STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square
New Britain, Connecticut 06051
Phone: (860) 827-2935
Fax: (860) 827-2950

July 13, 2001

Sandy M. Carter
Verizon Wireless
20 Alexander Drive
P.O. Box 5029
Wallingford, CT 06492

RE: **TS-VER-019-010614** - Cellco Partnership d/b/a Verizon Wireless request for an order to approve tower sharing at an existing telecommunications facility located at 130 Tatnic Hill Road, Brooklyn, Connecticut.

Dear Ms. Carter:

At a public meeting held July 11, 2001, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures. 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. Any additional change to this facility may require an explicit request to this agency pursuant to General Statutes § 16-50aa or notice pursuant to Regulations of Connecticut State Agencies Section 16-50j-73, as applicable. Such request or notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

This decision applies only to this request for tower sharing and is not applicable to any other request or construction.

The proposed shared use is to be implemented as specified in your letter dated June 14, 2001.

Thank you for your attention and cooperation.

Very truly yours,

Mortimer A. Gelston
Chairman

MAG/RKE/laf

c: Honorable Maurice F. Bowen, First Selectman, Town of Brooklyn
Chester Dobrowski, Zoning Enforcement Officer, Town of Brooklyn
Esther McNany, SBA, Inc.
Julie M. Donaldson, Esq., Hurwitz & Sagarin LLC
Ronald C. Clark, Nextel Communications
Peter W. van Wilgen, SNET Mobility, LLC

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square
New Britain, Connecticut 06051
Phone: (860) 827-2935
Fax: (860) 827-2950

June 15, 2001

Honorable Maurice F. Bowen
First Selectman
Town of Brooklyn
Town Hall
P. O. Box 356
Brooklyn, CT 06234-0356

RE: **TS-VER-019-010614** - Cellco Partnership d/b/a Verizon Wireless request for an order to approve tower sharing at an existing telecommunications facility located at 130 Tatnic Hill Road, Brooklyn, Connecticut.

Dear Mr. Bowen:

The Connecticut Siting Council (Council) received this request for tower sharing, pursuant to Connecticut General Statutes § 16-50aa.

The Council will consider this item at the next meeting scheduled for July 11, 2001, at 1:30 p.m. in Hearing Room One, Ten Franklin Square, New Britain, Connecticut.

Please call me or inform the Council if you have any questions or comments regarding this proposal.

Thank you for your cooperation and consideration.

Very truly yours,

Joel M. Rinebold
Executive Director

JMR/laf

Enclosure: Notice of Tower Sharing

c: Planning and Zoning Department, Town of Brooklyn

Network Dept.

Verizon Wireless
20 Alexander Drive
Wallingford, Connecticut 06492

June 14, 2001

HAND DELIVERED

Mr. Mortimer A. Gelston, Chairman
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: Request by Cellco Partnership d/b/a Verizon Wireless for an Order to Approve the Shared Use of a Tower Facility located at 130 Tatnic Hill Road, Brooklyn, Connecticut.

Dear Chairman Gelston:

Pursuant to Connecticut General Statutes (C.G.S.) Sec. 16-50aa, Cellco Partnership d/b/a Verizon Wireless hereby requests an order from the Connecticut Siting Council ("Council") to approve the proposed shared use by Verizon Wireless of an existing tower located at 130 Tatnic Hill Road, Brooklyn, Connecticut. The property is owned by Benjamin and Sophie Davidson and leased to SBA Towers, Inc. SBA Towers, Inc. owns and manages the tower. As shown on the attached drawing and as further described below, Verizon Wireless proposes to install antennas on the existing tower and to locate its equipment building at the base of the tower. Verizon Wireless requests that the Council finds that the proposed shared use of the tower facility satisfy the criteria stated in C.G.S. Sec. 16-50aa, and to issue an order approving the proposed shared use.

Background

Verizon Wireless is licensed by the Federal Communications Commission to provide cellular telephone service in the Windham County New England County Metropolitan Area (NECMA), which includes the area to be served by the proposed Brooklyn installation.

The facility at 130 Tatnic Hill Road, Brooklyn, consists of a 175-foot AGL monopole tower. Verizon Wireless and SBA Towers, Inc. have agreed to the proposed-shared use of this tower pursuant to mutually acceptable terms and conditions. SBA Towers, Inc. has authorized Verizon Wireless to apply for all necessary permits, approvals and authorizations which may be required for the proposed shared use of this facility.

Verizon Wireless proposes to install twelve (12) panel type antennas on a platform with their center of radiation at approximately 178 feet above ground level ("AGL"). Verizon Wireless will also install one (1) GPS antenna on the tower. Of the twelve antennas, six will be used in Cellco's cellular system, Model No. DB844H90, and six will be used in its Personal Communications Services (PCS) system, Model No. DB948F85. Equipment associated with these antennas will be located in a new approximately 12-foot x 30-foot equipment building located at the base of the tower. Verizon Wireless will install a diesel generator for emergency use. The generator will be installed following receipt of the required DEP permit

C.G.S. Sec. 16-50aa provides that, upon written request for approval of a proposed shared use, "if the Council finds that the proposed shared use of the facility is technically, legally, environmentally and economically feasible and meets public safety concerns, the Council shall issue an order approving such shared use" (C.G.S. Sec. 16-50aa(c)(1).)

Discussion

A. Technical Feasibility. The existing tower is structurally sound and capable of supporting the proposed Verizon antennas. Enclosed is the structural design and analysis of the tower. Verizon engineers have determined that the proposed antenna installations present minimal potential for interference to or from existing radio transmissions from this location. In addition, the applicant is unaware of any occasion where its operations have caused interference with AM, FM, or television reception. The proposed shared use of this tower therefore is technically feasible.

B Legal Feasibility. Under C.G.S. Sec. 16-50aa, the Council has been authorized to issue an order approving the proposed-shared use of an existing communications tower facility such as the facility at 130 Tatnic Hill Road in Brooklyn. (C.G.S. Sec. 16-50aa(c)(1).) This authority complements the Council's prior-existing authority under C.G.S. Sec. 16-50p to issue orders approving the construction of new towers that are subject to the Council's jurisdiction. C.G.S. Section 16-50x(a) directs the Council to "give consideration to other state laws and municipal regulations as it shall deem appropriate" in ruling on requests for the shared use of existing tower facilities. Under the authority vested in the Council by C.G.S. Sec. 16-50aa, an order by the Council approving the shared use would permit the applicant to obtain a building permit for the proposed installations.

C. Environmental Feasibility. The proposed shared use would have a minimal environmental effect, for the following reasons:

1. The proposed installations would have an insignificant incremental visual impact, and would not cause any significant change or alteration in the physical or environmental characteristics of the existing site. The addition of the proposed antennas would not increase the height of the tower, and would not extend the boundaries of the tower site, including the placement of the equipment building near the base of the existing tower.

2. The proposed installation would not increase the noise levels at the existing facility by six decibels or more. The only additional noise will occur during emergency use or periodic exercising of the generator.

3. Operation of the additional antennas will not increase the total radio frequency electromagnetic radiation power density, measured at the tower base to a level at or above the applicable standard. "Worst-case" exposure calculations for a point at the base of the tower in relation to operation of each of Verizon's antenna arrays are as follows:

	Applicable ANSI Stnd.	Calculated "Worst-Case"	Percentage of Stnd.
Verizon (cellular)	0.583 mW/cm2	0.0216 mW/cm2	3.70%
Verizon (PCS)	1.000 mW/cm2	0.0014 mW/cm2	0.14%
Sprint	1.000 mW/cm2	0.0179 mW/cm2	1.79%
Nextel	0.572 mW/cm2	0.0138 mW/cm2	2.42%
		Total	8.05%

The collective "worst-case" exposure would be only 8.05 % of the ANSI standard, as calculated for mixed frequency sites. Power density levels from shared use of the tower facility would thus be well below applicable ANSI standards.

4. The proposed installations would not require any water or sanitary facilities, or generate discharges to water bodies. Operation of the emergency back-up generator will result in limited air emission; pursuant to R.C.S.A. Section 22a-174-3, the generator will require the issuance of a permit from the Department of Environmental Protection Bureau of Air Management. After construction is complete, the proposed installation would not generate any traffic other than periodic maintenance visits. The proposed use of this facility would therefore have a minimal environmental effect, and is environmentally feasible.

D. Economic Feasibility. As previously mentioned, the tower owner and the applicant has entered into a mutual agreement to share use of the existing tower on terms agreeable to the parties, and the proposed tower sharing is thus economically feasible.

E. Public Safety Concerns. As stated above, the existing tower is structurally capable of supporting the proposed Verizon antennas. The Applicant is not aware of any other public safety concerns relative to the proposed tower sharing of the existing tower. In fact, the provision of new or improved cellular phone service in the Town of Brooklyn, and surrounding area, through shared use of the tower is expected to enhance the safety and welfare of area residents and travelers. The public safety benefits of wireless service are further illustrated by the decision of local authorities elsewhere in Connecticut to provide cellular phones to the residents to improve local public safety and emergency communications. The proposed-shared use of this facility would likewise improve public safety in the Brooklyn area.

Conclusion

For the reasons discussed above, the proposed shared use of the existing telecommunications tower facility at located at 130 Tatnic Hill Road in Brooklyn satisfies the criteria stated in C.G.S. Sec. 16-50aa, and advances the General Assembly's and the Council's goal of preventing the proliferation of towers in Connecticut. The Applicant therefore requests that the Council issue an order approving the proposed shared use.

Thank you for your consideration of this matter.

Pursuant to Connecticut General Statutes, Section 16-50v and Section 16-50v-1(a) of the Regulations of Connecticut State Agencies, Verizon Wireless is submitting a check in the amount of $500.00 for the required filing fee.

Respectfully yours,

Sandy M. Carter

Sandy M. Carter
Manager – Regulatory
Verizon Wireless

Attachment
cc: Mr. Maurice Bowen, First Selectman

Network Dept.

Verizon Wireless
20 Alexander Drive
Wallingford, Connecticut 06492

June 14, 2001

Honorable Mr. Maurice Bowen,
First Selectman
Town Hall
P. O. Box 356
Brooklyn, Connecticut 06234

Dear Mr. Bowen:

This letter is to inform you that Cellco Partnership d/b/a Verizon Wireless plans to install antennas and associated equipment at the existing tower facility located at 130 Tatnic Hill Road, Brooklyn, Connecticut. I am enclosing a copy of Verizon Wireless's tower sharing application to the Connecticut Siting Council.

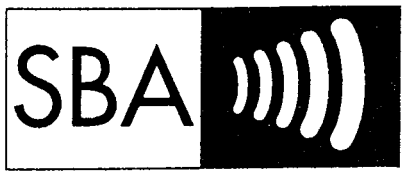
The application fully sets forth the Company's proposal. However, if you have any questions or require further information on our plans or the Siting Council's procedures, please contact me at (203) 294-8519 or Mr. Joel Rinebold, Executive Director of the Connecticut Siting Council at (860) 827-2935.

Sincerely,

Sandy M. Carter

Sandy M. Carter
Manager – Regulatory
Verizon Wireless

Enclosure



June 28, 2000

Sandy Carter
Regulatory Manager
Verizon Wireless
20 Alexander Drive
Wallingford, CT 06492

RE: SBA Telecommunications Facility
South Brooklyn, 130 Old Tatnic Hill Road
4275-037

Dear Sandy:

Please consider this as a Letter of Authorization for Verizon to proceed with any and all necessary permits and approvals to collocate on the above referenced facility.

We acknowledge that Verizon has filed a Collocation Application with SBA and that that application has been approved. As always, we look forward to working with you. If I can be of further assistance, please call.

Sincerely,

Esther K. McNany
Market Development Manager

SBA, Inc. ▪ 80 Eastern Blvd. ▪ Glastonbury, CT 06033 ▪ (860) 659-9101 Fax (860) 659-9140

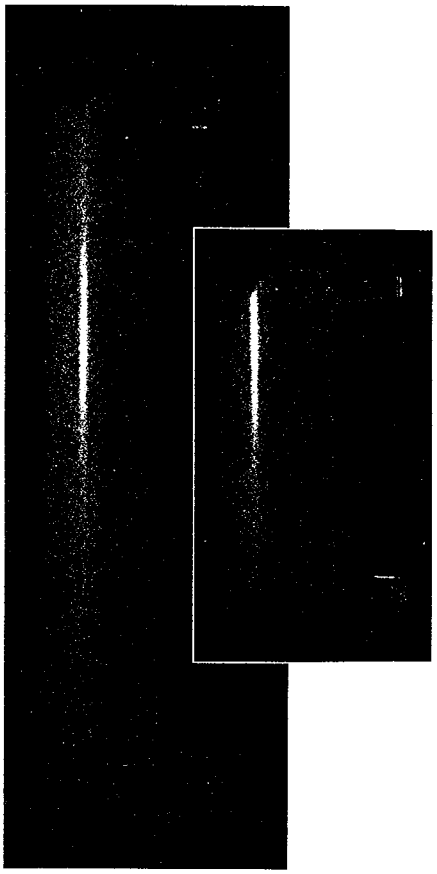
DB842H80N-XY, DB842H90N-XY dB DIRECTOR™ LOG PERIODIC ANTENNAS
DB844H80N-XY, DB844H90N-XY 9-13 dBd GAIN, 40 dB F/B RATIO, 806-960 MHz

Ideal for cellular and trunking/ESMR applications, these high quality log periodics are now available from Decibel in four new models with 80 or 90 degree horizontal apertures. They're compact, lightweight, and provide an **unmatched front-to-back ratio of 40 dB**.

- **Less Wind Loading** - They measure only 24 or 48 inches (610 or 1219 mm) tall, 8.5 inches deep (216 mm), and 6 inches wide (152 mm). They weigh only 5 or 10 pounds.
- **Downtilt** - Electrical downtilt is available on all 4-foot models, 6°, 8°, 11°, 13°, or for mechanical downtilt, order DB5083 bracket.
- **Null-Fill** - Four-foot models provide null-fill and upper lobe suppression.
- **Most Stringent IM Test** - Each antenna is tested for the absence of IM with 16 carriers at 500 watts of composite power.
- **Sturdy Construction** - Made in the U.S. of high-strength aluminum alloy backs, brass elements and UV resistant ABS plastic radomes. No rivets are used!
- **Lightning Resistant** - All metal parts are grounded.
- **Terminations and Mounts** - All models are available with N-Female or 7/16 DIN connectors. DB380 pipe mount is included.

