City of Portland, Maine – Building or Use Permit Application

389 Congress Street, 04101, Tel: (207) 874-8703, FAX: 874-8716

Location of Construction: 1 Monument Square (rooftop) 04101	Owner: Pinard & Company		Phone: 772-2257
Owner Address: 1 Monument Sq. Portland, ME 04101	Lessee/Buyer's Name: Portland Cellular Partnership	Phone: 772-3456	BusinessName: Portland Cellular
Contractor Name: Maine Tower Services	Address: 150 Riverside Street, Ptld, ME 101 Mighty St. G 04103	Phone: 839-7000	
Past Use: Communication Facility	Proposed Use: Gorham, ME 04038 Same	COST OF WORK: $ 25,000	PERMIT FEE: $ 174.00
		FIRE DEPT. ☐ Approved ☐ Denied Signature:	INSPECTION: Antennas Use Group: 1OOCA 96 Type: Signature:

Proposed Project Description:

Replacement of 10 communication cellular antennas and addition of 2 extra antennas onto an existing tower and facilities at the top of 1 Monument Sq.

PEDESTRIAN ACTIVITIES DISTRICT (P.A.D.)

Action: Approved ☐ Approved with Conditions: ☐ Denied ☐

Signature: Date:

Permit Taken By: KA	Date Applied For: 10-25-99

1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal rules.
2. Building permits do not include plumbing, septic or electrical work.
3. Building permits are void if work is not started within six (6) months of the date of issuance. False information may invalidate a building permit and stop all work..

***Please Send To: Portland Cellular Partnership
150 Riverside Street
Portland, ME 04103

#3

PERMIT ISSUED WITH REQUIREMENTS

CERTIFICATION

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provisions of the code(s) applicable to such permit

10-25-99

SIGNATURE OF APPLICANT | ADDRESS: | DATE: | PHONE:

RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE | PHONE:

White–Permit Desk Green–Assessor's Canary–D.P.W. Pink–Public File Ivory Card–Inspector

Permit No: 991180

Permit Issued: OCT 27 1999 CITY OF PORTLAND

Zone: **CBL:** 032-K-012

Zoning Approval:

Special Zone or Reviews:
- ☐ Shoreland
- ☐ Wetland
- ☐ Flood Zone
- ☐ Subdivision
- ☐ Site Plan maj ☐ minor ☐ mm ☐

Zoning Appeal
- ☐ Variance
- ☐ Miscellaneous
- ☐ Conditional Use
- ☐ Interpretation
- ☐ Approved
- ☐ Denied

Historic Preservation
- ☐ Not in District or Landmark
- ☐ Does Not Require Review
- ☐ Requires Review

Action:
- ☐ Appoved
- ☐ Approved with Conditions
- ☐ Denied

Date: _____

PERMIT ISSUED WITH REQUIREMENTS

CEO DISTRICT

THIS IS NOT A PERMIT/CONSTRUCTION CANNOT COMMENCE UNTIL THE PERMIT IS ISSUED

Building or Use Permit Pre-Application

Attached Single Family Dwellings/Two-Family Dwelling

Multi-Family or Commercial Structures and Additions Thereto

In the interest of processing your application in the quickest possible manner, please complete the Information below for a Building or Use Permit.

NOTEIf you or the property owner owes real estate or personal property taxes or user charges on ANY PROPERTY within the City, payment arrangements must be made before permits of any kind are accepted.**

Location/Addressof Construction (include Portion of Building): 1 MONUMENT SQUARE (ROOFTOP) 04101		
Total Square Footage of Proposed Structure: EXISTING N/A	Square Footage of Lot: N/A	
Tax Assessor's Chart, Block & Lot Number Chart# 032 Block# K Lot# 017	Owner: FINARD & COMPANY	Telephone#: 772-2257
Owner's Address: 1 MONUMENT SQ. PORTLAND, ME 04101	Lessee/Buyer's Name (If Applicable) 772-3456 PORTLAND CELLULAR PARTNERSHIP 150 RIVERSIDE ST. PORTLAND, ME 04103	Cost Of Work: $ 25,000.— Fee: $ 174.00
Proposed Project Description:(Please be as specific as possible) REPLACEMENT OF 10 COMMUNICATION CELLULAR ANTENNAS AND ADDITION OF 2 EXTRA ANTENNAS ONTO AN EXISTING TOWER AND FACILITIES AT THE TOP OF 1 MONUMENT SQ.		
Contractor's Name, Address & Telephone: MAINE TOWER SERVICES 101 MIGHTY ST, GORHAM, ME 04038 839-7000		Rec'd By: K
Current Use: COMMUNICATION FACILITY	Proposed Use: SAME	

Separate permits are required for Internal & External Plumbing, HVAC and Electrical installation.

•All construction must be conducted in compliance with the 1996 B.O.C.A. Building Code as amended by Section 6-Art II.

•All plumbing must be conducted in compliance with the State of Maine Plumbing Code.

•All Electrical Installation must comply with the 1996 National Electrical Code as amended by Section 6-Art III.

•HVAC(Heating, Ventililation and Air Conditioning) installation must comply with the 1993 BOCA Mechanical Code.

You must Include the following with you application:

1) ACopy of Your Deed or Purchase and Sale Agreement ✓

2) A Copy of your Construction Contract, if available NA

3) A Plot Plan/Site Plan ✓

Minor or Major site plan review will be required for the above proposed projects. The attached checklist outlines the minimum standards for a site plan.

RECEIVED OCT 25 1999

4) Building Plans ✓

Unless exempted by State Law, construction documents must be designed by a registered design professional.

A complete set of construction drawings showing all of the following elements of construction:

- Cross Sections w/Framing details (including porches, decks w/ railings, and accessory structures)
- Floor Plans & Elevations
- Window and door schedules
- Foundation plans with required drainage and dampproofing
- Electrical and plumbing layout. Mechanical drawings for any specialized equipment such as furnaces, chimneys, gas equipment, HVAC equipment (air handling) or other types of work that may require special review must be included.

Certification

I hereby certify that I am the Owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his/her authorized agent. I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in this application is issued, I certify that the Code Official's authorized representative shall have the authority to enter all areas covered by this permit at any reasonable hour to enforce the provisions of the codes applicable to this permit.

Signature of applicant: AGENT James Seymour	**Date:** 10-25-99

Building Permit Fee: $30.00 for the 1st $1000.cost plus $6.00 per $1,000.00 construction cost thereafter.

Additional Site review and related fees are attached on a separate addendum

Sebago Technics

Engineering & Planning for the Future

October 25, 1999
99410

Samuel Hoffses, Code Enforcement Officer
City of Portland
389 Congress Street
Portland, ME 04101

One Monument Square - Antenna Change-Out
Portland Cellular Partnership (PCP), Portland, Maine

Dear Mr. Hoffses:

We have attached the necessary documentation and calculations to show that a change-out or swapping of antennas atop One Monument Square meets the necessary structural codes for stability and strength. Currently, the tower at One Monument Square has ten panel antennas, previously completed by Northeast Cellular (d/b/a Maine Wireless). However, due to our digital upgrade needs within the Downtown Portland area, new panel antennas are necessary. In addition to the full swap of 10 panels, an extra two panels will be added to assist in the current and future capacity demand. Our structural analysis has been completed for the full 12 panel antenna build-out and shows that the current tower can handle all the required load conditions with some minor tower repairs. As part of periodic routine maintenance, the tower repairs have been completed.

It is our outstanding that a change-out or swap and addition of antennas requires a building permit even though no change of the building area or tower will occur.

Recently, Portland Cellular Partnership has been upgrading its sites acquired from the Maine Wireless FCC licensing reversal decision. This work needs to be completed immediately to meet the network build-out of Bell Atlantic Mobile who is the major holder of Portland Cellular Partnership and soon will be the name holder of PCP's market. We believe that this does not require site plan review and can be approved at the Code Enforcement level. We would appreciate any effort you could make to allow us to begin as soon as possible changing the 10 panel antennas currently on One Monument Square. The additional two antennas will be added concurrently at the time of the swapping procedure.

Sincerely,

SEBAGO TECHNICS, INC.

James R. Seymour

James R. Seymour
Project Engineer

JRS:dlf/jc
Enc.

