CUDDY & FEDER LLP

445 Hamilton Avenue, 14th Floor
White Plains, New York 10601
Tel 914.761.1300 Fax 914.761.5372
www.cuddyfeder.com

April 12, 2012

BY EMAIL & FEDEX
Ms. Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: Docket 420
SBA Towers III – Development and Management Plan
350B Cossaduck Hill Road, North Stonington, Connecticut

Dear Ms. Roberts:

On behalf of SBA Towers III please accept for review and Council approval this Development and Management Plan ("D&M Plan") filing for the captioned Facility as approved in Docket 420.

Tower, Compound & Other Equipment

Enclosed are fifteen (15) sets of 11" x 17" construction drawings being filed in accordance with the Council's Decision and Order dated February 2, 2012. Two full-sized sets of the construction drawings will follow under separate cover. The D&M Plan incorporates a 190' monopole as provided for in the Siting Council's Order No. 1 in this Docket. AT&T will mount nine (9) panel antennas on a low profile platform at a centerline height of 186' AGL as depicted on the signed and stamped drawings prepared by Centek Engineering dated March 19, 2012. The proposed D&M Plan also includes construction plans for the site clearing, drainage, and erosion and sedimentation control measures consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control as amended.

Attached please also find a geotechnical study, structural design report for the tower and foundation, specifications for AT&T's antennas and generator as well as a letter from Centek Engineering regarding the designed access drive.

Required Notifications

In accordance with the provisions of RCSA Section 16-50j-77, SBA hereby notifies the Council of its intention to begin site work after Council approval of the D&M Plan. Construction of the tower and other site improvements will commence upon issuance of a local building permit. The construction director on this project is Shawn McCoy of SBA Communications Corporation. Mr. McCoy is located at 5900 Broken Sound Parkway NW, Boca Raton, Florida and can be

reached by telephone at (561) 226-9366, and the local contact is Hollis Redding, Zoning Specialist. Ms. Redding is located at One Research Drive, Suite 200C, Westborough, MA and can be reached by telephone at (203) 464-3623.

We respectfully request that this matter be included on the Council's next available agenda for review and approval.

Thank you for your consideration of the enclosed.

Very truly yours,

Daniel M. Laub

Enclosures

cc: Hon. Michael H. Mullane, II, First Selectman, Town of North Stonington
Peter R. and Gisele A. Buehler, Intervenors
Hollis Redding, SBA
Jason Laskey, SBA
Michele Briggs, AT&T
Christopher B. Fisher, Esq.

Attachment 1

Date: **March 9, 2012**

Shawn McCoy
SBA Communications Corporation
5900 Broken Sound
Boca Raton, FL 33487
Office: (561) 226-9366

Tower Engineering Professionals, Inc.
3703 Junction Boulevard
Raleigh, NC 27603
(919) 661-6351
Geotech@tepgroup.net

Subject: Subsurface Exploration Report

SBA Designation:	**Site Number:**	CT11796-S
	Site Name:	N. Stonington 3
Engineering Firm Designation:	**TEP Project Number:**	121203.10
Site Data:	**350 B Cossaduck Hill Road, North Stonington, CT 06359 (New London County)** **Latitude N*41° 29' 57.236"*, Longitude W*71° 53' 22.277"*** **190 Foot - Proposed Monopole Tower**	

Dear Mr. McCoy,

Tower Engineering Professionals, Inc. is pleased to submit this **"Subsurface Exploration Report"** to evaluate subsurface conditions in the tower area as they pertain to providing support for the tower foundation.

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions in this report are based on the applicable standards of TEP's practice in this geographic area at the time this report was prepared. No other warranty, express or implied, is made.

TEP assumes the current ground surface elevation; tower location and subsequent centerline provided are correct and are consistent with the elevation and centerline to be used for construction of the structure. Should the ground surface elevation be altered and/or the tower location be moved or shifted TEP should be contacted to determine if additional borings are necessary.

The analyses and recommendations submitted herein are based, in part, upon the data obtained from the subsurface exploration. The soil conditions may vary from what is represented in the boring log. While some transitions may be gradual, subsurface conditions in other areas may be quite different. Should actual site conditions vary from those presented in this report, TEP should be provided the opportunity to amend its recommendations as necessary.

We at *Tower Engineering Professionals, Inc.* appreciate the opportunity of providing our continuing professional services to you and SBA Communications Corporation. If you have any questions or need further assistance on this or any other projects please give us a call.

Report Prepared/Reviewed by: Cory A. Bauer / John D. Longest, P.E.

Respectfully submitted by:

Pete Jernigan, P.E.

TABLE OF CONTENTS

1) PROJECT DESCRIPTION

Based on the preliminary drawings, it is understood a monopole communications tower will be constructed at the referenced site. The structure loads will be provided by the tower manufacturer.

2) SITE EXPLORATION

The field exploration included the performance of one soil test boring (B-1) to the auger refusal depth of 8 feet (bgs) at the approximate centerline of the proposed monopole tower. The boring was performed by an ATV mounted drill rig using continuous flight hollow stem augers to advance the hole. Split-spoon samples and Standard Penetration Resistance Values (N-values) were obtained in accordance with ASTM D 1586 at a frequency of 2 samples to auger refusal.

The Split-spoon samples were transported to the TEP laboratory where they were classified by a Geotechnical Engineer in general accordance with the Unified Soil Classification System (USCS), using visual-manual identification procedures (ASTM D 2488).

Diamond-bit core drilling procedures were used to help determine the character and continuity of the rock in boring B-1. The core drilling procedures were in accordance with ASTM Specification D-2113. Rock core samples of the materials penetrated were protected and retained in a swivel-mounted inner tube of the core barrel. Upon completion of the drill run, the core barrel was brought to the surface and samples removed and placed in standard boxes. The samples were classified by a Geotechnical Engineer and the “Recovery” and “Rock Quality Designation” were determined.

The “Recovery” is the ratio of the sample length obtained to the length drilled, expressed as a percent. The “Rock Quality Designation” (RQD) is the percent of the recovered rock samples in lengths of four or more inches, compared to the total length of the core run. This designation is generally applied to samples of NWX size (2-1/8 inch diameter) or larger and to samples described as moderately hard or harder. The percent recovery and RQD are related to rock soundness and continuity. Generalized rock descriptions, percent recovery, and the RQD value are shown on the boring log.

A Boring Location Plan showing the approximate boring location, a Boring Log presenting the subsurface information obtained and a brief guide to interpreting the boring log are included in the Appendix.

3) SITE CONDITIONS

The site is located at 350 B Cossaduck Hill Road in North Stonington, New London County, Connecticut. The proposed tower and compound are to be located in a small clearing surrounded by woodlands. The ground topography is sloping.

4) SUBSURFACE CONDITIONS

The following description of subsurface conditions is brief and general. For more detailed information, the individual Boring Log contained in Appendix B - Boring Log may be consulted.

4.1) Soil

The USCS classification of the materials encountered in the boring include SP, SW and Gneiss. The Standard Penetration Resistance ("N" Values) recorded in the materials ranged from 5 blows per foot to 120 blows per 0 inches of penetration.

4.2) Rock

Gneiss was encountered at a depth of 8 feet (bgs) in the boring. Refusal of auger advancement was encountered at a depth of 8 feet (bgs) in the boring.

4.3) Subsurface Water

Subsurface water was not encountered in the boring at the time of drilling. It should be noted the subsurface water level will fluctuate during the year, due to seasonal variations and construction activity in the area.

4.4) Frost

The TIA frost depth for New London County Connecticut is 40 inches.

5) TOWER FOUNDATION DESIGN

Based on the boring data and the shallow depth of rock, it is the opinion of TEP that a pier extending to a single large mat foundation can be used to support the new tower. The following presents TEP's conclusions and recommendations regarding the foundation type.

5.1) Shallow Foundation

The foundation should bear a minimum of 3.5 feet below the ground surface to penetrate the frost depth and with sufficient depth to withstand the overturning of the tower. To resist the overturning moment, the weight of the concrete and any soil directly above the foundation can be used. A friction factor of 0.50 can be utilized at this depth. The values are based on the current ground surface elevation.

Table 1A –Shallow Foundation Analysis Parameters – Boring B-1

Depth		Soil	Static Bearing[1] (psf)	Cohesion[2,3] (psf)	Friction Angle[2] (degrees)	Effective Unit Weight (pcf)
Top	Bottom					
0	3	SP	3200	-	29	116
3	8	SW	17350	-	45	123
8	13	Gneiss[3]	18650	-	45	145

Notes:
1) The bearing values provided are net allowable with a minimum factor of safety of 2 with anticipated settlement less than 1 inch. Bearing may be increased by 1/3 for transient loading (e.g. wind or earthquake loading)
2) These values should be considered ultimate soil parameters
3) Due to the fractured nature of the rock sample. Cohesion of the rock cannot be relied upon for strength parameters. Indicated layers have been evaluated as a granular material

Table 1B – Rock Parameters – Boring B-1

Depth		Rock	Recovery (%)	Rock Quality Designation (%)	Unconfined Compressive Strength (psi)	Grout/Rock[1,2] Bond Stress (psi)	Effective Unit Weight (pcf)
Top	Bottom						
8	13	Gneiss[3]	100	53	6700	-	145

Notes:
1) These values should be considered ultimate rock parameters. A minimum factor of safety of 4 should be utilized
2) The rock encountered is not considered competent, see section 5.2 for design recommendations
3) In cases where the shear failure is likely to develop along planes of discontinuity or through highly fractured rock masses cohesion cannot be relied upon to provide resistance to failure

5.2) Rock Anchor Foundations

A rock anchor foundation is not recommended at the reference site. Competent rock was not encountered at the time of the exploration. Rock anchor design considerations can be provided upon request.

6) SOIL RESISTIVITY

Soil resistivity was performed at the TEP laboratory in accordance with ASTM G187-05 (Standard Test Method for Measurement of Soil Resistivity Using the Two Electrode Soil Box Method). Test results indicated a result of 145,000 ohms/cm.

7) CONSTRUCTION CONSIDERATIONS - SHALLOW FOUNDATION

7.1) Excavation

The boring data indicates excavation to the expected subgrade level for the shallow foundation will extend through sand and gneiss bedrock. A large tracked excavator should be able to remove the sand with minimal difficulty. A large tracked excavator with rock teeth and/or a pneumatic hammer will be necessary to remove the gneiss bedrock with difficulty. TEP anticipates the depth to the surface of the rock will vary outside of the boring location. Boulders and bedrock outcroppings are common to this geographic region and may also be encountered in the excavation area.

Excavations should be sloped or shored in accordance with local, state and federal regulations, including OSHA (29 CFR Part 1926) excavation trench safety standards. It is the responsibility of the contractor for site safety. This information is provided as a service and under no circumstance should TEP be assumed responsible for construction site safety.

7.2) Foundation Evaluation/Subgrade Preparation

After excavation to the design elevation for the footing, the materials should be evaluated by a Geotechnical Engineer or a representative of the Geotechnical Engineer prior to reinforcement and concrete placement. This evaluation should include probing, shallow hand auger borings and dynamic cone penetrometer testing (ASTM STP-399) to help verify that suitable residual material lies directly under the foundation and to determine the need for any undercut and replacement of unsuitable materials. Loose surficial material should be compacted in the excavation prior to reinforcement and concrete placement to stabilize surface soil that may have become loose during the excavation process. TEP recommends a 6-inch layer of compacted crushed stone be placed just after excavation to aid in surface stability.

If the foundation excavation shows that only a portion of the foundation will bear on rock, with a portion bearing on soil, then the entire footprint should be over-excavated by a minimum of 4 inches and the bearing elevation should be re-established with a coarse graded aggregate.

7.3) Fill Placement and Compaction

Backfill materials placed above the shallow foundation to the design subgrade elevation should not contain more than 5 percent by weight of organic matter, waste, debris or any otherwise deleterious materials. To be considered for use, backfill materials should have a maximum dry density of at least 100 pounds per cubic foot as determined by standard Proctor (ASTM D 698), a Liquid Limit no greater than 40, a Plasticity Index no greater than 20, a maximum particle size of 4 inches, and 20 percent or less of the material having a particle size between 2 and 4 inches. Because small handheld or walk-behind compaction equipment will most likely be used, backfill should be placed in thin horizontal lifts not exceeding 6 inches (loose).

Fill placement should be monitored by a qualified Materials Technician working under the direction of a Geotechnical Engineer. In addition to the visual evaluation, a sufficient amount of in-place field density tests should be conducted to confirm the required compaction is being attained.

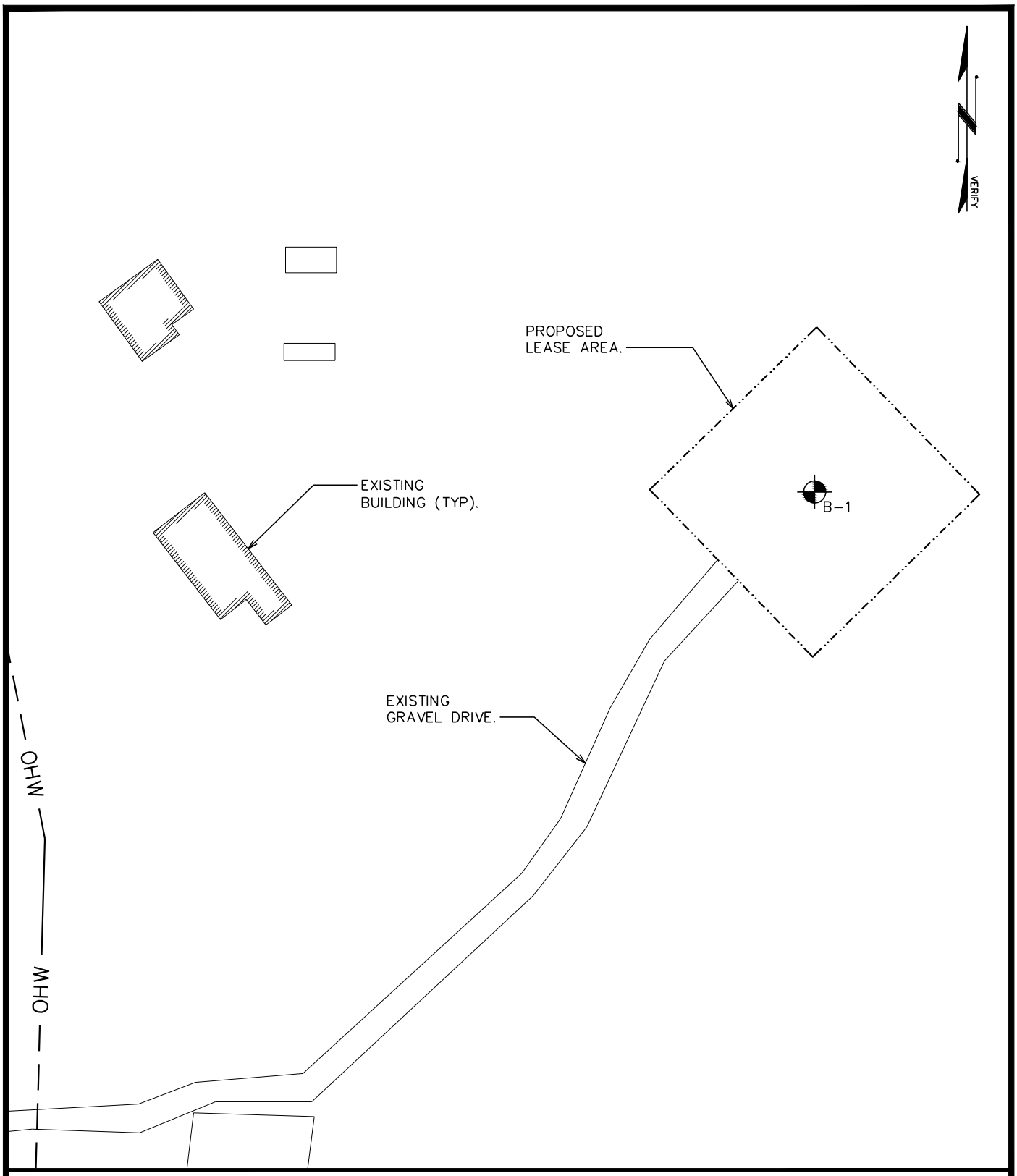
7.4) Reuse of Excavated Soil

The sand that meets the above referenced criteria can be utilized as backfill based on dry soil and site conditions at the time of construction.

