of ONESIDE AJAX bolts at termination

$s := 3 \cdot in$ = spacing of termination bolts

$V_{all} := 20.9 \cdot kip$ = shear breaking strength of ONESIDE AJAX

$T_{all} := 74.4 \cdot kN$ = tensile breaking strength of ONESIDE AJAX PC8.8 $T_{all} = 16.7 \cdot kip$

$b_{GPL} := 5.75 \cdot in$ = width of gusset plate

$t_{GPL} := 1 \cdot in$ = thickness of gusset plate

$F_{yGPL} := 50 \cdot ksi$ = specified minimum yield stress of gusset plate

$F_{uGPL} := 65 \cdot ksi$ = specified minimum tensile stress of gusset plate

$n_{sPLbolt} := 14$ = number of bar termination bolts for height of gusset plate (bolt providing M_{resist})

$n_{bGPL} := 16$ = number of gusset plate termination bolts

$d_{bGPL} := 0.75 \cdot in$ = diameter of gusset plate termination bolts

$F_{vbGPL} := 21.0 \cdot ksi$ = specified minimum tensile stength of gusset plate termiantion bolt

$s_{bGPL} := 3 \cdot in$ = spacing of gusset plate termination bolts

$end_{bGPL} := 1.5 \cdot in$ = end distance of gusset plate termination bolts

$K_{GPL} := 1.0$ = effective buckling length factor of gusset plate [Table C-C2.1, LRFD-99]

$b_{SPL} := 5.75 \cdot in$ = width of splice plate

$t_{SPL} := 1 \cdot in$ = thickness of splice plate

$F_{ySPL} := 50 \cdot ksi$ = specified minimum yield stress of splice plate

$F_{uSPL} := 65 \cdot ksi$ = specified minimum tensile stress of splice plate

$K_{SPL} := 1.0$ = effective buckling length factor of splice plate [Table C-C2.1, LRFD-99]

$L_{SPL} := 3.25 \cdot in$ = maximum spacing between gusset/splice plate bolts

$F_{EXX} := 70 \cdot ksi$ = ultimate stress of weld electrode

$H_{GPL} := \left(n_{sPLbolt} + 1\right) \cdot s$ = height of gusset plate $\quad H_{GPL} = 45.00 \cdot in$

$$b'_{bar} := \begin{cases} b_{bar} & \text{if } b_{bar} \geq 4.5 \cdot in \\ 4.5 \cdot in & \text{if } b_{bar} < 4.5 \cdot in \end{cases} \qquad b'_{bar} = 7 \cdot in$$

$H_{GPLcheck} := 2 \cdot end_{bGPL} + \left(n_{bGPL} - 1\right) \cdot s_{bGPL}$ $\quad H_{GPLcheck} = 48.00 \cdot in$

$Length_{SPL} := L_{SPL} + 2 \cdot end_{bGPL} + 2 \cdot \left[\left(n_{bGPL} - 1\right) \cdot s_{bGPL}\right]$ $\quad Length_{SPL} = 96.25 \cdot in$

Output: Tension on Gross

$F_{tGross} := 0.6 \cdot F_{yBar}$ $\quad F_{tGross} = 30.0 \cdot ksi$

$P_{tGross} := F_{tGross} \cdot A_{gBar}$ $\quad P_{tGross} = 315.0 \cdot kip$

Output: Tension on Net

$$A_{en} := \left[b_{bar} - \left(d_{hole} + \frac{1}{16} \cdot in\right)\right] \cdot t_{bar} \qquad A_{en} = 8.576 \cdot in^2$$

$F_{tNet} := 0.5 \cdot F_{uBar}$ $\quad F_{tNet} = 32.5 \cdot ksi$

$P_{tNet} := F_{tNet} \cdot A_{en}$ $\quad P_{tNet} = 278.7 \cdot kip$

SPLICE:

Output - Shear Strength of Bar Termination Bolts

$V_{max} := \min\left(P_{tGross}, P_{tNet}\right) \cdot ASI \cdot 1.05$ $\quad V_{max} = 389.2 \cdot kip$

$A_{bolt} := \frac{\pi}{4} \cdot d^2$ $\quad A_{bolt} = 0.487 \cdot in^2$

$t_{sleeve} := \frac{d_{sleeve} - d}{2}$ $\quad t_{sleeve} = 0.177 \cdot in$

$A_{sleeve} := \frac{\pi}{4} \cdot \left[d_{sleeve}^2 - \left(d_{sleeve} - 2 \cdot t_{sleeve}\right)^2\right]$ $\quad A_{sleeve} = 0.537 \cdot in^2$

$A_{assembly} := A_{sleeve} + A_{bolt}$ $\quad A_{assembly} = 1.024 \cdot in^2$

$F_v := \frac{V_{all}}{A_{assembly}}$ $\quad F_v = 20.4 \cdot ksi$

$f_v := \frac{V_{max}}{n \cdot A_{assembly}}$ $\quad f_v = 27.2 \cdot ksi$

$r_v := \frac{f_v}{F_v}$ $\quad r_v = 133 \cdot \%$

Output - Combined Tension & Shear Strength Bar Termination Bolts

- Eccentricity Normal to the Plane of the Faying Surface: Case I-NA not at CG

$P_{bMax} := V_{max}$ $\quad P_{bMax} = 389 \cdot kip$

$edge_{bGPL} := \frac{b_{GPL}}{2}$ $\quad edge_{bGPL} = 2.875 \cdot in$

$e := t_{bar} + \left(b_{GPL} - edge_{bGPL}\right)$ $\quad e = 4.38 \cdot in$

$$b_{eff} := \begin{cases} 8 \cdot t_{GPL} & \text{if } 8 \cdot t_{GPL} \le b'_{bar} \\ b'_{bar} & \text{otherwise} \end{cases}$$ 6.145

$b_{eff} = 7 \cdot in$

$d_1 := 7.87 \cdot in$ ***** adjust until d_1 is the same (Eq 1 = Eq 2)**

$$n' := \begin{cases} n_{sPLbolt} & \text{if } d_1 < s \\ \left(n_{sPLbolt} - 1\right) & \text{if } d_1 \ge s \wedge d_1 < 2 \cdot s \\ \left(n_{sPLbolt} - 2\right) & \text{if } d_1 \ge 2 \cdot s \wedge d_1 \le 3 \cdot s \\ \text{"ERROR"} & \text{otherwise} \end{cases}$$ $\quad n' = 12$

$y := \left(\frac{n'}{2} + 0.5\right) \cdot s - \left[d_1 - \left(n_{sPLbolt} - n'\right) \cdot s\right]$ $\quad y = 17.630 \cdot in$

$A_b := A_{assembly}$ $\quad A_b = 1.02 \cdot in^2$

$\Sigma A_b := n' \cdot A_b$ $\quad \Sigma A_b = 12.29 \cdot in^2$

Given

$\Sigma A_b \cdot y = b_{eff} \cdot d_1 \cdot \frac{d_1}{2}$

$Find(d_1) = 7.867 \cdot in$ ***

$Eq1 := \Sigma A_b \cdot y$ $\quad Eq1 = 216.60 \cdot in^3$

$Eq2 := b_{eff} \cdot d_1 \cdot \frac{d_1}{2}$ $\quad Eq2 = 216.78 \cdot in^3$

$c := n_{sPLbolt} \cdot s - d_1$ $\quad c = 34.13 \cdot in$

$$y_i := \begin{bmatrix} c \\ (n_{sPLbolt} - 1)\cdot s - d_1 \\ (n_{sPLbolt} - 2)\cdot s - d_1 \\ (n_{sPLbolt} - 3)\cdot s - d_1 \\ (n_{sPLbolt} - 4)\cdot s - d_1 \\ (n_{sPLbolt} - 5)\cdot s - d_1 \\ (n_{sPLbolt} - 6)\cdot s - d_1 \\ (n_{sPLbolt} - 7)\cdot s - d_1 \\ (n_{sPLbolt} - 8)\cdot s - d_1 \\ (n_{sPLbolt} - 9)\cdot s - d_1 \\ (n_{sPLbolt} - 10)\cdot s - d_1 \\ (n_{sPLbolt} - 11)\cdot s - d_1 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$$ * increase/decrease rows as needed

