# STATE OF CONNECTICUT

*CONNECTICUT SITING COUNCIL*

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


April 7, 1999

Peter van Wilgen
SNET Mobility Inc.
500 Enterprise Drive
Rocky Hill, CT 06067-3900

RE: **TS-SCLP-003-990317** - Springwich Cellular Limited Partnership request for an order to approve tower sharing at an existing telecommunications facility located off 20 Seles Road in Ashford, Connecticut.

Dear Mr. van Wilgen:

At a public meeting held April 6,1999, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures.

This facility has been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequency now used on this tower. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point 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 17, 1999, and additional information provided on April 16, 1999. Please notify the Council when all work is complete.

Very truly yours,

Mortimer A. Gelston
Chairman

MAG/RKE/kj

c: Honorable John M. Zulick, First Selectman, Town of Ashford

TS-SCLP-003-990317

SNET

RECEIVED

MAR 17 1999

CONNECTICUT
SITING COUNCIL

**SNET Mobility, Inc.**
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 513-7730
Fax: (860) 513-7614

**Peter W. van Wilgen**
*Director - Real Estate Operations*

March 17, 1999

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

**RE: Springwich Cellular Limited Partnership—Ashford Cellular Communication Site**

Dear Chairman Gelston:

Springwich Cellular Limited Partnership (SCLP) plans to install cellular antennas and a related equipment building at the tower facility owned by Mr. Raymond Baker of Ashford, Connecticut, and managed by Cordless Data Transfer, Inc. of Marlborough, Connecticut. Please accept this letter as notice of intent, pursuant to R.C.S.A. Section 16-50aa, of the placement of associated equipment on an existing non-facility tower pursuant to R.C.S.A. Section 16-50aa. In further compliance with R.C.S.A. Section 16-50j-73, a copy of this letter is being sent to the First Selectman of Ashford.

The existing non-facility tower is a 180' guyed tower located at 20 Seles Road, Ashford, Connecticut. NEXTEL Communications is presently located on this tower, and SCLP plans to install up to twelve panel-type cellular antennas on the tower. SCLP will also install a single story, approximately 12'x26' equipment building, which will contain radio transmission equipment.

The addition of SCLP's antennas and equipment to the tower site does not constitute a substantial environmental affect since such additions do not cause a significant change or alteration in the physical and environmental characteristics of the site (see attached site plan). Rather, the planned changes to the existing non-facility tower falls squarely within those activities explicitly provided for in R.C.S.A. Section 16-50aa.

First, the height of the existing tower will be unaffected. Twelve antennas, ALP Model 11011N, will be mounted four per sector on a triangular platform to be attached to the tower. The center of radiation will be 160' AGL and the top of the antennas will be 162' high. The tower will not require any structural modification to support the proposed attachments.

Second, the proposed addition will not extend the site boundaries. The proposed equipment building will be located next to the tower on a parcel of land of approximately 312 square feet in size, which will be leased to SCLP (see attached site plan).

Third, the proposed addition will not increase the noise levels at the existing facility by six decibels or more.

Fourth, operation of the additional antennas will not increase the total radio frequency electromagnetic radiation power density, measured at the tower base, to a level at or above the ANSI standard. The following table summarizes the power densities at the site from the various sources on the tower (including proposed herein) in relation to the standard.

| FREQUENCY | POWER DENSITY | HEIGHT | ANSI/IEEE STANDARD LIMITS (mW/cm2) | % OF MPE |
|---|---|---|---|---|
| | | | | |
| NEXTEL 851 | 0.0228 | 175' | 0.5673 | 4.02 |
| SCLP 880-894 | 0.0290 | 160' | 0.5867 | 4.95 |
| **TOTAL** | **N/A** | | **N/A** | **8.97** |
| | | | | |

As the table demonstrates, SCLP's proposed antennas would contribute 4.95% of the ANSI standard for the cellular frequency range, bringing the site total to 8.97% of the standard as calculated for a mixed frequency site.

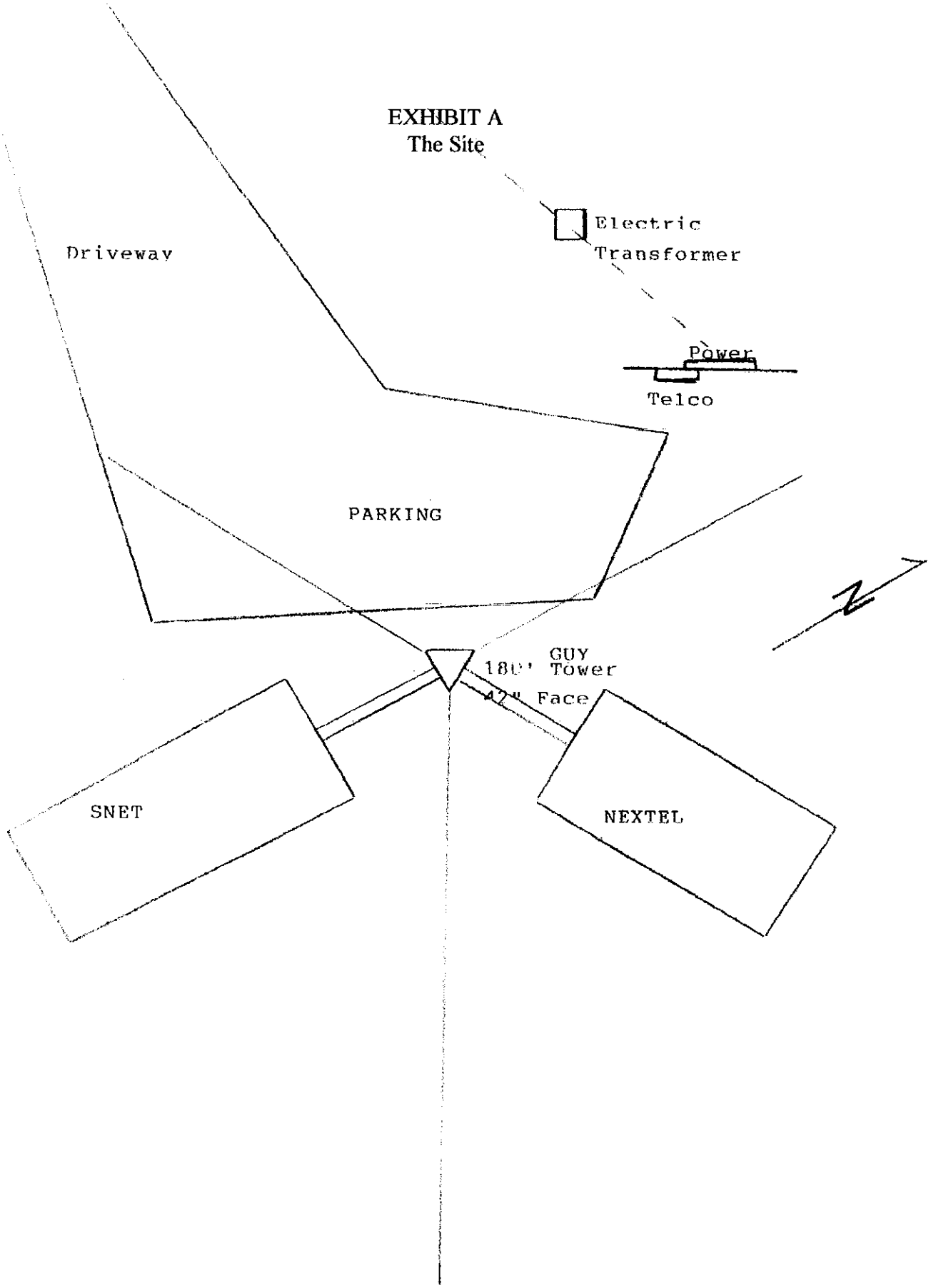
Finally, SCLP will obtain the necessary municipal approvals and permits for the project once Connecticut Siting Council approval has been received, as the Town of Ashford requires proof of CSC approval before any permits will be issued.

SCLP submits that the proposed additions would not cause a significant change or alteration in the physical and environmental characteristics of the site and comply with R.C.S.A. Section 16-50aa. For the foregoing reasons, SCLP therefore requests a determination that the placement of the antennas and equipment on the existing non-facility tower site does not constitute a substantial environmental effect under R.C.S.A. Section 16-50aa, and that the requested tower sharing be approved.

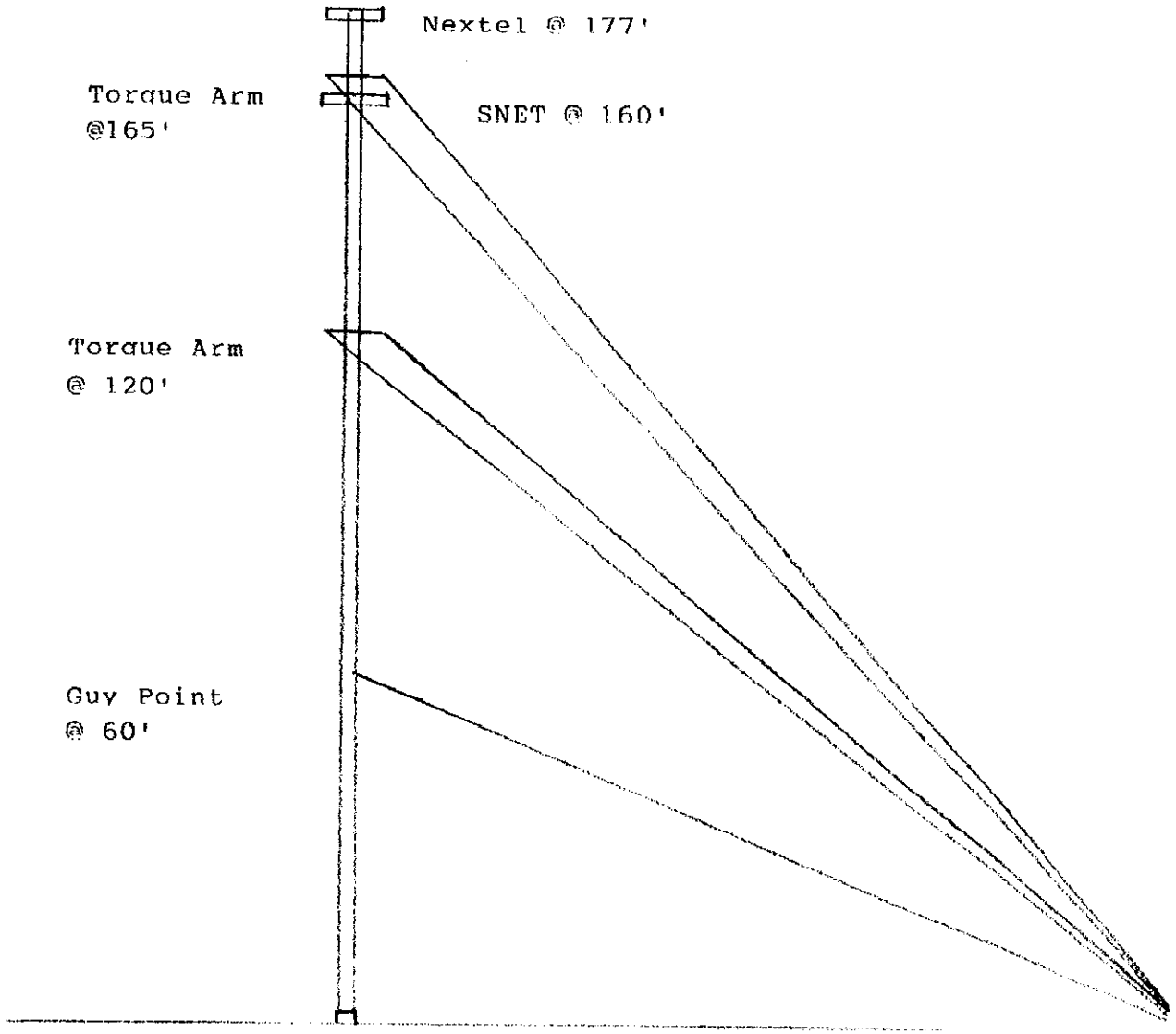
Thank you for your consideration.

