DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK

CITY OF PORTLAND

BUILDING PERMIT

This is to certify that CITY OF » PORTLAND

Located At 947 WESTBROOK

Job ID: 2011-07-1805-ALTCOMM

CBL: 199 - - A - 001 - 002 - - - - -

has permission to Replace existing antennas

provided that the person or persons, firm or corporation accepting this permit shall comply with all of the provisions of the Statues of Maine and of the Ordinances of the City of Portland regulating the construction, maintenance and use of the buildings and structures, and of the application on file in the department.

Notification of inspection and written permission procured before this building or part thereof is lathed or otherwise closed-in. 48 HOUR NOTICE IS REQUIRED.	A final inspection must be completed by owner before this building or part thereof is occupied. If a certificate of occupancy is required, it must be

8/8/11

Fire Prevention Officer

Code Enforcement Officer / Plan Reviewer

THIS CARD MUST BE POSTED ON THE STREET SIDE OF THE PROPERTY

PENALTY FOR REMOVING THIS CARD

BUILDING PERMIT INSPECTION PROCEDURES

Please call 874-8703 or 874-8693 (ONLY)

or email: buildinginspections@portlandmaine.gov

With the issuance of this permit, the owner, builder or their designee is required to provide adequate notice to the city of Portland Inspections Services for the following inspections. Appointments must be requested 48 to 72 hours in advance of the required inspection. The inspection date will need to be confirmed by this office.

- **Please read the conditions of approval that is attached to this permit!! Contact this office if you have any questions.**
- **Permits expire in 6 months. If the project is not started or ceases for 6 months.**
- **If the inspection requirements are not followed as stated below additional fees may be incurred due to the issuance of a "Stop Work Order" and subsequent release to continue.**

The project cannot move to the next phase prior to the required inspection and approval to continue, REGARDLESS OF THE NOTICE OF CIRCUMSTANCES.

IF THE PERMIT REQUIRES A CERTIFICATE OF OCCUPANCY, IT MUST BE PAID FOR AND ISSUED TO THE OWNER OR DESIGNEE BEFORE THE SPACE MAY BE OCCU0PIED.

PORTLAND MAINE

Strengthening a Remarkable City, Building a Community for Life • www.portlandmaine.gov

Director of Planning and Urban Development
Penny St. Louis

Job ID: 2011-07-1805-ALTCOMM **Located At:** 947 WESTBROOK **CBL:** 199 - - A - 001 - 002 - - - - -

Conditions of Approval:

Building

1. Application approval based upon information provided by applicant. Any deviation from approved plans requires separate review and approval prior to work.

City of Portland, Maine - Building or Use Permit Application

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

Job No:	Date Applied:	CBL:	
2011-07-1805-ALTCOMM	7/27/2011	199 - - A - 001 - 002 - - - - -	
Location of Construction: 947 WESTBROOK ST - Jetport	Owner Name: CITY OF PORTLAND	Owner Address: 389 Congress ST PORTLAND, ME - MAINE 04101	Phone:
Business Name:	Contractor Name: John McGilicuddy	Contractor Address: 49 Brattle St., Arlington, MA 02474	Phone: 617-388-6324
Lessee/Buyer's Name: Verizon Wireless	Phone: 617-780-5746	Permit Type: Antennas	Zone: A-B
Past Use: Antennas	Proposed Use: Antennas -- replace existing antennas with new ones	Cost of Work: 10000.00	CEO District:
		Fire Dept: J Approved ___ Denied ___ N/A Signature:	Inspection: Use Group: Type: Antennas IBC 09 Signature:
Proposed Project Description: Change out antennas		Pedestrian Activities District (P.A.D.)	
Permit Taken By:		**Zoning Approval**	

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 electrial work.
3. Building permits are void if work is not started within six (6) months of the date of issuance. False informatin may invalidate a building permit and stop all work.

Special Zone or Reviews	Zoning Appeal	Historic Preservation
___ Shoreland	___ Variance	J Not in Dist or Landmark
___ Wetlands	___ Miscellaneous	___ Does not Require Review
___ Flood Zone	___ Conditional Use	___ Requires Review
___ Subdivision	___ Interpretation	___ Approved
___ Site Plan	___ Approved	___ Approved w/Conditions
___ Maj ___ Min ___ MM	___ Denied	___ Denied
Date: OK 8/2/11 ABR	Date:	Date: ABR

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 provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT ADDRESS DATE PHONE

RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE DATE PHONE

2011-07-1805.

General Building Permit Application

If 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/Address of Construction: 1001 Westbrook St. Portland International Airport		
Total Square Footage of Proposed Structure/Area	Square Footage of Lot	
Tax Assessor's Chart, Block & Lot Chart# Block# Lot# 199 A001002	Applicant *must be owner, Lessee or Buyer* Name Verizon Wireless Address 400 Friberg Pkwy City, State & Zip Westborough MA	Telephone: 617-786-5746
Lessee/DBA (If Applicable) Verizon Wireless	Owner (if different from Applicant) Name City of Address Portland City, State & Zip	Cost Of Work: $ 10,000 C of O Fee: $ Total Fee: $ 120

Current legal use (i.e. single family) _____
If vacant, what was the previous use? _____
Proposed Specific use: _____
Is property part of a subdivision? _____ If yes, please name _____
Project description:
Swap existing antennas with new ones. No change to antenna location or quantity.

11-862

Contractor's name: John McGillicuddy
Address: 49 Brattle St.
City, State & Zip Arlington MA 02474 Telephone: 617-388-6324
Who should we contact when the permit is ready: Krista Champagne Telephone: 781-454-9134
Mailing address: 49 Brattle St. Arlington MA 02474

Please submit all of the information outlined on the applicable Checklist. Failure to do so will result in the automatic denial of your permit.

In order to be sure the City fully understands the full scope of the project, the Planning and Development Department may request additional information prior to the issuance of a permit. For further information or to download copies of this form and other applications visit the Inspections Division on-line at www.portlandmaine.gov, or stop by the Inspections Division office, room 315 City Hall or call 874-8703.

I hereby certify that I am the Owner of record of the named property, or that the owner of record authorizes the proposed work 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.

RECEIVED
JUL 27 2011
Dept of Building Inspections
City of Portland Maine

Signature: John McGillicuddy Date: 7-13-11

This is not a permit; you may not commence ANY work until the permit is issue

Kristin Champagne

From: Kristin Champagne

Sent: Monday, July 25, 2011 4:00 PM

To: 'buildinginspections@portlandmaine.gov'

Subject: VZW Portland Airport BP app

Attachments: BP app.pdf; PORTLAND JETPORT ME Final LE REV2 06-29-11.pdf

I was informed to email a PDF copy of my building permit application packet in addition to dropping off the hard copy
Please find the attached two documents.
The first attachment includes the completed building permit application, fee check, CCA, existing and proposed antenna spec sheets and the structural. I had to attach the drawings separately because I couldn't get it to scan because of the page size difference.
This building permit application is for Verizon Wireless to swap existing antennas with new ones. Verizon currently has 12 antennas installed on the rooftop of the Portland International Airport. All 12 will be removed and replaced with new ones. No change to antenna quantity Scheduling of this work will need to be worked out with the Airport personnel once the Consent document has been complete with our Lease owner

Please let me know if any questions come up while this is under review. This packet of hard copies will be brought to you office as soon as possible.

Thanks
Kristin

Kristin Champagne
Structure Consulting Group
49 Brattle St.
Arlington, MA 02474
M: 781.454.9134
O: 781-791-7724 x32
F: 781.791.7704

Certificate of Design Application

From Designer: Hudson Design Group LLC

Date: 7-18-11

Job Name: Portland Jetport (Verizon Wireless)

Address of Construction: 100 Westbrook Street, Portland, ME

2003 International Building Code

Construction project was designed to the building code criteria listed below:

Building Code & Year IBC 2009 Use Group Classification (s) Mixed Use - Utility

Type of Construction No Change - Swapping existing Antennas for Verizon Wireless

Will the Structure have a Fire suppression system in Accordance with Section 903.3.1 of the 2003 IRC N/A

Is the Structure mixed use? Yes If yes, separated or non separated or non separated (section 302.3) Non-seperated

Supervisory alarm System? N/A Geotechnical/Soils report required? (See Section 1802.2) N/A

Structural Design Calculations

N/A Submitted for all structural members (106.1 – 106.11)

Design Loads on Construction Documents (1603)

Uniformly distributed floor live loads (7603.11, 1807)

Floor Area Use	Loads Shown
N/A	N/A

Wind loads (1603.1.4, 1609)

Yes Design option utilized (1609.1.1, 1609.6) (EIA/TIA-222-F)

80 MPH Basic wind speed (1809.3) (110 MPH-3 Second Gust)

N/A Building category and wind importance Factor, I_s table 1604.5, 1609.5)

Exposure C Wind exposure category (1609.4)

N/A Internal pressure coefficient (ASCE 7)

N/A Component and cladding pressures (1609.1.1, 1609.6.2.2)

N/A Main force wind pressures (7603.1.1, 1609.6.2.1)

Earth design data (1603.1.5, 1614-1623)

N/A Design option utilized (1614.1)

Seismic use group ("Category")

Spectral response coefficients, SDs & SD1 (1615.1)

Site class (1615.1.5)

N/A Live load reduction

Roof *live* loads (1603.1.2, 1607.11)

Roof snow loads (1603.7.3, 1608)

Ground snow load, P_g (1608.2)

If P_g > 10 psf, flat-roof snow load $_{Pf}$

If P_g > 10 psf, snow exposure factor, $_{Ce}$

If P_g > 10 psf, snow load importance factor, $_{Is}$

Roof thermal factor, $_{Ct}$ (1608.4)

Sloped roof snowload, $_{Ps}$ (1608.4)

Seismic design category (1616.3)

Basic seismic force resisting system (1617.6.2)

Response modification coefficient, $_{RI}$ and deflection amplification factor $_{Cd}$ (1617.6.2)

Analysis procedure (1616.6, 1617.5)

Design base shear (1617.4, 16175.5.1)

Flood loads (1803.1.6, 1612)

N/A Flood Hazard area (1612.3)

Elevation of structure

Other loads

N/A Concentrated loads (1607.4)

Partition loads (1607.5)

Misc. loads (Table 1607.8, 1607.6.1, 1607.7, 1607.12, 1607.13, 1610, 1611, 2404

Accessibility Building Code Certificate

Designer: Daniel P. Hamm, P.E.