Ordering information - See table for models to fit your requirements.

UPS Shippable



4-Foot and 2-Foot dB DIRECTORS

Models Available				
Model*	DB842H80N-XY	DB844H80N-XY	DB842H90N-XY	DB844H90N-XY
Gain – dBd/dBi	10/12.1	13/15.1	9/11.1	12/14.1
F/B Ratio – dB	40	40	40	40
Horizontal beamwidth**	80°	80°	90°	90°
Vertical beamwidth**	30°	15°	30°	15°
Height – in. (mm)	24 (610)	48 (1219)	24 (610)	48 (1219)
Weight – lbs. (kg)	5 (2.3)	10 (4.6)	5 (2.3)	10 (4.6)
Shipping weight – lbs. (kg)	8 (3.6)	15 (6.8)	8 (3.6)	15 (6.8)

* For 7/16 DIN connectors substitute "E" for "N" in the model numbers. Example: DB842H80E-XY.

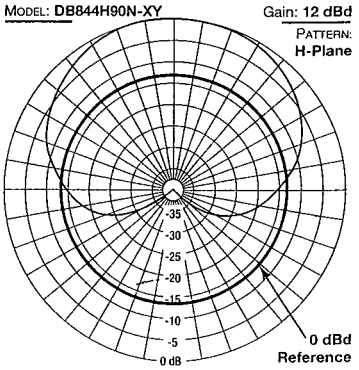
** 3 dB from maximum.

Side offset mounting bracket is included. For electrical downtilt of 6°, 8°, 11° or 13° add T6, T8, T11 or T13 before the "N" or "E" in any 4-foot model number. Example: DB844H80T6N-XY. Note: Electrical downtilt causes a gain loss of .05 dB, or , at the horizon, a reduction of 3, 6, 9 or 12 dB on downtilts of 6°, 8°, 11° or 13° respectively. For mechanical downtilt order DB5083 bracket.

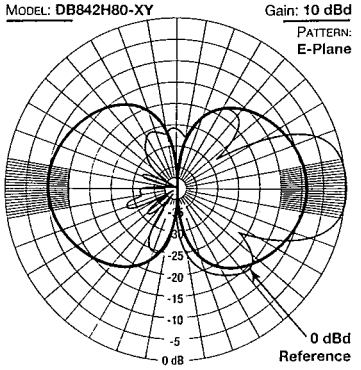
Mechanical Data	
Width – in. (mm)	6 (152)
Depth – in. (mm)	8.5 (216)
Height	See table above
Maximum wind speed – mph (km/h)	125 (200)
Wind area – ft² (m²)	
24" (610 mm) antenna	1 (.093)
48" (1219 mm) antenna	2 (.186)
Wind load (at 100 mph/161 km/h) – lbf (N) kp	
24" (610 mm) antenna	40 (178) 18
48" (1219 mm) antenna	80 (356) 36
Radome	Gray ABS
Backplate	Passivated aluminum
Radiators	Brass
Mounting hardware	Galvanized steel
Weight	See table above

Electrical Data	
Frequency Range - MHz	806-960
Gain - dBd	See table above
Front-to-back ratio - dB	>40
Beamwidths	See table above
VSWR	<1.5:1
Null-fill and secondary lobe suppression	On 48" (1219 mm) models only
Maximum power input - watts	500
Nominal impedance - ohms	50
Lightning protection	All metal parts grounded
Termination	N-Female or 7/16 DIN

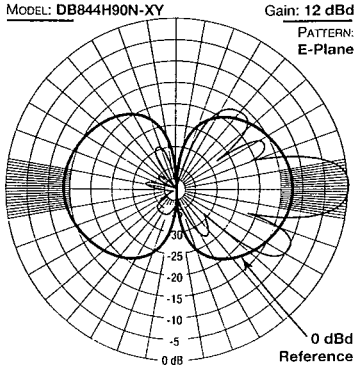
Typical DB842H90N-XY, DB844H90N-XY Horizontal Pattern



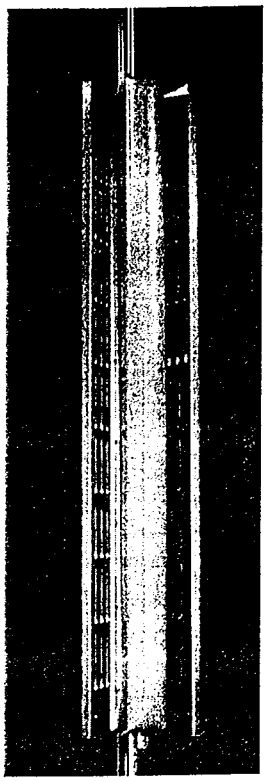
Typical DB842H80-XY Vertical Pattern



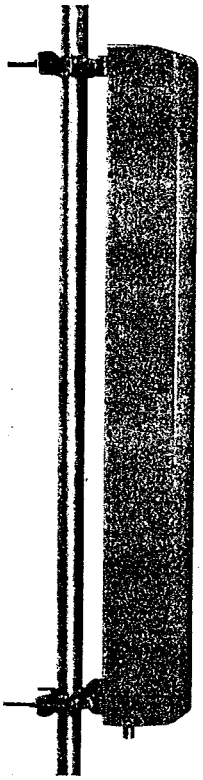
Typical DB844H90N-XY Vertical Pattern



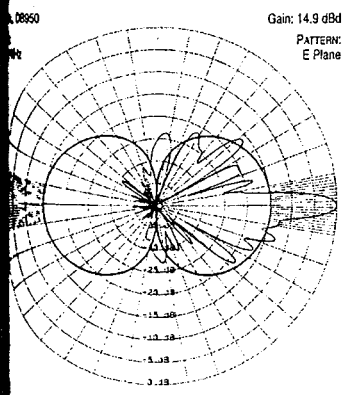
dB Director Log Periodic Antenna Family is engineered to
de the best possible coverage control for today's complex
l systems.
educe co-channel interference.
rovide exact coverage penetration.
ntegrated phasing and array structure in a single circuit.
o uncontrolled fasteners, mechanical screws, or rivets in
F current path.
attern shaping options:
Max Gain™ – focused gain on the horizon.
Max Fill™ – excellent USLS of 18 db and null fill
of 11 to 12 dB.
utstanding "cone of silence" and front to back ratio
40 dB, typical.
xcellent control of intermodulation, IM3-147 dBc.
vailable in a wide range of gains and beam shapes.
lim profile for outstanding reduction of wind load.
ring Information: "G" indicates "Max Gain™", "F" indicates
Fill™". Max Fill™ antenna gain is typically down 0.5 to
B from Max Gain™. All antennas above are standard with
DIN connectors, bottom mounted.
uency Designations: M-1850-1990, KL-1710-1880.
nting:
DB390 Pipe mount kit (included).
DB5098 Downtilt Bracket (optional).

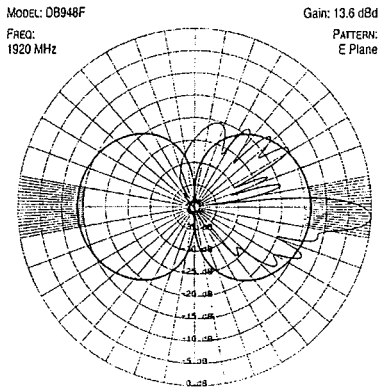


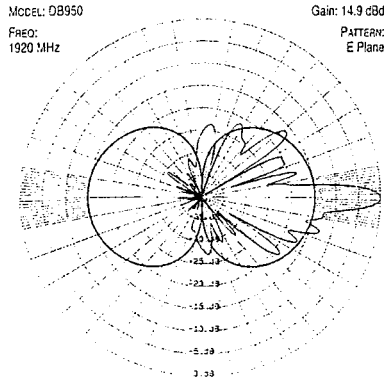
DB950G65

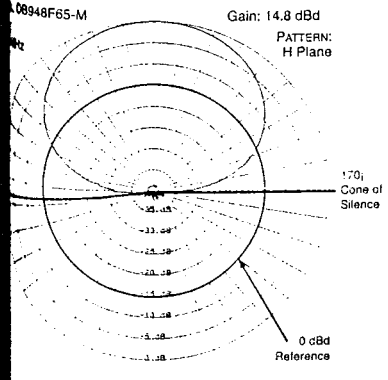


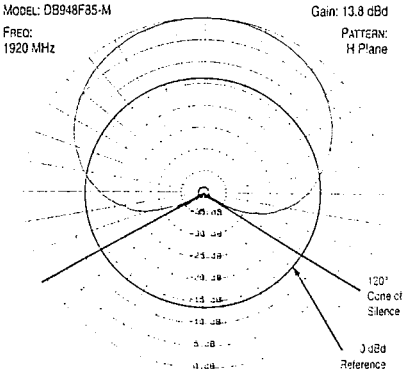
DB948F85



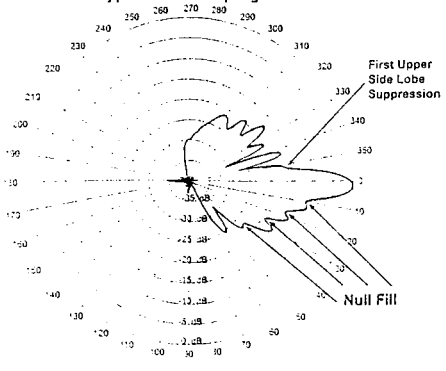








Typical Fill Shaping



DECIBEL PRODUCTS

806 - 960 MHz

DB Director™ Log Periodic Antenna

DB948, DB950

Medium Gain	MaxGain®	MaxFill™	MaxGain®	MaxFill®	MaxGain®
Model Number	**DB948G40**	**DB948F65**	**DB948G65**	**DB948F85**	**DB948G85**
Gain: dbd (dBi)	17.5 (19.6)	15.1 (17.2)	15.5 (17.6)	14 (16.1)	14.8 (16.9)
Horizontal Beamwidth	40°	65°	65°	85°	85°
Vertical Beamwidth	7°	8°	7°	8°	7°
Electrical Downtilt Options	0°	0°, 2°, 4°	0°, 4°	0°, 2°, 4°	0°, 4°
Length: in. (mm)	48.5 (1232)	48.5 (1232)	48.5 (1232)	48.5 (1232)	48.5 (1232)
Width: in. (mm)	11 (279)	10.5 (267)	10.5 (267)	3.5 (89)	3.5 (89)
Depth: in. (mm)	7.8 (198)	7 (178)	6.5 (165)	6.9 (175)	6.5 (165)
Weight: lbs. (Kg)	17 (7.7)	14 (6.4)	14 (6.4)	8.5 (3.9)	8.5 (3.9)
Frontal Wind Area: ft² (m²)	3.7 (0.34)	3.5 (0.33)	3.5 (0.33)	1.2 (0.11)	1.2 (0.11)
Lateral Wind Area: ft² (m²)	2.6 (0.24)	2.4 (0.22)	2.2 (0.20)	2.3 (0.21)	2.2 (0.20)
Frontal Wind Load (at 100mph)	148 lbf (658N) 66.5 kp	140 lbf (623N) 62.9 kp	140 lbf (623N) 62.9 kp	48 lbf (214N) 21.6 kp	48 lbf (214N) 21.6 kp
Lateral Wind Load (at 100mph)	104 lbf (463N) 46.7 kp	96 lbf (427N) 43.1 kp	88 lbf (391N) 93.5 kp	92 lbf (409N) 41.3 kp	88 lbf (391N) 39.5 kp

High Gain	MaxGain®	MaxFill™	MaxGain®	MaxFill®	MaxGain®
Model Number	**DB950G40**	**DB950F65**	**DB950G65**	**DB950F85**	**DB950G85**
Gain: dbd (dBi)	19 (21.1)	16.1 (18.2)	16.6 (18.7)	14.9 (17.0)	15.9 (18.0)
Horizontal Beamwidth	40°	65°	65°	85°	85°
Vertical Beamwidth	5.5°	6.5°	5.5°	6.5°	5.5°
Electrical Downtilt Options	0°	0°, 2°, 4°	0°	0°, 2°, 4°	0°
Length: in. (mm)	60 (1524)	60 (1524)	60 (1524)	60 (1524)	60 (1524)
Width: in. (mm)	11 (279)	10.5 (267)	10.5 (267)	3.5 (89)	3.5 (89)
Depth: in. (mm)	7.8 (198)	7 (178)	7 (178)	6.9 (175)	6.9 (175)
Weight: lbs. (Kg)	20 (9 1)	15 (6.8)	15 (6.8)	10.5 (4.8)	10.5 (4.8)
Frontal Wind Area: ft² (m²)	4.6 (0.43)	4.4 (0.41)	4.4 (0.41)	1.5 (0.14)	1.5 (0.14)
Lateral Wind Area: ft² (m²)	3.3 (0.30)	2.9 (0.27)	2.9 (0.27)	2.9 (0.27)	2.9 (0.27)
Frontal Wind Load (at 100mph)	184 lbf (818N) 82.7 kp	176 lbf (783N) 79.1 kp	176 lbf (783N) 79.1 kp	60 lbf (267N) 27.0 kp	60 lbf (267N) 27.0 kp
Lateral Wind Load (at 100mph)	132 lbf (587N) 59.3 kp	116 lbf (516N) 52.1 kp	116 lbf (516N) 52.1 kp	60 lbf (267N) 27.0 kp	60 lbf (267N) 27.0 kp

