DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK

CITY OF PORTLAND

BUILDING PERMIT

This is to certify that RONALD J DORLER

Located At 220 RIVERSIDE IND PKWY

Job ID: 2011-04-736-ALTCOMM

CBL: 330 - - H - 005 - 001 - - - - -

has permission to Construct a 12 'x 16' equipment shelter, add appurtenances to existing communication tower & generator 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

Fire Prevention Officer

Code Enforcement Officer / Plan Reviewer 5/5/11

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

PENALTY FOR REMOVING THIS CARD

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:	
2011-04-736-ALTCOMM	4/5/2011	330 - - H - 005 - 001 - - - - -	
Location of Construction: 220 RIVERSIDE IND PKWY	Owner Name: RONALD J DORLER	Owner Address: 210 BLACKSTRAP RD FALMOUTH, ME 04105	Phone:
Business Name:	Contractor Name: CFE Telecom –Steve Portnoy	Contractor Address: 4544 S. Lamar Blvd, G-300, Austin, TX, 78745	Phone: 512-674-9484
Lessee/Buyer's Name:	Phone:	Permit Type: BLDG - Building	Zone: I-M
Past Use: Communication tower & supporting structures	Proposed Use: Communication tower & supporting structures – add appurtenances to existing tower & build 12' x 16' equipment shelter	Cost of Work: 50000.00 Fire Dept: ✓ Approved ___ Denied ___ N/A Signature: BJ (58)	CEO District: Inspection: Use Group: N/A Type: Comm. Tower Signature: 5/5/11
Proposed Project Description: 220 Riverside Industrial Parkway – add to tower & 12'x16' shelter		Pedestrian Activities District (P.A.D.)	
Permit Taken By:			

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.

Zoning Approval

Special Zone or Reviews	Zoning Appeal	Historic Preservation
___ Shoreland	___ Variance	✓ Not in Dist or Landmark
___ Wetlands	___ Miscellaneous	___ Does not Require Review
___ Flood Zone	___ Conditional Use	___ Requires Review
___ Subdivision	___ Interpretation	___ Approved
___ Site Plan – Admin. Athr.	___ Approved	___ Approved w/Conditions
___ Maj ___ Min ___ MM	___ Denied	___ Denied
Date: 4/14/11	Date:	Date: ARM
Otw/ conditio ARM		

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 appication 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

G3-11

11'8" x 16'

#4 18" o.c.

#4 Baskets

5000psi from Auburn

& 3'8" setback to face

Summit engineering is doing special Inspection

okay to pour NLD

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: 2011-04-736-ALTCOMM **Located At:** 220 RIVERSIDE IND **CBL:** 330 - - H - 005 - 001 - - - - -

Conditions of Approval:

Zoning

1. This permit is being approved on the basis of plans submitted. Any deviations shall require a separate approval before starting that work.

Building

1. Application approval based upon information provided by applicant. Any deviation from approved plans requires separate review and approval prior to work.
2. At the completion of the work, a licensed engineer is required to sign off that the installation is in compliance with the approved design.

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.**

1. Electrical – Commercial
2. Foundation/Rebar
3. Final at completion including letter of compliance from engineer

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.

Received & e-mailed 4.6.11

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: Riverside Industrial Parkway		
Total Square Footage of Proposed Structure/Area 192	Square Footage of Lot 54,813 SF	
Tax Assessor's Chart, Block & Lot Chart# 330 Block# H Lot# 5	Applicant *must be owner, Lessee or Buyer* Name US CUSTOMS AND BORDER PROTECTION c/o CFE Telecom 4544 S. Lamar Blvd. G-300 Austin, TX 78745	Telephone: 512 674-9484
Lessee/DBA (If Applicable)	Owner (if different from Applicant) Name: Ronald J. Dorler Address:220 Riverside Industrial Pkwy. Portland, ME 04013	Cost Of Work: $50,000 C of O Fee: $ Total Fee: $

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APR 12 2011
Dept. of Building Inspections
City of Portland Maine

Current legal use (i.e. single family) Communications tower and supporting structures

If vacant, what was the previous use? _____

Proposed Specific use: Public safety communications facility

Is property part of a subdivision? No If yes, please name N/A

Project description: Addition of appurtenances to existing tower and construction of 12x16 equipment shelter

Contractor's name: CFE Telecom - Steve

Address: 4544 South Lamar Blvd. G-300

City, State & Zip Austin, TX 78745 Telephone: 512-674-9484

Who should we contact when the permit is ready: Michael Neville* Telephone: 512-786-7578

Mailing address: Same as above *POINT OF CONTACT

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.

Signature: Date: 4.4.11

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

Job Summary Report
Job ID: 2011-04-736-ALTCOMM

Job Type:	Adds/Alter Commercial	**Job Description:**	220 Riverside Industrial Parkway	**Job Year:**	2011
Building Job Status Code:	Initiate Plan Review	**Pin Value:**	1051	**Tenant Name:**	
Job Application Date:		**Public Building Flag:**	N	**Tenant Number:**	
Estimated Value:	50,000	**Square Footage:**			
Related Parties:		RONALD DORLER		*Property Owner*	
		- CFE Telecom CFE Telecom		*GENERAL CONTRACTOR*	

Job Charges

Fee Code Description	Charge Amount	Permit Charge Adjustment	Net Charge Amount	Payment Date	Receipt Number	Payment Amount	Payment Adjustment Amount	Net Payment Amount	Outstanding Balance

Location ID: 45938

Location Details

Alternate Id	Parcel Number	Census Tract	GIS X	GIS Y	GIS Z	GIS Reference	Longitude	Latitude
D31022	330 H 005 001		M				-70.310687	43.706103

Location Type	Subdivision Code	Subdivision Sub Code	Related Persons	Address(es)
1				220 RIVERSIDE IND PARKWAY

Location Use Code	Variance Code	Use Zone Code	Fire Zone Code	Inside Outside Code	District Code	General Location Code	Inspection Area Code	Jurisdiction Code
VACANT LAND		NOT APPLICABLE	I M				DISTRICT 8	RIVERTON

Structure Details

Structure: Communications tower

Occupancy Type Code:

Structure Type Code	Structure Status Type	Square Footage	Estimated Value	Address
Commercial ie; Wharfs, terminals	0		50000	220 RIVERSIDE IND PARKWAY

Longitude	Latitude	GIS X	GIS Y	GIS Z	GIS Reference

User Defined Property	Value

Permit #: 20112487

GO

Permit Data

Location Id	Structure Description	Permit Status	Permit Description	Issue Date	Reissue Date	Expiration Date
45938	Communications tower	Initialized	const. 12 'x 16' equipment shelter			

Permit Copy only - JmB

4/21/11 I have completed my review and sent the following comments via email to Steve Portnoy:

1. Please provide stamped construction drawings, details of the building construction (it appears only the foundation is supplied),
2. Tower mounting kit specs and details,
3. Engineers assessment that the tower is structurally designed to accept the loads of the proposed additional equipment,
4. A condition of the permit will require confirmation by a licensed professional that the installation of the equipment is in compliance with the design standards.

I have not received the approved Administrative Authorization documents for approval of the structure on this site. I can only issue the permit when this has been approved.

4/26/11 Received approved Admn. Auth
4/29/11 Received revisions and details via email

Certificate of Design Application

From Designer: Alex Potter, CEC Telecom

Date: 4-4-11

Job Name: US Customs and Border Protection Public Safety Facility

Address of Construction: 225 Riverside Industrial Parkway

2003 International Building Code

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

Building Code & Year 2003 Use Group Classification(s)

Type of Construction pre-cast telecommunications equipment shelter (concrete)

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

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

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

Structural Design Calculations

_____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
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Wind loads (1603.1.4, 1609)

_____Design option utilized (1609.1.1, 1609.6)

_____Basic wind speed (1809.3)

_____Building category and wind importance Factor, *Iw*

_____Wind exposure category (1609.4)

_____Internal pressure coefficient (ASCE 7)

_____Component and cladding pressures (1609.1.1, 1609.6.2.2)

_____Main force wind pressures (7603.1.1, 1609.6.2.1)

Earth design data (1603.1.5, 1614-1623)

_____Design option utilized (1614.1)

_____Seismic use group ("Category")

_____Spectral response coefficients, SDs & SD1 (1615.1)

_____Site class (1615.1.5)

_____Live load reduction

_____Roof *live* loads (1603.1.2, 1607.11)

_____Roof snow loads (1603.7.3, 1608)

_____Ground snow load, *Pg* (1608.2)

_____If *Pg* > 10 psf, flat-roof snow load *Pf*

_____If *Pg* > 10 psf, snow exposure factor, *Ce*

_____If *Pg* > 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, *R1* 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)

_____Flood Hazard area (1612.3)

_____Elevation of structure

Other loads

_____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 table 1604.5, 1609.5)

City of Portland E-911 Addressing Officer
Leslie Kaynor
Department of Public Services
55 Portland St., Portland, ME 04101
(207) 756-8346
lmk@PortlandMaine.gov

May 2, 2011

To whom it may concern:

This is to inform you that the official E911 address for the structure on Assessor parcel 330 H005 is

222 Riverside Industrial Parkway 04103

This information will be sent to the City Departments, Portland Post Office, Verizon and the State E-911 Office.

Identifying Your Building/House

For Fire and Rescue purposes it is very important that you place your street number on your building in a location visible from the street or driveway at all times of year. The height of each number in your address should be a minimum of **4 inches**. The color of the number should **contrast** with the background color.

In addition, if your house or building is located further than **75 feet back** from the road or otherwise not visible from the road, your street number is required to be placed at the beginning of your driveway. The numbers should be a minimum height of **4 inches, contrast** with the background color and be made of **reflective** materials. Acceptable methods of display include the use of your mailbox, placement of a plaque on a post, etc.

In addition, you are requested to prominently post your assigned number and street name near your telephone for emergency reference.

Please feel free to contact me if you have any questions regarding this notice.
Sincerely,

Leslie Kaynor
cc: Michael J. Bobinsky, Director of Public Services

Jeanie Bourke - RE: FW: US Customs & Border Protection tower site building permit - 225 Riverside Industrial Parkway

From: "Portnoy, Steve" <sportnoy@ccc411.com>
To: "Jeanie Bourke" <JMB@portlandmaine.gov>
Date: 4/29/2011 1:30 PM
Subject: RE: FW: US Customs & Border Protection tower site building permit - 225 Riverside Industrial Parkway
CC: "Neville, Michael T." <mneville@ccc411.com>
Attachments: FW: CBP Houlton Maine; STAMPED PDF.US CBP_ATC_10047 Portland ME_Structural Analysis (94%)_20110214.pdf; Portland Antenna Mount info.pdf

Hi Jeanie,

Please see the attached E-mail that contains attachments with additional building construction information. The telecommunications equipment shelter is pre-cast concrete delivered to the site on flat bed truck and unloaded on the slab with a crane.

I have also attached a copy of the PE sealed tower structural analysis that shows the tower passes with the proposed additional loading as well as the mounting kit details you requested.

I assume that Item 4 below related to an engineer issued post-construction compliance letter. Let me know if you need anything else in order to issue this permit. I appreciate it.

Steve Portnoy

CFE Telecom
DESK (512) 674 9484
MBL (512) 415 5890

From: Jeanie Bourke [mailto:JMB@portlandmaine.gov]
Sent: Thursday, April 21, 2011 3:00 PM
To: Portnoy, Steve
Subject: Re: FW: US Customs & Border Protection tower site building permit - 225 Riverside Industrial Parkway

Hi Steve,
I have completed my review and have the following comments:

1. Please provide stamped construction drawings, details of the building construction (it appears only the foundation is supplied),
2. Tower mounting kit specs and details,
3. Engineers assessment that the tower is structurally designed to accept the loads of the proposed additional equipment,
4. A condition of the permit will require confirmation by a licensed professional that the installation of the equipment is in compliance with the design standards.

I have not received the approved Administrative Authorization documents for approval of the structure on this site. I can only issue the permit when this has been approved.

Let me know if you have further questions. I am out of the office tomorrow.
Thanks,
Jeanie

Jeanie Bourke
CEO/Plan Reviewer

City of Portland
Planning & Urban Development Dept./ Inspections Division
389 Congress St. Rm 315
Portland, ME 04101
jmb@portlandmaine.gov
Direct: (207) 874-8715
Office: (207) 874-8703

>>> "Portnoy, Steve" <sportnoy@ccc411.com> 4/21/2011 10:38 AM >>>
Hi Jeanie,

Can you please update me on the approval status for this requested building permit for this federal telecommunications project? Also, please let me know if you need any additional information from our office. Once approved, if it's not too much trouble, could you please e-mail me a scanned copy and snail mail me the hard copy to the address below? I appreciate it.

Steve Portnoy

CFE Telecom
DESK (512) 674 9484
MBL (512) 415 5890

From: Ann Machado [mailto:AMACHADO@portlandmaine.gov]
Sent: Thursday, April 21, 2011 9:38 AM
To: Portnoy, Steve
Subject: Re: US Customs & Border Protection tower site building permit - 225 Riverside Industrial Parkway

Steve -

The permit has been reviewed and signed off by zoning and fire. The final review is with a plan reviewer/building inspector. It will probably be Jeanie Bourke doing the review. Her email is jmb@portlandmaine.gov Her phone number is 207.874.8715.