Address of Project: 100 Westbrook Street, Portland, ME

Nature of Project: Antenna modification work to existing telecommunication site.

The technical submissions covering the proposed construction work as described above have been designed in compliance with applicable referenced standards found in the Maine Human Rights Law and Federal Americans with Disability Act. Residential Buildings with 4 units or more must conform to the Federal Fair Housing Accessibility Standards. Please provide proof of compliance if applicable.

(SEAL) STATE OF MAINE — DANIEL P. HAMM — No. 10344 — LICENSED PROFESSIONAL ENGINEER

Signature:

Title: Principal

Firm: Hudson Design Group LLC

Address: 1600 Osgood St, Suite 2-101 Bld 20N
N. Andover, MA 01845

Phone: 978-557-5553

For more information or to download this form and other permit applications visit the Inspections Division on our website at www.portlandmaine.gov

Certificate of Design

Date: 7-18-11

From: Daniel P. Hamm, P.E.

These plans and / or specifications covering construction work on:

Antenna modification work to existing telecommunication site.

Have been designed and drawn up by the undersigned, a Maine registered Architect / Engineer according to the ***2003 International Building Code*** and local amendments.

STATE OF MAINE
DANIEL P. HAMM
(SEAL)
No. 10344
LICENSED
PROFESSIONAL ENGINEER

Signature:

Title: Principal

Firm: Hudson Design Group LLC

Address: 1600 Osgood St, Suite 2-101 Bld 20N
N. Andover, MA 01845

Phone: 978-557-5553

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6 Existing - To Be Removed

Vertically Polarized, Panel 80° / 12 dBd

WPA-80080/4CF ___

When ordering replace "___" with connector type.

Mechanical specifications

Length	1205 mm	47.4 in
Width	285 mm	11.2 in
Depth	114 mm	4.5 in
Depth with z-bracket	154 mm	6.1 in
[4] Weight	4.5 kg	9.9 lbs
Wind Area		
Fore/Aft	0.36 m^2	3.9 ft^2
Side	0.15 m^2	1.6 ft^2
Rated Wind Velocity (Safety factor 2.0)	>653 km/hr	>406 mph
Wind Load @ 100 mph (161 km/hr)		
Fore/Aft	522 N	117 lbs
Side	233 N	52 lbs

Antenna consisting of aluminum alloy with brass feedlines covered by a UV safe fiberglass radome.

Mounting and Downtilting

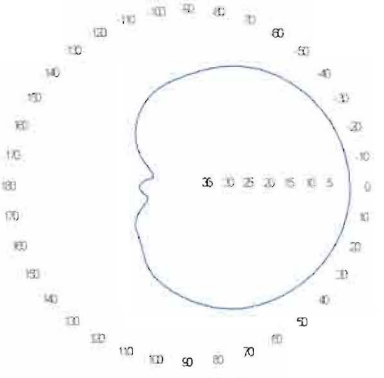
Mounting brackets attach to a pipe diameter of Ø50-127 mm (2.0-5.0 in).

Mounting bracket kit #36210002
Downtilt bracket kit #36114003

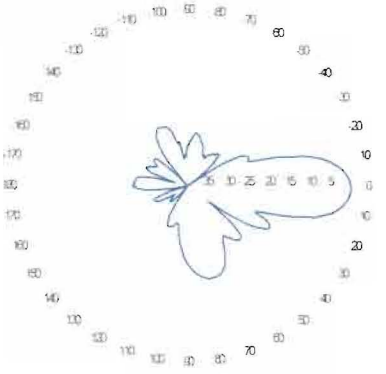
Electrical specifications

	Frequency Range	806-960 MHz
	Impedance	50Ω
[3]	Connector(s)	NE or E-DIN 1 port / center
[1]	VSWR	≤ 1.4 1
	Polarization	Vertical
[1]	Gain	12 dBd
[2]	Power Rating	500 W
[1]	Half Power Angle	
	H-Plane	80°
	E-Plane	15°
[1]	Electrical Downtilt	0°
[1]	Null Fill	5-10%
	Lightning Protection	Direct Ground

Radiation pattern[1]



Horizontal

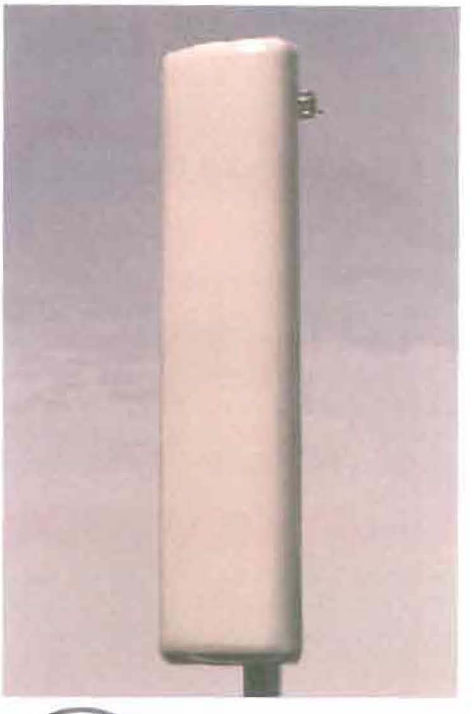


Vertical

Featuring upper side lobe suppression.

Radiation patterns for all antennas are measured with the antenna mounted on a fiberglass pole.

Mounting on a metal pole will typically improve the Front-to-Back ratio.



Amphenol Antel's Exclusive 3T (True Transmission Line Technology) Antenna Design:

- Watercut brass feedline assembly for consistent performance.
- Unique feedline design eliminates the need for conventional solder joints in the signal path.
- A non-collinear system with access to every radiating element for broad band-width and superior performance.
- Air as insulation for virtually no internal signal loss.

This Amphenol Antel antenna is under a five-year limited warranty for repair or replacement.

Antenna available with center-fed connector only.

Patented Dipole Design: U.S. Patent No. 6,229,496 B1

1) Typical values
2) Power rating limited by connector only.
3) NE indicates an elongated N connector.
E-DIN indicates an elongated DIN connector.
4) The antenna weight listed above does not include the bracket weight.

Improvements to mechanical and/or electrical performance of the antenna may be made without notice.

CF Denotes a Center-Fed Connector.

806-960 MHz

Amphenol Antel, Inc. 1300 Capital Drive Rockford, Illinois 61109 USA Tel. (815) 399-0001
Toll-Free (888) 417-9562 Fax. (815) 399-0156 antel@antelinc.com www.antelinc.com

Revision Date: 7/2/07

6 Existing - To be Removed

CSS® Antenna

X7C-FRO-640

40° Azimuth Beam, 72.0 inches

Directing our energies for you.

698-896 MHz Xpol

Electrical Specifications

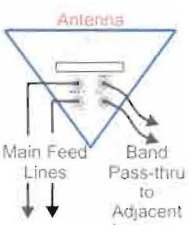
Frequency	698-896 MHz
Polarization	Slant +/- 45
Gain @ 698 MHz	15.6 dBd
Gain @ 782 MHz	16.1 dBd
Gain @ 896 MHz	16.7 dBd
Horizontal Beam (3dB Points)	40°
Vertical Beam (3dB Points)	11°
Elect. Downtilt Range, 2° Increments	0-10°
VSWR (0° ET) / Return Loss	<1.45:1 / 14.7 dB
VSWR (2, 4 & 6° ET)	<1.40:1 / 15.6 dB
VSWR Opt "i" / Return Loss	<1.50:1 / 14.0 dB
Front-to-Back at Horizon	>30 dB
Upper Side Lobe Suppression	<-18 dB
Impedance	50 Ohms
Power Input Per Connector	500 CW at 800 MHz
Isolation	< -28 dB
Intermodulation (2x20W)	<-150 dBc

Mechanical Specifications

Input Connector (female)	Back 7/16 DIN (silver finish) or w/bot. opt.
Antenna Dimensions (LxWxD)	72.0 x 18.8 x 8.9 in. (1829 x 478 x 226mm)
*Antenna Weight	28 lbs
Bracket Weight	13.2 lbs
Lightning Protection	Direct Ground
RF Distribution	Printed Microstrip Substrate
Radome	Ultra High-Strength Luran
Weatherability	UV Stabilized, ASTM D1925
Radome Water Absorption	ASTM D570, 0.45%
Environmental	MIL-STD-810E
Wind Survival	120 mph
Front Wind Load @ 100MPH	234 lbs
Equivalent Flat Plate @ 100MPH	4.8 sq-ft. (c=2)
Mounting Brackets	Fits 3.5 Inch Max. O.D. Pipe
Mechanical Downtilt Range	0-12°
Clamps/Bolts	Hot Dip Galvanized Steel/Stainless Steel

Available with Opt "i"

- The Opt "i" antenna option provides Integrated Diplexers that reduce mainline cables and eliminate separate external devices.