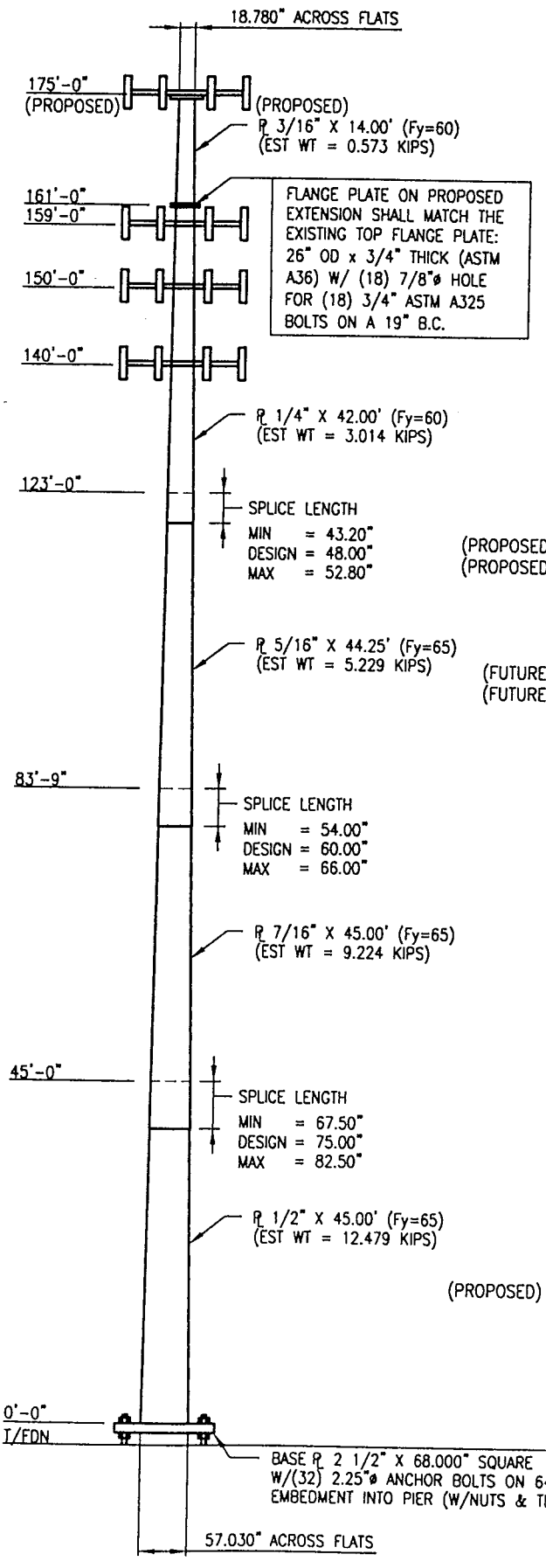
Other configurations available. Please call Customer Service or your Sales Representative.

Standard Specifications	KL	M
Frequency Range (MHz)	1710 - 1880	1850 - 1990
Application	GSM 1800	PCS
VSWR	1.4:1	
IM3	150 dBc, typical	
Polarization	Vertical	
Front-to-Back Ratio	40 db, typical	
Max. Input Power	250 Watts	
Lightning Protection	All metal parts grounded	
Connector Options	E: 7/16 DIN, N: Type N-Female	

SUMMIT MANUFACTURING, LLC

225 KIWANIS BOULEVARD, WEST HAZLETON, PA 18201
PHONE: (888) 847-6537 E-MAIL: SUMMITCA@EPIX.NET
FAX: (888) 460-6885 WWW.SUMMITMFGLLC.COM

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street, Suite 500, Columbus, Ohio 43215
(614) 221-6679 Fax: (614) 221-0166 www.PJFweb.com



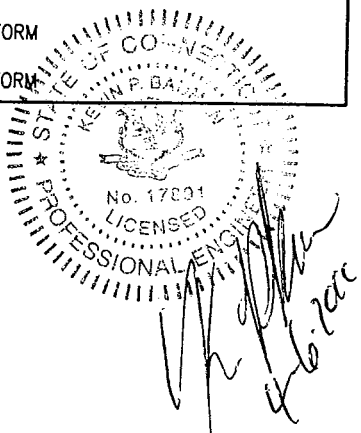
JOB DATA			
Page 1 of 2		Job No.	29200-401
By	SWL	Design No.	SUMMIT #9046-A252
Chk'd By	KJS	Date	4-5-2000
		Rev. No.	Rev. Date
Pole	175' POLE		
Site	SOUTH BROOKLYN, CT: SBA SITE #4275-037		
Owner	SHAFFER TOWER		
Ref. No.	29299-439 (161' POLE)		
Design	85 MPH / 74 MPH + 1/2" ICE ACCORDING TO TIA/EIA-222-F 1996		

LOAD CASES		
CASE 1	85 MPH WITH NO ICE	DESIGN WIND
CASE 2	74 MPH WITH 1/2" RADIAL ICE	REDUCED WIND WITH ICE
CASE 3	50 MPH WITH NO ICE	OPERATIONAL WIND

POLE SPECIFICATIONS	
Pole Shape Type:	18-SIDED POLYGON
Taper:	0.230000 IN/FT
Shaft Steel:	ASTM A607 GRADE 60 & 65
Base PL Steel:	ASTM A572 GRADE 50 (50 KSI)
Anchor Bolts:	2 1/4"ø x 8'-0" LONG #18J ASTM A615 GRADE 75

ANTENNA LIST		
No.	Elev.	Description
-	TOP	5/8" LIGHTNING ROD
1-12	TOP	(12) SWEDCOM ALP-9212-N
-	TOP	14' LOW PROFILE PLATFORM
13-21	159.00	(9) DB980H PCS
-	159.00	14' CLAMP-ON LOW PROFILE PLATFORM
22-33	150.00	(12) SWEDCOM ALP-9212-N
-	150.00	14' CLAMP-ON LOW PROFILE PLATFORM
34-45	140.00	(12) DB896H PANEL
-	140.00	14' CLAMP-ON LOW PROFILE PLATFORM

STEP BOLTS FULL HEIGHT.
ANTENNA FEED LINES RUN INSIDE OF POLE.



Elevation	85 MPH WIND		50 MPH WIND	
	Lateral Deflection (Inches)	Rotation (sway) (degrees)	Lateral Deflection (Inches)	Rotation (sway) (degrees)
TOP	130.9	7.116	45.2	2.462

SHAFT SECTION DATA					
Shaft Section	Section Length (feet)	Plate Thickness (in.)	Lap Splice (in.)	Diameter Across Flats (inches) @ Top	@ Bottom
1	14.00	0.1875		18.780	22.000
2	42.00	0.2500	48.00	22.000	31.660
3	44.25	0.3125	60.00	30.240	40.417
4	45.00	0.4375	75.00	38.643	48.993
5	45.00	0.5000		46.680	57.030

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

UNFACTORED BASE REACTIONS
MOMENT = 3710 ft-kips
SHEAR = 29.7 kips
AXIAL = 38.3 kips

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SUMMIT MANUFACTURING LLC
225 KIWANIS BOULEVARD, WEST HAZLETON, PA 18201
PHONE: (88) 847-6537 E MAIL: SUMMITCA@EPIX.NET
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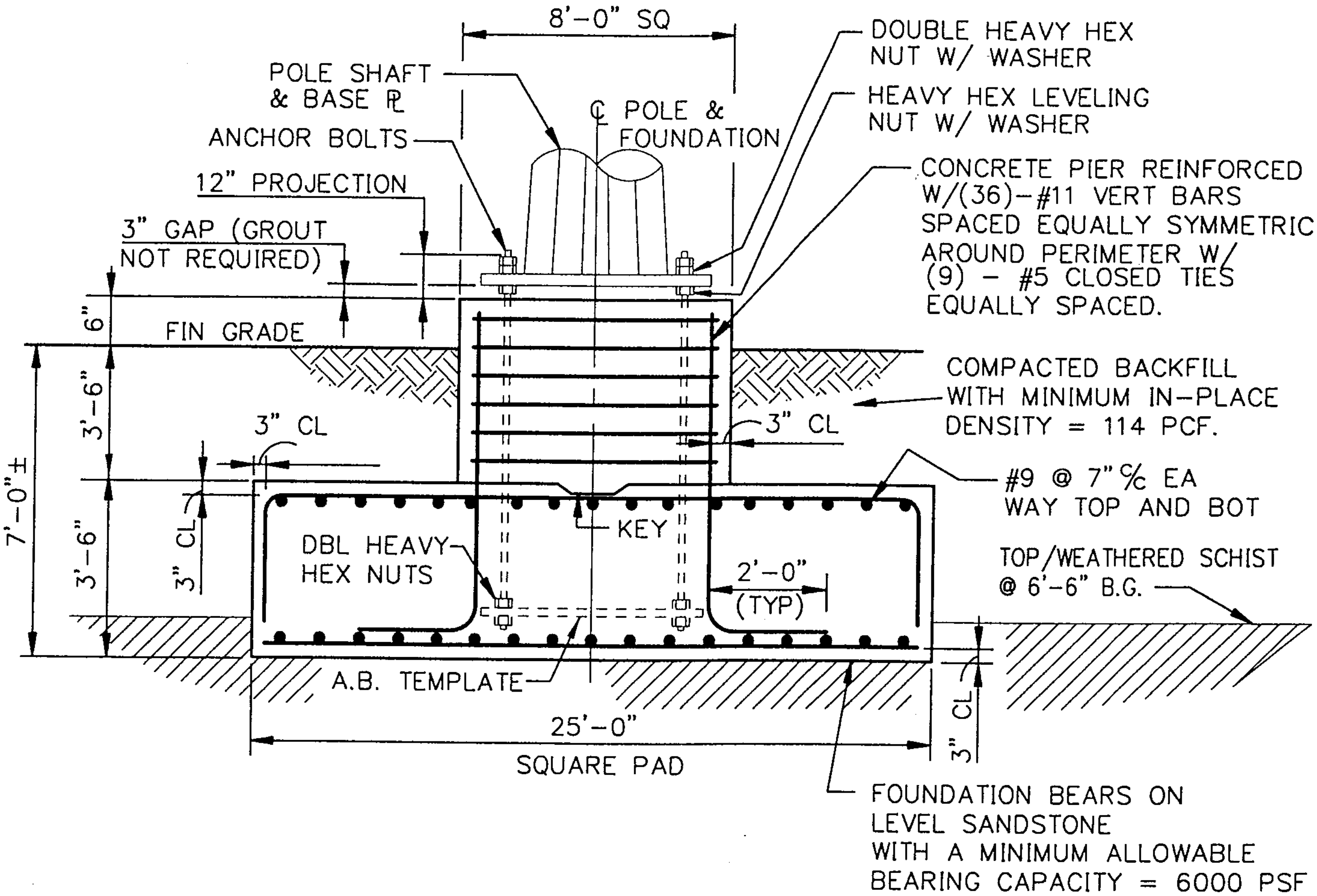
PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street, Suite 500, Columbus, Ohio 43215
(614)-221-6679 FAX (614)-221-0166

Pole	161-FT MONOPOLE	Page 2	Of 2
Location	SOUTH BROOKLYN, CT	By SWL	Date 4-5-2000
Site	SBA #4275-037	Summit Job No. 5054	Job No. 29200-401
Owner	SBA, INC	Revision No.	Date
Design	85 MPH/74 MPH + 1/2" RADIAL ICE	According to TIA/EIA-222-F 1996	



EXISTING FOUNDATION

NOTES:

1. ALL STRUCTURAL CONCRETE HAS A MINIMUM COMPRESSIVE STRENGTH OF AT LEAST 3000 PSI AT 28 DAYS.
2. REINFORCING STEEL CONFORMS TO ASTM A615 (GRADE 60) EXCEPT PIER TIES MAY BE ASTM A615 (GRADE 40).
3. SEE PAGE 1 FOR ANCHOR BOLT QUANTITY, SIZE, LENGTH, AND BOLT CIRCLE.
4. TOTAL CONCRETE = 88 CUBIC YARDS.
5. FOUNDATION DESIGN BASED UPON GEOTECHNICAL EXPLORATION REPORT
   PREPARED BY: JAWORSKI GEOTECH, INC.
   REPORT NO: 99365C
   DATED: 08-25-1999
6. THE EXISTING FOUNDATION HAS BEEN ANALYSED FOR THE FOWWOLING BASE REACTIONS:
   OVERTURNING MOMENT = 3710 FT*KIPS SHAER = 29.7 KIPS AXIAL = 28.3 KIPS

PJF_Pole (tm) - Monopole Design Program
Windows Version 1.28.0100 Wed Apr 5, 2000 - 3:35:54 pm
(c) 1993 to 1998 PAUL J. FORD AND COMPANY, Columbus, Ohio

Job No.....: 29200-401 Design No: Summit #9046-A252 Engineer : SWL
Description : 175' Pole - South Brooklyn, CT: SBA Site #4275-037
Design..... : 85 mph / 74 mph + 1/2" ice
Owner..... : Shaffer Tower Client: Summit Manufacturing, LLC (
Status..... : Final Design Revision: Rev. Date :

S U M M A R Y O F A N A L Y S I S R E S U L T S

Pole Height.....: 175.00 ft
Top Diameter.....: 18.780 in
Bottom Diameter.....: 57.030 in
Pole Shape.....: 18-Sided Polygon
Splice Joint Type...: Taper shaft - Slip Joint Splice
Shaft Taper.....: 0.230000 (in/ft)
Shaft Steel Weight..: 30.519 kips

POLE SHAFT PROPERTIES:

Shaft Section Number	Section Length (ft)	Wall Thickness [t] (in)	Steel Yield [Fy] (ksi)	Top Diameter [Dt] (in)	Bottom Diameter [Db] (in)	Slip Joint Overlap (in)
1.	14.000	0.18750	60	18.780	22.000	0.00
2.	42.000	0.25000	60	22.000	31.660	48.00
3.	44.250	0.31250	65	30.240	40.417	60.00
4.	45.000	0.43750	65	38.642	48.993	75.00
5.	45.000	0.50000	65	46.680	57.030	

POLE SHAFT SECTION MAXIMUM FORCES AND MOMENTS:

Shaft Section Number	Wind Load No.	Wind Speed (mph)	Radial Ice (in)	At Base of Section: Sect. Elev. (ft)	Axial Load (kips)	Horiz. Shear (kips)	Bending Moment (ft-kips)	Max. Ratio Actual/ Allowable [Ftot/Fb]
1.	1	85.0	0.00	161.00	2.331	5.281	71.526	0.2623
2.	1	85.0	0.00	123.00	11.542	19.179	633.793	0.8841
3.	1	85.0	0.00	83.75	16.770	22.363	1484.578	0.9320
4.	1	85.0	0.00	45.00	26.079	25.796	2446.312	0.7513
5.	1	85.0	0.00	0.00	38.308	29.710	3709.576	0.6936
>> MAXIMUM BASE REACTIONS :					38.308	29.710	3709.576 <<	