If variability in the subsurface materials is encountered, a representative of the Geotechnical Engineer should verify that the design parameters are valid during construction. Modification to the design values presented above may be required in the field.

APPENDIX A

BORING LAYOUT



BORING LAYOUT

SCALE: N.T.S.

PREPARED BY:
TOWER ENGINEERING PROFESSIONALS
3703 JUNCTION BOULEVARD
RALEIGH, NC 27603-5263
(919) 661-6351
www.tepgroup.net

PREPARED FOR:
SBA COMMUNICATIONS CORPORATION
5900 BROKEN SOUND PARKWAY
BOCA RATON, FL 33486
OFFICE: (561) 226-9523

PROJECT INFORMATION:
N STONINGTON 3
SITE #: CT11796-S
350 B COSSADUCK HILL ROAD
NORTH STONINGTON, CT 06359
(NEW LONDON COUNTY)

REVISION: 0
TEP JOB #: 121203.10
SHEET NUMBER:
C-1

APPENDIX B

BORING LOG

Project: CT11796-S N. Stonington 3
Project Location: North Stonington, Connecticut
Project Number: 121203.10

Key to Log of Boring

Sheet 1 of 1

Elevation, feet	Depth, feet	Sample Type	Sample Number	Sampling Resistance, blows/foot	Relative Consistency	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10

COLUMN DESCRIPTIONS

1 **Elevation, feet:** Elevation (MSL, feet)

2 **Depth, feet:** Depth in feet below the ground surface.

3 **Sample Type:** Type of soil sample collected at the depth interval shown.

4 **Sample Number:** Sample identification number.

5 **Sampling Resistance, blows/foot:** Number of blows to advance driven sampler foot (or distance shown) beyond seating interval using the hammer identified on the boring log.

6 **Relative Consistency:** Relative consistency of the subsurface material.

7 **USCS Symbol:** USCS symbol of the subsurface material.

8 **Graphic Log:** Graphic depiction of the subsurface material encountered.

9 **MATERIAL DESCRIPTION:** Description of material encountered. May include consistency, moisture, color, and other descriptive text.

10 **REMARKS AND OTHER TESTS:** Comments and observations regarding drilling or sampling made by driller or field personnel.

FIELD AND LABORATORY TEST ABBREVIATIONS

CHEM: Chemical tests to assess corrosivity
COMP: Compaction test
CONS: One-dimensional consolidation test
LL: Liquid Limit, percent
PI: Plasticity Index, percent
SA: Sieve analysis (percent passing No. 200 Sieve)
UC: Unconfined compressive strength test, Qu, in ksf
WA: Wash sieve (percent passing No. 200 Sieve)

TYPICAL MATERIAL GRAPHIC SYMBOLS

- Well graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- Well graded GRAVEL with Silt (GW-GM)
- Well graded GRAVEL with Clay (GW-GC)
- Poorly graded GRAVEL with Silt (GP-GM)
- Poorly graded GRAVEL with Clay (GP-GC)
- Silty GRAVEL (GM)
- Clayey GRAVEL (GC)
- Well graded SAND (SW)
- Poorly graded SAND (SP)
- Well graded SAND with Silt (SW-SM)
- Well graded SAND with Clay (SW-SC)
- Poorly graded SAND with Silt (SP-SM)
- Poorly graded SAND with Clay (SP-SC)
- Silty SAND (SM)
- Clayey SAND (SC)
- SILT, SILT w/SAND, SANDY SILT (ML)
- Lean CLAY, CLAY w/SAND, SANDY CLAY (CL)
- SILT, SILT w/SAND, SANDY SILT (MH)
- Fat CLAY, CLAY w/SAND, SANDY CLAY (CH)
- SILT, SILT with SAND, SANDY SILT (ML-MH)
- Lean-Fat CLAY, CLAY w/SAND, SANDY CLAY (CL-CH)
- SILTY CLAY (CL-ML)
- Lean CLAY/PEAT (CL-OL)
- Fat CLAY/SILT (CH-MH)
- Fat CLAY/PEAT (CH-OH)
- Silty SAND to Sandy SILT (SM-ML)
- Silty SAND to Sandy SILT (SM-MH)
- Clayey SAND to Sandy CLAY (SC-CL)
- Clayey SAND to Sandy CLAY (SC-CH)
- SILT to CLAY (CL/ML)
- Silty to Clayey SAND (SC/SM)

TYPICAL SAMPLER GRAPHIC SYMBOLS

- 2-inch-OD unlined split spoon (SPT)
- 2.5-inch-OD Modified California w/ brass liners
- 3-inch-OD California w/ brass rings
- Shelby Tube (Thin-walled, fixed head)
- Grab Sample
- Bulk Sample
- Pitcher Sample
- Other sampler

OTHER GRAPHIC SYMBOLS

- Water level (at time of drilling, ATD)
- Water level (after waiting a given time)
- Minor change in material properties within a stratum
- Inferred or gradational contact between strata
- Queried contact between strata

GENERAL NOTES

1. Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2. Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

Figure 1

Q:\1203_N Stonington 3\Geotech\Boring B-1.bgs [Basic Boring Log.tpl]

Project: CT11796-S N. Stonington 3
Project Location: North Stonington, Connecticut
Project Number: 121203.10

Log of Boring B-1

Sheet 1 of 1

Date(s) Drilled **March 1, 2012**	Logged By **Cory Bauer**	Checked By **John Longest**
Drilling Method **Hollow Stem Auger**	Drill Bit Size/Type	Total Depth of Borehole **13 feet bgs**
Drill Rig Type **ATV**	Drilling Contractor **TEP**	Approximate Surface Elevation **444 feet AMSL**
Groundwater Level and Date Measured **Not Encountered ATD**	Sampling Method(s) **SPT, Other**	Hammer Data **140 lb, 30 in drop, Auto Hammer**
Borehole Backfill **Cuttings**	Location **Approximate centerline of the proposed monopole tower**	

Elevation, feet	Depth, feet	Sample Type	Sample Number	Sampling Resistance, blows/foot	Relative Consistency	USCS Symbol	Graphic Log	MATERIAL DESCRIPTION	REMARKS AND OTHER TESTS
444	0		S1	5	Loose	SP		Dark brown, fine to medium, poorly graded (SP), trace silt, moist	
439	5		S2	80	Very Dense	SW		Light brown and light gray, fine to coarse, well graded SAND (SW), with gravel, wet	
			S3	120/0"				No Recovery	
434	10		R1			GNEISS		Auger refusal - Rock Core - Gray, moderately fractured GNEISS (Recovery 100%, Rock Quality Designation 53%, Unconfined Compressive Strength 6700 psi)	Rec=100%, RQD=53%
429	15							Bottom of Boring at 13 feet bgs	

Figure 1

Q:\1203_N Stonington 3\Geotech\Boring B-1.bgs [Basic Boring Log.tpl]

Attachment 2

Sabre™ Towers & Poles

A Division of Sabre Industries, Inc.

March 26, 2012

Mr. Shawn McCoy
SBA Network Services Inc.
5900 Broken Sound Parkway NW
Boca Raton, FL 33487

RE: Proposed 190 ft Sabre Monopole for North Stonington 3, CT

Dear Mr. McCoy,

The above referenced Sabre monopole is to be designed for a Basic Wind Speed of 115 mph (no ice), 50 mph (0.75" ice), Structure Class II, Exposure Category B, and Topographic Category 3 with a crest height of 100', in accordance with the Telecommunications Industry Association Standard ANSI/TIA-222-G, "Structural Standard for Antenna Supporting Structures and Antennas".

When designed according to this standard, the wind pressures and steel strength capacities include several safety factors, resulting in an overall minimum safety factor of 25%. Therefore, it is highly unlikely that the monopole will fail structurally in a wind event where the design wind speed is exceeded within the range of the built-in safety factors.

Should the wind speed increase beyond the capacity of the built-in safety factors, to the point of failure of one or more structural elements, the most likely location of the failure would be within one of the monopole shaft sections. This would result in a buckling failure mode, where the steel shaft would bend beyond its elastic limit (beyond the point where the shaft would return to its original shape upon removal of the wind load).

Therefore, the overall effect of an extreme wind event would be localized buckling of the monopole shaft. Assuming that the wind pressure profile is similar to that used to design the monopole, the shaft will buckle at the location of the highest combined stress ratio in the upper portion of the monopole. This would result in the portion of the monopole above "folding over" onto the portion below, essentially collapsing upon itself. ***Please note that this letter only applies to a monopole designed and manufactured by Sabre Towers & Poles***. In the unlikely event of total separation, the monopole will be designed to collapse within a radius of 50% of the tower height from the base.

Sincerely,

STATE OF CONNECTICUT
ROBERT E. BEACOM
NO. 28196
LICENSED
PROFESSIONAL ENGINEER
3/26/12

Robert E. Beacom, P.E.
Engineer

Guyed Towers | Self-Supporting Towers | Monopoles | Concealment Structures | Turnkey Installations | Tower Modifications

2101 Murray Street | P.O. Box 658 | Sioux City, IA 51102-0658 | Phone 712.258.6690 | Fax 712.279.0814 | www.SabreTowersandPoles.com

Sabre Industries™
Towers and Poles

Structural Design Report

190' Monopole
Site: North Stonington 3, CT
Site Number: CT11796-S

prepared for: SBA NETWORK SERVICES INC
by: Sabre Towers & Poles ™

Job Number: 57617

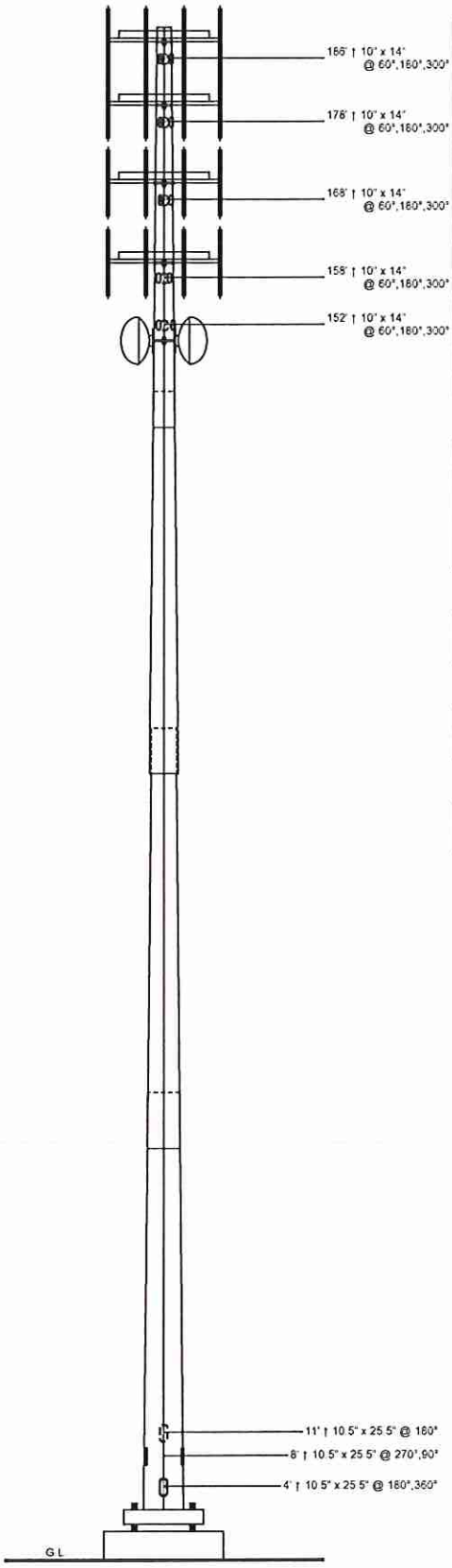
March 26, 2012

Monopole by TRJ

Foundation by RBB

Approved by RBB

Section	1	2	3	4
Length (ft)	51' - 0"	48' - 9"	53' - 6"	53' - 3"
Number Of Sides	18			
Thickness (in)	1/4"	3/8"	7/16"	1/2"
Lap Splice (ft)	A	5' - 9"	7' - 3"	
Top Diameter (in)	21.65"	31.27305"	39.88415"	49.077775"
Bottom Diameter (in)	32.7527"	41.885925"	51.5311"	60.6703"
Taper (in/ft)	0.2177			
Grade	A572-65			
Weight (lbs)	4461	7592	12147	18977



Designed Appurtenance Loading

Elev	Description	Tx-Line
190	L.P. Platform (Monopole Only) - 14' w/ Handrail	
190	(6) TMAs	
190	(12) DB848H90E-XY Panel Antennas	(24) 1 5/8"
180	L.P. Platform (Monopole Only) - 14' w/ Handrail	
180	(6) TMAs	
180	(12) DB848H90E-XY Panel Antennas	(18) 1 5/8"
170	L.P. Platform (Monopole Only) - 14' w/ Handrail	
170	(6) TMAs	
170	(12) DB848H90E-XY Panel Antennas	(18) 1 5/8"
160	L.P. Platform (Monopole Only) - 14' w/ Handrail	
160	(6) TMAs	
160	(12) DB848H90E-XY Panel Antennas	(18) 1 5/8"
150	(2) Dish Mount (Monopole Only) - Pipe Mount (up to 6' Dish)	
150	(2) 6' Solid Dishes w/ Radome	(12) 1 5/8"

Load Case Reactions

Description	Axial (kips)	Shear (kips)	Moment (ft-k)	Deflection (ft)	Sway (deg)
3s Gusted Wind	78.7	60.4	7779	20.2	12.11
3s Gusted Wind 0.9 Dead	59.6	60.4	7599	19.5	11.64
3s Gusted Wind&Ice	107.4	12.9	1682	4.4	2.66
Service Loads	63.6	9.3	1180	3.1	1.82

Base Plate Dimensions

Shape	Width	Thickness	Bolt Circle	Bolt Qty	Bolt Diameter
Square	69.75"	3"	67.5"	24	2.25"

Anchor Bolt Dimensions

Length	Diameter	Hole Diameter	Weight	Type	Finish
84"	2.25"	2.625"	3265	A615-75	Galv-18"

Material List

Display	Value
A	4' - 6"

Notes

1) Full Height Step Bolts
2) Antenna Feed Lines Run Inside Pole
3) All dimensions are above ground level, unless otherwise specified.
4) The Monopole was designed for a basic wind speed of 115 mph with 0" of radial ice, and 50 mph with 3/4" of radial ice, in accordance with ANSI/TIA-222-G, Structure Class II, Exposure Category B, Topographic Category 3, with a Crest Height of 100'.
5) Weights shown are estimates. Final weights may vary.