Return Loss at pass-thru port into 50Ω load ≥17.7 dB

1 Year Warranty

Recommended Connector Coupling Torque 7/16 DIN: 220-265 lbf-in (25-30 N-m)

Ordering Information & Options

X7C-FRO-640-x	"-x" is a placeholder for the built-in fixed electrical downtilt in degrees, set to 0, 2, 4, 6, 8 or 10
X7C-FRO-640-xi	to add the Opt "i" option for integrated diplexers, add "i" to model number
X7C-FRO-640-xi-bot	for bottom mounted connectors, add "-bot" (otherwise antenna comes standard with back mounted connectors)
X7C-FRO-640-xi-bot-j#	add a "-j#" to add a 1/2" RF cable, where "#" is the cable length, "j2" is 2 meters, "j4" is 4 meters, "j6" is 6 meters.

*Antenna Weight may vary slightly with options such as back or bottom connector and integrated diplexers.

Published 062111
Subject to alteration

410-612-0080
www.cssantenna.com

WBENC

Made in USA

6 Proposed

DB846F65ZAXY

Directed Dipole Antenna

Decibel®
Base Station Antennas

- Exceptional azimuth roll off reducing soft hand offs and improving capacity
- Strong null filling for below horizon RF penetration
- Extremely rugged, reliable design yet lightweight for low tower loading
- Air dielectric feed system

ELECTRICAL

Frequency (MHz) :	806 - 896	870 - 960
Polarization :	Vertical	Vertical
Gain (dBd/dBi) :	14.5/16.6	14.8/16.9
Azimuth BW (Deg.):	65	60
Elevation BW (Deg.):	11	10.5
Beam Tilt (Deg.):	0	0
USLS* (dB) :	15	15
Front-To-Back Ratio* (dB) :	40	40
VSWR :	<1.33:1	<1.33:1
PIM3 @ 2 x 20w (dBc) :	-150	-150
Max. Input Power (Watts) :	500	500
Impedance (Ohms) :	50	50
Lightning Protection :	DC Ground	DC Ground

MECHANICAL

Weight :	9.5 kg (21 lb)
Dimensions (LxWxD) :	1,829 x 254 x 216 mm (72 x 10 x 8.5 in)
Max. Wind Area :	0.15 m² (1.6 ft²)
Max. Wind Load (@ 100 mph) :	386.9 N (87 lbf)
Max. Wind Speed :	241 km/h (150 mph)
Hardware Material :	Galvanized Steel
Connector Type :	7-16 DIN - Female (1, Back)
Color :	Light Gray
Standard Mounting Hardware :	DB380
Standard Downtilt Mounting Hardware :	DB5083

Andrew Corporation
2601 Telecom Parkway
Richardson, Texas U.S.A 75082-3521
Tel: 214.631.0310

Fax: 214 631.4706
Toll Free Tel: 1.800.676.5342
Fax: 1.800.229.4706
www.andrew.com

* - Indicates Typical

4/13/2007

dbtech@andrew.com

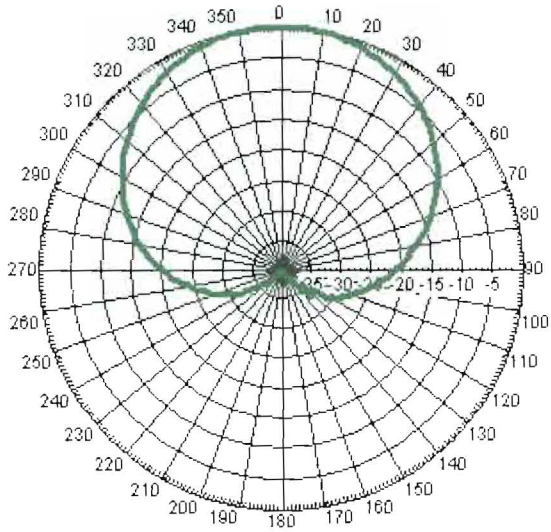
Information correct at date of issue but may be subject to change without notice.

DB846F65ZAXY

Directed Dipole Antenna

Decibel®
Base Station Antennas

AZIMUTH PATTERN



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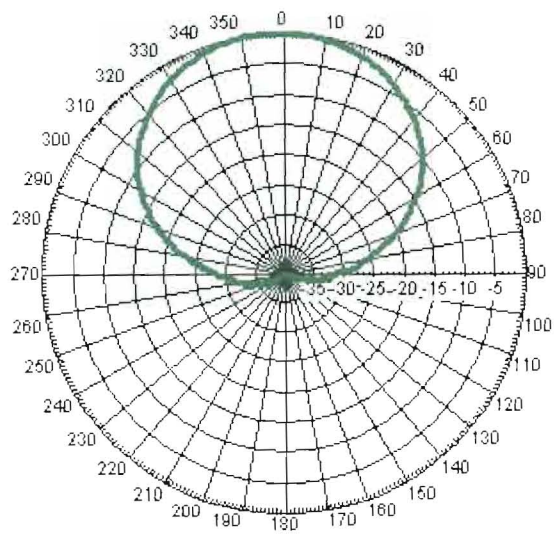
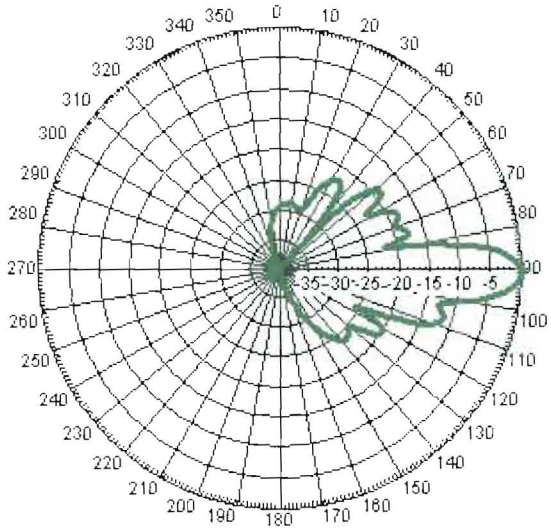


Freq: 940 MHz, Tilt: 0

ELEVATION PATTERN



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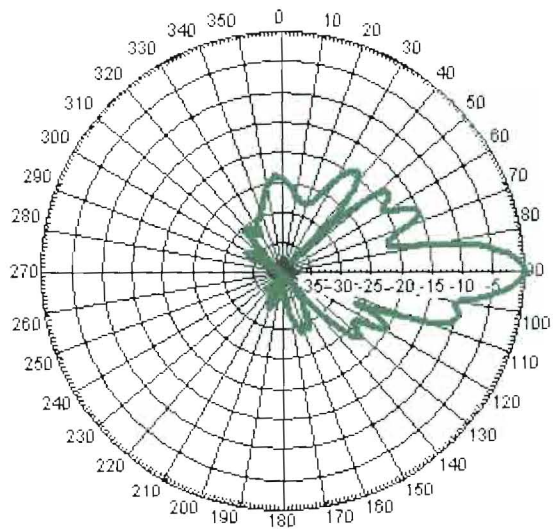


Freq: 940 MHz, Tilt: 0

Andrew Corporation
2601 Telecom Parkway
Richardson, Texas U.S.A 75082-3521
Tel: 214.631.0310

Fax: 214.631.4706
Toll Free Tel: 1.800.676.5342
Fax: 1.800.229.4706
www.andrew.com

* - Indicates Typical

4/13/2007

dbtech@andrew.com

Information correct at date of issue but may be subject to change without notice.

3 Proposed

CSS® Antenna

X7-665

65° Azimuth Beam, 72.0 inches

Directing our energies for you.

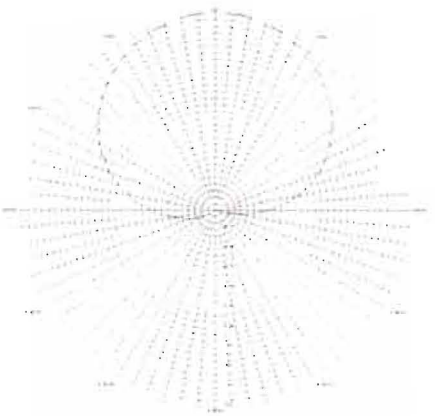
698-800 MHz Xpol

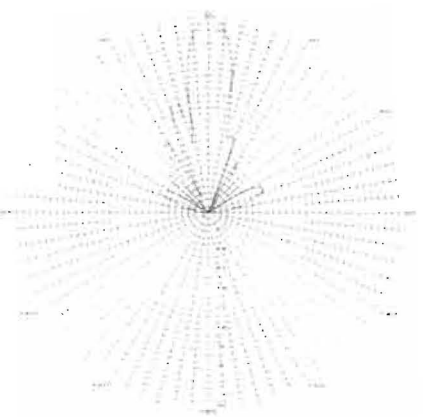
Electrical Specifications

Frequency	698-800 MHz
Polarization	Slant +/- 45
Gain @ 698 MHz	13.2 dBd
Gain @ 752 MHz	13.5 dBd
Gain @ 782 MHz	13.7 dBd
Horizontal Beam (3dB Points)	65°
Vertical Beam (3dB Points)	10°
Elect. Downtilt Range, 2° Increments	0-10°
VSWR / Return Loss	<1.40:1 / 15.6 dB
VSWR Opt "i" / Return Loss	<1.50:1 / 14.0 dB
Front-to-Back at Horizon	>30 dB
Upper Side Lobe Suppression	<-18 dB
Impedance	50 Ohms
Power Input Per Connector	500 CW at 800 MHz
Isolation	<-28 dB
Intermodulation (2x20W)	<-150 dBc

Mechanical Specifications

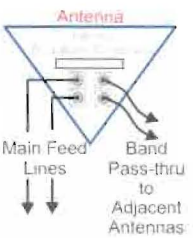
Input Connector (female)	Back 7/16 DIN (silver finish) or w/bot. opt.
Antenna Dimensions (LxWxD)	72.0 x 12.5 x 7.1 in. (1829 x 318 x 180mm)
*Antenna Weight	30.0 lbs
Bracket Weight	13.2 lbs
Lightning Protection	Direct Ground
RF Distribution	Printed Microstrip Substrate
Radome	Ultra High-Strength Luran
Weatherability	UV Stabilized, ASTM D1925
Radome Water Absorption	ASTM D570, 0.45%
Environmental	MIL-STD-810E
Wind Survival	150 mph
Front Wind Load @ 100MPH	177.4 lbs
Equivalent Flat Plate @ 100MPH	3.6 sq-ft. (c=2)
Mounting Brackets	Fits 3.5 Inch Max. O.D. Pipe
Mechanical Downtilt Range	0-12°
Clamps/Bolts	Hot Dip Galvanized Steel/Stainless Steel





Available with Opt "i"

- The Opt "i" antenna option provides Integrated Diplexers that reduce mainline cables and eliminate separate external devices.