Ann

>>> "Portnoy, Steve" <sportnoy@ccc411.com> 4/20/2011 10:55 AM >>>
Hi Ann,

Do you know who I can follow up with to determine the status of issuance of this requested building permit? I appreciate the feedback.

Steve Portnoy

Project Manager/Site Acquisition
CFE Telecom

From: "Kehl, Nicholas" <nkehl@ccc411.com>
To: "Portnoy, Steve" <sportnoy@ccc411.com>
Date: 4/26/2011 12:49 PM
Subject: FW: CBP Houlton Maine
Attachments: concrete 2003 IBC SCBP11 Houlton, ME 11-8x16 4-25-11jti.pdf; 108-036.pdf; SCBP11 2-0 (03-30-11).pdf; Houlton Maine Code Compliance Calcs.pdf

Steve,

Documentation for the shelter construction is attached from Cellxion for the Portland Permit. I have not had a chance to print and/or review the information yet.

Nicholas G. Kehl, P.E.
CFE Telecom
4544 South Lamar Boulevard
Building G-300
Austin, TX 78745
Desk: (512) 674-9463
Mobile: (414) 526-8408

From: Keith Underhill [mailto:kunderhill@cellxion.com]
Sent: Monday, April 25, 2011 4:15 PM
To: Kehl, Nicholas
Cc: Doug Henry; Jeff Hood
Subject: CBP Houlton Maine

Nick,
Please find the attachments for the Houlton Maine project floor plan, wall construction detail , structural calculations, and energy code compliance. Let me know if you need anything else to proceed with permits.
Thanks,

Keith Underhill
Technical Project Manager
CellXion
603-488-1261 Office
603-860-0548 Mobile

Administrative Authorization Application

Portland, Maine

Planning and Urban Development Department, Planning Division

PROJECT NAME: US Customs and Border Protection Communications Project

PROJECT ADDRESS: Riverside Industrial Parkway **CHART/BLOCK/LOT:** 330/--/5 330 H005

APPLICATION FEE: $50.00 ($50.00)

PROJECT DESCRIPTION: (Please Attach Sketch/Plan of the Proposal/Development)

Addition of appurtenances to existing tower and construction of 12x16 equipment shelter – see attached plans

CONTACT INFORMATION:

OWNER/APPLICANT		CONSULTANT/AGENT	
Name:	US Customs and Border Protection	Name:	Steve Portnoy, CFE Telecom
Attention:	Barry K. Bracken US CBP TACCOM Program Manager		
Address:	7501 Boston Blvd, B-216-1 Beauregard Springfield, VA 20229	Address:	4544 South Lamar Blvd. G-300 Austin, TX 78745
Work #:	703-921-7393	Work #:	512-674-9484
Cell #:	571-241-1604	Cell #:	512-415-5890
Fax #:	N/A	Fax #:	512-495-9473
Home #:	not published	Home #:	512-892-2949
E-mail:	barry.k.bracken@cbp.dhs.gov	E-mail:	sportnoy@cfeamerica.com

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Dept. of Building Inspections
City of Portland Maine

Criteria for an Administrative Authorization: (see section 14-523(4) on pg .2 of this appl.)	Applicant's Assessment Y(yes), N(no), N/A	Planning Division Y(yes), N(no), N/A
a) Is the proposal within existing structures?	Y	Y
b) Are there any new buildings, additions, or demolitions?	Y	Y
c) Is the footprint increase less than 500 sq. ft.?	Y	Y
d) Are there any new curb cuts, driveways or parking areas?	N	NO
e) Are the curbs and sidewalks in sound condition?	N/A	None
f) Do the curbs and sidewalks comply with ADA?	N/A	N/A
g) Is there any additional parking?	N	NO
h) Is there an increase in traffic?	N	NO
i) Are there any known stormwater problems?	N	NO
j) Does sufficient property screening exist?	Y	Y
k) Are there adequate utilities?	Y	Y
l) Are there any zoning violations?	N	N
m) Is an emergency generator located to minimize noise?	Y	Y
n) Are there any noise, vibration, glare, fumes or other impacts?	N	N

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Dept. of Building Inspections
City of Portland Maine

Signature of Applicant:	Date: 4-4-11

Planning Division Use Only Authorization Granted X Partial Exemption ____ Exemption Denied ____

w/ condition

Barbara Barhydt Dev Rev Serv Mgr

Standard Condition of Approval: The applicant shall obtain all required City Permits, including building permits from the Inspection Division (Room 315, City Hall (874-8703)) prior to the start of any construction.

IMPORTANT NOTICE TO APPLICANT: The granting of an Administrative Authorization to exempt a development from site plan review does not exempt this proposal fro other approvals or permits, nor is it an authorization for construction. You should first check with the Building Inspections Office, Room 315, City Hall (207)874-8703, to determine what other City permits, such as a building permit, will be required.

PROVISION OF PORTLAND CITY CODE
14-523 (SITE PLAN ORDINANCE)
RE: Administrative Authorization

Sec. 14-523 (b). Applicability
No person shall undertake any development identified in Section 14-523 without obtaining a site plan improvement permit under this article. (c) Administrative Authorization. Administrative Authorization means the Planning Authority may grant administrative authorization to exempt a development proposal from complete or partial site plan review that meets the standards below, as demonstrated by the applicant.

1. The proposed development will be located within existing structures, and there will be no new buildings, demolitions, or building additions other than those permitted by subsection b of this section;
2. Any building addition shall have a new building footprint expansion of less than five hundred (500) square feet;
3. The proposed site plan does not add any new curb cuts, driveways, or parking areas; the existing site has no more than one (1) curb cut and will not disrupt the circulation flows and parking on-site; and there will be no drive-through services provided;
4. The curbs and sidewalks adjacent to the lot are complete and in sound condition, as determined by the public works authority, with granite curb with at least four (4) inch reveal, and sidewalks are in good repair with uniform material and level surface and meet accessibility requirements of the Americans with Disabilities Act;
5. The use does not require additional or reduce existing parking, either on or off the site, and the project does not significantly increase traffic generation;
6. There are no known stormwater impacts from the proposed use or any existing deficient conditions of stormwater management on the site;
7. There are no evident deficiencies in existing screening from adjoining properties; and
8. Existing utility connections are adequate to serve the proposed development and there will be no disturbance to or improvements within the public right-of-way.
9. There are no current zoning violations;
10. Any emergency generators are to be located to minimize noise impacts to adjoining properties and documentation that routine testing of the generators occur on weekdays between the hours of 9 a.m. to 5 p.m. Documentation pertaining to the noise impacts of the emergency generator shall be submitted; and
11. There is no anticipated noise, vibration, glare, fumes or other foreseeable impacts associated with the project.

a. Filing the Application. An applicant seeking an administrative authorization under this subsection shall submit an administrative authorization application for review, detailing the site plan with dimensions of proposed improvements and distances from all property lines, and stating that the proposal meets all of the provisions in standards 1-11 of Section 14-523 (b)1. The application must be accompanied by an application fee of $50.

b. Review. Upon receipt of such a complete application, the Planning Authority will process it and render a written decision of approval, approval with conditions or denial, with all associated findings.

c. Decision. If a full administrative authorization is granted, the application shall be approved without further review under this article, and no performance guarantee shall be required. In the event that the Planning Authority determines that standards a and b of Section 14-523 (b) (1) and at least four (4) of the remaining standards have been met, the Planning Authority shall review the site plan according to all applicable review standards of Section 14-526 that are affected by the standards in this subsection that have not been met. If an exemption or partial exemption from site plan review is not granted, the applicant must submit a site plan application that will undergo a full review by the Planning Board or Planning Authority according to the standards of Section 14-526.

Criteria for an Adminstrative Authorizations: (See Section 14-523 (4) on page 2 of this application)	Applicant's Assessment Y(yes), N(no), N/A	Planning Division Use Only
a) Is the proposal within existing structures?	Yes	Yes
b) Are there any new buildings, additions, or demolitions?	Yes	Yes
c) Is the footprint increase less than 500 sq. ft.?	Yes	Yes
d) Are there any new curb cuts, driveways or parking areas?	No	No
e) Are the curbs and sidewalks in sound condition?	n/a	None
f) Do the curbs and sidewalks comply with ADA?	n/a	n/a
g) Is there any additional parking?	No	No
h) Is there an increase in traffic?	No	No
i) Are there any known stormwater problems?	No	No
j) Does sufficient property screening exist?	Yes	Yes
k) Are there adequate utilities?	Yes	Yes
l) Are there any zoning violations?	No	No
m)Is an emergency generator located to minimize noise?	Yes	Yes
n) Are there any noise, vibration, glare, fumes or other impacts?	No	No

The Administrative Authorization for Riverside Industrial Parkway was granted by Barbara Barbarhydt, Development Review Coordinator on 4-22-11 with conditions:

1. The applicant shall obtain all required City Permits, including building permits from the Inspection Division (Room 315, City Hall (874-8703) prior to the start of any construction.

U.S. Customs and Border Protection Public Safety Communications Facility

ADMINISTRATIVE AUTHORIZATION APPLICATION
ATTACHMENT 1

Noise Impacts from Generator

U.S. Customs & Border Protection ("CBP"), a division of the Department of Homeland Security, plans a statewide upgrade to their public safety communications network. The proposed Portland antenna facility is an integral part of that improved network plan.

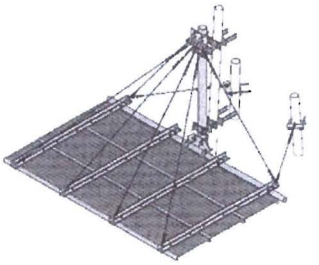
The Portland project involves the placement of two antennas and two microwave dishes on an existing 275' guyed tower owned by American Tower Corp. located at 225 Riverside Industrial Parkway. A small precast concrete 12' x 16' equipment shelter with an adjacent emergency generator and propane tank will also be constructed on the site.

The proposed project is located in a heavily developed light industrial area adjacent to Interstate 295. The tower site compound is buffered by a wooded boundary but otherwise backs directly to the highway. It is anticipated that any noise created by the periodic testing and emergency operation of the on site generator will be negligible when compared to ambient noise in the vicinity of the site.

This project is federally funded through the Department of Homeland Security. U.S. Customs and Border Protection has contracted with Motorola, Inc./CFE Telecom to design and construct these proposed telecommunications facilities in Maine. CFE Telecom has developed over five hundred telecommunications tower sites around the country and has experience in all facets of tower design, construction, remediation and maintenance.

Parabolic Antenna Ice Shield

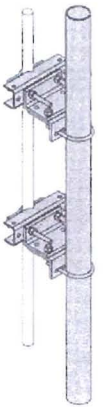
Protects parabolic dish antennas up to 10' (3.05 m) in diameter from falling ice. Mounts to the provided 4 1/2" OD (114.3 mm) mounting pipe or 4 1/2" OD (114.3 mm) tower leg and fits leg sizes of 1 1/2" to 5" OD (38.1 mm to 127 mm). Each kit comes with all hardware required for attachment to the tower.
(Mounting hardware for leg sizes larger than 5" OD (127 mm) is available by special order.)



Item #	Description	Wt. lb.	Wt. kg.
C30-085-001	For 4' (1.22 m) Parabolic Antenna	401.00	181.89
C30-085-002	For 6' - 8' (1.83 m - 2.44 m) Parabolic Antenna	701.00	317.97
C30-085-003	For 10' (3.05 m) Parabolic Antenna	745.00	337.93

Universal Microwave Mounting Kit

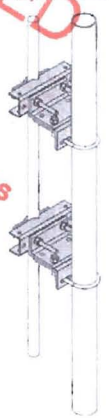
Mounts microwave dishes to either round or angle legs. Kits also adapt to straight or tapered towers. Kits include 4 1/2" OD x 7' (114.3 mm x 2.13 m) pipe.