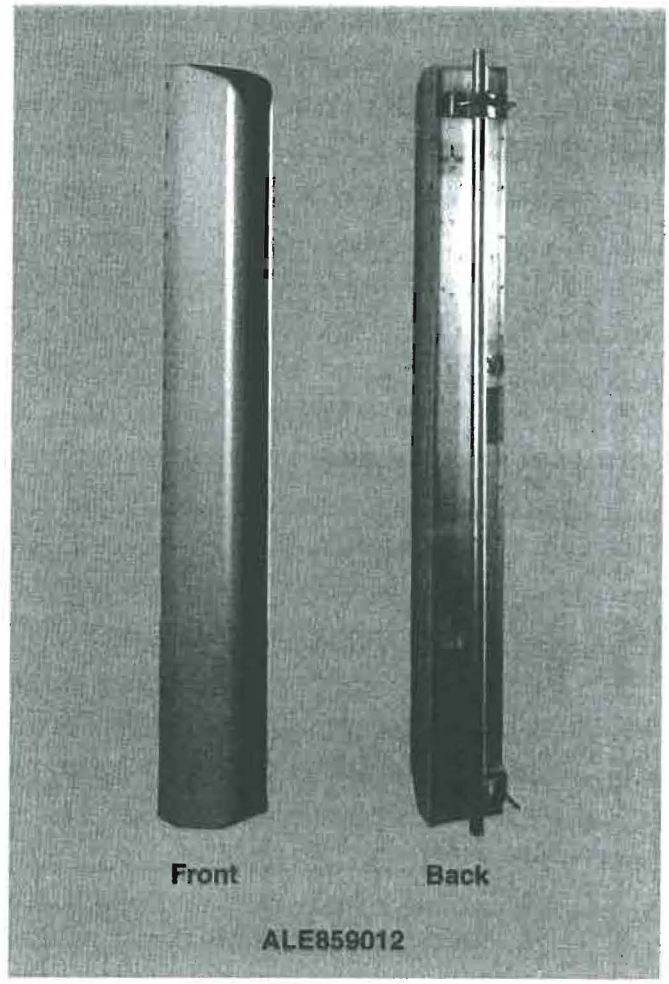
cc: Ed Shaw, PCP
Sheila Becker, Bell Atlantic Mobil
Ray Pelletier, Verrill & Dana

Optimizer™ Directional Panel Antennas

ALE859012

The Celwave Optimizer is a log periodic dipole antenna with continuously adjustable electrical downtilt. By utilizing the patent pending adjustable electrical downtilt feature ESMR, cellular, and paging system performance can be optimized in the field. This optimization is done simply and easily by turning a dial on the back of the antenna. The Optimizer features our patented CELite technology, which eliminates cables and soldered joints, often the cause of reduced system performance due to potential long-term IM issues. The Optimizer also features a high front-to-back ratio which reduces co-channel interference. The Optimizer has been shown to significantly reduce interference in actual field performance.

- **Continuous dial-turn adjustment of electrical downtilt**
  Allows electrical tilt to be changed easily without the hassles of changing out the whole antenna.
- **Electrical downtilt footprint is continuously adjustable**
  Easy optimization of system performance and minimization of co-channel interference.
- **High front-to-back ratio**
  Minimizes co-channel interference towards rear of site.
- **Continuously adjustable electrical downtilt**
  Allows pilot pollution to be minimized in CDMA systems.
- **High reliability.**
  No solder joints



Order Information

Item Number	Frequency Range MHz
ALE859012	806- 941

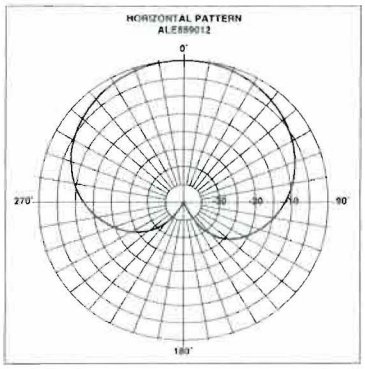
Optimizer™ Directional Panel Antennas

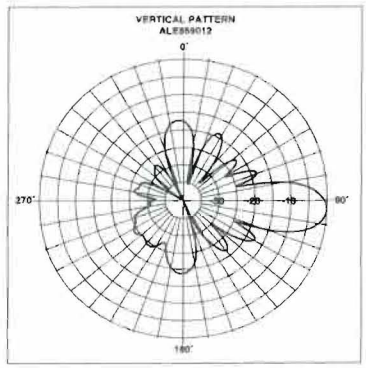
ELECTRICAL SPECIFICATIONS	ALE859012
Frequency Range - MHz	806-941
Gain - dBd (dBi)	11.5 (13.6)
Bandwidth - MHz for 1.5:1 VSWR	135
Horizontal Beamwidth - Degrees	90
Vertical Beamwidth - Degrees	16
Null Fill - dB Typ.	-
Upper Sidelobe Suppression - dB Typ.	-
Polarization	Vertical
Front-To-Back Ratio - dB*	40
Maximum Power Input - Watts	500
Lightning Protection	Direct Ground
Termination - Direct Fixed	7/16 DIN,N-female
Electrical Downtilt - Degrees	0-14
3rd Order IMD 16 x 41 dBm: -dBm	-100

Note: *typ 40 dB 824-894, typ 32 dB 806-824

MECHANICAL SPECIFICATIONS	
Dimensions - WxDxH - in. (mm)	48.3 X 10.1 X (1227 X 197 X 257)
Weight w/o Mtg. Hardware - lbs. (kg)	15.5 (7.0)
Weight w/ Mtg. Hardware - lbs. (kg)	22 (10)
Radiating Element Material	Aluminum Alloy
Radome Material	UV Resistant ABS
Reflector Material	Aluminum Alloy
Max Wind Loading Area (Flat Plate Equivalent) - ft² (m²)	2.6 (0.242)
Rated Wind Speed - mph (km/hr)	125 (201)
Maximum Thrust @ Rated Wind - lbf (N)	163 (725)
Side Wind Loading Area (FPE) - ft² (m²)	3.4 (0.32)
Side Thrust @ Rated Wind - lbf (N)	213 (947)
Mounting Hardware - Supplied	10238-1
Mounting Hardware - Optional	N/A

SHIPPING SPECIFICATIONS	
Shipping Weight - lbs. (kg)	20 (9.1)
Shipping Dimensions of Antenna - WxDxH - in. (mm)	91 x 18 x 12 (2311 x 457 x 305)
Shipping Dimensions of Accessory - WxDxH in. (mm)	Packed w/antenna
Shipping Mode	TBD





MEMORANDUM OF LEASE

THIS MEMORANDUM OF LEASE is made this 9th day of September, 1999, pursuant to Title 33, Section 201 of the Maine Revised Statutes with respect to the following described Lease:

DATE OF LEASE:	September 1, 1994, as amended by Amendment of Lease dated March 29, 1999
LANDLORD:	Congress Federal Realty, LLC, as successor Trustee of Congress Federal Trust, having a mailing address c/o Finard & Company, LLC, Three Burlington Woods Drive, Burlington, Massachusetts 01803
TENANT:	Portland Cellular Partnership, a Maine general partnership with a mailing address of 150 Riverside Street, Portland, Maine 04103, successor in interest to the original tenant, Northeast Cellular Telephone Company, L.P.
DEMISED PREMISES:	300 square feet of space consisting of a room containing 200 square feet of floor area on the Penthouse level and an adjoining area of the Penthouse floor containing 100 square feet of floor area, in the building owned by Landlord known as One Monument Square, at Congress Street and Monument Square, in Portland, Maine (the "Building"), as shown on Exhibit A attached hereto, together with the nonexclusive right to use in common with others the common facilities from time to time included in the Building or on the parcel of land on which the Building is located (the "Lot"), and together with the right to install an antenna system on the exterior Penthouse wall near the cooling tower, all as more fully set forth in the Lease.
TERM:	A term of twenty (20) years commencing on September 1, 1994 and expiring on August 31, 2014.
RENEWAL TERMS:	None
TENANT'S FACILITIES:	All equipment and facilities installed, erected or placed by Tenant on the demised premises in accordance with the provisions of the Lease shall be and remain the property of Tenant.

THIS MEMORANDUM OF LEASE is prepared for recording and for the purpose of making a public record of said Lease, and it is intended that the parties shall be subject to all of the provisions of the Lease, and that nothing herein shall be construed or deemed to alter or change any of the terms or provision of the Lease.

IN WITNESS WHEREOF, Landlord has caused this Memorandum of Lease to be duly executed as of the day and year first above mentioned.

WITNESS.

