STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@po.state.ct.us
Web Site: www.state.ct.us/csc/index.htm

November 4, 2003

Thomas J. Regan, Esq.
Brown Rudnick Berlack Israels LLP
185 Asylum Street, CityPlace I
Hartford, CT 06103-3402

RE: **TS-SPRINT-078-031017** - Sprint Spectrum, L.P. d/b/a/ Sprint PCS request for an order to approve tower sharing for a proposed telecommunications facility to be constructed at 230 Clover Mill Road, Mansfield, Connecticut.

Dear Attorney Regan:

At a public meeting held October 29, 2003, the Connecticut Siting Council (Council) ruled that the shared use of this proposed 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 of 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 October 17, 2003.

Thank you for your attention and cooperation.

Very truly yours,

PBK/laf

Pamela B. Katz, P.E.
Chairman

PBK/laf

c: Honorable Elizabeth Patterson, Mayor, Town of Mansfield
Gregory Padick, Town Planner, Town of Mansfield
Christopher B. Fisher, Esq., Cuddy & Feder LLP
Sandy M. Carter, Verizon Wireless

I:\siting\em\sprint\mansfield\dc102903.doc

BROWN
RUDNICK
BERLACK
ISRAELS LLP

THOMAS J. REGAN
direct dial: (860) 509-6522
tregan@brbilaw.com

October 17, 2003

VIA HAND DELIVERY

Pamela B. Katz, Chairman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

TS-SPRINT-078-031017

RE: Request of Sprint Spectrum, L.P. d/b/a Sprint PCS for Approval of the Shared Use of the Municipal Communications Tower Located at 230 Clover Mill Road, Mansfield, CT.

Dear Chairman Katz:

Enclosed for filing are an original and twenty-five copies of Sprint's above-referenced tower sharing proposal. Three full-size copies of the site plan are enclosed for bulk filing.

Also enclosed is a check in the amount of $500.00 representing the filing fee.

Please do not hesitate to contact me directly should you have any questions.

Very truly yours,

BROWN RUDNICK BERLACK ISRAELS LLP

By: _____
Thomas J. Regan

Enclosures

#40178284 v\1 - merciecm - nx5rg01!.doc - 80563/2948

CityPlace I
Hartford, Connecticut 06103
860.509.6500
fax 860.509.6501
www.brownrudnick.com

CONNECTICUT SITING COUNCIL

In re:

Request of Sprint Spectrum, L.P. d/b/a Sprint PCS for the Approval of the Shared Use of the Municipal Communications Tower to be Built by TCP Communications located at 230 Clover Mill Road in Mansfield, Connecticut.	:	Petition No. ____
	:	October 17, 2003

TOWER SHARING PROPOSAL

Sprint proposes herein to share a 180-foot municipal communication tower and associated compound at 230 Clover Mill Road in Mansfield, Connecticut (the "Facility"). Pursuant to Connecticut General Statutes § 16-50aa (the "Statute"), Sprint requests a finding from the Connecticut Siting Council (the "Council") that the shared use of this Facility is technically, legally, environmentally and economically feasible, will meet public safety concerns, will avoid the unnecessary proliferation of towers and is in the public interest. Sprint further requests an order approving the shared use of this Facility.

The purpose of this request is to use an existing facility to meet Sprint's coverage needs in the Mansfield area and to avoid the construction of an additional tower in Mansfield.

A. The Facility

On September 15, 2003, the Mansfield Planning and Zoning Commission unanimously adopted a motion to approve the special permit application of the Town of Mansfield ("Town") and TCP Communication, Inc. ("TCP") to construct a 180-foot telecommunications tower and related facilities at 230 Clover Mill Road. The approval is attached as Exhibit A. The Facility, which has not been built yet, will be owned by the Town and will be built by TCP. The Facility is located on Town owned property used by the Mansfield Department of Public Works. The

BROWN RUDNICK
BERLACK ISRAELS LLP
CITYPLACE I
185 ASYLUM STREET
HARTFORD, CT 06103
(860) 509-6500

Town Fire, EMS, Police and Department of Public Works plan to locate their antennas on the monopole.

B. Proposed Project

Sprint will install 12 panel antennas mounted on a triangular platform with 4 antennas per sector and a centerline at 158 feet. Sprint will also install a small global positioning system antenna at 75 feet. An ice bridge will connect the monopole and the equipment building at the base of the monopole. The equipment building sits on a 9-foot 5-inch by 18-foot concrete foundation within Sprint's 13-foot 5-inch by 21-foot 5-inch lease area. The site plan is attached as Exhibit B.

C. Technical Feasibility

Consistent with the requirements of the Statute, it is technically feasible for Sprint to collocate at this Facility. As the site plans indicate, the compound is large enough to fit Sprint's equipment cabinets, therefore it will not require any expansion. Furthermore, the monopole will be designed to structurally support the Town's antennas as well as the antennas of 6 additional carriers. Sprint will be the second carrier located on the Tower (AT&T recently received approval to collocate at this Facility). The Paul J. Ford Company (structural engineers) confirmed the structural capability of the monopole in a report attached as Exhibit C.

D. Legal Feasibility

The Council has the authority, pursuant to the Statute, to issue an order approving the shared use of the Clover Mill Road Facility. By issuing an order approving Sprint's use of this

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HARTFORD, CT 06103
(860) 509-6500

Facility, Sprint will be able to proceed with obtaining a building permit for its proposed installation on the monopole. Therefore, consistent with the Statute, Sprint's proposal is legally feasible.

E. Economic Feasibility

Sprint is a wireless telecommunications provider licensed by the Federal Communications Commission in 32 major United States trading areas, including Connecticut. Sprint has entered into a lease with TCP for the purpose of locating Sprint's antennas and associated equipment at the Facility to provide wireless telecommunications service to this area of Mansfield. Therefore, the shared use of this Facility is economically feasible.

F. Environmental Feasibility

Pursuant to the Statute, the proposal will be environmentally feasible for the following reasons:

- The overall impact on the Town of Mansfield will be decreased with the sharing of a single tower versus the proliferation of towers in this area.
- The proposal will not increase the height of the Tower nor will it extend the boundaries of the compound.
- The proposal will have an insignificant visual impact and will minimally alter the physical characteristics of the Facility.
- There will be no increased impact on any wetlands or water resources.

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- There will be no increased impact on air quality because no air pollutants will be generated during the normal operation of the Facility.

- There will only be a brief, slight increase in noise pollution during the attachment of the antennas.

- During construction, the proposed project will generate a small amount of traffic as workers arrive and depart and materials are delivered. Upon completion, traffic will be limited to an average of 1 monthly maintenance/inspection visit.

G. Public Safety Concerns / Benefits

In accordance with the Statute, there are no known public safety concerns associated with this proposal. The total radio-frequency electromagnetic radiation of Sprint's antennas will be well below the standard adopted by the Federal Communications Commission (the "FCC"). Attached as Exhibit D is a worst case power density analysis for the operation of Sprint's antennas at the Facility as measured at the base of the monopole. The power density is 3.287 % of the maximum permissible exposure based on the NCRP standard. Sprint also calculated the cumulative power density for the operation of Sprint's, AT&T's and Verizon's antennas and found that cumulatively, they only reach 13.45 % of the maximum permissible exposure. These calculations show that Sprint will be well below the FCC mandated limits in all locations around the Facility, even with extremely conservative assumptions.

Moreover, Sprint expects to enhance the safety of the Mansfield community by improving the wireless communications of local residents and travelers through the area. This Facility will improve Sprint's coverage gap on and around Clover Mill Road, Spring Hill Road,

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HARTFORD, CT 06103
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Davis Road, Mansfield City Road, Browns Road, Storrs Road/Route 195 and Crane Hill Road. Sprint has attached, as Exhibit E, coverage plots showing the existing coverage in this area and the coverage provided by this Facility.

Conclusion

For the reasons stated above, the attachment of Sprint's antennas to this Facility would meet all the requirements set forth in the Statute. This proposal is technically, legally, environmentally and economically feasible and meets all public safety concerns. Therefore, Sprint respectfully requests that the Council approve this request for the shared use of the telecommunications facility at 230 Clover Mill Road in Mansfield, Connecticut.

Sprint Spectrum, L.P.
d/b/a Sprint PCS

By: _____

Thomas J. Regan, Esq.
Brown Rudnick Berlack Israels LLP
185 Asylum Street, CityPlace I
Hartford, CT 06103-3402
Phone - (860) 509-6522
Fax - (860) 509-6501

BROWN RUDNICK
BERLACK ISRAELS LLP
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185 ASYLUM STREET
HARTFORD, CT 06103
(860) 509-6500

Certificate of Service

This is to certify that on this 17th day of October, 2003, the foregoing Tower Sharing Proposal was delivered, via first class mail, to the following:

Elizabeth C. Paterson, Mayor
Town of Mansfield
Four South Eagleville Road
Storrs, CT 06268

Martin Berliner, Town Manager
Town of Mansfield
Four South Eagleville Road
Storrs, CT 06268

Gregory Padick, Town Planner
Town of Mansfield
Four South Eagleville Road
Storrs, CT 06268

By: _____
Thomas J. Regan, Esq.