Sabre Industries
Towers and Poles

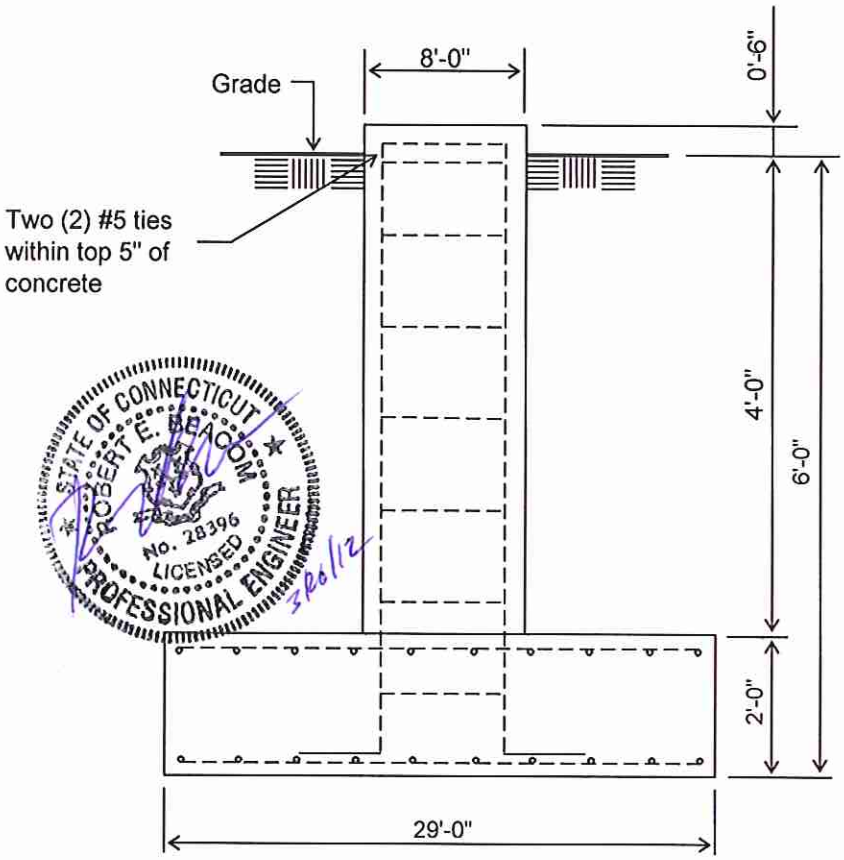
Sabre Communications Corporation
2101 Murray Street
P.O. Box 658
Sioux City, IA 51102-0658
Phone (712) 258-6690
Fax (712) 258-8250

Job:	57617
Customer:	SBA NETWORK SERVICES INC
Site Name:	North Stonington 3, CT CT11796-S
Description:	190' Monopole
Date:	3/26/2012 By: TRJ

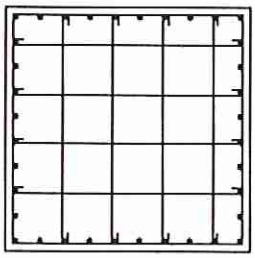
Sabre Industries
Towers and Poles

Customer: SBA NETWORK SERVICES INC
Site: North Stonington 3, CT CT11796-S

190' Monopole at
115 mph Wind with no ice and 50 mph Wind with 0.75 in. Ice per ANSI/TIA-222-G.
Antenna Loading per Page 1



ELEVATION VIEW
(72.97 Cu. Yds. each)
(1 REQUIRED; NOT TO SCALE)



Typical pier cross–section

Notes:

1). Concrete shall have a minimum 28-day compressive strength of 4000 PSI, in accordance with ACI 318-05

2). Rebar to conform to ASTM specification A615 Grade 60.

3). All rebar to have a minimum of 3" concrete cover.

4). All exposed concrete corners to be chamfered 3/4".

5). The foundation design is based on the geotechnical report by TEP project no. 121203.10, dated: 3/9/12

6). See the geotechnical report for compaction requirements, if specified.

7). The foundation is based on the following factored loads:
Moment (kip-ft) = 7779.17
Axial (kips) = 78.74
Shear (kips) = 60.41

Rebar Schedule per Pad and Pier	
Pier	(40) #10 vertical rebar w/hooks at bottom w/#5 ties, two within top 5" of top of pier then 12" C/C
Pad	(57) #9 horizontal rebar evenly spaced each way top and bottom (228 Total)

8). This is a design drawing only. Please see final construction drawings for all installation details.

9). The foundation is designed for a 15% increase in loads shown in note 7.

SABRE COMMUNICATIONS CORP	JOB: 00-57617	26-Mar-12 07:39
2101 Murray Street	SBA NETWORK SERVICES INC	Ph 712.258.6690
Sioux City, IA 51101	North Stonington 3, CT	Fx 712.258.8250

TOP	DIAMETER	21.65 in.	[21.98 in. Point-Point]
BOTTOM	DIAMETER	60.67 in.	[61.61 in. Point-Point]
POLE	HEIGHT	189.00 ft.	18 SIDED FLAT ORIENTATION
BASE	HEIGHT	1.00 ft.	ABOVE GROUND
E-MODULUS		29000 ksi	[12000 ksi SHEAR MODULUS]

APPURTENANCES

ATTACH POINTS:

NO.	X,ft	Qty	Description	Status
1	187.00	1	14' LP Platform with Handrail (R	Future Appurt
2	179.00	1	14' LP Platform with Handrail (R	Future Appurt
3	169.00	1	14' LP Platform with Handrail (R	Future Appurt
4	159.00	1	14' LP Platform with Handrail (R	Future Appurt
5	149.00	2	Pipe Mount (up to 6' Dish)	Future Appurt

Pole Section	Bottom X,ft.	Thick in.	Connect Type	LAP in.	Taper in/ft	Length ft.	Weight lbs	Steel Spec	Pole Finish
1	51.00	.25000	SLIP-JNT	54.	.2177	51.00	3711	A572-65	GALVANIZE
2	95.25	.37500	SLIP-JNT	69.	.2177	48.75	7148	A572-65	GALVANIZE
3	143.00	.43750	SLIP-JNT	87.	.2177	53.50	11443	A572-65	GALVANIZE
4	189.00	.50000	C-WELD		.2177	53.25	15635	A572-65	GALVANIZE

SECTION PROPERTIES

X,ft	UP,ft	D,in	T,in	Area in^2	Iz in^4	IxIy in^4	SxSy in^3	w/t	d/t	F_y(ksi)	
189.00	.00	21.65	.2500	16.98	1964	982	89.3	13.51	86.6	65.00	TOP
187.00	2.00	22.09	.2500	17.33	2086	1043	93.0	13.81	88.3	65.00	P01
182.00	7.00	23.17	.2500	18.19	2414	1207	102.6	14.58	92.7	65.00	
179.00	10.00	23.83	.2500	18.71	2626	1313	108.5	15.04	95.3	65.00	P02
174.00	15.00	24.92	.2500	19.57	3008	1504	118.9	15.81	99.7	65.00	
169.00	20.00	26.00	.2500	20.44	3424	1712	129.7	16.58	104.0	65.00	P03
164.00	25.00	27.09	.2500	21.30	3878	1939	141.0	17.35	108.4	65.00	
159.00	30.00	28.18	.2500	22.16	4366	2183	152.6	18.11	112.7	65.00	P04
154.00	35.00	29.27	.2500	23.03	4898	2449	164.8	18.88	117.1	65.00	
149.00	40.00	30.36	.2500	23.89	5472	2736	177.5	19.65	121.4	65.00	P05
144.00	45.00	31.45	.2500	24.75	6084	3042	190.5	20.42	125.8	65.00	
142.50	46.50	31.77	.2500	25.01	6280	3140	194.6	20.65	127.1	65.00	Slip-B01
138.00	51.00	32.25	.3750	37.94	9740	4870	297.4	13.40	86.0	65.00	Slip-T02
133.00	56.00	33.34	.3750	39.24	10772	5386	318.2	13.91	88.9	65.00	
128.00	61.00	34.43	.3750	40.53	11874	5937	339.6	14.43	91.8	65.00	
123.00	66.00	35.52	.3750	41.83	13050	6525	361.8	14.94	94.7	65.00	
118.00	71.00	36.61	.3750	43.12	14300	7150	384.7	15.45	97.6	65.00	
113.00	76.00	37.70	.3750	44.42	15628	7814	408.3	15.96	100.5	65.00	
108.00	81.00	38.78	.3750	45.71	17036	8518	432.6	16.47	103.4	65.00	
103.00	86.00	39.87	.3750	47.01	18526	9263	457.6	16.98	106.3	65.00	
99.50	89.50	40.63	.3750	47.92	19620	9810	475.5	17.34	108.4	65.00	Slip-B02
94.50	94.50	40.97	.4375	56.29	23364	11682	561.6	14.75	93.7	65.00	
93.75	95.25	41.14	.4375	56.51	23646	11823	566.1	14.82	94.0	65.00	Slip-T03
88.75	100.25	42.22	.4375	58.02	25594	12797	596.9	15.25	96.5	65.00	
83.75	105.25	43.31	.4375	59.54	27648	13824	628.6	15.69	99.0	65.00	
78.75	110.25	44.40	.4375	61.05	29806	14903	661.1	16.13	101.5	65.00	
73.75	115.25	45.49	.4375	62.56	32076	16038	694.4	16.57	104.0	65.00	
68.75	120.25	46.58	.4375	64.07	34458	17229	728.5	17.01	106.5	65.00	
63.75	125.25	47.67	.4375	65.58	36954	18477	763.5	17.45	109.0	65.00	
58.75	130.25	48.76	.4375	67.09	39570	19785	799.3	17.89	111.4	65.00	
53.75	135.25	49.84	.4375	68.60	42304	21152	835.8	18.33	113.9	65.00	
53.25	135.75	49.95	.4375	68.76	42582	21291	839.5	18.37	114.2	65.00	Slip-B03
48.25	140.75	50.17	.5000	78.82	49114	24557	964.2	15.93	100.3	65.00	
46.00	143.00	50.66	.5000	79.59	50582	25291	983.4	16.10	101.3	65.00	Slip-T04
41.00	148.00	51.74	.5000	81.32	53948	26974	1026.7	16.48	103.5	65.00	
36.00	153.00	52.83	.5000	83.05	57458	28729	1071.0	16.87	105.7	65.00	
31.00	158.00	53.92	.5000	84.78	61118	30559	1116.2	17.25	107.8	65.00	
26.00	163.00	55.01	.5000	86.50	64930	32465	1162.4	17.64	110.0	65.00	
21.00	168.00	56.10	.5000	88.23	68898	34449	1209.5	18.02	112.2	65.00	
16.00	173.00	57.19	.5000	89.96	73024	36512	1257.5	18.40	114.4	65.00	
11.00	178.00	58.28	.5000	91.69	77312	38656	1306.5	18.79	116.6	65.00	
6.00	183.00	59.36	.5000	93.41	81764	40882	1356.4	19.17	118.7	65.00	
1.00	188.00	60.45	.5000	95.14	86384	43192	1407.2	19.56	120.9	65.00	
.00	189.00	60.67	.5000	95.49	87328	43664	1417.5	19.63	121.3	65.00	BASE

SABRE COMMUNICATIONS CORP	JOB: 00-57617	26-Mar-12 07:39
2101 Murray Street	SBA NETWORK SERVICES INC	Ph 712.258.6690
Sioux City, IA 51101	North Stonington 3, CT	Fx 712.258.8250

CASE - 1: 3s Gusted Wind — **ANSI-TIA-222-G**

WIND OLF	1.60	GUSTED WIND (3sec)	115.0 mph	185.1 kph	
VERTICAL OLF	1.20	EXP-CAT/STRUC CLASS	B-II		
DESIGN ICE	.00 in	EXP-POWER COEFF.	.2857		
GUST FACTOR (Gh)	1.10	REFERENCE HEIGHT	1200.0 ft		
FORCE COEFF (Cf)	.65	PRESSURE @ 104.2 ft	56.6 psf	2708.7 Pa	
IMPORTANCE FAC (I)	1.00	BASE ABOVE Grd	1.0		
DIRECTION FAC (Kd)	.95	CREST HEIGHT	100.0 ft		
TOPOGRAPHIC CAT	3				

APPURTENANCE LOADS

#	Qty	Description	Center Line Elev-Ft	WEIGHT each Lbs	AREA each Ft^2	Tx-CABLE Type	Qty	#/Ft	WIND Psf	FORCES Tra-Y Kips	Ax-Z Kips	MOM. Lg-X Ft-K
1	1	14' LP Platform with Handrail (R	187.0	1704	92.0				68.6	6.31	-2.0	-9.5
	12	DB848H90E-XY.	189.0	28		1 5/8"	24	1.04	68.6		-6.0	
	6	TMA	189.0	8		None	1	.00	68.6		-.1	
2	1	14' LP Platform with Handrail (R	179.0	1704	92.0				68.0	6.26	-2.0	-9.4
	12	DB848H90E-XY.	179.0	28		1 5/8"	18	1.04	67.9		-4.4	
	6	TMA	179.0	8		None	1	.00	67.9		-.1	
3	1	14' LP Platform with Handrail (R	169.0	1704	92.0				67.3	6.19	-2.0	-9.3
	12	DB848H90E-XY.	169.0	28		1 5/8"	18	1.04	67.2		-4.2	
	6	TMA	169.0	8		None	1	.00	67.2		-.1	
4	1	14' LP Platform with Handrail (R	159.0	1704	92.0				66.6	6.13	-2.0	-9.2
	12	DB848H90E-XY.	159.0	28		1 5/8"	18	1.04	66.5		-4.0	
	6	TMA	159.0	8		None	1	.00	66.5		-.1	
5	2	Pipe Mount (up to 6' Dish)	149.0	49	.1				65.8	.01	-.1	.0
	2	6' SOLID DISH W/ RADOME	149.0	330	24.4	1 5/8"	12	1.04	65.8	3.21	-3.0	