CONGRESS FEDERAL TRUST

By: CONGRESS FEDERAL REALTY, LLC
as Trustee

By: _____
Print Name: William G Finard
Its: Trustee

COMMONWEALTH OF MASSACHUSETTS
Middlesex, SS. September 9, 1999

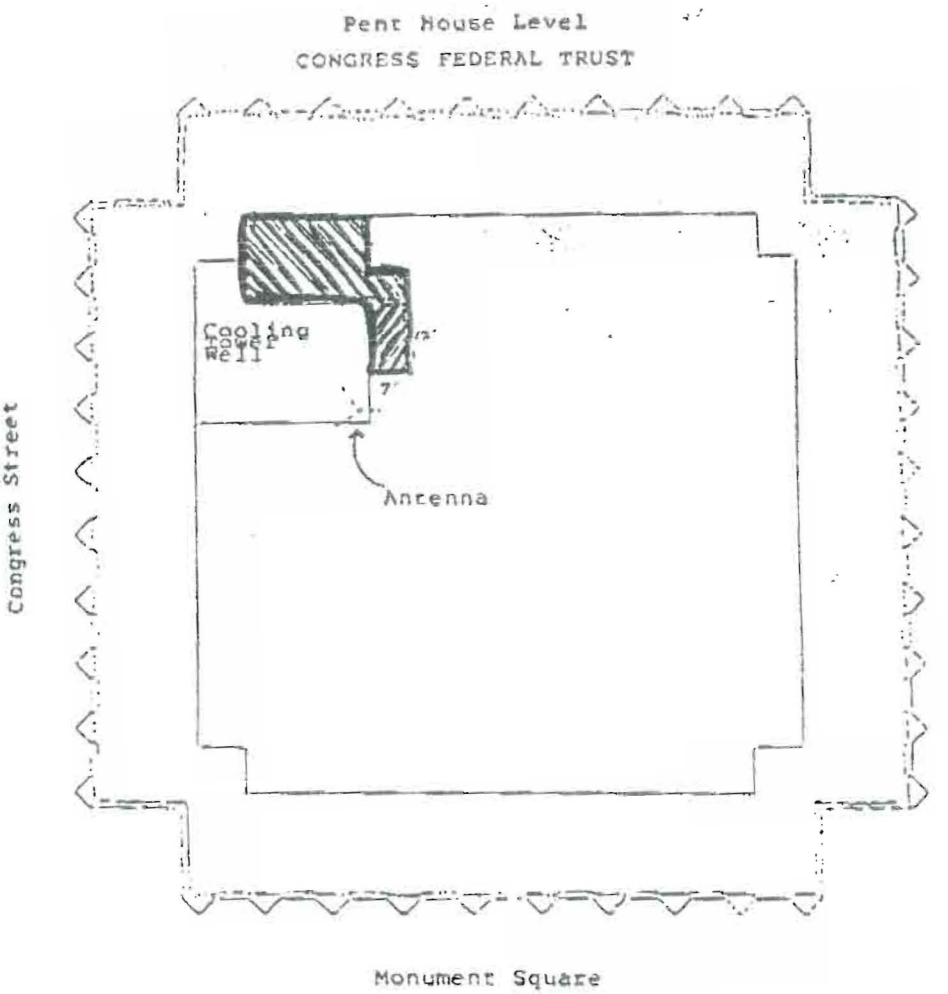
Then personally appeared the above-named William G Finard, _____ of Congress Federal Realty, LLC, Trustee of Congress Federal Trust, and acknowledged the foregoing instrument to be his/her free act and deed in his/her said capacity, and the free act and deed of Congress Federal Trust.

_____
Notary Public/~~Attorney-at-Law~~
Print Name: Robert K. Lemons
My Commission Expires: Dec 7, 2001

P:\PPRT\DCFLL\Northeast\memPort.wpd

EXHIBIT A

PLAN



FRED A. NUDD CORPORATION

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

Analysis of
40 ' Self Supporting Tower

MODEL #: G30WRAR

PROJECT #: 7145

LOCATION: Portland, ME

for

ATLANTIC TELCOM SERVICES
40 Blake Road
Standish, ME 04084

September, 1999

FRED A. NUDD CORPORATION
1743 ROUTE 104, BOX 577
ONTARIO, NY 14519
(315) 524 -2531 FAX (315) 524-4249
www.nuddtowers.com

September 24, 1999

George Crouse
Atlanttic Telcom Services
40 Blake Road
Standish, ME 04084

George,

We have completed the analysis of the tower installed at One Monument Square in Portland, ME and have found it adequate to support the proposed antenna loading with the proposed structural modifications implemented. The analysis was performed using 80 mph wind speed with 1/2" radial ice per EIA/TIA 222-F recommended standard for Cumberland County.

The tower we analyzed is a 40' Nudd G30WRAR mounted on the wall of a penthouse room. The tower consists of rod legs and rod/angle bracing. Tower sections are all-welded with a face dimension of 30". Support wall reaction capacities are unknown to us and will have to be verified by the building architect.

The antenna loading used in the analysis consisted of the following proposed antennas:

QTY	Antenna	Elev.	T-Line	Status
12	Celwave ALE859012	38	7/8" Heliax	BAM Proposed
3	G42 Cellarms/12' Booms	38		Existing
1	6' MHP dish	28	EW64	Existing

The results of the analysis showed the legs in section 1 (4th section from bottom) being 115% loaded. To reinforce the tower leg, 1-1/2" Sch.80 pipe stitch welded together and to the leg will make the leg elements 91% loaded. Note that this is 6 pieces to be added. The estimated cost for reinforcement is $1500 plus travel. All other tower elements were loaded within allowable limits. Note also that the analysis assumes that the broken diagonal brace is repaired to a fully functioning condition.

If you have any questions concerning this analysis, please contact me.

Sincerely,

FRED A. NUDD CORPORATION

Patrick Botimer
Engineer

SYNOPSIS OF TOWER ANALYSIS

1. Wind loading conditions considered:
   75% wind load with concurrent 1/2" ice.
   100% wind with no ice.

Worst wind load case is wind with ice.

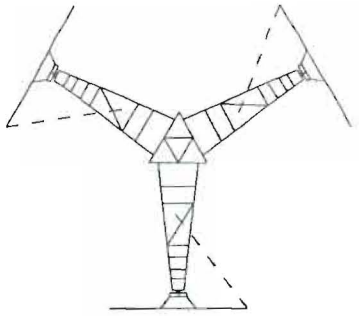
2. Maximum Leg Load: 91% loaded after reinforcement

3. Tower Bracing: 48% loaded

4. Foundations: Unknown

PRIMARY ASSUMPTIONS USED IN THE ANALYSIS

1. Allowable steel stresses are defined by AISC-ASD 9th Edition.
2. All tower members adequately galvanized to prevent corrosion of steel members.
3. All proposed antenna mounts are modeled as Nudd manufactured.
4. No residual stresses due to incorrect tower erection.
5. All bolts are appropriately tightened providing the necessary connection continuity.
6. All welds conform to the requirements of AWS D1.1.
7. We have assumed an allowable wind speed of 80 mph (Cumberland Co.) per EIA/TIA 222-F standard for analysis purposes.
8. The acceptability of the analyzed antenna loading is the responsibility of Atlantic Telcom to confirm with the tower owner.
9. Any deviation from the analyzed antenna loading will require a tower analysis for verification of structural integrity.
10. This analysis has been commissioned by George Crouse of Atlantic Telcom Services who has provided information about the proposed antennas and location.

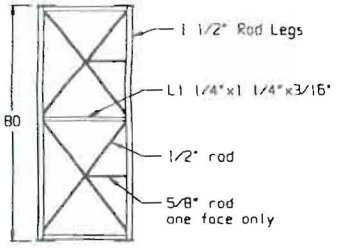


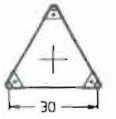
G30 tower / G42 cellarm
with 12' booms

TOWER ANAL ONDITIONS
This tower nalyzed to resist 80 mph wind speed (Cumberland Co)
with 1/2" radial ice per ANSI/EIA/TIA-222-F recommended standard.
Worst 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 ASSUMPTIONS
Tower Legs: ASTM A36-Modified, Fy > 45 ksi
All other Steel: ASTM A36, Fy > 36 ksi
Hardware: ASTM A325 Hot Dipped Galvanized Bolts
with Anco Nuts.
Galvanizing: ASTM A123
Anchor Bolts: ASTM A36, Fu > 58 ksi
***Results of tower mast analysis: Pass pending reinforcement
***Results of foundation analysis: Unknown

NOTE: THIS CERTIFICATION DOES NOT INCLUDE THE WALL CONNECTION.