Item #	Description	Wt. lb.	Wt. kg.
C10-153-202	Universal Mounting Kit (small) fits 1 1/2" to 5 9/16" OD (38.1 mm to 141.29 mm) legs and 2 1/2" x 2 1/2" (63.5 mm x 63.5 mm) up to 4" x 4" (101.6 mm x 101.6 mm) angle legs	145.00	65.77
C10-153-204	Universal Mounting Kit (large) fits 5 3/4" to 10 3/4" OD (146.05 mm to 273.05 mm) legs and 5" x 5" (127 mm x 127 mm) to 8" x 8" (203.2 mm x 203.2 mm) angle legs	165.00	74.84
C10-172-998	Universal Mounting Kit (small) fits 1 1/2" to 5 9/16" OD (38.1 mm to 141.29 mm) legs and 2 1/2" x 2 1/2" (63.5 mm x 63.5 mm) up to 4" x 4" (101.6 mm x 101.6 mm) angle legs. Double U-bolts for heavy duty pipe connection	175.00	79.38
C10-172-999	Universal Mounting Kit (large) fits 5 3/4" to 10 3/4" OD (146.05 mm to 273.05 mm) legs and 5" x 5" (127 mm x 127 mm) to 8" x 8" (203.2 mm x 203.2 mm) angle legs. Double U-bolts for heavy duty pipe connection	195.00	88.45

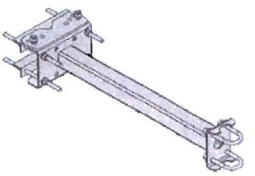
Universal Pipe Mounting Kit

Accommodates pipe sizes from 2 3/8" up to 4 1/2" OD (60.33 mm up to 114.3 mm). Mount can be used on both tapered and straight leg towers. *(Pipe purchased separately on page 67)*



Item #	Description	Wt. lb.	Wt. kg.
C10-172-101	Universal Pipe Mounting Kit (small) fits1 1/2" to 5 9/16" OD (38.1 mm to 141.29 mm) legs and 2 1/2" x 2 1/2" (63.5 mm x 63.5 mm) to 4" x 4" (101.6 mm x 101.6 mm) angle legs	83.00	37.65
C10-172-102	Universal Pipe Mounting Kit (large) fits 5 3/4" to 10 3/4" OD (146.05 mm to 273.05 mm) legs and 5" x 5" (127 mm x 127 mm) to 8" x 8" (203.2 mm x 203.2 mm) angle legs	103.00	46.72

3' Standoff for Round and Angle Leg Towers



Item #	Description	Wt. lb.	Wt. kg.
C10-148-003	3' (914.4 mm) Standoff Assembly for 2 3/8" (60.33 mm) mounting pipes. Fits 1 1/2" to 5 9/16" OD (38.1 mm to 141.29 mm) legs and 2 1/2" x 2 1/2" (63.5 mm x 63.5 mm) up to 4" x 4" (101.6 mm x 101.6 mm) angle legs	44.10	20.00

Antenna Mounting Systems

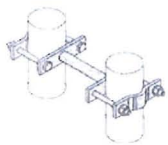

-100

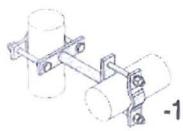

-001

Pipe to Pipe Mounting Kit

Allows attachment of a pipe 1 1/2" to 5" OD (38.1 mm to 127 mm) to a tower leg 1 1/2" to 5" OD (38.1 mm to 127 mm). Mounting hardware included. *(Pipe sold separately on page 67.)*

Item #	Description	Wt. lb.	Wt. kg.
C10-158-100	Pipe to Pipe Mounts from 1 1/2" to 5" OD (38.1 mm to 127 mm). Kit of two	25.5	11.57
C10-158-001	GPS Antenna Mounting Kit with 1.9" OD x 2' (48.26 mm x 609.6 mm) pipe	23.00	10.43

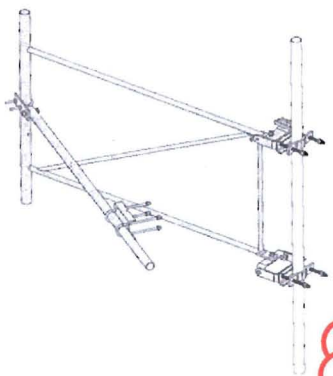

-001


-101

6" Pipe to Pipe Standoff

Used to standoff anything away from a tower leg. Fits 1 1/4" to 3 1/2" OD (31.75 mm to 88.9 mm) round legs. Two can be used for a simple pipe mount. Mounting hardware included.

Item #	Description	Wt. lb.	Wt. kg.
C10-180-001	Pipe to Pipe 6" (152.4 mm) Standoff	7.00	3.18
C10-180-101	90° Pipe to Pipe 6" (152.4 mm) Standoff	7.00	3.18



Universal Sidearm

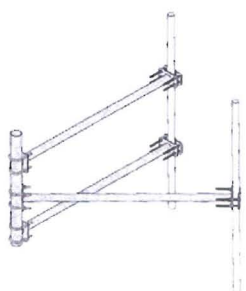
Mounts to straight leg towers from 1 1/2" to 5" OD (38.1 mm to 127 mm) round legs and 2" x 2" (50.8 mm x 50.8 mm) to 3 1/2" x 3 1/2" (88.9 mm x 88.9 mm) angle legs. 1.9" OD x 3' (48.26 mm x 914.4 mm) welded mounting pipe and all attachment hardware included. All sidearms include 1.9" OD x 10' (48.26 mm x 3.05 m) tieback assembly.

Item #	Description	Wt. lb.	Wt. kg.
C10-151-902	2' (609.6 mm) Universal Sidearm	96.10	43.59
C10-151-903	3' (914.4 mm) Universal Sidearm	113.00	51.26
C10-151-904	4' (1.22 m) Universal Sidearm	123.50	56.02
C10-151-905	5' (1.52 m) Universal Sidearm	134.40	60.96
C10-151-906	6' (1.83 m) Universal Sidearm	145.40	65.95

Double Antenna Clamp - 2' Separation

Allows for dual antenna attachment to Universal Sidearms and Heavy Duty Sidearms. Accepts 1 1/2" OD to 5" OD (38.1 mm to 127 mm) Antenna Mounting Pipes. *(Pipes sold separately on page 67.)*

Item #	Description	Wt. lb.	Wt. kg.
C10-854-101	Double Antenna Clamp	30.66	13.91



Heavy Duty Sidearm

Includes 4" OD (101.6 mm) mounting pipe, stiffarm and all mounting hardware to mount to straight leg towers from 1 1/2" to 5 9/16" OD (38.1 mm to 141.29 mm) round legs. Fits towers with face widths between 3' and 5' (914.4 mm and 1.52 m). Comes preassembled and ready for installation.

Item #	Description	Wt. lb.	Wt. kg.
C10-149-006	Face Mounted for Heavy Duty 6' (1.83 m) Standoff	198.70	90.13

Phone: **866-428-6937** *Fax:* **712-293-1964** *Email:* **catalog@sabrecom.com** *Web:* **www.SabreSiteSolutions.com**

COMcheck Software Version 3.8.1
Envelope Compliance Certificate

90.1 (2007) Standard

Section 1: Project Information

Project Type: **New Construction**
Project Title : Concrete Shelter

Construction Site:
MAINE

Owner/Agent:
TN

Designer/Contractor:
Corey Mitchel
CellXion, LLC
5031 Hazel Jones Road
Bossier City, TN 71111
318-213-2900

Section 2: General Information

Building Location (for weather data): **Houlton, Maine**
Climate Zone: **7**
Building Type for Envelope Requirements: **Non-Residential**

Activity Type(s)	Floor Area
Common Space Types:Electrical/Mechanical	192

Section 3: Requirements Checklist

Envelope PASSES: Design 1% better than code.

Climate-Specific Requirements:

Component Name/Description	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor(a)
Roof 1 Other Roof (b)	192	---	---	0.045	0.027
Exterior Wall 1 Other Mass Wall, Heat capacity 1.0 (b)	532	---	---	0.045	0.051
Door 1 Insulated Metal, Swinging	21	---	---	0.240	0.500
Floor 1 Slab-On-Grade:Unheated, Vertical 2 ft.	56	---	10.0	---	---

(a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.
(b) 'Other' components require supporting documentation for proposed U-factors.

Insulation:

- ☐ 1. Open-blown or poured loose-fill insulation has not been used in attic roof spaces with ceiling slope greater than 3 in 12.
- ☐ 2. Wherever vents occur, they are baffled to deflect incoming air above the insulation.
- ☐ 3. Recessed lights, equipment and ducts are not affecting insulation thickness.
- ☐ 4. No roof insulation is installed on a suspended ceiling with removable ceiling panels.
- ☐ 5. All exterior insulation is covered with protective material.
- ☐ 6. Cargo and loading dock doors are equipped with weather seals.

Fenestration and Doors:

- ☐ 7 Windows and skylights are labeled and certified by the manufacturer for U-factor and SHGC.
- ☐ 8. Fixed windows and skylights unlabeled by the manufacturer have been site labeled using the default U-factor and SHGC.
- ☐ 9. Other unlabeled vertical fenestration, operable and fixed, that are unlabeled by the manufacturer have been site labeled using the default U-factor and SHGC. No credit has been given for metal frames with thermal breaks, low-emissivity coatings, gas fillings, or insulating spacers.

Air Leakage and Component Certification:

- ☐ 10. All joints and penetrations are caulked, gasketed, weather-stripped, or otherwise sealed.
- ☐ 11 Windows, doors, and skylights certified as meeting leakage requirements.
- ☐ 12. Component R-values & U-factors labeled as certified.
- ☐ 13. 'Other' components have supporting documentation for proposed U-Factors.

Section 4: Compliance Statement

Compliance Statement: The proposed envelope design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed envelope system has been designed to meet the 90.1 (2007) Standard requirements in COM*check* Version 3.8.1 and to comply with the mandatory requirements in the Requirements Checklist.

Corey Mitchel - Code Compliance Engineer		
Name - Title	Signature	Date

COMcheck Software Version 3.8.1

Interior Lighting and Power Compliance Certificate

90.1 (2007) Standard

Section 1: Project Information

Project Type: **New Construction**
Project Title : Concrete Shelter

Construction Site:
MAINE

Owner/Agent:
TN

Designer/Contractor:
Corey Mitchel
CellXion, LLC
5031 Hazel Jones Road
Bossier City, TN 71111
318-213-2900

Section 2: Interior Lighting and Power Calculation

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B x C)
Common Space Types:Electrical/Mechanical	192	1.5	288
		Total Allowed Watts =	288

Section 3: Interior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Common Space Types:Electrical/Mechanical (192 sq.ft.)				
Linear Fluorescent 1 48" T8 32W / Electronic	2	4	51	204
			Total Proposed Watts =	204

Section 4: Requirements Checklist

Lighting Wattage:

☐ 1 Total proposed watts must be less than or equal to total allowed watts.

Allowed Watts	Proposed Watts	Complies
288	204	YES

☐ 2. Exit signs 5 Watts or less per sign.

Controls, Switching, and Wiring:

☐ 3. Independent manual or occupancy sensing controls for each space (remote switch with indicator allowed for safety or security).
☐ 4 Occupant sensing control in class rooms, conference/meeting rooms, and employee lunch and break rooms.

Exceptions:

☐ Spaces with multi-scene control; shop classrooms, laboratory classrooms, and preschool through 12th grade classrooms.

☐ 5. Automatic shutoff control for lighting in >5000 sq.ft buildings by time-of-day device, occupant sensor, or other automatic control.

Exceptions:

☐ 24 hour operation lighting; patient care areas; where auto shutoff would endanger safety or security.

☐ 6. Master switch at entry to hotel/motel guest room.
☐ 7 Separate control device for display/accent lighting, case lighting, task lighting, nonvisual lighting, lighting for sale, and demonstration lighting.

☐ 8. Tandem wired one-lamp and three-lamp ballasted luminaires (No single-lamp ballasts).

Exceptions:

☐ Electronic high-frequency ballasts.

☐ Luminaires not on same switch.

☐ Recessed luminaires 10 ft. apart or surface/pendant not continuous.

☐ Luminaires on emergency circuits.

Voltage Drop:

☐ 9. Feeder conductors have been designed for a maximum voltage drop of 2 percent.

☐ 10. Branch circuit conductors have been designed for a maximum voltage drop of 3 percent.

Interior Lighting PASSES: Design 29% better than code.

Section 5: Compliance Statement

Compliance Statement: The proposed lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 90.1 (2007) Standard requirements in COM*check* Version 3.8.1 and to comply with the mandatory requirements in the Requirements Checklist.

Corey Mitchel - Code Compliance Engineer		
Name - Title	Signature	Date

Section 6: Post Construction Compliance Statement

Record Drawings and Operating and Maintenance Manuals:

☐ 1 Construction documents with record drawings and operating and maintenance manuals provided to the owner

Lighting Designer or Contractor Name	Signature	Date

COMcheck Software Version 3.8.1

Mechanical Compliance Certificate

90.1 (2007) Standard

Section 1: Project Information

Project Type: **New Construction**
Project Title : Concrete Shelter

Construction Site:
MAINE

Owner/Agent:
TN

Designer/Contractor:
Corey Mitchel
CellXion, LLC
5031 Hazel Jones Road
Bossier City, TN 71111
318-213-2900

Section 2: General Information

Building Location (for weather data): **Houlton, Maine**
Climate Zone: **7**

Section 3: Mechanical Systems List

Quantity	System Type & Description
2	HVAC System 1 (Single Zone) : Heating: 1 each - Other, Electric, Capacity = 17 kBtu/h Cooling: 1 each - Other, Capacity = 42 kBtu/h, Air-Cooled Condenser

Section 4: Requirements Checklist

Requirements Specific To: HVAC System 1 :

☐ 1 Hot gas bypass limited to 50% of total cooling capacity

Generic Requirements: Must be met by all systems to which the requirement is applicable:

☐ 1 Load calculations per ASHRAE Fundamentals

☐ 2. Hot water pipe insulation: 1 in. for pipes <=1.5 in. and 2 in. for pipes >1.5 in.
Chilled water/refrigerant/brine pipe insulation: 1 in. for pipes <=1.5 in. and 1.5 in. for pipes >1.5 in.
Steam pipe insulation: 1.5 in. for pipes <=1.5 in. and 3 in. for pipes >1.5 in.

- ☐ Exception: Piping within HVAC equipment.
- ☐ Exception: Fluid temperatures between 60 and 105°F
- ☐ Exception: Fluid not heated or cooled.
- ☐ Exception: Runouts <4 ft in length.
- ☐ Exception: Pipe unions in heating systems.

☐ 3. Thermostatic controls have 5°F deadband

- ☐ Exception. Thermostats requiring manual changeover between heating and cooling
- ☐ Exception: Special occupancy or special applications where wide temperature ranges are not acceptable and are approved by the authority having jurisdiction.

