STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

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

March 31, 2000

Kenneth E. Lee
Real Estate Consultant
Springwich Cellular Limited Partnership
500 Enterprise Drive
Rocky Hill, CT 06067

RE: TS-BAM/SCLP-105-000314 - Cellco Partnership d/b/a Bell Atlantic Mobile and Springwich Cellular Limited Partnership request for an order to approve tower sharing at an existing telecommunications facility located at 38 Hatchetts Hill Road in Old Lyme, Connecticut.

Dear Mr. Lee:

At a public meeting held March 22, 2000, 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. 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.

The proposed placement of antennas on this existing tower is in technical compliance with General Statutes § 16-50aa; nonetheless, the Council is concerned that the construction of two towers, with municipal approval, adjacent to each other may contradict the intent of tower sharing policy. To fully comply with the spirit of tower sharing policy, all those concerned would have developed only one tower, if feasible. However, the Council did not have jurisdiction over these towers that were constructed. This situation allows the circumvention of tower sharing policy and may encourage the very proliferation of towers that the Connecticut General Assembly sought to avoid. While this particular request is approved, please be advised that the Council may seek to refine its procedure to deal with this type of situation for the long term, and such approval should not be seen as setting a precedent for future requests.

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 March 14, 2000.

Thank you for your attention and cooperation.

Very truly yours,

Mortimer A. Gelston
Chairman

MAG/RKE/grg

c: Honorable Timothy C. Griswold, First Selectman, Town of Old Lyme
Honorable Moira K. Lyons, Representative of the 146th District
Honorable Robert M. Ward, Representative of the 86th District
Sandy Carter, Bell Atlantic Mobile
J. Brendan Sharkey, VoiceStream Wireless

SPRINGWICH CELLULAR LIMITED PARTNERSHIP
500 Enterprise Drive, 3rd Floor
Rocky Hill, CT. 06067
860/513-7700

BELL ATLANTIC MOBILE
20 Alexander Drive
Wallingford, CT. 06492
203/294-8519

RECEIVED
MAR 14 2000
CONNECTICUT
SITING COUNCIL

HAND DELIVERED

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

March 14, 2000

Re: **Request by Cellco Partnership d/b/a Bell Atlantic Mobile and Springwich Cellular Limited Partnership for an Order to Approve the Shared Use of a Tower Facility, 38 Hatchetts Hill Road, Old Lyme, Connecticut**

Dear Chairman Gelston:

Pursuant to Connecticut General Statutes (C.G.S.) Sec. 16-50aa, Cellco Partnership d/b/a Bell Atlantic Mobile ("BAM") and Springwich Cellular Limited Partnership ("SCLP") (collectively, the "Applicants") hereby request an order from the Connecticut Siting Council ("Council") to approve the proposed shared use by the Applicants of an existing tower facility located at 38 Hatchetts Hill Road in Old Lyme, Connecticut. The property is owned by Hatchetts Hill, LLC, from which Omnipoint Communications, Inc. leases property for the tower facility. Omnipoint Communications, Inc. owns and operates the tower. As shown on the attached drawings and as further described below, BAM and SCLP each propose to install antennas on the existing tower and to locate two equipment shelters at the base of the tower. The Applicants request the Council to find that the proposed shared use of the tower facility satisfies the criteria stated in C.G.S. Sec. 16-50aa, and to issue an order approving the proposed shared use

Background

Cellco Partnership d/b/a Bell Atlantic Mobile and Springwich Cellular Limited Partnership are each licensed by the Federal Communications Commission (FCC) to provide cellular telephone service in the New London County New England County Metropolitan Area (NECMA), which includes the area to be served by the Applicants' proposed installations.

The Omnipoint facility at 38 Hatchetts Hill Road, Old Lyme, Connecticut consists of an approximately 2,080 s. f. leased area, on which is located a 190' monopole and one equipment cabinet located at the base of the monopole. The monopole supports several Omnipoint antennas, which provide mobile communications service to the public pursuant to a FCC license. The Applicants and Omnipoint have agreed to the proposed shared use of this tower pursuant to mutually acceptable terms and conditions. Omnipoint has authorized the Applicants to apply for all necessary permits, approvals and authorizations which may be required for the proposed shared use of this facility. On Monday, March 13, 2000, the Old Lyme Planning & Zoning Commission approved the modification to the original Omnipoint site plan. This modification approved the antennas and equipment buildings for BAM and SCLP for the co-location on this existing tower.

BAM proposes to install twelve (12) Decibel Model DB844H80E antennas, approximately 48 inches in height, on a second antenna platform with their center of radiation at approximately 175 feet above ground level ("AGL"). BAM also will install one (1) GPS antenna on its platform at the 175' level of the tower. Equipment associated with these antennas, as well as a 40 KW diesel-fueled emergency stand-by generator, would be located in a new approximately 12-foot x 30-foot equipment building located at the base of Omnipoint's tower.

SCLP proposes to install twelve (12) Allgon Model 7120.16 antennas, approximately 52 inches in height, on a third antenna platform with their center of radiation at approximately 165 feet above ground level ("AGL"). Equipment associated with these antennas will be located in a new approximately 11'-3" x 16 foot equipment building located at the base of Omnipoint's tower.

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).)

The shared use of the tower satisfies the criteria in C.G.S. Sec. 16-50aa as follows:

A. Technical Feasibility. The existing tower is structurally sound and capable of supporting the proposed BAM and SCLP antennas. A copy of the tower design by Pirod Inc.was done for Omnipoint showing the pole design for multiple carriers and is included with this application. The proposed shared use of this tower is therefore 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 tower facility such as the facility in Old Lyme. (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. Sec. 16-50x(a) directs the Council to "give such 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 Applicants to obtain a building permit for the proposed installation.

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

1. The proposed installation would have an insignificant incremental visual impact, and would not cause any significant change or alteration in the physical or environmental characteristics of the property. The addition of the proposed antennas would not increase the height of the tower. The equipment shelters, within a fenced area, will be placed adjacent to Omnipoint's 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 applicable ANSI standards. "Worst-case" exposure calculations for a point at the base of the tower in relation to operation of each of BAM's, SCLP's, and Omnipoint's antenna arrays are as follows:

	Applicable ANSI Stnd.	Calculated "Worst Case"	Percentage of Stnd.
BAM	0.583 mW/cm2	0.0223 mW/cm2	3.82%
SCLP	0.5867 mW/cm2	0.0272 mW/cm2	4.64%
Omnipoint	1.000 mW/cm2	0.0102 mW/cm2	1.02%
		Total	9.48%

The collective "worst-case" exposure would be only 9.48 % 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 installation 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 emissions; 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 for periodic maintenance visits.

The proposed use of this facility would therefore have a minimal environmental effect, and is environmentally feasible.

E. Economic Feasibility. As previously mentioned, Omnipoint and the Applicants have entered into a mutual agreement to share use of the existing tower on terms agreeable to the parties. The proposed tower sharing is therefore economically feasible.

F. Public Safety Concerns. As stated above, the existing tower is structurally capable of supporting the proposed BAM and SCLP antennas. The Applicants are not aware of any other public safety concerns relative to the proposed sharing of the existing tower. In fact, the provision of new or improved cellular communications service in the Old Lyme area through shared use of the existing tower is expected to enhance the safety and welfare of area residents and travelers.

Conclusion

For the reasons discussed above, the proposed shared use of the existing tower facility at 38 Hatchetts Hill Road in Old Lyme 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 Applicants therefore request that the Council issue an order approving the proposed shared use.

Thank you for your consideration of this matter.

Pursuant to Connecticut General Statutes Sec. 16-50v and Section 16-50v-1(a) of the Regulations of Connecticut State Agencies, BAM and SCLP have enclosed a check in the amount of $500.00 for the required filing fee.

Respectfully yours,

Kenneth E. Lee sc

Kenneth E. Lee
Real Estate Consultant for
Springwich Cellular
Limited Partnership

Sandy M. Carter

Sandy M. Carter
Manager-Regulatory
Bell Atlantic Mobile

Attachments
cc: Honorable Timothy Griswold, First Selectman

SPRINGWICH CELLULAR LIMITED PARTNERSHI
500 Enterprise Drive, 3rd Floor
Rocky Hill. CT. 06067
860/513-7700

BELL ATLANTIC MOBILE
20 Alexander Drive
Wallingford, CT. 06492
203/294-8519

March 14, 2000

Honorable Timothy Griswold
First Selectman
Town Hall
52 Lyme Street, P. O. Box 338
Old Lyme, Connecticut 06371

Dear Mr. Griswold:

This letter is to inform you that Cellco Partnership d/b/a Bell Atlantic Mobile and Springwich Cellular Limited Partnership (SCLP) plan to install antennas and associated equipment at the existing tower facility located at 38 Hatchetts Hill Road, Old Lyme, Connecticut. I am enclosing a copy of Bell Atlantic Mobile's and Springwich Cellular Limited Partnership's joint 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. Kenneth Lee at (203) 556-1655 or Mr. Joel Rinebold, Executive Director of the Connecticut Siting Council at (860) 827-2935.

Sincerely,

Sandy M. Carter
Manager – Regulatory
Bell Atlantic Mobile

Kenneth E. Lee sc
Kenneth E. Lee
Real Estate Consultant for
Springwich Cellular
Limited Partnership

Enclosure

OMNIPOINT
COMMUNICATIONS INC.

100 Filley Street
Bloomfield, CT 06002
Telephone: (860) 692-7156
Fax: (860) 692-7159

February 16, 2000

Ms. Sandy Carter
Regulatory Manager
Bell Atlantic Mobile
20 Alexander Drive
Wallingford, CT 06492

Re: CT-11-038 (Old Lyme)
38 Hatchetts Hill Road
Old Lyme, CT

Co-ordinates: 41-19-07
72-16-14

Dear Ms. Carter:

Please be advised that Bell Atlantic Mobile is authorized to proceed in seeking Connecticut Siting Council approvals for the above referenced Omnipoint tower site located at 38 Hatchetts Hill Road, Old Lyme, CT.

If you need any further assistance, please don't hesitate to contact me.

Sincerely,

Sherry Sukow
Collocations Manager
Omnipoint Communications, Inc.

cc: Master File

Town of Old Lyme, Old Lyme, CT 06371-0160

PLANNING COMMISSION
52 Lyme Street
P.O. Box 160
(860) 434-9174
FAX (860) 434-9283

January 28, 1999

Brendan Sharkey, Attorney
Omnipoint Communications
25 Van Zant Street, Suite 18E
East Norwalk, CT 06855

RE: Application for Special Exception - Omnipoint Communications
36 Hatchetts Hill Road, Old Lyme, CT 06371

Dear Attorney Sharkey,

On January 14, 1999, the Planning Commission granted Special Exception approval for the above referenced application in accordance site plan dated September 10, 1998 and revised through December 9, 1998, with the following modifications:

1. Paragraph 13 be amended in accordance with Attorney Mattern's letter of January 13, 1999.

Notice of said decision was published in The Day on January 25, 1999. The Certificate of Decision and the mylar and legal documents as modified may be filed on the Land Records in the office of the Town Clerk on February 11, 1999. The mylars must be signed by the Commission Chairman prior to filing. All required documentation must be filed prior to issuance of any permits.

Please note that all site work must comply with the approved site plan. Changes may not be made without prior approval from the Commission or Zoning Enforcement Officer. Also, as-built mylars are required by Regulation to be filed prior to the issuance of a Certificate of Zoning Compliance.

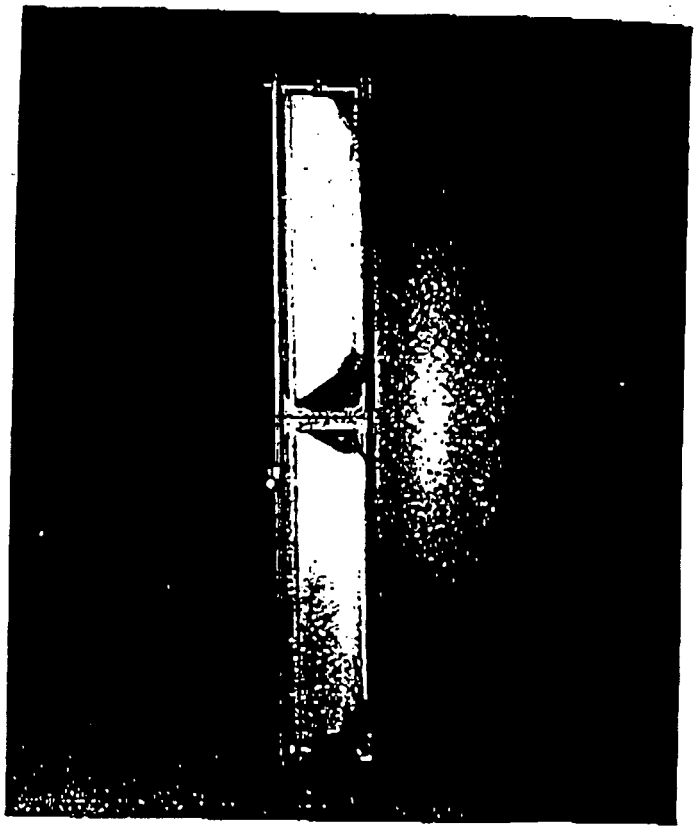
If you have any questions, please do not hesitate to contact me.