$$y_i = \begin{pmatrix} 34.13 \\ 31.13 \\ 28.13 \\ 25.13 \\ 22.13 \\ 19.13 \\ 16.13 \\ 13.13 \\ 10.13 \\ 7.13 \\ 4.13 \\ 1.13 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot in$$

$$I_x := n'\cdot\left(\frac{\pi\cdot d^4}{64}\right) + \sum\left(A_b\cdot y_i^2\right) + \frac{b_{eff}\cdot {d_1}^3}{12} + b_{eff}\cdot d_1\cdot\left(\frac{d_1}{2}\right)^2$$

$$I_x = 6273.84\cdot in^4$$

$$T_{bMax} := \frac{P_{bMax}\cdot e\cdot c}{I_x}\cdot A_b$$

$$T_{bMax} = 9.5\cdot kip$$

$$F_t := \frac{T_{all}}{A_{bolt}}$$

$$F_t = 34.3\cdot ksi$$

$$F'_t := \left[\sqrt{\left(\frac{ASI\cdot F_t}{ksi}\right)^2 - 2.15\cdot\left(\frac{f_v}{ksi}\right)^2}\right]\cdot ksi$$

$$F'_t = 22.4\cdot ksi$$

$$f_t := \frac{T_{bMax}}{A_{bolt}}$$

$$f_t = 19.5\cdot ksi$$

$$r_{combVT} := \frac{f_t}{F'_t}$$

$$r_{combVT} = 87\cdot\%$$

Output - Bearing Strength: Reinforcing Bar

$P_{max} := V_{max}$

$F_{pBar} := 1.2 \cdot F_{uBar}$ $F_{pBar} = 78.0 \cdot ksi$

$f_{pBar} := \frac{P_{max}}{n \cdot t_{bar} \cdot d_{sleeve}}$ $f_{pBar} = 16.2 \cdot ksi$

$r_{pBar} := \frac{f_{pBar}}{F_{pBar}}$ $r_{pBar} = 21 \cdot \%$

Output - Flexural Strength of Gusset Plate

$P_{maxGPL} := \frac{P_{max}}{2}$ $P_{maxGPL} = 194.6 \cdot kip$

$S_{GPL} := \frac{t_{GPL} \cdot H_{GPL}^{2}}{6}$ $S_{GPL} = 337.5 \cdot in^{3}$

$f_{bGPL} := \frac{P_{maxGPL} \cdot e}{S_{GPL}}$ $f_{bGPL} = 2.5 \cdot ksi$

$F_{bGPL} := 0.75 \cdot F_{yGPL}$ $F_{bGPL} = 37.5 \cdot ksi$

$r_{mGPL} := \frac{f_{bGPL}}{F_{bGPL}}$ $r_{mGPL} = 7 \cdot \%$

$compact_{GPL} := \begin{cases} \text{"YES"} & \text{if } \frac{b_{GPL}}{t_{GPL}} < 0.38 \cdot \sqrt{\frac{E}{F_{yGPL}}} \\ \text{"NO"} & \text{otherwise} \end{cases}$ $compact_{GPL} = \text{"YES"}$

Output - Compression Strength of Gusset Plate

$r_{GPL} := \frac{t_{GPL}}{\sqrt{12}}$ $r_{GPL} = 0.289 \cdot in$

$A_{gGPL} := b_{GPL} \cdot t_{GPL}$ $A_{gGPL} = 5.75 \cdot in^{2}$

$KLr := K_{GPL} \cdot \frac{s_{bGPL}}{r_{GPL}}$ $KLr = 10.4$

$C_{cGPL} := \sqrt{\frac{2 \cdot \pi^{2} \cdot E}{F_{yGPL}}}$ $C_{cGPL} = 107.0$

$$F_{aGPL} := \begin{cases} \dfrac{\left(1 - \dfrac{KLr^2}{2 \cdot C_{cGPL}^2}\right) \cdot F_{yGPL}}{\dfrac{5}{3} + \dfrac{3}{8} \cdot \left(\dfrac{KLr}{C_{cGPL}}\right) - \dfrac{KLr^3}{8 \cdot C_{cGPL}^3}} & \text{if } KLr \le C_{cGPL} \\ \dfrac{12 \cdot \pi^2 \cdot E}{23 \cdot KLr^2} & \text{otherwise} \end{cases} \qquad F_{aGPL} = 29.2 \cdot ksi$$

$$f_{aGPL} := \frac{P_{maxGPL}}{A_{gGPL}} \qquad f_{aGPL} = 33.8 \cdot ksi$$

$$r_{cGPL} := \frac{f_{aGPL}}{F_{aGPL}} \qquad r_{cGPL} = 116 \cdot \%$$

Output - Combined Fexure & Compression Strength of Gusset Plate

$$C_m := 0.85$$

$$F'_{eGPL} := \frac{12 \cdot \pi^2 \cdot E}{23 \cdot KLr^2} \qquad F'_{eGPL} = 1382.7 \cdot ksi$$

$$Eq_{H11GPL} := \frac{f_{aGPL}}{F_{aGPL}} + \frac{C_m \cdot f_{bGPL}}{\left(1 - \dfrac{f_{aGPL}}{F'_{eGPL}}\right) \cdot F_{bGPL}} \qquad Eq_{H11GPL} = 1.217$$

$$Eq_{H12GPL} := \frac{f_{aGPL}}{0.6 \cdot F_{yGPL}} + \frac{f_{bGPL}}{F_{bGPL}} \qquad Eq_{H12GPL} = 1.195$$

$$Eq_{H13GPL} := \frac{f_{aGPL}}{F_{aGPL}} + \frac{f_{bGPL}}{F_{bGPL}} \qquad Eq_{H13GPL} = 1.225$$

$$r_{CcombGPL} := \begin{cases} Eq_{H13GPL} & \text{if } \dfrac{f_{aGPL}}{F_{aGPL}} \le 0.15 \\ Eq_{H11GPL} & \text{if } \dfrac{f_{aGPL}}{F_{aGPL}} > 0.15 \wedge Eq_{H11GPL} \ge Eq_{H12GPL} \\ Eq_{H12GPL} & \text{if } \dfrac{f_{aGPL}}{F_{aGPL}} > 0.15 \wedge Eq_{H12GPL} > Eq_{H11GPL} \end{cases} \qquad r_{CcombGPL} = 122 \cdot \%$$

Output - Shear Strengh of Gusset Plate Bolts

$V_{maxGPL} := P_{maxGPL}$ $V_{maxGPL} = 194.6 \cdot kip$

$A_{bGPL} := \frac{\pi \cdot d_{bGPL}^2}{4}$ $A_{bGPL} = 0.442 \cdot in^2$

$f_{vbGPL} := \frac{V_{maxGPL}}{n_{bGPL} \cdot A_{bGPL}}$ $f_{vbGPL} = 27.5 \cdot ksi$

$r_{vbGPL} := \frac{f_{vbGPL}}{F_{vbGPL}}$ $r_{vbGPL} = 131 \cdot \%$

Output - Bearing Strength: Gusset Plate

$F_{pGPL} := 1.2 \cdot F_{uGPL}$ $F_{pGPL} = 78.0 \cdot ksi$

$f_{pGPL} := \frac{P_{maxGPL}}{n_{bGPL} \cdot t_{GPL} \cdot d_{bGPL}}$ $f_{pGPL} = 16.2 \cdot ksi$

$r_{bGPL} := \frac{f_{pGPL}}{F_{pGPL}}$ $r_{bGPL} = 21 \cdot \%$

Output - Tension Strength of Gusset Plate

$T_{maxGPL} := P_{maxGPL}$ $T_{maxGPL} = 194.6 \cdot kip$

- Gross Area:

$F_{tGrossGPL} := 0.6 \cdot F_{yGPL}$ $F_{tGrossGPL} = 30.0 \cdot ksi$

$f_{tGrossGPL} := \frac{T_{maxGPL}}{A_{gGPL}}$ $f_{tGrossGPL} = 33.8 \cdot ksi$

$r_{tGrossGPL} := \frac{f_{tGrossGPL}}{F_{tGrossGPL}}$ $r_{tGrossGPL} = 113 \cdot \%$

- Net Area

$A_{enGPL} := \left[b_{GPL} - \left(d_{bGPL} + \frac{1}{8} \cdot in + \frac{1}{16} \cdot in \right) \right] \cdot t_{GPL}$ $A_{enGPL} = 4.81 \cdot in^2$