Sincerely,

# EXHIBIT A
The Site



# EXHIBIT B
Antennae Placement



**SNET Mobility, Inc.**
500 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 513-7730
Fax: (860) 513-7614

**Peter W. van Wilgen**
*Director - Real Estate Operations*

March 17, 1999

Mr. John M. Zulick, First Selectman
Town of Ashford
25 Pompey Hollow Road
Ashford, Connecticut 06278

Dear First Selectman Zulick:

Springwich Cellular Limited Partnership (SCLP) plans to install antennas and associated equipment at the existing tower facility owned by Mr. Raymond Baker of Ashford, Connecticut and managed by Cordless Data Transfer of Marlborough, Connecticut. As required by Section 16-50j-73 of the Regulations of Connecticut State Agencies (R.C.S.A.), please accept this letter and the attached letter to the Connecticut Siting Council dated March 16, 1999, describing SCLP's planned use of this tower facility.

The attached letter fully describes SCLP's proposal. However, if you have any questions or require any further information on our plans or the Siting Council's procedures, please call me at (860) 513-7730 or Mr. Joel Rinebold, Executive Director, Connecticut Siting Council at (860) 827-2935.

Sincerely,

Enclosure

# STATE OF CONNECTICUT

*CONNECTICUT SITING COUNCIL*

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


March 19, 1999

Honorable John M. Zulick
First Selectman
Town of Ashford
Knowlton Memorial Town Hall
Route 44, 25 Pompey Hollow Road
Ashford, CT 06278

RE: TS-SCLP-003-990317 - Springwich Cellular Limited Partnership request for an order to approve tower sharing at an existing telecommunications facility located off 20 Seles Road in Ashford, Connecticut.

Dear Mr. Zulick:

On March 17, 1999, the Connecticut Siting Council (Council) received a request from Springwich Cellular Limited Partnership for an order to approve tower sharing at an existing telecommunications facility located off 20 Seles Road in Ashford, Connecticut, pursuant to Connecticut General Statutes § 16-50aa.

The Council will consider this item at the next meeting tentatively scheduled for Tuesday, April 6, 1999, at 1:30 p.m., in Hearing Room Two, Ten Franklin Square, New Britain, Connecticut.

Please call me or inform the Council if you have any questions or comments regarding this modification of an existing facility.

Thank you for your cooperation and consideration.

Very truly yours,

Joel M. Rinebold
Executive Director

JMR/jlh

Enclosure: Notice of Intent

# FRED A. NUDD CORPORATION

1743 ROUTE 104, BOX 577
ONTARIO, NY 14519
(315) 524 -2531 FAX (315) 524-4249

*www.nuddtowers.com*



RECEIVED
APR - 6 1999
CONNECTICUT
SITING COUNCIL


Design of 180'
Guyed Tower

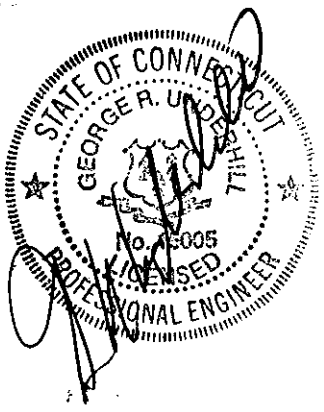
MODEL #: G42WPAR

PROJECT #: 6111

LOCATION: Ashford, CT

for

**CDT**
17 Ridgewood Drive
Marlborough, CT 06447

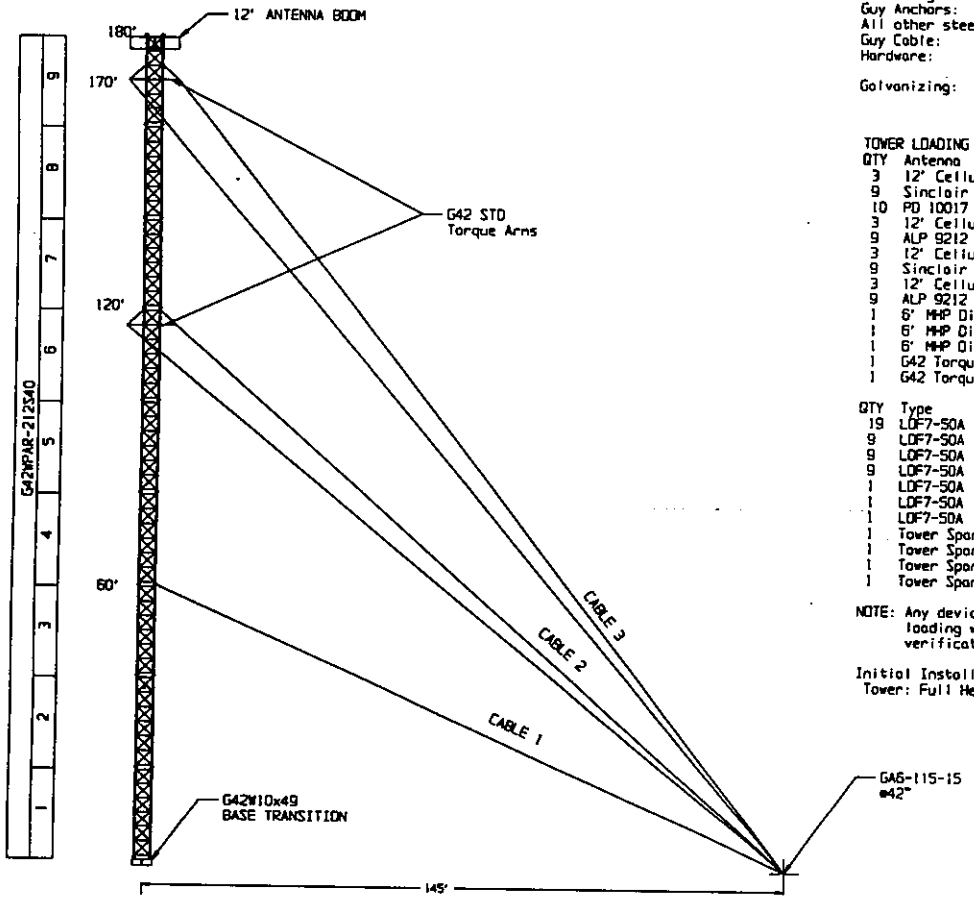



June, 1998

Tower was designed to resist 85 mph wind speed with
radial ice per ANSI/EIA/TIA 222-F recommended standard.
Base at case load condition is wind with ice with load reduction.
Allowable steel stresses per AISC ASD 9th Edition
Allowable concrete stresses per ACI 318-89.

MATERIAL SPECIFICATIONS

| | |
|---|---|
| Tower Legs: | ASTM A36 Modified, Fy > 55 ksi. See Section Schedule. |
| Guy Anchors: | ASTM A36 Modified, Fy > 48 ksi |
| All other steel: | ASTM A36, Fy > 36 ksi |
| Guy Cable: | Extra High Strength grade |
| Hardware: | A325 Hot Dipped Galvanized Bolts with Anco Nuts |
| Galvanizing: | ASTM A123 |



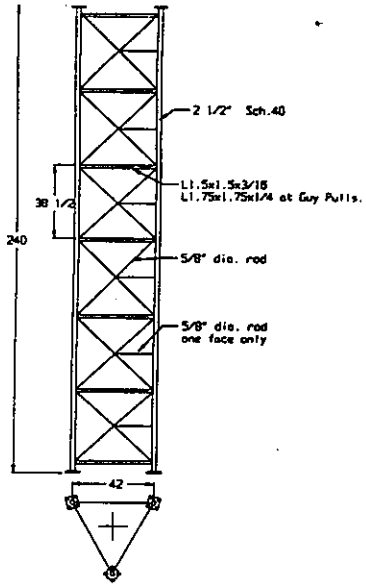

TOWER LOADING CONDITIONS

| QTY | Antenna | Elevation | Windload | Deadload |
|---|---|---|---|---|
| 3 | 12' Cellular Boom | 178 | 285 | 170 |
| 9 | Sinclair SRL 411C9R130 | 178 | 392 | 80 |
| 10 | PD 10017 | 180 | 104 | 25 |
| 3 | 12' Cellular Boom | 170 | 281 | 170 |
| 9 | ALP 9212 | 170 | 124 | 27 |
| 3 | 12' Cellular Boom | 160 | 276 | 170 |
| 9 | Sinclair SRL 411C9R130 | 160 | 380 | 80 |
| 3 | 12' Cellular Boom | 150 | 271 | 170 |
| 9 | ALP 9212 | 150 | 119 | 27 |
| 1 | 6' MHP Dish | 140 | 837 | 814 |
| 1 | 6' MHP Dish | 130 | 819 | 814 |
| 1 | 6' MHP Dish | 120 | 801 | 814 |
| 1 | G42 Torque Arm | 170 | 537 | 262 |
| 1 | G42 Torque Arm | 120 | 486 | 262 |

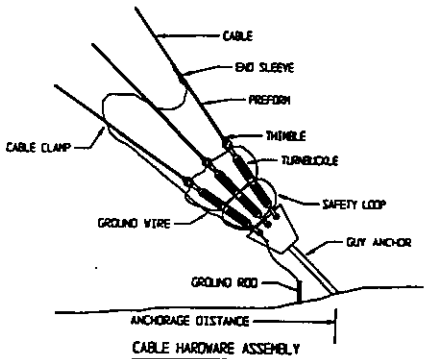
| QTY | Type | | Elevation Start | Stop | #/ft Windload | Deadload |
|---|---|---|---|---|---|---|
| 19 | LDF7-50A | 1-5/8" | 170 | 180 | 5.50 | 0.90 |
| 9 | LDF7-50A | 1-5/8" | 170 | 170 | 0.00 | 0.90 |
| 9 | LDF7-50A | 1-5/8" | 0 | 160 | 0.00 | 0.90 |
| 9 | LDF7-50A | 1-5/8" | 0 | 150 | 0.00 | 0.90 |
| 1 | LDF7-50A | 1-5/8" | 0 | 140 | 0.00 | 0.90 |
| 1 | LDF7-50A | 1-5/8" | 0 | 130 | 0.00 | 0.90 |
| 1 | LDF7-50A | 1-5/8" | 0 | 120 | 0.00 | 0.90 |
| 1 | Tower Span 1 | | 0 | 60 | 155.00 | 54.78 |
| 1 | Tower Span 2 | | 60 | 120 | 207.10 | 53.28 |
| 1 | Tower Span 3 | | 120 | 170 | 237.10 | 53.28 |
| 1 | Tower Span 4 | | 170 | 180 | 45.96 | 53.28 |

NOTE: Any deviation from the proposed design antenna loading will require a tower analysis for verification of structural integrity.