Sincerely yours,

Marilyn M. Ozols
Zoning Enforcement Officer

SNET

LOG-PREIODIC REFLECTOR ANTENNA
110 Degrees 11 dBd



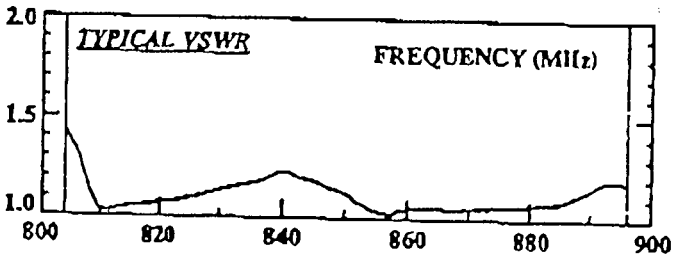
Features:

- ☐ Broadbanded. (800-900 MHz)
- ☐ Low backlobe radiation. Front to back ratio better than 25 dB.
- ☐ Low intermodulation products.
- ☐ Low wind-load.
- ☐ Low weight.
- ☐ Small size.
- ☐ Rugged design.

Please see the following pages including radiation patterns for ALP 11011-N.

Electrical Specifications:

Frequency range:	806-896 MHz
Impedance:	50 Ohm
Connector:	N female
VSWR:	Typ. 1,3:1 max 1,5:1
Polarization:	Vertical
Gain:	11 dBd
Front to back ratio:	>25 dB
Intermodulation: (2 x 25 W)	IM5 - 107 dBm
Power Rating:	500 W
H-Plane: -3 dB	110°
E-Plane: -3 dB	15°
Lightning Protection:	DC Grounded



Mechanical Specifications:

Overall height:	51 in. (1320 mm)
Width:	8.3 in. (210 mm)
Depth:	11.4 in. (290 mm)
Weight incl. mounting items:	24.5 lbs (11 Kg)
Rated wind velocity:	113 mph (180 Km/h)
Wind Area (CxA/Front):	3.7 sq.ft (0.34 sq.m)
Lateral thrust at rated wind:	
Worst case	530 N

Materials:

Radiating elements:	Aluminum
Element housing:	Grey PVC
Reflector:	Aluminum
Mounting Hardware	
clamps:	Hot dip galvanized steel
bolts:	Stainless steel

Manufactured by: Allgon System AB

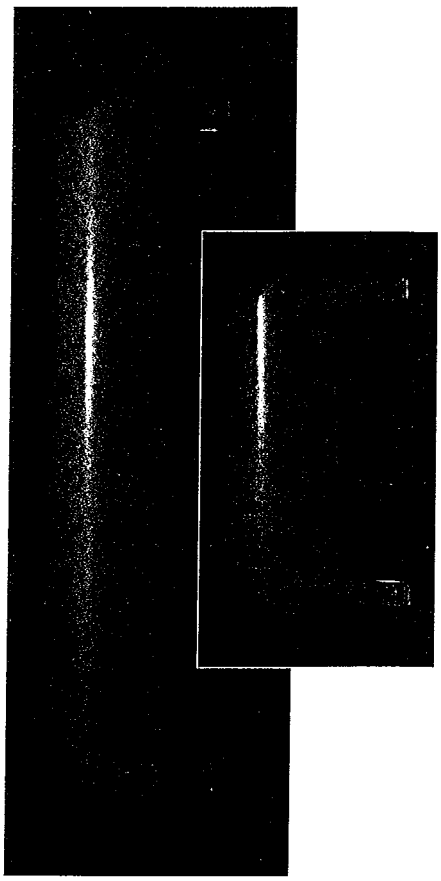
7120.16

dB DIRECTOR™ LOG PERIODIC ANTENNAS
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 BAM

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.

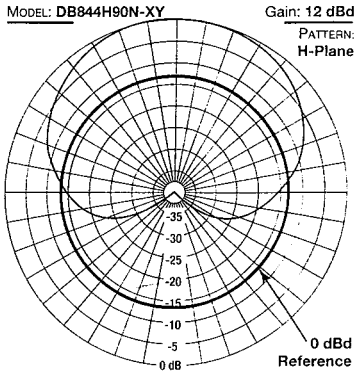
** 3 dB from maximum.

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.

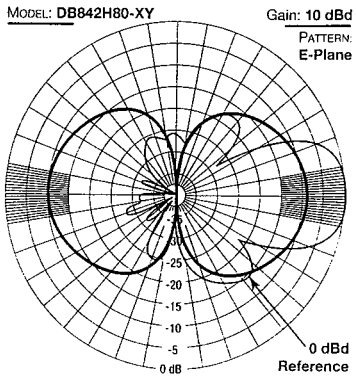
Mechanical Data	
Width – in. (mm)	6 (152)
Depth – in. (mm)	8.5 (216)
Height	See table above
Maximum wind speed – mph (km/h)	125 (200)
Wind area – ft² (m²)	
24" (610 mm) antenna	1 (.093)
48" (1219 mm) antenna	2 (.186)
Wind load (at 100 mph/161 km/h) – lbf (N) kp	
24" (610 mm) antenna	40 (178) 18
48" (1219 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

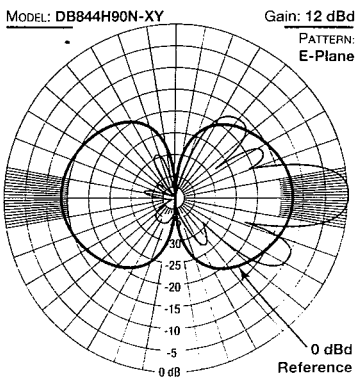
Typical DB842H90N-XY, DB844H90N-XY Horizontal Pattern

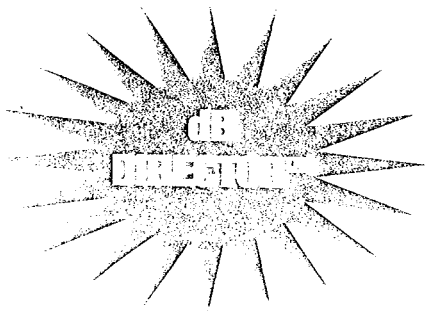


Typical DB842H80-XY Vertical Pattern

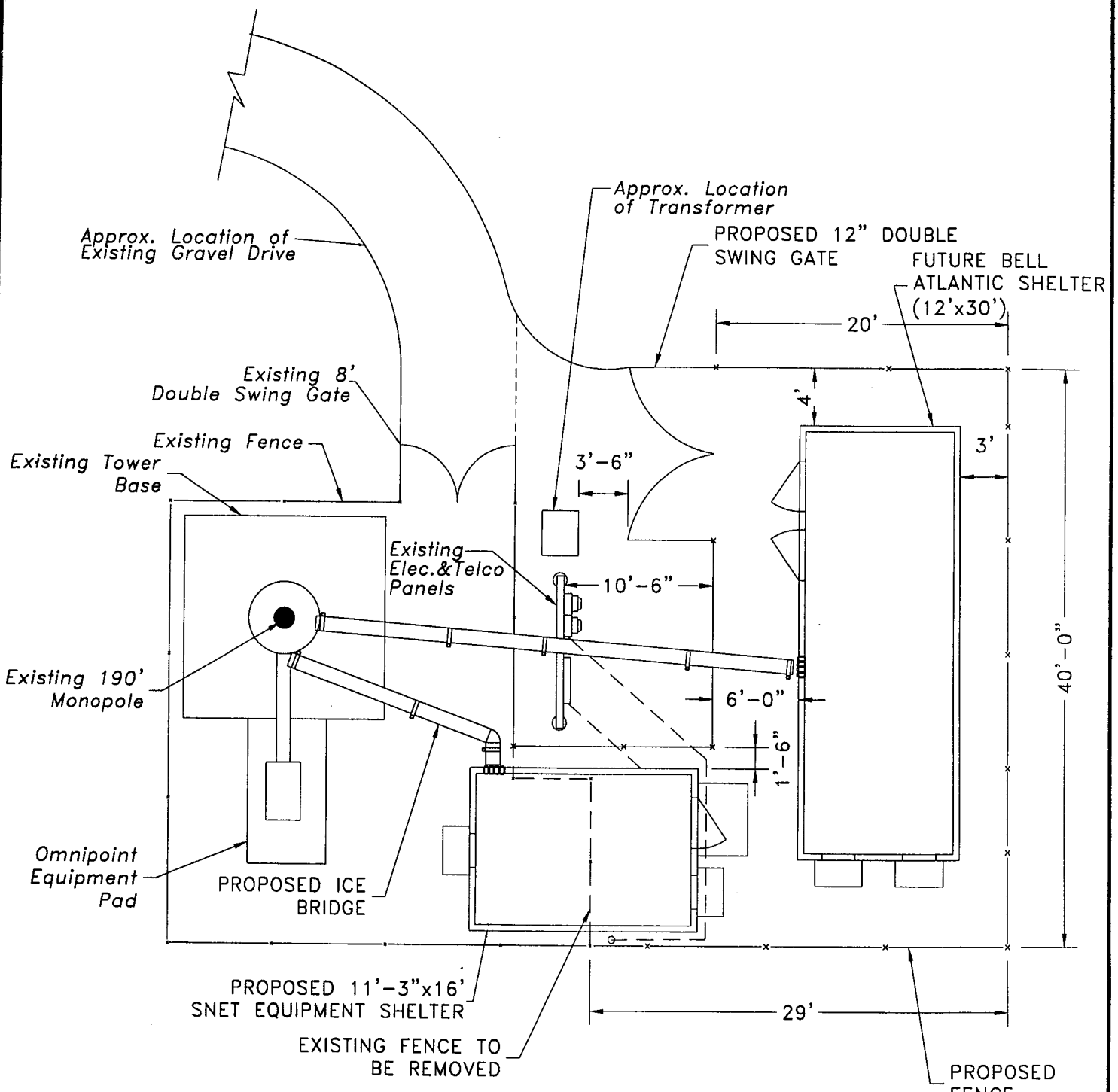


Typical DB844H90N-XY Vertical Pattern





RAD. CENTER: _____ FT. (AGL)



SITE PLAN

SCALE: 1"=10'

SNET MOBILITY PRELIMINARY DESIGN EXHIBIT	NORTH	SITE NAME: OLD LYME - OMNIPOINT MONOPOLE	SNET #:
		ADDRESS: 38 HATCHETTS HILL ROAD OLD LYME, CT	MGI #: 15364
			TASK #: 2135
		DRAWN: GMP / CHECKED: RGT / SCALE: 1"=10'	DATE: 2/18/00

Maguire Group Inc.
Architects · Engineers · Planners
One Court Street
New Britain, Connecticut 06051