Return Loss at pass-thru port into 50Ω load ≥17.7 dB

1 Year Warranty

Recommended Connector Coupling Torque
7/16 DIN: 220-265 lbf-in (25-30 N-m)

Ordering Information & Options

X7-665-x	"-x" is a placeholder for the built-in fixed electrical downtilt in degrees, set to 0, 2, 4, 6, 8 or 10
X7-665-xi	to add the Opt "i" option for integrated diplexers, add "i" to model number
X7-665-xi-bot	for bottom mounted connectors, add "-bot" (otherwise antenna comes standard with back mounted connectors)
X7-665-xi-bot-j#	add a "-j#" to add a 1/2" RF cable, where "#" is the cable length, "j2" is 2 meters, "j4" is 4 meters, "j6" is 6 meters...

*Antenna Weight may vary slightly with options such as back or bottom connector and integrated diplexers.

Published 062111
Subject to alteration

410-612-0080
www.cssantenna.com

WBENC

Made in USA

3 Proposed

CSS® Antenna

AXP19-60

60° Azimuth Beam, 69.1 inches

Directing our energies for you.

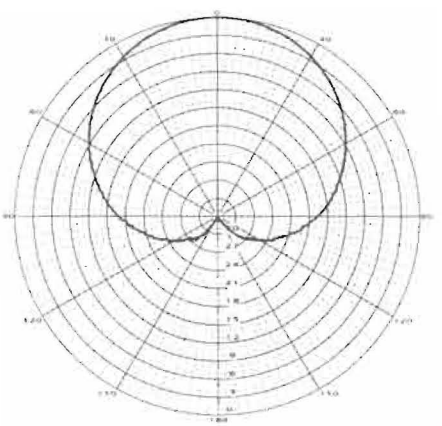
1710-2170 MHz Xpol

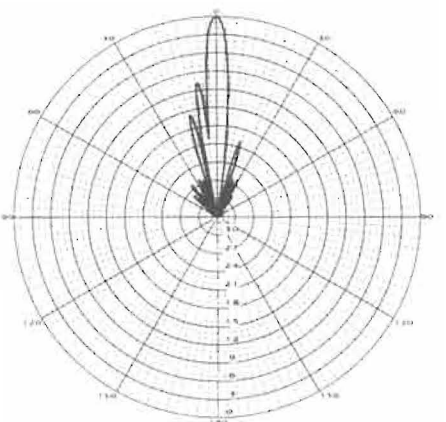
Electrical Specifications

Frequency	1710-2170 MHz
Polarization	Slant +/- 45
Gain @ 1710 MHz	19.0 dBi
Gain @ 1920 MHz	19.3 dBi
Gain @ 2170 MHz	19.6 dBi
Horizontal Beam (3dB Points)	60°
Vertical Beam (3dB Points)	5°
Elect. Downtilt Range, 2° Increments	0-6°
VSWR / Return Loss	<1.40:1 / 15.6 dB
Front-to-Back at Horizon	>30 dB
Upper Side Lobe Suppression	<-18 dB
Impedance	50 Ohms
Power Input Per Connector	250 CW at 1900 MHz
Isolation	< -28 dB
Intermodulation (2x20W)	typ -150 dBc

Mechanical Specifications

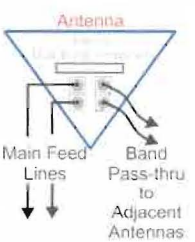
Input Connector (female)	Back 7/16 DIN (silver finish) or w/bot. opt.
Antenna Dimensions (LxWxD)	69.1 x 6.7 x 4.1 in. (1755 x 170 x 104mm)
*Antenna Weight	15.0 lbs
Bracket Weight	13.2 lbs
Lightning Protection	Direct Ground
RF Distribution	Printed Microstrip Substrate
Radome	Ultra High-Strength Luran
Weatherability	UV Stabilized, ASTM D1925
Radome Water Absorption	ASTM D570, 0.45%
Environmental	MIL-STD-810E
Wind Survival	150 mph
Front Wind Load @ 100MPH	105 lbs
Equivalent Flat Plate @ 100MPH	2.13 sq-ft. (c=2)
Mounting Brackets	Fits 3.5 Inch Max. O.D. Pipe
Mechanical Downtilt Range	0-12°
Clamps/Bolts	Hot Dip Galvanized Steel/Stainless Steel





Available with Opt "i"

- The Opt "i" antenna option provides Integrated Diplexers that reduce mainline cables and eliminate separate external devices. Add 1" to the antenna depth for Opt "i".



1 Year Warranty

Recommended Connector Coupling Torque
7/16 DIN: 220-265 lbf-in (25-30 N-m)

Ordering Information & Options

AXP19-60-x	"-x" is a placeholder for the built-in fixed electrical downtilt in degrees, set to 0, 2, 4 or 6
AXP19-60-xi	to add the Opt "i" option for integrated diplexers, add "i" to model number
AXP19-60-xi-bot	for bottom mounted connectors, add "-bot" (otherwise antenna comes standard with back mounted connectors)
AXP19-60-xi-bot-j#	add a "-j#" to add a 1/2" RF cable, where "#" is the cable length, "j2" is 2 meters, "j4" is 4 meters, "j6" is 6 meters...

*Antenna Weight may vary slightly with options such as back or bottom connector and integrated diplexers.

Published 070611
Subject to alteration

410-612-0080
www.cssantenna.com

WBENC

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STRUCTURAL ANALYSIS REPORT

For

PORTLAND JETPORT ME

1001 Westbrook Street
Portland, ME

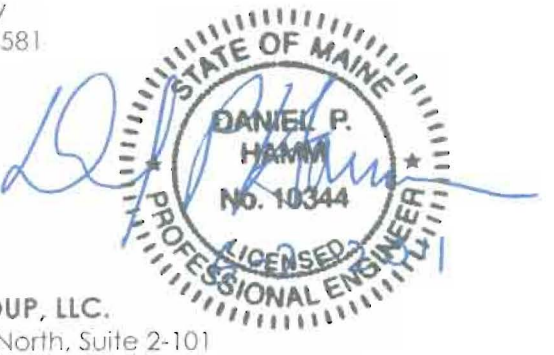
Antennas Mounted on the Penthouse Facade

Prepared for:

VERIZON WIRELESS
400 Friberg Parkway
Westborough, MA 01581

Dated:

June 2, 2011



Prepared by:
HUDSON DESIGN GROUP, LLC.
1600 Osgood Street Building 20 North, Suite 2-101
North Andover, MA 01845
Phone: (978) 557-5553
www.hudsondesigngroupllc.com

Hudson Design Group LLC

SCOPE OF WORK:

Hudson Design Group LLC (HDG) has been authorized by Verizon Wireless to conduct a structural evaluation of the structure supporting the proposed Verizon Wireless equipment.

This report represents this office's findings, conclusions and recommendations' pertaining to the support of Verizon's proposed equipment.

This office conducted an on-site visual survey of the above areas on May 23, 2011. Attendees included Pierre Gagnon (HDG-Associate).

CONCLUSION SUMMARY:

Building plans were not available and could not be obtained for our reference. A limited visual survey of the structure was completed in or near the areas of the Proposed Work. Based on our evaluation, we have determined that, in general, structural designs to support the proposed Verizon Wireless Equipment within or near the Proposed Location can be completed and components installed with **NO STRUCTURAL UPGRADES REQUIRED** to the existing structure.

A summary of the proposed support types and attachment locations are as follows:

(6) DB846F65ZAXY Andrew antennas (2 per sector) (72.0"x10.0"x8.5") (Wt. = 20.0 lbs/each)..... Supported by the existing steel pipe mounts secured to the penthouse façade with through-bolts and steel backer plates.

(3) X7-665-0D CSS antennas (1 per sector) (72.0"x12.5"x7.1") (Wt. = 43.2 lbs/each)..... Supported by the existing steel pipe mounts secured to the penthouse façade with through-bolts and steel backer plates.

(3) AXP-19-60-0D CSS antennas (1 per sector) (69.0"x6.7"x4.1") (Wt. = 28.2 lbs/each)..... Supported by the existing steel pipe mounts secured to the penthouse façade with through-bolts and steel backer plates.

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Referenced documents are attached.