☐ 4. Demand control ventilation (DCV) present for high design occupancy areas (>40 person/1000 ft2 in spaces >500 ft2) and served by systems with any one of 1) an air-side economizer, 2) automatic modulating control of the outdoor air damper, or 3) a design outdoor airflow greater than 3000 cfm.

- ☐ Exception: Systems with heat recovery.
- ☐ Exception. Multiple-zone systems without DDC of individual zones communicating with a central control panel.
- ☐ Exception: Systems with a design outdoor airflow less than 1200 cfm.

- ☐ Exception: Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1200 cfm.

☐ 5. Where separate thermostats are used for heating and cooling, acceptable measures are used to prevent simultaneous heating and cooling

☐ 6. Stair and elevator shaft vents are equipped with motorized dampers

- ☐ Exception: Ventilation systems serving unconditioned spaces.
- ☐ Exception: Gravity (non-motorized) dampers are acceptable in buildings less than three stories in height above grade.

☐ 7 Acceptable measures used to prevent simultaneous humidification and dehumidification

- ☐ Exception: Desiccant systems and systems for uses requiring specific humidity levels (approval required)

☐ 8. Automatic controls for freeze protection systems present

☐ 9. Duct, plenum, and piping insulation surfaces suitably protected from weather, moisture, or likely damage

☐ 10. Duct Sealing:
a) Pressure sensitive tape used as the primary sealant is certified to comply with UL-181A or UL-181B,
b) longitudinal and transverse seams for ducts in unconditioned spaces,
c) longitudinal and transverse seams and duct wall penetrations for ducts outside the building,
d) transverse seams on buried ducts

☐ 11. R-8 for supply air ducts located outside the building,
R-6 for supply air ducts in ventilated attics and in unvented attic above insulated ceiling,
R-1.9 for supply air ducts in unvented attic with roof insulation,
R-3.5 for supply air ducts in unconditioned and underground spaces
R-3.5 for return air ducts located outside the building, in ventilated attics and in unvented attic above insulated ceiling

☐ 12. Humidistat controls prevent reheating, recooling, and mixing of mechanically heated air with mechanically cooled air

- ☐ Exception: Capability to first reduce flow rate.
- ☐ Exception: Cooling capacity <80 kBtu/h and capability to unload cooling equipment.
- ☐ Exception: Cooling capacity <40 kBtu/h.
- ☐ Exception: Rigid humidity requirements.
- ☐ Exception: Site-recovered or site-solar energy sources or
- ☐ Exception: Use of a desiccant systems.

☐ 13. Exhaust air heat recovery included for systems 5,000 cfm or greater with more than 70% outside air fraction or specifically exempted

- ☐ Exception: Laboratory fume hood systems with a total exhaust rate of 15,000 cfm or less.
- ☐ Exception: Systems serving spaces that are not cooled and heated to <60°F
- ☐ Exception: Systems with more than 60% of the outdoor heating energy is provided from site-recovered or site solar energy.
- ☐ Exception: Cooling systems in climates with a 1% cooling design wet-bulb temperature less than 64°F

☐ 14. Kitchen hoods >5,000 cfm provided with 50% makeup air that is uncooled and heated to no more than 60°F unless specifically exempted

- ☐ Exception: Where hoods are used to exhaust ventilation air that would otherwise exfiltrate or be exhausted by other fan systems.
- ☐ Exception: Certified grease extractor hoods that require a face velocity no >60 fpm.

☐ 15. Buildings with fume hood systems having an exhaust rate > 15,000 cfm has at least one of the following features:
a) VAV hood exhaust and room supply systems capable of reducing exhaust and makeup air volume to 50% or less of design values.
b) Direct makeup air supply equal to at least 75% of the exhaust rate, heated no warmer than 2°F below room setpoint, cooled to no cooler than 3°F above room setpoint, no humidification added, and no simultaneous heating and cooling used for dehumidification control.
c) Heat recovery systems to precondition makeup air from fume hood exhaust.

Section 5: Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 90.1 (2007) Standard requirements in COM*check* Version 3.8.1 and to comply with the mandatory requirements in the Requirements Checklist.

Corey Mitchel - Code Compliance Engineer		
Name - Title	Signature	Date

Section 6: Post Construction Compliance Statement

☐ HVAC record drawings of the actual installation and performance data for each equipment provided to the owner within 90 days after system acceptance.

☐ HVAC O&M documents for all mechanical equipment and system provided to the owner within 90 days after system acceptance.

☐ Written HVAC balancing report provided to the owner

The above post construction requirements have been completed.

1.1 REFERENCE MATERIAL FOR DESIGN CALCULATIONS

- 2003 International Building Code
- American Concrete Institute (ACI) 318-02
- Embedment Properties for Headed Studs, TRW Nelson, Design Data Catalog
- Steel Construction Manual, AISC, LRFD (1999
- ASCE 7-02

1.2 DESIGN CRITERIA USED IN CALCULATIONS

- Reinforcing Steel Yield Strength = fy = 60 ksi
- Structural Steel is ASTM A 36/A 36M-00
- Unconfined Compressive Strength of Concrete = f'c = 5000 psi
- Unit weight of Concrete = 110 pcf
- Stud Yield Strength = 50 ksi

1.3 INTERNATIONAL BUILDING CODE REQUIREMENTS

The following is a summary of the Code requirements applicable to CellXion precast concrete equipment shelters.

1.3.1 Occupancy Classification

Occupancy may be Group S-2 per sec 311, Group B per sec 304 or Group U per sec 312.

1.3.2 Construction Type

Type V-B per section 602.5 and Table 601.

1.3.3 Building Limitations

Occupancy S-2 or B or U

Relative to the location of the nearest structure or property line:

Walls must be rated one hour if less than 10 feet.	(Table 602)
Maximum size of S-2 building (Table 503) is 13,500 SF, 2 story.	(Table 503)
Maximum size of B building (Table 503) is 9,000 SF, 2 story.	(Table 503)
Maximum size of U building (Table 503) is 5,500 SF, 1 story.	(Table 503)

NOTE: STANDARD SHELTERS MAY BE RATED UP TO 2-HOURS.

REF: Table 720.1(2), Item number 4-1.1, Sand-lightweight concrete 4 inches thick.

IF PROTECTED OPENINGS ARE REQUIRED:

3/4 HOUR RATED OPENINGS ARE REQUIRED IN ONE HOUR ASSEMBLIES.

1.5 HOUR RATED OPENINGS ARE REQUIRED IN TWO HOUR ASSEMBLIES.

Unprotected Openings Allowed	Protected Openings Allowed Table 704.8
Not permitted up to 5 feet.	Not permitted up to 3 feet.
10% permitted > 5 feet to 10 feet.	15% permitted > 3 feet to 5 feet.
15% permitted > 10 feet to 15 feet.	25% permitted > 5 feet to 10 feet.
25% permitted > 15 feet to 20 feet.	45% permitted > 10 feet to 15 feet.
45% permitted > 20 feet to 25 feet.	75% permitted > 15 feet to 20 feet.
70% permitted > 25 feet to 30 feet.	No restriction > 20 feet.
No restriction > 30 feet.	

1.4 FLOOR LOADS

Floor live load required (Table 1607.1) for light storage is; 125 psf

The summary loading chart in Section 2.0.1 indicates allowable load of:

310 psf 11.667 ft wide **OK**

For some equipment, such as batteries, a concentrated load is realized (2.5 SF in size).

Section 2.3.6 shows that concentrated loads of 1680 lbs can be placed anywhere.

If the concentrated load is next to the wall, 6614 lbs can be used.

1.5 ROOF LOADS Minimum roof live load required (2006 IBC 1607.11.2.1) is:

$L_r = L_o R_1 R_2$ [sec 1607.11.2.1, Eq 16-27]

L_o = 20 psf (worst case) [sec 1607.11.2.1]

R_1 = 1 (worst case for smaller shelters) [sec 1607.11.2.1, Eq 16-28]

F = .167 in per ft slope R_2 = 1 (for F< 4) [sec 1607.11.2.1, Eq 16-31]

L_r = 20 psf

The summary loading chart in Section 2.0.1 indicates allowable loads of:

154 psf 11.67 ft wide shelter **OK**

Snow Loads Section 1608.2 requires use of section 7 of ASCE 7-05

$p_f = 0.7\ C_e\ C_t\ I\ p_g$ [ASCE 7-05, Equation 7-1, Sec 7.3]

p_f = (Min. design live load for roofs from section 2 of these calcs)

= 154 psf 11.67 ft wide shelter

C_e = 1.2 (worst case-ASCE 7-05,Table 7-2, lesser factors may be used as appropriate)

C_t = 1.0 (From ASCE 7-05, Table 7-3, heated structure)

I = 1.0 (Category II, ASCE 7-05 Table 7-4)

Using the design load from section 2 for p_f and solving for p_g:

$p_g = p_f / (0.7\ C_e\ C_t\ I)$

= **(Allowable ground snow load)**

= 184 psf 11.67 ft wide shelter

1.6 WIND LOADS

Sect. 1609.1.1 allows ASCE 7-05, Chapter 6; use sec 6.4, Method 1 - Simplified Procedure:

V = 150 mph [ASCE 7-05, Section 6.5.4 and Figure 6-1]

I = 1.0 [ASCE 7-05,Category II, Table 6-1 >> Table 1-1]

Exposure Classification: C [ASCE 7-05, section 6.5.6.3]

Exposure C multiplier: λ = 1.21 [ASCE 7-07, section 6.4.2 & Figure 6-2]

Enclosure Classification: enclosed [ASCE 7-05, section 6.5.9]

Roof angle: 0 to 5 degrees K_{zt} = 1.0 [ASCE 7-05, sec 6.5.7.2]

MWFRS Design Wind Pressures: [From ASCE 7-05, Figure 6-2]

$p_s = \lambda K_{zt} I p_{s30}$ [ASCE 7-05, sec 6.4.2.1, Eq 6-1]

WALLS: **43.2 psf** **[zone A]**

-22.4 psf [zone B, negligible--> only 1 inch tall]

28.7 psf [zone C]

-13.3 psf [zone D, negligible--> only 1 inch tall]

Zone A controls, use it for analysis

ROOF: **-51.9 psf** **[zone E]**

-29.5 psf [zone F]

-36.1 psf [zone G]

-22.9 psf [zone H]

Zone E controls, use it for analysis

1.6.1 Check structural connections for carrying wind loads to the foundation.

The worst case for the windward forces are when they are projected onto the long walls. Half of the load is carried to the floor connections and half is carried to the roof connections.

The walls are 9.250 ft tall

The connections which connect the long walls to the end walls are neglected for the purposes of this particular analysis. Analysis with Calculations from section 3

1.6.1.1 Check connections for transfer of windward loads from wall to the floor and roof.

The connections along the top and bottom of the walls are at a standard spacing of 56 inches. This will be the tributary width of wind load for each connection at the floor and roof. The load for this tributary area on the windward wall is then:

P'(w)= P(windward wall) x tributary area

Where tributary area = (9.250 ft / 2) x 4 ft 8 in = 21.583 sq. ft.

= 43.2 psf x 21.583 sq. ft.

P'(w)= 932 lbs

This load is resisted by three main components of the connection at the floor:

5.95 kips Capacity of P/N 223100 in tension per Clacs Section 3.3.1

22.87 kips Capacity of the Floor Lifting Insert in shear per Clacs Section 3.7

8.35 kips Capacity of the weld which connects the plates per Clacs Section 3.8

The capacity of all 3 components exceed the wind load **OK**

This load is resisted by three main components of the connection at the roof:

3.52 kips Capacity of P/N 223000 in shear per Clacs Section 3.4.3

5.95 kips Capacity of P/N 222000 in tension per Clacs Section 3.5.1

8.35 kips Capacity of the weld which connects the plates per Clacs Section 3.8

The capacity of all 3 components exceed the wind load **OK**

1.6.1.2 Check connections for transfer of leeward loads from wall to the floor and roof.

The leeward wall has similar construction, but the loads are less and are outward.

P'(l)= P(leeward wall) x tributary area

Where tributary area = (9.250 ft / 2) x 4 ft 8 in = 21.583 sq. ft.

= 43.2 psf x 21.583 sq. ft.

P'(l)= 932 lbs (negative indicating an outward direction)

This load is resisted by three main components of the connection at the floor:

5.95 kips Capacity of P/N 223100 in tension per Section 3.3.1

22.87 kips Capacity of the Floor Lifting Insert in shear per Clacs Section 3.7

8.35 kips Capacity of the weld which connects the plates per Section 3.8

The capacity of all 3 components exceed the wind load **OK**

This load is resisted by three main components of the connection at the roof:

3.52 kips Capacity of P/N 223000 in Y-shear per Section 3.4.3

5.95 kips Capacity of P/N 222000 in tension per Section 3.5.1

8.35 kips Capacity of the weld which connects the plates per Section 3.8

The capacity of all 3 components exceed the wind load **OK**

1.6.1.3 Windward and leeward loading transfer to endwalls:

The loads on the top half of the shelter must be transferred to the ground through the connections on the endwalls. There are three connections from the roof to the endwall and three connections from the endwall to the floor. The load on the projected area of the top half of the long side of the shelter is resisted by these connections and is assumed to distribute half of the load to each endwall.

A shelter which is 16.000 feet long has a tributary area of:

Area = (9.250 feet / 2) x (16.000 feet / 2) = 37.000 sq. ft.