40178273

BROWN RUDNICK
BERLACK ISRAELS LLP
CITYPLACE I
185 ASYLUM STREET
HARTFORD, CT 06103
(860) 509-6500

Exhibit A

Wendell Davis

TOWN OF MA

Planning and Zonin

Audrey P. Beck
Four South Eagle
Storrs, Connecticut 06268
Telephone (203) 429-3330

Memo to: Town Council
From: Planning and Zoning Commission
A. H. Barberet, Chairman

Date: 9/17/03

Re: PZC approval of proposed telecommunication tower and related facilities adjacent to Town Garage, PZC file 1209

At a meeting held on September 15, 2003, the Mansfield Planning and Zoning Commission unanimously adopted the following motion:

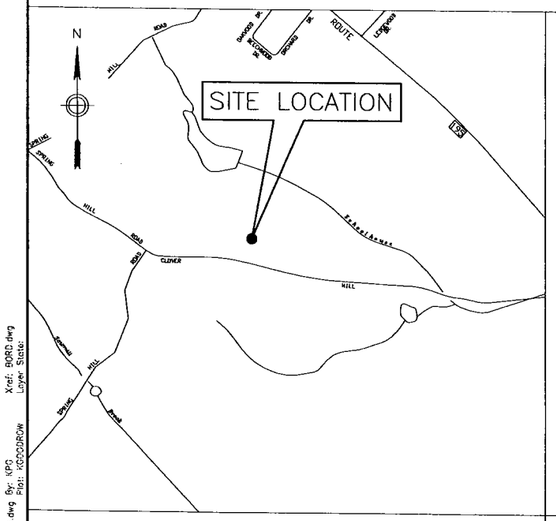
"to approve with conditions the special permit application (file 1209) of the Town of Mansfield and TCP Communications, Inc. for a 180-foot telecommunication tower and related facilities and site work to be located at 230 Clover Mill Road, in an RAR-90 zone, as submitted to the Commission and shown on plans revised through 6/5/03 and as presented at a Public Hearing on 8/4/03. This approval is granted because the application as hereby approved is considered to be in compliance with Article V, Section B, Article X, Section R, and other provisions of the Mansfield Zoning Regulations, and is granted with the following conditions:

1. This approval is based on submitted plans and project descriptions. Any change in plans or the proposed use of the site shall require further review and approval as per Mansfield's Zoning Regulations. The applicant shall be responsible for meeting Building Permit requirements and complying with all applicable State and Federal regulations pertaining to the subject telecommunication use.
2. Prior to any use of the telecommunication facilities and the issuance of a Certificate of Compliance, all site work shall be satisfactorily completed. Based on the provisions of Article V, Section B.7.c, a variation of this condition may be authorized by the Commission, provided that public health and safety components of the project have been satisfactorily completed.
3. To help ensure effective long-term screening of the equipment compound area and compliance with regulatory provisions, the plans shall be revised to incorporate a staggered row of evergreen trees of mixed species between the Town Garage/Bicentennial Pond access road and the compound area. The size, type and location of this required evergreen screen shall be approved by the PZC officers, with staff assistance. With this revision, the proposed eight (8) foot high wooden fence around the compound, and the retention of existing wooded areas around the compound, the proposal will be acceptably screened. The compound and tower are not expected to be readily visible from Clover Mill Road or nearby residences along Clover Mill Road.
4. Whereas abandonment/tower removal issues are addressed by Town ownership and the Town's contract with TCP Communications, Inc., a separate bond pursuant to Article X, Section R.6 of the Zoning Regulations shall not be required.
5. This permit shall not become valid until the applicant obtains the permit form from the Planning Office and files it on the Land Records."

If there are any questions regarding this action, the Planning Office may be contacted.

Sprint PCS℠

MANSFIELD TOWN GARAGE
230 CLOVER MILL ROAD
MANSFIELD, CONNECTICUT
CT43XC852



MANSFIELD

SCALE
1000 0 1000 2000 3000 FEET

LOCATION MAP

LEGEND

DATUM IS MEAN SEA LEVEL

- EXISTING HIGHWAY LINE/PROPERTY LINE
- PROPOSED LEASE AREA
- 130 EXISTING CONTOUR
- X132 EXISTING SPOT ELEVATION @ X
- FENCE
- EXISTING UTILITY POLE AND OVERHEAD UTILITIES
- PROPOSED UTILITY POLE AND OVERHEAD UTILITIES
- CHD BOUNDARY MONUMENT
- CLEARING LINE

NOTE 1:
THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAIN. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.

NOTE 2:
THESE PLANS ARE TO BE WORKED WITH PLANS BY OTHERS DEPICTING FUTURE CONSTRUCTION AT THIS SITE. OBJECTS ON THESE PLANS DESIGNATED AS "BY OTHERS" REFER TO CONSTRUCTION YET TO BE DONE.

DRIVING DIRECTIONS FROM NEW HAVEN:

ON I-91 NORTH TAKE US-5 N/ CT-15 EXIT 29 TO I-84 EAST HARTFORD. MERGE ONTO WILBER CROSS HWY. TAKE EXIST 59 ON I-384 EAST TOWARD PROVIDENCE. I-384 E BECOMES US-44 EAST. TURJ RIGHT ONTO CT-32)STAFFORD ROAD). TURN LEFT ONTO CT-275 (SOUTH EAGLEVILL RD) TURN RIGHT ONTO MAPLE ROAD (MAPLE ROAD BECOMES SPRING HILL ROAD). STAY STRAIGHT TO REACH CLOVE MILLL ROAD.

PROJECT SUMMARY

APPLICANT / LESSEE
SPRINT PCS
ONE INTERNATIONAL BOULEVARD, SUITE 800
MAHWAH, NJ 07495
(201) 684-4085

PROPERTY OWNER
TOWN OF MANSFIELD
4 SOUTH EAGLEVILLE RD.
STORRS, CONNECTICUT 06268
CONTACT: MARTIN BERLINER, TOWN
MANAGER (860) 429-3337

PROJECT DESCRIPTION:
THE PROJECT CONSISTS OF INSTALLATION AND OPERATION OF ANTENNAS AND ASSOCIATED EQUIPMENT. THE ASSOCIATED CABINETS WILL BE LOCATED ON A CONCRETE SLAB WITH OUTDOOR EQUIPMENT CABINETS. THIS SYSTEM WILL BOTH TRANSMIT AND RECEIVE RADIO SIGNALS.

POWER AND TELCO UTILITIES NECESSARY FOR THIS FACILITY WILL BE INSTALLED UNDERGROUND. NO WATER OR SEWER SERVICES ARE NEEDED.

THE PROPOSED USE DOES NOT REQUIRE FULL-TIME OR PART-TIME EMPLOYEES AT THE SITE.

ELECTRIC UTILITY: CONNECTICUT LIGHT & POWER (CL&P)
"CALL BEFORE YOU DIG" (800) 922-4455

TELEPHONE UTILITY: SOUTHERN NEW ENGLAND TELEPHONE (SNET)

LEASE PARCEL INFORMATION	
ADDRESS	230 CLOVER MILL ROAD
CURRENT OWNER	TOWN OF MANSFIELD
DEED	VOLUME 83, PAGE 413
ASSESSORS ID	MAP 23, BLOCK 60, LOT 7
FEMA FIRM MAP	ZONED "X"
ZONING DISTRICT	RAR-90
AREA OF LEASE PARCEL	291 S.F.

DRAWING INDEX

DRAWING	TITLE
YT0852T01	TITLE SHEET
YT0852SC01	SITE LAYOUT PLAN AND ELEVATION VIEW

Dewberry-Goodkind, Inc.
A Dewberry Company
59 Elm Street, Suite 101
New Haven, CT 06510
p. (203) 776-2277
f. (203) 776-2288
Engineers
Planners
Surveyors

MANSFIELD TOWN GARAGE
230 CLOVER MILL ROAD
MANSFIELD, CONNECTICUT
CT43XC852

Sprint Spectrum LP
HARTFORD MTA

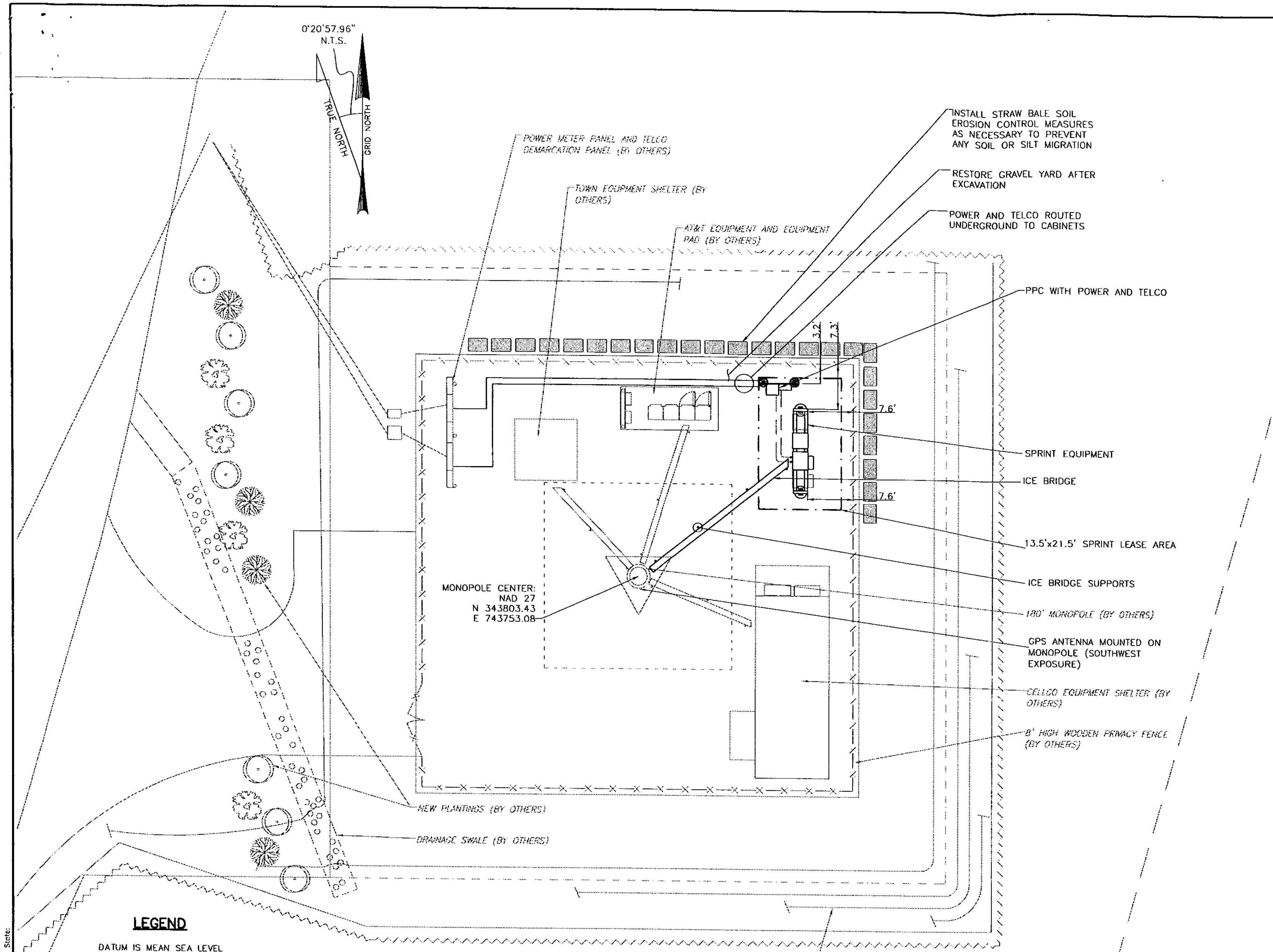
NO.	DATE	REVISIONS	BY	CHK	APP'D
1	10/16/03	ISSUE SITING COUNCIL	MJS	CKD	RMF
2	07/16/03	PRELIMINARY ISSUE SITING COUNCIL	MJS	CKD	RMF