$f_{tNetGPL} := f_{tGrossGPL} \cdot \frac{A_{gGPL}}{A_{enGPL}}$ $f_{tNetGPL} = 40.4 \cdot ksi$

$F_{tNetGPL} := 0.5 \cdot F_{uGPL}$ $F_{tNetGPL} = 32.5 \cdot ksi$

$r_{tNetGPL} := \frac{f_{tNetGPL}}{F_{tNetGPL}}$ $r_{tNetGPL} = 124 \cdot \%$

Output - Combined Fexure & Tension Strength of Gusset Plate

$Eq_{H21GPLgross} := \frac{f_{tGrossGPL}}{F_{tGrossGPL}} + \frac{f_{bGPL}}{F_{bGPL}}$ $Eq_{H21GPLgross} = 1.195$

$$Eq_{H21GPLnet} := \frac{f_{tNetGPL}}{F_{tNetGPL}} + \frac{f_{bGPL}}{F_{bGPL}} \qquad Eq_{H21GPLnet} = 1.312$$

$$r_{TcombGPL} := \max\left(Eq_{H21GPLgross}, Eq_{H21GPLnet}\right) \qquad r_{TcombGPL} = 131 \cdot \%$$

Output - Shear Strength Gusset Plate

- Gross Area:

$$F_{vGrossGPL} := 0.4 \cdot F_{yGPL} \qquad F_{vGrossGPL} = 20.0 \cdot ksi$$

$$A_{vGPL} := H_{GPL} \cdot t_{GPL} \qquad A_{vGPL} = 45.00 \cdot in^2$$

$$f_{vGrossGPL} := \frac{V_{maxGPL}}{A_{vGPL}} \qquad f_{vGrossGPL} = 4.3 \cdot ksi$$

$$r_{vGrossGPL} := \frac{f_{vGrossGPL}}{F_{vGrossGPL}} \qquad r_{vGrossGPL} = 22 \cdot \%$$

- Net Area

$$A_{nvGPL} := \left[H_{GPL} - \left(d_{bGPL} + \frac{1}{8} \cdot in + \frac{1}{16} \cdot in\right) \cdot n_{bGPL}\right] \cdot t_{GPL} \qquad A_{nvGPL} = 30.00 \cdot in^2$$

$$f_{vNetGPL} := f_{vGrossGPL} \cdot \frac{A_{vGPL}}{A_{nvGPL}} \qquad f_{vNetGPL} = 6.5 \cdot ksi$$

$$F_{vNetGPL} := 0.3 \cdot F_{uGPL} \qquad F_{vNetGPL} = 19.5 \cdot ksi$$

$$r_{vNetGPL} := \frac{f_{vNetGPL}}{F_{vNetGPL}} \qquad r_{vNetGPL} = 33 \cdot \%$$

Output - Block Shear Strength of Gusset Plate

$$A_{gv} := \left[\left(n_{bGPL} - 1\right) \cdot s_{bGPL} + edge_{bGPL}\right] \cdot t_{GPL} \qquad A_{gv} = 47.87 \cdot in^2$$

$$A_{nv} := A_{gv} - \left[\left[d_{bGPL} + \left(\frac{1}{8} \cdot in\right) + \left(\frac{1}{16} \cdot in\right)\right] \cdot \left(n_{bGPL} - 0.5\right) \cdot \left(t_{GPL}\right)\right] \qquad A_{nv} = 33.34 \cdot in^2$$

$$A_{nt} := \left[edge_{bGPL} - \frac{\left[d_{bGPL} + \left(\frac{1}{8} \cdot in\right)\right]}{2}\right] \cdot \left(t_{GPL}\right) \qquad A_{nt} = 2.44 \cdot in^2$$

$$F_{vbsGPL} := 0.30 \cdot F_{uGPL} \qquad F_{vbsGPL} = 19.5 \cdot ksi$$

$$F_{tbsGPL} := 0.50 \cdot F_{uGPL} \qquad F_{tbsGPL} = 32.5 \cdot ksi$$

$$T_{bsGPLall} := A_{nv} \cdot F_{vbsGPL} + A_{nt} \cdot F_{tbsGPL} \qquad T_{bsGPLall} = 729.4 \cdot kip$$

$$r_{bsGPL} := \frac{T_{maxGPL}}{T_{bsGPLall}} \qquad r_{bsGPL} = 27 \cdot \%$$

Output - Strength of Gusset Plate Welds

$V_{maxW} := \frac{P_{max}}{2}$ $V_{maxW} = 195 \cdot kip$

- Shear:

$t_{VW} := \begin{cases} \left[t_{GPL} - \left(\frac{3}{16} + \frac{1}{4}\right) \cdot in\right] & \text{if } t_{GPL} > 1.0 \cdot in \\ \left[t_{GPL} - \left(\frac{1}{8} + \frac{1}{8}\right) \cdot in\right] & \text{if } t_{GPL} \le 1.0 \cdot in \end{cases}$ $t_{VW} = 0.750 \cdot in$

$V_{allW} := \left(0.30 \cdot F_{EXX}\right) \cdot t_{VW} \cdot H_{GPL}$ $V_{allW} = 708.7 \cdot kip$

$r_{vW} := \frac{V_{maxW}}{V_{allW}}$ $r_{vW} = 27 \cdot \%$

- Tension/Flexure:

$S_w := \frac{t_{VW} \cdot H_{GPL}^{\ 2}}{6}$ $S_w = 253.1 \cdot in^3$

$M_{allW} := \left(0.30 \cdot F_{EXX}\right) \cdot S_w$ $M_{allW} = 443.0 \cdot kip \cdot ft$

$r_{fW} := \frac{V_{maxW} \cdot e}{M_{allW}}$ $r_{fW} = 16 \cdot \%$

- Combined

$r_{vfW} := \sqrt{r_{vW}^{\ 2} + r_{fW}^{\ 2}}$ $r_{vfW} = 32 \cdot \%$

Output - Compression Strength of Splice Plate

$P_{maxSPL} := \frac{P_{max}}{2}$ $P_{maxSPL} = 194.6 \cdot kip$

$r_{SPL} := \frac{t_{SPL}}{\sqrt{12}}$ $r_{SPL} = 0.289 \cdot in$

$A_{gSPL} := b_{SPL} \cdot t_{SPL}$ $A_{gSPL} = 5.75 \cdot in^2$

$KLr := K_{SPL} \cdot \frac{L_{SPL}}{r_{SPL}}$ $KLr = 11.3$

$C_{cSPL} := \sqrt{\frac{2 \cdot \pi^2 \cdot E}{F_{ySPL}}}$ $C_{cSPL} = 107.0$

$$F_{aSPL} := \begin{cases} \dfrac{\left(1 - \dfrac{KLr^2}{2 \cdot C_{cSPL}^2}\right) \cdot F_{ySPL}}{\dfrac{5}{3} + \dfrac{3}{8} \cdot \left(\dfrac{KLr}{C_{cSPL}}\right) - \dfrac{KLr^3}{8 \cdot C_{cSPL}^3}} & \text{if } KLr \le C_{cSPL} \\ \dfrac{12 \cdot \pi^2 \cdot E}{23 \cdot KLr^2} & \text{otherwise} \end{cases} \qquad F_{aSPL} = 29.1 \cdot ksi$$

$$f_{aSPL} := \frac{P_{maxSPL}}{A_{gSPL}} \qquad f_{aSPL} = 33.8 \cdot ksi$$

$$r_{cSPL} := \frac{f_{aSPL}}{F_{aSPL}} \qquad r_{cSPL} = 116 \cdot \%$$

Output - Tension Strength of Splice Plate

$$T_{maxSPL} := P_{maxGPL} \qquad T_{maxSPL} = 194.6 \cdot kip$$

- Gross Area:

$$F_{tGrossSPL} := 0.6 \cdot F_{ySPL} \qquad F_{tGrossSPL} = 30.0 \cdot ksi$$

$$f_{tGrossSPL} := \frac{T_{maxSPL}}{A_{gSPL}} \qquad f_{tGrossSPL} = 33.8 \cdot ksi$$

$$r_{tGrossSPL} := \frac{f_{tGrossSPL}}{F_{tGrossSPL}} \qquad r_{tGrossSPL} = 113 \cdot \%$$