Initial Installation:
Tower: Full Height




G42WPAR TOWER SECTION




CABLE HARDWARE ASSEMBLY

NOTE: Install cable hardware per manufacturer's specifications.

INSTALLATION NOTES
1. Installation of tower must be performed by a qualified tower erector.
2. Install sections with section number on the bottom, and climbing device is aligned.
3. Install safety climb, lights, cable attachments per manufacturer's recommendations.
4. Do not lift more than 100' of assembled tower sections.
5. Install "sharp" edge of adapter plates against face of tower.
6. Plumb and tension tower and cables as erected.
7. "Ti"=Initial tension of cable.

G42 Section Weights: 785/685 +/-
Top Frame: 1000 +/-

SECTION DESIGNATION:
G42WPAR-212555 = 2-1/2"; (212), (S)Sch.40/(EH)Sch.80, (55)ksi strength
96-47-xx = Year-(47) ksi strength-xx

GUY CABLE SCHEDULE

| CABLE: | QTY/Type | Length | Ti | Turnbuckle | Preform | Thmbl | Endslve | Shckl |
|---|---|---|---|---|---|---|---|---|
| Cable 3: | 2 @ 5/8x7 EHS | 224' | 4240# | 1"x18" J-J | 5/8" BG | 3/4" | 65268 | 3/4" |
| Cable 2: | 2 @ 9/16x7 EHS | 189' | 3500# | 7/8"x12" J-J | 9/16" BG | 5/8" | 65267 | 3/4" |
| Cable 1: | 1 @ 9/16x7 EHS | 157' | 3500# | 7/8"x12" J-J | 9/16" BG | 5/8" | 65267 | 3/4" |

NOTE: Cable lengths assume anchors at elevation 0'.
Cable lengths and anchor layout must compensate for site topography.


FRED A. NUDD CORPORATION
Route 104-Ontario, New York 14519-315/524-253


| | | |
|---|---|---|
| SCALE: N/S | DRAWN BY: EES | APPROVED BY: |
| DATE: 6/19/98 | | |

180' G42WPAR TOWER

CDT
Ashford, CT

DRAWING NUMBER: 98-6111-1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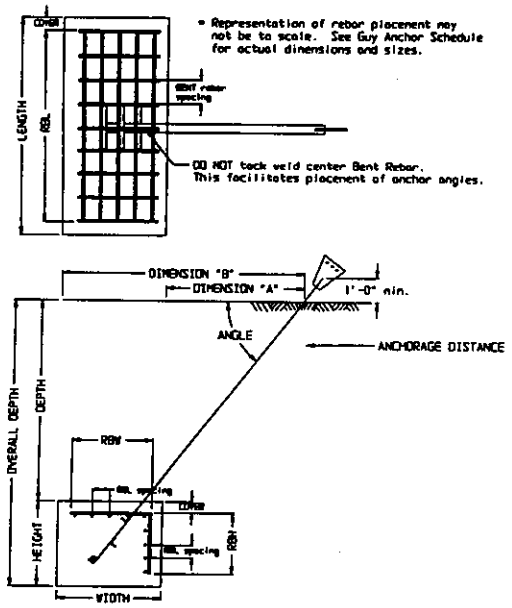



* Representation of rebar placement may not be to scale. See Guy Anchor Schedule for actual dimensions and sizes.

GUY ANCHOR PLAN AND ELEVATION VIEWS

This guy anchor foundation conforms to ANSI/EIA 222-E recommended standard.

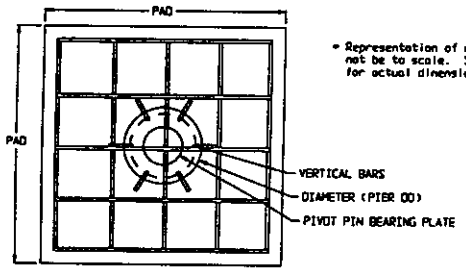
DIMENSION INNER GUY ANCHOR

| | |
|---|---|
| Guy Anchor ID: | GA8-115-15 |
| Bar Dimensions: | 1 @ 1.75" HRR Fy=48000 |
| Design Loads: | |
| Vertical: | 48.1 kip |
| Horizontal: | 56.0 kip |
| Resultant: | 74.4 kip |
| Safety Factor: | 2.37 |
| Anchor Dimensions | |
| Anchor distance: | 145 ft |
| Length: | 11'-6" |
| Width: | 5'-6" |
| Height: | 2'-0" |
| Depth: | 8'-0" |
| Overall Depth: | 8'-0" |
| Dimension "A" | 7'-0" |
| Dimension "B" | 12'-6" |
| Angle: | 41.2° |
| Long Rebar RBL: | 121" 12+1 pcs |
| RBL Vert. spacing: | 4" |
| RBL Hori. spacing: | 7" |
| Bent Rebar DAL: | 68" 12+2 pcs |
| Bent Rebar RBH: | 12" |
| Bent Rebar RBW: | 56" |
| Bent Rebar Spacing: | 11" |
| Design Cover: | 6" |
| Rebar Size: | #4 Bar |
| Concrete Volume: | 3 @ 4.7 cu yds |
| Total Concrete: | 14.1 cu yds |

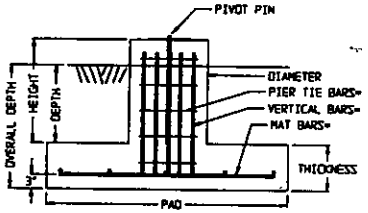
NOTE: *Install the extra one long rebar inside the bottom angle of the guy anchor.
*Field tie the 2 extra bent rebar.
*Rebar QTY's for one anchor only

CONCRETE SPECIFICATIONS
1. Concrete shall have a minimum compressive strength of at least 3000 psi at 28 days. It is our recommendation that 4000 psi concrete be installed to account for any unknown installation variables that could degrade the concrete.
2. Concrete installation shall meet ACI 318-89 installation requirements for reinforced concrete.
3. All concrete shall be placed against undisturbed soil free of water and all foreign objects and materials.
4. Minimum concrete cover shall be 3" over all reinforcing bars.
5. Reinforcing bars shall be ASTM A-615 Grade 60 deformed bars.
7. Assemble bars with tie wires or weld. Welding of bars must conform to ANSI/AWS D1.4-92 specifications. Structural weld splices on bars must be inspected by a Fred A. Nudd engineer.
8. Chamfer all sharp corners of exposed concrete.

SOIL SPECIFICATIONS
1. Per customer specification soil is assumed to be EIA normal soil.
2. All foundations shall be free of free standing water as far as possible prior to pouring concrete and shall be kept thus until backfill is in place. If not possible, special pouring procedures must be followed.
3. Rock, non-cohesive, saturated or submerged soils are not to be considered as normal soil. See EIA 7.2.2.
4. Backfill shall be compacted to 100 pcf in 6" lifts using excavated material.
5. Backfill shall be placed so as to prevent accumulation of water around foundations or anchors.




* Representation of rebar placement may not be to scale. See Footing Specifications for actual dimensions and sizes.



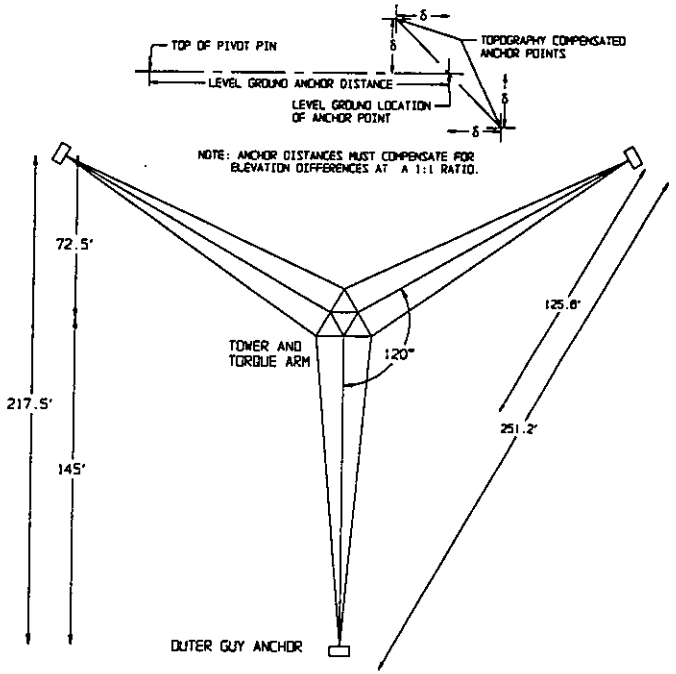

PAD & PIER PLAN & ELEVATION VIEW

PIER SPECIFICATIONS

| | |
|---|---|
| Diameter: | 2'-0" |
| Pad: | 5'-6" |
| Depth: | 3'-0" |
| Height: | 4'-0" |
| Thickness: | 1'-6" |
| Overall Depth: | 4'-8" |
| Pier Tie Bars: | #4 @ 10" c-c, 18"DIAM, 57+2" cut length |
| Vertical Bars: | 8-#5 @ 82" DAL w. 6" bent leg. |
| V. Bar Spacing: | 4.09" |
| Pad Bars: | 10-#5 bars, 54" DAL, 13.50" spacing 5 bars crossed each way. |

DESIGN LOADS

| | |
|---|---|
| Volume: | 2.0 cu. yd. |
| Download: | 71 kip |
| Shear: | 3.602 kip |




TOWER PLOT PLAN AND ANCHOR LAYOUT

FRED A. NUDD CORPORATION
Route 104•Ontario, New York 14519•315/524-253

SCALE: N/S
DRAWN BY: EES
DATE: 6/19/98
APPROVED BY:
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FOUNDATION DETAILS

COT
Ashford, CT

DRAWING NUMBER: 98-6111-2

06-19-1998
13:58:33
CDT
Ashford, CT
6111

Guy Cable Data ft, lb

| | Elev | Horiz | Length | Angle | Wind Length | Total Length | Cable Type |
|---|---|---|---|---|---|---|---|
| Cable 3 : | 170 | 145 | 224 | 49.70 | 1189 | 1345 | EHS |
| Cable 2 : | 120 | 145 | 189 | 39.84 | 938 | 1133 | EHS |
| Cable 1 : | 60 | 145 | 157 | 22.81 | 339 | 472 | EHS |

Cable Loads -lb

| | Shear | Download | Cable Load | Cable Size | %Loaded |
|---|---|---|---|---|---|
| Cable 3 : | 19864 | 27050 | 35465 | 2 - 5/8x7 | 83.64 |
| Cable 2 : | 16975 | 16356 | 25529 | 2 - 9/16x7 | 72.94 |
| Cable 1 : | 11618 | 5644 | 14555 | 1 - 9/16x7 | 83.17 |

Cable Safety Factor: 2
Shear at 0': 3618 lb
Shear on Guy Anchors: 351 lb

Accumulated Down Loads

| Elevation | Down load (lb) |
|---|---|
| 170.0 | 30327 |
| 145.0 | 34819 |
| 120.0 | 55328 |
| 90.0 | 58569 |
| 60.0 | 66695 |
| 30.0 | 68905 |
| 0.0 | 71116 |