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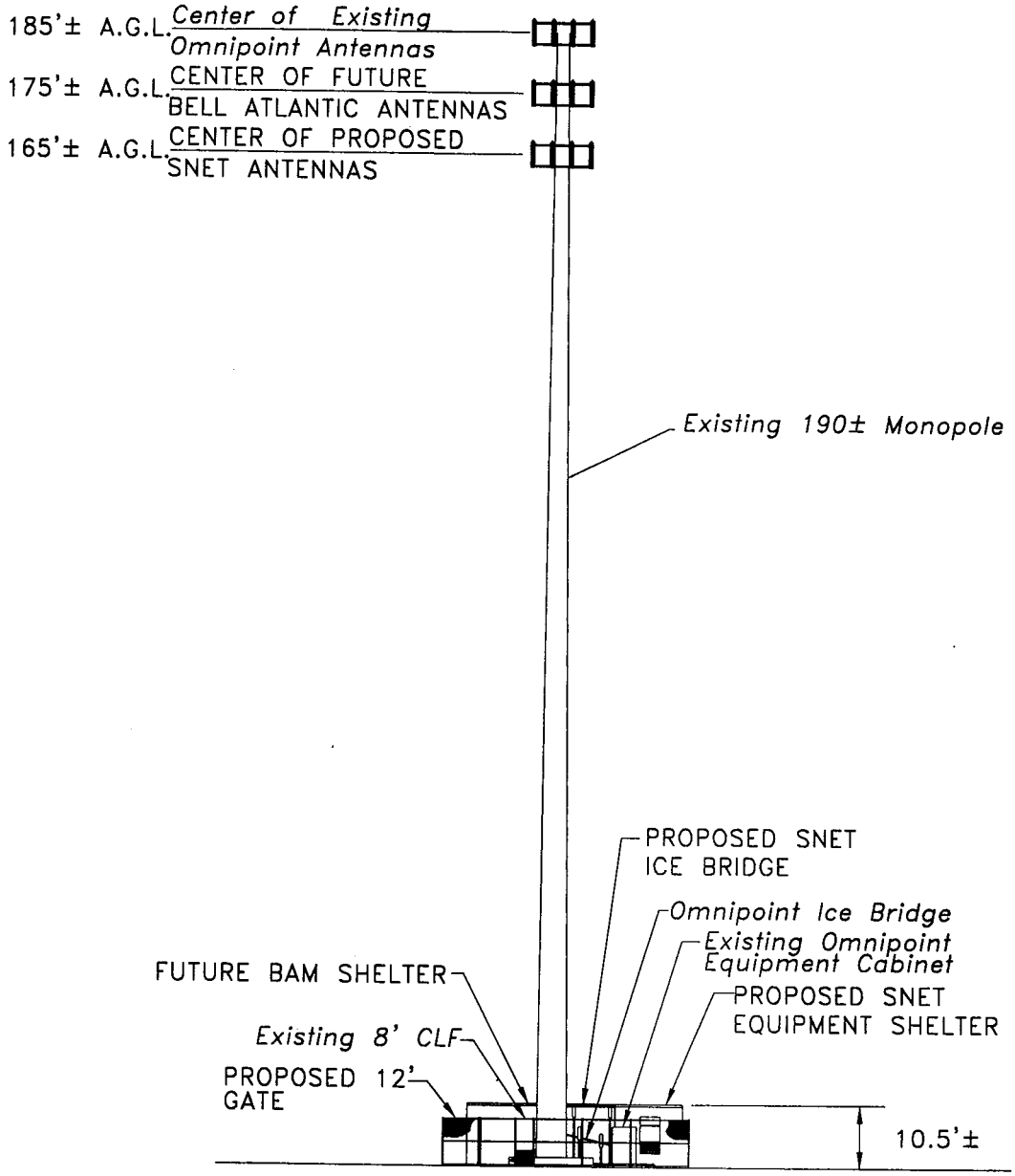
RAD. CENTER: 165 FT. (AGL)



NORTH ELEVATION

SCALE: 1"=30'

SNET MOBILITY PRELIMINARY DESIGN EXHIBIT	NORTH	SITE NAME: OLD LYME – OMNIPOINT MONOPOLE	SNET #:
		ADDRESS: 38 HATCHETTS HILL ROAD OLD LYME, CT	MGI #: 15364
			TASK #: 2135
		DRAWN: GMP / CHECKED: RGT / SCALE: 1"=30'	DATE: 2/18/00

Maguire Group Inc.
Architects · Engineers · Planners
One Court Street
New Britain, Connecticut 06051

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H. E. Bergeron Engineers
• Civil • Structural • Land Surveying

P.O. Box 440
2605 White Mountain Highway
North Conway, NH 03860
(603) 356-6936
(603) 356-7715 (fax)

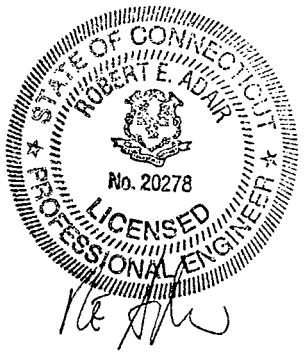
65 W. Commercial Street
Portland, ME 04101
(207) 780-1100
(207) 780-1101 (fax)
www.hebcivil.com

HEB

STRUCTURAL ANALYSIS REPORT
of
191' PIROD MONOPOLE TOWER
OLD LYME, CONNECTICUT

Prepared for Maguire Group, Inc.

March 3, 2000



Prepared by: H. E. Bergeron Engineers
P.O. Box 440, 2605 White Mountain Highway
North Conway, New Hampshire 03860
HEB Project No. 2000-032

H. E. Bergeron Engineers
• Civil • Structural • Land Surveying

P.O. Box 440
2605 White Mountain Highway
North Conway, NH 03860
(603) 356-6936
(603) 356-7715 (fax)

65 W. Commercial Street
Portland, ME 04101
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(207) 780-1101 (fax)
www.hebcivil.com

HEB

STRUCTURAL ANALYSIS REPORT
of
191' PIROD MONOPOLE
OLD LYME, CONNECTICUT
prepared for
MAGUIRE GROUP, INC.

EXECUTIVE SUMMARY:

H. Edmund Bergeron Civil Engineers, P.A. (HEB) performed a structural analysis of this 191-foot PiROD monopole tower. The analysis was performed with the addition of two twelve-panel antenna arrays mounted on low-profile platforms at centerline elevations of 165' and 175' respectively.

Our analysis indicates the tower and its foundation are capable of supporting the proposed antennas.

INTRODUCTION:

A structural analysis of this communications tower was performed by H. Edmund Bergeron Civil Engineers, P.A. (HEB) for Maguire Group, Inc. (Maguire). HEB did not visit the tower site. This analysis was based on information provided by Maguire, which included design drawings by PiROD, Inc., lease exhibits by Maguire and Techstar Communications, and antennas proposed by SNET Mobility and Bell Atlantic Mobile.

The structure is a 191-foot, galvanized steel monopole manufactured by PiROD. This analysis was conducted with the following antenna loads:

- (4) RV90-17 and (2) RV33-20 panel antennas on a low-profile platform at the top of the tower
- (12) ALP9212 panel antennas on a low-profile platform at 175'
- (12) ALP7120.16 panel antennas on a low-profile platform at 165'

For the purpose of the analysis, all waveguide cables were assumed to be 1-5/8" diameter installed on the inside of the pole.

HEB

STRUCTURAL ANALYSIS:

Methodology:

The structural analysis was done in accordance with TIA/EIA-222-F (EIA), Structural Standards for Steel Antenna Towers and Antenna Supporting Structures; and the American Institute of Steel Construction (AISC), Manual of Steel Construction, Allowable Stress Design, Ninth Edition.

The analysis was conducted using a wind speed of 85 miles per hour and one-half inch of radial ice over the entire structure and all appurtenances. The TIA/EIA Standard requires a minimum of 85-mph wind load for New London County, Connecticut.

Two analytical methods were used to evaluate the structure: a two-dimensional linear computer model developed by HEB, and a P-delta analysis using CSTRAAD finite element software distributed by ECOM Associates. The HEB 2-D model was used to generate dead loads of the tower and all of its appurtenances, radial ice loads and the resultant wind loading. The maximum bending moments and axial loads were used to calculate combined axial and bending stresses at intervals on the monopole, which were compared to allowable stresses according to AISC and TIA/EIA.

Loads generated in the 2-D model were input into the CSTRAAD program to evaluate secondary bending moments induced during deflection of the structure under load and to independently evaluate stresses. Evaluation of secondary bending moments is required by EIA paragraph 3.1.15. Our analysis indicates that the secondary moments exceed those of the linear analysis, and therefore govern in determining the capacity of the structure.

EIA requires two loading conditions to be evaluated to determine the tower's capacity. The higher stresses resulting from the two cases is used to calculate the tower capacity:

- Case 1 = Wind Load (without ice) + Tower Dead Load (controls)
- Case 2 = **0.75** Wind Load (with ice) + Ice Load + Tower Dead Load

EIA permits a one-third increase in allowable stresses for towers less than 700-feet tall. Allowable stresses of tower members were increased by one-third in computing the load capacity values indicated herein.

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ANALYSIS RESULTS:

Our analysis determined the tower will support the proposed antennae in addition to its current loading. Supporting calculations are provided in Appendix A.

The following table summarizes the capacity of the tower based on combined axial and bending stresses:

Elevation	Capacity
0'-20'	**76%**
20'-40'	**80%**
40'-60'	**88%**
60'-80'	**87%**
80'-100'	**87%**
100'-120'	**85%**
120'-140'	**81%**
140'-160'	**71%**
160'-191'	**46%**

The capability of the existing foundation to support the proposed loading was evaluated by comparing calculated values of shear, compression and overturning moment to design reactions provided on the PiROD record drawings. We found that the shear and overturning moment reactions were less than the design values, but the compression load slightly exceeded the design value (0.2 kips). Based on these figures, the tower's foundation is adequate to support the proposed loading, provided the foundations were designed and built to the requirements of the original design drawing.

CONCLUSIONS AND SUGGESTIONS:

As detailed above, our analysis indicates that the existing 191' PiROD monopole tower and foundation are capable of supporting the additional antenna loading proposed by SNET Mobility and Bell Atlantic Mobile.

HEB

LIMITATIONS:

This report is based on the following:

1. Tower is properly installed and maintained.
2. All members are in new condition.
3. All required members are in place.
4. All bolts are in place and are properly tightened.
5. Tower is in plumb condition.
6. All members are galvanized.
7. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
8. Record drawings accurately reflect tower dimensions and height.

H. Edmund Bergeron Civil Engineers, P.A. (HEB) is not responsible for any modifications completed prior to or hereafter which HEB is not or was not directly involved. Modifications include but are not limited to:

1. Adding or relocating antennas.
2. Installing antenna mounting gates or side arms.
3. Extending tower.

HEB hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon the information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact HEB. HEB disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Appendix A

Calculations

H. E. BERGERON ENGINEERS
2605 White Mountain Highway, PO Box 440
North Conway, NH 03860
(603) 356-6936

Client: Maguire Group
Job: Old Lyme, CT

Job No.: 2000-032

Calculated By: R. Adair
Checked By:

Date: 3-Mar-00
Date:

Monopole Summary

Wind Speed = 85 mph
Height of the Tower = 191 ft

Section	Length (ft.)	Midpt Elev.	Base Width (in.)	Top Width (in.)	Area (sf) w/o Ice	Area (sf) w/ Ice	Wall Thknss	Wt. (lbs) Tower	Wt. (lbs) Ice
10		0.00			0.00	0.00		0	0
9	31.00	175.50	24.00	24.00	62.00	64.58	0.375	2936	464
8	20.00	150.00	30.00	30.00	50.00	51.67	0.375	2375	373
7	20.00	130.00	36.00	36.00	60.00	61.67	0.375	2856	446
6	20.00	110.00	42.00	42.00	70.00	71.67	0.375	3337	519
5	20.00	90.00	48.00	48.00	80.00	81.67	0.375	3818	593
4	20.00	70.00	54.00	54.00	90.00	91.67	0.375	4299	666
3	20.00	50.00	60.00	60.00	100.00	101.67	0.375	4781	739
2	20.00	30.00	60.00	60.00	100.00	101.67	0.500	6361	739
1	20.00	10.00	60.00	60.00	100.00	101.67	0.625	7934	739
							Total	38698	5278

Section Properties

Section	I in^4	r in	S in^3	Area in^2
10	0	#DIV/0!	#DIV/0!	0.00
9	1942	8.35	162	27.83
8	3829	10.47	255	34.90
7	6659	12.60	370	41.97
6	10621	14.72	506	49.04
5	15908	16.84	663	56.11
4	22710	18.96	841	63.18
3	31217	21.08	1041	70.24
2	41363	21.04	1379	93.46
1	51380	20.99	1713	116.58

Tower Dead Load Summary

Elev.	Tower (lbs)	Ice (lbs)
191	0	0
160	2936	464
140	5311	837
120	8167	1283
100	11505	1802
80	15323	2394
60	19623	3060
40	24403	3799
20	30764	4538
0	38698	5278

H. E. BERGERON ENGINEERS
2605 White Mountain Highway, PO Box 440
North Conway, NH 03860
(603) 356-6936

Client: Maguire Group
Job: Old Lyme, CT — Job No.: 2000-032

Calculated By: R. Adair — Date: 3-Mar-00
Checked By: — Date:

Antennae Summary

Calculations based on EIA/TIA-222-F, using the following formulas:
Force on discrete appurtenance: F=Qz*Gh*Ca*A
Force on microwave antennae: F=Cr*A*Gh*Kz*V^2, where Cr=((Ca^2)+(Cs^2))^(1/2)
Gh=1.69 for monopoles Gh= 1.69
V as specified EIA-222-F

Input:
Wind Velocity= 85 mph
Tower Hgt= 191 ft.