RESULTS

X, ft	Kzt	WIND psf	ICE in	FORCES,kips ShearX	ShearY	AxiaZ	MOMENTS,ft-kips BendX	BendY	TorqZ	F'y ksi	Inter 4.8.2
189.00	1.02	44.62	.00	.0	.01	-.1	.0	.0	.0	82.55	.000
187.00	1.02	44.52	.00	.0	8.22	-6.9	-9.7	.0	.0	82.55	.022
182.00	1.02	44.28	.00	.0	8.68	-7.2	-51.1	.0	.0	82.55	.086
179.00	1.03	44.14	.00	.0	16.56	-12.6	-86.6	.0	.0	82.55	.138
174.00	1.03	43.90	.00	.0	17.04	-13.1	-169.3	.0	.0	82.55	.240
169.00	1.03	43.67	.00	.0	24.87	-18.5	-263.8	.0	.0	81.88	.345
164.00	1.04	43.44	.00	.0	25.34	-19.0	-388.3	.0	.0	80.98	.467
159.00	1.04	43.22	.00	.0	32.98	-24.4	-524.1	.0	.0	80.08	.589
154.00	1.04	43.00	.00	.0	33.41	-25.1	-689.0	.0	.0	79.17	.721
149.00	1.05	42.79	.00	.0	37.56	-28.4	-855.8	.0	.0	78.27	.840
144.00	1.05	42.59	.00	.0	37.82	-28.9	-1044.2	.0	.0	77.37	.963
142.50	1.05	42.53	.00	.0	38.13	-29.8	-1100.8	.0	.0	77.09	.997
138.00	1.06	42.35	.00	.0	38.65	-31.2	-1272.5	.0	.0	82.55	.703
133.00	1.07	42.16	.00	.0	39.17	-32.4	-1465.8	.0	.0	82.55	.756
128.00	1.07	41.98	.00	.0	39.66	-33.5	-1661.7	.0	.0	82.55	.802
123.00	1.08	41.82	.00	.0	40.15	-34.7	-1860.0	.0	.0	82.55	.842
118.00	1.09	41.66	.00	.0	40.65	-35.8	-2060.0	.0	.0	82.55	.877
113.00	1.10	41.52	.00	.0	41.15	-37.0	-2263.3	-.1	.0	82.55	.907
108.00	1.11	41.40	.00	.0	41.66	-38.2	-2469.2	-.1	.0	82.01	.940
103.00	1.12	41.29	.00	.0	42.12	-39.5	-2677.5	-.1	.0	81.41	.970
99.50	1.13	41.22	.00	.0	42.62	-41.0	-2825.0	-.1	.0	80.98	.990
94.50	1.15	41.14	.00	.0	42.96	-42.1	-3038.3	-.1	.0	82.55	.884
93.75	1.15	41.13	.00	.0	43.33	-43.2	-3070.0	-.1	.0	82.55	.887
88.75	1.16	41.07	.00	.0	43.94	-45.0	-3286.7	-.1	.0	82.55	.900
83.75	1.18	41.02	.00	.0	44.54	-46.5	-3506.7	-.1	.0	82.55	.912
78.75	1.20	41.00	.00	.0	45.17	-48.0	-3729.2	-.1	.0	82.41	.924
73.75	1.23	41.00	.00	.0	45.82	-49.5	-3955.0	-.1	.0	81.89	.938
68.75	1.25	41.02	.00	.0	46.50	-51.1	-4184.2	-.1	.0	81.38	.952
63.75	1.28	41.06	.00	.0	47.22	-52.7	-4416.7	-.1	.0	80.86	.965
58.75	1.31	41.11	.00	.0	47.96	-54.4	-4652.5	-.1	.0	80.34	.978
53.75	1.34	41.16	.00	.0	48.38	-55.3	-4892.5	-.1	.0	79.83	.989
53.25	1.35	41.17	.00	.0	48.85	-56.7	-4916.7	-.1	.0	79.78	.991
48.25	1.39	41.22	.00	.0	49.47	-58.5	-5160.8	-.1	.0	82.55	.875
46.00	1.41	41.25	.00	.0	50.14	-60.5	-5272.5	-.1	.0	82.45	.878
41.00	1.45	41.27	.00	.0	51.05	-62.8	-5523.3	-.1	.0	81.99	.886
36.00	1.51	41.25	.00	.0	52.01	-64.8	-5778.3	-.1	.0	81.54	.893
31.00	1.57	41.13	.00	.0	53.03	-66.7	-6038.3	-.1	.0	81.09	.901
26.00	1.63	42.07	.00	.0	54.11	-68.8	-6303.3	-.1	.0	80.64	.908
21.00	1.71	44.01	.00	.0	55.28	-70.8	-6574.2	-.1	.0	80.19	.915
16.00	1.79	46.22	.00	.0	56.53	-72.9	-6850.8	-.1	.0	79.73	.923
11.00	1.89	48.71	.00	.0	57.88	-75.1	-7133.3	-.1	.0	79.28	.930
6.00	2.00	51.55	.00	.0	59.34	-77.2	-7422.5	-.1	.0	78.83	.938
1.00	2.13	54.77	.00	.0	60.27	-78.5	-7719.2	-.1	.0	78.38	.945

SABRE COMMUNICATIONS CORP	JOB: 00-57617	26-Mar-12 07:39
2101 Murray Street	SBA NETWORK SERVICES INC	Ph 712.258.6690
Sioux City, IA 51101	North Stonington 3, CT	Fx 712.258.8250

.00 2.15 55.47 .00 .0 60.41 -78.7 7779.2 .1 .0 78.29 .947

DISPLACEMENTS

ELEV	DEFLECTION feet				ROTATION, degrees			
X, ft	X	Y	Z	XY-Result	X	Y	Z	XY-Result
189.00	.00	20.15	-1.52	20.15<10.66%>	-12.11	.00	.00	12.11

SABRE COMMUNICATIONS CORP	JOB: 00-57617	26-Mar-12 07:39
2101 Murray Street	SBA NETWORK SERVICES INC	Ph 712.258.6690
Sioux City, IA 51101	North Stonington 3, CT	Fx 712.258.8250

CASE - 2: 3s Gusted Wind 0.9 Dead — **ANSI-TIA-222-G**

WIND OLF	1.60		GUSTED WIND (3sec)	115.0 mph	185.1 kph
VERTICAL OLF	.90		EXP-CAT/STRUC CLASS	B-II	
DESIGN ICE	.00	in	EXP-POWER COEFF.	.2857	
GUST FACTOR (Gh)	1.10		REFERENCE HEIGHT	1200.0 ft	
FORCE COEFF (Cf)	.65		PRESSURE @ 104.2 ft	56.6 psf	2708.7 Pa
IMPORTANCE FAC (I)	1.00		BASE ABOVE Grd	1.0	
DIRECTION FAC (Kd)	.95		CREST HEIGHT	100.0 ft	
TOPOGRAPHIC CAT	3				

APPURTENANCE LOADS

#	Qty	Description	Center Line Elev-Ft	WEIGHT each Lbs	AREA each Ft^2	Tx-CABLE Type	Qty	#/Ft	WIND Psf	FORCES Tra-Y Kips	Ax-Z Kips	MOM. Lg-X Ft-K
_ 1	1	14' LP Platform with Handrail (R	187.0	1704	92.0				68.6	6.31	-1.5	-9.5
	12	DB848H90E-XY.	189.0	28		1 5/8"	24	1.04	68.6		-4.5	
	6	TMA	189.0	8		None	1	.00	68.6		.0	
_ 2	1	14' LP Platform with Handrail (R	179.0	1704	92.0				68.0	6.26	-1.5	-9.4
	12	DB848H90E-XY.	179.0	28		1 5/8"	18	1.04	67.9		-3.3	
	6	TMA	179.0	8		None	1	.00	67.9		.0	
_ 3	1	14' LP Platform with Handrail (R	169.0	1704	92.0				67.3	6.19	-1.5	-9.3
	12	DB848H90E-XY.	169.0	28		1 5/8"	18	1.04	67.2		-3.1	
	6	TMA	169.0	8		None	1	.00	67.2		.0	
_ 4	1	14' LP Platform with Handrail (R	159.0	1704	92.0				66.6	6.13	-1.5	-9.2
	12	DB848H90E-XY.	159.0	28		1 5/8"	18	1.04	66.5		-3.0	
	6	TMA	159.0	8		None	1	.00	66.5		.0	
5	2	Pipe Mount (up to 6' Dish)	149.0	49	.1				65.8	.01	-.1	.0
	2	6' SOLID DISH W/ RADOME	149.0	330	24.4	1 5/8"	12	1.04	65.8	3.21	-2.3	

RESULTS

X, ft	Kzt	WIND psf	ICE in	FORCES,kips ShearX	ShearY	AxiaZ	MOMENTS,ft-kips BendX	BendY	TorqZ	F'y ksi	Inter 4.8.2
189.00	1.02	44.62	.00	.0	.01	-.1	.0	.0	.0	82.55	.000
187.00	1.02	44.52	.00	.0	7.74	-4.9	-9.6	.0	.0	82.55	.021
182.00	1.02	44.28	.00	.0	8.19	-5.1	-48.7	.0	.0	82.55	.081
179.00	1.03	44.14	.00	.0	15.68	-8.9	-82.7	.0	.0	82.55	.130
174.00	1.03	43.90	.00	.0	16.16	-9.3	-161.1	.0	.0	82.55	.226
169.00	1.03	43.67	.00	.0	23.64	-13.1	-251.2	.0	.0	81.88	.325
164.00	1.04	43.44	.00	.0	24.12	-13.5	-369.4	.0	.0	80.98	.441
159.00	1.04	43.22	.00	.0	31.46	-17.3	-499.2	.0	.0	80.08	.557
154.00	1.04	43.00	.00	.0	31.92	-17.9	-656.5	.0	.0	79.17	.683
149.00	1.05	42.79	.00	.0	35.96	-20.3	-816.1	.0	.0	78.27	.797
144.00	1.05	42.59	.00	.0	36.25	-20.7	-995.8	.0	.0	77.37	.915
142.50	1.05	42.53	.00	.0	36.58	-21.4	-1050.0	.0	.0	77.09	.947
138.00	1.06	42.35	.00	.0	37.11	-22.5	-1215.0	.0	.0	82.55	.669
133.00	1.07	42.16	.00	.0	37.65	-23.5	-1400.0	.0	.0	82.55	.719
128.00	1.07	41.98	.00	.0	38.18	-24.3	-1588.3	.0	.0	82.55	.764
123.00	1.08	41.82	.00	.0	38.71	-25.2	-1779.2	.0	.0	82.55	.803
118.00	1.09	41.66	.00	.0	39.25	-26.2	-1973.3	.0	.0	82.55	.837
113.00	1.10	41.52	.00	.0	39.80	-27.1	-2169.2	.0	.0	82.55	.867
108.00	1.11	41.40	.00	.0	40.36	-28.1	-2368.3	-.1	.0	82.01	.899
103.00	1.12	41.29	.00	.0	40.86	-29.0	-2570.0	-.1	.0	81.41	.929
99.50	1.13	41.22	.00	.0	41.39	-30.2	-2713.3	-.1	.0	80.98	.949
94.50	1.15	41.14	.00	.0	41.75	-31.1	-2920.0	-.1	.0	82.55	.848
93.75	1.15	41.13	.00	.0	42.14	-32.0	-2951.7	-.1	.0	82.55	.850
88.75	1.16	41.07	.00	.0	42.79	-33.3	-3162.5	-.1	.0	82.55	.864
83.75	1.18	41.02	.00	.0	43.45	-34.5	-3375.8	-.1	.0	82.55	.876
78.75	1.20	41.00	.00	.0	44.13	-35.7	-3593.3	-.1	.0	82.41	.888
73.75	1.23	41.00	.00	.0	44.84	-36.9	-3814.2	-.1	.0	81.89	.903
68.75	1.25	41.02	.00	.0	45.58	-38.1	-4038.3	-.1	.0	81.38	.917
63.75	1.28	41.06	.00	.0	46.36	-39.4	-4265.8	-.1	.0	80.86	.930
58.75	1.31	41.11	.00	.0	47.17	-40.7	-4497.5	-.1	.0	80.34	.943
53.75	1.34	41.16	.00	.0	47.63	-41.4	-4733.3	-.1	.0	79.83	.955
53.25	1.35	41.17	.00	.0	48.13	-42.5	-4757.5	-.1	.0	79.78	.956
48.25	1.39	41.22	.00	.0	48.79	-43.9	-4998.3	-.1	.0	82.55	.845
46.00	1.41	41.25	.00	.0	49.49	-45.4	-5108.3	-.1	.0	82.45	.848
41.00	1.45	41.27	.00	.0	50.47	-47.2	-5355.0	-.1	.0	81.99	.856
36.00	1.51	41.25	.00	.0	51.50	-48.7	-5607.5	-.1	.0	81.54	.864
31.00	1.57	41.13	.00	.0	52.59	-50.3	-5865.0	-.1	.0	81.09	.872
26.00	1.63	42.07	.00	.0	53.75	-51.9	-6128.3	-.1	.0	80.64	.880
21.00	1.71	44.01	.00	.0	55.00	-53.5	-6396.7	-.1	.0	80.19	.888
16.00	1.79	46.22	.00	.0	56.33	-55.1	-6671.7	-.1	.0	79.73	.896
11.00	1.89	48.71	.00	.0	57.76	-56.7	-6953.3	-.1	.0	79.28	.904
6.00	2.00	51.55	.00	.0	59.31	-58.4	-7242.5	-.1	.0	78.83	.912
1.00	2.13	54.77	.00	.0	60.29	-59.5	-7539.2	-.1	.0	78.38	.921

SABRE COMMUNICATIONS CORP	JOB: 00-57617	26-Mar-12 07:39
2101 Murray Street	SBA NETWORK SERVICES INC	Ph 712.258.6690
Sioux City, IA 51101	North Stonington 3, CT	Fx 712.258.8250

.00 2.15 55.47 .00 .0 60.43 -59.6 7599.2 .1 .0 78.29 .922

DISPLACEMENTS

ELEV	DEFLECTION feet				ROTATION, degrees			
X, ft	X	Y	Z	XY-Result	X	Y	Z	XY-Result
189.00	.00	19.46	-1.41	19.46<10.30%>	-11.64	.00	.00	11.64

SABRE COMMUNICATIONS CORP	JOB: 00-57617	26-Mar-12 07:39
2101 Murray Street	SBA NETWORK SERVICES INC	Ph 712.258.6690
Sioux City, IA 51101	North Stonington 3, CT	Fx 712.258.8250

CASE - 3: 3s Gusted Wind&Ice — **ANSI-TIA-222-G**

WIND OLF	1.00	GUSTED WIND (3sec)	50.0 mph	80.5 kph	
VERTICAL OLF	1.20	EXP-CAT/STRUC CLASS	B-II		
DESIGN ICE	.75 in	EXP-POWER COEFF.	.2857		
GUST FACTOR (Gh)	1.10	REFERENCE HEIGHT	1200.0 ft		
FORCE COEFF (Cf)	1.20	PRESSURE @ 104.2 ft	6.7 psf	320.0 Pa	
IMPORTANCE FAC (I)	1.00	BASE ABOVE Grd	1.0		
DIRECTION FAC (Kd)	.95	CREST HEIGHT	100.0 ft		
TOPOGRAPHIC CAT	3				