POLE DEFLECTION AND ROTATION AT TOP AND AT HIGHEST MICROWAVE DISH ELEVATION:

Wind Load No.	Wind Speed (mph)	Radial Ice (in)	Location	Elev (ft)	Deflection (in)	Rotation (deg)	Max. Allowable Rotation Limit (deg)
1.	85.0	0.00	Top	175.00	130.933	7.116	
2.	73.6	0.50	Top	175.00	108.174	5.913	
3.	50.0	0.00	Top	175.00	45.183	2.462	

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Job No.....: 29200-401 Design No: Summit #9046-A252 Engineer : SWL
Description : 175' Pole - South Brooklyn, CT: SBA Site #4275-037
Design..... : 85 mph / 74 mph + 1/2" ice
Owner..... : Shaffer Tower Client: Summit Manufacturing, LLC (
Status..... : Final Design Revision: Rev. Date :

Pole Height : 175 ft
Pole Shape : 18-Sided Polygon
Pole Type : Taper shaft - Slip Joint Splice
Pole Taper : 0.230000 (in/ft)

INPUT TUBE PROPERTIES:

Tube Sect No.	Top / Splice Elev (ft)	Bot Tube Elev (ft)	Tube Length (ft)	Wall Thick [t] (in)	Steel [Fy] (ksi)	Top Diam [Dt] (in)	Bot Diam [Db] (in)	Slip Joint Overlap (in)
1.	175.00	161.00	14.000	0.18750	60	18.780	22.000	0.00
2.	161.00	119.00	42.000	0.25000	60	22.000	31.660	48.00
3.	123.00	78.75	44.250	0.31250	65	30.240	40.417	60.00
4.	83.75	38.75	45.000	0.43750	65	38.642	48.993	75.00
5.	45.00	0.00	45.000	0.50000	65	46.680	57.030	

TUBE SECTION PROPERTIES:

Tube Sect No.	Section Weight (kips)	Location	Elev (ft)	Diam. Across Flats (in)	Wall Thick [t] (in)	[W/t] Ratio	Diam/ Thick [D/t] Ratio	Area (in^2)	Ix (in^4)
1	0.573	@Top	175.0	18.780	0.1875	15.90	100.16	11.06	483.1
		@Splice	0.0	.000		0.00	0.00	0.00	0.0
		@Bot	161.0	22.000		18.93	117.33	12.98	780.1
2	3.014	@Top	161.0	22.000	0.2500	13.75	88.00	17.26	1031.2
		@Splice	123.0	30.740		19.92	122.96	24.19	2840.7
		@Bot	119.0	31.660		20.57	126.64	24.92	3105.6
3	5.229	@Top	123.0	30.240	0.3125	15.30	96.77	29.68	3358.1
		@Splice	83.8	39.268		20.39	125.66	38.64	7405.4
		@Bot	78.8	40.417		21.04	129.34	39.78	8080.7
4	9.224	@Top	83.8	38.643	0.4375	13.81	88.33	53.05	9780.8
		@Splice	45.0	47.555		17.40	108.70	65.43	18346.0
		@Bot	38.8	48.993		17.98	111.98	67.42	20076.8
5	12.479	@Top	45.0	46.680	0.5000	14.70	93.36	73.29	19740.7
		@Bot	0.0	57.030		18.35	114.06	89.71	36209.3

Total Shaft Steel Weight = 30.519 kips

PJF_Pole (tm) - Monopole Design Program
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Job No.....: 29200-401 Design No: Summit #9046-A252 Engineer : SWL
Description : 175' Pole - South Brooklyn, CT: SBA Site #4275-037
Design..... : 85 mph / 74 mph + 1/2" ice
Owner..... : Shaffer Tower Client: Summit Manufacturing, LLC (
Status..... : Final Design Revision: Rev. Date :

Segment Properties: (@ Max Segment = 10 ft)

Tube Segmt No.	Segment Feature Location	Segment Elev. (ft)	Diam. Across Flats (in)	Wall Thick [t] (in)	[W/t] Ratio	Diam/ Thick [D/t] Ratio	Area (in^2)	Ix (in^4)
1.	top	175.000	18.780	0.18750	15.90	100.16	11.06	483.1
2.	<arm [1]>	175.000	18.780	0.18750	15.90	100.16	11.06	483.1
3.	<arm [2]>	175.000	18.780	0.18750	15.90	100.16	11.06	483.1
4.	<arm [3]>	175.000	18.780	0.18750	15.90	100.16	11.06	483.1
5.		170.000	19.930	0.18750	16.98	106.29	11.75	578.4
6.	bot sec(1)	161.000	22.000	0.18750	18.93	117.33	12.98	780.1
7.	top sec(2)	161.000	22.000	0.25000	13.75	88.00	17.26	1031.2
8.		160.000	22.230	0.25000	13.92	88.92	17.44	1064.3
9.	<arm [4]>	159.000	22.460	0.25000	14.08	89.84	17.62	1098.0
10.	<arm [5]>	159.000	22.460	0.25000	14.08	89.84	17.62	1098.0
11.		150.000	24.530	0.25000	15.54	98.12	19.27	1434.5
12.	<arm [6]>	150.000	24.530	0.25000	15.54	98.12	19.27	1434.5
13.	<arm [7]>	150.000	24.530	0.25000	15.54	98.12	19.27	1434.5
14.		140.000	26.830	0.25000	17.16	107.32	21.09	1882.0
15.	<arm [8]>	140.000	26.830	0.25000	17.16	107.32	21.09	1882.0
16.	<arm [9]>	140.000	26.830	0.25000	17.16	107.32	21.09	1882.0
17.		130.000	29.130	0.25000	18.78	116.52	22.92	2414.0
18.	top sec(3)	123.000	30.740	0.25000	19.92	122.96	24.19	2840.7
19.		120.000	30.930	0.31250	15.69	98.98	30.37	3595.7
20.	bot sec(2)	119.000	31.660	0.31250	16.10	101.31	31.09	3859.1
21.		110.000	33.230	0.31250	16.99	106.34	32.65	4468.4
22.		100.000	35.530	0.31250	18.28	113.70	34.93	5471.9
23.		90.000	37.830	0.31250	19.58	121.06	37.21	6615.5
24.	top sec(4)	83.750	39.268	0.31250	20.39	125.66	38.64	7405.4
25.		80.000	39.505	0.43750	14.16	90.30	54.25	10458.2
26.	bot sec(3)	78.750	39.793	0.43750	14.27	90.95	54.65	10690.8
27.		70.000	41.805	0.43750	15.09	95.55	57.44	12416.1
28.		60.000	44.105	0.43750	16.01	100.81	60.64	14604.1
29.		50.000	46.405	0.43750	16.94	106.07	63.83	17035.3
30.	top sec(5)	45.000	47.555	0.43750	17.40	108.70	65.43	18346.0
31.		40.000	47.830	0.50000	15.10	95.66	75.11	21252.4
32.	bot sec(4)	38.750	48.118	0.50000	15.21	96.24	75.57	21642.0
33.		30.000	50.130	0.50000	15.92	100.26	78.76	24503.4
34.		20.000	52.430	0.50000	16.73	104.86	82.41	28070.1
35.		10.000	54.730	0.50000	17.54	109.46	86.06	31967.2
36.	base	0.000	57.030	0.50000	18.35	114.06	89.71	36209.3

Total Number of Antennas / Arms = 9

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Job No.....: 29200-401 Design No: Summit #9046-A252 Engineer : SWL
Description : 175' Pole - South Brooklyn, CT: SBA Site #4275-037
Design..... : 85 mph / 74 mph + 1/2" ice
Owner..... : Shaffer Tower Client: Summit Manufacturing, LLC (
Status..... : Final Design Revision: Rev. Date :

ANTENNA AND ARM PROPERTIES AND LOAD DATA:

LOAD CASE 1: BASIC WIND VELOCITY = 85.00 mph

Ant Arm No.	Arm Mount. Elev. (ft)	Load Applic. Elev. (ft)	Arm Length (ft)	Ice Load Case	Antenna Area [CaAa] (sf)	Antenna Force [qzGhCaAa] (lbs)	Antenna Weight (lbs)
[1]	175.000	178.000	0.0000	No Ice:	0.25	12.65	75.00
Description: 5/8" Lightning Rod							
		[Gh] 1.69	[Kz] 1.619	No Ice:	[qz] (psf) 29.936	[qz] [Gh] (psf) 50.592	
[2]	175.000	175.000	0.0000	No Ice:	66.66	3356.11	324.00
Description: (12) Swedcom ALP-9212-N							
		[Gh] 1.69	[Kz] 1.611	No Ice:	[qz] (psf) 29.791	[qz] [Gh] (psf) 50.347	
[3]	175.000	175.000	2.0000	No Ice:	21.52	1083.46	1300.00
Description: 14' Low Profile Platform							
		[Gh] 1.69	[Kz] 1.611	No Ice:	[qz] (psf) 29.791	[qz] [Gh] (psf) 50.347	
[4]	159.000	159.000	0.0000	No Ice:	25.88	1267.52	81.00
Description: (9) DB980H PCS							
		[Gh] 1.69	[Kz] 1.567	No Ice:	[qz] (psf) 28.986	[qz] [Gh] (psf) 48.986	
[5]	159.000	159.000	2.0000	No Ice:	26.88	1316.75	1835.00
Description: 14' Clamp-on Low Profile Platform							
		[Gh] 1.69	[Kz] 1.567	No Ice:	[qz] (psf) 28.986	[qz] [Gh] (psf) 48.986	
[6]	150.000	150.000	0.0000	No Ice:	66.66	3211.51	324.00
Description: (12) Swedcom ALP-9212-N							
		[Gh] 1.69	[Kz] 1.541	No Ice:	[qz] (psf) 28.507	[qz] [Gh] (psf) 48.177	
[7]	150.000	150.000	2.0000	No Ice:	21.52	1036.78	1835.00
Description: 14' Clamp-on Low Profile Platform							
		[Gh] 1.69	[Kz] 1.541	No Ice:	[qz] (psf) 28.507	[qz] [Gh] (psf) 48.177	
[8]	140.000	140.000	0.0000	No Ice:	73.62	3477.59	264.00
Description: (12) DB896H Panel							
		[Gh] 1.69	[Kz] 1.511	No Ice:	[qz] (psf) 27.951	[qz] [Gh] (psf) 47.237	
[9]	140.000	140.000	2.0000	No Ice:	21.19	1000.95	1835.00
Description: 14' Clamp-on Low Profile Platform							
					[qz]	[qz] [Gh]	

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Description : 175' Pole - South Brooklyn, CT: SBA Site #4275-037
Design..... : 85 mph / 74 mph + 1/2" ice
Owner..... : Shaffer Tower Client: Summit Manufacturing, LLC (
Status..... : Final Design Revision: Rev. Date :

POLE SHAFT LOADS:

LOAD CASE 1: BASIC WIND VELOCITY = 85.00 mph

Design Loads per TIA/EIA-222-F Standard; Gust Factor ..... Gh = 1.69
Pole DL Overload Factor = 1
Per TIA/EIA Table 1: Note 3: For all cross sectional shapes,
Force Coefficient [Cf] need not exceed 1.2
for any value of C. (Where C=sqrt(Kz)*V*D.)

Top of Segment Elev. (ft)	Expos Coeff [Kz]	Veloc Press [qz] (psf)	Pole Veloc Coeff [C]	Force Coeff [Cf]	Projected Area Shaft [Ae] (sf)	Projected Area Segment [Cf Ae] (sf)	Segment Wind Force (lbs)	Shaft Segment Weight (lbs)
175.000	1.611	29.79	168.82	0.650	0.000	0.000	0.00	0.00
175.000	1.611	29.79	168.82	0.650	0.000	0.000	0.00	0.00
175.000	1.611	29.79	168.82	0.650	0.000	0.000	0.00	0.00
175.000	1.611	29.79	168.82	0.650	1.575	1.023	51.53	37.88
170.000	1.597	29.55	178.42	0.650	8.160	5.304	265.72	196.40
161.000	1.573	29.09	195.43	0.650	14.053	9.135	452.57	338.46
161.000	1.573	29.09	195.43	0.650	1.843	1.198	58.89	59.04
160.000	1.570	29.04	197.30	0.650	1.862	1.210	59.40	59.66
159.000	1.567	28.99	199.16	0.650	0.000	0.000	0.00	0.00
159.000	1.567	28.99	199.16	0.650	1.881	1.223	59.90	60.28
150.000	1.541	28.51	215.71	0.650	15.740	10.231	497.03	504.58
150.000	1.541	28.51	215.71	0.650	0.000	0.000	0.00	0.00
150.000	1.541	28.51	215.71	0.650	2.054	1.335	64.31	65.87
140.000	1.511	27.95	233.62	0.650	19.346	12.575	599.90	620.75
140.000	1.511	27.95	233.62	0.650	0.000	0.000	0.00	0.00
140.000	1.511	27.95	233.62	0.650	2.245	1.460	68.94	72.08
130.000	1.480	27.37	250.98	0.650	23.508	15.280	713.45	754.92
123.000	1.456	26.94	262.77	0.650	17.575	11.424	523.59	898.98
120.000	1.446	26.75	263.46	0.650	7.725	5.021	227.49	309.68
119.000	1.443	26.68	269.35	0.650	2.627	1.708	77.00	105.34
110.000	1.411	26.09	279.55	0.650	24.319	15.807	704.00	975.42
100.000	1.373	25.39	294.86	0.650	28.842	18.747	814.38	1157.54
90.000	1.332	24.64	309.26	0.650	30.758	19.993	843.88	1235.17
83.750	1.305	24.13	317.73	0.650	19.355	12.581	517.81	1444.64
80.000	1.288	23.82	317.56	0.650	13.092	8.510	344.38	734.03
78.750	1.282	23.71	319.15	0.650	3.321	2.159	86.53	186.22
70.000	1.240	22.93	329.70	0.650	30.750	19.988	786.70	1724.92
60.000	1.186	21.94	340.26	0.650	35.988	23.392	885.14	2019.82
50.000	1.126	20.83	348.80	0.650	37.904	24.638	888.38	2128.50
45.000	1.093	20.21	352.11	0.650	19.634	12.762	441.29	2515.60
40.000	1.057	19.54	348.24	0.650	19.785	12.861	430.59	1268.60
38.750	1.047	19.36	348.74	0.650	4.015	2.609	85.44	257.45
30.000	1.000	18.50	355.09	0.650	36.994	24.046	761.95	2372.90
20.000	1.000	18.50	371.38	0.650	42.925	27.901	872.14	2754.55
10.000	1.000	18.50	387.67	0.650	44.842	29.147	911.09	2878.75
1.000	1.000	18.50	402.33	0.650	41.996	27.298	853.27	2697.06
					Summation TOTAL =		13946.70	30435.09