DESIGN CRITERIA:

1. International Building Code- 2009 Edition and ASCE 7-05, Minimum Design Loads for Buildings and Other Structures.

   Wind Analysis:

   Basic Wind Speed: 110 MPH (includes 3-second gust)
   Exposure: C

2. EIA/TIA -222- F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures

   County: Cumberland
   Wind Load: 80 mph

3. Approximate height above grade to antennas: 43'-6"+/-

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EXISTING PENTHOUSE CONSTRUCTION:

The penthouse wall construction consists of a metal panel veneer system support by a structural steel frame consisting of a system of I-beams and steel columns.

Antenna SUPPORT RECOMMENDATIONS:

- HDG recommends that the new antennas be supported by the existing pipe mounts secured to the penthouse façade with through-bolts and steel backer plates.

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PROPOSED ANTENNA SUPPORT LOCATIONS:

Photo 1: Sample photo of the existing Verizon Antennas secured to the penthouse wall.

Hudson Design Group LLC

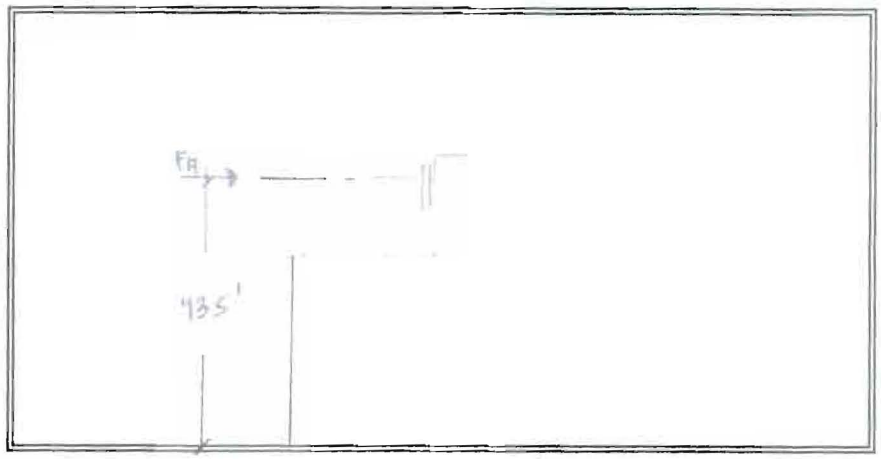
Photo 2: Sample photo looking from the behind the wall. Notice the through-bolts and steel backer plates.

Hudson Design Group LLC

Calculations

Site Name	PORTLAND JETPORT ME
Site No.	0
Done by:	MSC Checked by:
Date:	6/2/2011

Proposed/Existing AT&T Antennas



=Input Values

V= **80** (mph)
z= **43.5** (ft)

K_z= **1.08**

Velocity Pressure: **qz= 17.73 psf** [2.3.3]

Is member analyzing a tube pole structure? If yes, then: Gh= 1.69

If no, then use value below:
Gh= 1.23 [2.3.4.1]

Gh= 1.69

Determine Cf:

If lattice structure see manual..

If cantilevered tube pole, then: Use Correct Value form Table 1 Below:

TABLE 1
Coefficients (Cf) for Cantilevered Tubular Pole Structures

C (mph ft)	Round	16 Sided r<0.26	16 Sided r≥0.26	12 Sides	8 Sided
<32	1.2	1.2	1.2	1.2	1.2
32 to 64	$130/C^{1.3}$	1.78+1.40r-C/91.5-Cr/22.9	.72+(64-C)/44.8	$12.5/C^{.6}$	1.2
>64	0.59	1.08-1.40r	0.72	1.03	1.2

Derivation of Structure Coefficient (Cf):

Dp = Avg. Diam. or Avg. Least width of Tubular Pole Structure: 0.2 feet

Site Name:	PORTLAND JETPORT ME
Site No.	
Done by:	MSC Checked by:
Date:	6/2/2011

References:

* Structural Standards for Steel Antenna Towers and Antenna Supporting Structures (TIA/EIA-222-F).

Material Reference Notes:

2.3.1 Wind and Ice Loads

The total design wind load shall include the sum of he horizontal forces applied to the structure in the direction of the wind and the design wind load on guys and discrete appurtenances.

Ice loading, depending on tower height, elevation, and exposure, may be a significant load on the structure in most parts of the United States. If the structure is to be located where ice accumulation is expected, consideration shall be given to an ice load when specifying the requirements for the structure.

2.3.2 Horizontal Force Applied to each Section of the Structure

$$F=q_z*G_H\,[C_F*A_E+\sum(C_A*A_A)]$$ (Not to exceed $2*q_z*G_H*A_G$)

where A_G = Gross area of one tower face (ft^2)

2.3.3 Velocity Pressure (q_z) and Exposure Coefficient (K_Z)

$q_z=.00256*K_z*V^2$ V=Basic Wind Speed for the Structure Location (mph)

$K_z=(z/33)^{2/7}$ z=Ht. above avg. ground level to midpoint of section (ft.)

$1.00 \le K_z \le 2.58$ A_E=effective projected area of structural components in one face

2.3.4 Gust Response Factors (G_H)

2.3.4.1 For latticed structures , gust response factor (G_H) shall be calculated from the equation:

$G_H=0.65+0.60/(h/33)^{1/7}$ (h in (ft.)) $1.0 < G_H < 1.25$

2.3.4.2 For Tubular pole structures, the gust response factor (G_H) shall be 1.69

2.3.4.3 One gust response factor shall apply for the entire structure.

2.3.4.4 When Cantilevered tubular or latticed pole structures are mounted on latticed structures, the gust response factor the the pole and the latticed structure shall be based on the height of the latticed structure without the pole. The stresses calculated for the pole structures and their connections to latticed structures shall be multiplied by 1.25 to compensate for the greater gust response for the mounted pole structures.

2.3.5 Structure Force Coefficients (Reference Table 1)

Site Name	PORTLAND JETPORT ME
Site No.	0
Done by:	MSC Checked by:
Date:	6/2/2011

Hudson Design Group LLC

$C = (K_z)^{1/2} * V * Dp$ (for Dp in ft [m]

C= 16.64

C (mph ft)	Round Only Member
<32	1.2
32 < 64	3.36
> 64	0.59

(Max Cf= 1.2)
(Min Cf= 0.59)

Cf= 1.2

Determine Ae: **[2.3.6]**

If tube structure, then use projected area including ice:
If not a tube structure, then see manual.

Ae= 0.00 sf

Determine Ca: **[2.3.7]**

2.3.7 The force coefficient (C_A) applied to the projected area (ft^2) [m^2] of a linear appurtenance (A_A) not considered as a structural component shall be determined from Table 3. The force coefficient for cylindrical members may be applied to the additional projected area of radial ice when specified. (Refer to Figure 1.)

TABLE 3

Appurtenance Force Coefficients

Member Type	Aspect Ratio ≤ 7	Aspect Ratio ≥ 25
	C_A	C_A
Flat	1.4	2
Cylindrical	0.8	1.2

Aspect Ratio=Overall length/width ratio in plane normal to wind direction. (Aspect ratio is not a function of the spacing between support points of a linear appurtenance, nor the section length considered to have a uniformly distributed force.)

Note: Linear interpolation may be used to aspect ratios other than shown

2.3.8 Regardless of location, linear appurtenances not considered as structural components in accordance with 2.3.6.3 shall be included in the term $\Sigma C_A A_A$.

2.3.9 The horizontal force (F) applied to a section of the structure may be assumed to be uniformly distributed based on the wind pressure at the mid-height of the section.

Site Name	PORTLAND JETPORT ME
Site No.	0
Done by:	MSC Checked by:
Date:	6/2/2011

Hudson Design Group LLC

	Item #1	Item #2	Item #3	Item #4	Item #5
Member Length (Inches):	72	72	69	0	0
Member Width (Inches):	10	12.5	6.7	0	0
Calculated Aspect Ratio:	7	6	10	#DIV/0!	#DIV/0!
From Table 3 Above: Ca=	1.4	1.4	1.55	0	0

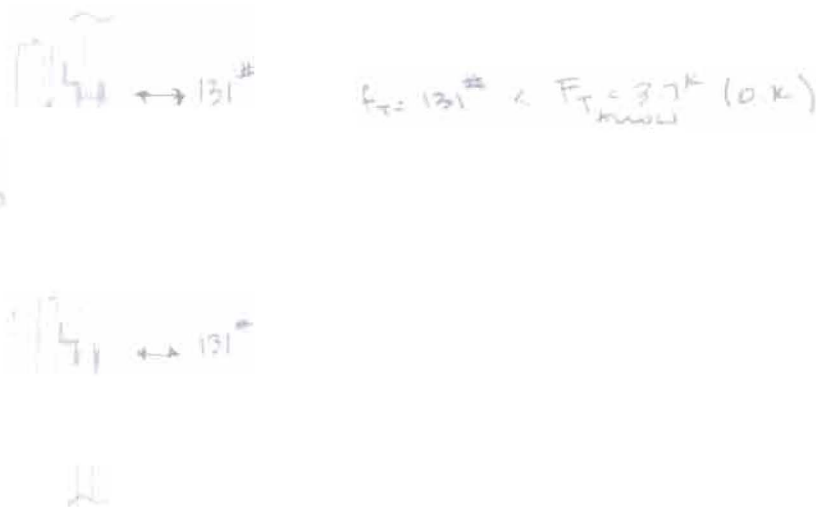
Determine Aa: (sf)

	Item #1	Item #2	Item #3	Item #4	Item #5
From above: Aa=	5.00	6.25	3.21	0.00	0.00
Calculated Ca*Aa:	7.00	8.75	4.98	0.00	0.00