APPURTENANCE LOADS

#	Qty	Description	Center Line Elev-Ft	WEIGHT each Lbs	AREA each Ft^2	Tx-CABLE Type	Qty	#/Ft	WIND Psf	FORCES Tra-Y Kips	Ax-Z Kips	MOM. Lg-X Ft-K
1	1	14' LP Platform with Handrail (R	187.0	1874	151.0				8.1	1.22	-7.5	-1.8
	12	DB848H90E-XY.	189.0	55		1 5/8"	24	1.04	8.1		-9.0	
	6	TMA	189.0	11		None	1	.00	8.1		-.3	
2	1	14' LP Platform with Handrail (R	179.0	1874	150.8				8.0	1.21	-7.5	-1.8
	12	DB848H90E-XY.	179.0	55		1 5/8"	18	1.04	8.0		-7.4	
	6	TMA	179.0	11		None	1	.00	8.0		-.3	
3	1	14' LP Platform with Handrail (R	169.0	1874	150.6				8.0	1.20	-7.5	-1.8
	12	DB848H90E-XY.	169.0	55		1 5/8"	18	1.04	7.9		-7.2	
	6	TMA	169.0	11		None	1	.00	7.9		-.3	
4	1	14' LP Platform with Handrail (R	159.0	1874	150.3				7.9	1.18	-7.4	-1.8
	12	DB848H90E-XY.	159.0	55		1 5/8"	18	1.04	7.9		-6.9	
	6	TMA	159.0	11		None	1	.00	7.9		-.3	
5	2	Pipe Mount (up to 6' Dish)	149.0	53	.1				7.8	.00	-.1	.0
	2	6' SOLID DISH W/ RADOME	149.0	838	25.1	1 5/8"	12	1.04	7.8	.39	-3.0	

RESULTS

X, ft	Kzt	WIND psf	ICE in	FORCES,kips ShearX	ShearY	AxiaZ	MOMENTS,ft-kips BendX	BendY	TorqZ	F'y ksi	Inter 4.8.2
189.00	1.02	9.73	1.80	.0	.01	-.1	.0	.0	.0	82.55	.000
187.00	1.02	9.71	1.80	.0	1.86	-12.0	-1.9	.0	.0	82.55	.013
182.00	1.02	9.66	1.80	.0	1.99	-12.5	-11.3	.0	.0	82.55	.027
179.00	1.03	9.63	1.79	.0	3.76	-23.0	-19.1	.0	.0	82.55	.045
174.00	1.03	9.58	1.79	.0	3.90	-23.7	-37.9	.0	.0	82.55	.068
169.00	1.03	9.53	1.79	.0	5.65	-34.0	-59.2	.0	.0	81.88	.097
164.00	1.04	9.48	1.78	.0	5.77	-34.8	-87.4	.0	.0	80.98	.125
159.00	1.04	9.43	1.78	.0	7.46	-45.0	-118.1	.0	.0	80.08	.157
154.00	1.04	9.38	1.78	.0	7.55	-45.8	-155.3	.0	.0	79.17	.187
149.00	1.05	9.33	1.77	.0	8.15	-49.8	-193.2	.0	.0	78.27	.215
144.00	1.05	9.29	1.77	.0	8.20	-50.4	-233.9	.0	.0	77.37	.241
142.50	1.05	9.28	1.77	.0	8.27	-51.3	-246.2	.0	.0	77.09	.248
138.00	1.06	9.24	1.77	.0	8.38	-52.8	-283.4	.0	.0	82.55	.173
133.00	1.07	9.20	1.76	.0	8.49	-54.2	-325.3	.0	.0	82.55	.184
128.00	1.07	9.16	1.76	.0	8.59	-55.4	-367.7	.0	.0	82.55	.193
123.00	1.08	9.12	1.76	.0	8.69	-56.7	-410.7	.0	.0	82.55	.202
118.00	1.09	9.09	1.76	.0	8.79	-58.0	-454.1	.0	.0	82.55	.209
113.00	1.10	9.06	1.76	.0	8.89	-59.4	-498.0	.0	.0	82.55	.215
108.00	1.11	9.03	1.75	.0	8.99	-60.7	-542.5	.0	.0	82.01	.222
103.00	1.12	9.01	1.75	.0	9.08	-62.1	-587.4	.0	.0	81.41	.228
99.50	1.13	8.99	1.75	.0	9.19	-63.8	-619.3	.0	.0	80.98	.233
94.50	1.15	8.97	1.75	.0	9.25	-65.0	-665.2	.0	.0	82.55	.207
93.75	1.15	8.97	1.75	.0	9.33	-66.3	-672.1	.0	.0	82.55	.208
88.75	1.16	8.96	1.75	.0	9.46	-68.2	-718.8	.0	.0	82.55	.210
83.75	1.18	8.95	1.75	.0	9.58	-69.9	-766.0	.0	.0	82.55	.213
78.75	1.20	8.94	1.75	.0	9.71	-71.7	-813.9	.0	.0	82.41	.215
73.75	1.23	8.94	1.75	.0	9.84	-73.5	-862.5	.0	.0	81.89	.218
68.75	1.25	8.95	1.75	.0	9.98	-75.3	-911.7	.0	.0	81.38	.221
63.75	1.28	8.96	1.75	.0	10.13	-77.2	-961.7	.0	.0	80.86	.224
58.75	1.31	8.97	1.75	.0	10.28	-79.1	-1012.5	.0	.0	80.34	.227
53.75	1.34	8.98	1.75	.0	10.37	-80.2	-1063.3	.0	.0	79.83	.229
53.25	1.35	8.98	1.75	.0	10.47	-81.8	-1069.2	.0	.0	79.78	.229
48.25	1.39	8.99	1.75	.0	10.60	-83.8	-1120.8	.0	.0	82.55	.202
46.00	1.41	9.00	1.75	.0	10.74	-86.0	-1145.0	.0	.0	82.45	.203
41.00	1.45	9.00	1.75	.0	10.93	-88.7	-1198.3	.0	.0	81.99	.205
36.00	1.51	9.00	1.75	.0	11.14	-91.0	-1253.3	.0	.0	81.54	.206
31.00	1.57	8.97	1.75	.0	11.35	-93.3	-1309.2	.0	.0	81.09	.208
26.00	1.63	9.18	1.75	.0	11.58	-95.7	-1365.8	.0	.0	80.64	.210
21.00	1.71	9.60	1.74	.0	11.83	-98.1	-1423.3	.0	.0	80.19	.211
16.00	1.79	10.08	1.72	.0	12.10	-100.6	-1482.5	.0	.0	79.73	.213
11.00	1.89	10.62	1.69	.0	12.39	-103.1	-1543.3	.0	.0	79.28	.214
6.00	2.00	11.24	1.64	.0	12.70	-105.7	-1605.0	.0	.0	78.83	.216
1.00	2.13	11.95	1.48	.0	12.90	-107.2	-1669.2	.0	.0	78.38	.218

.00 2.15 12.10 1.38 .0 12.93 -107.4 1681.7 .0 .0 78.29 .218

DISPLACEMENTS

ELEV	DEFLECTION feet				ROTATION, degrees			
X, ft	X	Y	Z	XY-Result	X	Y	Z	XY-Result
189.00	.00	4.42	-.08	4.42< 2.34%>	-2.66	.00	.00	2.66

SABRE COMMUNICATIONS CORP	JOB: 00-57617	26-Mar-12 07:39
2101 Murray Street	SBA NETWORK SERVICES INC	Ph 712.258.6690
Sioux City, IA 51101	North Stonington 3, CT	Fx 712.258.8250

CASE - 4: Service Loads — ANSI-TIA-222-G

WIND OLF	1.00	GUSTED WIND (3sec)	60.0 mph	96.6 kph	
VERTICAL OLF	1.00	EXP-CAT/STRUC CLASS	B-II		
DESIGN ICE	.00 in	EXP-POWER COEFF.	.2857		
GUST FACTOR (Gh)	1.10	REFERENCE HEIGHT	1200.0 ft		
FORCE COEFF (Cf)	.65	PRESSURE @ 104.2 ft	8.6 psf	412.3 Pa	
IMPORTANCE FAC (I)	1.00	BASE ABOVE Grd	1.0		
DIRECTION FAC (Kd)	.85	CREST HEIGHT	100.0 ft		
TOPOGRAPHIC CAT	3				

APPURTENANCE LOADS

#	Qty	Description	Center Line Elev-Ft	WEIGHT each Lbs	AREA each Ft^2	Tx-CABLE Type	Qty	#/Ft	WIND Psf	FORCES Tra-Y Kips	Ax-Z Kips	MOM. Lg-X Ft-K
1	1	14' LP Platform with Handrail (R	187.0	1704	92.0				10.4	.96	-1.7	-1.4
	12	DB848H90E-XY.	189.0	28		1 5/8"	24	1.04	10.4		-5.0	
	6	TMA	189.0	8		None	1	.00	10.4		.0	
2	1	14' LP Platform with Handrail (R	179.0	1704	92.0				10.4	.95	-1.7	-1.4
	12	DB848H90E-XY.	179.0	28		1 5/8"	18	1.04	10.3		-3.7	
	6	TMA	179.0	8		None	1	.00	10.3		.0	
3	1	14' LP Platform with Handrail (R	169.0	1704	92.0				10.2	.94	-1.7	-1.4
	12	DB848H90E-XY.	169.0	28		1 5/8"	18	1.04	10.2		-3.5	
	6	TMA	169.0	8		None	1	.00	10.2		.0	
4	1	14' LP Platform with Handrail (R	159.0	1704	92.0				10.1	.93	-1.7	-1.4
	12	DB848H90E-XY.	159.0	28		1 5/8"	18	1.04	10.1		-3.3	
	6	TMA	159.0	8		None	1	.00	10.1		.0	
5	2	Pipe Mount (up to 6' Dish)	149.0	49	.1				10.0	.00	-.1	.0
	2	6' SOLID DISH W/ RADOME	149.0	330	24.4	1 5/8"	12	1.04	10.0	.49	-2.5	

RESULTS

X, ft	Kzt	WIND psf	ICE in	FORCES,kips ShearX	ShearY	AxiaZ	MOMENTS,ft-kips BendX	BendY	TorqZ	F'y ksi	Inter 4.8.2
189.00	1.02	6.79	.00	.0	.00	-.1	.0	.0	.0	82.55	.000
187.00	1.02	6.78	.00	.0	1.23	-7.0	-1.5	.0	.0	82.55	.008
182.00	1.02	6.74	.00	.0	1.30	-7.2	-7.7	.0	.0	82.55	.017
179.00	1.03	6.72	.00	.0	2.49	-12.9	-13.0	.0	.0	82.55	.029
174.00	1.03	6.68	.00	.0	2.56	-13.2	-25.4	.0	.0	82.55	.044
169.00	1.03	6.65	.00	.0	3.74	-18.8	-39.6	.0	.0	81.88	.062
164.00	1.04	6.61	.00	.0	3.81	-19.2	-58.3	.0	.0	80.98	.081
159.00	1.04	6.58	.00	.0	4.96	-24.6	-78.8	.0	.0	80.08	.101
154.00	1.04	6.55	.00	.0	5.03	-25.0	-103.6	.0	.0	79.17	.121
149.00	1.05	6.51	.00	.0	5.65	-28.0	-128.8	.0	.0	78.27	.140
144.00	1.05	6.48	.00	.0	5.69	-28.3	-157.0	.0	.0	77.37	.158
142.50	1.05	6.47	.00	.0	5.74	-28.9	-165.6	.0	.0	77.09	.164
138.00	1.06	6.45	.00	.0	5.82	-29.9	-191.4	.0	.0	82.55	.115
133.00	1.07	6.42	.00	.0	5.90	-30.7	-220.5	.0	.0	82.55	.122
128.00	1.07	6.39	.00	.0	5.97	-31.4	-250.0	.0	.0	82.55	.129
123.00	1.08	6.37	.00	.0	6.05	-32.1	-279.8	.0	.0	82.55	.135
118.00	1.09	6.34	.00	.0	6.13	-32.9	-310.1	.0	.0	82.55	.140
113.00	1.10	6.32	.00	.0	6.21	-33.6	-340.8	.0	.0	82.55	.145
108.00	1.11	6.30	.00	.0	6.29	-34.4	-371.8	.0	.0	82.01	.150
103.00	1.12	6.28	.00	.0	6.36	-35.2	-403.2	.0	.0	81.41	.155
99.50	1.13	6.27	.00	.0	6.44	-36.3	-425.4	.0	.0	80.98	.158
94.50	1.15	6.26	.00	.0	6.49	-37.1	-457.7	.0	.0	82.55	.141
93.75	1.15	6.26	.00	.0	6.55	-37.9	-462.5	.0	.0	82.55	.141
88.75	1.16	6.25	.00	.0	6.64	-39.1	-495.3	.0	.0	82.55	.143
83.75	1.18	6.24	.00	.0	6.74	-40.2	-528.4	.0	.0	82.55	.145
78.75	1.20	6.24	.00	.0	6.84	-41.2	-562.2	.0	.0	82.41	.147
73.75	1.23	6.24	.00	.0	6.94	-42.3	-596.3	.0	.0	81.89	.149
68.75	1.25	6.24	.00	.0	7.05	-43.4	-631.1	.0	.0	81.38	.151
63.75	1.28	6.25	.00	.0	7.17	-44.5	-666.3	.0	.0	80.86	.153
58.75	1.31	6.26	.00	.0	7.29	-45.6	-702.2	.0	.0	80.34	.155
53.75	1.34	6.27	.00	.0	7.36	-46.3	-738.6	.0	.0	79.83	.157
53.25	1.35	6.27	.00	.0	7.43	-47.3	-742.3	.0	.0	79.78	.157
48.25	1.39	6.28	.00	.0	7.53	-48.7	-779.4	.0	.0	82.55	.139
46.00	1.41	6.28	.00	.0	7.63	-50.2	-796.3	.0	.0	82.45	.139
41.00	1.45	6.28	.00	.0	7.78	-51.9	-834.2	.0	.0	81.99	.141
36.00	1.51	6.28	.00	.0	7.93	-53.3	-873.3	.0	.0	81.54	.142
31.00	1.57	6.26	.00	.0	8.10	-54.8	-913.3	.0	.0	81.09	.143
26.00	1.63	6.40	.00	.0	8.27	-56.3	-953.3	.0	.0	80.64	.145
21.00	1.71	6.70	.00	.0	8.46	-57.8	-995.0	.0	.0	80.19	.146
16.00	1.79	7.04	.00	.0	8.66	-59.3	-1037.5	.0	.0	79.73	.147
11.00	1.89	7.42	.00	.0	8.87	-60.9	-1080.8	.0	.0	79.28	.148
6.00	2.00	7.85	.00	.0	9.10	-62.5	-1125.0	.0	.0	78.83	.150
1.00	2.13	8.34	.00	.0	9.25	-63.4	-1170.0	.0	.0	78.38	.151

.00 2.15 8.44 .00 .0 9.27 -63.6 1180.0 .0 .0 78.29 .151

DISPLACEMENTS

ELEV	DEFLECTION feet				ROTATION, degrees				MicroW
X, ft	X	Y	Z	XY-Result	X	Y	Z	XY-Result	AlloW
189.00	.00	3.05	-.04	3.05< 1.62%>	-1.82	.00	.00	1.82	