---------(END LOAD CASE 1 -- POLE SHAFT LOADS)----------

PJF_Pole (tm) - Monopole Design Program
Windows Version 1.28.0100 Wed Apr 5, 2000 - 3:35:54 pm
(c) 1993 to 1998 PAUL J. FORD AND COMPANY, Columbus, Ohio

Job No.....: 29200-401 Design No: Summit #9046-A252 Engineer : SWL
Description : 175' Pole - South Brooklyn, CT: SBA Site #4275-037
Design..... : 85 mph / 74 mph + 1/2" ice
Owner..... : Shaffer Tower Client: Summit Manufacturing, LLC (
Status..... : Final Design Revision: Rev. Date :

POLE SHAFT SEGMENTS -- AXIAL AND SHEAR FORCES:

LOAD CASE 1: BASIC WIND VELOCITY = 85.00 mph

Tube Segment No.	Segment Elevation (ft)	Axial Load (kips)	Cumulative Axial Load (kips)	Horiz. Shear (kips)	Cumulative Horiz. Shear (kips)
1.	175.000	0.000	0.000	0.000	0.000
2.	175.000	0.075	0.075	0.013	0.013
3.	175.000	0.324	0.399	3.356	3.369
4.	175.000	1.338	1.737	1.135	4.504
5.	170.000	0.196	1.933	0.266	4.769
6.	161.000	0.338	2.272	0.453	5.222
7.	161.000	0.059	2.331	0.059	5.281
8.	160.000	0.060	2.390	0.059	5.340
9.	159.000	0.081	2.471	1.268	6.608
10.	159.000	1.895	4.367	1.377	7.985
11.	150.000	0.505	4.871	0.497	8.482
12.	150.000	0.324	5.195	3.212	11.693
13.	150.000	1.901	7.096	1.101	12.794
14.	140.000	0.621	7.717	0.600	13.394
15.	140.000	0.264	7.981	3.478	16.872
16.	140.000	1.907	9.888	1.070	17.942
17.	130.000	0.755	10.643	0.713	18.655
18.	123.000	0.899	11.542	0.524	19.179
19.	120.000	0.310	11.852	0.227	19.406
20.	119.000	0.105	11.957	0.077	19.483
21.	110.000	0.975	12.932	0.704	20.187
22.	100.000	1.158	14.090	0.814	21.001
23.	90.000	1.235	15.325	0.844	21.845
24.	83.750	1.445	16.770	0.518	22.363
25.	80.000	0.734	17.504	0.344	22.708
26.	78.750	0.186	17.690	0.087	22.794
27.	70.000	1.725	19.415	0.787	23.581
28.	60.000	2.020	21.435	0.885	24.466
29.	50.000	2.128	23.563	0.888	25.354
30.	45.000	2.516	26.079	0.441	25.796
31.	40.000	1.269	27.347	0.431	26.226
32.	38.750	0.257	27.605	0.085	26.312
33.	30.000	2.373	29.978	0.762	27.074
34.	20.000	2.755	32.732	0.872	27.946
35.	10.000	2.879	35.611	0.911	28.857
36.	1.000	2.697	38.308	0.853	29.710
Base	0.000		38.308		29.710

---------(END LOAD CASE 1 -- AXIAL AND SHEAR FORCE)----------

PJF_Pole (tm) - Monopole Design Program
Windows Version 1.28.0100 Wed Apr 5, 2000 - 3:35:54 pm

Job No.....: 29200-401 Design No: Summit #9046-A252 Engineer : SWL
Description : 175' Pole - South Brooklyn, CT: SBA Site #4275-037
Design..... : 85 mph / 74 mph + 1/2" ice
Owner..... : Shaffer Tower Client: Summit Manufacturing, LLC (
Status..... : Final Design Revision: Rev. Date :

POLE SHAFT SEGMENTS -- MOMENTS and DEFLECTIONS:

LOAD CASE 1: BASIC WIND VELOCITY = 85.00 mph

Segmnt Elev (ft)	[-------- MOMENTS (ft-kips) ---------] From Ant/ Arm	From Shaft Wind	From P-Delta Effects	Total Moment	[--DEFLECTIONS (inch)-------] No P-Delta Effects	Total W/ P-Delta Effects	Total Rotation (deg)
175.00	0.038	0.000	0.000	0.038	124.888	130.933	7.116
175.00	0.038	0.000	0.000	0.038	124.888	130.933	7.116
175.00	0.038	0.000	0.000	0.038	124.888	130.933	7.116
175.00	0.038	0.000	0.050	0.088	123.465	129.435	7.116
170.00	22.299	0.784	1.181	24.263	116.357	121.957	7.084
161.00	62.369	5.654	3.228	71.250	105.123	110.138	6.907
161.00	62.369	5.654	3.503	71.526	103.742	108.684	6.907
160.00	66.821	6.482	3.785	77.089	102.362	107.232	6.887
159.00	71.274	7.371	3.785	82.429	102.360	107.230	6.866
159.00	71.274	7.371	4.083	82.727	100.987	105.785	6.866
150.00	134.602	18.119	8.434	161.154	90.158	94.393	6.621
150.00	134.602	18.119	8.434	161.154	90.158	94.393	6.621
150.00	134.602	18.119	9.037	161.758	88.834	93.000	6.621
140.00	247.450	36.184	16.540	300.174	77.209	80.775	6.226
140.00	247.450	36.184	16.540	300.174	77.209	80.775	6.226
140.00	247.450	36.184	17.411	301.044	75.964	79.466	6.226
130.00	405.083	61.141	28.103	494.327	64.013	66.908	5.701
123.00	515.426	82.944	35.423	633.793	56.323	58.833	5.274
120.00	562.716	93.416	38.595	694.727	53.207	55.564	5.106
119.00	578.480	97.058	39.649	715.187	52.191	54.498	5.053
110.00	720.349	133.331	49.004	902.684	43.540	45.427	4.545
100.00	877.983	181.206	59.000	1118.190	35.013	36.497	3.966
90.00	1035.616	237.362	68.394	1341.372	27.644	28.789	3.386
83.75	1134.137	276.780	73.661	1484.578	23.776	24.749	3.027
80.00	1193.249	302.045	77.168	1572.462	21.411	22.279	2.862
78.75	1212.953	310.731	78.036	1601.720	20.842	21.685	2.808
70.00	1350.883	375.387	85.647	1811.917	16.090	16.729	2.440
60.00	1508.516	457.538	93.563	2059.616	11.596	12.047	2.032
50.00	1666.149	548.562	100.716	2315.427	7.905	8.205	1.638
45.00	1744.966	597.402	103.944	2446.312	6.352	6.591	1.446
40.00	1823.782	648.426	107.092	2579.301	4.984	5.169	1.270
38.75	1843.486	661.510	107.689	2612.686	4.732	4.907	1.227
30.00	1981.416	756.859	112.552	2850.826	2.767	2.867	0.932
20.00	2139.049	873.853	116.728	3129.630	1.213	1.256	0.608
10.00	2296.682	999.744	119.398	3415.825	0.299	0.310	0.298
0.00	2454.315	1134.922	120.339	3709.576	0.000	0.000	0.000

---------(END LOAD CASE 1 -- MOMENTS AND DEFLECTIONS)----------

PJF_Pole (tm) - Monopole Design Program
Windows Version 1.28.0100 Wed Apr 5, 2000 - 3:35:54 pm
(c) 1993 to 1998 PAUL J. FORD AND COMPANY, Columbus, Ohio

Job No.....: 29200-401 Design No: Summit #9046-A252 Engineer : SWL
Description : 175' Pole - South Brooklyn, CT: SBA Site #4275-037
Design..... : 85 mph / 74 mph + 1/2" ice
Owner..... : Shaffer Tower Client: Summit Manufacturing, LLC (
Status..... : Final Design Revision: Rev. Date :

POLE SHAFT SEGMENTS -- ACTUAL VS. ALLOWABLE STRESSES:

LOAD CASE 1: BASIC WIND VELOCITY = 85.00 mph
Note: Per TIA/EIA Sec. 3.1.1.1: Allow a 1/3 stress increase for poles under 700 feet in height. The allowable stresses shown include the factor of 1.333

Segmnt Elev (ft)	[---------- ACTUAL STRESSES ----------] Bending [fb] (ksi)	Axial [fa] (ksi)	Torsion [ft] (ksi)	Shear [fv] (ksi)	Combined [Ftot] (ksi)	Allow. Stress [Fb] (ksi)	Actual/ Allowable [Ftot/Fb] Ratio
175.00	0.009	0.000	0.000	0.000	0.009	48.00	0.0002
175.00	0.009	0.007	0.001	0.002	0.017	48.00	0.0004
175.00	0.009	0.036	0.304	0.607	1.579	48.00	0.0329
175.00	0.021	0.157	0.553	0.812	2.371	48.00	0.0494
170.00	5.094	0.165	0.491	0.810	5.720	48.00	0.1192
161.00	12.243	0.175	0.402	0.803	12.592	48.00	0.2623
161.00	9.297	0.135	0.303	0.611	9.564	48.00	0.1992
160.00	9.810	0.137	0.297	0.611	10.071	48.00	0.2098
159.00	10.272	0.140	0.362	0.748	10.589	48.00	0.2206
159.00	10.309	0.248	0.522	0.904	10.842	48.00	0.2259
150.00	16.789	0.253	0.437	0.878	17.194	48.00	0.3582
150.00	16.789	0.270	0.603	1.211	17.346	48.00	0.3614
150.00	16.852	0.368	0.708	1.325	17.577	48.00	0.3662
140.00	26.072	0.366	0.591	1.267	26.633	48.00	0.5549
140.00	26.072	0.378	0.755	1.596	26.762	48.00	0.5575
140.00	26.147	0.469	0.840	1.697	26.977	48.00	0.5620
130.00	36.342	0.464	0.711	1.624	37.028	48.00	0.7714
123.00	41.786	0.477	0.638	1.582	42.438	48.00	0.8841
120.00	36.409	0.390	0.506	1.275	36.929	52.00	0.7102
119.00	35.748	0.385	0.483	1.250	36.257	48.00	0.7554
110.00	40.899	0.396	0.438	1.234	41.397	52.00	0.7961
100.00	44.236	0.403	0.383	1.200	44.723	52.00	0.8601
90.00	46.733	0.412	0.337	1.171	47.217	52.00	0.9080
83.75	47.961	0.434	0.313	1.155	48.462	52.00	0.9320
80.00	36.189	0.323	0.222	0.835	36.557	52.00	0.7030
78.75	36.323	0.324	0.219	0.832	36.692	52.00	0.7056
70.00	37.169	0.338	0.198	0.819	37.549	52.00	0.7221
60.00	37.896	0.353	0.178	0.805	38.288	52.00	0.7363
50.00	38.428	0.369	0.160	0.793	38.832	52.00	0.7468
45.00	38.634	0.399	0.153	0.787	39.066	52.00	0.7513
40.00	35.367	0.364	0.132	0.697	35.760	52.00	0.6877
38.75	35.391	0.365	0.131	0.695	35.785	52.00	0.6882
30.00	35.534	0.381	0.120	0.686	35.942	52.00	0.6912
20.00	35.615	0.397	0.110	0.677	36.038	52.00	0.6930
10.00	35.630	0.414	0.101	0.669	36.068	52.00	0.6936
0.00	35.597	0.427	0.093	0.661	36.047	52.00	0.6932

---------(END LOAD CASE 1 -- ACTUAL VS. ALLOWABLE STRESSES)----------

PJF_Pole (tm) - Monopole Design Program
Windows Version 1.28.0100 Wed Apr 5, 2000 - 3:35:54 pm
(c) 1993 to 1998 PAUL J. FORD AND COMPANY, Columbus, Ohio

Job No.....: 29200-401 Design No: Summit #9046-A252 Engineer : SWL
Description : 175' Pole - South Brooklyn, CT: SBA Site #4275-037
Design..... : 85 mph / 74 mph + 1/2" ice
Owner..... : Shaffer Tower Client: Summit Manufacturing, LLC (
Status..... : Final Design Revision: Rev. Date :

ANTENNA AND ARM PROPERTIES AND LOAD DATA:

LOAD CASE 2: WIND VELOCITY = 73.61 mph + 0.50 inches Radial Ice.