SCALE AS NOTED | DESIGNED CKD | DRAWN MJS

STATE OF CONNECTICUT
RAYMOND M. FARINA, JR.
No. 14399
LICENSED PROFESSIONAL ENGINEER

Sprint PCS
MANSFIELD
TITLE SHEET

JOB NUMBER	DRAWING NUMBER	REV
3139-11	YT0852T01	0



SITE LAYOUT PLAN

10 0 10 20

SCALE: 1" = 10'

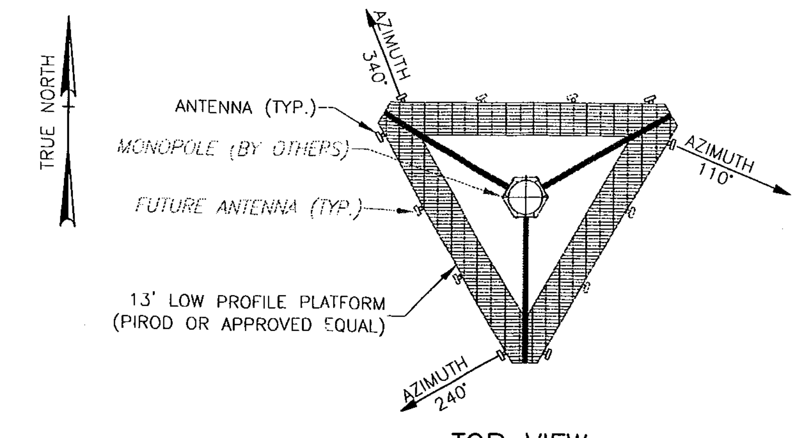
LEGEND

DATUM IS MEAN SEA LEVEL

- EXISTING HIGHWAY LINE/PROPERTY LINE
- SETBACK LINE
- LEASE AREA
- TREE
- ROCK OUT CROP
- —130— EXISTING CONTOUR
- CHAIN LINK FENCE
- EXISTING UTILITY POLE AND OVERHEAD UTILITIES
- PROPERTY CORNER IRON PIN (I.P.)
- EXISTING EDGE OF ROAD
- HAY BALE

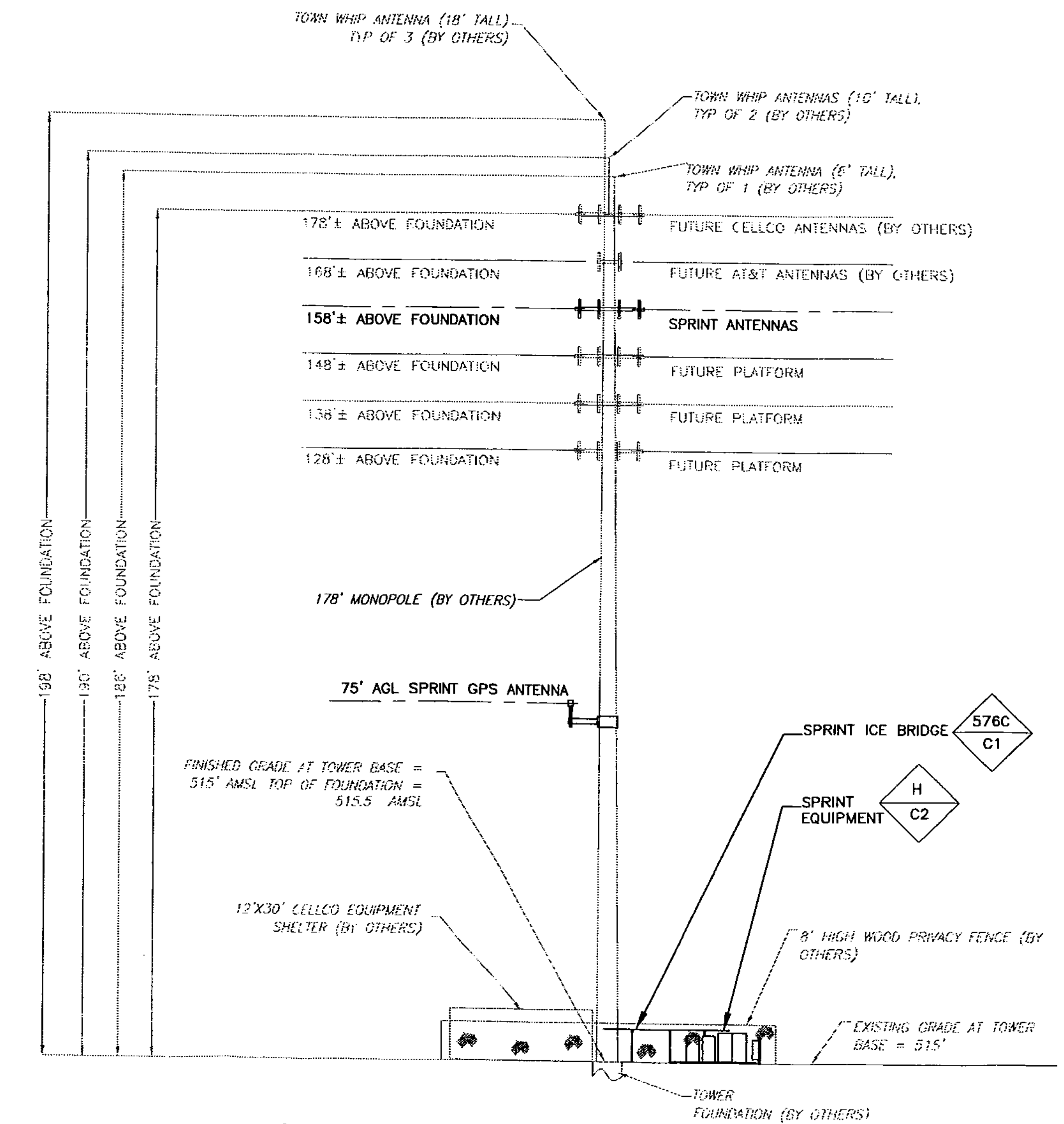
REFERENCE MAP:

THIS PLAN WAS DEVELOPED USING INFORMATION TAKEN FROM A PLAN ENTITLED "EXISTING CONDITION SURVEY" PREPARED BY GOODKIND & O'DEA, INC. CONSULTING ENGINEERS AND PLANNERS, 59 ELM STREET, SUITE 101, NEW HAVEN, CT 06510 FOR SBA PROPERTIES, INC. DATED 04/25/01



TOP VIEW

SCALE: N.T.S.



EAST ELEVATION

20 0 20 40

SCALE: 1" = 20'

Dewberry-Goodkind, Inc.
A Dewberry Company
59 Elm Street, Suite 101
New Haven, CT 06510
p. (203) 776-2277
f. (203) 776-2288

Engineers
Planners
Surveyors

MANSFIELD TOWN GARAGE
230 CLOVER MILL ROAD
MANSFIELD, CONNECTICUT
CT43XC852

Sprint Spectrum LP

HARTFORD MTA

NO.	DATE	REVISIONS	BY	CHK	APP'D
	10/15/03	ISSUE SITING COUNCIL	MJS	CKD	RMF
	07/16/03	PRELIMINARY ISSUE SITING COUNCIL	MJS	CKD	RMF

SCALE AS NOTED | DESIGNED CKD | DRAWN MJS

Sprint PCS

MANSFIELD
SITE LAYOUT PLAN AND ELEVATION

JOB NUMBER	DRAWING NUMBER	REV
3139-11	YTO852SC01	0

Exhibit C

PennSummit Tubular, LLC
225 Kiwanis Boulevard, West Hazleton, PA 18202
Phone: (888) 847-6537 Fax: (888) 460-6885

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street, Suite 500, Columbus, Ohio 43215
(614) 221-6679 Fax: (614) 448-4105 www.PJFweb.com

NOTES:

1. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.

2. REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A-615 (GRADE 60) EXCEPT THAT PIER TIES MAY BE ASTM A-615 (GRADE 40).

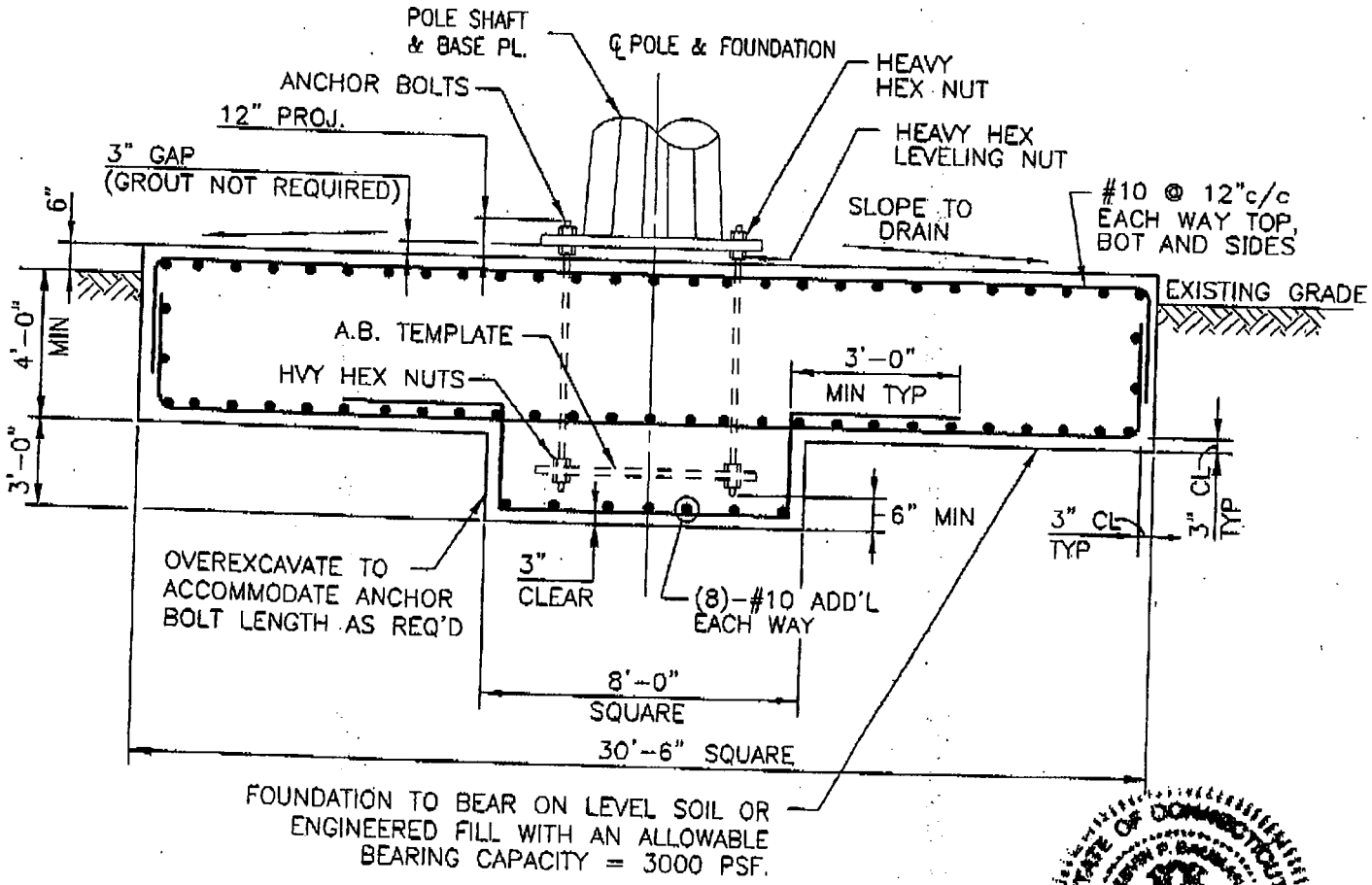
3. SEE PAGE 1 FOR ANCHOR BOLT QUANTITY, SIZE, LENGTH, AND BOLT CIRCLE.

4. CONTRACTOR SHALL READ THE GEOTECHNICAL REPORT AND CONSULT THE GEOTECHNICAL ENGINEER AS NECESSARY PRIOR TO CONSTRUCTION.

JOB DATA		
Page 2 of 2	Job No.	29203-0151
By MFP	Design No.	#20031
Chk'd By MFP	Date	06-06-2003
	Rev. No. Rev. Date	
Pole	178-FT MONOPOLE	
Site	CT010002, MANSFIELD, TOLLAND CO., CT	
Owner	TCP COMMUNICATIONS	
Ref. No.		
Design	85 MPH / 74 MPH + 1/2" RADIAL ICE ACCORDING TO IBC & TIA/EIA-222-F 1996	

FOUNDATION SPECIFICATIONS	
Volume Concrete Required:	163 CUBIC YARDS
Soils Report:	JAWORSKI GEOTECH, INC. 01133G 05-14-2001

DESIGN CRITERIA	
Moment:	6250 FT-KIPS
Shear:	48 KIPS
Axial:	52 KIPS



MAT FOUNDATION

STATE OF CONNECTICUT * KEVIN P. BRUNNER * No. 17891 LICENSED PROFESSIONAL ENGINEER

6-7-2003

PJF_Pole (tm) - Monopole Design Program
Windows Version 3.04.0000 Fri Jun 6, 2003 - 1:43:17 pm
(c) 1993 to 2000 PAUL J. FORD AND COMPANY, Columbus, Ohio

Job No.....: 29203-0151 Design No: #20031 Engineer : MFP
Description : 178-ft Monopole - CT01002, MANSFIELD, TOLLAND CO., CT
Design..... : 85 MPH / 74 MPH + 1/2" RADIAL ICE
Owner..... : -
Status..... : Final Design Client: PennSummit Tubular, LLC
Revision: Rev. Date :

SUMMARY OF ANALYSIS RESULTS

Pole Height.....: 178.00 ft
Top Diameter.....: 25.500 in
Bottom Diameter.....: 68.360 in
Pole Shape.....: 18-Sided Polygon
Splice Joint Type.....: Taper shaft - Slip Joint
Shaft Taper.....: 0.252023 (in/ft)
Shaft Steel Weight.....: 37.123 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.	49.000	0.25000	65	25.500	37.849	57.00
2.	45.000	0.37500	65	36.152	47.493	72.00
3.	51.000	0.37500	65	45.231	58.084	87.00
4.	51.000	0.43750	65	55.507	68.360	

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	133.75	13.528	27.944	760.536	0.6920
2.	1	85.0	0.00	94.75	23.435	36.087	2119.865	0.8116
3.	1	85.0	0.00	51.00	35.184	40.810	3856.868	0.9807
4.	1	85.0	0.00	0.00	51.198	46.179	6103.341	0.9155
>> MAXIMUM BASE REACTIONS :					51.198	46.179	6103.341 <<	

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	178.00	126.491	6.271	
2.	73.6	0.50	Top	178.00	107.254	5.351	
3.	50.0	0.00	Top	178.00	43.675	2.170	

2 2

PJF_Pole (tm) - Monopole Design Program
Windows Version 3.04.0000 Fri Jun 6, 2003 - 1:43:17 pm

Job No.....: 29203-0151 Design No: #20031 Engineer : MFP
Description : 178-ft Monopole - CT01002, MANSFIELD, TOLLAND CO., CT
Design..... : 85 MPH / 74 MPH + 1/2" RADIAL ICE
Owner..... : -
Status..... : Final Design Client: PennSummit Tubular, LLC
Revision: Rev. Date :

Pole Height : 178 ft
Pole Shape : 18-Sided Polygon
Pole Type : Taper shaft - Slip Joint
Pole Taper : 0.252023 (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.	178.00	129.00	49.000	0.25000	65	25.500	37.849	57.00
2.	133.75	88.75	45.000	0.37500	65	36.152	47.493	72.00
3.	94.75	43.75	51.000	0.37500	65	45.231	58.084	87.00
4.	51.00	0.00	51.000	0.43750	65	55.507	68.360	

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	4.157	@Top	178.0	25.500	0.2500	16.22	102.00	20.04	1613.4
		@Splice	133.8	36.652		24.09	146.61	28.88	4834.1
		@Bot	129.0	37.849		24.93	151.40	29.83	5326.9
2	7.554	@Top	133.8	36.152	0.3750	15.24	96.41	42.58	6884.5
		@Splice	94.8	45.981		19.86	122.62	54.28	14259.5
		@Bot	88.8	47.493		20.57	126.65	56.08	15725.3
3	10.592	@Top	94.8	45.231	0.3750	19.50	120.62	53.39	13567.5
		@Splice	51.0	56.257		24.69	150.02	66.51	26232.7
		@Bot	43.8	58.084		25.55	154.89	68.69	28890.8
4	14.819	@Top	51.0	55.507	0.4375	20.61	126.87	76.47	29289.7
		@Bot	0.0	68.360		25.79	156.25	94.32	54956.1

Total Shaft Steel Weight = 37.123 kips

3

PJF_Pole (tm) - Monopole Design Program
Windows Version 3.04.0000 Fri Jun 6, 2003 - 1:43:17 pm