- Net Area

$$A_{enSPL} := \left[b_{SPL} - \left(d_{bGPL} + \frac{1}{8} \cdot in + \frac{1}{16} \cdot in\right)\right] \cdot t_{SPL} \qquad A_{enSPL} = 4.81 \cdot in^2$$

$$f_{tNetSPL} := f_{tGrossSPL} \cdot \frac{A_{gSPL}}{A_{enSPL}} \qquad f_{tNetSPL} = 40.4 \cdot ksi$$

$$F_{tNetSPL} := 0.5 \cdot F_{uSPL} \qquad F_{tNetSPL} = 32.5 \cdot ksi$$

$$r_{tNetSPL} := \frac{f_{tNetSPL}}{F_{tNetSPL}} \qquad r_{tNetSPL} = 124 \cdot \%$$

Output - Block Shear Strength of Splice Plate

$$A_{gv} := \left[\left(n_{bGPL} - 1\right) \cdot s_{bGPL} + edge_{bGPL}\right] \cdot t_{SPL} \qquad A_{gv} = 47.87 \cdot in^2$$

$$A_{nv} := A_{gv} - \left[\left[d_{bGPL} + \left(\frac{1}{8} \cdot in\right) + \left(\frac{1}{16} \cdot in\right)\right] \cdot \left(n_{bGPL} - 0.5\right) \cdot \left(t_{SPL}\right)\right] \qquad A_{nv} = 33.34 \cdot in^2$$

$$A_{nt} := \left[edge_{bGPL} - \frac{\left[d_{bGPL} + \left(\frac{1}{8} \cdot in\right)\right]}{2}\right] \cdot \left(t_{SPL}\right) \qquad A_{nt} = 2.44 \cdot in^2$$

$F_{vbsSPL} := 0.30 \cdot F_{uSPL}$ $F_{vbsSPL} = 19.5 \cdot ksi$

$F_{tbsSPL} := 0.50 \cdot F_{uSPL}$ $F_{tbsSPL} = 32.5 \cdot ksi$

$T_{bsSPLall} := A_{nv} \cdot F_{vbsSPL} + A_{nt} \cdot F_{tbsSPL}$ $T_{bsSPLall} = 729.4 \cdot kip$

$r_{bsSPL} := \frac{T_{maxSPL}}{T_{bsSPLall}}$ $r_{bsGPL} = 27 \cdot \%$

Output - Bearing Strength: Splice Plate

$F_{pSPL} := 1.2 \cdot F_{uSPL}$ $F_{pGPL} = 78.0 \cdot ksi$

$f_{pSPL} := \frac{P_{maxSPL}}{n_{bGPL} \cdot t_{SPL} \cdot d_{bGPL}}$ $f_{pSPL} = 16.2 \cdot ksi$

$r_{bSPL} := \frac{f_{pSPL}}{F_{pSPL}}$ $r_{bSPL} = 21 \cdot \%$

Output - Design Summary:

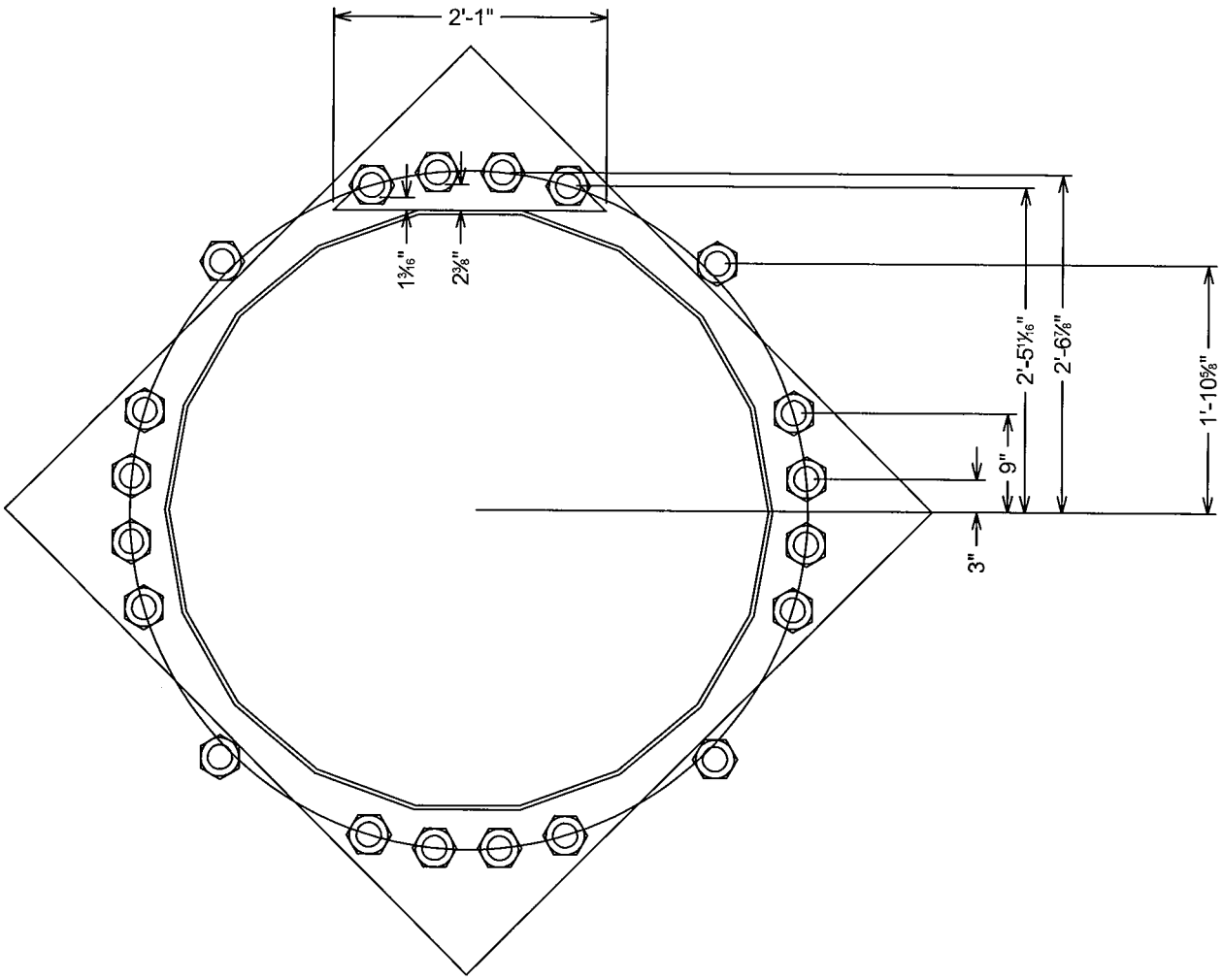
$results_{TB} := \begin{pmatrix} \frac{r_v}{ASI} \\ r_{combVT} \end{pmatrix}$ $results_{TB} = \begin{pmatrix} 100 \\ 87 \end{pmatrix} \cdot \%$ $results_{Bar} := \frac{r_{pBar}}{ASI}$ $results_{Bar} = 16 \cdot \%$

$results_{GPL} := \begin{pmatrix} r_{mGPL} \\ r_{cGPL} \\ r_{CcombGPL} \\ r_{vbGPL} \\ r_{bsGPL} \\ r_{tGrossGPL} \\ r_{tNetGPL} \\ r_{TcombGPL} \\ r_{vGrossGPL} \\ r_{vNetGPL} \\ r_{bGPL} \\ r_{vW} \\ r_{fW} \\ r_{vfW} \end{pmatrix} \cdot \left(\frac{1}{ASI} \right)$ $results_{GPL} = \begin{pmatrix} 5 \\ 87 \\ 91 \\ 99 \\ 20 \\ 85 \\ 94 \\ 99 \\ 16 \\ 25 \\ 16 \\ 21 \\ 12 \\ 24 \end{pmatrix} \cdot \%$

$results_{SPL} := \begin{pmatrix} r_{cSPL} \\ r_{tGrossSPL} \\ r_{tNetSPL} \\ r_{bsSPL} \\ r_{bSPL} \end{pmatrix} \cdot \left(\frac{1}{ASI} \right)$ $results_{SPL} = \begin{pmatrix} 87 \\ 85 \\ 94 \\ 20 \\ 16 \end{pmatrix} \cdot \%$