Guy Anchor Reactions

Vertical Reaction: 49050 lbs
Horizontal Reaction: 55953 lbs
Resultant: 74408 lbs
Angle: 41.23 Degrees

Tower Plot Dimensions

A= 217.5 ft
B= 145 ft
C= 72.5 ft
D= 251.2 ft
E= 125.58 ft

MOMENT DISTRIBUTION OUTPUT - E

Beam Configuration:

4 Spans 3 Beams

| SPAN | FEMB | FEMT | VB | VT | dfB | dfT |
|---|---|---|---|---|---|---|
| 1 | -46500 | 46500 | 4650 | 4650 | 1.0000 | 0.5000 |
| 2 | -62130 | 62130 | 6213 | 7499 | 0.5000 | 0.4545 |
| 3 | -76519 | 95503 | 8689 | 13450 | 0.5455 | 1.0000 |
| 4 | -52946 | 0 | 6923 | 0 | 0.0000 | 0.0000 |

10 Iterations

| SPAN | DISTRIBUTED MOMENTS(ft-lb) | | SHEARS(lb) | | REACTIONS(lb) |
|---|---|---|---|---|---|
| # | MOM B | MOM T | VB | VT | |
| | | | | | 3618 |
| 1 | 0 | 61869 | 3618 | 5681 | |
| | | | | | 11618 |
| 2 | -61870 | 78413 | 5937 | 7775 | |
| | | | | | 16974 |
| 3 | -78414 | 52945 | 9198 | 12940 | |
| | | | | | 19863 |
| 4 | -52946 | 0 | 6923 | 0 | |
| | | | | | 0 |

Tower Loads

Point Loads

| No. | QTY | Antenna | Elevation | Windload | Deadload |
|---|---|---|---|---|---|
| 1 | 3 | 12' Cellular Boom | 178 | 285 | 170 |
| 2 | 9 | Sinclair SRL 411C9R130 | 178 | 392 | 80 |
| 3 | 10 | PD 10017 | 180 | 104 | 25 |
| 4 | 3 | 12' Cellular Boom | 170 | 281 | 170 |
| 5 | 9 | ALP 9212 | 170 | 124 | 27 |
| 6 | 3 | 12' Cellular Boom | 160 | 276 | 170 |
| 7 | 9 | Sinclair SRL 411C9R130 | 160 | 380 | 80 |
| 8 | 3 | 12' Cellular Boom | 150 | 271 | 170 |
| 9 | 9 | ALP 9212 | 150 | 119 | 27 |
| 10 | 1 | 6' MHP Dish | 140 | 837 | 814 |
| 11 | 1 | 6' MHP Dish | 130 | 819 | 814 |
| 12 | 1 | 6' MHP Dish | 120 | 801 | 814 |
| 13 | 1 | G42 Torque Arm | 170 | 537 | 262 |
| 14 | 1 | G42 Torque Arm | 120 | 486 | 262 |

Uniform Loads

| No. | QTY | Type | Start | Stop | Windload | Deadload |
|---|---|---|---|---|---|---|
| 1 | 19 | LDF7-50A 1-5/8" | 170 | 180 | 5.50 | 0.90 |
| 2 | 9 | LDF7-50A 1-5/8" | 170 | 170 | 0.00 | 0.90 |
| 3 | 9 | LDF7-50A 1-5/8" | 0 | 160 | 0.00 | 0.90 |
| 4 | 9 | LDF7-50A 1-5/8" | 0 | 150 | 0.00 | 0.90 |
| 5 | 1 | LDF7-50A 1-5/8" | 0 | 140 | 0.00 | 0.90 |
| 6 | 1 | LDF7-50A 1-5/8" | 0 | 130 | 0.00 | 0.90 |
| 7 | 1 | LDF7-50A 1-5/8" | 0 | 120 | 0.00 | 0.90 |
| 8 | 1 | Tower Span 1 | 0 | 60 | 155.00 | 54.78 |
| 9 | 1 | Tower Span 2 | 60 | 120 | 207.10 | 53.28 |
| 10 | 1 | Tower Span 3 | 120 | 170 | 237.10 | 53.28 |
| 11 | 1 | Tower Span 4 | 170 | 180 | 45.96 | 53.28 |

Project: CDT
Location: Ashford, CT
Date: 6/19/98

$i := 0, step.. M_{last(M^{<0>}),0}$ $j := 0, 1.. L_{last(L^{<0>}),0}$

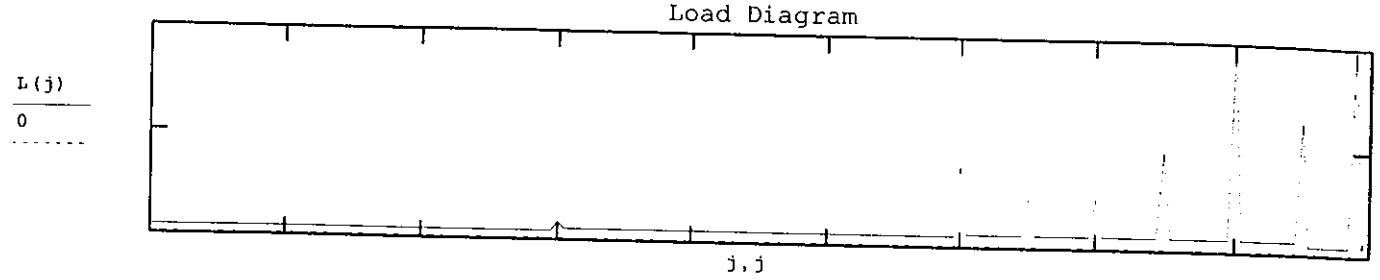
Maximum_Download := 117720

Maximum_Load = 4531.6

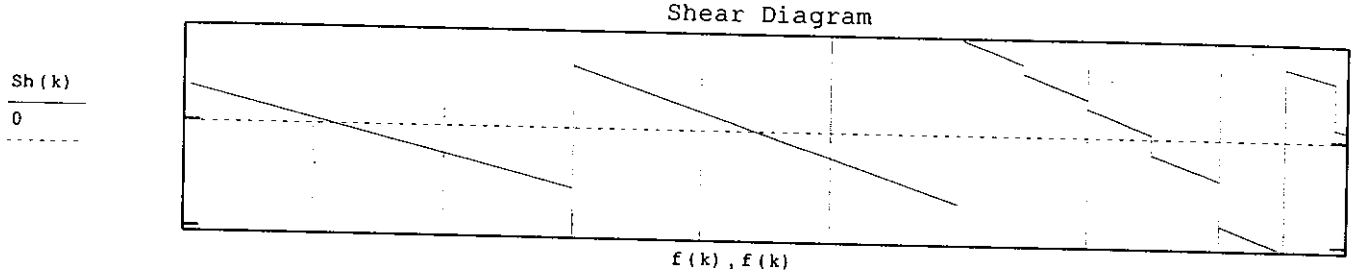
Lmax := Maximum_Load

Top := 180 ft High

Load Diagram

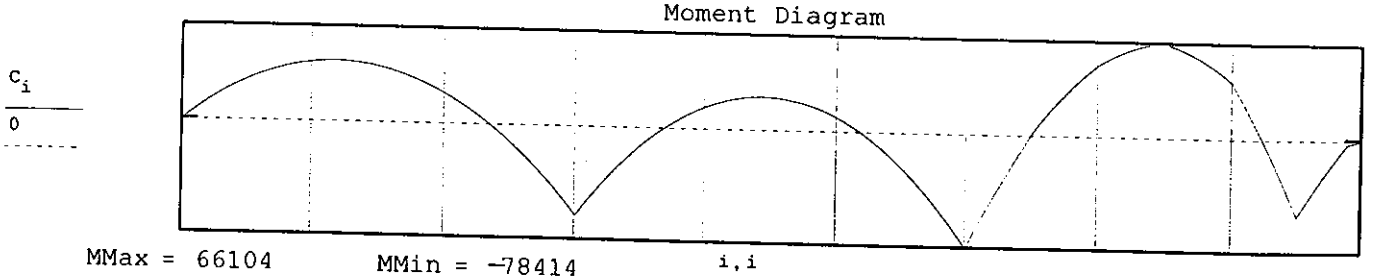



Shear Diagram



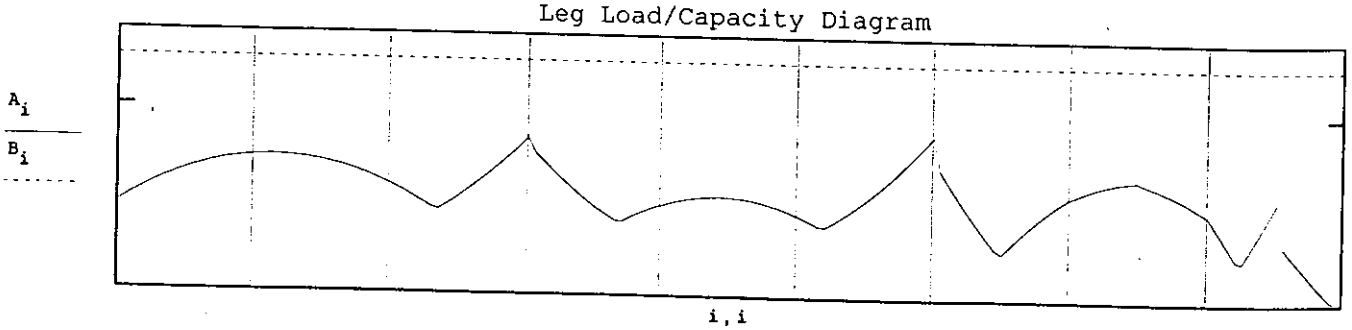

SMax = 9198.8 SMin = −10448.4

Moment Diagram




MMax = 66104 MMin = −78414

Leg Load/Capacity Diagram




$A_i$=Leg Load
$B_i$=Leg Capacity
$C_i$=Moment

Elevation = 120
Moment = −78414

Leg_Load = 44671
Leg_Capacity = 63828

$Percent\_Loaded_1$ = 70.8%

Check Girts at Guy Pulls:

Steel Properties:

$E := 29 \cdot 10^6 \cdot psi$

$Fy_{girt} := 45000 \cdot psi$

$Fy_{diag} := 45000 \cdot psi$

Tensile capacity of (1) L1.75x1.75x1/4:

$Area := \left[ 1.75^2 - (1.75 - .25)^2 - .375 \cdot .25 \right] \cdot in^2$

$Capacity := .6 \cdot Fy_{girt} \cdot \frac{4}{3} \cdot Area \cdot 1 \cdot bars$

Capacity = 25875 lbf

Maximum Single cable shear is 11618 lb, resolved into each brace.

$$Percent\_Loaded_2 := \frac{\frac{11618 \cdot lbf}{2 \cdot girt \cdot \cos(30 \cdot deg)}}{Capacity}$$

Percent_Loaded$_2$ = 25.9 %

Check compression capacity of girts against maximum shear:

$l := (42 - 2.875) \cdot in$ $\quad Area := \left[ 1.5^2 - (1.5 - .1875)^2 \right] \cdot in^2$

Area = 0.527 in$^2$

$r := .293 \cdot in$ $\quad$ L1.5x1.5x.1875"