Job No.....: 29203-0151 Design No: #20031 Engineer : MFP
Description : 178-ft Monopole - CT01002, MANSFIELD, TOLLAND CO., CT
Design..... : 85 MPH / 74 MPH + 1/2" RADIAL ICE
Owner..... : -
Status..... : Final Design Client: PennSummit Tubular, LLC
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	178.000	25.500	0.25000	16.22	102.00	20.04	1613.4
2.	<arm [1]>	178.000	25.500	0.25000	16.22	102.00	20.04	1613.4
3.	<arm [2]>	178.000	25.500	0.25000	16.22	102.00	20.04	1613.4
4.	<arm [3]>	178.000	25.500	0.25000	16.22	102.00	20.04	1613.4
5.	<arm [4]>	178.000	25.500	0.25000	16.22	102.00	20.04	1613.4
6.	<arm [5]>	178.000	25.500	0.25000	16.22	102.00	20.04	1613.4
7.	<arm [6]>	178.000	25.500	0.25000	16.22	102.00	20.04	1613.4
8.		170.000	27.516	0.25000	17.64	110.06	21.63	2031.6
9.	<arm [7]>	168.000	28.020	0.25000	18.00	112.08	22.03	2146.3
10.	<arm [8]>	168.000	28.020	0.25000	18.00	112.08	22.03	2146.3
11.		160.000	30.036	0.25000	19.42	120.15	23.63	2648.5
12.	<arm [9]>	158.000	30.540	0.25000	19.78	122.16	24.03	2785.3
13.	<arm [10]>	158.000	30.540	0.25000	19.78	122.16	24.03	2785.3
14.		150.000	32.557	0.25000	21.20	130.23	25.63	3379.3
15.	<arm [11]>	148.000	33.061	0.25000	21.55	132.24	26.03	3539.9
16.	<arm [12]>	148.000	33.061	0.25000	21.55	132.24	26.03	3539.9
17.		140.000	35.077	0.25000	22.98	140.31	27.63	4233.4
18.	<arm [13]>	138.000	35.581	0.25000	23.33	142.32	28.03	4419.8
19.	<arm [14]>	138.000	35.581	0.25000	23.33	142.32	28.03	4419.8
20.	top sec(2)	133.750	36.652	0.25000	24.09	146.61	28.88	4834.1
21.		130.000	37.097	0.37500	15.68	98.93	43.71	7444.5
22.	bot sec(1)	129.000	37.849	0.37500	16.03	100.93	44.60	7911.3
23.	<arm [15]>	128.000	37.601	0.37500	15.92	100.27	44.31	7755.3
24.	<arm [16]>	128.000	37.601	0.37500	15.92	100.27	44.31	7755.3
25.		120.000	39.617	0.37500	16.87	105.65	46.71	9084.8
26.		110.000	42.138	0.37500	18.05	112.37	49.71	10949.8
27.		100.000	44.658	0.37500	19.24	119.09	52.71	13054.1
28.	top sec(3)	94.750	45.981	0.37500	19.86	122.62	54.28	14259.5
29.		90.000	46.428	0.37500	20.07	123.81	54.81	14682.9
30.	bot sec(2)	88.750	46.743	0.37500	20.22	124.65	55.19	14986.3
31.		80.000	48.948	0.37500	21.25	130.53	57.81	17227.7
32.		70.000	51.468	0.37500	22.44	137.25	60.81	20050.7
33.		60.000	53.989	0.37500	23.62	143.97	63.81	23166.4
34.	top sec(4)	51.000	56.257	0.37500	24.69	150.02	66.51	26232.7
35.		50.000	55.759	0.43750	20.71	127.45	76.82	29693.7
36.	bot sec(3)	43.750	57.334	0.43750	21.34	131.05	79.01	32302.9
37.		40.000	58.279	0.43750	21.73	133.21	80.32	33939.4
38.		30.000	60.799	0.43750	22.74	138.97	83.82	38571.7
39.		20.000	63.320	0.43750	23.76	144.73	87.32	43607.3
40.		10.000	65.840	0.43750	24.77	150.49	90.82	49063.3
41.	base	0.000	68.360	0.43750	25.79	156.25	94.32	54956.1

Total Number of Antennas / Arms = 16

PJF_Pole (tm) - Monopole Design Program
Windows Version 3.04.0000 Fri Jun 6, 2003 - 1:43:17 pm
(c) 1993 to 2000 PAUL J. FORD AND COMPANY, Columbus, Ohio

Job No.....: 29203-0151 Design No: #20031 Engineer : MFP
Description : 178-ft Monopole - CT01002, MANSFIELD, TOLLAND CO., CT
Design..... : 85 MPH / 74 MPH + 1/2" RADIAL ICE
Owner..... : -
Status..... : Final Design Client: PennSummit Tubular, LLC
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]	178.000	186.000	2.0000	No Ice:	0.25	12.81	75.00
Description: 5/8" Diam. x 8' Lightning Rod							
		[Gh] 1.69	[Kz] 1.639	No Ice:	[qz] (psf) 30.314	[qz] [Gh] (psf) 51.231	
[2]	178.000	180.000	2.0000	No Ice:	72.50	3679.64	264.00
Description: (12) Decibel DB896H Panel							
		[Gh] 1.69	[Kz] 1.624	No Ice:	[qz] (psf) 30.032	[qz] [Gh] (psf) 50.754	
[3]	178.000	185.000	2.0000	No Ice:	5.00	255.76	40.00
Description: (2) 10' Whip Antenna							
		[Gh] 1.69	[Kz] 1.636	No Ice:	[qz] (psf) 30.268	[qz] [Gh] (psf) 51.152	
[4]	178.000	183.000	0.0000	No Ice:	2.40	122.39	25.00
Description: (1) 6' Omni Antenna							
		[Gh] 1.69	[Kz] 1.631	No Ice:	[qz] (psf) 30.174	[qz] [Gh] (psf) 50.994	
[5]	178.000	189.000	2.0000	No Ice:	16.05	826.03	114.00
Description: (3) 16' Whip Antenna							
		[Gh] 1.69	[Kz] 1.646	No Ice:	[qz] (psf) 30.453	[qz] [Gh] (psf) 51.466	
[6]	178.000	180.000	2.0000	No Ice:	27.41	1391.16	2100.00
Description: 14' Platform W/ Handrail							
		[Gh] 1.69	[Kz] 1.624	No Ice:	[qz] (psf) 30.032	[qz] [Gh] (psf) 50.754	
[7]	168.000	168.000	2.0000	No Ice:	74.17	3690.92	264.00
Description: (12) Decibel DB896H Panel							
		[Gh] 1.69	[Kz] 1.592	No Ice:	[qz] (psf) 29.446	[qz] [Gh] (psf) 49.763	
[8]	168.000	168.000	2.0000	No Ice:	18.59	925.09	1300.00
Description: 14' Low Profile Platform							

		[Gh] 1.69	[ ] 1.[illegible]2	No Ice:	[qz] (psf) 29.446	[qz] [Gh] (f) 4[illegible].763	
[9]	158.000	158.000	2.0000	No Ice:	74.17	3626.77	264.00
	Description: (12) Decibel DB896H Panel						
		[Gh] 1.69	[Kz] 1.564	No Ice:	[qz] (psf) 28.934	[qz] [Gh] (psf) 48.898	
[10]	158.000	158.000	2.0000	No Ice:	18.59	909.01	1300.00
	Description: 14' Low Profile Platform						
		[Gh] 1.69	[Kz] 1.564	No Ice:	[qz] (psf) 28.934	[qz] [Gh] (psf) 48.898	
[11]	148.000	148.000	2.0000	No Ice:	74.17	3559.64	264.00
	Description: (12) Decibel DB896H Panel						
		[Gh] 1.69	[Kz] 1.535	No Ice:	[qz] (psf) 28.398	[qz] [Gh] (psf) 47.993	
[12]	148.000	148.000	2.0000	No Ice:	18.59	892.19	1300.00
	Description: 14' Low Profile Platform						
		[Gh] 1.69	[Kz] 1.535	No Ice:	[qz] (psf) 28.398	[qz] [Gh] (psf) 47.993	
[13]	138.000	138.000	2.0000	No Ice:	74.17	3489.20	264.00
	Description: (12) Decibel DB896H Panel						
		[Gh] 1.69	[Kz] 1.505	No Ice:	[qz] (psf) 27.836	[qz] [Gh] (psf) 47.043	
[14]	138.000	138.000	2.0000	No Ice:	18.59	874.53	1300.00
	Description: 14' Low Profile Platform						
		[Gh] 1.69	[Kz] 1.505	No Ice:	[qz] (psf) 27.836	[qz] [Gh] (psf) 47.043	
[15]	128.000	128.000	2.0000	No Ice:	74.17	3415.01	264.00
	Description: (12) Decibel DB896H Panel						
		[Gh] 1.69	[Kz] 1.473	No Ice:	[qz] (psf) 27.244	[qz] [Gh] (psf) 46.043	
[16]	128.000	128.000	2.0000	No Ice:	18.59	855.94	1300.00
	Description: 14' Low Profile Platform						
		[Gh] 1.69	[Kz] 1.473	No Ice:	[qz] (psf) 27.244	[qz] [Gh] (psf) 46.043	

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PJF_Pole (tm) - Monopole Design Program
Windows Version 3.04.0000 Fri Jun 6, 2003 - 1:43:17 pm