Ant Arm No.	Arm Mount. Elev. (ft)	Load Applic. Elev. (ft)	Arm Length (ft)	Ice Load Case	Antenna Area [CaAa] (sf)	Antenna Force [qzGhCaAa] (lbs)	Antenna Weight (lbs)
[1]	175.000	178.000	0.0000	W/ Ice:	0.50	18.97	100.00
Description: 5/8" Lightning Rod							
		[Gh] 1.69	[Kz] 1.619	W/ Ice:	[qz] (psf) 22.452	[qz] [Gh] (psf) 37.944	
[2]	175.000	175.000	0.0000	W/ Ice:	72.99	2756.11	864.00
Description: (12) Swedcom ALP-9212-N							
		[Gh] 1.69	[Kz] 1.611	W/ Ice:	[qz] (psf) 22.343	[qz] [Gh] (psf) 37.760	
[3]	175.000	175.000	2.0000	W/ Ice:	22.90	864.71	2100.00
Description: 14' Low Profile Platform							
		[Gh] 1.69	[Kz] 1.611	W/ Ice:	[qz] (psf) 22.343	[qz] [Gh] (psf) 37.760	
[4]	159.000	159.000	0.0000	W/ Ice:	30.02	1103.07	234.00
Description: (9) DB980H PCS							
		[Gh] 1.69	[Kz] 1.567	W/ Ice:	[qz] (psf) 21.739	[qz] [Gh] (psf) 36.740	
[5]	159.000	159.000	2.0000	W/ Ice:	29.06	1067.65	2019.00
Description: 14' Clamp-on Low Profile Platform							
		[Gh] 1.69	[Kz] 1.567	W/ Ice:	[qz] (psf) 21.739	[qz] [Gh] (psf) 36.740	
[6]	150.000	150.000	0.0000	W/ Ice:	72.99	2637.35	864.00
Description: (12) Swedcom ALP-9212-N							
		[Gh] 1.69	[Kz] 1.541	W/ Ice:	[qz] (psf) 21.381	[qz] [Gh] (psf) 36.133	
[7]	150.000	150.000	2.0000	W/ Ice:	22.90	827.45	2019.00
Description: 14' Clamp-on Low Profile Platform							
		[Gh] 1.69	[Kz] 1.541	W/ Ice:	[qz] (psf) 21.381	[qz] [Gh] (psf) 36.133	
[8]	140.000	140.000	0.0000	W/ Ice:	81.21	2877.09	756.00
Description: (12) DB896H Panel							
		[Gh] 1.69	[Kz] 1.511	W/ Ice:	[qz] (psf) 20.963	[qz] [Gh] (psf) 35.428	
[9]	140.000	140.000	2.0000	W/ Ice:	22.75	805.98	2019.00
Description: 14' Clamp-on Low Profile Platform							
					[qz]	[qz] [Gh]	

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Job No.....: 29200-401 Design No: Summit #9046-A252 Engineer : SWL
Description : 175' Pole - South Brooklyn, CT: SBA Site #4275-037
Design..... : 85 mph / 74 mph + 1/2" ice
Owner..... : Shaffer Tower Client: Summit Manufacturing, LLC (
Status..... : Final Design Revision: Rev. Date :

POLE SHAFT LOADS:

LOAD CASE 2: WIND VELOCITY = 73.61 mph with 0.50 inches Radial Ice.

Design Loads per TIA/EIA-222-F Standard; Gust Factor ..... Gh = 1.69
Pole DL Overload Factor = 1
Per TIA/EIA Table 1: Note 3: For all cross sectional shapes,
Force Coefficient [Cf] need not exceed 1.2
for any value of C. (Where C=sqrt(Kz)*V*D.)

Top of Segment Elev. (ft)	Expos Coeff [Kz]	Veloc Press [qz] (psf)	Pole Veloc Coeff [C]	Force Coeff [Cf]	Projected Area Shaft [Ae] (sf)	Segment [Cf Ae] (sf)	Segment Wind Force (lbs)	Shaft Segment Weight (lbs)
175.000	1.611	22.34	146.21	0.650	0.000	0.000	0.00	0.00
175.000	1.611	22.34	146.21	0.650	0.000	0.000	0.00	0.00
175.000	1.611	22.34	146.21	0.650	0.000	0.000	0.00	0.00
175.000	1.611	22.34	146.21	0.650	1.658	1.078	40.69	49.85
170.000	1.597	22.16	154.52	0.650	8.577	5.575	209.47	258.38
161.000	1.573	21.82	169.25	0.650	14.720	9.568	355.53	445.00
161.000	1.573	21.82	169.25	0.650	1.926	1.252	46.16	72.99
160.000	1.570	21.78	170.86	0.650	1.945	1.265	46.54	73.76
159.000	1.567	21.74	172.48	0.650	0.000	0.000	0.00	0.00
159.000	1.567	21.74	172.48	0.650	1.965	1.277	46.92	74.52
150.000	1.541	21.38	186.81	0.650	16.407	10.664	388.56	623.61
150.000	1.541	21.38	186.81	0.650	0.000	0.000	0.00	0.00
150.000	1.541	21.38	186.81	0.650	2.137	1.389	50.19	81.38
140.000	1.511	20.96	202.32	0.650	20.096	13.063	467.37	766.80
140.000	1.511	20.96	202.32	0.650	0.000	0.000	0.00	0.00
140.000	1.511	20.96	202.32	0.650	2.329	1.514	53.63	89.01
130.000	1.480	20.52	217.36	0.650	24.342	15.822	554.06	932.10
123.000	1.456	20.20	227.56	0.650	18.159	11.803	405.73	1109.55
120.000	1.446	20.06	228.16	0.650	7.975	5.183	176.14	367.81
119.000	1.443	20.01	233.27	0.650	2.710	1.762	59.58	125.11
110.000	1.411	19.57	242.10	0.650	25.069	16.295	544.28	1158.29
100.000	1.373	19.04	255.36	0.650	29.675	19.289	628.44	1374.22
90.000	1.332	18.48	267.83	0.650	31.592	20.535	650.06	1466.04
83.750	1.305	18.10	275.16	0.650	19.855	12.906	398.39	1714.32
80.000	1.288	17.87	275.02	0.650	13.425	8.726	264.86	832.22
78.750	1.282	17.79	276.40	0.650	3.404	2.213	66.52	211.13
70.000	1.240	17.20	285.53	0.650	31.500	20.475	604.42	1955.43
60.000	1.186	16.46	294.68	0.650	36.821	23.934	679.23	2289.42
50.000	1.126	15.62	302.07	0.650	38.737	25.179	680.94	2412.29
45.000	1.093	15.16	304.93	0.650	20.051	13.033	337.99	2850.68
40.000	1.057	14.66	301.58	0.650	20.202	13.131	329.75	1416.67
38.750	1.047	14.52	302.02	0.650	4.098	2.664	65.41	287.49
30.000	1.000	13.87	307.51	0.650	37.744	24.533	583.05	2649.64
20.000	1.000	13.87	321.62	0.650	43.758	28.443	666.81	3075.52
10.000	1.000	13.87	335.73	0.650	45.675	29.689	696.01	3213.92
1.000	1.000	13.87	348.43	0.650	42.746	27.785	651.38	3010.85
						Summation TOTAL =	10748.11	34988.03

---------(END LOAD CASE 2 -- POLE SHAFT LOADS)----------

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Windows Version 1.28.0100 Wed Apr 5, 2000 - 3:35:54 pm

Job No.....: 29200-401 Design No: Summit #9046-A252 Engineer : SWL
Description : 175' Pole - South Brooklyn, CT: SBA Site #4275-037
Design..... : 85 mph / 74 mph + 1/2" ice
Owner..... : Shaffer Tower Client: Summit Manufacturing, LLC (
Status..... : Final Design Revision: Rev. Date :

POLE SHAFT SEGMENTS -- AXIAL AND SHEAR FORCES:

LOAD CASE 2: WIND VELOCITY = 73.61 mph with 0.50 inches Radial Ice.

Tube Segment No.	Segment Elevation (ft)	Axial Load (kips)	Cumulative Axial Load (kips)	Horiz. Shear (kips)	Cumulative Horiz. Shear (kips)
1.	175.000	0.000	0.000	0.000	0.000
2.	175.000	0.100	0.100	0.019	0.019
3.	175.000	0.864	0.964	2.756	2.775
4.	175.000	2.150	3.114	0.905	3.680
5.	170.000	0.258	3.372	0.209	3.890
6.	161.000	0.445	3.817	0.356	4.245
7.	161.000	0.073	3.890	0.046	4.292
8.	160.000	0.074	3.964	0.047	4.338
9.	159.000	0.234	4.198	1.103	5.441
10.	159.000	2.094	6.291	1.115	6.556
11.	150.000	0.624	6.915	0.389	6.944
12.	150.000	0.864	7.779	2.637	9.582
13.	150.000	2.100	9.879	0.878	10.459
14.	140.000	0.767	10.646	0.467	10.927
15.	140.000	0.756	11.402	2.877	13.804
16.	140.000	2.108	13.510	0.860	14.663
17.	130.000	0.932	14.442	0.554	15.218
18.	123.000	1.110	15.552	0.406	15.623
19.	120.000	0.368	15.920	0.176	15.799
20.	119.000	0.125	16.045	0.060	15.859
21.	110.000	1.158	17.203	0.544	16.403
22.	100.000	1.374	18.577	0.628	17.032
23.	90.000	1.466	20.043	0.650	17.682
24.	83.750	1.714	21.758	0.398	18.080
25.	80.000	0.832	22.590	0.265	18.345
26.	78.750	0.211	22.801	0.067	18.412
27.	70.000	1.955	24.757	0.604	19.016
28.	60.000	2.289	27.046	0.679	19.695
29.	50.000	2.412	29.458	0.681	20.376
30.	45.000	2.851	32.309	0.338	20.714
31.	40.000	1.417	33.726	0.330	21.044
32.	38.750	0.287	34.013	0.065	21.109
33.	30.000	2.650	36.663	0.583	21.692
34.	20.000	3.076	39.738	0.667	22.359
35.	10.000	3.214	42.952	0.696	23.055
36.	1.000	3.011	45.963	0.651	23.706
Base	0.000		45.963		23.706

---------(END LOAD CASE 2 -- AXIAL AND SHEAR FORCE)----------

PJF_Pole (tm) - Monopole Design Program
Windows Version 1.28.0100 Wed Apr 5, 2000 - 3:35:54 pm
(c) 1993 to 1998 PAUL J. FORD AND COMPANY, Columbus, Ohio

Job No.....: 29200-401 Design No: Summit #9046-A252 Engineer : SWL
Description : 175' Pole - South Brooklyn, CT: SBA Site #4275-037
Design..... : 85 mph / 74 mph + 1/2" ice
Owner..... : Shaffer Tower Client: Summit Manufacturing, LLC (
Status..... : Final Design Revision: Rev. Date :

POLE SHAFT SEGMENTS -- MOMENTS and DEFLECTIONS:

LOAD CASE 2: WIND VELOCITY = 73.61 mph with 0.50 inches Radial Ice.

	[-------- MOMENTS (ft-kips) ---------]				[--DEFLECTIONS (inch)-------]		
Segmnt Elev (ft)	From Ant/ Arm	From Shaft Wind	From P-Delta Effects	Total Moment	No P-Delta Effects	Total W/ P-Delta Effects	Total Rotation (deg)
175.00	0.057	0.000	0.000	0.057	101.327	108.174	5.913
175.00	0.057	0.000	0.000	0.057	101.327	108.174	5.913
175.00	0.057	0.000	0.000	0.057	101.327	108.174	5.913
175.00	0.057	0.000	0.100	0.157	100.171	106.931	5.913
170.00	18.256	0.618	1.763	20.637	94.397	100.726	5.886
161.00	51.014	4.454	4.673	60.141	85.272	90.923	5.737
161.00	51.014	4.454	5.057	60.524	84.150	89.718	5.737
160.00	54.654	5.105	5.447	65.206	83.029	88.514	5.719
159.00	58.293	5.804	5.448	69.545	83.028	88.512	5.702
159.00	58.293	5.804	5.867	69.964	81.912	87.314	5.702
150.00	110.588	14.245	11.029	135.862	73.116	77.870	5.495
150.00	110.588	14.245	11.029	135.862	73.116	77.870	5.495
150.00	110.588	14.245	11.777	136.610	72.040	76.715	5.495
140.00	203.341	28.402	20.395	252.138	62.599	66.588	5.162
140.00	203.341	28.402	20.395	252.138	62.599	66.588	5.162
140.00	203.341	28.402	21.425	253.168	61.588	65.504	5.162
130.00	332.925	47.919	33.479	414.324	51.883	55.110	4.721
123.00	423.634	64.944	41.678	530.255	45.639	48.433	4.363
120.00	462.509	73.113	45.207	580.829	43.111	45.731	4.223
119.00	475.467	75.954	46.376	597.797	42.285	44.850	4.178
110.00	592.093	104.221	56.704	753.017	35.265	37.358	3.754
100.00	721.677	141.478	67.632	930.786	28.349	29.990	3.272
90.00	851.260	185.120	77.801	1114.181	22.374	23.638	2.790
83.75	932.250	215.722	83.462	1231.434	19.239	20.312	2.492
80.00	980.844	235.325	87.198	1303.368	17.323	18.280	2.355
78.75	997.042	242.063	88.119	1327.224	16.862	17.791	2.310
70.00	1110.428	292.189	96.146	1498.763	13.014	13.716	2.005
60.00	1240.012	355.816	104.397	1700.225	9.376	9.870	1.668
50.00	1369.596	426.250	111.772	1907.618	6.389	6.718	1.343
45.00	1434.388	464.017	115.075	2013.480	5.133	5.394	1.185
40.00	1499.180	503.456	118.265	2120.902	4.027	4.229	1.041
38.75	1515.378	513.567	118.868	2147.813	3.823	4.015	1.005
30.00	1628.764	587.222	123.758	2339.744	2.235	2.344	0.763
20.00	1758.348	677.538	127.924	2563.809	0.980	1.026	0.497
10.00	1887.932	774.653	130.567	2793.151	0.242	0.253	0.243
0.00	2017.515	878.860	131.491	3027.866	0.000	0.000	0.000

---------(END LOAD CASE 2 -- MOMENTS AND DEFLECTIONS)----------

PJF_Pole (tm) - Monopole Design Program
Windows Version 1.28.0100 Wed Apr 5, 2000 - 3:35:54 pm
(c) 1993 to 1998 PAUL J. FORD AND COMPANY, Columbus, Ohio

Job No.....: 29200-401 Design No: Summit #9046-A252 Engineer : SWL
Description : 175' Pole - South Brooklyn, CT: SBA Site #4275-037
Design..... : 85 mph / 74 mph + 1/2" ice
Owner..... : Shaffer Tower Client: Summit Manufacturing, LLC (
Status..... : Final Design Revision: Rev. Date :

POLE SHAFT SEGMENTS -- ACTUAL VS. ALLOWABLE STRESSES:

LOAD CASE 2: WIND VELOCITY = 73.61 mph with 0.50 inches Radial Ice.
Note: Per TIA/EIA Sec. 3.1.1.1: Allow a 1/3 stress increase for poles under 700 feet in height. The allowable stresses shown include the factor of 1.333