P(proj.)= 37.00 sq. ft. x 43.2 psf

= 1,598 lbs.

The roof connection consist of the same three components as were indicated in the sidewalls, except that they are loaded in a different direction. Their capacities are shown below.

7.04 kips Capacity of P/N 223000 in X-shear per Section 3.4.2
22.87 kips Capacity of the Wall Corner Insert per Section 3.6.1
8.35 kips Capacity of the weld which connects the plates per Section 3.8

Since there are three of these connections, the total capacity is: 21.12 kips **OK**

1.6.1.4 Windward and Leeward loading transfer to floor:

The same loads that are transferred to the endwalls from the roof need to be transferred to the floor panel. This is accomplished through the three connections at the base of the endwall.

The floor connections consist of the same three components as were indicated in the sidewalls, except that they are loaded in a different direction. Their capacities are shown below.

14.54 kips Capacity of P/N 223100 in X-shear per Section 3.3.2
22.87 kips Capacity of the Floor Lifting Insert in shear per Clacs Section 3.7
8.35 kips Capacity of the weld which connects the plates per Section 3.8

Since there are three of these connections, the total capacity is: 25.05 kips **OK**

1.6.1.5 Find horizontal forces and overturning moments.

This is used in the tie-down anchor analysis in 1.8 below.

Shelter Dims (feet)			Shelter Weight	Hor.Wind (PxA-hor)	Vert. Wind (PxA-vert.)	Overturn Moment
Width	Length	Height	lbs	lbs	lbs	ft-lbs
11.67	16.00	10.083	34,084	6,969	9,690	91,662

1.6.1.6 Components and Cladding:

$p_{net} = \lambda K_{zt} I p_{net30}$ [ASCE 7-05, sec 6.4.2.2, Eq 6-2]

	POS	NEG		[From ASCE 7-05, Figure 6-3]
ROOF ZONE 1:	15.7	-44.8	psf	(100 sf effective wind area)
ROOF ZONE 2:	18.6	-73.4	psf	(20 sf effective wind area)
ROOF ZONE 3:	20.0	-123.7	psf	(10 sf effective wind area)

Allowable positive load on roof: (From section 2)
154 psf 11.67 ft wide

Allowable negative load on roof: (From section 2, neglecting DL)
-61.0 psf 11.67 ft wide

Allowable negative load on roof: (From section 2, including .6 x DL)
Roof Dead Load: 43.9 psf X .6 = 26.32 psf
-87.4 psf 11.67 ft wide **OK**

WALL ZONE 4:	39.6	-43.4	psf	(200 sf effective wind area)
WALL ZONE 5:	45.9	-59.2	psf	(30 sf effective wind area)

Allowable load on walls: (From section 2)
87 psf 9.25 ft tall **OK**

The larger load at the corners does not produce a significant bending stress, and the shear strength of the roof panel will be more than adequate to resist this uplift load. In addition, extra connections between the roof and endwalls anchor the roof at these end zones.

1.7 SEISMIC LOADS Section 1613.1, requires ASCE 7-05 for analysis.

Site Class is D [Section 1613.5.2, assumed due to unknown soil properties]

Occupancy Category: II [Table 1604.5]

Seismic Design Category: E [Table 1613.5.6]

Seismic Importance Factor I is: 1.00 [ASCE 7-05, sec 11.5, Table 11.5-1]

$V = C_s W$ [ASCE 7-05, sec 12.8.1, Eq. 12.8-1]

$W = D$ [ASCE 7-05, sec 12.7.2]

$C_s = S_{DS} / (R / I)$ [ASCE 7-05, sec 12.8.1.1, Eq. 12.8-2]

$V = (S_{DS} / (R / I)) D$

$R =$ 4 [ASCE 7-05, Table 12.2-1, A.2]

$S_{DS} = 2/3\ S_{MS}$ [Per 1613.5.4, Eq. 16-39]

$S_{MS} = F_a S_S$ [Per 1613.5.3, Eq. 16-37]

$F_a =$ 1.0 [Table 1613.5.3(1)]

$S_S =$ 3.00 [Fig 1613.5(1), meets all US areas]

$S_{MS} =$ 3.00

$S_{DS} =$ 2.00

$V =$ 0.500 D [Use for base shear]

Determine E for use in load combinations on individual panel design.

$E = E_h + E_v$ [ASCE 7-05, sec 12.4.2, Eq. 12.4-1]

$E_h = \rho\ Q_E$ [ASCE 7-05, sec 12.4.2.1, Eq. 12.4-3]

$E_v = 0.2\ S_{DS}\ D$ [ASCE 7-05, sec 12.4.2.2, Eq. 12.4-4]

$E = \rho\ Q_E + 0.2\ S_{DS}\ D$

$Q_E = V$ [ASCE 7-05, sec 12.4.2.1] $\rho =$ 1.0 [ASCE 7-05, sec 12.3.4.2]

$E = \rho\ V + 0.2\ S_{DS}\ D$ = 0.900 D [Use in load comb 4 & 6]

$E_m = E_{mh} - E_v$ [ASCE 7-05, sec 12.4.3, Eq. 12.4-6]

$E_{mh} = \Omega_0\ Q_E$ [ASCE 7-05, sec 12.4.3.1 Eq. 12.4-7]

$E_m = \Omega_0\ Q_E - 0.2\ S_{DS}\ D$ $\Omega_0 = 2.5$ [ASCE 7-05, Table 12.2-1, A.2]

$E_m =$ 0.850 D [Use in load comb 7]

$D_{wall} =$ 34.7 psf $D_{roof} =$ 43.9 psf $D_{floor} =$ 42.5 psf (calcs sec 4)

Load combinations: Section 1605.3.1 & 1605.4

Comb 1	D	[Notes 1, 2, 3]
Comb 2	D + L	[Notes 1, 2, 3]
Comb 3	D + L + (Lr or S or R)	[Notes 1, 2, 3]
Comb 4	D + (W or 0.7E) + L + (Lr or S or R)	[Notes 1, 2, 3, 4]
Comb 5	0.6 D + W	[Notes 1, 2, 3]
Comb 6	0.6D + 0.7E	[Notes 1, 2, 3, 4]
Comb 7	0.9D + E_m	See analysis below:

Note 1: Roof and floor panels are designed using 1.4D and 1.7L, exceeds req'd factors.

Note 2: Wall panels are designed using 1.4D and 1.7W, exceeds req'd factors.

Note 3: S, R, and Lr are used as L in panel calculations, see section 2 of these calcs.

Note 4: Wind loads control over Seismic.

Comb 7 check			psf Min. Design Loads		
Walls:	0.9D + E_m =	1.750 D_{wall} =	61	87 psf	**OK**
Roof:	0.9D + E_m =	1.750 D_{roof} =	77	154 psf	**OK**
Floor:	0.9D + E_m =	1.750 D_{floor} =	74	310 psf	**OK**

1.7.1 Seismic loads from top half of the wall panel are transferred to the roof.

Equipment permanently installed in the building is estimated at 20,000 pounds. For a 16.00 ft long shelter, this is an average of 1250 pounds per linear foot. If this equipment is mounted to the floor and braced at the top, then half the seismic load from the equipment should be added to the top of the walls. Analysis uses sec 3 of these calculations.

The weight of a wall section transferred to the connections at 56" on center is:

= (56/12 ft wide) x (9.250 ft high) x (4 /12 ft thick) x 110 pcf)

W(wall) = 791 lbs

W(equipment) = (56/12 ft width) x(625 plf) = 2917 lbs

W(top of wall) = W(wall) + W(equipment) = 3,708 lbs

For the wall panel, the seismic shear is:

V = 1,854 lbs Seismic shear per connection plate at top of walls

This load is resisted by three main components of the connection at the floor:

5.95 kips Capacity of P/N 223100 in tension per Section 3.3.1
22.87 kips Capacity of the Floor Lifting Insert in shear per Clacs Section 3.7
8.35 kips Capacity of the weld which connects the plates per Section 3.8

The capacity of all 3 components exceed the seismic load **OK**

This load is resisted by three main components of the connection at the roof:

3.52 kips Capacity of P/N 223000 in shear per Section 3.4.3
5.95 kips Capacity of P/N 222000 in tension per Section 3.5.1
8.35 kips Capacity of the weld which connects the plates per Section 3.8

The capacity of all 3 components exceed the seismic load **OK**

1.7.2 Seismic loads from roof are transferred to the top of the endwall.

The seismic load at the top connection plates of the endwalls includes the seismic loads from the top quarter of two sidewalls, one half of the roof, and one half of the total equipment. Use a 9.25 ft tall wall x 15.33 ft long, and use a 11.997 ft wide x 16.33 ft long roof.

W(quarter wall)= 35.451 ft^2 x 4 /12 ft x 110 pcf = 1,300 lbs.
W(half roof)= 97.956 ft^2 x 4.25 /12 ft x 110 pcf = 3,816 lbs.
W(equipment) = 8 ft^2 x 625 plf = 5,000 lbs

TOTAL W(top of endwall)= 1,300 lbs x 2 + 3,816 lbs + 5,000 lbs = 11,416 lbs.

The seismic load is then: V(top of endwall) = 5,708 lbs.

The roof connection consist of the same three components as were indicated in the sidewalls, except that they are loaded in a different direction. Their capacities are shown below.

7.04 kips Capacity of P/N 223000 in X-shear per Section 3.4.2
22.87 kips Capacity of the Wall Corner Insert per Section 3.6.1
8.35 kips Capacity of the weld which connects the plates per Section 3.8

Since there are three of these connections, the total capacity is:

21.12 kips **This capacity exceeds the seismic load** **OK**

1.7.3 Seismic loads from endwall are transferred to the floor.

The connections at the bottom of the endwalls have the same seismic load as the connections at the top, except that the seismic load from the endwall itself is added.

The weight of the endwall is: W(endwall)= 11.667 ft x 9.250 ft x 4 /12 ft x 110 pcf = 3,957 lbs

V(endwall)= 1,979 lbs

V(bottom)= V(top of endwall) + V(endwall) = 7,686 lbs

The same loads that are transferred to the endwalls from the roof need to be transferred to the floor panel. This is accomplished through the three connections at the base of the endwall.

The floor connections consist of the same three components as were indicated in the sidewalls, except that they are loaded in a different direction. Their capacities are shown below.

14.54 kips Capacity of P/N 223100 in X-shear per Section 3.3.2

22.87 kips Capacity of the Floor Lifting Insert in shear per Clacs Section 3.7

8.35 kips Capacity of the weld which connects the plates per Section 3.8

Since there are three of these connections, the total capacity is:

25.05 kips **This capacity exceeds the seismic load** **OK**

1.8 Check shelter tie-downs to foundation For tie-down anchor capacity see Sec 3.9 of calcs:

Horizontal: 10472 lbs Per connection

Vertical: 6615 lbs Per connection

Horizontal forces due to seismic/wind loads:

Shelter Dims (feet)			Shelter	Contents	Seis.Load	Wind load	Control'g	Tie-down	CHECK	Safety
Width	Length	Height	Weight	Weight	(W x Cs)	1.6.1.5	Load	Capacity		Factor
11.67	16.00	10.083	34,084	11,248	22,666	6,969	SEISMIC	41,887	OK	1.85

Friction against sliding is ignored.

lengths under 24 ft have 4 tie-downs, lengths 24 ft and over have 8 tie-downs

Overturning forces due to seismic/wind loads:

Shelter Dims (feet)			Seis.load (W x Cs)	Overturn Force	Wind over. See1.6.1.5	Control'g Load	Overturn Resist.	Tie-down Capacity	CHECK	Safety Factor
Width	Length	Height	lbs.	lbs.	ft-lbs.		ft-lbs.	lbs		1.5 req'd
11.67	16.00	10.083	22,666	114274	91,662	SEISMIC	178946	41,887	OK	3.70

Overturning resistance uses 0.9 x DL of shelter (no contents)

Weight of shelter and contents are the same as in the horizontal force chart above.

2.0 DESIGN CRITERIA

NOTE: These calculations represent the panels of a
11.667 ft wide x 16.000 ft long x 9.250 ft tall shelter.