SABRE COMMUNICATIONS CORP	JOB: 00-57617	26-Mar-12 07:39
2101 Murray Street	SBA NETWORK SERVICES INC	Ph 712.258.6690
Sioux City, IA 51101	North Stonington 3, CT	Fx 712.258.8250

SHAPE: 18 SIDED POLYGON with FLAT-FLAT ORIENTATION
BOLTS: QUADRANT SPACED BOLTS 6.00 in. ON CENTER
LOCATE:

POLE DATA

DIAMETER	= 60.67 in.	BASE	AXIAL FORCE=	-78.7 kips	Vert
PLATE	= .5000 in.	ACTIONS	SHEAR X =	38.8 kips	Long
TAPER	= .2177 in/ft		SHEAR Y =	46.3 kips	Tran
POLE Fy	= 65.00 ksi		X-AXIS MOM =	5499.9 ft-kips	Tran
			Y-Axis MOM =	5499.9 ft-kips	Long
			Z-Axis MOM =	.0 ft-kips	Vert

DESIGN CASE = 1 3s Gusted Wind

Design: ANY Orientation Reactions at 45.00 deg to X-AXIS

BOLT LOADS

	AXIAL - COMPRESSION	= 233.77 kips		
	AXIAL - TENSION	= 227.21 kips		
	SHEAR	= 3.55 kips		
AXIAL	STRESS	= 71.93 ksi		
SHEAR	STRESS	= 1.15 ksi		
YIELD	STRENGTH Fy	= 75.00 ksi		
ULT.	STRENGTH Fu	= 100.00 ksi	Interaction	
ALLOW	STRESS Fa [.80 x 1.00]	= 80.00 ksi	.928	TIA-G
	SHEAR Fv [.80 x .40]	= 32.00 ksi		
	TENSION AREA REQUIRED	= 2.92 in^2		
	TENSION AREA FURNISHED	= 3.25 in^2		
	ROOT AREA FURNISHED	= 3.07 in^2		

A615 ::: ANCHOR BOLT DESIGN USED			
24 Bolts on a	67.500 in.	Bolt Circle	SHIP
2.250 in. Diameter	67.13 in.	Embedded	(lbs)
12.00 in. Exposed	84.00 in.	Total Length	3189

CONCRETE - Fc= 4000 psi

ANCHOR BOLTS are STRAIGHT w\ UPLIFT NUT

BASE PLATE

[Bend Model: 1/4 Circ]

YIELD STRENGTH	=	50.0 ksi
BEND LINE WIDTH	=	48.1 in.
PLATE MOMENT	=	4245.7 in-k
THICKNESS REQD	=	2.800 in.
BENDING STRESS	=	39.2 ksi
ALLOWABLE STRESS	=	45.0 ksi

[Fy x .90 x 1.00]

BASE PLATE USED			
3.00	in.	THICK	SHIP
69.75	in.	SQUARE	(lbs)
48.25	in.	CENTER HOLE	1972
17.00	in.	CORNER CLIP	

LOAD CASE SUMMARY

	FORCES-(kips)			MOMENTS-(ft-k)			ABolt-Str	Plate-Str		
							Allow	Actual	Allow	Design
LC	Axial	ShearX	ShearY	X-axis	Y-axis	TorQ	CSR	ksi	ksi	ksi	Code
1	78.7	38.8	46.3	4989	5967	0	.928	75.00	39.20	45.00	TIA-G
2	59.6	38.8	46.4	4874	5829	0	.904	75.00	38.16	45.00	TIA-G
3	107.4	8.3	9.9	1078	1290	0	.215	75.00	9.14	45.00	TIA-G
4	63.6	5.9	7.1	756	905	0	.149	75.00	6.33	45.00	TIA-G

MAT FOUNDATION DESIGN BY SABRE TOWERS & POLES

190' Monopole SBA NETWORK SERVICES INC North Stonington 3, CT (57617) 3-26-12 REB

Overall Loads:			
Factored Moment (ft-kips)	8946.05		
Factored Axial (kips)	90.55		
Factored Shear (kips)	69.47		
Bearing Design Strength (ksf)	**34.70**	Max. Net Bearing Press. (ksf)	5.55
Water Table Below Grade (ft)	**999**		
Width of Mat (ft)	29	Ultimate Bearing Pressure (ksf)	**46.27**
Thickness of Mat (ft)	2	Bearing Φs	**0.75**
Depth to Bottom of Slab (ft)	6		
Quantity of Bolts in Bolt Circle	24		
Bolt Circle Diameter (in)	67.5		
Top of Concrete to Top of Bottom Threads (in)	60		
Equivalent Diameter of Pier (ft)	9.03	Minimum Pier Diameter (ft)	7.13
Ht. of Pier Above Ground (ft)	0.5	Equivalent Square b (ft)	8.00
Ht. of Pier Below Ground (ft)	4		
Quantity of Bars in Mat	57		
Bar Diameter in Mat (in)	1.128		
Area of Bars in Mat (in^2)	56.96		
Spacing of Bars in Mat (in)	6.09	Recommended Spacing (in)	6 to 12
Quantity of Bars Pier	40		
Bar Diameter in Pier (in)	1.27		
Tie Bar Diameter in Pier (in)	0.625		
Spacing of Ties (in)	12		
Area of Bars in Pier (in^2)	50.67	Minimum Pier A_s (in^2)	46.11
Spacing of Bars in Pier (in)	7.84	Recommended Spacing (in)	6 to 12
f'c (ksi)	4		
fy (ksi)	60		
Unit Wt. of Soil (kcf)	**0.116**		
Unit Wt. of Concrete (kcf)	0.15		
Volume of Concrete (yd^3)	72.97		
Two-Way Shear Action:			
Average d (in)	19.872		
ϕV_c (kips)	1508.7	V_u (kips)	142.4
$\phi V_c = \phi(2 + 4/\beta_c)f'_c{}^{1/2}b_o d$	2278.4		
$\phi V_c = \phi(\alpha_s d/b_o + 2)f'_c{}^{1/2}b_o d$	1508.7		
$\phi V_c = \phi 4 f'_c{}^{1/2}b_o d$	1518.9		
Shear perimeter, b_o (in)	402.85		
β_c	1		
One-Way Shear:			
ϕV_c (kips)	743.5	V_u (kips)	599.0
Stability:			
Overturning Design Strength (ft-k)	9546.0	Total Applied M (ft-k)	9397.6

A-1

MAT FOUNDATION DESIGN BY SABRE TOWERS & POLES (CONTINUED)
190' Monopole SBA NETWORK SERVICES INC North Stonington 3, CT (57617) 3-26-12 REB

Pier Design:

ϕV_n (kips)	1014.9	V_u (kips)	69.5
$\phi V_c=\phi 2(1+N_u/(2000A_g))f'_c{}^{1/2}b_wd$	1014.9		
V_s (kips)	0.0	*** V_s max = 4 $f'_c{}^{1/2}b_wd$ (kips)	2376.4
Maximum Spacing (in)	6.80	(Only if Shear Ties are Required)	
Actual Hook Development (in)	18.74	Req'd Hook Development l_{dh} (in)	16.87
		*** Ref. To Spacing Requirements ACI 11.5.4.3	

Flexure in Slab:

ϕM_n (ft-kips)	4723.5	M_u (ft-kips)	4421.6
a (in)	2.89		
Steel Ratio	0.00824		
β_1	0.85		
Maximum Steel Ratio (.75p_b)	0.0214		
Minimum Steel Ratio	0.0018		
Rebar Development in Pad (in)	171.00	Required Development in Pad (in)	49.82

Condition	1 is OK, 0 Fails
Maximum Soil Bearing Pressure	1
Pier Area of Steel	1
Pier Shear	1
Interaction Diagram Visual Check	1
Two-Way Shear Action	1
One-Way Shear Action	1
Overturning	1
Flexure	1
Steel Ratio	1
Length of Development in Pad	1
Hook Development	1

Attachment 3

Simply Intelligent

KMW Communications
Base Station Antennas
For Mobile Communications

AM-X-CD-17-65-00T-RET(8' 65° Dual Broadband Antenna)

Dual Band Electrical DownTilt Antenna

698 ~ 894MHz, X-pol., H65° / V8.0°
1710 ~ 2170MHz, X-pol., H65° / V7.0°

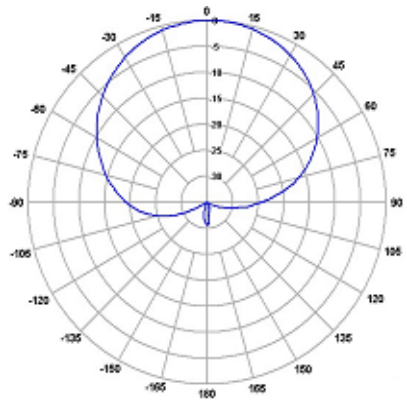
Electrical Specification

Frequency Range		698~894MHz	1710~2170MHz
Impedance		50Ω	
Polarization		Dual, Slant ±45°	
Gain		16.8dBi / 14.65dBd @ 698-806MHz 17.5dBi / 15.35dBd @ 824-894MHz	17.0dBi / 14.85dBd @ 1710-1755MHz 17.3dBi / 15.15dBd @ 1850-1900MHz 17.5dBi / 15.35dBd @ 2110-2155MHz
Beamwidth	Horizontal	68° @ 698-806MHz 63° @ 824-894MHz	67° @ 1710-1755MHz 65° @ 1850-1900MHz 62° @ 2110-2155MHz
	Vertical	9.2° @ 698-806MHz 8.0° @ 824-894MHz	7.3° @ 1710-1755MHz 7.0° @ 1850-1900MHz 6.7° @ 2110-2155MHz
VSWR		≤1.5:1	
Front-to-Back Ratio		≥27 dB	
Electrical Downtilt Range		2° ~ 16°	0° ~ 10°
Isolation Between Ports		≥30 dB	
Isolation Between Ports of Different Frequency Elements		≥35 dB	
Cross Pole Discrimination		10.0 dB @ ±60° 15.0 dBi @ 0°	
First Upper Side Lobe Suppression		16dB	
Side Lobe Suppression		> 16dB @ 0-6° Tilt > 18dB @ 7-12° Tilt (Up to 10° from Boresight)	> 16dB @ 0-6° Tilt > 18dB @ 7-10° Tilt (Up to 10° from Boresight)
Passive Intermodulation		≤ -150 dBc @ 2x20w	
Input Maximum CW Power		500 W	300 W
Environmental Compliance		IP65 for Radome IP67 for Connectors	
RET Motor Configuration		Field Replaceable RET Electronic Control Module / RET Motor is internal to antenna & not field replaceable	
Compliant with AISG 1.1 and 2.0		AISG 1.1 and 2.0	

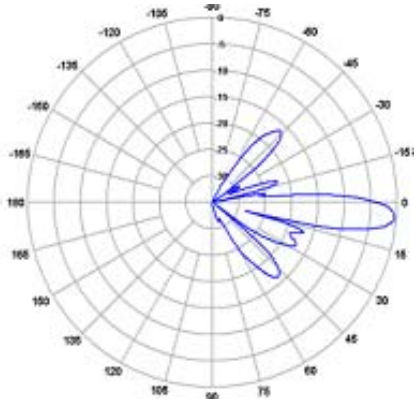
Mechanical Specification

Dimension (W×D×H)	11.8×6.0×96 inches
Weight (Without clamp)	27kg (59.5 lbs)
Connector	4 x 7/16 DIN(F), Long Neck
Max Wind Speed	150mph
Wind Load (@150 mph)	2521 N

AM-X-CD-17-65-00T-RET(8' 65° Dual Broadband Antenna)

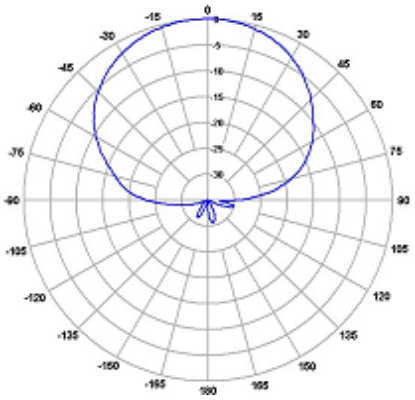


Horizontal Pattern

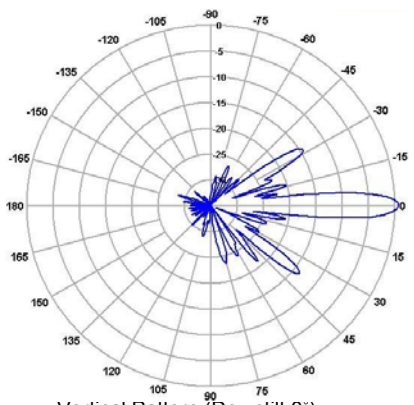


Vertical Pattern (Downtilt 2°)