Segmnt Elev (ft)	[---------- ACTUAL STRESSES ----------] Bending [fb] (ksi)	Axial [fa] (ksi)	Torsion [ft] (ksi)	Shear [fv] (ksi)	Combined [Ftot] (ksi)	Allow. Stress [Fb] (ksi)	Actual/ Allowable [Ftot/Fb] Ratio
175.00	0.013	0.000	0.000	0.000	0.013	48.00	0.0003
175.00	0.013	0.009	0.002	0.003	0.024	48.00	0.0005
175.00	0.013	0.087	0.250	0.500	1.304	48.00	0.0272
175.00	0.037	0.281	0.449	0.664	1.954	48.00	0.0407
170.00	4.332	0.287	0.398	0.661	4.970	48.00	0.1035
161.00	10.334	0.294	0.326	0.653	10.762	48.00	0.2242
161.00	7.867	0.225	0.246	0.496	8.194	48.00	0.1707
160.00	8.298	0.227	0.241	0.496	8.620	48.00	0.1796
159.00	8.667	0.238	0.299	0.616	9.045	48.00	0.1884
159.00	8.719	0.357	0.428	0.742	9.299	48.00	0.1937
150.00	14.154	0.359	0.358	0.719	14.633	48.00	0.3048
150.00	14.154	0.404	0.495	0.992	14.784	48.00	0.3080
150.00	14.232	0.513	0.578	1.083	15.023	48.00	0.3130
140.00	21.900	0.505	0.483	1.034	22.558	48.00	0.4700
140.00	21.900	0.541	0.618	1.306	22.686	48.00	0.4726
140.00	21.989	0.641	0.687	1.387	22.913	48.00	0.4774
130.00	30.461	0.630	0.582	1.325	31.266	48.00	0.6514
123.00	34.960	0.643	0.522	1.289	35.740	48.00	0.7446
120.00	30.440	0.524	0.414	1.038	31.066	52.00	0.5974
119.00	29.880	0.516	0.395	1.018	30.495	48.00	0.6353
110.00	34.118	0.527	0.358	1.002	34.725	52.00	0.6678
100.00	36.822	0.532	0.313	0.973	37.420	52.00	0.7196
90.00	38.818	0.539	0.276	0.948	39.413	52.00	0.7580
83.75	39.783	0.563	0.256	0.934	40.399	52.00	0.7769
80.00	29.996	0.416	0.182	0.675	30.448	52.00	0.5855
78.75	30.098	0.417	0.179	0.672	30.551	52.00	0.5875
70.00	30.745	0.431	0.162	0.661	31.209	52.00	0.6002
60.00	31.284	0.446	0.145	0.648	31.760	52.00	0.6108
50.00	31.660	0.462	0.131	0.637	32.149	52.00	0.6182
45.00	31.798	0.494	0.125	0.632	32.319	52.00	0.6215
40.00	29.081	0.449	0.108	0.559	29.553	52.00	0.5683
38.75	29.094	0.450	0.107	0.557	29.566	52.00	0.5686
30.00	29.164	0.465	0.098	0.550	29.650	52.00	0.5702
20.00	29.176	0.482	0.090	0.541	29.678	52.00	0.5707
10.00	29.135	0.499	0.082	0.535	29.653	52.00	0.5703
0.00	29.055	0.512	0.076	0.527	29.586	52.00	0.5690

---------(END LOAD CASE 2 -- ACTUAL VS. ALLOWABLE STRESSES)----------

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
350 East Broad Street • Suite 500 • Columbus, Ohio 43215
Ph: (614) 221-6679 • Fax1: (614) 221-2540 • Fax2: (614) 221-0166

MONOPOLE FLANGE PLATE DESIGN SPREADSHEET (Ver 1.2 5/18/95)

TITLE: **175' POLE**
SITE: **SOUTH BROOKLIN, CT**
OWNER: **SHAFFER TOWER**
COMM. NO: **29200-401**
DATE: **05-Apr-00**

MOMENT	71.53	FT-KIPS
AXIAL	2.33	KIPS
BASE DIAM, DF	22.000	INCHES
(PT-to-PT), DP	22.776	INCHES

FLANGE LOCATION: 161'-0"
ID *0*

USE: BC = **19** INCHES

NUMBER OF BOLTS	10	14	18	22	26
Y-DISTANCE	4.5	7.5	10.5	13.5	16.5
D_bpl (a)	22.000	22.000	22.000	22.000	22.000
D_bpl (b)	24.196	24.853	#NUM!	#NUM!	#NUM!
MAX: D_bpl	24.20	24.85	#NUM!	#NUM!	#NUM!

USE PLATE WIDTH = **26** INCHES (ROUND)

MOM. INERTIA, IB	451.25	631.75	812.25	992.75	1173.25
BOLT TENSION, T	18.07	12.91	10.04	8.21	6.95
ALLOWABLE TENSION =	25.92	25.92	25.92	25.92	25.92
BOLT COMPR, C	18.30	13.07	10.17	8.32	7.04

USE: N = **18** BOLTS BOLT DIAM **3/4** INCHES

SPECIFICATION **ASTM A325**

PLATE MOMENT, Mpl	17.16	12.26	9.53	7.80	6.60
BEND PLANE, W	6.91	4.94	3.84	3.14	2.66

	FLANGE PLATE THICKNESS, (INCHES)				
FY = 36 KSI	0.643	0.643	0.643	0.643	0.643
FY = 42 KSI	0.596	0.596	0.596	0.596	0.596
FY = 50 KSI	0.546	0.546	0.546	0.546	0.546
FY = 60 KSI	0.498	0.498	0.498	0.498	0.498
FY = 65 KSI	0.479	0.479	0.479	0.479	0.479

USE: PLATE THK = **3/4** INCHES USE: F_Y = **36** KSI

PLATE WEIGHT = **113** LBS PECIFICATION **ASTM A36**

FLANGE PLATE DESIGN SUMMARY

USE: FLANGE PLATE **3/4** INCHES THICK X **26** IN. ROUND
PLATE WEIGHT **0.113** KIPS USE: F_Y = **36** KSI
WITH **18** BOLTS ON **19** IN. BOLT CIRCLE.
BOLT DIAMETER **3/4** INCHES ASTM **A325**

PAUL J. FORD AND COMPANY
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MONOPOLE BASE PLATE DESIGN SPREADSHEET (Ver 1.21 6/1/96)

TITLE: **175' POLE**
SITE: **SOUTH BROOKLIN, CT**
OWNER: **SHAFFER TOWER**
COMM. NO: **29200-401**
DATE: 05-Apr-00

MOMENT	**3710**	FT-KIPS
AXIAL	**38.3**	KIPS
BASE DIAM, DF	**57.030**	INCHES
(PT-to-PT), DP	**57.910**	INCHES *(18-SIDED SHAFT)*
MIN. BOLT CIRCLE, BC	**63.910**	INCHES

USE: BC = **64.00** INCHES

NUMBER OF BOLTS	**24**	**28**	**32**	**36**	**40**
Y-DISTANCE	15	18	21	24	27
D_bpl (a)	59.910	59.910	59.910	59.910	59.910
D_bpl (b)	67.188	68.872	69.845	69.874	68.474
MAX: D_bpl	67.19	68.87	69.85	69.87	68.47

USE BASE PL WIDTH = **68** INCHES (SQUARE)

MOM. INERTIA, IB	12288.00	14336.00	16384.00	18432.00	20480.00
BOLT TENSION, T	115.92	99.36	86.94	77.28	69.55
ALLOWABLE TENSION = 3.25 in^2 X 0.6 F_Y X 1.33	195.00	195.00	195.00	195.00	195.00
BOLT COMPR, C	117.52	100.73	88.14	78.35	70.51

USE: N = **32** BOLTS BOLT DIAM **2 - 1/4** INCHES

SPECIFICATION **ASTM A615 #18J GR 75**

PLATE MOMENT, Mpl	2060.72	2060.72	2060.72	2060.72	2060.72
BEND PLANE, W	39.14	40.37	41.75	41.79	39.81

	BASE PLATE THICKNESS, (INCHES)				
FY = 36 KSI	2.962	2.917	2.868	2.867	2.937
FY = 42 KSI	2.743	2.700	2.656	2.654	2.719
FY = 50 KSI	2.514	2.475	2.434	2.433	2.492
FY = 60 KSI	2.295	2.259	2.222	2.221	2.275
FY = 65 KSI	2.205	2.171	2.135	2.134	2.186

USE: PLATE THK = **2 - 1/2** INCHES USE: F_Y = **50** KSI

BASE PL WEIGHT = **1467** LBS SPECIFICATION **ASTM A572, GR 50**

Corner Chamfer = *15.0 in.* *(18.50 in. max)*
Hole Cut Out = *50.0 in.* *(52.03 in. max)*

BASE PLATE DESIGN SUMMARY

USE: BASE PLATE **2 - 1/2** INCHES THICK X **68** IN. SQUARE
PLATE WEIGHT **1.467** KIPS FY = **50** KSI
WITH **32** BOLTS BOLT CIRCLE = **64.00** INCHES
BOLT DIAMETER **2 - 1/4** INCHES SPECIFICATION = **ASTM A615 #18J GR 75**

SPREAD FOOTING FOR POLES PROGRAM BY PAUL J. FORD and COMPANY

NO. 29299-439 DATE 12-06-1999

REVISED CALCULATIONS PER FIELD REPORT OF BACKFILL SOILS

INPUT: SPREAD FOOTING (PAD and PIER) FOR POLES

POLE LOADS: POLE WEIGHT = 38.00 kips (pole,antenna,ice,mounts,etc.)
OVERTURNING MOMENT = 4320.00 ft-k (at the top of the pier)
TOTAL HORIZONTAL = 36.00 kips (at the top of the pier)
DESIGN SAFETY FACTOR AGAINST OVERTURNING = 1.50

CONCRETE: CONCRETE STRENGTH = 3000 psi at 28 days
REINFORCING STEEL STRENGTH = 60000 psi (ASTM A615 grade 60)

SOIL: WATER TABLE BELOW BOTTOM OF FOOTING
SOIL WT = 114 pcf (dry)
ALLOWABLE SOIL BEARING = 6000 psf

As Built

FOOTING SIZE: WIDTH = 25.0 ft LENGTH = 25.0 ft
THICKNESS = 3.50 ft DEPTH = 7.00 ft to bottom
PIERS = 8.00 ft square PIER 0.5 ft above grade
CONCRETE WEIGHT = 150 pcf

OUTPUT: SPREAD FOOTING (PAD and PIER) FOR POLES

VOLUME OF CONCRETE = 2444 ft^3 (90.50 cubic yards)

WEIGHT OF POLE =====> 38.00 kips
WEIGHT OF CONCRETE => 366.53 kips (2444 x 0.150)
WEIGHT OF SOIL =====> 223.84 kips (1964 x 0.114)

TOTAL WEIGHT = 628.36 kips

OVERTURNING MOMENT = 4320.00 ft-k + (36.00 k x 7.50 ft) = 4590 ft-kips
RESISTING MOMENT = 628.36 k x (25.00 ft / 2) = 7855 ft-kips

SAFETY FACTOR = Mresist / O.T.M. = 7855 / 4590 = 1.71 > 1.50 O.K.

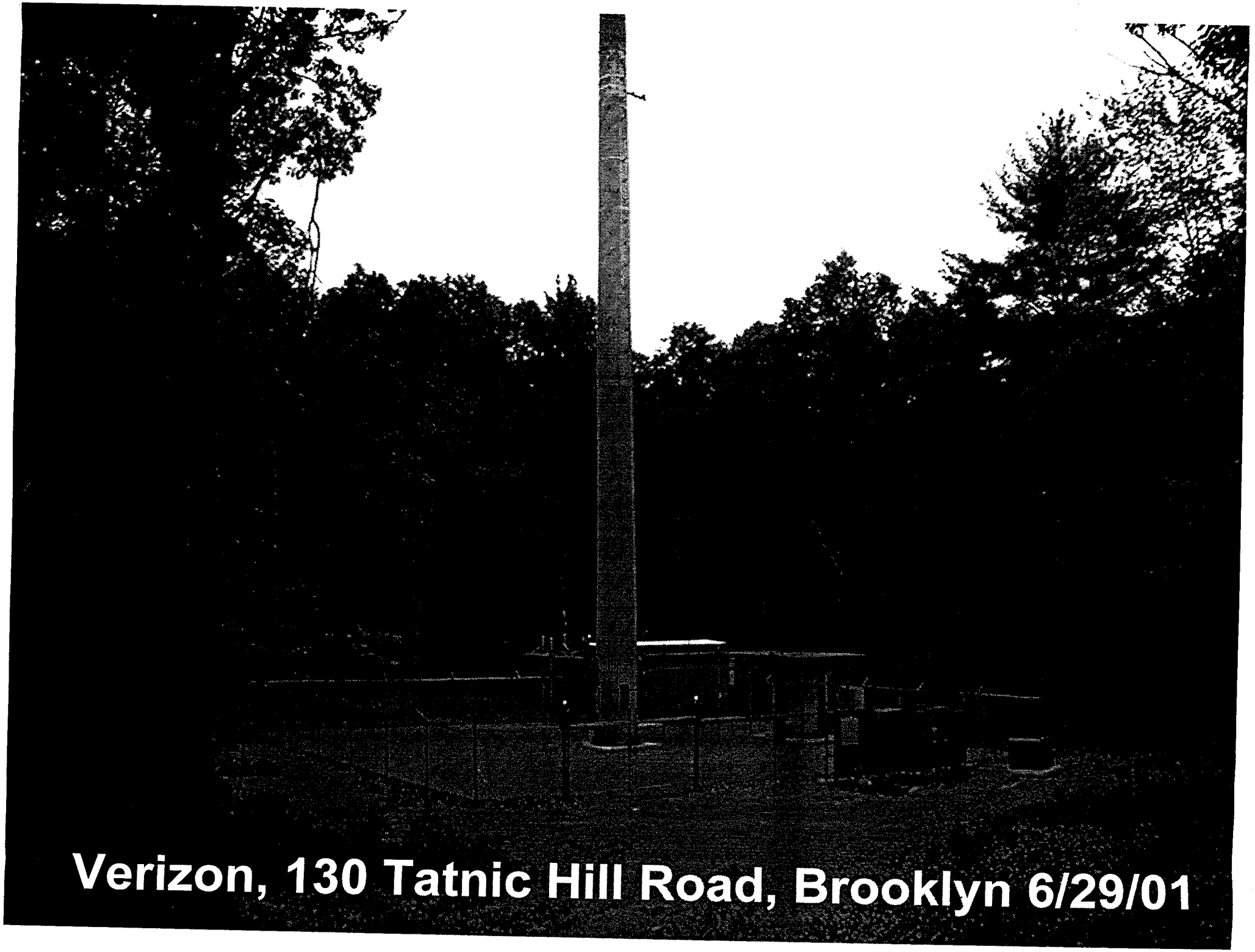
ULTIMATE OVERTURNING MOMENT = 4590 ft-k x 1.50 = 6885 ft-kips
ULTIMATE NET SOIL BEARING PRESSURE = 10062 psf