Type	Elev. (z)	Coeff. (C)	Kz	Qz	Area (no ice)	Area (ice)	Force (no ice)	Force (ice)	Weight			
(4) RV90-17 and	187	1.4	1.64	30.36	30.0	32.4	**2155**	**2327**	240			
(2) RV33-20 on platform	187	1.4	1.64	30.36	12.6	16.8	**903**	**1207**	1600			
			1.00	18.50			**0**	**0**				
(12) ALP9212 Panels	175	1.4	1.61	29.79	46.8	49.2	**3299**	**3468**	360			
Low-profile platform	175	1.4	1.61	29.79	12.6	16.8	**886**	**1184**	1600			
			1.00	18.50			**0**	**0**				
(12) ALP7120.16	165	1.4	1.58	29.29	44.4	46.8	**3077**	**3244**	300			
Low-profile platform	165	1.4	1.58	29.29	12.6	16.8	**871**	**1164**	1600			
			1.00	18.50			**0**	**0**				
			1.00	18.50			**0**	**0**				
DISHES										Orient	Ca	Cs
		0.00000	1.00	18.50			**0**	**0**				
		0.00000	1.00	18.50			**0**	**0**				
		0.00000	1.00	18.50			**0**	**0**				
		0.00000	1.00	18.50			**0**	**0**				
		0.00000	1.00	18.50			**0**	**0**				
									5700			

CABLES & LINEAR APPURT.

Section	Area w/o Ice	Area w/ Ice	Weight w/o Ice	Weight w/ Ice
10				
9	0.97	3.55	418	449
8	0.63	2.29	769	789
7	0.63	2.29	769	789
6	0.63	2.29	769	789
5	0.63	2.29	769	789
4	0.63	2.29	769	789
3	0.63	2.29	769	789
2	0.63	2.29	769	789
1	0.63	2.29	769	789

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North Conway, NH 03860
(603) 356-6936

Client: Maguire Group
Job: Old Lyme, CT
Job No.: 2000-032

Calculated By: R. Adair
Date: 3-Mar-00
Checked By:
Date:

Wind Load Summary

Wind Velocity = 85 mph
Height of Tower = 191 feet

Kz = Exposure coefficient = $(z/33)^{2/7}$; 1.00<=Kz<=2.58
Qz = Velocity pressure = .00256*Kz*V^2
Gh = Gust response factor = 1.69
Cf = Structure force coefficient from Table 1 of TIA/EIA
Aa and Ai = Areas of linear apputenances, w/o & with ice
Ae = Effective area = Avg. width*section length
Force = Qz*Gh*(Cf*Ae+Ca*Aa)

Wind Load Without Ice

Section	Midpoint Height	Areas Ae	Areas Aa	Kz	Qz	Gh	Cf	Wind Load	Wind Load
10	0	0.0	0.00	1.00	18.50	1.69	0.59	**0 lbs.**	**#DIV/0! plf.**
9	175.5	62.0	0.97	1.61	29.82	1.69	0.59	**1902 lbs.**	**61 plf.**
8	150	50.0	0.63	1.54	28.51	1.69	0.59	**1457 lbs.**	**73 plf.**
7	130	60.0	0.63	1.48	27.37	1.69	0.59	**1672 lbs.**	**84 plf.**
6	110	70.0	0.63	1.41	26.09	1.69	0.59	**1854 lbs.**	**93 plf.**
5	90	80.0	0.63	1.33	24.64	1.69	0.59	**1996 lbs.**	**100 plf.**
4	70	90.0	0.63	1.24	22.93	1.69	0.59	**2087 lbs.**	**104 plf.**
3	50	100.0	0.63	1.13	20.83	1.69	0.59	**2103 lbs.**	**105 plf.**
2	30	100.0	0.63	1.00	18.50	1.69	0.59	**1868 lbs.**	**93 plf.**
1	10	100.0	0.63	1.00	18.50	1.69	0.59	**1868 lbs.**	**93 plf.**

Wind Load With Ice

Section	Midpoint Height	Areas Ae	Areas Ai	Kz	Qz	Gh	Cf	Wind Load	75% Wind Load
10	0	0.0	0.00	1.00	18.50	1.69	0.59	**0 lbs.**	**#DIV/0! plf.**
9	175.5	64.6	3.55	1.61	29.82	1.69	0.59	**2135 lbs.**	**52 plf.**
8	150	51.7	2.29	1.54	28.51	1.69	0.59	**1601 lbs.**	**60 plf.**
7	130	61.7	2.29	1.48	27.37	1.69	0.59	**1810 lbs.**	**68 plf.**
6	110	71.7	2.29	1.41	26.09	1.69	0.59	**1986 lbs.**	**74 plf.**
5	90	81.7	2.29	1.33	24.64	1.69	0.59	**2121 lbs.**	**80 plf.**
4	70	91.7	2.29	1.24	22.93	1.69	0.59	**2202 lbs.**	**83 plf.**
3	50	101.7	2.29	1.13	20.83	1.69	0.59	**2208 lbs.**	**83 plf.**
2	30	101.7	2.29	1.00	18.50	1.69	0.59	**1961 lbs.**	**74 plf.**
1	10	101.7	2.29	1.00	18.50	1.69	0.59	**1961 lbs.**	**74 plf.**

NODAL COORDINATES						BOUNDARY CONDITIONS (F=FIX, S=SUP, M=MASTER/SLAVE)					
NODE NO	REBAND NO	X	Y	Z	NODE TEMP	ALPHA	BETA	GAMMA	DIR	DDDOOO XYZXYZ	STIFFNESS
Units:		Ft	Ft	Ft	F	Deg	Deg	Deg			K /In /Deg
1	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00		FFFFFF	
2	2	0.00	20.00	0.00	0.00	0.00	0.00	0.00			
3	3	0.00	40.00	0.00	0.00	0.00	0.00	0.00			
4	4	0.00	60.00	0.00	0.00	0.00	0.00	0.00			
5	5	0.00	80.00	0.00	0.00	0.00	0.00	0.00			
6	6	0.00	100.00	0.00	0.00	0.00	0.00	0.00			
7	7	0.00	120.00	0.00	0.00	0.00	0.00	0.00			
8	8	0.00	140.00	0.00	0.00	0.00	0.00	0.00			
9	9	0.00	160.00	0.00	0.00	0.00	0.00	0.00			
10	10	0.00	191.00	0.00	0.00	0.00	0.00	0.00			

TOTAL NUMBER OF ACTIVE NODES = 10
TOTAL NUMBER OF EQUATIONS = 54

2 NODE PRISMATIC BEAM ELEMENT														
ELEM NO	NE NO	PE NO	ALPHA	BETA	GAMMA	LENGTH	MAT TYPE	PROP TYPE	RELEASE NE	RELEASE PE	REF TEMP	DIR	OFFSET NE	OFFSET PE	STIFFNESS NE	STIFFNESS PE
Units:			Deg	Deg	Deg	Ft					F		Ft	Ft	K /In /Deg	K /In /Deg
1	1	2	90.00	-90.00	0.00	20.00	1	1								
2	2	3	90.00	-90.00	0.00	20.00	1	2								
3	3	4	90.00	-90.00	0.00	20.00	1	3								
4	4	5	90.00	-90.00	0.00	20.00	1	4								
5	5	6	90.00	-90.00	0.00	20.00	1	5								
6	6	7	90.00	-90.00	0.00	20.00	1	6								
7	7	8	90.00	-90.00	0.00	20.00	1	7								
8	8	9	90.00	-90.00	0.00	20.00	1	8								
9	9	10	90.00	-90.00	0.00	31.00	1	9								

TOTAL NUMBER OF ACTIVE PRISMATIC BEAM ELEMENTS = 9

MATERIAL PROPERTIES						
MATL NO	DESIGNATION	YOUNG'S MODULUS	POISSON'S RATIO	THERMAL COEFF	MASS DENSITY	WEIGHT DENSITY
Units:		K /In ^2		F	Slug/Ft^3	Lb/Ft ^3
1	Pole	2.9e+004	0.250	6.5e-006	15.2	490

2 NODE PRISMATIC BEAM ELEMENT PROPERTIES									
PROP	DESIGNATION	A	IXX	IYY	J	IXY	SFY	SFX	CW
Units:		In^2	In^4	In^4	In^4	In^4			In^6
1	Section 1	117	5.14e+004	5.14e+004	1.03e+005	0	1.000	1.000	0
2	Section 2	93.5	4.14e+004	4.14e+004	8.27e+004	0	1.000	1.000	0
3	Sect. 3	70.2	3.12e+004	3.12e+004	6.24e+004	0	1.000	1.000	0
4	Sect. 4	63.2	2.27e+004	2.27e+004	4.54e+004	0	1.000	1.000	0
5	Sect. 5	56.1	1.59e+004	1.59e+004	3.18e+004	0	1.000	1.000	0
6	Sect. 6	49	1.06e+004	1.06e+004	2.12e+004	0	1.000	1.000	0
7	Sect. 7	42	6.66e+003	6.66e+003	1.33e+004	0	1.000	1.000	0
8	Sect. 8	34.9	3.83e+003	3.83e+003	7.66e+003	0	1.000	1.000	0
9	Sect. 9	27.8	1.94e+003	1.94e+003	3.88e+003	0	1.000	1.000	0

GRAVITY LOAD MULTIPLIERS			
REC NO	PX	PY	PZ
DESCRIPTION : Pole dead loads			
LOAD CASES : 1			
ELEMENT LIST : 1-9			
1	0.000	-1.300	0.000

2 NODE PRISMATIC BEAM ELEMENT LOAD INFORMATION

REC NO	LOAD TYPE	LOAD SYS	DIST SPEC		DIST	PX	PY	PZ	MX	MY	MZ
Units:					Ft	K	K	K	Ft-K	Ft-K	Ft-K
DESCRIPTION : Wind on Section 1											
LOAD CASES : 1											
ELEMENT LIST : 1											
1	UNIF	GLO	FRAC	B	0.000	0.093	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.093	0.000	0.000	0.000	0.000	0.000
DESCRIPTION : Wind on 2											
LOAD CASES : 1											
ELEMENT LIST : 2											
2	UNIF	GLO	FRAC	B	0.000	0.093	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.093	0.000	0.000	0.000	0.000	0.000
DESCRIPTION : Wind on 3											
LOAD CASES : 1											
ELEMENT LIST : 3											
3	UNIF	GLO	FRAC	B	0.000	0.105	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.105	0.000	0.000	0.000	0.000	0.000
DESCRIPTION : Wind on 4											
LOAD CASES : 1											
ELEMENT LIST : 4											
4	UNIF	GLO	FRAC	B	0.000	0.104	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.104	0.000	0.000	0.000	0.000	0.000
DESCRIPTION : Wind on 5											
LOAD CASES : 1											
ELEMENT LIST : 5											
5	UNIF	GLO	FRAC	B	0.000	0.100	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.100	0.000	0.000	0.000	0.000	0.000
DESCRIPTION : Wind on 6											
LOAD CASES : 1											
ELEMENT LIST : 6											
6	UNIF	GLO	FRAC	B	0.000	0.093	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.093	0.000	0.000	0.000	0.000	0.000
DESCRIPTION : Wind on 7											
LOAD CASES : 1											
ELEMENT LIST : 7											
7	UNIF	GLO	FRAC	B	0.000	0.084	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.084	0.000	0.000	0.000	0.000	0.000
DESCRIPTION : Wind on 8											
LOAD CASES : 1											
ELEMENT LIST : 8											
8	UNIF	GLO	FRAC	B	0.000	0.073	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.073	0.000	0.000	0.000	0.000	0.000
DESCRIPTION : Wind on 9											
LOAD CASES : 1											
ELEMENT LIST : 9											
9	UNIF	GLO	FRAC	B	0.000	0.061	0.000	0.000	0.000	0.000	0.000
				E	1.000	0.061	0.000	0.000	0.000	0.000	0.000
DESCRIPTION : (4) RV90-17 an (2) RV33-20 on platform at 187'											
LOAD CASES : 1											
ELEMENT LIST : 9											
DISTANCES : 27											
101	CONC	GLO	DIST			3.058	-1.840	0.000	0.000	0.000	0.000
DESCRIPTION : (12) ALP9212 panels on platform @ 175'											
LOAD CASES : 1											
ELEMENT LIST : 9											
DISTANCES : 15											
102	CONC	GLO	DIST			4.185	-1.960	0.000	0.000	0.000	0.000

DESCRIPTION : (12) ALP7120.16 panels on platform @ 165'
LOAD CASES : 1
ELEMENT LIST : 9
DISTANCES : 5

103	CONC	GLO	DIST	3.948	-1.900	0.000	0.000	0.000	0.000

REC NO	ALPHA	BETA	GAMMA	NODAL LOADS PX	PY	PZ	MX	MY	MZ
Units:	Deg	Deg	Deg	K	K	K	Ft-K	Ft-K	Ft-K

DESCRIPTION : Waveguide cables:dead load
LOAD CASES : 1
NODE LIST : 2-9

1	0.00	0.00	0.00	0.000	-0.769	0.000	0.000	0.000	0.000

DESCRIPTION : WG cable d.l.
LOAD CASES : 1
NODE LIST : 10

2	0.00	0.00	0.00	0.000	-0.418	0.000	0.000	0.000	0.000

L I N E A R A N A L Y S I S R E S U L T S

S T R U C T U R E L O A D C O M B I N A T I O N S

COMB LIST OF FACTORS * CASES

LOAD COMBINATIONS:

COMB 1 (Wind + dead loads) : 1.00 X CASE 1

N O D A L D I S P L A C E M E N T S

(* Indicates Displacements Occur in Nodal Local System)

NODE NO	LOAD COMB	DX	DY	DZ	OX	OY	OZ
Units:		In	In	In	Deg	Deg	Deg
1	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	1	0.7589	-0.0041	0.0000	0.0000	0.0000	-0.3501
3	1	3.0151	-0.0083	0.0000	0.0000	0.0000	-0.7130
4	1	6.8604	-0.0129	0.0000	0.0000	0.0000	-1.1056
5	1	12.4332	-0.0172	0.0000	0.0000	0.0000	-1.5343
6	1	19.8951	-0.0211	0.0000	0.0000	0.0000	-2.0024
7	1	29.4163	-0.0247	0.0000	0.0000	0.0000	-2.5096
8	1	41.1402	-0.0279	0.0000	0.0000	0.0000	-3.0408
9	1	55.0561	-0.0308	0.0000	0.0000	0.0000	-3.5313
10	1	79.3791	-0.0332	0.0000	0.0000	0.0000	-3.8151

2 N O D E P R I S M A T I C B E A M E L E M E N T -- F O R C E S A N D M O M E N T S

SIGN CONVENTION : BEAM DESIGNERS

ELEM NO	LOAD COMB	NODE NO	AXIAL	SHEAR X	SHEAR Y	MOMENT X	MOMENT Y	TORSION
Units:			K	K	K	K -Ft	K -Ft	K -Ft
1	1	1	-62.5735	0.0000	27.9820	-3434.5115	0.0000	0.0000
		2	-52.2577	0.0000	26.1220	-2893.4715	0.0000	0.0000
2	1	2	-51.4887	0.0000	26.1220	-2893.4715	0.0000	0.0000
		3	-43.2165	0.0000	24.2620	-2389.6315	0.0000	0.0000
3	1	3	-42.4475	0.0000	24.2620	-2389.6315	0.0000	0.0000
		4	-36.2368	0.0000	22.1620	-1925.3915	0.0000	0.0000
4	1	4	-35.4678	0.0000	22.1620	-1925.3915	0.0000	0.0000
		5	-29.8781	0.0000	20.0820	-1502.9515	0.0000	0.0000
5	1	5	-29.1091	0.0000	20.0820	-1502.9515	0.0000	0.0000
		6	-24.1449	0.0000	18.0820	-1121.3115	0.0000	0.0000
6	1	6	-23.3759	0.0000	18.0820	-1121.3115	0.0000	0.0000
		7	-19.0408	0.0000	16.2220	-778.2715	0.0000	0.0000
7	1	7	-18.2718	0.0000	16.2220	-778.2715	0.0000	0.0000
		8	-14.5559	0.0000	14.5420	-470.6315	0.0000	0.0000
8	1	8	-13.7869	0.0000	14.5420	-470.6315	0.0000	0.0000
		9	-10.6993	0.0000	13.0820	-194.3915	0.0000	0.0000
9	1	9	-9.9303	0.0000	13.0820	-194.3915	0.0000	0.0000
		10	-0.4180	0.0000	0.0000	0.0000	0.0000	0.0000

R E A C T I O N S

(* Indicates Reactions Occur in Nodal Local System)

NODE NO	LOAD COMB	PX	PY	PZ	MX	MY	MZ
Units:		K	K	K	K -Ft	K -Ft	K -Ft
1	1	-27.9820	62.5735	0.0000	0.0000	0.0000	3434.5115

P-D E L T A A N A L Y S I S R E S U L T S

S T R U C T U R E L O A D C O M B I N A T I O N S

COMB LIST OF FACTORS * CASES

LOAD COMBINATIONS:

COMB 1 (Wind + dead loads) : 1.00 X CASE 1

N O D A L D I S P L A C E M E N T S

(* Indicates Displacements Occur in Nodal Local System)

NODE NO	LOAD COMB	DX	DY	DZ	OX	OY	OZ
Units:		In	In	In	Deg	Deg	Deg
1	1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	1	0.7858	-0.0054	0.0000	0.0000	0.0000	-0.3628
3	1	3.1274	-0.0209	0.0000	0.0000	0.0000	-0.7408
4	1	7.1272	-0.0589	0.0000	0.0000	0.0000	-1.1512
5	1	12.9356	-0.1334	0.0000	0.0000	0.0000	-1.6007
6	1	20.7268	-0.2637	0.0000	0.0000	0.0000	-2.0928
7	1	30.6829	-0.4738	0.0000	0.0000	0.0000	-2.6265
8	1	42.9552	-0.7908	0.0000	0.0000	0.0000	-3.1858
9	1	57.5315	-1.2366	0.0000	0.0000	0.0000	-3.7022
10	1	83.0240	-2.1133	0.0000	0.0000	0.0000	-4.0027

2 N O D E P R I S M A T I C B E A M E L E M E N T -- F O R C E S A N D M O M E N T S

SIGN CONVENTION : BEAM DESIGNERS

ELEM NO	LOAD COMB	NODE NO	AXIAL	SHEAR X	SHEAR Y	MOMENT X	MOMENT Y	TORSION
Units:			K	K	K	K -Ft	K -Ft	K -Ft
1	1	1	-62.4816	0.0000	28.1867	-3551.9011	0.0000	0.0000
		2	-52.1719	0.0000	26.2930	-3007.1038	0.0000	0.0000
2	1	2	-51.2314	0.0000	26.6231	-3007.1039	0.0000	0.0000
		3	-42.9778	0.0000	24.6825	-2494.0475	0.0000	0.0000
3	1	3	-42.0373	0.0000	24.9661	-2494.0489	0.0000	0.0000
		4	-35.8624	0.0000	22.7629	-2016.7593	0.0000	0.0000
4	1	4	-34.9210	0.0000	23.0139	-2016.7613	0.0000	0.0000
		5	-29.3833	0.0000	20.7992	-1578.6297	0.0000	0.0000
5	1	5	-28.4419	0.0000	21.0164	-1578.6302	0.0000	0.0000
		6	-23.5453	0.0000	18.8563	-1179.9033	0.0000	0.0000
6	1	6	-22.6058	0.0000	19.0362	-1179.9054	0.0000	0.0000
		7	-18.3516	0.0000	16.9980	-819.5632	0.0000	0.0000
7	1	7	-17.4179	0.0000	17.1353	-819.5679	0.0000	0.0000
		8	-13.7928	0.0000	15.2675	-495.5391	0.0000	0.0000
8	1	8	-12.8791	0.0000	15.3521	-495.5383	0.0000	0.0000
		9	-9.8858	0.0000	13.7073	-204.9443	0.0000	0.0000
9	1	9	-9.0097	0.0000	13.7318	-204.9429	0.0000	0.0000
		10	-0.4162	0.0000	0.0287	0.0013	0.0000	0.0000

R E A C T I O N S

(* Indicates Reactions Occur in Nodal Local System)

NODE NO	LOAD COMB	PX	PY	PZ	MX	MY	MZ
Units:		K	K	K	K -Ft	K -Ft	K -Ft
1	1	-27.9820	62.5735	0.0000	0.0000	0.0000	3551.9011

H. E. BERGERON ENGINEERS
2605 White Mountain Highway, PO Box 440
North Conway, NH 03860
(603) 356-6936

Client:	Maguire Group		
Job:	Old Lyme, CT	Job No.:	2000-032
Calculated By:	R. Adair	Date:	3-Mar-00
Checked By:		Date:	

Moments from Tower Without Ice @ Sections

Tower Force w/o Ice	Elev. of Force	0	20	40	60	80	100	120	140	160	191
1868	10	18677	0	0	0	0	0	0	0	0	0
1868	30	56030	18677	0	0	0	0	0	0	0	0
2103	50	105155	63093	21031	0	0	0	0	0	0	0
2087	70	146069	104335	62601	20867	0	0	0	0	0	0
1996	90	179676	139748	99820	59892	19964	0	0	0	0	0
1854	110	203947	166866	129784	92703	55622	18541	0	0	0	0
1672	130	217340	183903	150466	117029	83592	50155	16718	0	0	0
1457	150	218605	189458	160310	131163	102016	72868	43721	14574	0	0
1902	176	333759	295724	257689	219653	181618	143583	105548	67513	29477	0
0	0	0	0	0	0	0	0	0	0	0	0
Total (ft-kips)		**1479**	**1162**	**882**	**641**	**443**	**285**	**166**	**82**	**29**	**0**

Moments from Tower With Ice @ Sections

Tower Force w/ Ice	Elev. of Force	0	20	40	60	80	100	120	140	160	191
1961	10	19609	0	0	0	0	0	0	0	0	0
1961	30	58828	19609	0	0	0	0	0	0	0	0
2208	50	110406	66243	22081	0	0	0	0	0	0	0
2202	70	154161	110115	66069	22023	0	0	0	0	0	0
2121	90	190855	148443	106030	63618	21206	0	0	0	0	0
1986	110	218416	178704	138992	99280	59568	19856	0	0	0	0
1810	130	235276	199080	162883	126687	90491	54294	18098	0	0	0
1601	150	240165	208143	176121	144099	112077	80055	48033	16011	0	0
2135	176	374651	331956	289260	246565	203870	161175	118479	75784	33089	0
0	0	0	0	0	0	0	0	0	0	0	0
Total (ft-kips)		**1602**	**1262**	**961**	**702**	**487**	**315**	**185**	**92**	**33**	**0**

Total Moment (Tower & Antennas) | **Axial Loads (kips)** | **Shear**

Elevation	Mom. w/o Ice	75% Mom w/ Ice	100% Mom w/ Ice	P-Delta Secondary	D+A Force	D+A+I Force	P-Delta Secondary	Tower (lbs.)	Antenna (lbs)	Total (kips)	P-Delta Secondary
0	**3434.8**	**2853.5**	**3804.7**	**3551.9**	**45.2**	**50.5**	**62.5**	17984	10305	**28.29**	**28.2**
20	**2893.6**	**2409.6**	**3212.8**	**3007.1**	**37.2**	**42.5**	**51.2**	16023	10305	**26.33**	**26.6**
40	**2389.6**	**1995.0**	**2660.0**	**2494.0**	**30.9**	**35.4**	**42.0**	14062	10305	**24.37**	**25.0**
60	**1925.4**	**1611.7**	**2149.0**	**2016.7**	**26.1**	**29.9**	**34.9**	11854	10305	**22.16**	**23.0**
80	**1503.1**	**1261.5**	**1682.0**	**1578.6**	**21.8**	**24.9**	**28.4**	9652	10305	**19.96**	**21.0**
100	**1121.7**	**943.7**	**1258.3**	**1179.9**	**18.0**	**20.4**	**22.6**	7531	10305	**17.84**	**19.0**
120	**778.7**	**656.7**	**875.6**	**819.6**	**14.6**	**16.5**	**17.4**	**5546**	**10305**	**15.85**	**17.1**
140	**471.0**	**398.2**	**530.9**	**495.5**	**6.6**	**13.1**	**12.9**	**3736**	**10305**	**14.04**	**15.4**
160	**194.5**	**165.3**	**220.3**	**204.9**	**9.1**	**9.9**	**9.0**	**2135**	**10305**	**12.44**	**13.7**
191	**0.0**	**0.0**	**0.0**		**0.0**	**0.5**		0	0	**0.00**	

H. E. BERGERON ENGINEERS
2605 White Mountain Highway, PO Box 440
North Conway, NH 03860
(603) 356-6936

Client: Maguire Group
Job: Old Lyme, CT Job No.: 2000-032

Calculated By: R. Adair Date: ########
Checked By: Date:

Evaluation of Monopole fb= Moment/Section Modulus

Axial Force				
Axial Force				Actual
Elev.	w/o ice	Area	Fy	w/o ice
0	62.5	116.58	42	**0.54**
20	51.2	93.46	42	**0.55**
40	42.0	70.24	42	**0.60**
60	34.9	63.18	42	**0.55**
80	28.4	56.11	42	**0.51**
100	22.6	49.04	42	**0.46**
120	17.4	41.97	42	**0.41**
140	12.9	34.90	42	**0.37**
160	9.0	27.83	42	**0.32**
191	0.0	0.00	42	**#DIV/0!**