STRUCTURAL PROPERTY		UNITS	LABEL
Concrete Compressive Strength	5000	psi	f'_c (sand-lightweight)
Reinforcing bar Yield Stress	60000	psi	fy[REBAR]
Concrete Density	110	pcf	DENSITY
Maximum Building Width	11.667	feet	BLDGW
Maximum Building Length	16	feet	BLDGL
Maximum Wall Panel Height	9.25	feet	WALLH
Max. Est. weight of Shelter	34,084	LBS.	BLDGWT
Concrete volume req'd.	10.68	YDS.	CONCYDS
Roof thickness at peak	5	inches	H[ROOF]
Roof thickness at edge	4	inches	
Rebar size used in roof #	4	REBAR	REBARROOF
Rebar lateral spacing: roof	7	inches	ROOFSPACING
Longitudinal rebar spacing-roof:	18	inches	
Steel mesh used in roof:	W4	WIRE	
Steel spacing in roof (12"max.)	4	inches	
Steel mesh used in wall:	W4	WIRE	REBARWALL
Rebar size used in wall #	4	REBAR	REBARWALL2
Steel spacing in wall (12"max.)	4	inches	WALLSPACING
Vertical rebar spacing in wall	36	inches	WALLSPACING2
Horizontal rebar spacing in wall	48	inches	
Wall panel thickness	4	inches	WALLTHICKNESS
Rebar size used in floor #	6	REBAR	REBARFLR
Number of rebar per floor rib	2	each	REBARFLRQTY
Spacing of ribs in floor	19	inches	FLOORSPACING
Floor thickness	5.75	inches	H[FLOOR]
Floor deck thickness	2.75	inches	H[DECK]
Floor rib width	4	inches	B[RIB]
Floor deck steel size	W4	WIRE	
Floor deck steel spacing	4	inches	
Area per roof rebar	**0.200**	sq. in.	A[REBARROOF]
Diameter of roof rebar	**0.500**	inches	DIA[REBARROOF]
Area per roof wire	**0.040**	sq. in.	
Area per wall wire	**0.040**	sq. in.	A[REBARWALL]
Area per extra vert wall rebar	**0.200**	sq. in.	A[REBARWALL2]
Diameter of wall wire	**0.225**	inches	DIA[REBARWALL]
Diameter of wall rebar	**0.500**	inches	
Area of floor rebar	**0.880**	sq. in.	A[REBARFLR]
Diameter of floor rebar	**0.750**	inches	DIA[REBARFLR]
Area of deck rebar/wire	**0.040**	sq. in.	A[REBARDECK]
Diameter of deck rebar/wire	**0.225**	inches	DIA[REBARDECK]
Area of deck steel per foot	**0.120**	sq.in./ft.	A[DECKSTEEL]
Minimum req'd deck steel/foot	**0.059**	sq.in./ft.	A[DECKSTEEL-MIN]

2.0.1 STRUCTURAL LOADING SUMMARY FOR PANELS, AS DESIGNED.

PANEL	ALLOWABLE LOAD				TYPE
roof	**154**	psf	11.667	ft wide	LIVE
floor	**310**	psf	11.667	ft wide	LIVE
wall	**87.3**	psf	9.250	ft tall	WIND

2.0.2 CHECK STEEL RATIOS (ACI 318-05, sect. 21.7.2.3)

β_1 = 0.80

ρ_b = 0.0335 ρ_{max} = 0.0252 ρ_{min} = 0.0033

Min reqd. per ACI 318-05, sec 21.7.2.1 0.0025

	ρ_t	ρ_v	
ROOF:	0.0114	0.0069	**OK**
FLOOR:	0.0100		**OK**
WALL:	0.0066	0.0062	**OK**

2.0.3 CHECK DEVELOPMENT LENGTH

	Wall	Roof	Floor
Largest of: 10 db =	2.3 in	5.0 in	7.5 in
	7.5 in	7.5 in	7.5 in
$1.25 f_y d_b / (65 \times f'^{1/2}_c)$	3.7 in	8.2 in	12.2 in

All rebar development lengths are 18 in **OK**

2.1 ROOF PANEL CALCULATIONS

Temperature steel required. Ats

Panels are 4.00 in thick, minimum.

Maximum thickness of roof panel is 5.00 inches at center peak.

Ats= Aconc x 0.0018

= 5.00 in. x 12 in. x 0.0018

= 0.1080 sq. in. per foot of width of roof panel.

Use #4 rebar at 18 inches, longitudinal: Ats(actual)= 0.2533 sq. in. **OK**

2.1.1 Determine shear strength: Vu[ROOF]

b[ROOF] = **12.0** inches

d[ROOFSHEAR]= 3 in - DIA[REBARROOF] / 2

2.75 inches

Vu[ROOF]= 85 x .85 x 2 x (fc)^ 5 x b[ROOF] x d[ROOFSHEAR]

= **3372** lbs.

2.1.2 Determine allowable live load due to shear: w[ROOFSHEARLL]

ROOFSPANSHEAR= bldgw - ((d[ROOFSHEAR + 4) x 2 / 12)

= **10.542** feet 11.67 ft wide shelter

w[ROOFDL]= density x thickness (4.5 in avg) = **41.3** psf (concrete only)

w[ROOFSHEARLL]= (Vu[ROOF] / ROOFSPANSHEAR - 1.4 x w[ROOFDL]) / 1.7

= **154** psf allowable roof live load due to shear strength 11.67 ft wide

2.1.3 Determine allowable live load due to moment: w[ROOFMOMENTLL]

A[ROOFSTEEL]= A[REBARROOF] x (12 inches / ROOFSPACING)

= **0.34** sq inches per foot of roof panel

d[ROOFMOMENT]= (H[ROOF]) - (1 +DIA[REBARROOF] / 2)

= **3.75** inches

a[ROOF]= (A[ROOFSTEEL] x fy[REBAR]) / (.85 x fc x b[ROOF])

= **0.403** inches (for 8 to 11.5 wide shelters)

Mu[ROOF]= (.9/12) x A[ROOFSTEEL] x fy[REBAR] x (d[ROOFMOMENT] - a[ROOF] / 2)

= **5475** ft-lbs

l[ROOFSPAN]= BLDGW - .5 = **11.17** feet 11.67 ft wide

w[ROOFMOMENTLL]= [(8 x Mu[ROOF] / l[ROOFSPAN]^2) - (1.4 x w[ROOFDL])] / 1.7

= **173** psf allowable roof live load due to bending strength 11.67 ft wide

2.1.4 Determine allowable negative live load due to moment: w[ROOFNEGMOMENTLL]

d[RFNEGMOMENT]= 1 +DIA[REBARROOF] / 2)

= **1.25** inches

a[RFNEG]= (A[ROOFSTEEL] x fy[REBAR]) / (.85 x fc x b[ROOF])

= **0.403** inches

Mu[RFNEG]= (.9/12) x A[ROOFSTEEL] x fy[REBAR] x (d[RFNEGMOMENT] - a[RFNEG] / 2)

= **1617** ft-lbs

l[ROOFSPAN]= BLDGW - .5 = **11.17** feet 11.67 ft wide

w[ROOFNEGMOMLL]= [(8 x Mu[ROOF]) / (l[ROOFSPAN]^2)] / 1.7

= Allowable negative roof live load due to bending strength (neglecting dead load)

= **-61.0** psf 11.67 ft wide

2.1.5 CHECK SHEAR ALLOWED PARALLEL TO PLANE OF ROOF

2.1.5.1 CHECK SHEAR ALLOWED FOR ONE CURTAIN OF REINFORCEMENT

Use 4 inch panel, 4 foot length, for minimum A_{CV}. (ACI 318-05, 21.7.2.2)

$2 A_{CV} \times f'_c{}^{1/2}$ = 27153 lbs [CONTROLS]

2.1.5.2 NOMINAL SHEAR FOR ROOF SECTION (per ACI 318-05, eq. 21-7)

Use 4 inch panel, 4 foot length, for minimum A_{CV}.

$V_n = A_{CV} (\alpha_c \times f'_c{}^{1/2} + \rho_t \times f_y)$ $\rho_t = A_s / A_{CV}$ = 0.0114

A_{CV} = 192 in^2 α_c = 2.0 (for $h_w / l_w > 2$)

= 158173 lbs [DOES NOT CONTROL]

2.1.5.3 NOMINAL SHEAR FOR ROOF DIAPHRAGM (per ACI 318, eq. 21-10)

Use 4 inch panel, 4 foot length, for minimum A_{CV}.

$V_n = A_{CV} (2 \times f'_c{}^{1/2} + \rho_t \times f_y)$

= 158173 lbs [DOES NOT CONTROL]

2.2 WALL PANEL CALCULATIONS

Temperature steel required: Ats

Panel thickness is: 4 inches Ats= Aconc x 0.0018

= 4 in. x 12 in. x 0.0018

= 0.0864 sq. in. per foot of width of wall panel.

(ACI 318-05, 14.3.5; 18" MAX) use 4x4-W4xW4 mesh:

Use #4 rebar at 48 inches, longitudinal: Ats(actual)= 0.1700 sq. in. per foot **OK**

2.2.1 Determine allowable loads perpendicular to plane of wall

2.2.1.1 Determine shear strength perpendicular to plane of wall: (Vu)

b[WALL] = 12 inches

d[WALL] = 2 inches (Distance from outside face of panel to center of rebar)

Vu[WALL]= .85 x .85 x 2 x (fc)^.5 x b[WALL] x d[WALL]

= **2452** lbs.

2.2.1.2 Determine allowable live load due to shear: w[WALLSHEARLL]

WALLSPANSHEAR= WALLH - (d[WALL] x 2 / 12)
= **8.92** feet 9.25 ft tall wall
w[WALLDL]= **36.67** psf (does not add to horizontal force)
NOTE: WALL DEAD LOAD DOES NOT ACT PERPENDICULAR TO PLANE OF PANEL.
w[WALLSHEARLL]= Vu[WALL] / (WALLSPANSHEAR] x 1.7)
= Allowable wall load due to shear strength
= **162** psf 9.25 ft tall wall

2.2.1.3 Determine allowable live load due to WINDWARD moment: w(WALLMOMENTLL)

A[WALLSTEEL]= A[REBARWALL]x(12"/WALLSPACING)+A[REBARWALL2]x12"/WALLSPACING2
= **0.19** sq. inches per foot of wall panel
a[WALL]= (A[WALLSTEEL] x fy[REBAR]) / (.85 x fc x b[WALL])
= **0.220** inches
Mu[WALL]= (.9/12) x A[WALLSTEEL] x fy[REBAR] x (d[WALL] - a[WALL] / 2)
= **1588** ft-lbs
w[WALLMOMENTLL]= [(8 x Mu[WALL] / l[WALLH]^2) - (1.4 x w[WALLDL])] / 1 7
= Allowable wall live load due to bending strength.
= **87.3** psf 9.25 ft tall wall

2.2.1.4 Determine allowable live load due to LEEWARD moment: w(WALLMOMENTLL)

d[LEEWALL] = 2 inches (Distance from inside face of panel to center of rebar)
a[LEEWALL]= (A[WALLSTEEL] x fy[REBAR]) / (.85 x fc x b[WALL])
= **0.220** inches
Mu[LEEWALL]= (.9/12) x A[WALLSTEEL] x fy[REBAR] x (d[WALL] - a[WALL] / 2)
= **1588** ft-lbs
w[LEEWALLMOMENTLL]= [(8 x Mu[WALL] / l[WALLH]^2) - (1.4 x w[WALLDL])] / 1 7
= Allowable wall live load due to bending strength.
= **87.3** psf 9.25 ft tall wall

2.2.2 CHECK SHEAR ALLOWED PARALLEL TO PLANE OF WALL

2.2.2.1 CHECK SHEAR ALLOWED FOR ONE CURTAIN OF REINFORCEMENT

Use 4 inch panel, 4 foot length, for minimum A_{CV}. (ACI 318-05, 21.7.2.2)

$2 A_{CV} \times f'_c{}^{1/2}$ = 27153 lbs [CONTROLS]

2.2.2.2 NOMINAL SHEAR FOR WALL SECTION (per ACI 318-05, eq. 21-7)

Use 4 inch panel, 4 foot length, for minimum A_{CV}.

$V_n = A_{CV} (\alpha_c \times f'_c{}^{1/2} + \rho_t \times f_y)$ $\rho_t = A_s / A_{CV}$ = 0.0066

A_{CV} = 192 in^2 α_c = 2.0 (for $h_w / l_w > 2$)

= 103716 lbs [DOES NOT CONTROL]

2.2.2.3 NOMINAL SHEAR FOR WALL DIAPHRAGM (per ACI 318-05, eq. 21-10)

Use 4 inch panel, 4 foot length, for minimum A_{CV}.

$V_n = A_{CV} (2 \times f'_c{}^{1/2} + \rho_t \times f_y)$

= 103716 lbs [DOES NOT CONTROL]

2.3 FLOOR PANEL CALCULATIONS

2.3.1 Determine temperature steel required for the deck:

Deck temperature steel required is:

ATS[DECK]= H[DECK] X 12 in. X .0018
= 2.75 in. x 12 in. x 0.0018
= 0.0594 sq. in. per foot of width of floor panel.