Calculated Sums of Ca*Aa: 20.73 sf

Item 1 calculated force F:	209.741006
Item 2 calculated force F:	262.176257# CONTROLS
Item 3 calculated force F:	149.100262
Item 4 calculated force F:	0
Item 5 calculated force F:	0

Wind Force F= qz*Gh [Cf*Ae+∑(Ca*Aa)] F= 621.02 Pounds



CITY OF PORTLAND, MAINE
Department of Building Inspections

Original Receipt

_____ 20 11

Received from _____

Location of Work _____

Cost of Construction $_____ Building Fee:_____

Permit Fee $_____ Site Fee: _____

Certificate of Occupancy Fee: _____

Total: _____

Building (IL) ___ Plumbing (I5) ___ Electrical (I2) ___ Site Plan (U2) ___

Other _____

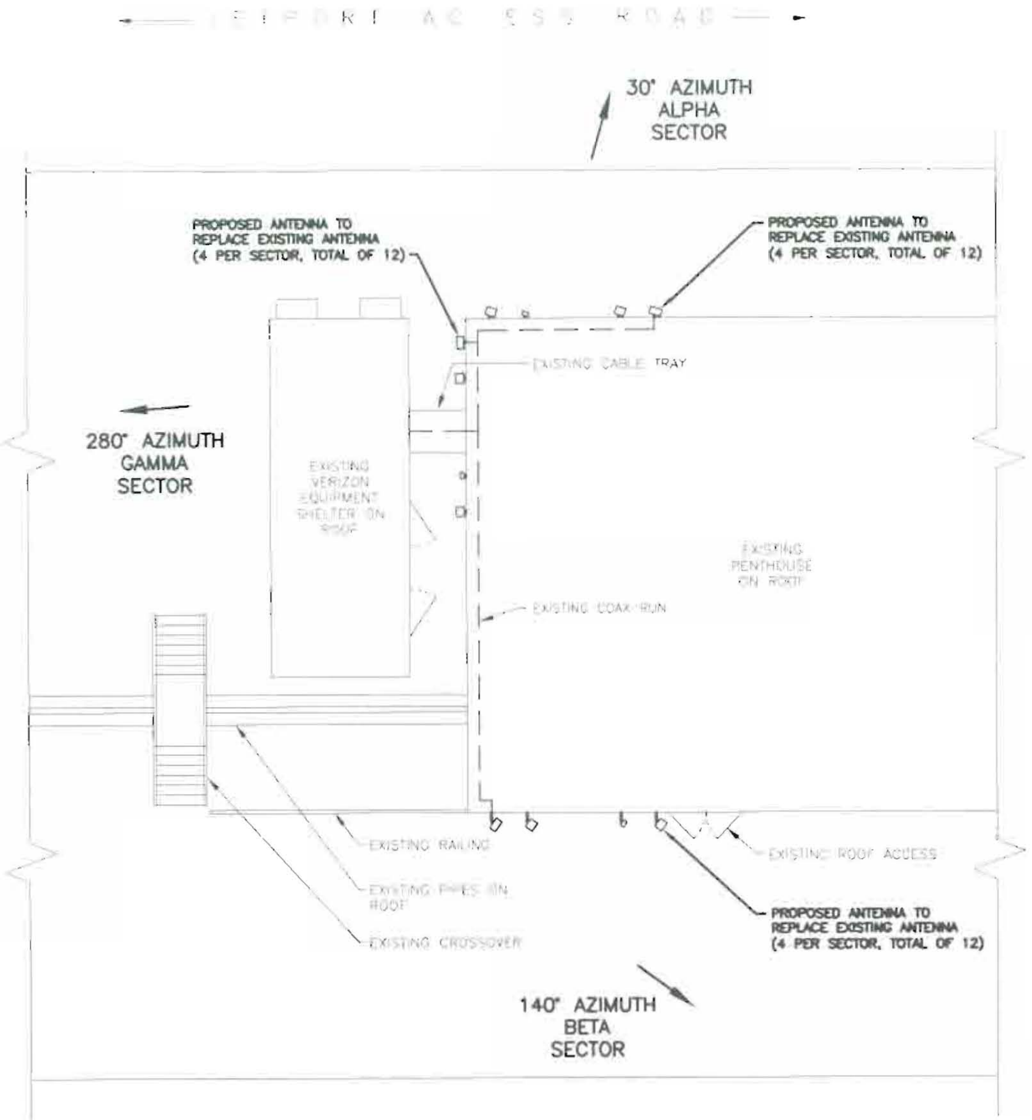
CBL:_____

Check #:_____ **Total Collected $**_____

No work is to be started until permit issued.
Please keep original receipt for your records.

Taken by: _____

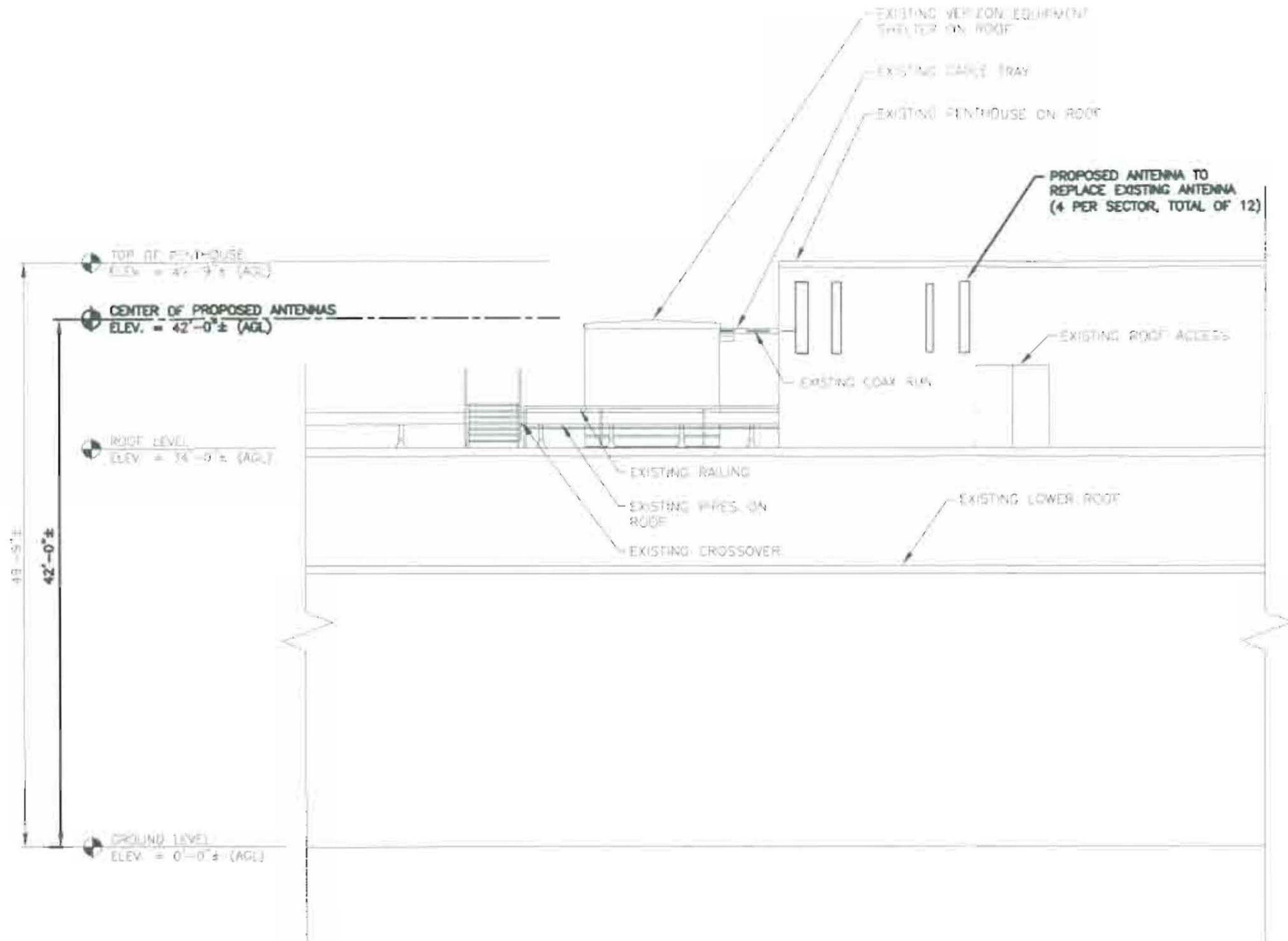
WHITE - Applicant's Copy
YELLOW - Office Copy
PINK - Permit Copy



PARTIAL ROOF PLAN (1 / CE-1)

APPROX. TRUE NORTH

GRAPHIC SCALE: 0, 4'-0", 8'-0", 16'-0", 24'-0"



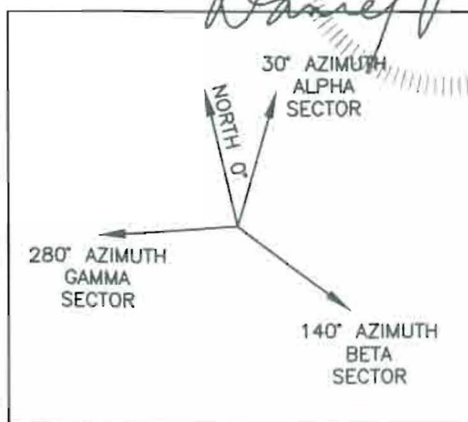
PARTIAL SOUTH ELEVATION (2 / CE-1)

GRAPHIC SCALE: 0, 4'-0", 8'-0", 16'-0", 24'-0"

SCOPE:

1. VERIFY EXACT COAX AND ANTENNA INSTALLATION WITH LATEST RF DATA SHEETS PRIOR TO INSTALLATION.
2. VERIFY EXACT ANTENNA HEIGHT & AZIMUTHS WITH RF DATA SHEET PRIOR TO INSTALLATION.