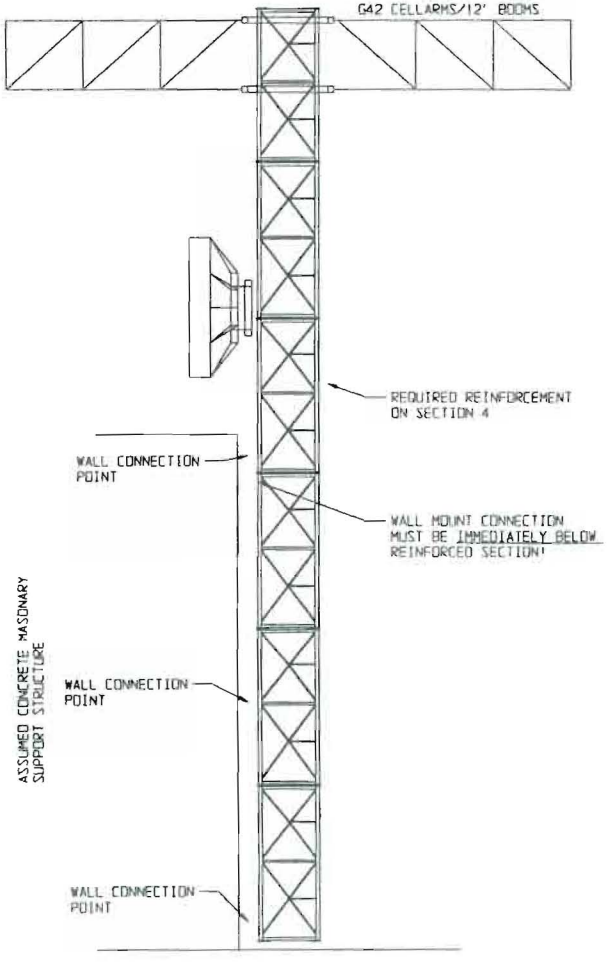
G30WRR TOWER SECTION

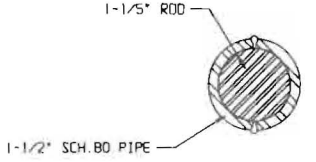
TOWER LOADING CONDITIONS

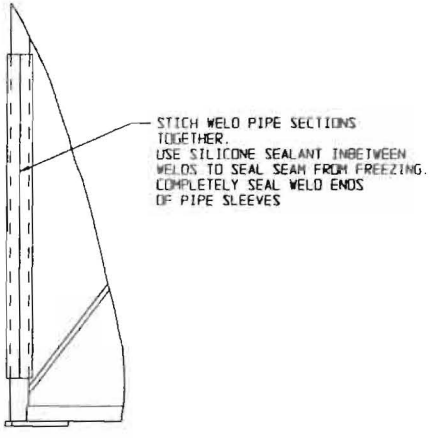
QTY	Antenna	Elevation	Windload	Deadload	
12	Celwave ALE8590I2	18	138	20	BAM Proposed
3	12' Cellular Boon	18	221	170	
3	G42 Boon Cellarms	18	320	301	
1	6' MHP Dish	8	1101	814	Existing

QTY	Type	Elevation Start	Stop	#/ft Windload	Deadload
12	LDF5-50A 7/8	0	18	3.3	1.3
1	EW64	0	8	4.5	1.7

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







REINFORCEMENT DETAIL
ALL THREE LEGS OF SECT 4 (12 HALVES TOTAL)

FRED A. NUDD CORPORATION
Route 104-Ontario, New York 14519-315/524-2531

SCALE: N/S
DRAWN BY: PCB
DATE: 9/27/99

ANALYSIS OF 40' G30WRAR TOWER

ATLANTIC TELCOM SERVICES
ONE MONUMENT SQR/PORTLAND, ME

DRAWING NUMBER: 99-7145-1

9/24/99
11:34:54 AM
Atlantic Telcom
Portland, ME
Project #: 7145

TOWER SECTION GEOMETRY

Section #	Top Face		Bottom Face		Bottom Elevation	Section Length
3	30.0"	2'- 6"	30.0"	2'- 6"	13.3'	6.7'
2	30.0"	2'- 6"	30.0"	2'- 6"	6.7'	6.7'
1	30.0"	2'- 6"	30.0"	2'- 6"	0.0'	6.7'

Section #	Leg OD x Wall (in)	Diag OD x Wall (in)	Panels/ section	Braces /panel	Section Wt.
3	1.500x 0.750	0.500x 0.250	2	2	256
2	1.500x 0.750	0.500x 0.250	2	2	256
1	1.500x 0.750	0.500x 0.250	2	2	256

				Tower Steel Wt:	767 lbf

9/24/99
11:34:54 AM
Atlantic Telcom
Portland, ME
Project #: 7145

TOWER SECTION FORCE /LOAD RESOLUTION DATA

Section #	Section Moment (ft-kip)	Accum. Moment (ft-kip)	Section Shear (kip)	Accum. Shear (kip)	Section Deadload (kip)	Accum. Deadload (kip)
--	0.00(1)	0.00(1)	0.00(1)	0.00(1)	0.00(1)	0.00(1)
3	0.62(2)	16.36(2)	0.19(2)	3.65(2)	0.44(2)	2.16(2)
2	0.61(2)	43.68(2)	0.18(2)	5.21(2)	0.44(2)	3.52(2)
1	0.60(2)	79.99(2)	0.18(2)	5.69(2)	0.44(2)	4.07(2)

Case (1): Wind with No Ice
Case (2): Wind with Ice

9/24/99
11:34:54 AM
Atlantic Telcom
Portland, ME
Project #: 7145

TOWER LEG CAPACITIES

Section #	Leg Compression Member Load (kip)	% Loaded	Leg Tension Member Load (kip)	%Loaded
3	8.28	25.0%	6.83	10.7%
2	21.35	64.6%	19.00	29.9%
1	38.30	115.9%	35.59	55.9%

Minimum A36 Anchor Bolt options @ Fu= 58ksi
4 Bolts @ 0.666ø
6 Bolts @ 0.544ø
8 Bolts @ 0.471ø
10 Bolts @ 0.421ø
Note: See Foundation Calculations for specific anchor bolt selection.

9/24/99
11:34:54 AM
Atlantic Telcom
Portland, ME
Project #: 7145

TOWER DISPLACEMENTS (50 mph)

Section #	Section M/EI (*1000)	End Rotation (deg)	End Displacement (in)
3	0.340	0.0017	0.3
2	1.248	0.0015	0.2
1	2.571	0.0010	0.1

Limit of tower sway for 6' diameter, 16 GHz microwave dish is 0.5 degrees.

Checking Capacity of Section:

Atlantic Telcom
Portland, ME
9/99

Sections = 3

Material Properties:

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

$Fy_{brace} := 36000 \cdot psi$

Applied Shear at each Elevation:

Panel/Face Dimensions:

$Elevation_i$	$\frac{Shear_i}{lbf}$ =	$Panel_i$ =	$AverageFace_i$ =
13.3	3651.8	38	30
6.7	5209.2	36	30
0	5685.7	34	30

Shear Resolved into one face of tower:

$$FaceShear_i := \frac{Shear_i}{2 \cdot Faces \cdot \cos(30 \cdot deg)}$$

i =	$HorCompCap_i$ = °lbf	$FaceShear_i$ = °lbf	$\frac{FaceShear_i}{HorCompCap_i}$ = °%
1	6842.5	2108.4	30.8
2	6842.5	3007.5	44
3	6842.5	3282.6	48

Resolve face shear into diagonal bracing:

$$Diagonal_i := \frac{FaceShear_i}{2 \cdot braces \cdot \cos\left(atan\left(\frac{Panel_i}{AverageFace_i}\right)\right)}$$

Check Tension Capacity of bracing:

$Elevation_i$ =	$\frac{Diagonal_i}{lbf}$ =	$\frac{DiagCap_i}{lbf}$ =	$\frac{\%Loaded_i}{\%}$ =
13.3	1701.3	9763.2	17.4
6.7	2349	9763.2	24.1
0	2480.7	9763.2	25.4

Check flange bolt tension loads:

$LegTension := 35.59 \cdot kip$

$BoltTension := LegTension \cdot \frac{30}{26}$ $\quad BoltTension = 41.1 \cdot kip$

$BoltCapacity := 34.6 \cdot kip \cdot \frac{4}{3}$ $\quad \frac{BoltTension}{BoltCapacity} = 89 \cdot \%$

Calculate the required reinforcement for the legs in section 1:

Add a 1-1/2" Sch.80 pipe:

$XArea := \frac{\pi}{4} \cdot (1.5 \cdot in)^2$ $\quad Fy_{leg} := 45000 \cdot psi$

$r_{old} := \frac{1.5 \cdot in}{4}$ $\quad r_{new} := \frac{1.9 \cdot in}{4}$ $\quad Panel := 38 \cdot in$

$$Cc(Fy) := \sqrt{\frac{2 \cdot \pi^2 \cdot E}{Fy}}$$

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

$Pmax := XArea \cdot \frac{4}{3} \cdot Fa\left(1 \cdot \frac{Panel}{r_{new}}, Cc\left(Fy_{leg}\right), Fy_{leg}\right)$ $\quad Pmax = 42031.1 \cdot lbf$

$LegLoad := 38.3 \cdot kip$

$\frac{LegLoad}{Pmax} = 91.1 \cdot \%$

Calculate new Penthouse reactions:

$OTM := 80 \cdot kip \cdot ft$

$Shear := 5.69 \cdot kip$

$DeadLoad := 4.07 \cdot kip$

ΣMoments_About_Bottom_Support

Given

$$OTM + Shear \cdot 20 \cdot ft - TopReaction \cdot 20 \cdot ft = 0$$

$$TopReaction = 9690 \cdot lbf$$

ΣMoments_About_Top_Support

$$BottomReaction := \frac{OTM}{20 \cdot ft}$$

$$BottomReaction = 4000 \cdot lbf$$

Check shear on (6) 5/8" A325-N:

$$6 \cdot 6.4 \cdot kip = 38400 \cdot lbf$$

Building architect must verify thru-bolt adequacy.