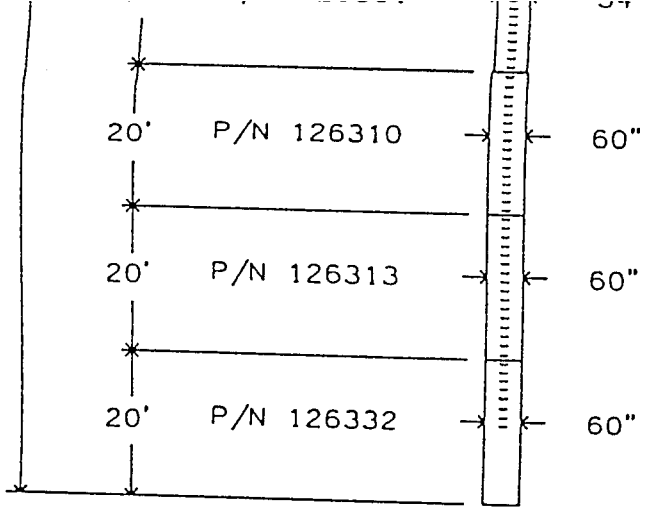
Bending Force			Bending Stress		
			Allowable		Actual
Elev.	w/o ice	S	Fb	1.33 Fb	w/o ice
0	3551.9	1712.67	**25.2**	**33.52**	**24.89**
20	3007.1	1378.75	**25.2**	**33.52**	**26.17**
40	2494.0	1040.56	**25.2**	**33.52**	**28.76**
60	2016.7	841.10	**25.2**	**33.52**	**28.77**
80	1578.6	662.84	**25.2**	**33.52**	**28.58**
100	1179.9	505.79	**25.2**	**33.52**	**27.99**
120	819.6	369.94	**25.2**	**33.52**	**26.59**
140	495.5	255.29	**25.2**	**33.52**	**23.29**
160	204.9	161.86	**25.2**	**33.52**	**15.19**
191	0.0	#DIV/0!	**25.2**	**33.52**	**#DIV/0!**

Elev.	Comb. Loads	Capacity
0	**0.759**	**76%**
20	**0.797**	**80%**
40	**0.876**	**88%**
60	**0.875**	**87%**
80	**0.868**	**87%**
100	**0.849**	**85%**
120	**0.806**	**81%**
140	**0.706**	**71%**
160	**0.463**	**46%**
191	**#DIV/0!**	**#DIV/0!**

Tower Capacity

Appendix B

Drawings



SEE PAGE 2 OF THIS DRAWING FOR OPENING INFORMATION.

SEE PAGE 4 OF THIS DRAWING FOR CONNECTION BOLT TIGHTENING SPECIFICATIONS.

SEE PAGE 9 OF THIS DRAWING FOR BASE SECTION INSTALL.

VIEW A

REMOVABLE CLIMBING RUNGS

REV	DESCRIPTION OF REVISIONS	INI	DATE
F	ADDED ANCHOR STEEL NOTE.	TSD	12/09/1998
E	NEW LOADING & NEW REACTIONS	TSD	12/09/1998
D	REVISED FOUNDATION	ODA	09/18/1998
C	NEW LOADING & NEW REACTIONS	KWD	09/17/1998
B	EDITED FOUNDATIONS	RCH	09/09/1998
A	ADDED FOUNDATION PER SOIL REPORT	ODA	09/09/1998

From: 77682.DFT - 12/09/98 06:54 > 2041631F.DWG - 12/09/98 06:52
Printed: 01/22/99 15:07

OMNIPOINT
EAST LYME #038, CT
MP60 X 190' ASSEMBLY DRAWING

APPROVED/ENG.	TSD	12/09/1998
APPROVED/FOUND.	N/A	
DRAWN BY	TSD	

ENG. FILE NO. A-115008-
ARCHIVE Q-77682

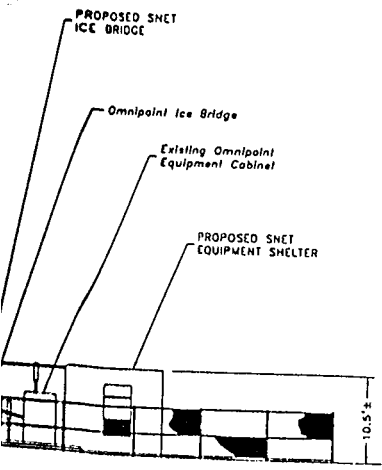
PIROD INC.
1545 Pidco Dr.
Plymouth, IN 46563-0128
219-936-4221

DRAWING NO. 204163-B
PAGE 1 OF 9

9 | 10 | 11 | 12 | 13 | 14 | 15

N M L K J H G F E D C B A

Existing 190'± Monopole
(Pirod File # A115008)



ON

Maguire Group Inc.
Architects · Engineers · Planners
One Court Street
New Britain, Connecticut 06051

ID#:

CONSULTANT
MAGUIRE GROUP INC.

KEY PLAN

SEAL

NORTH ARROW

No	Revisions / Submissions	Date

SNET

SNET MOBILITY INC.

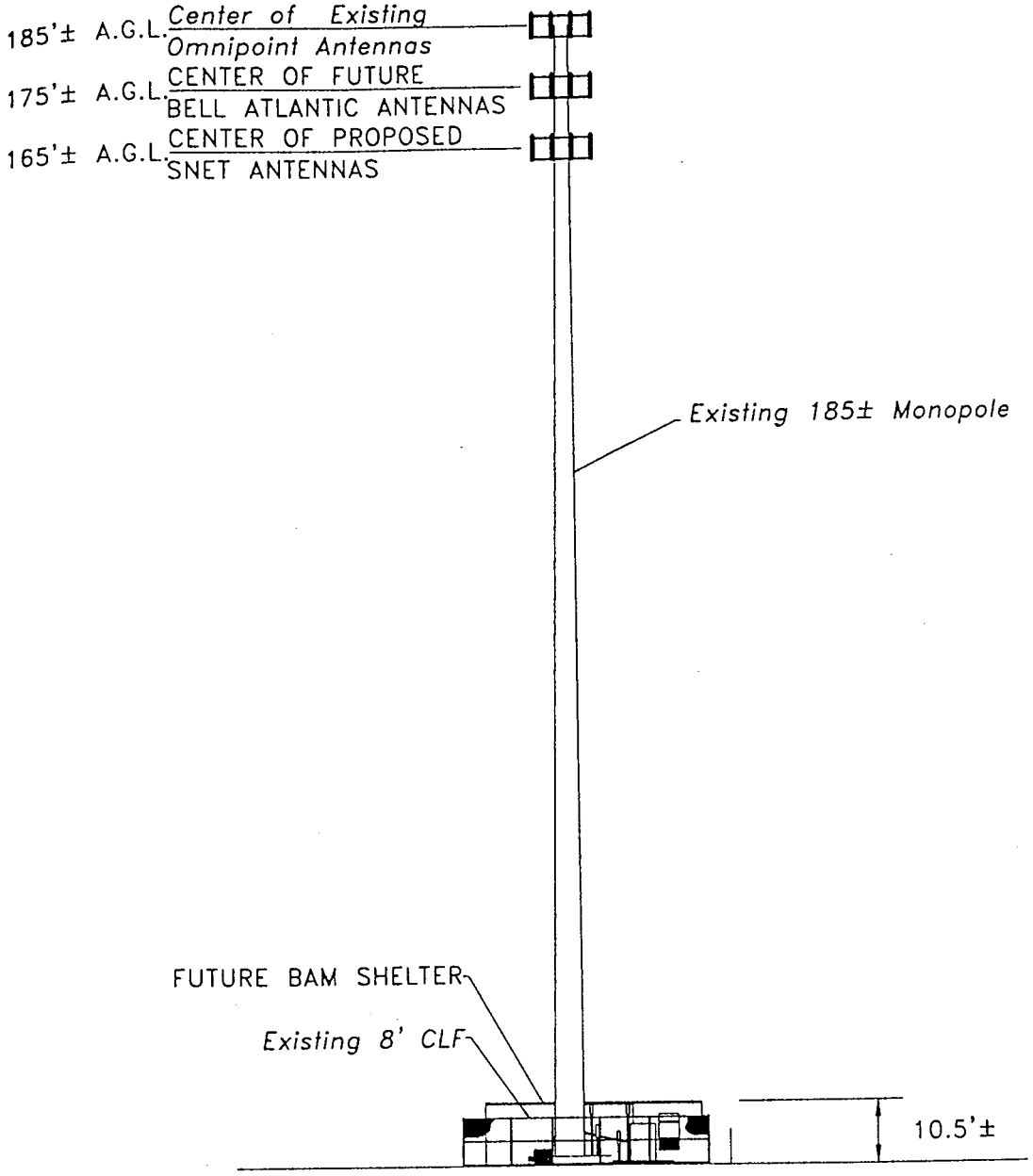
LOCATION:
38 HATCHETS HILL ROAD
OLD LYME, CT 06371
DESC.:
SPRINGWICH CELLULAR SITE
OLD LYME–HATCHETTS HILL MONOPOLE

DWG TITLE:
SOUTH ELEVATION

DRAWN JCH	SNET JOB NUMBER
CHECKED GMP	SCALE 1"=10'
CLLI CODE	DRAWING NO C–2
REC	
DATE 11/30/99	

9 | 10 | 11 | 12 | 13 | 14 | 15

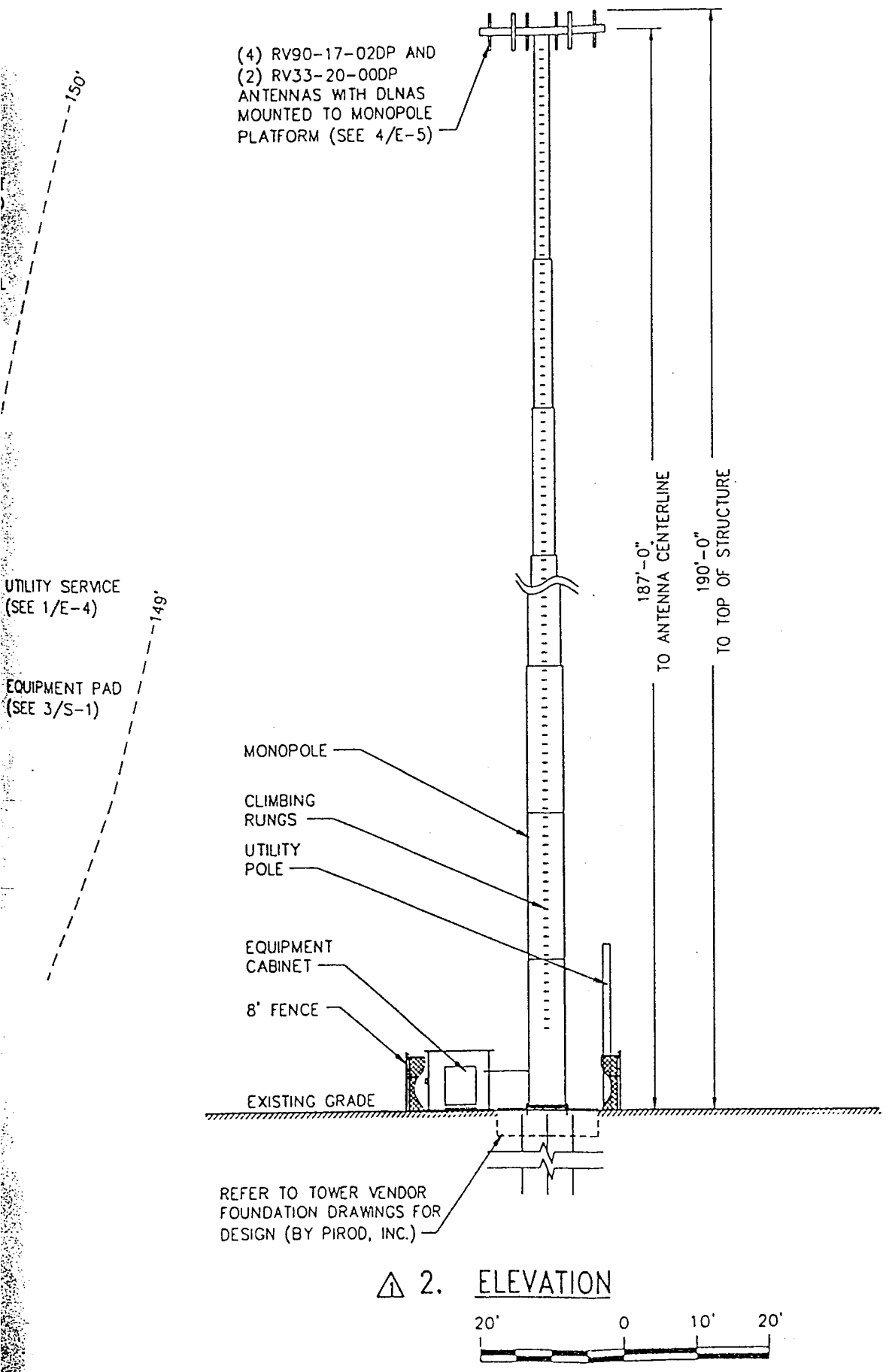
ENTER: 165 FT. (AGL)