$K := .70$ $\quad$ All welded

$$klr := \frac{K \cdot l}{r} \qquad Cc := \sqrt{\frac{2 \cdot \pi^2 \cdot E}{Fy_{girt}}}$$

klr = 93.5

Cc = 112.8

$$Fa := \frac{\left[ 1 - \frac{\left( \frac{klr}{Cc} \right)^2}{2} \right] \cdot Fy_{girt}}{\frac{5}{3} + \frac{3}{8} \cdot \frac{klr}{Cc} - \left( \frac{klr}{2 \cdot Cc} \right)^3} \cdot (klr < Cc) + \frac{12 \cdot \pi^2 \cdot E}{23 \cdot klr^2} \cdot (klr \geq Cc)$$

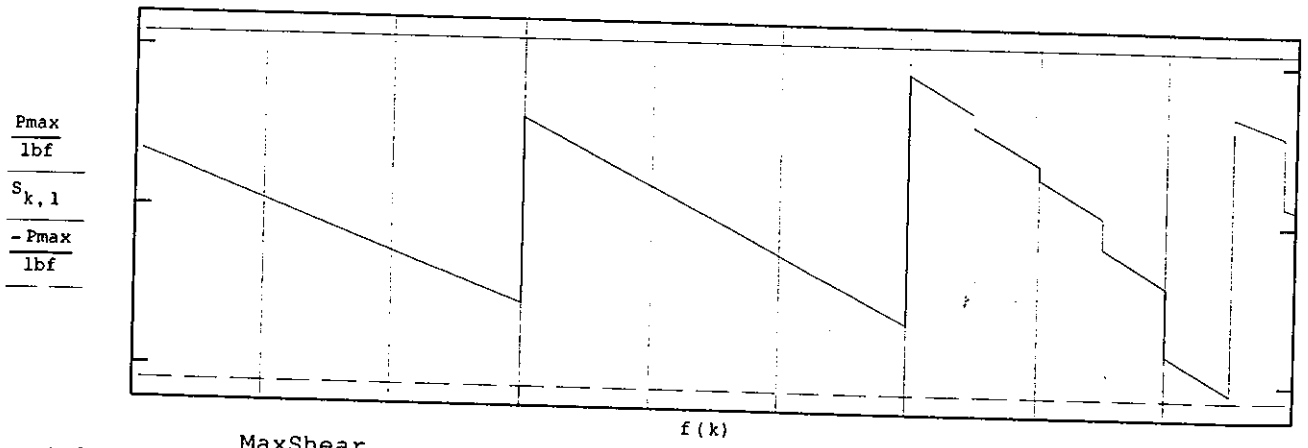
Fa = 15499.2 psi

Maximum allowable compression load:

$Pmax := Fa \cdot \frac{4}{3} \cdot Area$

Pmax = 10897.9 lbf

MaxShear = 10448.4




$$Percent\_Loaded_3 := \frac{MaxShear}{Pmax} \cdot lbf$$

Percent_Loaded$_3$ = 95.9 %

Check tension capacity of diagonals:

$$S(k) := \frac{Sh(k)}{2 \cdot braces \cdot \cos(45 \cdot deg)}$$

$$Pmax := \frac{\pi}{4} \cdot \left(\frac{5}{8} \cdot in\right)^2 \cdot .6 \cdot Fy_{diag} \cdot \frac{4}{3}$$

$$Pmax = 11044.7 \cdot lbf$$

Tensile load of Diagonals

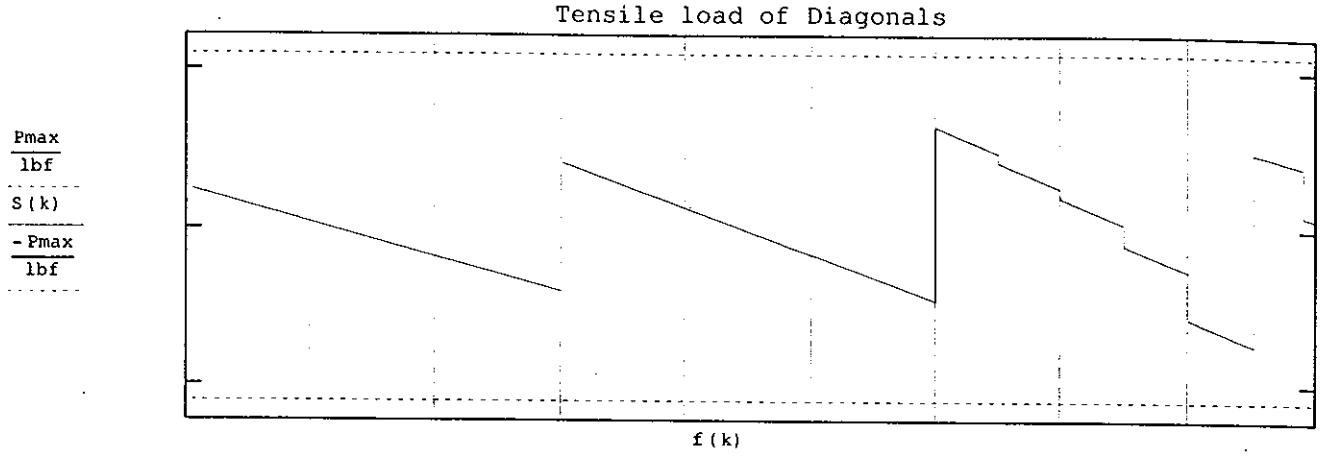
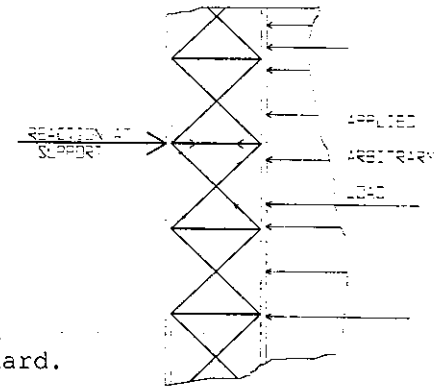



Diagram of force resolution:




Bracing:
Use 5/8" diagonals throughout tower,
Use L1.75x1.75x1/4 at guypulls,
L1.5x1.5x.1875" everywhere else.
Legs: 2-1/2" pipe

All allowable stresses per
American Institute of Steel Construction 9th edition and
Electronics Industry Association 222-E recommended standard.

INNER GUY ANCHOR DESIGN CALCULATIONS

Customer: CDT
Project: Ashford, CT
6/19/98 2:02 PM

REACTIONS:

| | | |
|---|---|---|
| Vertical | 49.1 | kips |
| Horizontal | 56.0 | kips |
| Resultant | 74.4 | kips |
| Hor. Angle | 41.2 | ° |
| Submerged? | 0 | No |
| Water Depth: | 0 | ft |

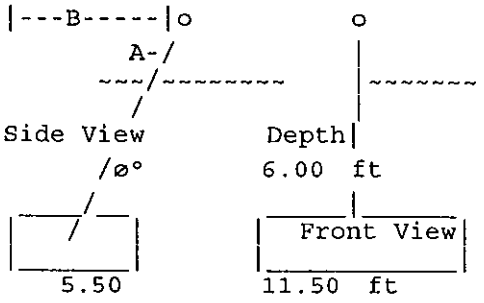
| | | |
|---|---|---|
| Soil Wt: | 100.0 | lb/ft^3 |
| Soil Gs: | 2.65 | |
| Subm Soil Wt | 62.3 | lb/ft^3 |
| H.Bearing | 400.0 | psf/ft |
| Rebar Fy: | 60.0 | ksi |
| Conc. Wt: | 150.0 | lb/ft^3 |
| Conc f`c: | 4.0 | ksi |

CONCRETE WEIGHT:

| | | |
|---|---|---|
| Block Volume | 4.7 | cu yds |
| Block Wt | 19.0 | kips |

SOIL FRUSTUM WEIGHT:

| | | |
|---|---|---|
| Frustum: | 30 | ° |
| Block: | 38.0 | kips |
| Edges: | 35.3 | kips |
| Corners: | 9.6 | kips |
| Total Wt: | 82.9 | kips |
| Excavatn: | 506 | cuft |




HORIZONTAL CAPACITY: EIA 7.1.2

| | | |
|---|---|---|
| Load @ | 7 | ft |
| Load: | 64400 | lb |

Check anchor shaft embedment? OK

| | Uplift | Horizontal | |
|---|---|---|---|
| Design Loads: | 49.05 | 55.95 | kips |
| Capacity:* | 56.62 | 64.40 | kips |
| % Loaded: | 87% | 87% | OK |

* EIA 7.2.4

GUY ANCHOR ROD:

| | | |
|---|---|---|
| Resultant | 74.41 | kips |
| Hole QTY | 6 | holes |
| # of rods | 1 | |
| Fy | 48000 | psi |
| Min. Area | 1.938 | in²/bar |
| Min. Dia. | 1.571 | in |
| Act. Area | 2.405 | in²/bar |
| Act. Dia. | 1.75 | in, 80.6% Loaded |
| Anchor ID: | GA6-115-15 | |

Concrete Volume: 14.1 cu yds

ANCHOR ROD LENGTH:

| | | |
|---|---|---|
| Minimum: | 13.38 | ft |
| Maximum: | 15.17 | ft |
| Recommend: | 14.00 | ft |
| Actual: | 15 | ft |

BLOCK REINFORCEMENT: Cover: 6 in

| | Vertical | Horizontal | | |
|---|---|---|---|---|
| Factored Loads: | 63.8 | 72.7 | kips | EIA 3.1.13 |
| Factored Moment: | 1222.2 | 1394.2 | kip-inch | |
| Minimum As: | 1.526 | 0.518 | in² | ACI 10.5.1 |
| Minimum Qty: | 8 | 3 | | Bar #: |
| Actual Qty: | 9 | 3 | | 4 |
| Actual As: | 1.767 | 0.589 | in² | OK |

ANCHOR DIMENSIONS:

| | |
|---|---|
| Length | 11'- 6" |
| Width | 5'- 6" |
| Height | 2'- 0" |
| Depth | 6'- 0" |
| OADepth | 8'- 0" |
| Dim. A: | 7'- 0" |
| Dim. B: | 12'- 6" |
| ø: | 41° |

REBAR DIMENSIONS:

| | | |
|---|---|---|
| RBL: | 121" | |
| RBH: | 12" | |
| RBW: | 56" | |
| Bent OAL: | 68" | |
| QTY Long: | 13 | Bars ea |
| QTY Bent: | 14 | Bars ea |
| Rebar Wt. | 157 | lb ea |

MASTER CHECK: OK

Anchor design per ACI 318-89, ANSI/EIA 222-E, AISC ASD 9th Edition

SQUARE FOOTING AND PIER DESIGN

Customer: CDT
Project: Ashford, CT
6/19/98 2:02 PM

Dead Load 0.0 kips
Live Load 75 kips

G42W10x49 Base Transition ID

ASSUMED DIMENSIONS:

| | | | | |
|---|---|---|---|---|
| Width | 5.50 ft OK | f'c: | 3000 | psi |
| Thickness | 1.50 ft | Fy: | 60000 | psi |
| Pier OD | 2.00 ft | Soil: | 4000 | psf bearing capacity |
| Sqr Pier | 0 | | | |
| Rnd Pier | 1 | Pier Area: | 452 | inch² |
| Depth | 3.00 ft | Ht. above Grade | 12 | inches |
| Cover | 6 inches | | | |
| Bar # | 4 0.5 | | | |
| Eff.Depth | 11.750 inches | | | |

CALCULATIONS: Minimum Width: 4.330 ft
Ultimate Load: 108.8 kips ACI 9.2.2
Net Load: 3598 psf (factored)

*CHECK SHEAR*

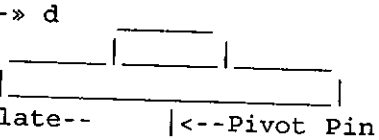
Two Way Action: Assumes ßc=1
Vu: 83753 lbs
Vc: 245756 lbs
34.08%

<= OK =>

One Way Action Load Area: 4.240 ft²
Vu: 15253 lbs
Vc: 72209 lbs
21.12%

*LOAD TRANSFER* Pier Capacity/Pu ACI 15.8
@ Pad/Pier interfac 742% OK - Dowels not required.