TOWER LOADS

Point Loads

QTY	Antenna	Elevation (ft)	Windload (lb)	Deadload (lb)	
12	Celwave ALE859012	18	138	20	BAM Proposed
3	12' Cellular Boom	18	221	170	
3	G42 Boom Cellarms	18	320	301	
1	6' MHP Dish	8	1101	814	Existing
0	Sinclair SRL 410C4R130	18	102	40	
0	Andrew UHX-6	14	900	814	Existing
0	Andrew UHX-6	7	900	814	Existing
0	G30 Cell Arms	18	263	200	

Uniform Loads

QTY	Type	Elevation Start	Elevation Stop	#/ft Windload	#/ft Deadload
12	LDF5-50A 7/8	0	18	3.3	1.3
1	EW64	0	8	4.5	1.7
0	LDF7-50A 1-5/8	0	18	4.8	2.4
0	EW64	0	14	4.6	1.7
0	EW64	0	7	4.5	1.7

TRIANGULAR TOWER SECTION DATA

Client: Atlantic Telcom
Project: Portland, ME
9/24/99 3:31 PM

Self-Supporting Tower			
Wind Angle 0,60,90	0 °	Span:	1
Elevation of Foundation:	80 ft	Elev@Top	6 feet
Wind Speed	80 mph	Elev@Base	0 feet
Gh	1.16 EIA 2.3.4	Tower Ht.	20 feet
Wind Pres.	24.8 psf EIA 2.3.3	Top Face	30.00 inches 2.50
Radial Ice	0.5 inch	Bot Face	30.00 inches 2.50
EIA 2.3.15 Wind/Ice Reductn?	Yes	Taper/Se	0.00 in.
ANSI/EIA Overstress Factor:	Yes	Ave Face	30.00 inches
		Length	80 inches

LEGS	OD,L1	ID,L2	wall
1-1/2" Rod	1.500	0.000	0.750
DIAGONALS			
1/2" Rod	0.500	0.000	0.250
HORIZONTALS			
L1.3x1.3x3	1.300	1.300	0.188

FL.to BR	2 inches		
# Panel	2 panels		
Panel	38.00 inches		
Br/Panel	2 |x|		
Br Lngth	47.50 inches		
# Horiz	3	3	
Density	0.283 lb/in^3		
Bracing Type:	1 |x|		

Dbl Angle Gap:	0 in	
Galvanizing?	Yes	
WaveGuide hole reduction?	Yes	
SECTION GEOMETRY »	796	in^4
Section Ixx,Iyy »	796	in^4
Face Vert. Angle	0.000	°
Leg Angle in face	0.000	°
Leg/Axis Angle	0.000	°
Brace Angle	51.710	°

ITEM	DL	WL
Ladder:	100	10
Misc.	60	0
Total lbf:	160	10

SECTION 1 WIND LOAD / WEIGHT CALCULATIONS:

	Pro OD	X-Area	Weight	Ice Wt
Legs	2.500	1.767	120.0	24.4 lbs
Diagonals	1.500	0.196	31.7	29.0 lbs
Horizontals	2.300	0.452	34.6	27.1 lbs
Total Weig			196	81 lbs

Ag:	2600			K	1.00	
Af:	111	Df:	1.000			
Ar:	771	Rr:	0.629			
SR(e):	0.339	Dr:	1.000	Legs: KL/r	101.3	OK
Cf:	2.197			Fy	45000	psi
				EIA 3.1.1, Cc	112.8	
Area:	4.14		ft²	AISC E2 Fa	18706	psi
Shear:	179	26.9	lbf,lbf/	Max.Compresn.Force	33056	lbs
CnMoment:	597		ft-lbf			
Deadload:	436	65.4	lbf,lbf/ft	K	1.00	
Solid Area Windloads:				Diagonals : KL/r	151.8	OK
Shear:	868	130.2	lbf,lbf/ft	Fy	36000	psi
				Cc	126.1	

	inches²	feet²
Ae 0°	595.5	4.14
Ae 45°	714.6	4.96
Ae 60°	573.3	3.98
Ae 90°	578.8	4.02

		EIA 3.1.1 Fa	8635 psi
		Max.Compresn.Force	1695 lbs
		Max.Tension.Force*	5655 lbs
		*Verify Net Section on member.	
		K	1
		Horizontals: KL/r	112.4 OK
Span Length	7 ft	Cc	126.1
pan Capacity	62695 lbf/leg	EIA 3.1.1 Fa	15127 psi
		Max.Compresn.Force	6842 lbs

TRIANGULAR TOWER SECTION DATA

Client: Atlantic Telcom
Project: Portland, ME
9/24/99 3:31 PM

Self-Supporting Tower
Wind Angle 0,60,90 0 °
Elevation of Foundation: 80 ft
Wind Speed 80 mph
Gh 1.16 EIA 2.3.4
Wind Pres. 25.4 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
1-1/2" Rod	1.500	0.000	0.750
DIAGONALS			
1/2" Rod	0.500	0.000	0.250
HORIZONTALS			
L1.3x1.3x3	1.300	1.300	0.188

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

ITEM	DL	WL
Ladder:	100	10
Misc.	60	0
Total lbf:	160	10

Span: 2
Elev@Top 13 feet
Elev@Base 6.6666667 feet
Tower Ht. 20 feet
Top Face 30.00 inches 2.50
Bot Face 30.00 inches 2.50
Taper/Se 0.00 in.
Ave Face 30.00 inches
Length 80 inches
FL.to BR 2 inches
Panel 2 panels
Panel 38.00 inches
Br/Panel 2 |x|
Br Lngth 47.50 inches
Horiz 3 3
Density 0.283 lb/in^3
Bracing Type: 1 |x|

SECTION GEOMETRY » 796 in^4
Section Ixx,Iyy » 796 in^4
Face Vert. Angle 0.000 °
Leg Angle in face 0.000 °
Leg/Axis Angle 0.000 °
Brace Angle 51.710 °

SECTION 2 WIND LOAD / WEIGHT CALCULATIONS:

	Pro OD	X-Area	Weight	Ice Wt
Legs	2.500	1.767	120.0	24.4 lbs
Diagonals	1.500	0.196	31.7	29.0 lbs
Horizontals	2.300	0.452	34.6	27.1 lbs
			---	---
Total Weig			196	81 lbs

Ag:	2600				K	1.00
Af:	111	Df:	1.000			
Ar:	771	Rr:	0.629			
SR(e):	0.339	Dr:	1.000	Legs:	KL/r	101.3 OK
Cf:	2.197				Fy	45000 psi
				EIA 3.1.1,	Cc	112.8
Area:	4.14		ft²	AISC E2	Fa	18706 psi
Shear:	183	27.4	lbf,lbf/	Max.Compresn.Force		33056 lbs
CnMoment:	609		ft-lbf			
Deadload:	436	65.4	lbf,lbf/ft		K	1.00
Solid Area Windloads:				Diagonals :	KL/r	151.8 OK
Shear:	888	133.1	lbf,lbf/ft		Fy	36000 psi
					Cc	126.1

	inches²	feet²
Ae 0°	595.5	4.14
Ae 45°	714.6	4.96
Ae 60°	573.3	3.98
Ae 90°	578.8	4.02

		EIA 3.1.1	Fa	8635 psi
		Max.Compresn.Force		1695 lbs
		Max.Tension.Force*		5655 lbs
		*Verify Net Section on member.		
			K	1
		Horizontals:	KL/r	112.4 OK
			Cc	126.1
		EIA 3.1.1	Fa	15127 psi
		Max.Compresn.Force		6842 lbs

Span Length	7	ft
pan Capacity	62695	lbf/leg

TRIANGULAR TOWER SECTION DATA

Client: Atlantic Telcom
Project: Portland, ME
9/24/99 3:31 PM

Self-Supporting Tower
Wind Angle 0,60,90 0 °
Elevation of Foundation: 80 ft
Wind Speed 80 mph
Gh 1.16 EIA 2.3.4
Wind Pres. 25.9 psf EIA 2.3.3
Radial Ice 0.5 inch
EIA 2.3.15 Wind/Ice Reductn? Yes
ANSI/EIA Overstress Factor: Yes