A[DECKSTEEL]= **0.120** sq. in per foot of panel. **OK**

2.3.2 Determine floor deck strength:

DECKSPAN= FLOORSPACING - B[RIB]
= **15.0** inches

d[DECK]= H[DECK] -1 (Assumes mesh is 1" clear from bottom of deck)
= **1.75** inches

a[DECK]= (A[DECKSTEEL] x FY[REBAR]) / (.85 x fc x 12 in.)
= **0.1412** inches

Mu[DECK]= 0.9/12 x A[DECKSTEEL] x fy[REBAR] x (d[DECK] - (a[DECK] / 2))
= **907** ft-lbs

w[DECKTOTALMOM]= (Mu[DECK] x 8) / (DECKSPAN x 12 in. per ft.)^2
= **4643** psf

w[DECKDL]= (H[DECK] / 12 in. per ft. x 1 ft.^2 x DENSITY)
= **25.2** psf

w[DECKLLMOM]= (w[DECKTOTAL - 1.4 x w[DECKDL]) / 1.7
= **2711** psf

Vu[DECK]= .85 x .85 x 2 x (fc^.5) x d[DECK] x 12 in.
= **2146** lbs.

w[DECKTOTSHEAR]= 2 x (Vu[DECK] / L
= **3433** psf

w[DECKLLSHEAR]= (w[DECKTOTSHEAR] - 1.4 x w[DECKDL]) / 1.7
= **1999** psf

Allowable live load for the floor deck is: **1999** psf (FLOOR DECK SHEAR CONTROLS)

2.3.3 Determine floor rib strength:

Effective width of flange:	ACI 318-05, 8.10		flange width		
1/4 span:	=		**33.5**	inches	
Effective width of overhang:	ACI 318-05, 8.10				
8 times H[DECK]	=	**22** inches	**48.0**	inches	
OR 1/2 clear dist.	=	**7.5** inches	**19.0**	inches	<controls>

bf= **19.0** inches

d[FLOOR]= H[FLOOR] - (.75" + DIA[REBARFLR] / 2)
4.625 inches

a[FLOOR]= (A[REBARFLR] x fy[REBAR]) / (.85 x fc x bf)
= **0.654** inches

Mu[FLOOR]= (.9/12) x A[REBARFLR] x fy[REBAR] x (d[FLOOR] - a[FLOOR] / 2)
= **17020** ft-lbs

FLOORSPANMOM= BLDGW - .5 ft. = **11.17** feet 11.67 ft wide

w[FLOORMOMTOT]= 8 x Mu[FLOOR] / (FLOORSPANMOM)^2
= **1092** plf 11.67 ft wide shelter

w[FLOORDL]= ((H[DECK] x bf / 144) + b[RIB] x (H[FLOOR] - H[DECK]) / 144) x 1 ft.x DENSITY
= **49.1** plf (PER RIB) = 31.0 psf
w[FLOORMOMLL]= [W[FLOORMOMTOT] - (1.4 x w[FLOORDL])] / (1.7 x trib)
= **380** psf 11.67 ft wide shelter

2.3.4 Determine rib shear strength: Vu[FLOOR]

b[RIB] = **4.00** inches
A[RIBSHEAR]= (H[FLOOR] - (.75" + DIA[REBARFLR]/2)) x B[RIB]
18.50 sq. in.

ACI 318-05, 11.3.2.1
Vc[FLOOR]= .85 x (1.9 x (fc)^.5 + (2500 x A[REBARFLR] / (b[RIB] x d[FLOOR]) x 1) x b[RIB] x d[FLOOR]
= **3983** lbs.
But not greater than: .85 x 3.5 x f'c^.5 x b[RIB] x d[FLOOR]
= **3892** lbs.
USE **3892** lbs.
ACI 318-05, 8.11.8 Vc[FLOORALLOW]= 1.1xVc[FLOOR]= **4281** lbs.

2.3.5 Determine allowable live load due to shear: w[FLOORSHEARLL]

FLOORSPANSHEAR= bldgw - ((d[FLOOR + 8.5) x 2 / 12)
= **9.48** feet 11.67 ft wide shelter
w[FLOORSHEARLL]= (Vc[FLOORALLOW] / (5xFLOORSPANSHEAR)-1.4 x w[FLOORDL]) / (1 7xFLOORSPACING/12)
= Allowable floor live load due to shear strength
= **310** psf 11.67 ft wide shelter
Allow live load for the 11.67 ft wide floor rib is **310** psf (FLOOR RIB SHEAR CONTROLS)
Gross allowable load = LL + 42 psf DL = 353 psf for a 11.67 ft wide shelter

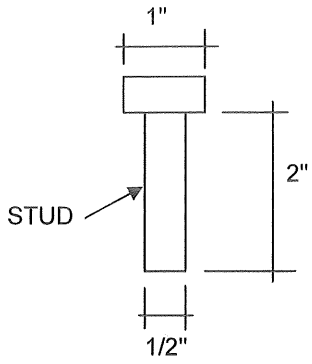
2.3.6 Determine allowable concentrated load over 2.5 sf.

2.5 square foot area is equivalent to approximately 19 inch x 19 inch, or 1.58 feet x 1.58 feet.
Assume one rib takes the entire concentrated load
Allowable load based on shear is: 310 psf
For a 11.67 foot wide shelter with an 10.67 foot span the equivalent concentrated load is:
P[shear) = 10.67 ft x 310 psf x 2.00
= **6614 lbs** **Maximum concentrated load (shear).**
Maximum live load for bending on one rib is:
w[FLOORRIBLL]= w[FLOORMOMLL] x BF / 12 = 602 plf
Make uniform load moment equal to concentrated load moment and solve for P
w[FLOORRIBLL]x (FLOORSPANMOM^2) /8 = P x FLOORSPANMOM / 2
P(moment) = w[FLOORRIBLL] x (FLOORSPANMOM) / 4
= **1680 LBS** **Maximum load in center of floor (bending).**
If the load is next to the wall (as is usually the case with batteries)
w[FLOORRIBLL]x (FLOORSPANMOM^2) / 8 = P x 1.5
P(moment) = w[FLOORRIBLL] x (FLOORSPANMOM^2) * (2 x 8)
= **6255 LBS** **Maximum load next to wall (bending).**
Shear controls.

Shear controls when load is next to wall.

3.0 INSERT PLATE ANALYSIS

(Analysis per ACI 318-05, Appendix D)



3.1 Material Properties

f'_c= 5000 psi (sand-lightweight)
f_{uta} = 61 ksi
A_{se} = 0.196 in^2
A_{brg} = 0.589 in^2
h_{ef} = 2 in
d_o = 0.5 in

3.2 Stud Analysis

3.2.1 Per D.5.3.4, Pullout strength in tension shall not exceed:

$N_p = 8\ A_{brg}\ f'_c$ = 23,562 lbs/stud

(due to crushing strength of concrete at the head of the stud.

3.2.2 Basic tension breakout strength of stud shall not exceed:

$N_b = k_c\ .85\ (f'_c)^{1/2}\ h_{ef}^{1.5}$ k_c = 24 (for cast-in anchors)

= 4080 lbs/stud [Eq D-7] Sec D.5.2.2

3.2.3 Check ductile strength of stud.

$N_{sa} = A_{se} f_{uta}$ = 11.98 kips/stud

Φ = 0.75 [See D.4.4 a) i)]

ΦN_{sa} = 8.98 kips/stud

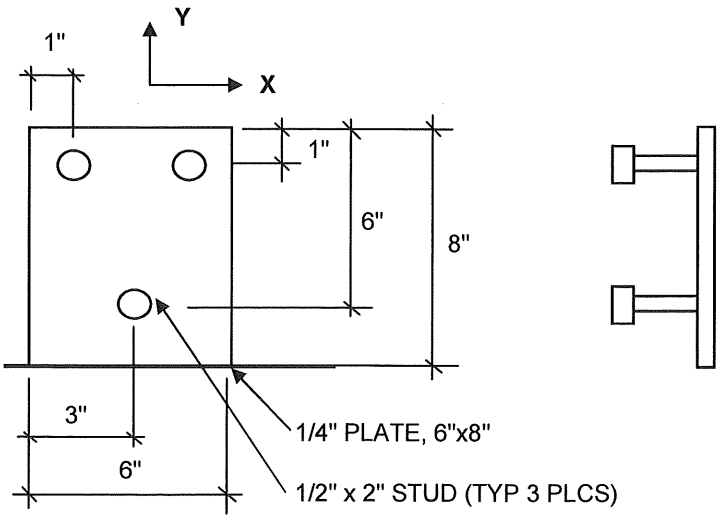
3.2.3 Check shear strength of stud.

$V_{sa} = A_{se} f_{uta}$ = 11.98 kips/stud

Φ = 0.65 [See D.4.4 a) ii)]

ΦN_{sa} = 7.79 kips/stud

3.3 INSERT PLATE "P/N 223100" ANALYSIS



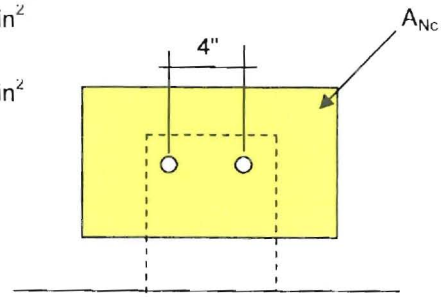
3.3.1 Tension Capacity of "P/N 223100" plate:

$N_{cbg} = (A_{nc}/A_{nco})\psi_{ec,N}\psi_{ed,N}\psi_{c,N}\psi_{cp,N}N_b$ [Eq D-5] Sec D.5.2.1

$A_{Nco} = 9h_{ef}^2$ = 36 in^2

Find A_{Nc} for just the two upper studs.

$A_{Nc} = A_{Nco} + 4(3)(h_{ef})$ = 60 in^2



$\psi_{ec,N}$ = 1.0 assume no eccentricity

$\psi_{ed,N}$ = 1.0 (c_a min > 1.5 h_{ef} for 2 studs)

$\psi_{c,N}$ = 1.25 (for cast-in anchors)

$\psi_{cp,N}$ = 1.0 (for cast-in anchors)

N_{cbg} = 8500 lbs ϕ = 0.70 [Use condition B, D.4.4]

ϕN_{cbg} = 5950 lbs

TENSION CAPACITY OF "P/N 223100" PLATE

3.3.2 Shear Capacity of "P/N 223100" plate in the X-direction:

This shear force is parallel to the edge of the panel.

$V_{cbg} = 2(A_{vc}/A_{vco})\psi_{ec,V}\psi_{ed,V}\psi_{c,V}V_b$ [Eq D-22] Sec D.6.2.1 (b)

where: $V_b = 7(l_e/d_o)^{0.2}(d_o)^{1/2}.85(f'_c)^{1/2}(c_{a1})^{1.5}$

l_e = h_{ef} = 2 inches

d_o = 0.5 inches c_{a1} = 7 inches

V_b = 7270 lbs/stud [Eq D-24] Sec D.6.2.2

$\psi_{ec,V}$ = 1.0 assume no eccentricity $\psi_{ed,V}$ = 1.0

$\psi_{c,V}$ = 1.2 (for #4 bar between anchor and edge)

h_a = 4 inches s_1 = 4 inches

$A_{vco} = 2(1.5\,c_{a1})\,h_a$ = 84 in^2

$A_{vc} = (2(1.5\,c_{a1}) + s_1)\,h_a$ = 100 in^2

V_{cbg} = 20772 lbs ϕ = 0.70 [Use condition B, D.4.4]

ϕV_{cbg} = 14540 lbs

SHEAR CAPACITY OF "P/N 223100" PLATE IN X-DIRECTION

3.3.3 Shear Capacity of "P/N 223100" plate in the (negative) Y-direction:

This shear force is perpendicular to the edge of the panel.

NOTE: The lower stud is ignored since it is close to the free edge.

$V_{cbg} = (A_{vc}/A_{vco})\psi_{ec,V}\psi_{ed,V}\psi_{c,V}V_b$ [Eq D-22] Sec D.6.2.1 (b)

V_b = 7270 lbs/stud from 3.3.2 above

$\psi_{ec,V}$ = 1.0 assume no eccentricity

$\psi_{ed,V}$ = 1.0 $c_{a2} > 1.5c_{a1}$

$\psi_{c,V}$ = 1.2 (for #4 bar between anchor and edge)

h_a = 4 inches s_1 = 4 inches

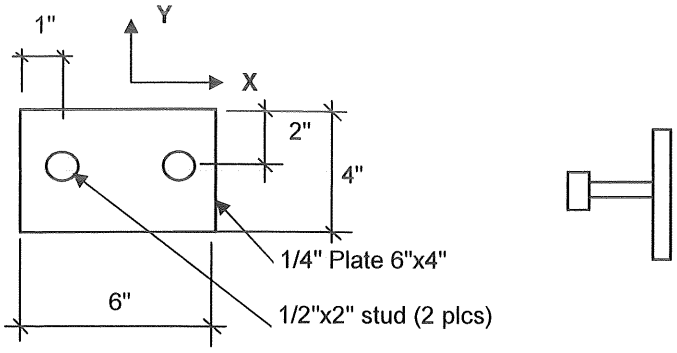
A_{vco} = 84 in^2 A_{vc} = 100 in^2 from 3.3.2 above

V_{cbg} = 10386 lbs ϕ = 0.70 [Use condition B, D.4.4]

ϕV_{cbg} = 7270 lbs

SHEAR CAPACITY OF "P/N 223100" PLATE IN Y-DIRECTION

3.4 INSERT PLATE "P/N 223000" ANALYSIS



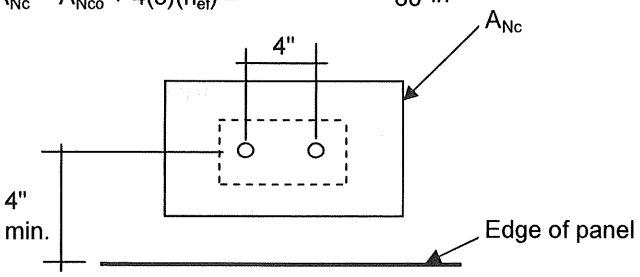
3.4.1 Tension Capacity of "P/N 223000" plate:

$N_{cbg} = (A_{nc}/A_{nco})\psi_{ec,N}\,\psi_{ed,N}\,\psi_{c,N}\,\psi_{cp,N}\,N_b$ [Eq D-5] Sec D.5.2.1 (b)

$A_{Nco} = 9h_{ef}^2$ = 36 in^2

Find A_{Nc} for just the two upper studs.