Pivot Pin Bearing Stress: ACI 10.15.1
Minimum Area 30 inch²
Minimum plate OD 6.23 inchø, 5.52" ea. side square
Distance "d" to edge 0.5 inch -» d
Minimum Plate Thickness: 0.2846 inch

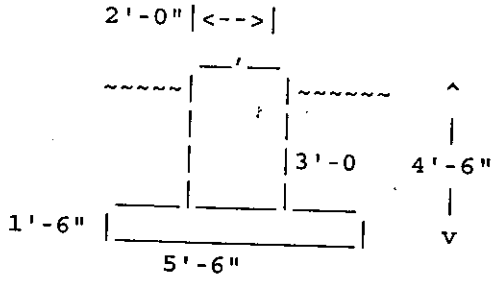



*MINIMUM PIER REINFORCING* ACI 15.8.2.1, 7.10.5
.5% Req. 2.262 inch² Steel Area:
8 Bars of # 5 2.454 inch² OK
Bar Lngth: 55.5 inch
Pier Tie bar #: 4

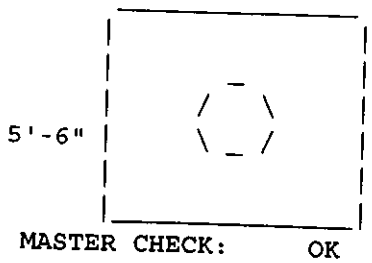
10 " tie bar spacing

*PAD BENDING MOMENT REINFORCEMENT*

Mu: 30300 ft-lbs
Ratio: 0.000997 ACI 10.5.1
Steel: 0.773 inch²
Bar #: 5
Req'd QTY: 3
Act'l QTY: 5 OK
Act. Stl: 1.534 inch²
Act. d: 11.500 inches




Moment? OK
Ldb: 11.25 inches OK




Mat Bars:
10 @ 13.50" spacing
85 lb

Concrete:
2.0 cuyd
8220.0 lb

MASTER CHECK: OK

TRIANGULAR TOWER SECTION DATA

Guyed Tower Section

Wind Angle 0,60,90 90 °

Elevation of Foundation: 1 ft

Wind Speed 85 mph

Gh 1.12 EIA 2.3.4

Wind Pres. 20.7 psf EIA 2.3.3

Radial Ice 0.5 inch

EIA 2.3.15 Wind/Ice Reductn? Yes

ANSI/EIA Overstress Factor: Yes

| LEGS | OD,L1 | ID,L2 | wall |
|---|---|---|---|
| 2.5" Sch40 | 2.875 | 2.469 | 0.203 |
| DIAGONALS | | | |
| 5/8" Rod | 0.625 | 0.000 | 0.313 |
| HORIZONTALS | | | |
| L1.5x1.5x3 | 1.500 | 1.500 | 0.188 |

Dbl Angle Gap: 0 in

Galvanizing? Yes

WaveGuide hole reduction? Yes

| ITEM | DL | WL |
|---|---|---|
| Ladder: | 10 | 10 |
| Misc. | 68 | 0 |
| Total lbf: | 78 | 10 |

Client: CDT

Project: Eastford, CT

6/19/98 2:03 PM

Span: 1

Elev@Top 40 feet

Elev@Base 20 feet

Tower Ht. 180 feet

Top Face 42 inches 3.50

Bot Face 42 inches 3.50

Taper 0 in./sect.

Ave Face 42 inches

Length 240 inches

FL.to BR 6 inches

# Panel 6 panels

Panel 38.00 inches

Br/Panel 2 |x|

Br Lngth 54.54 inches

# Horiz 7 7

Density 0.283 lb/in^3

Bracing Type: 1 |x|

SECTION GEOMETRY » 1508 in^4

Section Ixx,Iyy » 1508 in^4

Face Vert. Angle 0.000 °

Leg Angle in face 0.000 °

Leg/Axis Angle 0.000 °

Brace Angle 42.138 °

SECTION 1 WIND LOAD / WEIGHT CALCULATIONS:

| | Pro OD | X-Area | Weight | Ice Wt |
|---|---|---|---|---|
| Legs | 3.875 | 1.704 | 347.2 | 123.7 lbs |
| Diagonals | 1.625 | 0.307 | 170.5 | 112.4 lbs |
| Horizontals | 2.500 | 0.527 | 131.6 | 100.0 lbs |
| | | | --- | --- |
| Total Weig | | | 759 | 336 lbs |

| | | | |
|---|---|---|---|
| Ag: | 11010 | | |
| Af: | 411 | Df: | 0.850 |
| Ar: | 3197 | Rr: | 0.625 |
| SR(e): | 0.328 | Dr: | 1.000 |
| Cf: | 2.225 | | |
| Area: | 16.30 | ft² | |
| Shear: | 574 | 28.7 | lbf,lbf/ |
| CnMoment: | 5736 | | ft-lbf |
| Deadload: | 1096 | 54.8 | lbf,lbf/ft |
| Solid Area Windloads: | | | |
| Shear: | 3100 | 155.0 | lbf,lbf/ft |

| | inches² | feet² |
|---|---|---|
| Ae 0° | 2408.5 | 16.73 |
| Ae 45° | 2890.2 | 20.07 |
| Ae 60° | 2326.3 | 16.16 |
| Ae 90° | 2346.9 | 16.30 |

Span Length 60 ft

pan Capacity 63137 lbf/leg

Legs: K 1.00

KL/r 40.1 OK

Fy 55000 psi

EIA 3.1.1, Cc 102.0

AISC E2 Fa 37457 psi

Max.Compresn.Force 63828 lbs

Diagonals : K 0.70

KL/r 119.1 OK

Fy 36000 psi

Cc 126.1

EIA 3.1.1 Fa 13882 psi

Max.Compresn.Force 4259 lbs

Max.Tension.Force* 8836 lbs

*Verify Net Section on member.

Horizontals: K 0.7

KL/r 93.4 OK

Cc 126.1

EIA 3.1.1 Fa 18401 psi

Max.Compresn.Force 8194 lbs

TRIANGULAR TOWER SECTION DATA

Guyed Tower Section
Wind Angle 0,60,90 90 °
Elevation of Foundation: 1 ft
Wind Speed 85 mph
Gh 1.12 EIA 2.3.4
Wind Pres. 27.7 psf EIA 2.3.3
Radial Ice 0.5 inch
EIA 2.3.15 Wind/Ice Reductn? Yes
ANSI/EIA Overstress Factor: Yes

| | OD,L1 | ID,L2 | wall |
|---|---|---|---|
| LEGS | | | |
| 2.5" Sch40 | 2.875 | 2.469 | 0.203 |
| DIAGONALS | | | |
| 5/8" Rod | 0.625 | 0.000 | 0.313 |
| HORIZONTALS | | | |
| L1.5x1.5x3 | 1.500 | 1.500 | 0.188 |

Dbl Angle Gap: 0 in
Galvanizing? Yes
WaveGuide hole reduction? Yes

| ITEM | DL | WL |
|---|---|---|
| Ladder: | 10 | 10 |
| Misc. | 38 | 0 |
| Total lbf: | 48 | 10 |

Client: CDT
Project: Eastford, CT
6/19/98 2:03 PM
Span: 2
Elev@Top 100 feet
Elev@Base 80 feet
Tower Ht. 180 feet
Top Face 42 inches 3.50
Bot Face 42 inches 3.50
Taper 0 in./sect.
Ave Face 42 inches
Length 240 inches
FL.to BR 6 inches
# Panel 6 panels
Panel 38.00 inches
Br/Panel 2 |x|
Br Lngth 54.54 inches
# Horiz 7 7
Density 0.283 lb/in^3
Bracing Type: 1 |x|

SECTION GEOMETRY » 1508 in^4
Section Ixx,Iyy » 1508 in^4
Face Vert. Angle 0.000 °
Leg Angle in face 0.000 °
Leg/Axis Angle 0.000 °
Brace Angle 42.138 °

SECTION 2 WIND LOAD / WEIGHT CALCULATIONS:

| | Pro OD | X-Area | Weight | Ice Wt |
|---|---|---|---|---|
| Legs | 3.875 | 1.704 | 347.2 | 123.7 lbs |
| Diagonals | 1.625 | 0.307 | 170.5 | 112.4 lbs |
| Horizontals | 2.500 | 0.527 | 131.6 | 100.0 lbs |
| | | | --- | --- |
| Total Weig | | | 729 | 336 lbs |

Ag: 11010
Af: 411 Df: 0.850
Ar: 3197 Rr: 0.625
SR(e): 0.328 Dr: 1.000
Cf: 2.225

Area: 16.30 ft²
Shear: 763 38.2 lbf,lbf/ ft-lbf
CnMoment: 7631
Deadload: 1066 53.3 lbf,lbf/ft
Solid Area Windloads:
Shear: 4142 207.1 lbf,lbf/ft

| | inches² | feet² |
|---|---|---|
| Ae 0° | 2408.5 | 16.73 |
| Ae 45° | 2890.2 | 20.07 |
| Ae 60° | 2326.3 | 16.16 |
| Ae 90° | 2346.9 | 16.30 |

Span Length 60 ft
pan Capacity 63137 lbf/leg

Legs: K 1.00
KL/r 40.1 OK
Fy 55000 psi
EIA 3.1.1, Cc 102.0
AISC E2 Fa 37457 psi
Max.Compresn.Force 63828 lbs

Diagonals : K 0.70
KL/r 119.1 OK
Fy 36000 psi
Cc 126.1
EIA 3.1.1 Fa 13882 psi
Max.Compresn.Force 4259 lbs
Max.Tension.Force* 8836 lbs
*Verify Net Section on member.