Span: 3
Elev@Top 20 feet
Elev@Base 13.333333 feet
Tower Ht. 20 feet
Top Face 30.00 inches 2.50
Bot Face 30.00 inches 2.50
Taper/Se 0.00 in.
Ave Face 30.00 inches
Length 80 inches
FL.to BR 2 inches
Panel 2 panels
Panel 38.00 inches
Br/Panel 2 |x|
Br Lngth 47.50 inches
Horiz 3 3
Density 0.283 lb/in^3
Bracing Type: 1 |x|

LEGS	OD,L1	ID,L2	wall
1-1/2" Rod	1.500	0.000	0.750
DIAGONALS			
1/2" Rod	0.500	0.000	0.250
HORIZONTALS			
L1.3x1.3x3	1.300	1.300	0.188

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

SECTION GEOMETRY » 796 in^4
Section Ixx,Iyy » 796 in^4
Face Vert. Angle 0.000 °
Leg Angle in face 0.000 °
Leg/Axis Angle 0.000 °
Brace Angle 51.710 °

ITEM	DL	WL
Ladder:	100	10
Misc.	60	0
Total lbf:	160	10

SECTION 3 WIND LOAD / WEIGHT CALCULATIONS:

	Pro OD	X-Area	Weight	Ice Wt
Legs	2.500	1.767	120.0	24.4 lbs
Diagonals	1.500	0.196	31.7	29.0 lbs
Horizontals	2.300	0.452	34.6	27.1 lbs
			---	---
Total Weig			196	81 lbs

Ag: 2600
Af: 111 Df: 1.000
Ar: 771 Rr: 0.629
SR(e): 0.339 Dr: 1.000
Cf: 2.197

Area: 4.14 ft²
Shear: 186 28.0 lbf,lbf/
CnMoment: 621 ft-lbf
Deadload: 436 65.4 lbf,lbf/ft
Solid Area Windloads:
Shear: 906 135.9 lbf,lbf/ft

	inches²	feet²
Ae 0°	595.5	4.14
Ae 45°	714.6	4.96
Ae 60°	573.3	3.98
Ae 90°	578.8	4.02

Span Length 13 ft
pan Capacity 61594 lbf/leg

Legs: K 1.00
KL/r 101.3 OK
Fy 45000 psi
EIA 3.1.1, Cc 112.8
AISC E2 Fa 18706 psi
Max.Compresn.Force 33056 lbs

K 1.00
Diagonals : KL/r 151.8 OK
Fy 36000 psi
Cc 126.1
EIA 3.1.1 Fa 8635 psi
Max.Compresn.Force 1695 lbs
Max.Tension.Force* 5655 lbs
*Verify Net Section on member.

K 1
Horizontals: KL/r 112.4 OK
Cc 126.1
EIA 3.1.1 Fa 15127 psi
Max.Compresn.Force 6842 lbs

William E. Whited, Inc.
Professional Engineer
Registered Architect

October 21, 1999

Mr. Edward Shaw
Maine Wireless
150 Riverside Street
Portland, ME 04103

RE: Microwave Tower at One Monument Square, Portland
To Replace Existing Tower Installed in 1994

Dear Mr. Shaw:

A review of the new tower reactions compared with the reactions for the tower installed in 1994 shows that the new reactions are less than the 1994 tower reactions. The new installation will have a better safety factor than the earlier installation.

Sincerely,

William Whited

William E. Whited, P.E., R.A.
WILLIAM E. WHITED, INC.

1321 Washington Ave., Portland, ME 04103
(207) 878-4530 Fax (207) 878-4533

BUILDING PERMIT REPORT

DATE: 26 OCT. 99 ADDRESS: 1 Monument Sq. CBL: 032-K-012

REASON FOR PERMIT: Replace 10 Communication Antennas (2 extra)

BUILDING OWNER: Finard & Company

PERMIT APPLICANT: _____ /CONTRACTOR Maine Tower Service

USE GROUP: _____ CONSTRUCTION TYPE: _____ CONSTRUCTION COST: $25,000.00 PERMIT FEES: $174.00

The City's Adopted Building Code (The BOCA National Building code/1996 with City Amendments)
The City's Adopted Mechanical Code (The BOCA National Mechanical Code/1993)

CONDITION(S) OF APPROVAL

This permit is being issued with the understanding that the following conditions are met: #1, #3

1. This permit does not excuse the applicant from meeting applicable State and Federal rules and laws.
2. Before concrete for foundation is placed, approvals from the Development Review Coordinator and Inspection Services must be obtained. (A 24 hour notice is required prior to inspection) **"ALL LOT LINES SHALL BE CLEARLY MARKED BEFORE CALLING."**
3. Foundation drain shall be placed around the perimeter of a foundation that consists of gravel or crushed stone containing not more than 10 percent material that passes through a No. 4 sieve. The drain shall extend a minimum of 12 inches beyond the outside edge of the footing. The thickness shall be such that the bottom of the drain is not higher than the bottom of the base under the floor, and that the top of the drain is not less than 6 inches above the top of the footing. The top of the drain shall be covered with an approved filter membrane material. Where a drain tile or perforated pipe is used, the invert of the pipe or tile shall not be higher than the floor elevation. The top of joints or top of perforations shall be protected with an approved filter membrane material. The pipe or tile shall be placed on not less than 2" of gravel or crushed stone, and shall be covered with not less than 6" of the same material. Section 1813.5.2
4. Foundations anchors shall be a minimum of ½" in diameter, 7" into the foundation wall, minimum of 12" from corners of foundation and a maximum 6' O.C. between bolts. Section 2305.17
5. Waterproofing and damp proofing shall be done in accordance with Section 1813.0 of the building code.
6. Precaution must be taken to protect concrete from freezing. Section 1908.0
7. It is strongly recommended that a registered land surveyor check all foundation forms before concrete is placed. This is done to verify that the proper setbacks are maintained.
8. Private garages located beneath habitable rooms in occupancies in Use Group R-1, R-2, R-3 or I-1 shall be separated from adjacent interior spaces by fire partitions and floor/ceiling assembly which are constructed with not less than 1-hour fire resisting rating. Private garages attached side-by-side to rooms in the above occupancies shall be completely separated from the interior spaces and the attic area by means of ½ inch gypsum board or the equivalent applied to the garage means of 1.2 inch gypsum board or the equivalent applied to the garage side. (Chapter 4, Section 407.0 of the BOCA/1996)
9. All chimneys and vents shall be installed and maintained as per Chapter 12 of the City's Mechanical Code. (The BOCA National Mechanical Code/1993). Chapter 12 & NFPA 211
10. Sound transmission control in residential building shall be done in accordance with Chapter 12, Section 1214.0 of the City's Building Code.
11. Guardrails & Handrails: A guardrail system is a system of building components located near the o0pen sides of elevated walking surfaces for the purpose of minimizing the possibility of an accidental fall from the walking surface to the lower level. Minimum height all Use Groups 42", except Use Group R which is 36". In occupancies in Use Group A,B.H-4, I-1, I-2, M and R and public garages and open parking structures, open guards shall have balusters or be of solid material such that a sphere with a diameter of 4" cannot pass through any opening. Guards shall not have an ornamental pattern that would provide a ladder effect. (Handrails shall be a minimum of 34" but not more than 38". Use Group R-3 shall not be less than 30", but not more than 38"). Handrail grip size shall have a circular cross section with an outside diameter of at least 1 ¼" and not greater than 2". (Sections 1021 & 1022.0). Handrails shall be on both sides of stairway. (Section 1014.7)
12. Headroom in habitable space is a minimum of 6'6". (Section 1204.0)
13. Stair construction in **Use Group R-3 & R-4 isa minimum of 10" tread and 7 ¾" maximum rise.** All other Use Group minimum 11" tread, 7" maximum rise. (Section 1014.0)
14. The minimum headroom in all parts of a stairway shall not be less than 80 inches. (6'8") 1014.4
15. Every sleeping room below the fourth story in buildings of Use Groups R and I-1 shall have at least one operable window or exterior door approved for emergency egress or rescue. The units must be operable from the inside without the use of special knowledge or separate tools. Where windows are provided as means of egress or rescue they shall have a sill height not more than 44 inches (1118mm) above the floor. All egress or rescue windows from sleeping rooms shall have a minimum net clear opening height dimension of 24 inches (610mm). The minimum net clear opening width dimension shall be 20 inches (508)mm, and a minimum net clear opening of 5.7 sq. ft. (Section 1010.4)
16. Each apartment shall have access to two (2) separate, remote and approved means of egress. A single exit is acceptable when it exits directly from the apartment to the building exterior with no communications to other apartment units. (Section 1010.1)
17. All vertical openings shall be enclosed with construction having a fire rating of at least one (1) hour, including fire doors with self closer's. (Over 3 stories in height requirements for fire rating is two (2) hours. (Section 710.0)
18. The boiler shall be protected by enclosing with (1) hour fire rated construction including fire doors and ceiling, or by providing automatic extinguishment. (Table 302.1.1)