$Max_{Utilization} := \max(results_{Bar}, results_{TB}, results_{GPL}, results_{SPL})$

$Max_{Utilization} = 100 \cdot \%$



Base Plate

SCALE: 3/4" = 1'-0"

PROJECT INFORMATION:

EASTON-EVERETTS RD
CT46131-A

206 EVERETT ROAD
EASTON, CT 06612
(FAIRFIELD COUNTY)

REV	DATE:	Issued For:
0	01-14-12	SBA

DRAWN BY: KCI | CHECKED BY: JHW

SHEET NUMBER: **BPL**

REVISION: 0

VSI #: 130023

PLANS PREPARED FOR:

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PLANS PREPARED BY:

vertical solutions

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vertical solutions

VSi Job No.: 130023
Date: 01/15/2013
Calculated by: KCI

BASE PLATE DESIGN, DEFORMATION METHOD (DIFFERENT AREAS)

CONSTANTS:

$psi \equiv \frac{lb}{in^2}$

$ksi \equiv 1000 \cdot psi$

$kip \equiv 1000 \cdot lb$

Input -

$M := 4141 \cdot kip \cdot ft$ = moment at top of flange plate

$P := 45 \cdot kip$ = axial load (use zero if base plate is grouted)

$F_y := 50 \cdot ksi$ = yield stress of flange plate

$b_{eff} := 25 \cdot in$ = effective width of flange plate in flexure

$t := 3.25 \cdot in$ = thickness of flange plate

$ASI := 133 \cdot \%$ = allowable stress increase

$$Q := \begin{pmatrix} 4 \\ 4 \\ 4 \\ 4 \\ 4 \end{pmatrix} \qquad d := \begin{pmatrix} 2 \cdot 12 + 6 + \frac{7}{8} \\ 2 \cdot 12 + 5 + \frac{11}{16} \\ 9 \\ 3 \\ 1 \cdot 12 + 10 + \frac{5}{8} \end{pmatrix} \cdot in \qquad A_{stiff} := \begin{pmatrix} 3.98 \\ 3.98 \\ 3.98 \\ 3.98 \\ 3.98 \end{pmatrix} in^2 \qquad A_{stress} := \begin{pmatrix} 3.25 \\ 3.25 \\ 3.25 \\ 3.25 \\ 3.25 \end{pmatrix} in^2 \qquad F_t := \begin{pmatrix} 0.6 \cdot 75 \\ 0.6 \cdot 75 \\ 0.6 \cdot 75 \\ 0.6 \cdot 75 \\ 0.6 \cdot 75 \end{pmatrix} \cdot ksi$$

Output -

$\sum \overrightarrow{(Q)} = 20$ $\qquad sumQAd := \sum \overrightarrow{\left(Q \cdot d^2 \cdot A_{stiff}\right)}$

$sumQAd = 38789 \cdot in^4$

$$R := \frac{M \cdot \overrightarrow{\left(d \cdot A_{stiff}\right)}}{sumQAd} + \frac{P \cdot A_{stiff}}{\sum \overrightarrow{\left(A_{stiff} \cdot Q\right)}}$$

$$f_t := \overrightarrow{\left(\frac{R}{A_{stress}}\right)} \qquad r := \overrightarrow{\left(\frac{f_t}{ASI \cdot F_t}\right)}$$

$$R = \begin{pmatrix} 159.7 \\ 153.6 \\ 48.1 \\ 17.5 \\ 117.6 \end{pmatrix} \cdot kip \qquad f_t = \begin{pmatrix} 49.1 \\ 47.3 \\ 14.8 \\ 5.4 \\ 36.2 \end{pmatrix} \cdot ksi \qquad r = \begin{pmatrix} 82 \\ 79 \\ 25 \\ 9 \\ 60 \end{pmatrix} \cdot \%$$

Q = quantity of fasteners

d = distance from center

A = area of fastener

Ft = allowable tension stress

$$\underset{\sim}{m} := \begin{pmatrix} 2 + \frac{3}{8} \\ 1 + \frac{3}{16} \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot in \qquad M_{PL} := \overrightarrow{\left[\left(\frac{Q}{2}\right) \cdot R \cdot m\right]}$$

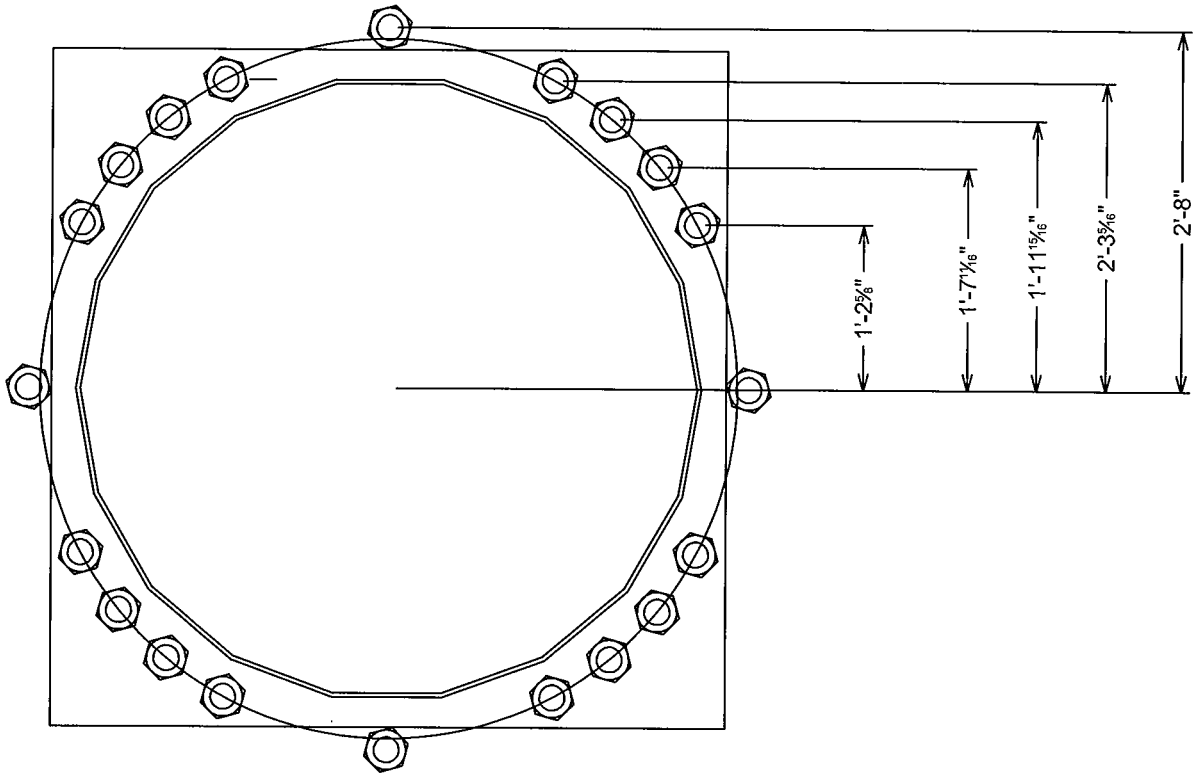
$$M_{PL} = \begin{pmatrix} 63.2 \\ 30.4 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot kip \cdot ft \qquad \sum M_{PL} = 1123.3 \cdot kip \cdot in$$

$$f_b := \frac{\sum M_{PL}}{\left(\frac{b_{eff} \cdot t^2}{6}\right)} \qquad f_b = 25.5 \cdot ksi$$

$$F'_b := ASI \cdot 0.75 \cdot F_y$$

$$r_b := \frac{f_b}{F'_b}$$

$$r_b = 51 \cdot \%$$



Base Plate

SCALE: 3/4" = 1'-0"

PROJECT INFORMATION:

EASTON-EVERETTS RD
CT46131-A

206 EVERETT ROAD
EASTON, CT 06612
(FAIRFIELD COUNTY)

REV	DATE:	Issued For:
0	01-14-13	SBA

DRAWN BY: KCI | CHECKED BY: JHW

SHEET NUMBER: **BPL**

REVISION: 0

VSI #: 130023

PLANS PREPARED FOR:

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vertical solutions

VSi Job No.: 130023
Date: 01/16/2012
Calculated by: KCI

BASE PLATE DESIGN, DEFORMATION METHOD (DIFFERENT AREAS)

CONSTANTS:

$psi \equiv \frac{lb}{in^2}$

$ksi \equiv 1000 \cdot psi$

$kip \equiv 1000 \cdot lb$

Input -

$M := 4141 \cdot kip \cdot ft$ = moment at top of flange plate

$P := 45 \cdot kip$ = axial load (use zero if base plate is grouted)

$F_y := 50 \cdot ksi$ = yield stress of flange plate

$b_{eff} := 25 \cdot in$ = effective width of flange plate in flexure

$t := 3.25 \cdot in$ = thickness of flange plate

$ASI := 133 \cdot \%$ = allowable stress increase

$$Q := \begin{pmatrix} 2 \\ 4 \\ 4 \\ 4 \\ 4 \\ 2 \end{pmatrix} \qquad d := \begin{pmatrix} 2 \cdot 12 + 8 \\ 2 \cdot 12 + 3 + \frac{5}{16} \\ 1 \cdot 12 + 11 + \frac{15}{16} \\ 1 \cdot 12 + 7 + \frac{11}{16} \\ 1 \cdot 12 + 2 + \frac{5}{8} \\ 0 \end{pmatrix} \cdot in \qquad A_{stiff} := \begin{pmatrix} 3.98 \\ 3.98 \\ 3.98 \\ 3.98 \\ 3.98 \\ 3.98 \end{pmatrix} in^2 \qquad A_{stress} := \begin{pmatrix} 3.25 \\ 3.25 \\ 3.25 \\ 3.25 \\ 3.25 \\ 3.25 \end{pmatrix} in^2 \qquad F_t := \begin{pmatrix} 0.6 \cdot 75 \\ 0.6 \cdot 75 \\ 0.6 \cdot 75 \\ 0.6 \cdot 75 \\ 0.6 \cdot 75 \\ 0.6 \cdot 75 \end{pmatrix} \cdot ksi$$

Output -

$\sum \overrightarrow{(Q)} = 20$ $\quad sumQAd := \sum \overrightarrow{\left(Q \cdot d^2 \cdot A_{stiff}\right)}$

$sumQAd = 38725 \cdot in^4$

$$R := \frac{M \cdot \overrightarrow{\left(d \cdot A_{stiff}\right)}}{sumQAd} + \frac{P \cdot A_{stiff}}{\sum \overrightarrow{\left(A_{stiff} \cdot Q\right)}}$$

$$f_t := \overrightarrow{\left(\frac{R}{A_{stress}}\right)} \qquad r := \overrightarrow{\left(\frac{f_t}{ASI \cdot F_t}\right)}$$

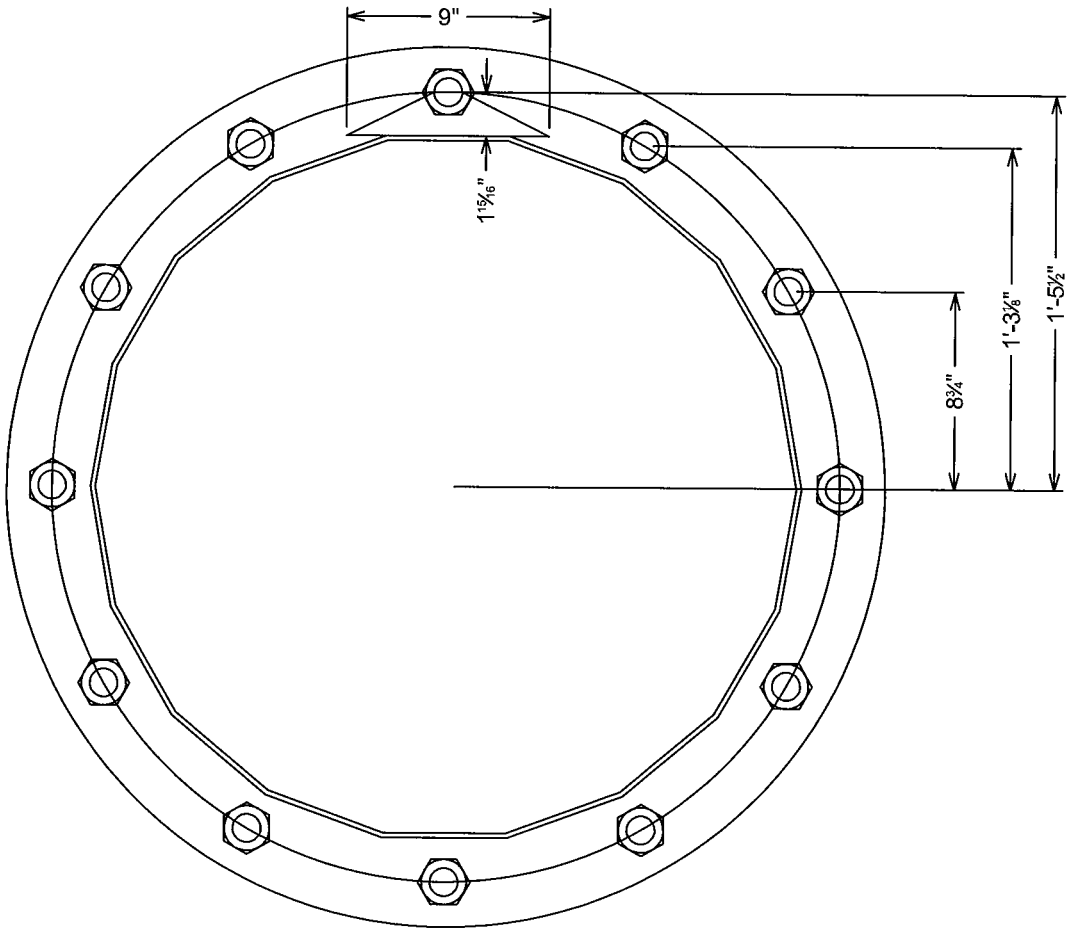
$$R = \begin{pmatrix} 165.7 \\ 141.7 \\ 124.5 \\ 102.8 \\ 76.9 \\ 2.3 \end{pmatrix} \cdot kip \qquad f_t = \begin{pmatrix} 51.0 \\ 43.6 \\ 38.3 \\ 31.6 \\ 23.7 \\ 0.7 \end{pmatrix} \cdot ksi \qquad r = \begin{pmatrix} 85 \\ 73 \\ 64 \\ 53 \\ 40 \\ 1 \end{pmatrix} \cdot \%$$

Q = quantity of fasteners

d = distance from center

A = area of fastener

Ft = allowable tension stress



Flange Plate

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

PROJECT INFORMATION:

EASTON-EVERETTS RD
CT46131-A

206 EVERETT ROAD
EASTON, CT 06612
(FAIRFIELD COUNTY)

REV	DATE:	Issued For:
0	01-14-12	SBA

DRAWN BY: KCI | CHECKED BY: JHW

SHEET NUMBER: **FPL**

REVISION: 0

VSI #: 130023

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vertical solutions

VSi Job No.: 130023
Date: 01/15/2013
Calculated by: KCI

FLANGE PLATE DESIGN, DEFORMATION METHOD (DIFFERENT AREAS)

CONSTANTS:

$psi \equiv \frac{lb}{in^2}$

$ksi \equiv 1000 \cdot psi$

$kip \equiv 1000 \cdot lb$

Input -

$M := 364.13 \cdot kip \cdot ft$ = moment at top of flange plate

$P := 18.14 \cdot kip$ = axial load (use zero if base plate is grouted)

$F_y := 50 \cdot ksi$ = yield stress of flange plate

$b_{eff} := 9 \cdot in$ = effective width of flange plate in flexure

$t := 1.5 \cdot in$ = thickness of flange plate

$ASI := 133 \cdot \%$ = allowable stress increase

$$Q := \begin{pmatrix} 2 \\ 4 \\ 4 \\ 2 \\ 0 \end{pmatrix} \qquad d := \begin{pmatrix} 12 + 5 + \frac{1}{2} \\ 12 + 3 + \frac{1}{8} \\ 8 + \frac{3}{4} \\ 0 \\ 0 \end{pmatrix} \cdot in \qquad A_{stiff} := \begin{pmatrix} 1.23 \\ 1.23 \\ 1.23 \\ 1.23 \\ 0 \end{pmatrix} in^2 \qquad A_{stress} := \begin{pmatrix} 1.23 \\ 1.23 \\ 1.23 \\ 1.23 \\ 0 \end{pmatrix} in^2 \qquad F_t := \begin{pmatrix} 44 \\ 44 \\ 44 \\ 44 \\ 0 \end{pmatrix} \cdot ksi$$