Horizontals: K 0.7
KL/r 93.4 OK
Cc 126.1
EIA 3.1.1 Fa 18401 psi
Max.Compresn.Force 8194 lbs

TRIANGULAR TOWER SECTION DATA

Guyed Tower Section
Wind Angle 0,60,90 90 °
Elevation of Foundation: 1 ft
Wind Speed 85 mph
Gh 1.12 EIA 2.3.4
Wind Pres. 31.7 psf EIA 2.3.3
Radial Ice 0.5 inch
EIA 2.3.15 Wind/Ice Reductn? Yes
ANSI/EIA Overstress Factor: Yes

| | OD,L1 | ID,L2 | wall |
|---|---|---|---|
| LEGS | | | |
| 2.5" Sch40 | 2.875 | 2.469 | 0.203 |
| DIAGONALS | | | |
| 5/8" Rod | 0.625 | 0.000 | 0.313 |
| HORIZONTALS | | | |
| L1.5x1.5x3 | 1.500 | 1.500 | 0.188 |

Dbl Angle Gap: 0 in
Galvanizing? Yes
WaveGuide hole reduction? Yes

| ITEM | DL | WL |
|---|---|---|
| Ladder: | 10 | 10 |
| Misc. | 38 | 0 |
| Total lbf: | 48 | 10 |

Client: CDT
Project: Eastford, CT
6/19/98 2:03 PM
Span: 3
Elev@Top 155 feet
Elev@Base 135 feet
Tower Ht. 180 feet
Top Face 42 inches 3.50
Bot Face 42 inches 3.50
Taper 0 in./sect.
Ave Face 42 inches
Length 240 inches
FL.to BR 6 inches
# Panel 6 panels
Panel 38.00 inches
Br/Panel 2 |x|
Br Lngth 54.54 inches
# Horiz 7 7
Density 0.283 lb/in^3
Bracing Type: 1 |x|

SECTION GEOMETRY » 1508 in^4
Section Ixx,Iyy » 1508 in^4
Face Vert. Angle 0.000 °
Leg Angle in face 0.000 °
Leg/Axis Angle 0.000 °
Brace Angle 42.138 °

SECTION 3 WIND LOAD / WEIGHT CALCULATIONS:

| | Pro OD | X-Area | Weight | Ice Wt |
|---|---|---|---|---|
| Legs | 3.875 | 1.704 | 347.2 | 123.7 lbs |
| Diagonals | 1.625 | 0.307 | 170.5 | 112.4 lbs |
| Horizontals | 2.500 | 0.527 | 131.6 | 100.0 lbs |
| | | | --- | --- |
| Total Weig | | | 729 | 336 lbs |

Ag: 11010
Af: 411 Df: 0.850
Ar: 3197 Rr: 0.625
SR(e): 0.328 Dr: 1.000
Cf: 2.225

Area: 16.30 ft²
Shear: 872 43.6 lbf,lbf/ft-lbf
CnMoment: 8720
Deadload: 1066 53.3 lbf,lbf/ft
Solid Area Windloads:
Shear: 4741 237.1 lbf,lbf/ft

| | inches² | feet² |
|---|---|---|
| Ae 0° | 2408.5 | 16.73 |
| Ae 45° | 2890.2 | 20.07 |
| Ae 60° | 2326.3 | 16.16 |
| Ae 90° | 2346.9 | 16.30 |

Span Length 50 ft
pan Capacity 65715 lbf/leg

Legs:
K 1.00
KL/r 40.1 OK
Fy 55000 psi
EIA 3.1.1, Cc 102.0
AISC E2 Fa 37457 psi
Max.Compresn.Force 63828 lbs

Diagonals :
K 0.70
KL/r 119.1 OK
Fy 36000 psi
Cc 126.1
EIA 3.1.1 Fa 13882 psi
Max.Compresn.Force 4259 lbs
Max.Tension.Force* 8836 lbs
*Verify Net Section on member.

Horizontals:
K 0.7
KL/r 93.4 OK
Cc 126.1
EIA 3.1.1 Fa 18401 psi
Max.Compresn.Force 8194 lbs

TRIANGULAR TOWER SECTION DATA

Guyed Tower Section

| | | |
|---|---|---|
| Wind Angle 0,60,90 | 90 ° | |
| Elevation of Foundation: | 1 | ft |
| Wind Speed | 85 | mph |
| Gh | 1.12 | EIA 2.3.4 |
| Wind Pres. | 33.4 | psf EIA 2.3.3 |
| Radial Ice | 0.5 | inch |
| EIA 2.3.15 Wind/Ice Reductn? | Yes | |
| ANSI/EIA Overstress Factor: | Yes | |

| LEGS | OD,L1 | ID,L2 | wall |
|---|---|---|---|
| 2.5" Sch40 | 2.875 | 2.469 | 0.203 |
| DIAGONALS | | | |
| 5/8" Rod | 0.625 | 0.000 | 0.313 |
| HORIZONTALS | | | |
| L1.5x1.5x3 | 1.500 | 1.500 | 0.188 |

| | | |
|---|---|---|
| Dbl Angle Gap: | 0 | in |
| Galvanizing? | Yes | |
| WaveGuide hole reduction? | Yes | |

| ITEM | DL | WL |
|---|---|---|
| Ladder: | 10 | 10 |
| Misc. | 38 | 0 |
| Total lbf: | 48 | 10 |

Client: CDT
Project: Eastford, CT
6/19/98 2:03 PM

| | | | |
|---|---|---|---|
| Span: | 4 | | |
| Elev@Top | 185 | feet | |
| Elev@Base | 165 | feet | |
| Tower Ht. | 180 | feet | |
| Top Face | 42 | inches | 3.50 |
| Bot Face | 42 | inches | 3.50 |
| Taper | 0 | in./sect. | |
| Ave Face | 42 | inches | |
| Length | 240 | inches | |
| FL.to BR | 6 | inches | |
| # Panel | 6 | panels | |
| Panel | 38.00 | inches | |
| Br/Panel | 2 | \|x\| | |
| Br Lngth | 54.54 | inches | |
| # Horiz | 7 | 7 | |
| Density | 0.283 | lb/in^3 | |
| Bracing Type: | 1 | \|x\| | |

| | | |
|---|---|---|
| SECTION GEOMETRY » | 1508 | in^4 |
| Section Ixx,Iyy » | 1508 | in^4 |
| Face Vert. Angle | 0.000 | ° |
| Leg Angle in face | 0.000 | ° |
| Leg/Axis Angle | 0.000 | ° |
| Brace Angle | 42.138 | ° |

SECTION 4 WIND LOAD / WEIGHT CALCULATIONS:

| | Pro OD | X-Area | Weight | Ice Wt |
|---|---|---|---|---|
| Legs | 3.875 | 1.704 | 347.2 | 123.7 lbs |
| Diagonals | 1.625 | 0.307 | 170.5 | 112.4 lbs |
| Horizontals | 2.500 | 0.527 | 131.6 | 100.0 lbs |
| | | | --- | --- |
| Total Weig | | | 729 | 336 lbs |

| | | | |
|---|---|---|---|
| Ag: | 11010 | | |
| Af: | 411 | Df: | 0.850 |
| Ar: | 3197 | Rr: | 0.625 |
| SR(e): | 0.328 | Dr: | 1.000 |
| Cf: | 2.225 | | |
| Area: | 16.30 | ft² | |
| Shear: | 919 | 46.0 | lbf,lbf/ |
| CnMoment: | 9193 | ft-lbf | |
| Deadload: | 1066 | 53.3 | lbf,lbf/ft |
| Solid Area Windloads: | | | |
| Shear: | 5001 | 250.1 | lbf,lbf/ft |

| | inches² | feet² |
|---|---|---|
| Ae 0° | 2408.5 | 16.73 |
| Ae 45° | 2890.2 | 20.07 |
| Ae 60° | 2326.3 | 16.16 |
| Ae 90° | 2346.9 | 16.30 |

| | | |
|---|---|---|
| Span Length | 20 | ft |
| pan Capacity | 72067 | lbf/leg |

| | | | |
|---|---|---|---|
| Legs: | K | 1.00 | |
| | KL/r | 40.1 | OK |
| | Fy | 55000 | psi |
| EIA 3.1.1, | Cc | 102.0 | |
| AISC E2 | Fa | 37457 | psi |
| Max.Compresn.Force | | 63828 | lbs |
| | K | 0.70 | |
| Diagonals : | KL/r | 119.1 | OK |
| | Fy | 36000 | psi |
| | Cc | 126.1 | |
| EIA 3.1.1 | Fa | 13882 | psi |
| Max.Compresn.Force | | 4259 | lbs |
| Max.Tension.Force* | | 8836 | lbs |
| *Verify Net Section on member. | | | |
| | K | 0.7 | |
| Horizontals: | KL/r | 93.4 | OK |
| | Cc | 126.1 | |
| EIA 3.1.1 | Fa | 18401 | psi |
| Max.Compresn.Force | | 8194 | lbs |

| Elevation | Moment | Accum. Download | Resolved Legload | Panel Capacity | Span Capacity | % Loaded |
|---|---|---|---|---|---|---|
| 0 | 0 | 71116 | 23705 | 63828 | 63137 | 37.5 |
| 1 | 3541 | 71042 | 24849 | 63828 | 63137 | 39.3 |
| 2 | 6928 | 70968 | 25942 | 63828 | 63137 | 41.0 |
| 3 | 10159 | 70895 | 26983 | 63828 | 63137 | 42.7 |
| 4 | 13235 | 70821 | 27974 | 63828 | 63137 | 44.2 |
| 5 | 16157 | 70747 | 28913 | 63828 | 63137 | 45.7 |
| 6 | 18923 | 70674 | 29801 | 63828 | 63137 | 47.1 |
| 7 | 21534 | 70600 | 30638 | 63828 | 63137 | 48.4 |
| 8 | 23991 | 70526 | 31424 | 63828 | 63137 | 49.6 |
| 9 | 26292 | 70453 | 32158 | 63828 | 63137 | 50.8 |
| 10 | 28438 | 70379 | 32842 | 63828 | 63137 | 51.9 |
| 11 | 30430 | 70305 | 33474 | 63828 | 63137 | 52.8 |
| 12 | 32266 | 70232 | 34056 | 63828 | 63137 | 53.8 |
| 13 | 33948 | 70158 | 34586 | 63828 | 63137 | 54.6 |
| 14 | 35474 | 70084 | 35065 | 63828 | 63137 | 55.3 |
| 15 | 36845 | 70011 | 35493 | 63828 | 63137 | 56.0 |
| 16 | 38062 | 69937 | 35869 | 63828 | 63137 | 56.6 |
| 17 | 39123 | 69863 | 36195 | 63828 | 63137 | 57.1 |
| 18 | 40029 | 69790 | 36469 | 63828 | 63137 | 57.5 |
| 19 | 40781 | 69716 | 36693 | 63828 | 63137 | 57.9 |
| 20 | 41377 | 69642 | 36865 | 63828 | 63137 | 58.2 |
| 21 | 41818 | 69568 | 36986 | 63828 | 63137 | 58.3 |
| 22 | 42105 | 69495 | 37056 | 63828 | 63137 | 58.5 |
| 23 | 42236 | 69421 | 37075 | 63828 | 63137 | 58.5 |
| 24 | 42212 | 69347 | 37042 | 63828 | 63137 | 58.4 |
| 25 | 42034 | 69274 | 36959 | 63828 | 63137 | 58.3 |
| 26 | 41700 | 69200 | 36824 | 63828 | 63137 | 58.1 |
| 27 | 41211 | 69126 | 36638 | 63828 | 63137 | 57.8 |
| 28 | 40568 | 69053 | 36401 | 63828 | 63137 | 57.4 |
| 29 | 39769 | 68979 | 36113 | 63828 | 63137 | 57.0 |
| 30 | 38815 | 68905 | 35774 | 63828 | 63137 | 56.4 |
| 31 | 37707 | 68832 | 35384 | 63828 | 63137 | 55.8 |
| 32 | 36443 | 68758 | 34942 | 63828 | 63137 | 55.1 |
| 33 | 35024 | 68684 | 34450 | 63828 | 63137 | 54.4 |
| 34 | 33451 | 68611 | 33906 | 63828 | 63137 | 53.5 |
| 35 | 31722 | 68537 | 33311 | 63828 | 63137 | 52.6 |
| 36 | 29839 | 68463 | 32665 | 63828 | 63137 | 51.6 |
| 37 | 27800 | 68390 | 31968 | 63828 | 63137 | 50.5 |
| 38 | 25606 | 68316 | 31220 | 63828 | 63137 | 49.3 |
| 39 | 23258 | 68242 | 30420 | 63828 | 63137 | 48.1 |
| 40 | 20754 | 68169 | 29570 | 63828 | 63137 | 46.7 |
| 41 | 18095 | 68095 | 28668 | 63828 | 63137 | 45.3 |
| 42 | 15282 | 68021 | 27715 | 63828 | 63137 | 43.8 |
| 43 | 12313 | 67947 | 26711 | 63828 | 63137 | 42.2 |
| 44 | 9189 | 67874 | 25656 | 63828 | 63137 | 40.6 |
| 45 | 5911 | 67800 | 24550 | 63828 | 63137 | 38.9 |
| 46 | 2477 | 67726 | 23393 | 63828 | 63137 | 37.0 |
| 47 | -1112 | 67653 | 22918 | 63828 | 63137 | 36.3 |
| 48 | -4855 | 67579 | 24128 | 63828 | 63137 | 38.2 |
| 49 | -8754 | 67505 | 25390 | 63828 | 63137 | 40.2 |