19. All single and multiple station smoke detectors shall be of an approved type and shall be installed in accordance with the provisions of the City's Building Code Chapter 9, Section 920.3.2 (BOCA National Building Code/1996), and NFPA 101 Chapter 18 & 19. (Smoke detectors shall be installed and maintained at the following locations):
    - **In the immediate vicinity of bedrooms**
    - **In all bedrooms**
    - **In each story within a dwelling unit, including basements**
20. A portable fire extinguisher shall be located as per NFPA #10. They shall bear the label of an approved agency and be of an approved type. (Section 921.0)
21. The Fire Alarm System shall maintained to NFPA #72 Standard.
22. The Sprinkler System shall maintained to NFPA #13 Standard.
23. All exit signs, lights and means of egress lighting shall be done in accordance with Chapter 10 Section & Subsections 1023.0 & 1024.0 of the City's Building Code. (The BOCA National Building Code/1996)
24. Section 25 – 135 of the Municipal Code for the City of Portland states, "No person or utility shall be granted a permit to excavate or open any street or sidewalk from the time of November 15 of each year to April 15 of the following year".
25. The builder of a facility to which Section 4594-C of the Maine State Human Rights Act Title 5 MRSA refers, shall obtain a certification from a design professional that the plans commencing construction of the facility, the builder shall submit the certification the Division of Inspection Services.
26. Ventilation shall meet the requirements of Chapter 12 Sections 1210.0 of the City's Building Code. (Crawl spaces & attics).
27. All electrical, plumbing and HVAC permits must be obtained by a Master Licensed holders of their trade. **No closing in of walls until all electrical** (min. 72 hours notice) **and plumbing inspections have been done.**
28. All requirements must be met before a final Certificate of Occupancy is issued.
29. All building elements shall meet the fastening schedule as per Table 2305.2 of the City's Building Code (The BOCA National Building Code/1996).
30. Ventilation of spaces within a building shall be done in accordance with the City's Mechanical code (The BOCA National Mechanical Code/1993). (Chapter M-16)
31. Please read and implement the attached Land Use Zoning report requirements.
32. Boring, cutting and notching shall be done in accordance with Sections 2305.3, 2305.3.1, 2305.4.4 and 2305.5.1 of the City's Building Code.
33. Bridging shall comply with Section 2305.16.
34. Glass and glazing shall meet the requirements of Chapter 24 of the building code. (Safety Glazing Section 2405.0)
35. All signage, shall be done in accordance with Section 3102.0 signs of the City's Building Code, (The BOCA National Building Code/1996).

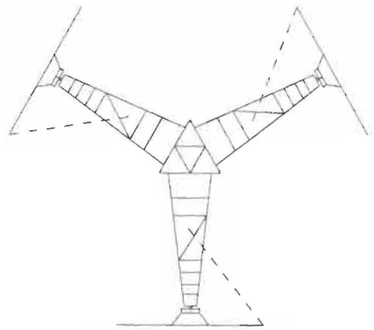
* 36. All Towers Shall Comply with Sections 3108.0 & 3109.0 of The bldg. Code.

P. Samuel Hoffses, Building Inspector

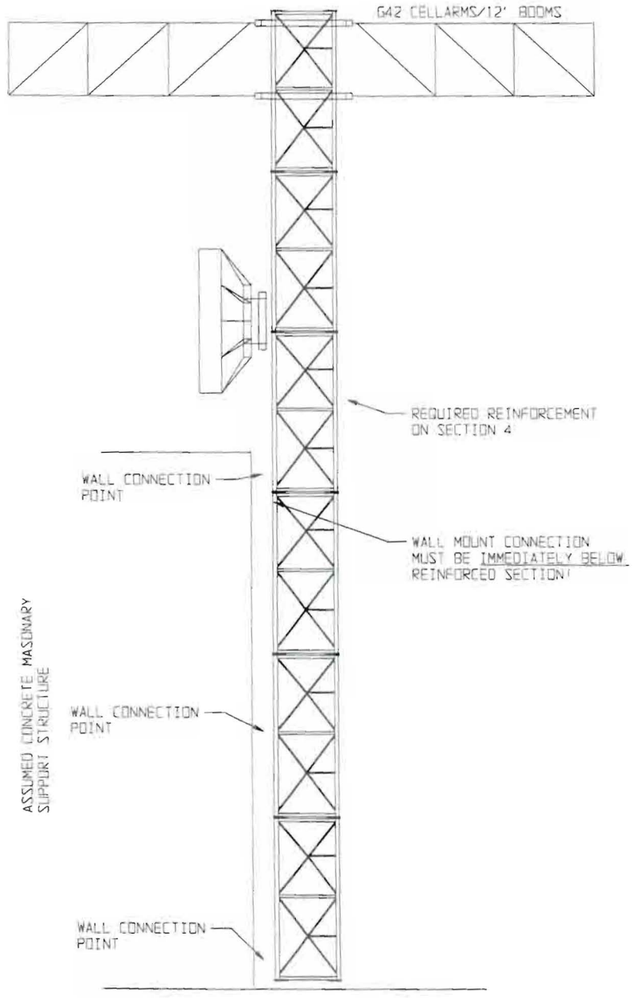
cc: M. McDougall, PFD
Marge Schmuckal, Zoning Administrator

PSH 10/25/99

****On the basis of plans submitted and conditions placed on these plans any deviations shall require a separate approval.**



G30 tower / G42 cellarm
with 12' booms



TOWER ANALYSIS CONDITIONS
This tower was analyzed to resist 80 mph wind speed (Cumberland Co.)
with 1/2" radial ice per ANSI/EIA/TIA-222-F recommended standard.
Worst 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 ASSUMPTIONS

Tower Legs:	ASTM A36-Modified, Fy > 45 ksi.
All other Steel:	ASTM A36, Fy > 36 ksi
Hardware:	ASTM A325 Hot Dipped Galvanized Bolts with Anco Nuts.
Galvanizing:	ASTM A123
Anchor Bolts:	ASTM A36, Fu > 58 ksi
***Results of tower mast analysis:	Pass pending reinforcement
***Results of foundation analysis:	Unknown

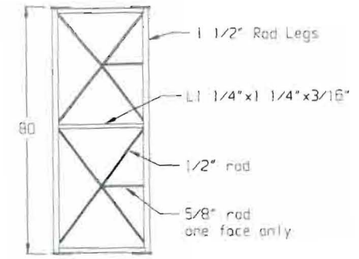
NOTE: THIS CERTIFICATION DOES NOT INCLUDE THE WALL CONNECTION

TOWER LOADING CONDITIONS

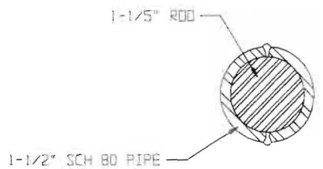
QTY	Antenna	Elevation	Windload	Deadload	
12	Celwave ALP859012	18	138	20	BAM Proposed
3	12' Cellular Boom	18	221	170	
3	G42 Boom Cellarms	18	320	301	
1	6' MHP Dish	8	1101	814	Existing

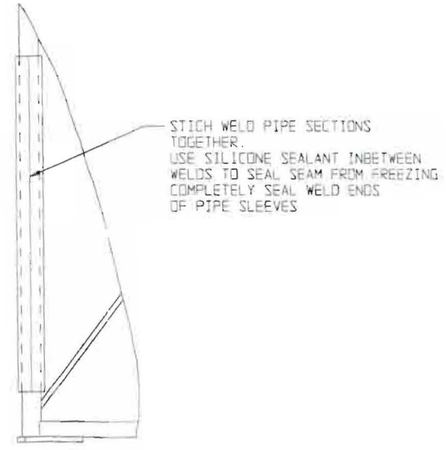
QTY	Type	Elevation Start	Elevation Stop	#/ft Windload	#/ft Deadload
12	LDF5-50A 7/8	0	18	3.3	1.3
1	EW64	0	8	4.5	1.7

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



G30WRR TOWER SECTION





REINFORCEMENT DETAIL
ALL THREE LEGS OF SECT 4 (12 HALVES TOTAL)