Job No......: 29203-0151 Design No: #20031 Engineer : MFP
Description : 178-ft Monopole - CT01002, MANSFIELD, TOLLAND CO., CT
Design..... : 85 MPH / 74 MPH + 1/2" RADIAL ICE
Owner...... : -
Status..... : Final Design
Client: PennSummit Tubular, LLC
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 = 1.1
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 Segment [Ae] (sf)	[Cf Ae] (sf)	Segment Wind Force (lbs)	Shaft Segment Weight (lbs)
178.000	1.619	29.94	229.79	0.650	0.000	0.000	0.00	0.00
178.000	1.619	29.94	229.79	0.650	0.000	0.000	0.00	0.00
178.000	1.619	29.94	229.79	0.650	0.000	0.000	0.00	0.00
178.000	1.619	29.94	229.79	0.650	0.000	0.000	0.00	0.00
178.000	1.619	29.94	229.79	0.650	0.000	0.000	0.00	0.00
178.000	1.619	29.94	229.79	0.650	0.000	0.000	0.00	0.00
178.000	1.619	29.94	229.79	0.650	2.136	1.388	70.23	75.37
170.000	1.597	29.55	246.34	0.650	17.840	11.596	582.33	629.88
168.000	1.592	29.45	250.43	0.650	2.325	1.511	75.32	82.10
168.000	1.592	29.45	250.43	0.650	2.346	1.525	75.87	82.85
160.000	1.570	29.04	266.58	0.650	19.520	12.688	626.46	689.76
158.000	1.564	28.93	270.57	0.650	2.535	1.647	80.70	89.59
158.000	1.564	28.93	270.57	0.650	2.556	1.661	81.22	90.34
150.000	1.541	28.51	286.30	0.650	21.200	13.780	668.22	749.64
148.000	1.535	28.40	290.17	0.650	2.745	1.784	85.78	97.07
148.000	1.535	28.40	290.17	0.650	2.766	1.798	86.27	97.82
140.000	1.511	27.95	305.43	0.650	22.881	14.872	707.43	809.52
138.000	1.505	27.84	309.19	0.650	2.955	1.920	90.53	104.56
138.000	1.505	27.84	309.19	0.650	2.976	1.934	90.99	105.31
133.750	1.492	27.59	317.07	0.650	12.097	7.863	367.92	950.14
130.000	1.480	27.37	319.62	0.650	12.303	7.997	371.03	651.01
129.000	1.476	27.31	325.74	0.650	3.144	2.043	94.30	166.40
128.000	1.473	27.24	323.25	0.650	0.000	0.000	0.00	0.00
128.000	1.473	27.24	323.25	0.650	3.144	2.044	94.09	166.40
120.000	1.446	26.75	337.46	0.650	25.908	16.840	767.38	1371.65
110.000	1.411	26.09	354.49	0.650	34.275	22.278	993.43	1815.62
100.000	1.373	25.39	370.61	0.650	36.375	23.644	1027.11	1927.89
94.750	1.352	25.00	378.66	0.650	18.952	12.318	523.89	2244.06
90.000	1.332	24.64	379.55	0.650	19.187	12.472	522.51	1017.41
88.750	1.327	24.54	381.36	0.650	3.901	2.535	105.16	206.85
80.000	1.288	23.82	393.47	0.650	36.050	23.432	956.35	1912.18
70.000	1.240	22.93	405.91	0.650	42.050	27.333	1077.84	2231.31
60.000	1.186	21.94	416.52	0.650	44.151	28.698	1085.94	2343.59
51.000	1.132	20.95	424.05	0.650	41.500	26.975	975.33	4037.98
50.000	1.126	20.83	419.11	0.650	4.657	3.027	106.55	288.19
43.750	1.084	20.05	422.81	0.650	28.384	18.449	635.79	1756.64
40.000	1.057	19.54	424.31	0.650	19.342	12.573	419.54	1197.29
30.000	1.000	18.50	430.66	0.650	49.826	32.387	1029.76	3084.92
20.000	1.000	18.50	448.51	0.650	51.926	33.752	1055.03	3215.91

1.000	1.000	18.50	466.37	0.650	54.026	35.117	1097.70	3346.90
1.000	1.000	18.50	2.43	0.650	50.419	32.773	924.42	3124.21

Summation TOTAL = 17652.41 40760.38

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

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PJF_Pole (tm) - Monopole Design Program
Windows Version 3.04.0000 Fri Jun 6, 2003 - 1:43:17 pm
(c) 1993 to 2000 PAUL J. FORD AND COMPANY, Columbus, Ohio

Job No.....: 29203-0151 Design No: #20031 Engineer : MFP
Description : 178-ft Monopole - CT01002, MANSFIELD, TOLLAND CO., CT
Design..... : 85 MPH / 74 MPH + 1/2" RADIAL ICE
Owner..... : -
Status..... : Final Design Client: PennSummit Tubular, LLC
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.	178.000	0.000	0.000	0.000	0.000
2.	178.000	0.075	0.075	0.013	0.013
3.	178.000	0.264	0.339	3.680	3.692
4.	178.000	0.040	0.379	0.256	3.948
5.	178.000	0.025	0.404	0.122	4.071
6.	178.000	0.114	0.518	0.826	4.897
7.	178.000	2.175	2.693	1.461	6.358
8.	170.000	0.630	3.323	0.582	6.940
9.	168.000	0.346	3.669	3.766	10.707
10.	168.000	1.383	5.052	1.001	11.708
11.	160.000	0.690	5.742	0.626	12.334
12.	158.000	0.354	6.096	3.707	16.041
13.	158.000	1.390	7.486	0.990	17.032
14.	150.000	0.750	8.236	0.668	17.700
15.	148.000	0.361	8.597	3.645	21.345
16.	148.000	1.398	9.994	0.978	22.324
17.	140.000	0.810	10.804	0.707	23.031
18.	138.000	0.369	11.173	3.580	26.611
19.	138.000	1.405	12.578	0.966	27.576
20.	133.750	0.950	13.528	0.368	27.944
21.	130.000	0.651	14.179	0.371	28.315
22.	129.000	0.166	14.345	0.094	28.410
23.	128.000	0.264	14.609	3.415	31.825
24.	128.000	1.466	16.076	0.950	32.775
25.	120.000	1.372	17.447	0.767	33.542
26.	110.000	1.816	19.263	0.993	34.536
27.	100.000	1.928	21.191	1.027	35.563
28.	94.750	2.244	23.435	0.524	36.087
29.	90.000	1.017	24.452	0.523	36.609
30.	88.750	0.207	24.659	0.105	36.714
31.	80.000	1.912	26.571	0.956	37.671
32.	70.000	2.231	28.803	1.078	38.748
33.	60.000	2.344	31.146	1.086	39.834
34.	51.000	4.038	35.184	0.975	40.810
35.	50.000	0.288	35.473	0.107	40.916
36.	43.750	1.757	37.229	0.636	41.552
37.	40.000	1.197	38.426	0.420	41.972
38.	30.000	3.085	41.511	1.030	43.001
39.	20.000	3.216	44.727	1.055	44.056
40.	10.000	3.347	48.074	1.098	45.154
41.	1.000	3.124	51.198	1.024	46.179
Base	0.000		51.198		46.179

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PJF_Pole (tm) - Monopole Design Program
Windows Version 3.04.0000 Fri Jun 6, 2003 - 1:43:17 pm
(c) 1993 to 2000 PAUL J. FORD AND COMPANY, Columbus, Ohio

Job No......: 29203-0151 Design No: #20031
Description : 178-ft Monopole - CT01002, MANSFIELD, TOLLAND CO., CT Engineer : MFP
Design..... : 85 MPH / 74 MPH + 1/2" RADIAL ICE
Owner...... : -
Status..... : Final Design Client: PennSummit Tubular, LLC
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) -------]
178.00	21.733	0.000	0.000	21.733	121.742	126.491	6.271
178.00	21.733	0.000	0.000	21.733	121.742	126.491	6.271
178.00	21.733	0.000	0.000	21.733	121.742	126.491	6.271
178.00	21.733	0.000	0.000	21.733	121.742	126.491	6.271
178.00	21.733	0.000	0.000	21.733	121.742	126.491	6.271
178.00	21.733	0.000	0.000	21.733	121.742	126.491	6.271
178.00	21.733	0.000	0.057	21.790	120.476	125.172	6.271
170.00	72.035	2.576	2.652	77.263	110.382	114.666	6.210
168.00	84.610	3.957	3.014	91.581	109.128	113.361	6.187
168.00	84.610	3.957	3.412	91.979	107.878	112.060	6.187
160.00	171.841	12.557	8.004	192.402	97.980	101.756	6.054
158.00	193.648	15.498	8.613	217.759	96.757	100.483	6.011
158.00	193.648	15.498	9.255	218.401	95.543	99.220	6.011
150.00	317.165	30.552	15.720	363.437	85.996	89.284	5.797
148.00	348.044	35.159	16.556	399.759	84.826	88.066	5.734
148.00	348.044	35.159	17.419	400.622	83.668	86.861	5.734
140.00	507.175	57.074	25.522	589.772	74.631	77.458	5.445
138.00	546.958	63.444	26.552	636.954	73.532	76.314	5.364
138.00	546.958	63.444	27.601	638.003	72.448	75.187	5.364
133.75	650.043	78.185	32.309	760.536	68.186	70.754	5.181
130.00	740.999	92.573	37.243	870.815	64.051	66.453	5.056
129.00	765.254	96.634	38.493	900.381	63.034	65.395	5.023
128.00	789.509	100.788	38.497	928.795	63.030	65.392	4.989
128.00	789.509	100.788	39.773	930.070	62.023	64.344	4.989
120.00	1017.718	137.447	51.078	1206.243	54.192	56.203	4.701
110.00	1302.979	192.048	65.456	1560.483	45.092	46.744	4.308
100.00	1588.240	256.739	79.876	1924.855	36.807	38.138	3.894
94.75	1738.002	294.839	87.025	2119.865	32.982	34.165	3.673
90.00	1873.500	331.794	94.464	2299.758	29.374	30.420	3.463
88.75	1909.158	341.904	95.933	2346.995	28.681	29.700	3.407
80.00	2158.761	417.364	108.822	2684.948	22.831	23.630	3.018
70.00	2444.023	513.650	122.275	3079.947	17.177	17.768	2.577
60.00	2729.283	620.757	134.562	3484.602	12.404	12.822	2.145
51.00	2986.018	726.440	144.411	3856.868	8.846	9.139	1.764
50.00	3014.544	738.724	145.482	3898.749	8.492	8.773	1.724
43.75	3192.832	817.894	151.592	4162.318	6.534	6.747	1.493
40.00	3299.805	867.372	155.345	4322.522	5.377	5.552	1.356
30.00	3585.066	1006.475	163.507	4755.048	2.991	3.086	1.000
20.00	3870.326	1155.940	169.685	5195.952	1.315	1.355	0.655
10.00	4155.587	1316.147	173.601	5645.334	0.325	0.335	0.322
0.00	4440.848	1487.524	174.970	6103.341	0.000	0.000	0.000