NORTH ELEVATION

SCALE: 1"=30'

ET MOBILITY ELIMINARY SIGN EXHIBIT	NORTH	SITE NAME: OLD LYME – OMNIPOINT MONOPOLE	SNET #: MGI #: 14777 TASK #: 1135 DATE: 2/3/00
		ADDRESS: 38 HATCHETS HILL ROAD OLD LYME, CT	
		DRAWN: GMP | CHECKED: RGT | SCALE: 1"=30'	
Maguire Group Inc. Architects · Engineers · Planners One Court Street New Britain, Connecticut 06051		THIS DRAWING AND ALL DATA CONTAINED HEREIN IS FOR INFORMATIONAL PURPOSES ONLY. NOT INTENDED FOR DESIGN OR CONSTRUCTION USE. ALL DATA SHOULD BE VERIFIED	SNET



2. ELEVATION

20' 0 10' 20'

OMNIPOINT

CT-11-038-C

HATCHETTS HILL LLC

36 HATCHETTS HILL RD
OLD LYME, CT

TECHSTAR
Communications, Inc.
8403 COLESVILLE ROAD 26TH FLOOR
SILVER SPRING, MD 20910
PHONE: (301) 562-8400
FAX: (301) 562-8410

APPROVALS:

CONSTRUCTION DATE

RF DATE

SAC DATE

PROFESSIONAL ENGINEER:
FRANK SMITH
CT #00220735

REVISIONS

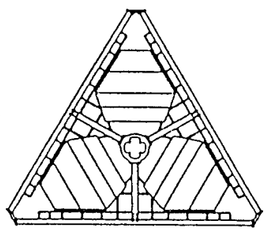
NO.	DESCRIPTION	DATE
1	GENERAL REVISION	10/7/98

ISSUED FOR
CONSTRUCTION

SHEET TITLE
PARTIAL SITE
PLAN AND
ELEVATION

SHEET NO
C-2

ISSUE DATE
08/05/98



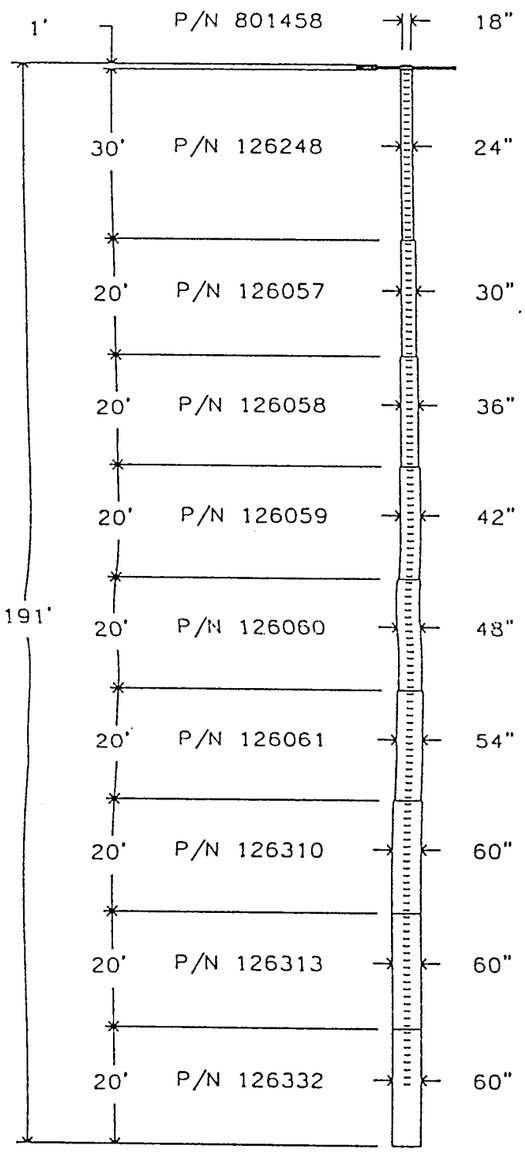
ROTATABLE TOP - TOP VIEW

MONOPOLE SECTION DATA

(ALL BOLTS ARE FOR BOTTOM OF SECTION)

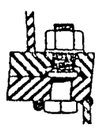
SECTION					CONNECT BOLT			PILOT BOLT		
LENGTH	PART#	SIZE	WALL	WT. *	DIAM	LENGTH	#	DIAM	LENGTH	#
1'	801458	18"	N/A		1"	4-1/2"	8			
30'	126248	24"	0.375"	3226#	1"	4-1/2"	17	1"	5"	3
20'	126057	30"	0.375"	2747#	1"	4-1/2"	21	1"	5"	3
20'	126058	36"	0.375"	3290#	1"	4-1/2"	25	1"	5"	3
20'	126059	42"	0.375"	3833#	1"	4-1/2"	29	1"	5"	3
20'	126060	48"	0.375"	4376#	1"	4-1/2"	33	1"	5"	3
20'	126061	54"	0.375"	4918#	1"	4-1/2"	45	1"	5"	3
20'	126310	60"	0.375"	5701#	1-1/4"	4-1/2"	64			
20'	126313	60"	0.500"	7779#	1-1/4"	4-1/2"	64			
20'	126332	60"	0.625"	10007#						

*THE WEIGHTS LISTED ARE THEORETICAL. THE ACTUAL WEIGHTS WILL VARY. ALL WEIGHTS SHOULD BE CONFIRMED IN THE FIELD PRIOR TO ERECTION.



TOP 1' CONSISTS OF ROTATABLE TOP ASSEMBLY. SEE DWG # 130555-B FOR INSTALLATION DETAILS. JAM NUTS NOT REQUIRED.

ALL CONNECTIONS ARE A-325 BOLTS SEE TABLE ABOVE FOR SIZE & QTY.



TYPICAL FLUSH FLANGE CONNECTION

VIEW A

SEE PAGE 2 OF THIS DRAWING FOR OPENING INFORMATION.

SEE PAGE 4 OF THIS DRAWING FOR CONNECTION BOLT TIGHTENING SPECIFICATIONS.

SEE PAGE 9 OF THIS DRAWING FOR BASE SECTION INSTALL.

REMOVABLE CLIMBING RUNGS

REV	DESCRIPTION OF REVISIONS	INI	DATE
F	ADDED ANCHOR STEEL NOTE.	TSD	12/09/1998
E	NEW LOADING & NEW REACTIONS	TSD	12/09/1998
D	REVISED FOUNDATION	ODA	09/18/1998
C	NEW LOADING & NEW REACTIONS	KWO	09/17/1998
B	EDITED FOUNDATIONS	RCH	09/09/1998
A	ADDED FOUNDATION PER SOIL REPORT	ODA	09/09/1998

From: 77682.DFT - 12/09/98 06:54 > 2041631F.DWG - 12/09/98 06:52
Printed: 01/22/99 15:07

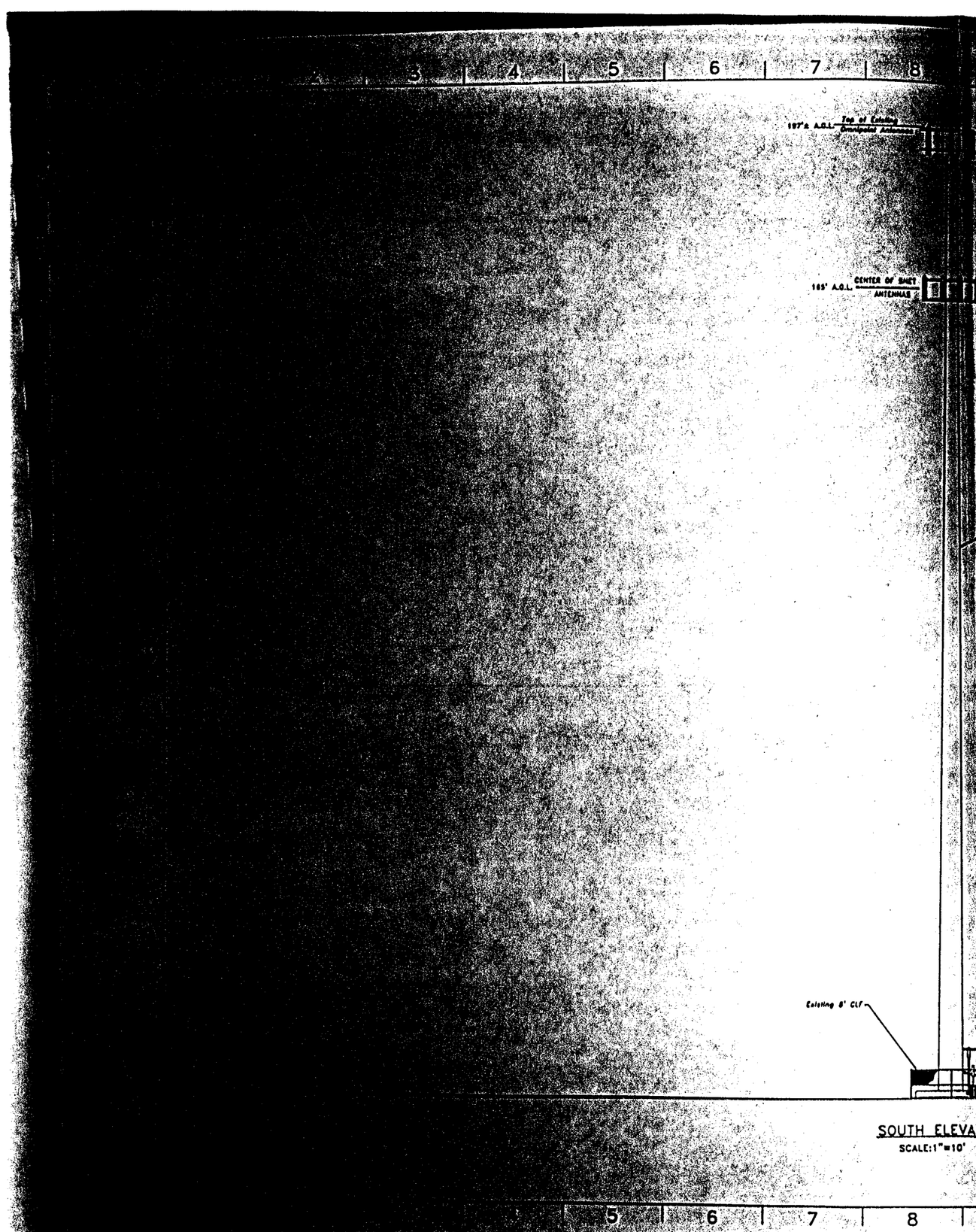
OMNIPOINT
EAST LYME #038, CT
MP60 X 190' ASSEMBLY DRAWING

APPROVED/ENG.	TSD	12/09/1998
APPROVED/FOUND.	N/A	
DRAWN BY	TSD	

PiROD INC.
1545 Pidco Dr.
Plymouth, IN 46563-0128
219-936-4221

ENG. FILE NO. A-115008-Q-77682
ARCHIVE

DRAWING NO. 204163-B
PAGE 1 OF 9



SOUTH ELEVATION
SCALE:1"=10'

Maguire Group Inc.
Architects · Engineers · Planners
One Court Street
New Britain, Connecticut 06051

ID#:

CONSULTANT
MAGUIRE GROUP INC.