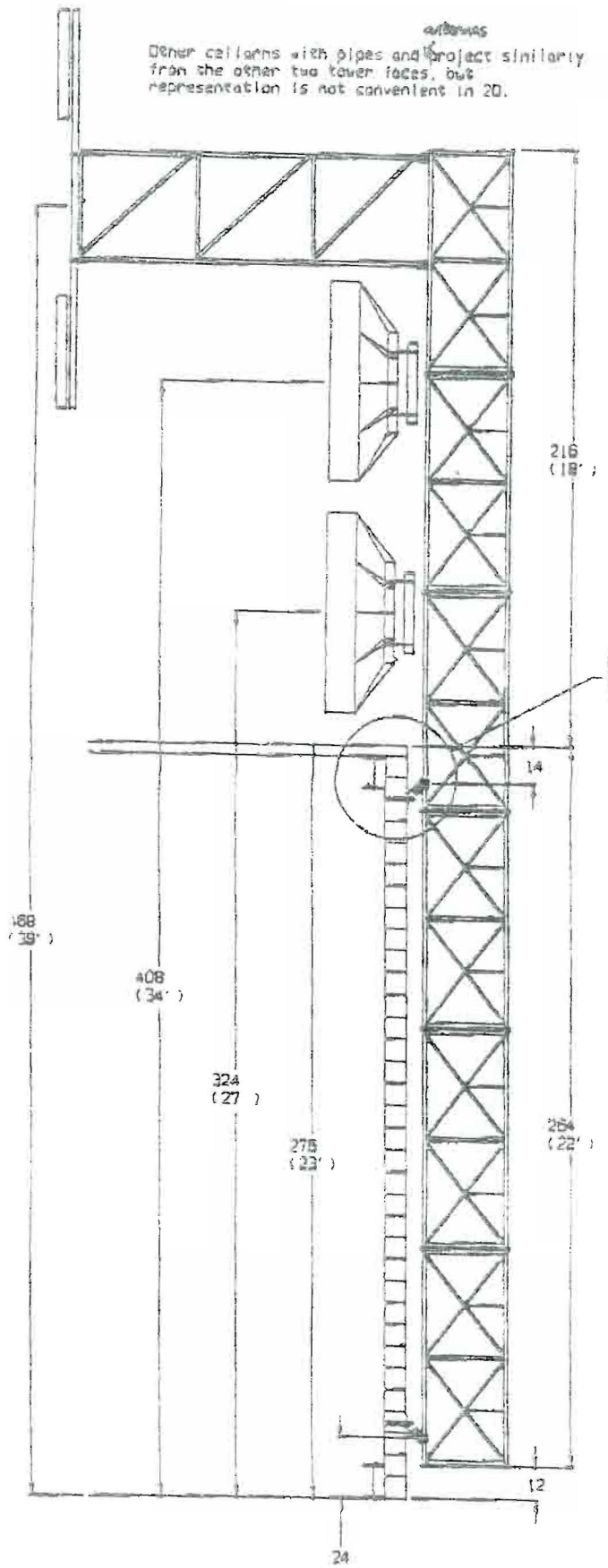
FRED A. NUDD CORPORATION
Route 104-Ontario, New York 14519-315/524-2531

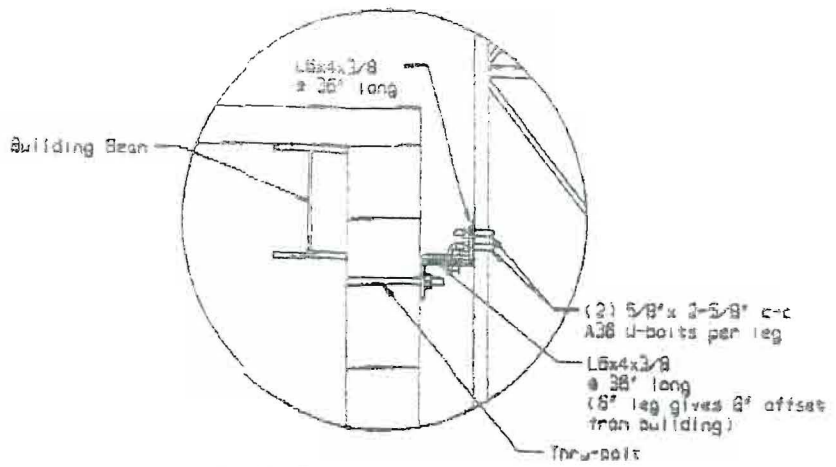
SCALE: N/S.	DRAWN BY: PCB	APPROVED BY:
DATE: 9/27/99		

ANALYSIS OF 40' G30WRAR TOWER

ATLANTIC TELCOM SERVICES
ONE MONUMENT SQR/PORTLAND, ME

DRAWING NUMBER 99-7145-1





CONNECTION DETAIL

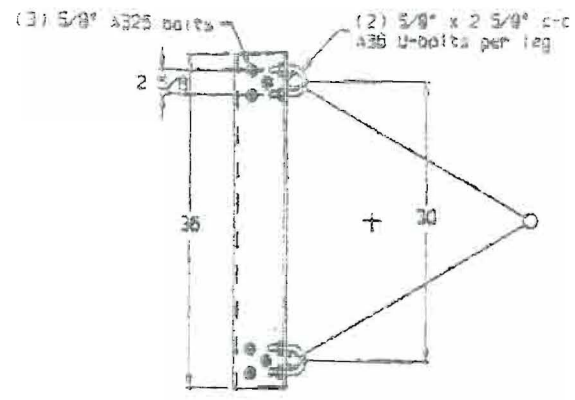
Connection to building must be approved by customer's architect.

APPLIED LOADS
Total Deadload = 3000 lb

LOAD CASE #1 (100 mph wind into the penthouse)
Tension on lower bracket = 3700 lb
Compression on upper brackes = 9500 lb

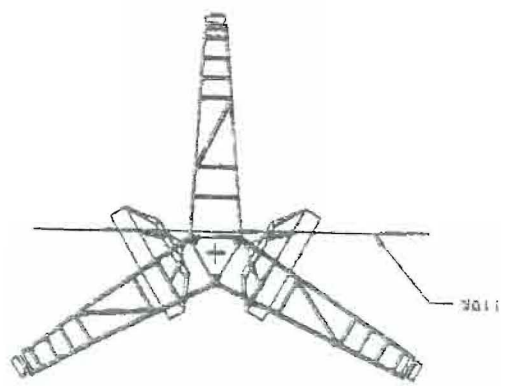
LOAD CASE #2 (100 mph wind coming off the penthouse)
Compression on lower brackets = 3700 lb
Tension on upper bracket = 9500 lb

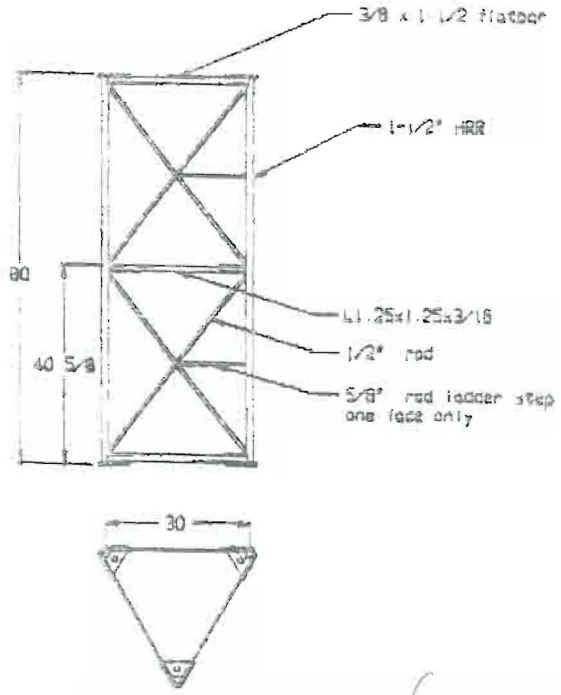
LOAD CASE #3 (100 mph wind parallel to penthouse wall)
Horizontal Shear at lower brackes = 3000 lb
Horizontal Shear at upper bracket = 9500 lb
(Tension is away from the wall, compression is into the wall, shear is parallel to the wall)



PLAN VIEW OF SUGGESTED CONNECTION

DESIGN ANTENNA LOADING
(3) G30 Callarms
(6) Sinclair C-4 antennas and 7/8" hellax
(2) 8' High Performance Dishes with Radomes @ 32' with Ew62 waveguide





G30WRAR TOWER SECTION

(ORIGINAL LOADING DESIGN)

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

SCALE N/S	DRAWN BY DRB
DATE 4/26/94	

40' G30WRAR ON BUILDING

ATLANTIC TELCOM
PORTLAND, ME

DRAWING NUMBER 94-3710-