CONSTRUCTION PLAN EXHIBIT



ANTENNA ORIENTATION

PREPARED BY: Hudson Design Group
1600 OSGOOD STREET, BUILDING 20 NORTH, SUITE 2-101, N. ANDOVER, MA 01845
TEL (978) 557-5553, FAX (978) 336-5586

ROOF PLAN & ELEVATION

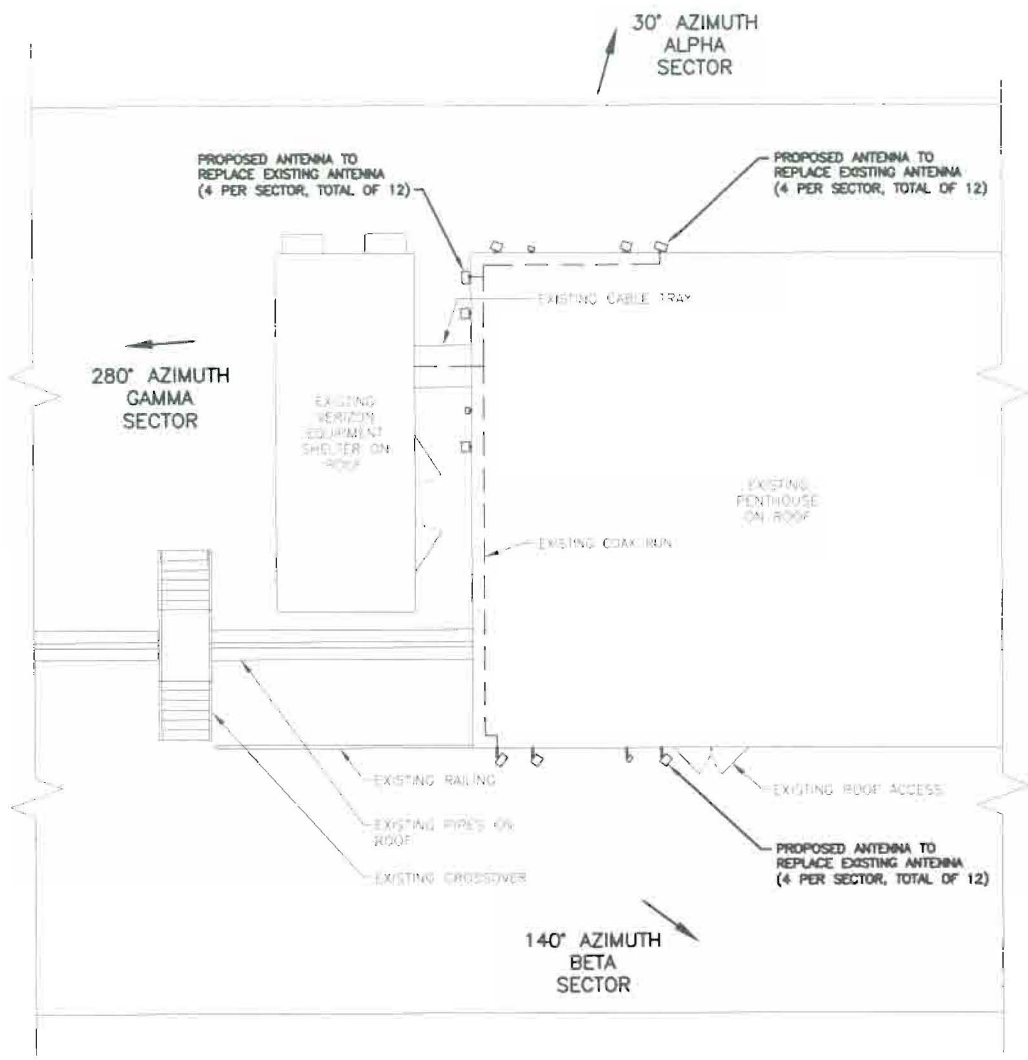
REV	DATE	DESCRIPTION	BY	CHK	APP'D
0	01/19/11	FOR REVIEW	DB	JX	DPH
1	01/26/11	FOR PERMITTING	DB	JX	DPH
2	06/29/11	REVISED PER COMMENTS	BR	JX	DPH

REGISTERED ENGINEER

PORTLAND JETPORT ME
1001 WESTBROOK STREET
PORTLAND, ME 04102

CE-1

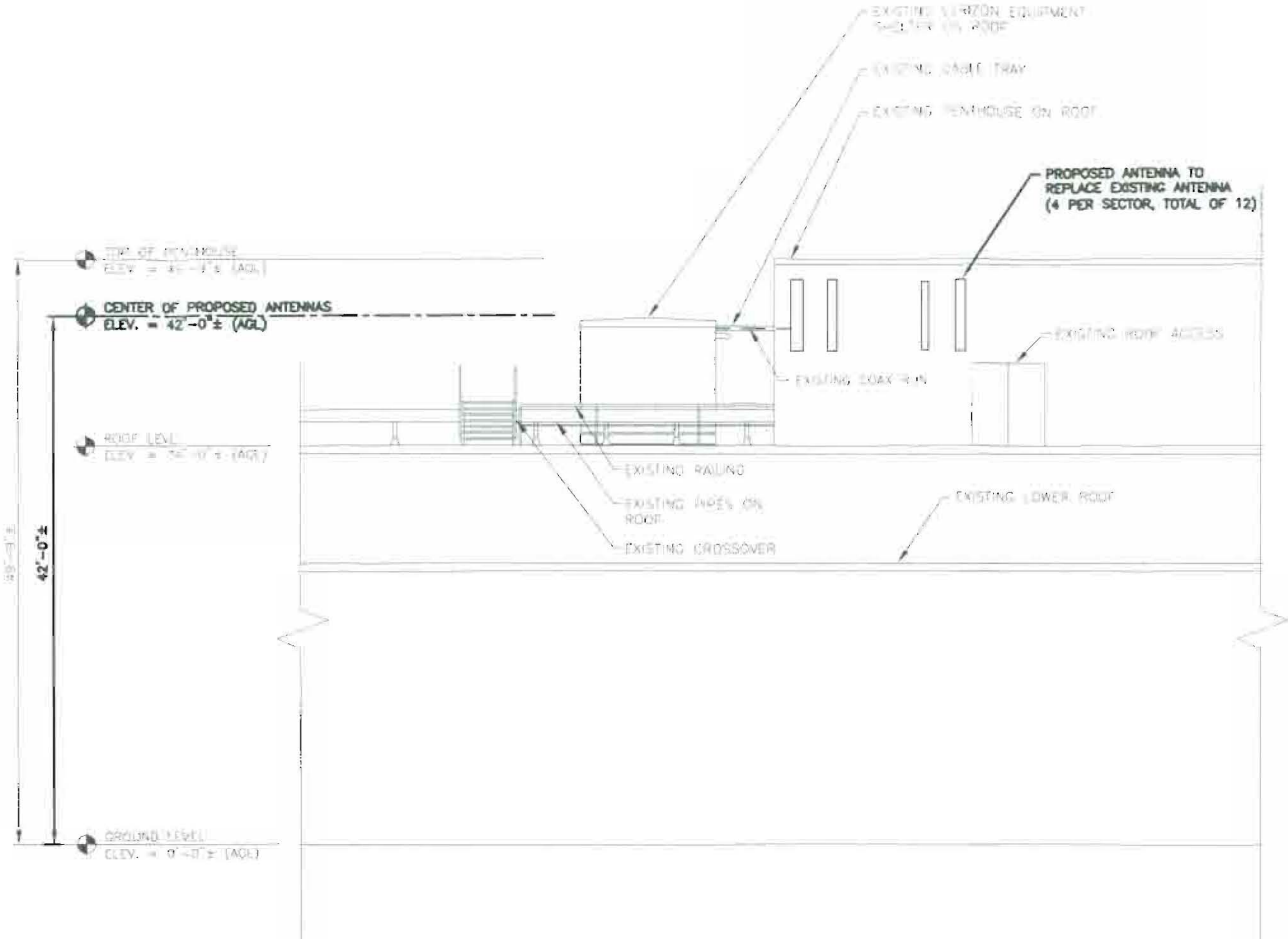
VERIZON #2010543717



PARTIAL ROOF PLAN (1/CE-1)
SCALE: 1/8" = 1'-0"

APPROX TRUE NORTH

GRAPHIC SCALE
0 4'-0" 8'-0" 16'-0" 24'-0"



PARTIAL SOUTH ELEVATION (2/CE-1)
SCALE: 1/8" = 1'-0"

GRAPHIC SCALE
0 4'-0" 8'-0" 16'-0" 24'-0"

SCOPE:

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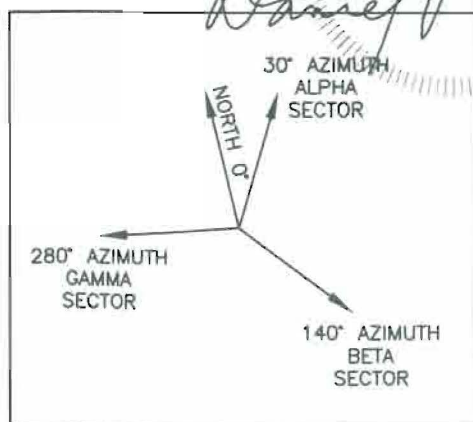