KEY PLAN

SEAL

NORTH ARROW

No	Revisions / Submissions	Date

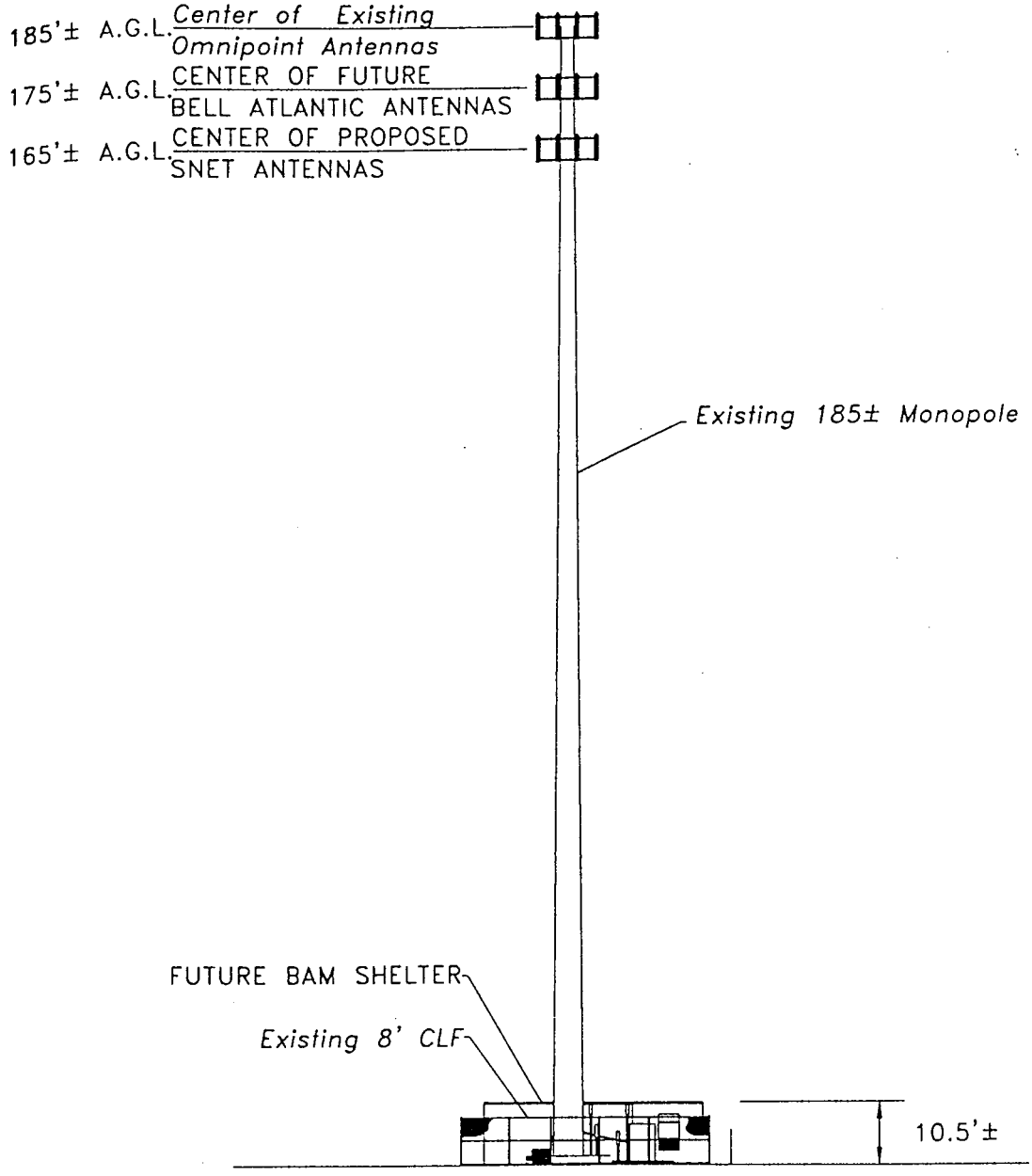
SNET MOBILITY INC.

LOCATION:
38 HATCHETS HILL ROAD
OLD LYME, CT 06371
DESC.:
SPRINGWICH CELLULAR SITE
OLD LYME-HATCHETTS HILL MONOPOLE

DWG TITLE:
SOUTH ELEVATION

DRAWN JCH	SNET JOB NUMBER
CHECKED GMP	SCALE 1"=10'
CLLI CODE	DRAWING NO C-2
REC	
DATE 11/30/99	

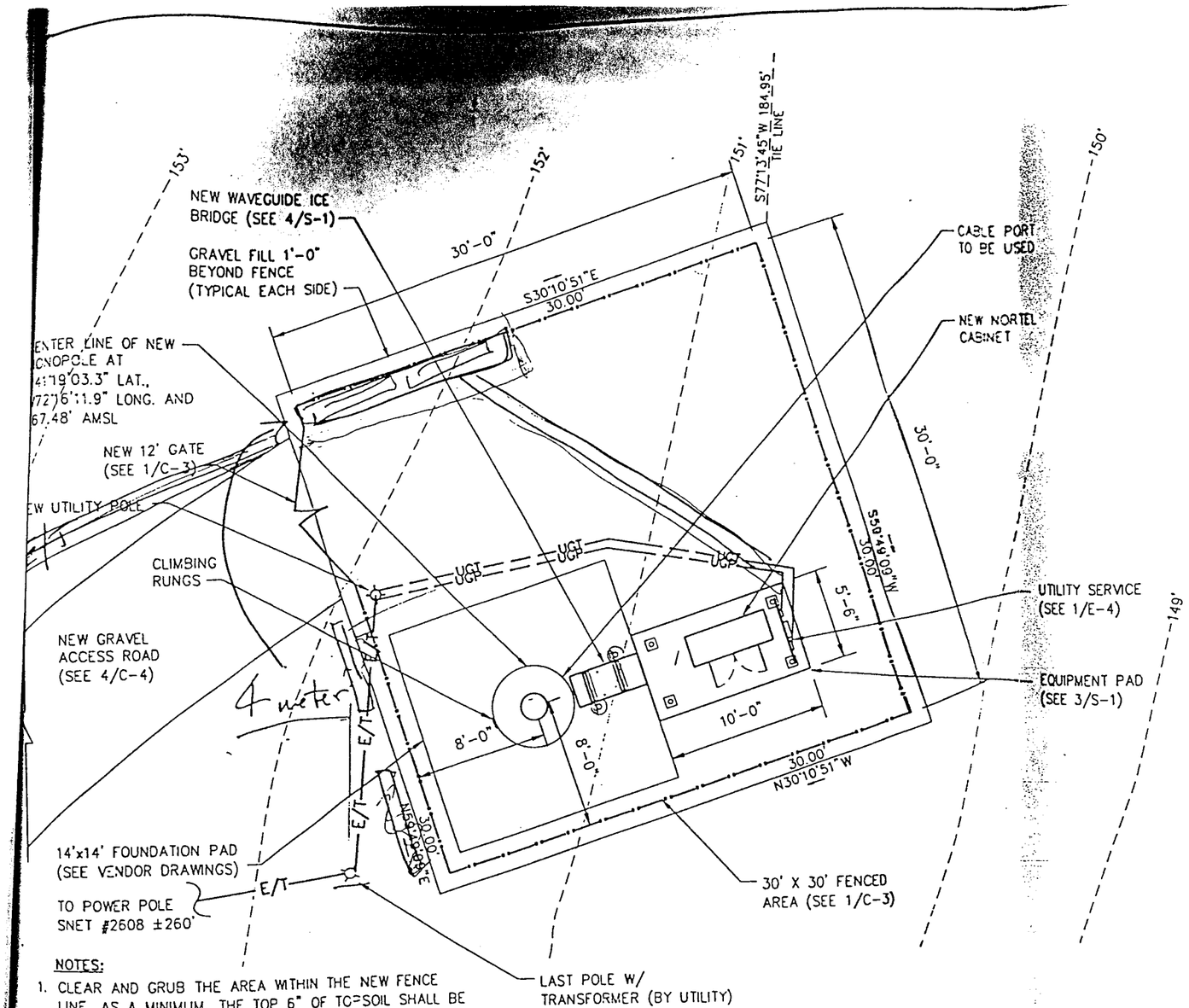
ENTER: 165 FT. (AGL)



NORTH ELEVATION

SCALE: 1"=30'

ET MOBILITY ELIMINARY SIGN EXHIBIT	NORTH	SITE NAME: OLD LYME – OMNIPOINT MONOPOLE	SNET #:
		ADDRESS: 38 HATCHETS HILL ROAD OLD LYME, CT	MGI #: 14777 TASK #: 1135
		DRAWN: GMP | CHECKED: RGT | SCALE: 1"=30'	DATE: 2/3/00
Maguire Group Inc. Architects · Engineers · Planners One Court Street New Britain, Connecticut 06051		THIS DRAWING AND ALL DATA CONTAINED HEREIN IS FOR INFORMATIONAL PURPOSES ONLY. NOT INTENDED FOR DESIGN OR CONSTRUCTION USE. ALL DATA SHOULD BE VERIFIED	SNET



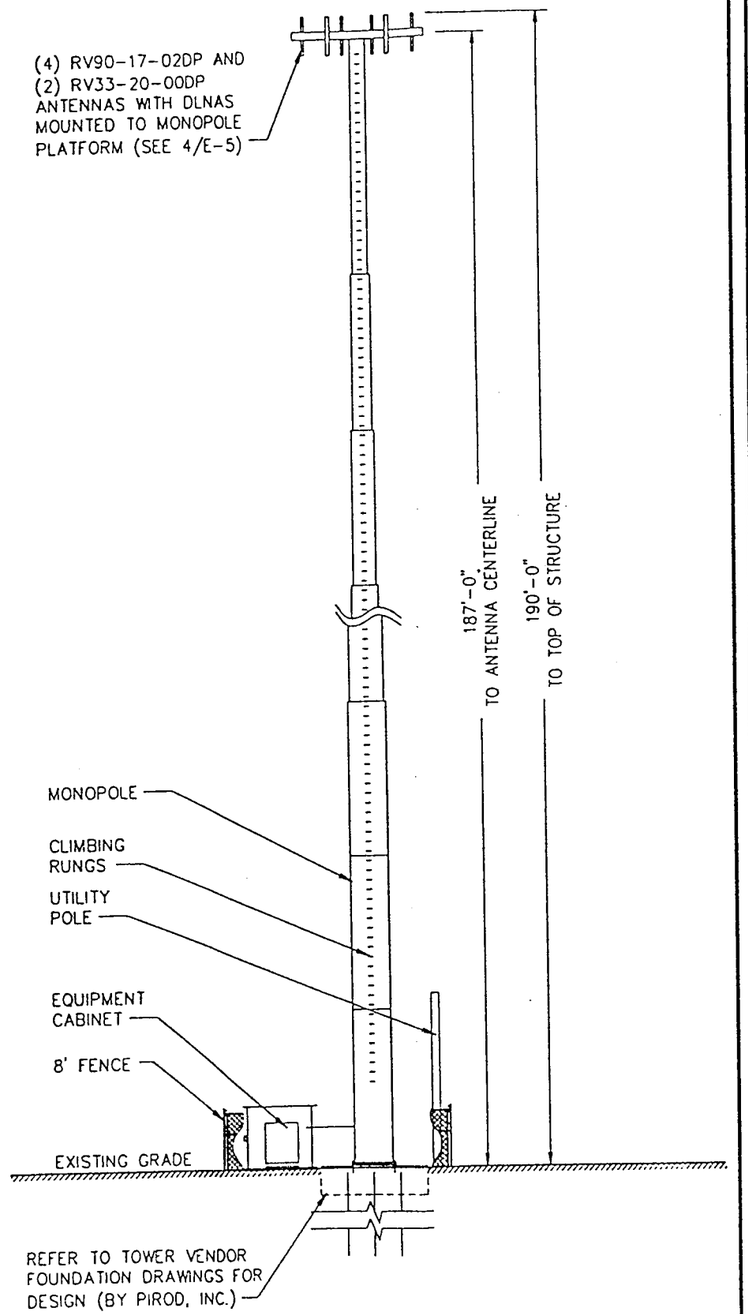
NOTES:

1. CLEAR AND GRUB THE AREA WITHIN THE NEW FENCE LINE. AS A MINIMUM, THE TOP 6" OF TOPSOIL SHALL BE REMOVED. THE EXPOSED SUBGRADE SHALL BE COMPACTED TO A MINIMUM DEPTH OF 6". GEOGRID FABRIC AND 4" MINIMUM #57 STONE PLACED ON SUBGRADE TO MATCH EXISTING SITE LEVEL.
2. ANTENNA PLATFORM REMOVED IN PLAN FOR CLARITY. SEE 4/E-5 FOR ORIENTATION.
3. THE ORIENTATION OF THE FENCE, MONOPOLE, FOUNDATION AND EQUIPMENT PAD CAN BE ADJUSTED TO FIT THE PARKING LOT AND OTHER FIELD CONDITIONS.
4. THE ORIENTATION OF THE CLIMBING RUNGS, CABLE PORT AND WAVEGUIDE ICE BRIDGE IS FIXED.
5. FOUR FENCE POLES AND MONOPOLE ARE IDENTIFIED IN FIELD BY WOODEN STAKES IN GROUND, LOCATED BY THE SURVEYOR.

⚠1 1. PARTIAL SITE PLAN

1" = 8' 0 4' 8'

N



⚠1 2. ELEVATION

1" = 20' 0 10' 20'

OMNIPOINT

CT-11-038-C

HATCHETTS HILL LLC

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APPROVALS

CONSTRUCTION DATE

RF DATE

SAC DATE

PROFESSIONAL ENGINEER:
FRANK SMITH
CT #00020735

REVISIONS

NO	DESCRIPTION	DATE
1	GENERAL REVISION	10/7/98

ISSUED FOR CONSTRUCTION

SHEET TITLE
PARTIAL SITE PLAN AND ELEVATION

SHEET NO
C-2

ISSUE DATE
08/05/98