Output -

$$\sum \overrightarrow{(Q)} = 12 \qquad sumQAd := \sum \overrightarrow{\left(Q \cdot d^2 \cdot A_{stiff}\right)}$$

$sumQAd = 2256 \cdot in^4$

$$R := \frac{M \cdot \overrightarrow{\left(d \cdot A_{stiff}\right)}}{sumQAd} + \frac{P \cdot A_{stiff}}{\sum \overrightarrow{\left(A_{stiff} \cdot Q\right)}}$$

$$f_t := \overrightarrow{\left(\frac{R}{A_{stress}}\right)} \qquad r := \overrightarrow{\left(\frac{f_t}{ASI \cdot F_t}\right)}$$

$$R = \begin{pmatrix} 43.2 \\ 37.6 \\ 22.4 \\ 1.5 \\ 0.0 \end{pmatrix} \cdot kip \qquad f_t = \begin{pmatrix} 35.1 \\ 30.5 \\ 18.2 \\ 1.2 \\ 0.0 \end{pmatrix} \cdot ksi \qquad r = \begin{pmatrix} 60 \\ 52 \\ 31 \\ 2 \\ 0 \end{pmatrix} \cdot \%$$

Q = quantity of fasteners

d = distance from center

A = area of fastener

Ft = allowable tension stress

$$\underset{\sim}{m} := \begin{pmatrix} 1 + \frac{15}{16} \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \cdot in \qquad M_{PL} := \overrightarrow{\left[\left(\frac{Q}{2}\right) \cdot R \cdot m\right]}$$

$$M_{PL} = \begin{pmatrix} 7.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \end{pmatrix} \cdot kip \cdot ft \qquad \sum M_{PL} = 83.7 \cdot kip \cdot in$$

$$f_b := \frac{\sum M_{PL}}{\left(\frac{b_{eff} \cdot t^2}{6}\right)} \qquad f_b = 24.8 \cdot ksi$$

$$F'_b := ASI \cdot 0.75 \cdot F_y$$

$$r_b := \frac{f_b}{F'_b}$$

$$r_b = 50 \cdot \%$$

CAISSON Version 4.91 10:26:25 AM Tuesday, January 15, 2013
Vertical Solutions Inc.

```
*****************************************************************************
*                                                                           *
*  PIER FOUNDATIONS ANALYSIS AND DESIGN - (C) 1995,2002 POWER LINE SYSTEMS, INC.*
*                                                                           *
*****************************************************************************
```

*** ANALYSIS IDENTIFICATION : Easton Everett Road (CT46131-A)
NOTES : 130023

*** PIER PROPERTIES CONCRETE STRENGTH (ksi) = 3.00 STEEL STRENGTH (ksi) = 60.00

DIAMETER (ft) = 7.000 DISTANCE FROM TOP OF PIER TO GROUND LEVEL (ft) = 0.50

*** SOIL PROPERTIES

LAYER	TYPE	THICKNESS (ft)	DEPTH AT TOP OF LAYER (ft)	DENSITY (pcf)	CU (psf)	KP	PHI (degrees)
1	S	4.00	0.00	115.0		1.000	-0.00
2	S	16.00	4.00	125.0		4.204	38.00
3	S	5.00	20.00	62.6		4.204	38.00

*** DESIGN (FACTORED) LOADS AT TOP OF PIER MOMENT (ft-k) = 5383.3 VERTICAL (k) = 58.5 SHEAR (k) = 49.4
ADDITIONAL SAFETY FACTOR AGAINST SOIL FAILURE = 1.54

*** CALCULATED PIER LENGTH (ft) = 22.500

*** CHECK OF SOILS PROPERTIES AND ULTIMATE RESISTING FORCES ALONG PIER

TYPE	TOP OF LAYER BELOW TOP OF PIER (ft)	THICKNESS (ft)	DENSITY (pcf)	CU (psf)	KP	FORCE (k)	ARM (ft)
S	0.50	4.00	115.0		1.000	19.32	3.17
S	4.50	12.00	125.0		4.204	1282.52	11.74
S	16.50	4.00	125.0		4.204	-779.80	18.58
S	20.50	2.00	62.6		4.204	-445.41	21.51

*** SHEAR AND MOMENTS ALONG PIER

DISTANCE BELOW TOP OF PIER (ft)	WITH THE ADDITIONAL SAFETY FACTOR SHEAR (k)	WITH THE ADDITIONAL SAFETY FACTOR MOMENT (ft-k)	WITHOUT ADDITIONAL SAFETY FACTOR SHEAR (k)	WITHOUT ADDITIONAL SAFETY FACTOR MOMENT (ft-k)
0.00	76.6	8945.8	49.8	5809.0
2.25	72.9	9116.1	47.4	5919.5
4.50	57.3	9264.9	37.2	6016.2
6.75	-62.0	9270.1	-40.3	6019.6
9.00	-237.2	8944.0	-154.0	5807.8
11.25	-468.2	8160.9	-304.0	5299.3
13.50	-755.1	6795.2	-490.3	4412.4
15.75	-1097.9	4721.0	-712.9	3065.6
18.00	-953.9	2212.6	-619.4	1436.7
20.25	-499.4	567.2	-324.3	368.3
22.50	0.0	0.0	0.0	0.0

*** TOTAL REINFORCEMENT PCT = 0.76 REINFORCEMENT AREA (in^2) = 42.12
*** USABLE AXIAL CAP. (k) = 58.5 USABLE MOMENT CAP. (ft-k) = 6141.6

*** US Standard Re-Bars (Select one of the following):

211	BARS #4	(AREA = 0.20 in^2	DIA = 0.500 in)	AT SPACING (in) =	1.10
136	BARS #5	(AREA = 0.31 in^2	DIA = 0.625 in)	AT SPACING (in) =	1.71
96	BARS #6	(AREA = 0.44 in^2	DIA = 0.750 in)	AT SPACING (in) =	2.42
71	BARS #7	(AREA = 0.60 in^2	DIA = 0.875 in)	AT SPACING (in) =	3.27
54	BARS #8	(AREA = 0.79 in^2	DIA = 1.000 in)	AT SPACING (in) =	4.31
43	BARS #9	(AREA = 1.00 in^2	DIA = 1.128 in)	AT SPACING (in) =	5.41
34	BARS #10	(AREA = 1.27 in^2	DIA = 1.270 in)	AT SPACING (in) =	6.84
27	BARS #11	(AREA = 1.56 in^2	DIA = 1.410 in)	AT SPACING (in) =	8.61
19	BARS #14	(AREA = 2.25 in^2	DIA = 1.693 in)	AT SPACING (in) =	12.24

*** WEIGHT OF CAISSON (kips) = 129.885
*** PRESSURE UNDER CAISSON DUE TO INPUT DESIGN AXIAL LOAD (psf) = 1520.1

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: CT03XC362

Easton - Nextel
206 Everett Road
Easton, CT 06612

August 26, 2012

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

EBI Consulting
environmental | engineering | due diligence

August 26, 2012

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

Re: Emissions Values for Site **CT03XC362 – Easton - Nextel**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 206 Everett Road, Easton, 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 206 Everett Road, Easton, 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) 2 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 antenna used in this modeling is the RFS APXVSPP18-C-A20. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna 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. 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 **158 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	CT03XC362 - Easton Nextel
Site Addresss	206 Everett Road, Easton, CT 06612
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	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	15.9	158	152	1/2 "	0.5	0	1386.9474	21.58136	2.15814%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	158	152	1/2 "	0.5	0	389.96892	6.068045	1.07020%
														Sector total Power Density Value:			3.228%

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	2	40	15.9	158	152	1/2 "	0.5	0	1386.9474	21.58136	2.15814%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	158	152	1/2 "	0.5	0	389.96892	6.068045	1.07020%
														Sector total Power Density Value:			3.228%

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	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	15.9	158	152	1/2 "	0.5	0	1386.9474	21.58136	2.15814%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	158	152	1/2 "	0.5	0	389.96892	6.068045	1.07020%
														Sector total Power Density Value:			3.228%

Site Composite MPE %	
Carrier	MPE %
Sprint	9.685%
T-Mobile	4.290%
AT&T	17.230%
Verizon Wireless	26.880%
Nextel	2.600%
Total Site MPE %	60.685%

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 **9.685% (3.228% from each sector)** 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 **60.685%** 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

EM-SPRINT-046-130402

206 Everett Road

Easton

Alcatel·Lucent

1 Robbins Road
Westford, MA 01886

July 9, 2014

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

RE: Notification of Construction Completion on telecommunication facilities

To whom it may concern:

Alcatel Lucent hereby acknowledges that the list of attached sites have completed construction per the approval granted on the specified date. Please advise if further information is needed..