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

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PJF_Pole (tm) - Monopole Design Program
Windows Version 3.04.0000 Fri Jun 6, 2003 - 1:43:17 pm
(c) 1993 to 2000 PAUL J. FORD AND COMPANY, Columbus, Ohio

Job No.....: 29203-0151 Design No: #20031 Engineer : MFP
Description : 178-ft Monopole - CT01002, MANSFIELD, TOLLAND CO., CT
Design..... : 85 MPH / 74 MPH + 1/2" RADIAL ICE
Owner..... : -
Status..... : Final Design Client: PennSummit Tubular, LLC
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
178.00	2.093	0.000	0.000	0.000	2.093	52.00	0.0402
178.00	2.093	0.004	0.001	0.001	2.096	52.00	0.0403
178.00	2.093	0.017	0.346	0.368	2.445	52.00	0.0470
178.00	2.093	0.019	0.370	0.393	2.491	52.00	0.0479
178.00	2.093	0.020	0.376	0.405	2.509	52.00	0.0483
178.00	2.093	0.026	0.453	0.488	2.673	52.00	0.0514
178.00	2.098	0.134	0.584	0.633	3.070	52.00	0.0590
170.00	6.376	0.154	0.500	0.640	6.822	52.00	0.1312
168.00	7.284	0.167	0.768	0.970	8.036	52.00	0.1545
168.00	7.316	0.229	0.840	1.060	8.232	52.00	0.1583
160.00	13.294	0.243	0.730	1.041	13.880	52.00	0.2669
158.00	14.547	0.254	0.942	1.332	15.316	52.00	0.2945
158.00	14.590	0.311	1.001	1.414	15.478	52.00	0.2976
150.00	21.333	0.321	0.880	1.378	22.004	52.00	0.4232
148.00	22.747	0.330	1.051	1.636	23.541	52.00	0.4527
148.00	22.796	0.384	1.100	1.711	23.686	52.00	0.4555
140.00	29.773	0.391	0.976	1.663	30.508	52.00	0.5867
138.00	31.241	0.399	1.116	1.894	32.066	52.00	0.6166
138.00	31.292	0.449	1.158	1.963	32.198	52.00	0.6192
133.75	35.132	0.468	1.090	1.930	35.983	52.00	0.6920
130.00	26.438	0.324	0.714	1.293	26.987	52.00	0.5190
129.00	26.244	0.322	0.686	1.271	26.781	52.00	0.5150
128.00	27.436	0.330	0.793	1.433	28.032	52.00	0.5391
128.00	27.474	0.363	0.818	1.476	28.119	52.00	0.5407
120.00	32.048	0.374	0.736	1.433	32.639	52.00	0.6277
110.00	36.587	0.388	0.650	1.386	37.142	52.00	0.7143
100.00	40.119	0.402	0.578	1.346	40.658	52.00	0.7819
94.75	41.647	0.432	0.545	1.327	42.203	52.00	0.8116
90.00	44.305	0.446	0.534	1.333	44.867	52.00	0.8628
88.75	44.600	0.447	0.527	1.327	45.161	52.00	0.8685
80.00	46.478	0.460	0.480	1.300	47.039	52.00	0.9046
70.00	48.168	0.474	0.434	1.271	48.731	52.00	0.9371
60.00	49.476	0.488	0.394	1.246	50.045	52.00	0.9624
51.00	50.393	0.529	0.363	1.224	50.996	52.00	0.9807
50.00	44.604	0.462	0.317	1.063	45.129	52.00	0.8679
43.75	45.010	0.471	0.300	1.049	45.541	52.00	0.8758
40.00	45.222	0.478	0.290	1.043	45.758	52.00	0.8800
30.00	45.665	0.495	0.267	1.024	46.215	52.00	0.8887
20.00	45.967	0.512	0.246	1.007	46.530	52.00	0.8948
10.00	46.155	0.529	0.227	0.992	46.732	52.00	0.8987
0.00	46.254	0.543	0.211	0.977	46.842	51.17	0.9155

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MONOPOLE ANCHOR BOLT & BASE PLATE ANALYSIS

TITLE: 178-ft Monopole
SITE: CT01002, MANSFIELD, TOLLAND CO. CT
OWNER: TCP
COMM. NO: 29203-0151
DATE: 06-Jun-03

Shaft Shape	18-Sided	Stress Increase	1.3333
Base Dia, DF	68.36 in.	Base Plate Shape	Square
PT-to-PT, DP	69.41 in.		
Min Bolt Circle	75.41 in.	Actual Bolt Circle	76.00 in.

Base Reactions

Moment	6104 ft-kips
Axial Load	52.0 kips

Anchor Bolt Details

Number of Bolts	24
Bolt Diameter	2.25 inches
Bolt Type	#18J ASTM A615
Mom. Of Inertia	17328.00 inches^4
Bolt Tension, T	160.63 kips
Allowable Tension	194.81 kips
Bolt Compression, C	162.80 kips
Actual / Allowable Ratio	82.5% ☑

Base Plate Details

Plate Moment, MPL	2632.45 inch-kips
Bend Plane, W	39.95 inches
Plate Thickness, t	3.00 inches
Plate Width	75.00 inches
Plate Steel Spec.	ASTM A572
Plate Steel Grade	55.00 ksi
Actual Stress	43.93 ksi
Allowable Stress	55.00 ksi
Actual / Allowable Ratio	79.9% ☑

Base Plate Analysis Summary

Plate Thickness	3.00 in.	Bolt Circle	76.00 in.
Plate Diameter	75.00 in.	Bolt Diameter	2.25 in.
Number of Bolts	24	Bolt Type	#18J ASTM A615

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12.

MAT FOOTING FOR TOWERS PROGRAM BY PAUL J. FORD and COMPANY

JOB NO. 29203-151 DATE 06-06-2003 PAGE 1

INPUT: MAT FOOTING FOR TOWERS

TOWER LOADS: TOWER WEIGHT = 52.00 kips (including ice,antenna etc)
OVERTURNING MOMENT = 6250.00 ft-k at base of tower
TOTAL HORIZONTAL = 48.00 kips total for entire tower

DESIGN SAFETY FACTOR AGAINST OVERTURNING = 1.50

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

SOIL: WATER TABLE BELOW BOTTOM OF FOOTING
SOIL WT = 100 pcf (dry)
ALLOWABLE SOIL BEARING =10000 psf

FOOTING SIZE: WIDTH = 30.5 ft LENGTH = 30.5 ft
THICKNESS = 4.50 ft DEPTH = 4.00 ft below grade
CONCRETE WEIGHT = 150 pcf

OUTPUT: MAT FOOTING FOR TOWERS

VOLUME OF CONCRETE = 4186 ft^3 (155.04 cubic yards)

WEIGHT OF TOWER ====> 52.00 kips
WEIGHT OF CONCRETE => 627.92 kips (4186 x 0.150)
TOTAL WEIGHT = 679.92 kips

OVERTURNING MOMENT =6250.00 ft-k + (48.00 k x 4.50 ft) = 6466 ft-kips
RESISTING MOMENT = 679.92 k x 30.50 ft/2 = 10369 ft-kips

SAFETY FACTOR = Mresist / O.T.M. =10369 / 6466 = 1.60 > 1.50 O.K.

GROSS SOIL BEARING = 2589 psf (includes soil overburden)
NET SOIL BEARING = 2189 psf <10000 psf O.K.

BENDING MOMENT IN FOOTING = 6438 ft-kips
FOOTING REINFORCING = 1.24 in^2/ft = 48 no. 8 bars @ 7.63 in. o.c.
(.18 % = 1.17 in^2/ft) half top and half bottom

BENDING SHEAR IN THE FOOTING =1135.37 kips
ALLOWABLE BENDING SHEAR =1318.93 kips O.K.

Power Density Analysis Table

Sprint Site Cascade : CT43XC852 - Storrs, CT

TCP Communications Tower, 230 Clover Mill Road, Storrs, CT

Worst Case Power Density Analysis of Sprint PCS Antennas @ Base of Tower. Assumes Max ERP & No Antenna Pattern Adjustment.