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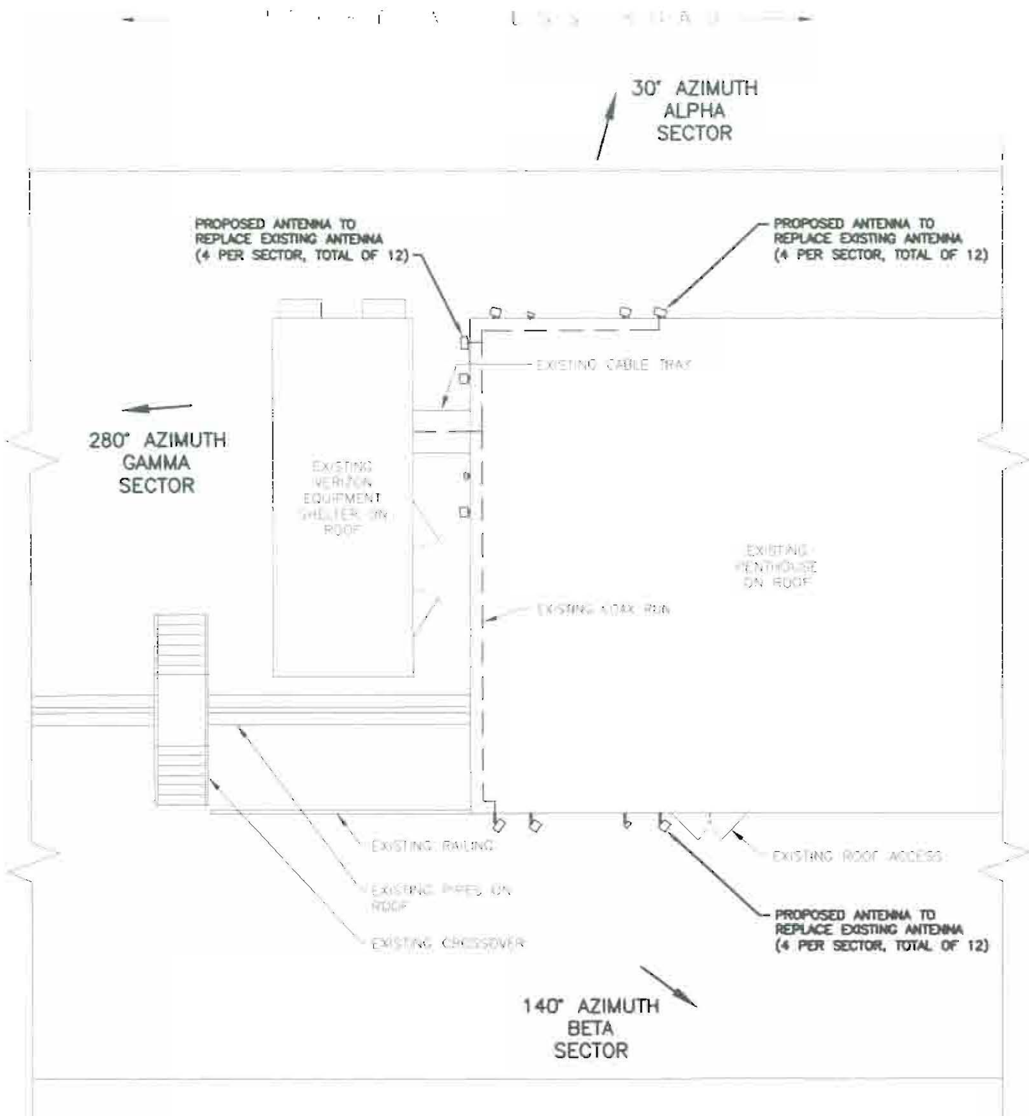
REGISTERED ENGINEER

PORTLAND JETPORT ME
1001 WESTBROOK STREET
PORTLAND, ME 04102

CE-1

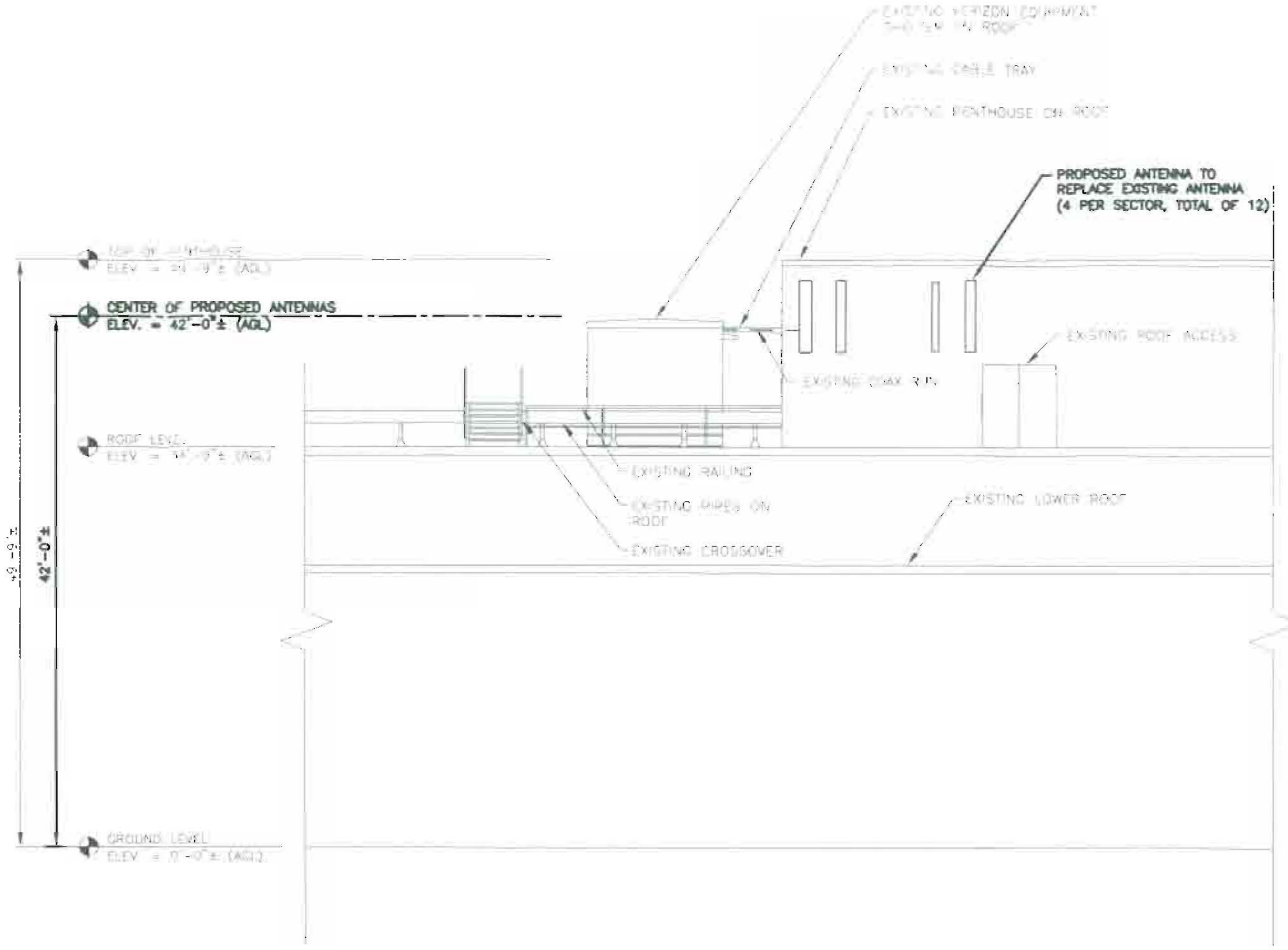
VERIZON #2010543717



PARTIAL ROOF PLAN (1 / CE-1)

APPROX. TRUE NORTH

GRAPHIC SCALE 0 4'-0" 8'-0" 16'-0" 24'-0"



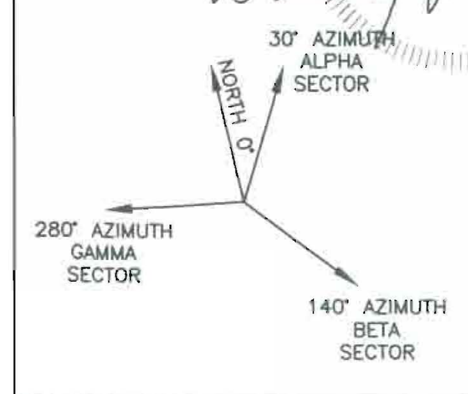
PARTIAL SOUTH ELEVATION (2 / CE-1)

GRAPHIC SCALE 0 4'-0" 8'-0" 16'-0" 24'-0"

SCOPE:

1. VERIFY EXACT COAX AND ANTENNA INSTALLATION WITH LATEST RF DATA SHEETS PRIOR TO INSTALLATION.
2. VERIFY EXACT ANTENNA HEIGHT & AZIMUTHS WITH RF DATA SHEET PRIOR TO INSTALLATION.

CONSTRUCTION PLAN EXHIBIT



ANTENNA ORIENTATION

PREPARED BY:
Hudson Design Group

ROOF PLAN & ELEVATION

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1	01/26/11	FOR PERMITTING	DB	JX	DPH
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REGISTERED ENGINEER

PORTLAND JETPORT ME
1001 WESTBROOK STREET
PORTLAND, ME 04102

CE-1

VERIZON #2010543717