Very truly yours,

Martha Powers

Martha Powers
Lead Development Manager
Alcatel-Lucent
Sprint Vision Project
1 Robbins Road
Westford, MA 01886

Cc: FST, Siterra

EM/TS #	Address	Town	Sprint ID	Decision Date
EM-SPRINT-062-130912	1065 Wintergreen Avenue	Hamden	CT03XC003	10/15/2013
EM-SPRINT-NEXTEL-060-130118	10 Tanner Marsh Road	Guilford	CT03XC022	2/14/2013
EM-SPRINT-004-130822	181 Montevideo Road	Avon	CT03XC053	9/6/2013
EM-SPRINT-NEXTEL-155-130214A	1358 New Britain Ave.	West Hartford	CT03XC057	3/1/2013
EM-SPRINT-NEXTEL-164-130201	440 Hayden Station Road	Windsor	CT03XC065	3/8/2013
EM-SPRINT-NEXTEL-132-130201	59 McGuire Road	South Windsor	CT03XC066	3/1/2013
EM-SPRINT-NEXTEL-054-130201	299 Paxton Way	Glastonbury	CT03XC081	3/1/2013
EM-SPRINT-NEXTEL-094-130214B	36 Prospect Street	Newington	CT03XC084	3/1/2013
EM-SPRINT-110-130725	10 Sparks Street	Plainville	CT03XC086	8/8/2013
EM-SPRINT-007-130314	260 Beckley Road	Kensington	CT03XC088	4/5/2013
EM-SPRINT-NEXTEL-155-130201	570 New Park Avenue	West Hartford	CT03XC091	3/1/2013
EM-SPRINT-NEXTEL-106-130201	430 Middlesex Turnpike	Old Saybrook	CT03XC102	3/1/2013
EM-SPRINT-NEXTEL-105-130201	30 Short Hills Road	Old Lyme	CT03XC104	3/1/2013
EM-SPRINT-NEXTEL-152-130201	41 Manitock Hill Road	Waterford	CT03XC105	3/1/2013
EM-SPRINT-NEXTEL-045-130201	93 Roxbury Road	East Lyme	CT03XC110	3/1/2013
EM-SPRINT-152-130114	45R Fargo Road	Waterford	CT03XC112	2/14/2013
EM-SPRINT-NEXTEL-027-130201	48 Cow Hill Road	Clinton	CT03XC156	3/1/2013
EM-SPRINT-NEXTEL-082-130201	238 Meridan Road	Middlefield	CT03XC160	3/8/2013
EM-SPRINT-047-130109	160 Plantation Road	East Windsor	CT03XC202	2/7/2013
EM-SPRINT-NEXTEL-077-130214	53 Slater Street	Manchester	CT03XC211	3/1/2013
EM-SPRINT-142-130109	497 Old Post Road	Tolland	CT03XC212	2/7/2013
EM-SPRINT-NEXTEL-042-130222	94 East High Street	East Hampton	CT03XC335	3/8/2013
EM-SPRINT-057-121226	Butternut Hollow Road	Greenwich	CT03XC343	1/11/2013
EM-SPRINT-158-130213	515 Boston Post Road	Westport	CT03XC355	3/1/2013
EM-SPRINT-046-130402	206 Everett Road	Easton	CT03XC362	4/19/2013
EM-SPRINT-085-130322	474 MAIN STREET	MONROE	CT03XC365	4/5/2013
EM-SPRINT-086-131011	57 Cook Drive	Montville	CT03XC365	10/25/2013
EM-SPRINT-118-130322	76 EAST RIDGE	RIDGEFIELD	CT03XC370	4/5/2013
EM-SPRINT-097-131230	20 Barnabas Road	Newtown	CT03XC383	1/21/2014
EM-SPRINT-051-130207	3965 Congress Street	Fairfield	CT03XC385	3/1/2013
EM-SPRINT-NEXTEL-094-130214A	123 Costello Road	Newington	CT23XC555	3/1/2013
EM-SPRINT-119-131008	699 Old Main Street	Rocky Hill	CT23XC556	10/25/2013
EM-SPRINT-077-131008	60 Adams Street	Manchester	CT23XC557	10/25/2013
EM-SPRINT-NEXTEL-080-130123	462 West Main Street	Meriden	CT25XC840	2/14/2013
EM-SPRINT-096-130920	18 Hilltop View Lane	New Milford	CT33XC095	10/4/2013
EM-SPRINT-157-130213	237 Godfrey Road	Weston	CT33XC522	3/1/2013
EM-SPRINT-018-131008	20 Vale Road	Brookfield	CT33XC525	10/25/2013
EM-SPRINT-077-130528	595 Keeney Street	Manchester	CT33XC538	6/14/2013
EM-SPRINT-NEXTEL-129-130214	400 Main Street	Somers	CT33XC554	3/1/2013
EM-SPRINT-047-130322	15 CHAMBERLAIN	BROADBROOK	CT33XC565	4/5/2013
EM-SPRINT-004-130502	277 Huckleberry Road	Avon	CT33XC589	5/17/2013

EM-SPRINT-143-130604	218 Wheeler Road	Torrington	CT33XC592	6/28/2013
EM-SPRINT-140-130724	583 Chapel Street	Thomaston	CT33XC603	8/8/2013
EM-SPRINT-103-130920	Charles Marshall Drive	Norwalk	CT33XC802	10/4/2013
EM-SPRINT-NEXTEL-064-130214	439-455 Homestead Ave.	Hartford	CT43XC805	3/1/2013
EM-SPRINT-064-130311	99 Meadow Street	Hartford	CT43XC806	4/5/2013
EM-SPRINT-083-131127	290 Preston Ave.	Middletown	CT43XC816	12/16/2013
EM-SPRINT-128-130920	530 Bushy Hill Road	Simsbury	CT43XC825	10/4/2013
EM-SPRINT-164-130405A	340 Bloomfield Avenue	Windsor	CT43XC826	4/19/2013
EM-SPRINT-077-130109	239 Middle Turnpike	Manchester	CT43XC827	2/13/2013
EM-SPRINT-165-130118	2-4 Volunteer Drive	Windsor Locks	CT43XC828	2/14/2013
EM-SPRINT-NEXTEL-139-130214	44 Fyler Place	Suffield	CT43XC829	3/8/2013
EM-SPRINT-111-130712	171 Town Hill Road	Plymouth	CT54XC712	7/26/2013
EM-SPRINT-009-130322	38 Spring Hill Road	Bethel	CT54XC749	4/5/2013
EM-SPRINT-154-131011	315 Spencer Plains Road	Westbrook	CT54XC758	10/25/2013
EM-SPRINT-023-130405	14 Canton Springs Road	Canton	CT54XC760	4/19/2013
EM-SPRINT-104-130606	153 Old Salem Road	Norwich	CT54XC775	6/28/2013
EM-SPRINT-164-130405B	99 Day Hill Road	Windsor	CT54XC787	4/19/2013
EM-SPRINT-132-130920	300 Governor's Highway	South Windsor	CT60XC014	10/4/2013
EM-SPRINT-094-130108	605 Willard Avenue	Newington	CT60XC018	1/25/2013
EM-SPRINT-146-130506	197 South Street	Vernon	CT60XC935	5/24/2013
EM-SPRINT-146-130311	777 Talcottville Road	Vernon	CT70XC147	4/5/2013
EM-SPRINT-126-130531	62 Birdseye Road	Shelton	CT73XC004	6/21/2013