Operating Frequency (MHz)	Number of Trans.	Effective Radiated Power (ERP) Per Transmitter (Watts)	Total ERP (Watts)	Antenna Height (Feet)	Distance From Base of Tower (Feet)	Calculated Power Density (mW/cm^2)*	Maximum Permissable Exposure*	%MPE
1962.5	11	205.9	2265	157.5	0	0.032869	1.000	3.287%
1962.5	11	205.9	2265	157.5	50	0.029860	1.000	2.986%
1962.5	11	205.9	2265	157.5	100	0.023426	1.000	2.343%
1962.5	11	205.9	2265	157.5	150	0.017236	1.000	1.724%
1962.5	11	205.9	2265	157.5	200	0.012582	1.000	1.258%
1962.5	11	205.9	2265	157.5	250	0.009339	1.000	0.934%
1962.5	11	205.9	2265	157.5	300	0.007102	1.000	0.710%
1962.5	11	205.9	2265	157.5	350	0.005535	1.000	0.554%
1962.5	11	205.9	2265	157.5	400	0.004412	1.000	0.441%
1962.5	11	205.9	2265	157.5	450	0.003587	1.000	0.359%
1962.5	11	205.9	2265	157.5	500	0.002967	1.000	0.297%

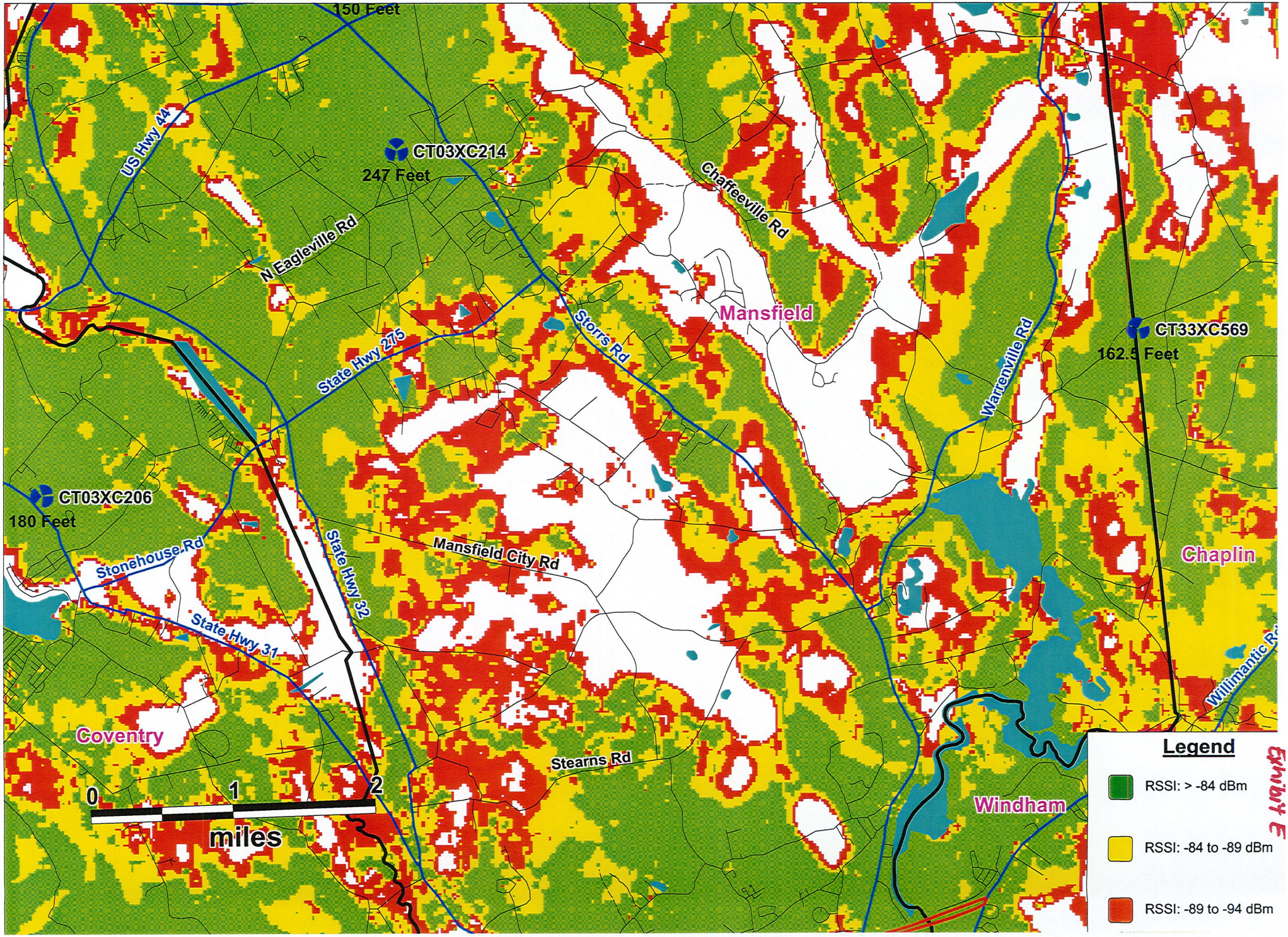
***Requirements set forth in OET Bulletin 65. Based on NCRP Report No. 86 and ANSI/IEEE C95.1-1992.**

Exhibit D

Cumulative Power Density Analysis of Sprint PCS, Verizon Wireless, and AT&T Wireless Antennas					
Operator	Frequency	Distance	Calculated Power Density	Maximum Permissable Exposure*	Percent of MPE
	(MHz)	(feet)	(mW/cm^2)	(mW/cm^2)	(%)
Sprint PCS	1962.5	157.5	0.032869	1.000	3.29%
AT&T Wireless	1965.0	167.5	0.038494	1.000	3.85%
Verizon Wireless	869.0	177.5	0.036564	0.579	6.31%
Total Percentage of Maximum Permissible Exposure					**13.45%**

Exhibit D

Coverage without TCP Communications Tower



Coverage with TCP Communications Tower

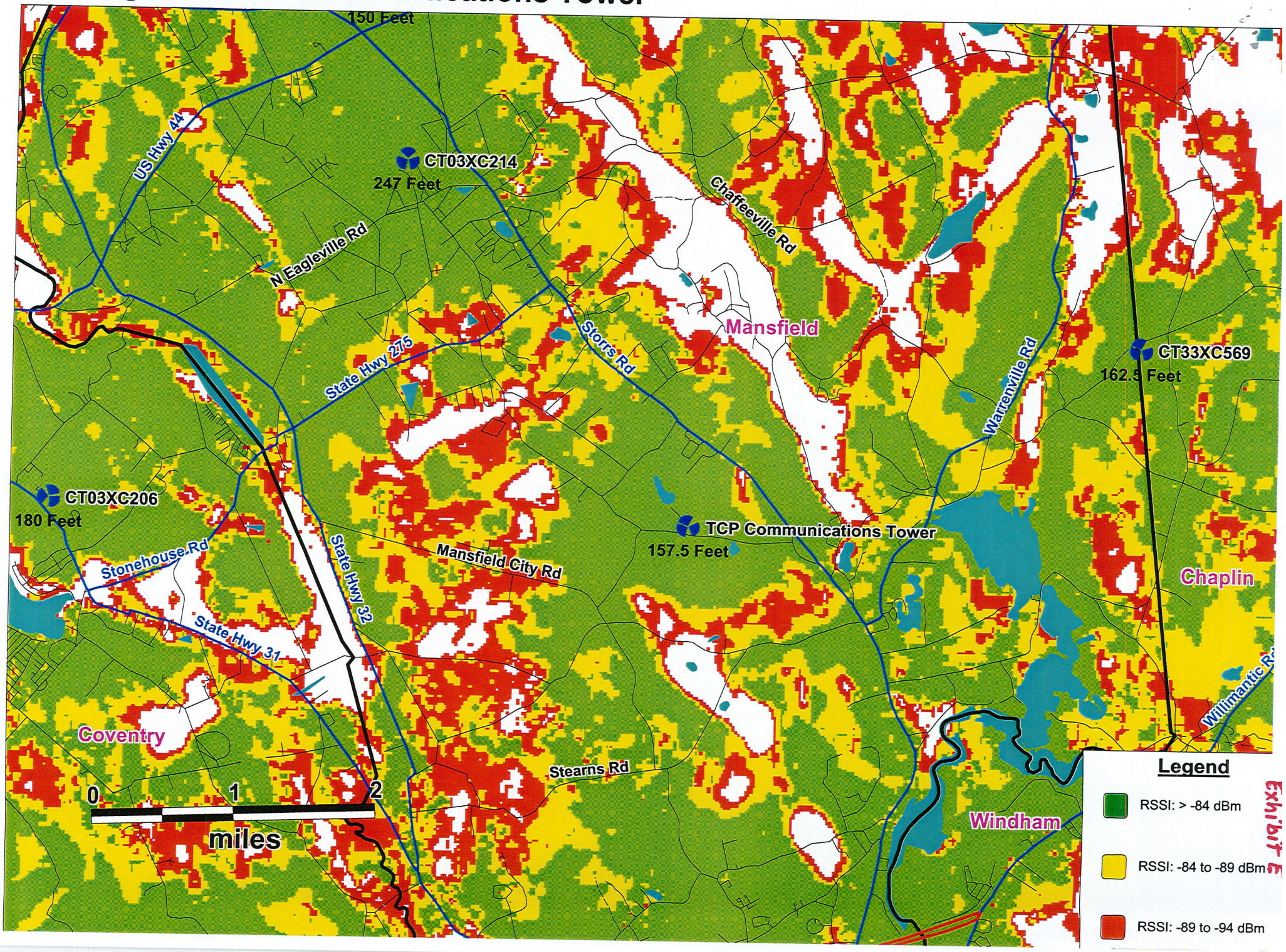


Exhibit E