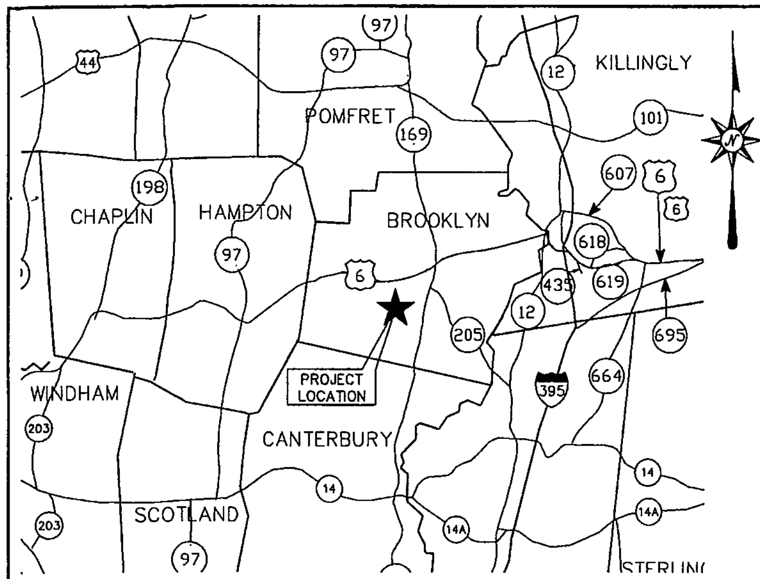
GROSS SOIL BEARING = 3225 psf (includes soil overburden)
SOIL OVERBURDEN = 798 psf (soil overburden)
NET SOIL BEARING = 2427 psf < 6000 psf O.K.

BENDING MOMENT IN PIER = 4320 ft-k +(36.00 k x 4.00 ft) = 4464 ft-kips
AREA OF REINF STEEL REQUIRED IN THE PIER = 51.12 sq in (36 no. 11 bars)
(.5 % = 46.08 sq in)

BENDING MOMENT IN FOOTING = 4781 ft-kips
FOOTING REINFORCING = 1.54 in^2/ft = 31 no. 10 bars @ 9.93 in. o.c.
(.18 % = 0.91 in^2/ft)

BENDING SHEAR IN THE FOOTING = 518.12 kips
ALLOWABLE BENDING SHEAR = 805.78 kips O.K.


Verizon, 130 Tatnic Hill Road, Brooklyn 6/29/01

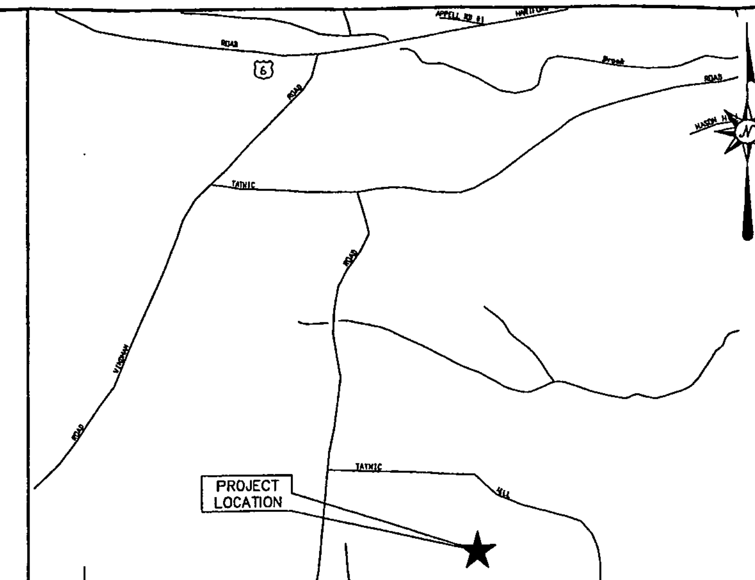


LOCATION MAP

SCALE: NONE

SITING COUNCIL SUBMISSION

BROOKLYN SOUTH TELECOMMUNICATION FACILITY



VICINITY MAP

SCALE: 1"=1000'

130 TATNIC HILL ROAD
BROOKLYN, CONNECTICUT 06234

PREPARED FOR:

CELLCO PARTNERSHIP DBA
VERIZON WIRELESS
20 ALEXANDER DRIVE
WALLINGFORD, CONNECTICUT 06492

STATE OF CONNECTICUT
No. 15248
LICENSED
PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

CONTENTS

	TITLE SHEET
SC-1	SITE PLAN AND ELEVATION

PREPARED BY:

BL Companies

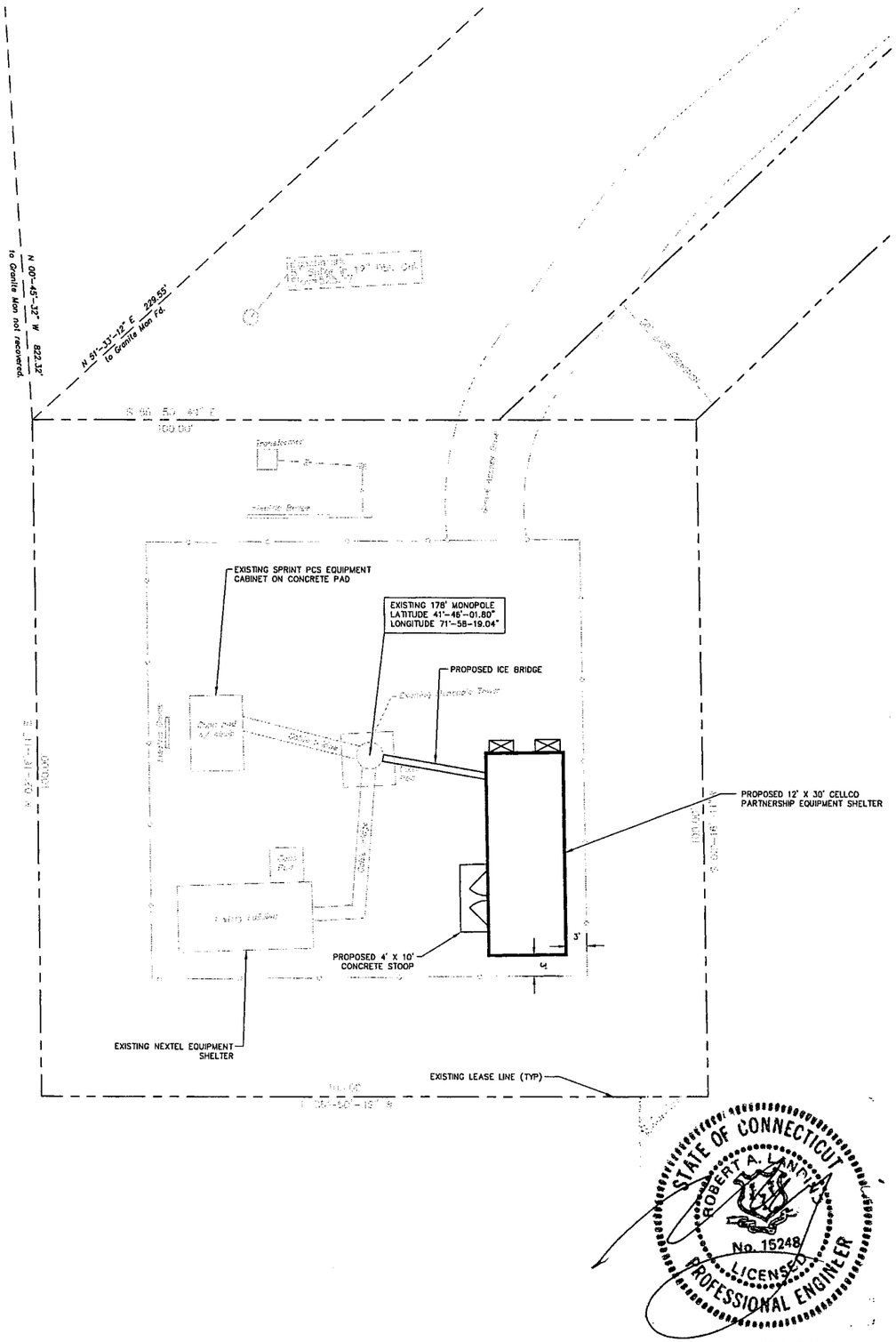
ARCHITECTURE ENGINEERING PLANNING LANDSCAPE ARCHITECTURE
LAND SURVEYING ENVIRONMENTAL SCIENCES ANALYTICAL SERVICES

355 RESEARCH PARKWAY
MERIDEN, CONNECTICUT 06450
(203) 630-1406
(203) 630-2615 Fax

DATES

ISSUE DATE: APRIL 10, 2001
REVISION:

CAD FILE: CVC84401

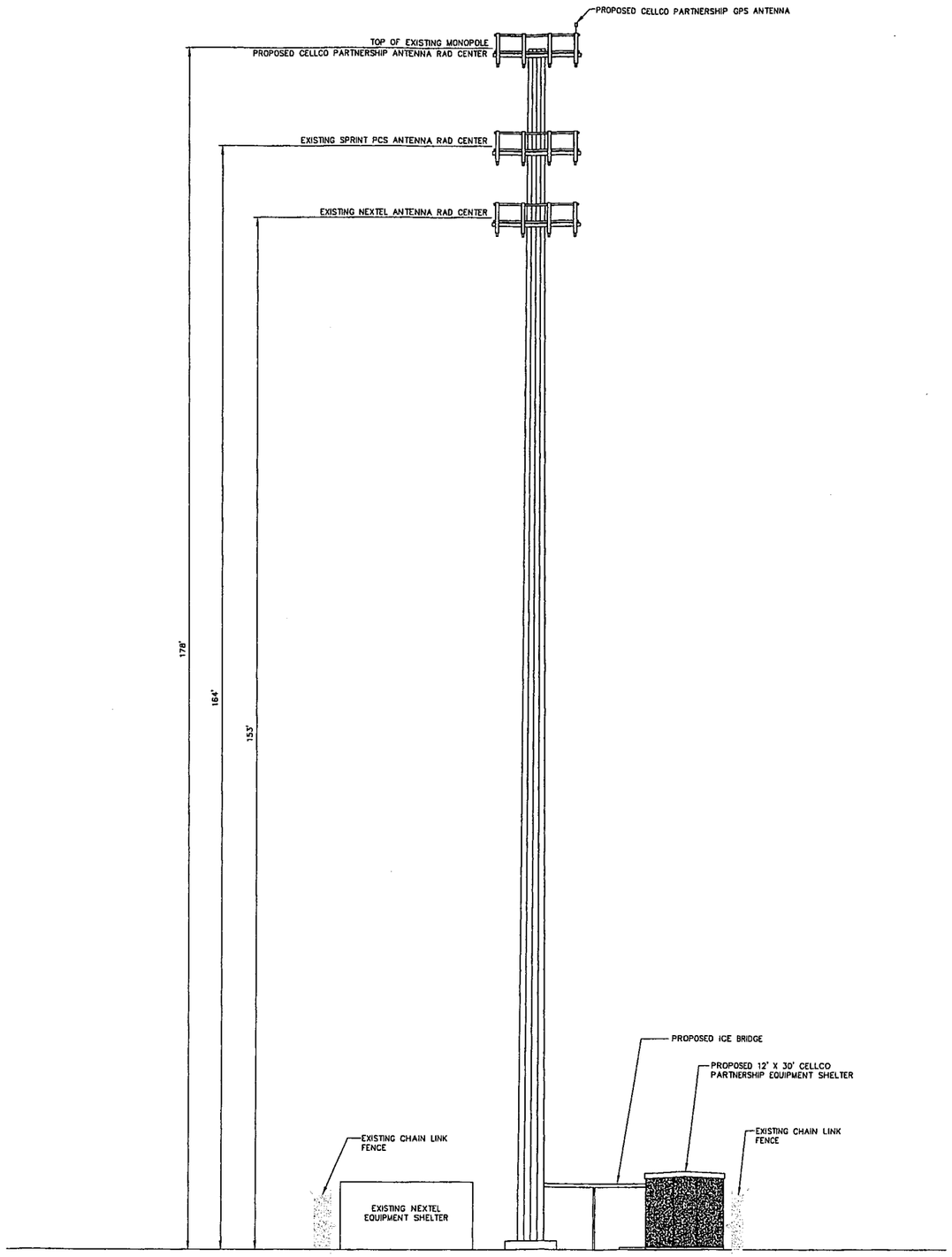


SITE PLAN

SCALE: 1"=10'

GRAPHIC SCALE
10 5 0 10
SCALE IN FEET

STATE OF CONNECTICUT
ROBERT A. LANDRY
No. 15248
LICENSED PROFESSIONAL ENGINEER



TOWER ELEVATION

SCALE: 1"=10'

GRAPHIC SCALE
10 5 0 10
SCALE IN FEET

BL Companies
ARCHITECTURE
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LANDSCAPE ARCHITECTURE
LAND SURVEYING
ENVIRONMENTAL SCIENCES
ANALYTICAL SERVICES

355 Research Parkway
Meriden, CT 06450
(203) 630-1406
(203) 630-2615 Fax

BROOKLYN SOUTH TELECOMMUNICATION FACILITY
130 OLD TATNIC HILL ROAD
BROOKLYN, CONNECTICUT

REVISIONS
No. Date Desc.

Designed	R.C.B.
Drawn	R.C.B.
Checked	R.C.B.
Approved	R.A.L.
Scale	AS SHOWN
Project No.	00CB44
Date	04/10/01
CAD File	SCCB4401

Title
SITE PLAN
AND TOWER
ELEVATION

Sheet No.
SC-1

Xref (s): XYCB4401, XCCB4401, XCCB4402