700MHz band Pattern

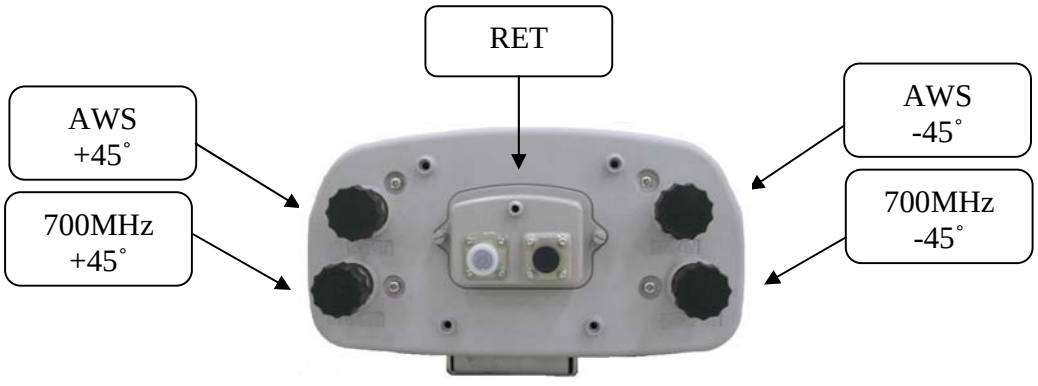


Horizontal Pattern



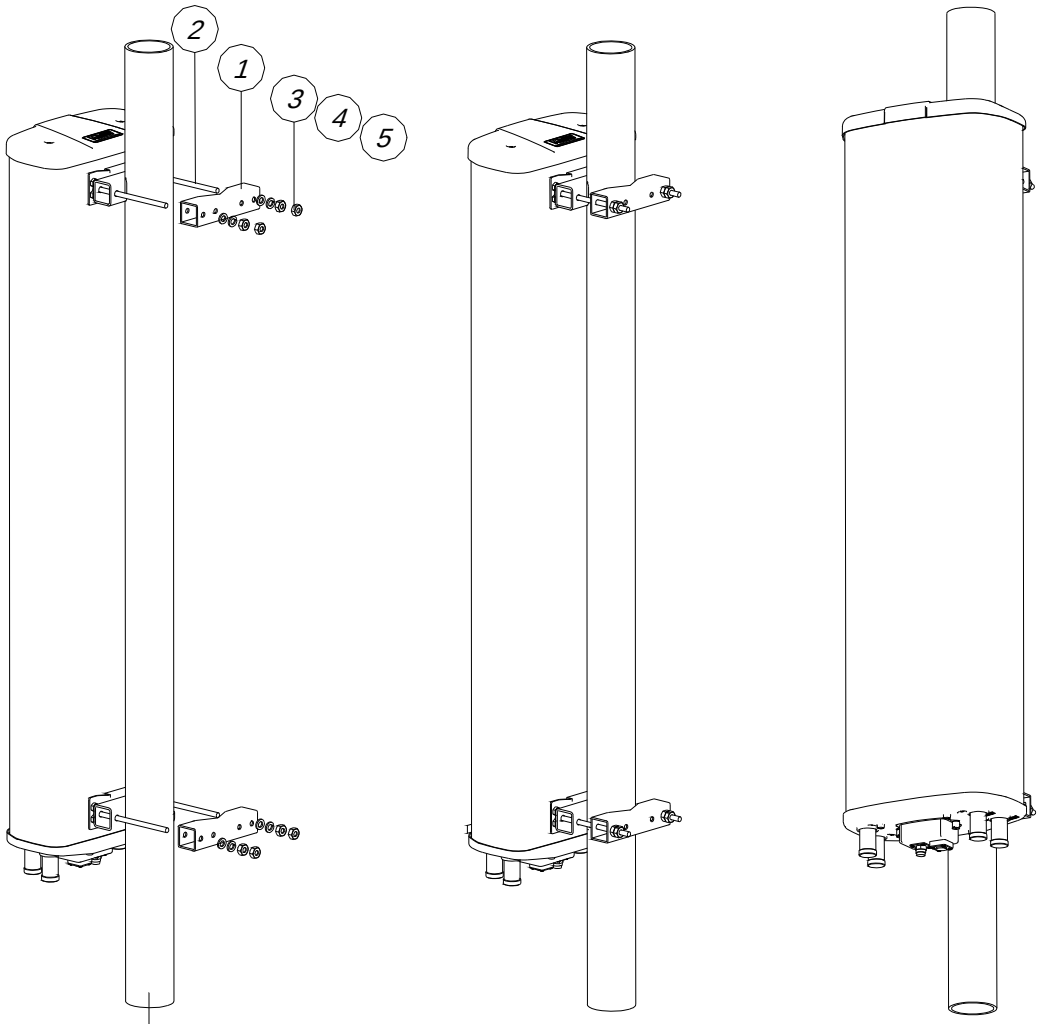
Vertical Pattern (Downtilt 0°)

AWS band Pattern



AM-X-CD-17-65-00T-RET(8' 65° Dual Broadband Antenna)

Antenna Drawings and Installation Diagram



MOUNT POLE
Ø1.97 ~ 3.15inch OD.
(50 ~ 80mm OD.)

STANDARD MOUNTING KITS

No.	PART NAME	Q'TY	Recommending Torque
1	FIXED CLAMP	4	
2	Hex. Cap Bolt, M10	4	17mm Spanner 208lbf.inch 240kgf.cm
3	Plain Washer, M10	4	
4	Spring Washer, M10	4	
5	Hex. Nut, M10	8	

Attachment 4

GENERAC® | INDUSTRIAL POWER

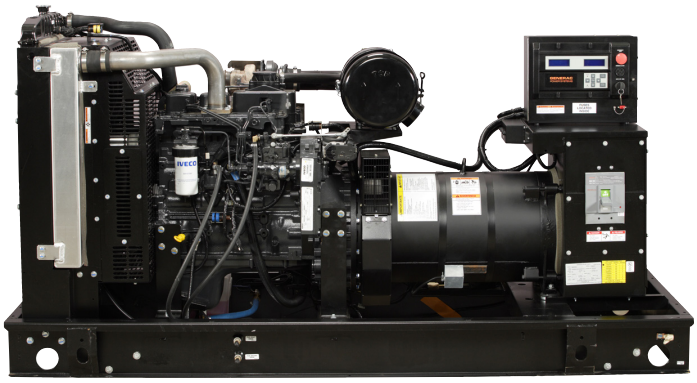
SD050

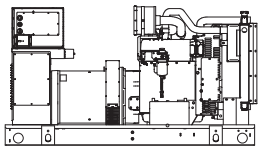
CUSTOM MODEL

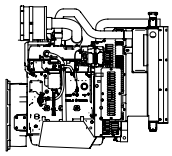
Industrial Diesel Generator Set

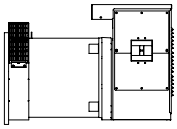
EPA Emissions Certification: Tier III

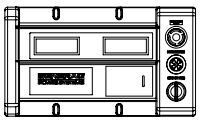
Standby Power Rating
50KW 60 Hz











features benefits

Generator Set

PROTOTYPE & TORSIONALLY TESTED	PROVIDES A PROVEN UNIT
UL2200 TESTED	ENSURES A QUALITY PRODUCT
RHINOCOAT PAINT SYSTEM	IMPROVES RESISTANCE TO ELEMENTS
SOUND LEVEL 2 ENCLOSURE	71dbA @ 7 METERS (23FT)

Engine

EPA TIER CERTIFIED	ENVIRONMENTALLY FRIENDLY
INDUSTRIAL TESTED, GENERAC APPROVED	ENSURES INDUSTRIAL STANDARDS
POWER-MATCHED OUTPUT	ENGINEERED FOR PERFORMANCE
INDUSTRIAL GRADE	IMPROVES LONGEVITY AND RELIABILITY

Alternator

TWO-THIRDS PITCH	ELIMINATES HARMFUL 3RD HARMONIC
LAYER WOUND ROTOR & STATOR	IMPROVES COOLING
CLASS H MATERIALS	HEAT TOLERANT DESIGN
DIGITAL 3-PHASE VOLTAGE CONTROL	FAST AND ACCURATE RESPONSE

Controls

ENCAPSULATED BOARD W/ SEALED HARNESS	EASY, AFFORDABLE REPLACEMENT
4-20mA VOLTAGE-TO-CURRENT SENSORS	NOISE RESISTANT 24/7 MONITORING
SURFACE-MOUNT TECHNOLOGY	PROVIDES VIBRATION RESISTANCE
ADVANCED DIAGNOSTICS & COMMUNICATIONS	HARDENED RELIABILITY

primary codes and standards

NEMA · c UL us LISTED · NFPA · ASTM INTERNATIONAL · ISO · ICC

SD050 application and engineering data

ENGINE SPECIFICATIONS

General

Make	Iveco / FPT
EPA Emissions Compliance	Tier III
EPA Emissions Reference	See Emissions Data Sheet
Cylinder #	4
Type	Diesel
Displacement - L (cu. in.)	4.5 (274)
Bore - mm (in.)	105 (4.1)
Stroke - mm (in.)	132 (5.2)
Compression Ratio	17.5:1
Intake Air Method	Turbocharged
Cylinder Head Type	2 Valve
Piston Type	Aluminum
Crankshaft Type	Forged Steel
Engine Block Type	Cast Iron / Wet Sleeve

Engine Governing

Governor	Electronic Isochronous
Frequency Regulation (Steady State)	+/- 0.25%

Lubrication System

Oil Pump Type	Gear
Oil Filter Type	Full Flow
Crankcase Capacity - L (gal)(qts)	13.6 (3.6) (14.4)

Cooling System

Cooling System Type	Closed
Water Pump	Belt Driven Centrifugal
Fan Type	Pusher
Fan Blade Number	2538 (10)
Fan Diameter (in.)	26
Coolant Heater Wattage	1500
Coolant Heater Standard Voltage	120

Fuel System

Fuel Type	Ultra Low Sulfur Diesel Fuel
Fuel Specifications	ASTM
Fuel Filtering (microns)	5
Fuel Inject Pump Make	Standyne
Fuel Pump Type	Engine Driven Gear
Injector Type	Mechanical
Engine Type	Direct Injection
Fuel Supply Line - mm (in.)	1/4 inch Npt
Fuel Return Line - mm (in.)	1/4 inch Npt

Engine Electrical System

System Voltage	12VDC
Battery Charging Alternator	90 Amp
Battery Size (at 0 oC)	Optima Redtop
Battery Group	34
Battery Voltage	12VC
Ground Polarity	Negative

ALTERNATOR SPECIFICATIONS

Standard Model	390
Poles	4
Field Type	Revolving
Insulation Class - Rotor	H
Insulation Class - Stator	H
Total Harmonic Distortion	< 3.5%
Telephone Interference Factor (TIF)	< 50
Standard Excitation	PMG
Bearings	Single Sealed Cartridge
Coupling	Direct, Flexible Disc
Load Capacity - Standby	100%
Load Capacity - Prime	100%
Prototype Short Circuit Test	Y

Voltage Regulator Type	Digital
Number of Sensed Phases	All
Regulation Accuracy (Steady State)	+/- 0.25%

CODES AND STANDARDS COMPLIANCE (WHERE APPLICABLE)

NFPA 99
NFPA 110
ISO 8528-5
ISO 1708A.5
ISO 3046
BS5514
SAE J1349
DIN6271
IEEE C62.41 TESTING
NEMA ICS 1

Rating Definitions:
Standby – Applicable for a varying emergency load for the duration of a utility power outage with no overload capability. (Max. load factor = 70%)
Prime – Applicable for supplying power to a varying load in lieu of utility for an unlimited amount of running time. (Max. load factor = 80%) A 10% overload capacity is available for 1 out of every 12 hours.

SD050 operating data (60Hz)

POWER RATINGS (kW)

	STANDBY		
Single-Phase 120/240VAC @1.0pf	50	Amps:	208
Three-Phase 120/208VAC @0.8pf	-	Amps:	-
Three-Phase 120/240VAC @0.8pf	-	Amps:	-
Three-Phase 277/480VAC @0.8pf	-	Amps:	-
Three-Phase 346/600VAC @0.8pf	-	Amps:	-

NOTE: Generator output limited to 200A.

STARTING CAPABILITIES (sKVA)

sKVA vs. Voltage Dip

		480VAC						208/240VAC					
Alternator*	kW	*10%*	*15%*	*20%*	*25%*	*30%*	*35%*	*10%*	*15%*	*20%*	*25%*	*30%*	*35%*
Standard	50	-	-	-	-	-	-	26	39	52	65	77	90
Upsize 1		-	-	-	-	-	-	-	-	-	-	-	-
Upsize 2		-	-	-	-	-	-	-	-	-	-	-	-

*All Generac industrial alternators utilize Class H insulation materials. Standard alternator provides less than or equal to Class B temperature rise. Upsize 1 provides less than or equal to Class B temperature rise. Upsize 2 provides less than or equal

FUEL

Fuel Consumption Rates

Fuel Pump Lift - in (m)

36(.9)

	STANDBY	
Percent Load	gph	lph
25%	1.52	5.75
50%	2.33	8.82
75%	3.08	11.65
100%	4.15	15.71

COOLING

Coolant System Capacity - Gal (L)

4.5 (17.44)

Maximum Radiator Backpressure

1.5" H_2O Column

		STANDBY
Coolant Flow per Minute	gpm (lpm)	32.7(123.8)
Heat rejection to Coolant	BTU/min	123,000
Inlet Air	cfm (m3/min)	6,360 (180.0)
Max. Operating Radiator Air Temp	F^o (C^o)	122(50)
Max. Operating Ambient Temperature	F^o (C^o)	122(50)

COMBUSTION AIR REQUIREMENTS

		STANDBY	
Intake Flow at Rated Power	cfm (m3/min)	247	(7.00)

EXHAUST

Exhaust Outlet Size (Open Set)

3.0"

Maximum Backpressure (Post-Silencer)

1.5" Hg

		STANDBY
Exhaust Flow (Rated Output)	cfm (m3/hr)	534(906.7)
Maximum Backpressure	inHg (Kpa)	1.5 (5.1)
Exhaust Temp (Rated Output)	^oF (^oC)	930(498.8)

ENGINE

		STANDBY
Rated Engine Speed	rpm	1800
Horsepower at Rated kW	hp	93
Temperature Deration		Consult Factory
Altitude Deration		Consult Factory

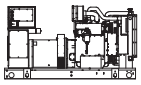
* CA units include aftertreatment

Deration – Operational characteristics consider maximum ambient conditions. Derate factors may apply under atypical site conditions. Please consult a Generac Power Systems Industrial Dealer for additional details. All performance ratings in accordance with ISO3046, BS5514, ISO8528 and DIN6271 standards.

SD050

standard features and options

GENERATOR SET



● Genset Vibration Isolation	Std
● Factory Testing	Std
● Extended warranty	Std
● Padlockable Doors	Std
● Steel Enclosure (Enclosed Models)	Std
○ Remote Emergency Shutdown	Opt

ENGINE SYSTEM

General

● Oil Drain Extension	Std
● Air Cleaner	Std
● Industrial Exhaust Silencer (Open Sets, ship loose)	Std
● Critical Exhaust Silencer (Enclosed Sets)	Std
● Stainless steel flexible exhaust connection	Std

Fuel System

● Primary Fuel Filter with Water Separator	Std
● Flexible Fuel Lines	Std
● UL142 Fuel Tank, 48 Hr Runtime	Std
● 2 Gal Overflow Containment with Alarm	Std

Cooling System

● 120VAC Coolant Heater (3-wire connection cord)	Std
● 50%/50% Coolant	Std
● Level 1 Guarding (Open Sets)	Std
● Closed Coolant Recovery System	Std
● UV/Ozone resistant hoses	Std
● Factory-Installed Radiator	Std
● Radiator Drain Extension	Std
● Fan guard	Std
● Radiator duct adapter (Open Sets)	Std
●	

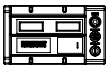
Engine Electrical System

● Battery charging alternator	Std
● Battery cables	Std
● Battery tray	Std
● 75W 120VAC Battery heater	Std
● Solenoid activated starter motor	Std
● 10A UL float/equalize battery charger	Std
● Weather Resistant electrical connections	Std
● Duplex GFCI Convenience Outlet	Std

ALTERNATOR SYSTEM

● UL2200 GENprotect™	Std
● 100% Rated 200A Main Line Circuit Breaker	Std

CONTROL SYSTEM



Control Panel

● Digital H Control Panel - Dual 4x20 Display	Std
● Programmable Crank Limiter	Std
● 7-Day Programmable Exerciser (requires H-Transfer Switch)	Std
● Special Applications Programmable PLC	Std
● RS-232	Std
● RS-485	Std
● All-Phase Sensing DVR	Std
● Full System Status	Std
● Utility Monitoring (Req. H-Transfer Switch)	Std
● 2-Wire Start Compatible	Std
● Power Output (kW)	Std
● Power Factor	Std
● Reactive Power	Std
● All phase AC Voltage	Std
● All phase Currents	Std
● Oil Pressure	Std
● Coolant Temperature	Std
● Coolant Level	Std
● Low Fuel Pressure Indication	Std
● Engine Speed	Std
● Battery Voltage	Std
● Frequency	Std
● Date/Time Fault History (Event Log)	Std
● UL2200 GENprotect™	Std
○ Low-Speed Exercise	Opt
● Isochronous Governor Control	Std
● -40deg C - 70deg C Operation	Std
● Weather Resistant Electrical Connections	Std
● Audible Alarms and Shutdowns	Std
● Not in Auto (Flashing Light)	Std
● On/Off/Manual Switch	Std
● E-Stop (Red Mushroom-Type)	Std
○ Remote E-Stop (Break Glass-Type, Surface Mount)	-
○ Remote E-Stop (Red Mushroom-Type, Surface Mount)	-
○ Remote E-Stop (Red Mushroom-Type, Flush Mount)	-
● NFPA 110 Level I and II (Programmable)	Std
● Remote Communication - RS232	Std