| Elevation | Moment | Accum. Download | Resolved Legload | Panel / Span Capacity | | % Loaded |
|---|---|---|---|---|---|---|
| 100 | 9941 | 57847 | 22562 | 63828 | 63137 | 35.7 |
| 101 | 7491 | 57775 | 21730 | 63828 | 63137 | 34.4 |
| 102 | 4834 | 57703 | 20829 | 63828 | 63137 | 33.0 |
| 103 | 1969 | 57631 | 19860 | 63828 | 63137 | 31.4 |
| 104 | -1103 | 57558 | 19550 | 63828 | 63137 | 31.0 |
| 105 | -4381 | 57486 | 20608 | 63828 | 63137 | 32.6 |
| 106 | -7867 | 57414 | 21733 | 63828 | 63137 | 34.4 |
| 107 | -11560 | 57342 | 22928 | 63828 | 63137 | 36.2 |
| 108 | -15460 | 57270 | 24190 | 63828 | 63137 | 38.2 |
| 109 | -19567 | 57198 | 25521 | 63828 | 63137 | 40.3 |
| 110 | -23881 | 57125 | 26921 | 63828 | 63137 | 42.5 |
| 111 | -28403 | 57053 | 28388 | 63828 | 63137 | 44.8 |
| 112 | -33131 | 56981 | 29924 | 63828 | 63137 | 47.2 |
| 113 | -38066 | 56909 | 31528 | 63828 | 63137 | 49.7 |
| 114 | -43209 | 56837 | 33201 | 63828 | 63137 | 52.3 |
| 115 | -48559 | 56764 | 34942 | 63828 | 63137 | 55.1 |
| 116 | -54115 | 56692 | 36751 | 63828 | 63137 | 57.9 |
| 117 | -59879 | 56620 | 38628 | 63828 | 63137 | 60.8 |
| 118 | -65850 | 56548 | 40574 | 63828 | 63137 | 63.9 |
| 119 | -72028 | 56476 | 42588 | 63828 | 63137 | 67.0 |
| 120 | -78414 | 56404 | 44671 | 63828 | 63137 | 70.3 |
| 121 | -69333 | 38140 | 35587 | 63828 | 65715 | 55.2 |
| 122 | -60490 | 38068 | 32646 | 63828 | 65715 | 50.6 |
| 123 | -51884 | 37997 | 29783 | 63828 | 65715 | 46.1 |
| 124 | -43515 | 37926 | 26998 | 63828 | 65715 | 41.7 |
| 125 | -35383 | 37855 | 24292 | 63828 | 65715 | 37.5 |
| 126 | -27488 | 37783 | 21663 | 63828 | 65715 | 33.4 |
| 127 | -19831 | 37712 | 19113 | 63828 | 65715 | 29.4 |
| 128 | -12410 | 37641 | 16641 | 63828 | 65715 | 25.5 |
| 129 | -5227 | 37569 | 14248 | 63828 | 65715 | 21.8 |
| 130 | 1720 | 37498 | 13067 | 63828 | 65715 | 19.9 |
| 131 | 7610 | 36614 | 14715 | 63828 | 65715 | 22.5 |
| 132 | 13263 | 36543 | 16557 | 63828 | 65715 | 25.4 |
| 133 | 18679 | 36473 | 18320 | 63828 | 65715 | 28.2 |
| 134 | 23857 | 36403 | 20005 | 63828 | 65715 | 30.8 |
| 135 | 28799 | 36332 | 21612 | 63828 | 65715 | 33.3 |
| 136 | 33504 | 36262 | 23141 | 63828 | 65715 | 35.7 |
| 137 | 37971 | 36192 | 24591 | 63828 | 65715 | 38.0 |
| 138 | 42201 | 36121 | 25963 | 63828 | 65715 | 40.1 |
| 139 | 46195 | 36051 | 27257 | 63828 | 65715 | 42.2 |
| 140 | 49951 | 35980 | 28473 | 63828 | 65715 | 44.1 |
| 141 | 52633 | 35097 | 29063 | 63828 | 65715 | 45.0 |
| 142 | 55078 | 35027 | 29847 | 63828 | 65715 | 46.2 |
| 143 | 57286 | 34958 | 30552 | 63828 | 65715 | 47.3 |
| 144 | 59257 | 34888 | 31179 | 63828 | 65715 | 48.3 |
| 145 | 60991 | 34819 | 31728 | 63828 | 65715 | 49.2 |
| 146 | 62488 | 34750 | 32199 | 63828 | 65715 | 49.9 |
| 147 | 63748 | 34680 | 32591 | 63828 | 65715 | 50.5 |
| 148 | 64770 | 34611 | 32906 | 63828 | 65715 | 51.0 |
| 149 | 65556 | 34541 | 33142 | 63828 | 65715 | 51.4 |

| Elevation | Moment | Accum. Download | Resolved Legload | Panel / Span Capacity | | % Loaded |
|---|---|---|---|---|---|---|
| 150 | 66104 | 34472 | 33299 | 63828 | 65715 | 51.7 |
| 151 | 64529 | 33657 | 32508 | 63828 | 65715 | 50.4 |
| 152 | 62717 | 33596 | 31890 | 63828 | 65715 | 49.5 |
| 153 | 60667 | 33534 | 31193 | 63828 | 65715 | 48.4 |
| 154 | 58381 | 33473 | 30418 | 63828 | 65715 | 47.2 |
| 155 | 55857 | 33412 | 29565 | 63828 | 65715 | 45.8 |
| 156 | 53097 | 33350 | 28634 | 63828 | 65715 | 44.4 |
| 157 | 50099 | 33289 | 27625 | 63828 | 65715 | 42.8 |
| 158 | 46864 | 33228 | 26537 | 63828 | 65715 | 41.1 |
| 159 | 43392 | 33166 | 25371 | 63828 | 65715 | 39.3 |
| 160 | 39683 | 33105 | 24127 | 63828 | 65715 | 37.3 |
| 161 | 31487 | 31822 | 20995 | 63828 | 65715 | 32.4 |
| 162 | 23054 | 31768 | 18195 | 63828 | 65715 | 28.0 |
| 163 | 14384 | 31715 | 15317 | 63828 | 65715 | 23.5 |
| 164 | 5477 | 31662 | 12361 | 63828 | 65715 | 18.9 |
| 165 | -3668 | 31608 | 11746 | 63828 | 65715 | 17.9 |
| 166 | -13049 | 31555 | 14823 | 63828 | 65715 | 22.8 |
| 167 | -22668 | 31502 | 17979 | 63828 | 65715 | 27.7 |
| 168 | -32523 | 31449 | 21213 | 63828 | 65715 | 32.8 |
| 169 | -42616 | 31395 | 24525 | 63828 | 65715 | 38.0 |
| 170 | -52946 | 31342 | 27915 | 63828 | 65715 | 43.3 |
| 171 | -46098 | 2113 | 15913 | 63828 | 72067 | 24.8 |
| 172 | -39401 | 2043 | 13680 | 63828 | 72067 | 21.3 |
| 173 | -32854 | 1973 | 11496 | 63828 | 72067 | 17.9 |
| 174 | -26457 | 1902 | 9363 | 63828 | 72067 | 14.6 |
| 175 | -20211 | 1832 | 7279 | 63828 | 72067 | 11.3 |
| 176 | -14115 | 1762 | 5244 | 63828 | 72067 | 8.1 |
| 177 | -8170 | 1691 | 3259 | 63828 | 72067 | 5.0 |
| 178 | -2376 | 1621 | 1324 | 63828 | 72067 | 2.0 |
| 179 | -1113 | 320 | 474 | 63828 | 72067 | 0.7 |
| 180 | 0 | 250 | 83 | 63828 | 72067 | 0.1 |

```
Input File:E

*Tower Data File*
*Associated Data Files*
E.out
E.mom
E.mcn
*ID*
CDT
Ashford, CT
6111
*th face wind ice vo int az*
 180  42  85  0  1  1  0
*Beam Configuration*
HBHBHBHC
*Guy Data*
 3
 2  170  145  1
 2  120  145  1
 1  60  145  1
*Section Inertia*
 4
 0  60  7.270259E-02
 60  120  7.270259E-02
 120  170  7.270259E-02
 170  180  7.270259E-02
*Leg Capacity*
 3
 0  120  63828.3  63136.79
 120  170  63828.3  65715.18
 170  180  63828.3  72067.23
*Point Loads*
 14
 3 12' Cellular Boom , 178  284.82  170
 9 Sinclair SRL 411C9R130 , 178  391.8543  80
 10 PD 10017 , 180  103.7366  25
 3 12' Cellular Boom , 170  281.1024  170
 9 ALP 9212 , 170  123.5418  27
 3 12' Cellular Boom , 160  276.2752  170
 9 Sinclair SRL 411C9R130 , 160  380.0984  80
 3 12' Cellular Boom , 150  271.2275  170
 9 ALP 9212 , 150  119.2019  27
 1 6' MHP Dish , 140  836.7584  814
 1 6' MHP Dish , 130  819.2274  814
 1 6' MHP Dish , 120  800.7048  814
 1 G42 Torque Arm , 170  537.1382  262
 1 G42 Torque Arm , 120  486.258  262
*Uniform Loads*
 11
 19 LDF7-50A  1-5/8" , 170  180  5.5  .9
 9 LDF7-50A  1-5/8" , 170  170  0  .9
 9 LDF7-50A  1-5/8" , 0  160  0  .9
 9 LDF7-50A  1-5/8" , 0  150  0  .9
```

```
 1 LDF7-50A  1-5/8" , 0  140  0  .9
 1 LDF7-50A  1-5/8" , 0  130  0  .9
 1 LDF7-50A  1-5/8" , 0  120  0  .9
 1 Tower Span 1 , 0  60  155  54.78
 1 Tower Span 2 , 60  120  207.1  53.28
 1 Tower Span 3 , 120  170  237.1  53.28
 1 Tower Span 4 , 170  180  45.96  53.28
*End*
```