Alarms (Programmable Tolerances, Pre-Alarms and Shutdowns)

● Low Fuel	Std
● Oil Pressure (Pre-programmed Low Pressure Shutdown)	Std
● Coolant Temperature (Pre-programmed High Temp Shutdo	Std
● Coolant Level (Pre-programmed Low Level Shutdown)	Std
● Engine Speed (Pre-programmed Overspeed Shutdown)	Std
● Voltage (Pre-programmed Overvoltage Shutdown)	Std
● Battery Voltage	Std

Other Options

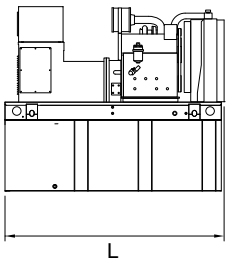
● Single Side Service

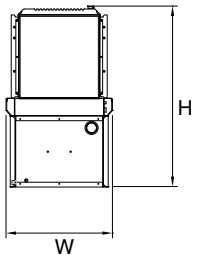
● _____

○ _____

SD050

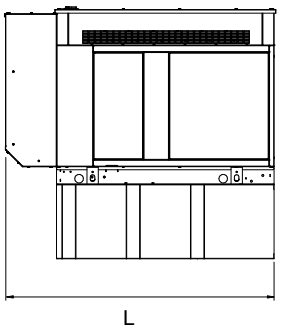
dimensions, weights and sound levels

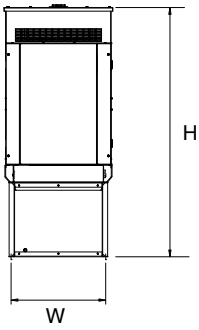




OPEN SET

	TANK SIZE							
	RUNTIME HOURS	CAPACITY (GAL)	TANK VOLUME	L	W	H	WT	dBA*
○	-	-	-	-	-	-	-	84
○	-	-	-	-	-	-	-	
○	-	-	-	-	-	-	-	
○	-	-	-	-	-	-	-	
○	-	-	-	-	-	-	-	
●	48	210	210	76	38	87	3400	
○	-	-	-	-	-	-	-	
○	-	-	-	-	-	-	-	





LEVEL 2 SOUND ENCLOSURE

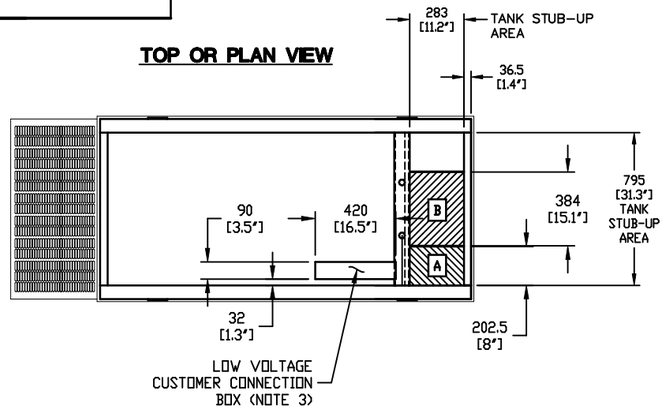
	TANK SIZE							
	RUNTIME HOURS	CAPACITY (GAL)	TANK VOLUME	L	W	H	WT	dBA*
○	-	-	-	-	-	-	-	71
○	-	-	-	-	-	-	-	
○	-	-	-	-	-	-	-	
○	-	-	-	-	-	-	-	
○	-	-	-	-	-	-	-	
●	48	210	210	94.8	38	99	3935	
○	-	-	-	-	-	-	-	
○	-	-	-	-	-	-	-	

*Required gallons based on 100% of standby rating. Weights consider steel enclosure and are without fuel in tank. Sound levels measured at 23ft (7m) and does not account for ambient site conditions.

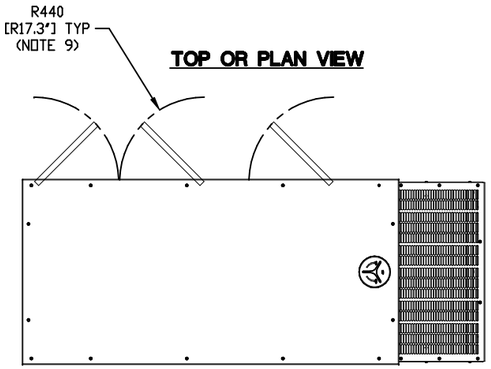
YOUR FACTORY RECOGNIZED GENERAC INDUSTRIAL DEALER

Specification characteristics may change without notice. Dimensions and weights are for preliminary purposes only. Please consult a Generac Power Systems Industrial Dealer for detailed installation drawings.

0J2534

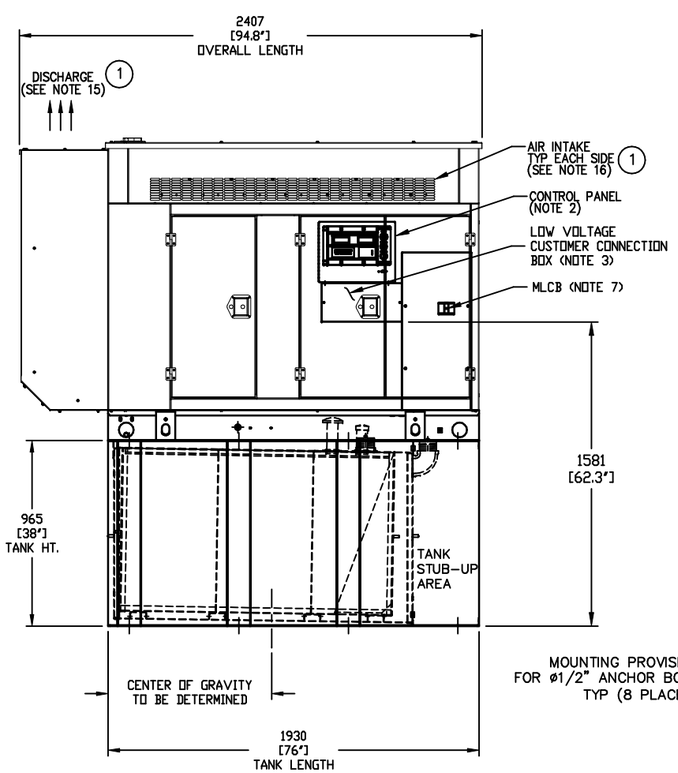


TOP OR PLAN VIEW

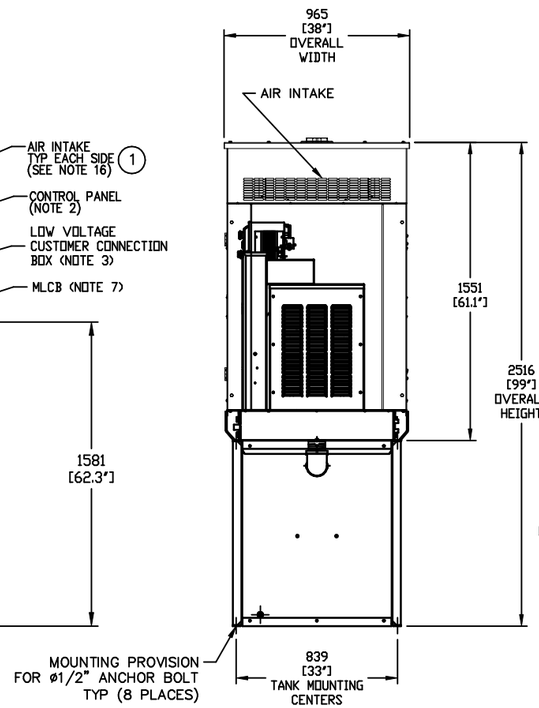


TOP OR PLAN VIEW

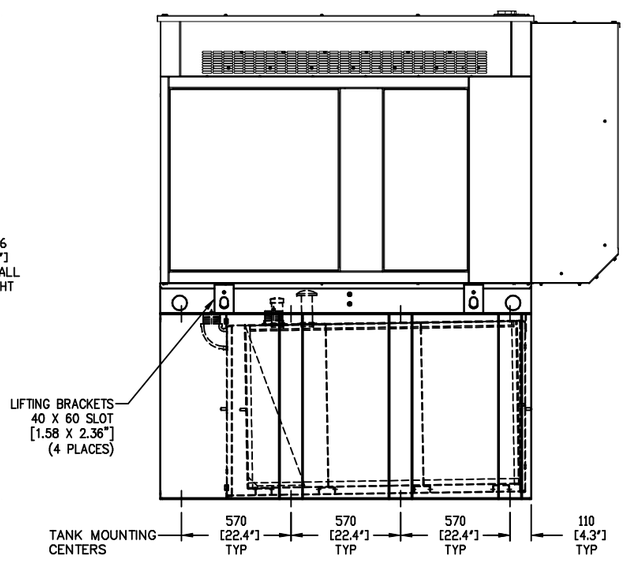
RECOMMENDED ELECTRICAL STUB-UPS (SEE TOP VIEW)	
DESCRIPTION	INSIDE BASE
AC LOAD LEAD CONDUIT GLAND AREA	A
1) LOW VOLTAGE CUSTOMER CONNECTION BOX FOR 120VAC GFCI OUTLET, (STANDARD BLOCK HEATER, BATTERY CHARGER AND OTHER 120 VAC OPTIONS). 2) TRANSFER SWITCH/ COMMUNICATION CONDUITS. COMMUNICATIONS AND 2-WIRE START MUST NOT BE RUN IN CONDUIT WITH AC WIRING.	B SEE NOTE 3



LEFT SIDE VIEW



REAR VIEW



RIGHT SIDE VIEW

NOTES:

1. THE LEFT SIDE OF THE GENERATOR IS SERVICE ACCESSIBLE.
2. 10 AMP BATTERY CHARGER ENCLOSED WITHIN CONTROL PANEL.
3. CONNECTION POINTS FOR CONTROL WIRES. BOTTOM OF LOW VOLTAGE CUSTOMER CONNECTION BOX HAS KNOCKOUTS FOR 1/2" AND 3/4" CONDUIT FITTINGS.
4. GENERATOR MUST BE GROUNDED.
5. 12 VOLT NEGATIVE GROUND SYSTEM.
6. OPTIONAL REMOTE EMERGENCY STOP SHIPPED LOOSE WITH GENERATOR.
7. MAIN LINE CIRCUIT BREAKER (MLCB), AC LOAD LEAD CONNECTION AND AUXILIARY 120/240V CONNECTION.
8. LEVEL 2A SOUND ATTENUATED ENCLOSURE STANDARD WITH GENERATOR.
9. DOORS MUST BE ABLE TO OPEN 90 DEG. TO BE REMOVED. DOORS ARE LOCATED ON THE LEFT SIDE OF THE GENERATOR ONLY.
10. STUB-UPS: BASE TANK REQUIRES ALL STUB-UPS TO BE IN THE REAR TANK STUB-UP AREA.
11. 'A' IS THE STUB UP AREA FOR THE MLCB AND NEUTRAL CONNECTION.
12. SEE DRAWING 0C3850 FOR DUCT REMOVAL. REMOVAL OF FRONT DUCT WILL PROVIDE ACCESS TO MUFFLER.
13. 120VAC ENGINE BLOCK HEATER.
14. 210 GALLON USEABLE CAPACITY BASETANK STANDARD WITH GENERATOR.
15. (1) MUST ALLOW FREE FLOW OF DISCHARGE AIR AND EXHAUST. SEE SPEC SHEET FOR MINIMUM AIR FLOW AND MAXIMUM RESTRICTION REQUIREMENTS.
16. (1) MUST ALLOW FREE FLOW OF INTAKE AIR. SEE SPEC SHEET FOR MINIMUM AIR FLOW AND MAXIMUM RESTRICTION REQUIREMENTS.
17. (1) IT IS THE RESPONSIBILITY OF THE INSTALLATION TECHNICIAN TO ENSURE THAT THE GENERATOR INSTALLATION COMPLIES WITH ALL APPLICABLE CODES, STANDARDS, AND REGULATIONS.

WEIGHT DATA (INCLUDES WOODEN SHIPPING SKID)

ENCLOSED GENERATOR WITH EMPTY FUEL TANK – TO BE DETERMINED

UNITS: mm [INCHES]

PRELIMINARY

INSTALLATION DRAWING

INSTALLATION D4.5L G17 50KW

ENCLOSED LEVEL 2A

GENERAC POWER SYSTEMS
Waukesha
P.O. BOX 8
WAUKESHA, WIS. 53187

FILE NAME	0J2534.DWG	SIZE B
SCALE	NTS	FIRST USE AT&T
DWG NO.	0J2534	REV 1

Attachment 5

CENTEK engineering

Centered on Solutions℠

April 11, 2012

Ms. Hollis Redding
SBA Communications Corporation
One Research Drive, Suite 200C
Westborough, MA 01581

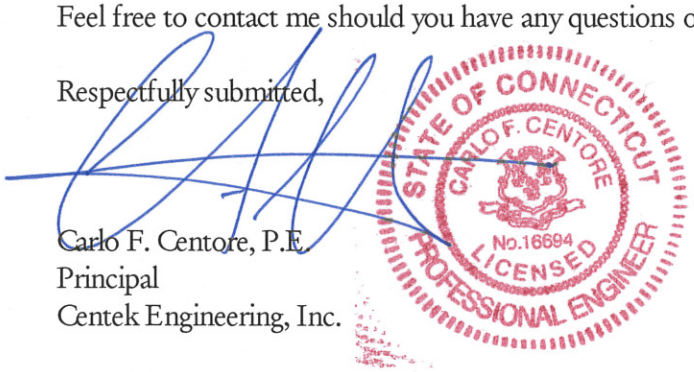
Re: SBA – N. Stonington 3 – Proposed Communications Facility

Dear Ms. Redding,

Centek has developed the site and access drive design as part of SBA's D&M Plan. As depicted in the Site Development Plan, sheet C-1.2 of the D&M Plan drawing set, a portion of the new site access drive transverses an area of existing ledge. It is anticipated that minimal ledge will require removal in the field for the access drive construction. The access drive is designed keeping the high side of the drive (northeast side) relatively level with the ledge with the addition of fill to the other side thereby minimizing ledge removal. If field conditions arise requiring some ledge removal, chipping with pneumatic equipment will be utilized.

Feel free to contact me should you have any questions or concerns.

Respectfully submitted,



Carlo F. Centore, P.E.
Principal
Centek Engineering, Inc.

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com