$A_{Nc} = A_{Nco} + 4(3)(h_{ef})$ = 60 in^2



$\psi_{ec,N}$ = 1.0 assume no eccentricity

$\psi_{ed,N}$ = 1.0 (c_a min > 1.5 h_{ef} for 2 studs considered)

$\psi_{c,N}$ = 1.25 (for cast-in anchors)

$\psi_{cp,N}$ = 1.0 (for cast-in anchors)

N_{cbg} = 8500 lbs

ϕ = 0.70 [Use condition B, D.4.4]

ϕN_{cbg} = 5950 lbs
TENSION CAPACITY OF "P/N 223000" PLATE

3.4.2 Shear Capacity of "P/N 223000" plate in the X-direction:

This shear force is parallel to the edge of the panel.

$V_{cbg} = 2(A_{vc}/A_{vco})\psi_{ec,V}\,\psi_{ed,V}\,\psi_{c,V}\,V_b$ [Eq D-22] Sec D.6.2.1 (b)

where: $V_b = 7(l_e/d_o)^{0.2}\,(d_o)^{1/2}\,.85(f'_c)^{1/2}\,(c_{a1})^{1.5}$

l_e= h_{ef} = 2 inches

d_o = 0.5 inches c_{a1} = 4 inches

V_b = 3140 lbs/stud [Eq D-24] Sec D.6.2.2

$\psi_{ec,V}$ = 1.0 assume no eccentricity $\psi_{ed,V}$ = 1.0

$\psi_{c,V}$ = 1.2 (for #4 bar between anchor and edge)

h_a = 3.5 inches [at step-joint] s_1 = 4 inches

$A_{vco} = 2(1.5\ c_{a1})\ h_a$ = 42 in^2

$A_{vc} = (\ 2\ (1.5\ c_{a1}) + s_1)\ h_a$ = 56 in^2

V_{cbg} = 10049 lbs

ϕ = 0.70 [Use condition B, D.4.4]

ϕV_{cbg} = 7035 lbs

SHEAR CAPACITY OF "P/N 223000" PLATE IN X-DIRECTION

3.4.3 Shear Capacity "P/N 223000" in the neg Y-direction (toward free edge):

This shear force is perpendicular to the edge of the panel.

$V_{cbg} = (A_{vc}/A_{vco})\psi_{ec,V}\psi_{ed,V}\psi_{c,V}V_b$ [Eq D-22] Sec D.6.2.1 (b)

V_b = 3140 lbs/stud from 3.4.2 above

$\psi_{ec,V}$ = 1.0 assume no eccentricity

$\psi_{ed,V}$ = 1.0 $c_{a2} > 1.5c_{a1}$

$\psi_{c,V}$ = 1.2 (for #4 bar between anchor and edge)

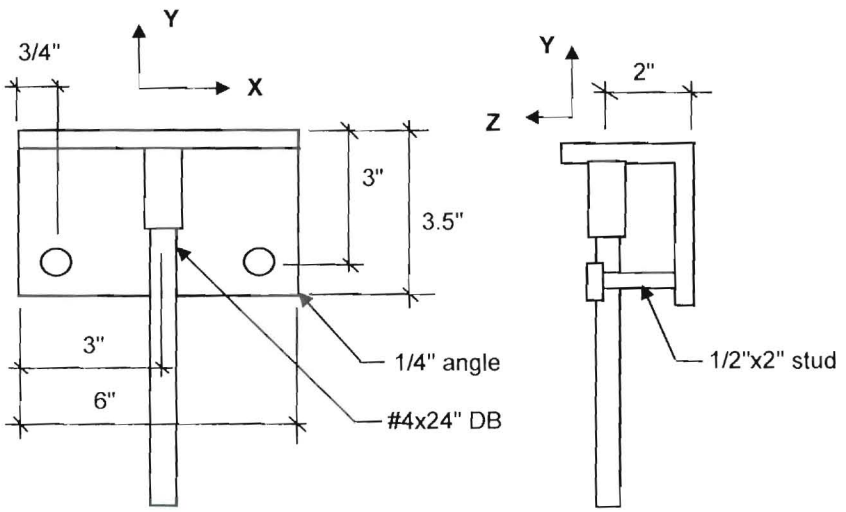
A_{vco} = 42 in^2 A_{vc} = 56 in^2 from 3.4.2 above

V_{cbg} = 5025 lbs ϕ = 0.70 [Use condition B, D.4.4]

ϕV_{cbg} = 3517 lbs

SHEAR CAPACITY OF "P/N 223000" PLATE IN Y-DIRECTION

3.5 INSERT ANGLE "P/N 222000" ANALYSIS



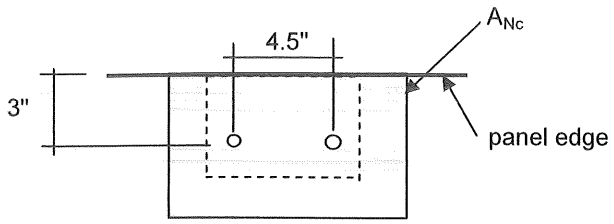
3.5.1 Tension Capacity of "P/N 222000" Insert Angle: (negative Z)

$N_{cbg} = (A_{nc}/A_{nco})\psi_{ec,N}\psi_{ed,N}\psi_{c,N}\psi_{cp,N}N_b$ [Eq D-5] Sec D.5.2.1 (b)

$A_{Nco} = 9h_{ef}^2$ = 36 in^2

Find A_{Nc} for just the two studs.

$A_{Nc} = A_{Nco} + (4.5)(3)(h_{ef}) =$ 60 in^2



$\psi_{ec,N}$ = 1.0 assume no eccentricity

$\psi_{ed,N}$ = 1.0 (c_a min > 1.5 h_{ef} for 2 studs considered)

$\psi_{c,N}$ = 1.25 (for cast-in anchors)

$\psi_{cp,N}$ = 1.0 (for cast-in anchors)

N_{cbg} = 8500 lbs ϕ = 0.70 [Use condition B, D.4.4]

ϕN_{cbg} = 5950 lbs
TENSION CAPACITY OF "P/N 222000" INSERT

3.5.2 Shear Capacity of "P/N 222000" Insert Angle in X direction:

This shear force is parallel to the edge of the panel.

$V_{cbg} = 2(A_{vc}/A_{vco})\psi_{ec,V}\,\psi_{ed,V}\,\psi_{c,V}\,V_b$ [Eq D-22] Sec D.6.2.1 (b)

where:

$V_b = 7(l_e/d_o)^{0.2}\,(d_o)^{1/2}\,.85(f'_c)^{1/2}\,(c_{a1})^{1.5}$

l_e = h_{ef} = 2 inches

d_o = 0.5 inches c_{a1} = 3 inches

V_b = 2040 lbs/stud [Eq D-24] Sec D.6.2.2

$\psi_{ec,V}$ = 1.0 assume no eccentricity $\psi_{ed,V}$ = 1.0

$\psi_{c,V}$ = 1.2 (for #4 bar between anchor and edge)

h_a = 4 inches [at step-joint]

s_1 = 4.5 inches

$A_{vco} = 2(1.5\,c_{a1})\,h_a =$ 36 in^2

$A_{vc} = (\,2\,(1.5\,c_{a1}) + s_1)\,h_a =$ 54 in^2

V_{cbg} = 7343 lbs ϕ = 0.70 [Use condition B, D.4.4]

ϕV_{cbg} = 5140 lbs
SHEAR CAPACITY OF "P/N 222000" INSERT, X-DIRECTION

3.5.3 Shear Capacity of "P/N 222000" Insert Angle in Y direction:

This is for uplift forces from the roof panel.

$V_{cbg} = (A_{vc}/A_{vco})\psi_{ec,V}\,\psi_{ed,V}\,\psi_{c,V}\,V_b$ [Eq D-22] Sec D.6.2.1 (b)

V_b = 2040 lbs/stud from 3.5.2 above

$\psi_{ec,V}$ = 1.0 assume no eccentricity

$\psi_{ed,V}$ = 1.0 $c_{a2} > 1.5c_{a1}$

$\psi_{c,V}$ = 1.2 (for #4 bar between anchor and edge)

A_{vco} = 36 in^2 from 3.5.2 above

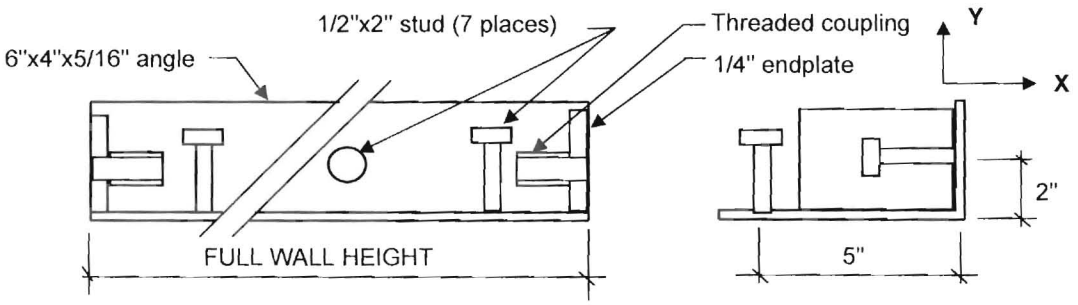
A_{vc} = 54 in^2 from 3.5.2 above

V_{cbg} = 3672 lbs

ϕ = 0.70 [Use condition B, D.4.4]

ϕV_{cbg} = 2570 lbs
SHEAR CAPACITY OF "P/N 222000" INSERT, Y-DIRECTION

3.6 WALL CORNER INSERT ANALYSIS



This insert is used on the vertical sides of the endwalls. The 4" leg forms the outside edge of the endwalls, and the 6" leg is abutted to the side walls and is used for the welded connection to the side wall, the roof, and the floor.
The primary loads on this insert are those from wind and seismic forces as they are transferred to/from the floor/roof panel by using the endwall as a shearwall against the forces as they are applied to the side walls.
The shearwall forces are applied in the X-direction as applied to the end view on the right side of the picture above. Of the 7 studs (minimum) that are on the insert, three of them would be analyzed for tension and the other four would be in shear. Depending on the direction of shear, (+X or -X direction), the free edge will come into play. This analysis will only consider the free edge allowable loads with the assumption that the insert will exceed that capacity when loaded in the opposite direction.

3.6.1 Capacity of Wall Corner Inserts in X-direction

Check capacity of individual studs on the 6" leg of the angle.
These studs would be in shear toward the free edge.

$V_{cb} = (A_{vc}/A_{vco})\ \psi_{ed,V}\ \psi_{c,V}\ V_b$ [Eq D-21 Sec D.6.2.1 (a0]

where:

$V_b = 7(l_e/d_o)^{0.2}\ (d_o)^{1/2}\ .85(f'_c)^{1/2}\ (c_{a1})^{1.5}$

$l_e = h_{ef}$ = 2 inches

d_o = 0.5 inches c_{a1} = 5 inches

V_b = 4389 lbs/stud [Eq D-24] Sec D.6.2.2

$\psi_{ed,V}$ = 1.0

$\psi_{c,V}$ = 1.2 (for #4 bar between anchor and edge)

h_a = 4 inches [at step-joint] s_1 = 24 inches

$A_{vco} = 4.5\ c_{a1}^2$ = 112.5 in^2

$A_{vc} = 2(1.5\ c_{a1})\ h_a$ = 60 in^2

V_{cb} = 5618 lbs Φ = 0.70 [Use condition B, D.4.4]

ΦV_{cb} = 3932 lbs
Shear capacity of studs on 6" leg, X direction.

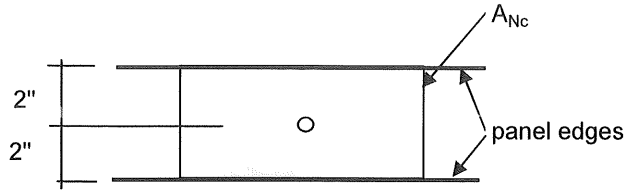
To this, add the tension load from the studs on the 4" leg.

$N_{cb} = (A_{nc}/A_{nco})\ \psi_{ed,N}\ \psi_{c,N}\ \psi_{cp,N}\ N_b$ [Eq D-4] Sec D.5.2.1 (a)

$A_{Nco} = 9h_{ef}^2$ = 36 in^2

Find A_{Nc} c_{a1} = 2 inches h_{ef} = 2 inches

$A_{Nc} = 2(c_{a1}) \times 2(1.5\ h_{ef})$ = 24 in^2



$\psi_{ed,N}$ = 1.0 (c_a min > 1.5 h_{ef} for 2 studs considered)

$\psi_{c,N}$ = 1.25 (for cast-in anchors)

$\psi_{cp,N}$ = 1.0 (for cast-in anchors)

N_{cb} = 3400 lbs Φ = 0.70 [Use condition B, D.4.4]

ΦN_{cb} = 2380 lbs
Shear capacity of studs on 6" leg, X direction.

These two were analyzed as individual studs since they are spaced 12 inches apart, far enough to act alone, not as a group.
In this direction, there would be a minimum of 4 studs in shear, and three studs in tension. The total allowable load is:

$P_x = 4(\Phi V_{cb}) + 3(\Phi N_{cb})$ = 22870 lbs
SHEAR CAPACITY OF WALL INSERT, +/- X-direction

3.7 FLOOR LIFTING INSERT ANALYSIS

The floor lifting inserts are made from 5"x5"x5/16" angle with a 5"x5/16" plate welded on the open top, to form a channel, and extend across the entire width of the floor panel at each end of the shelter. The inserts are similar to the wall corner inserts in design as they have no less than 6 studs, 1/2"x4" long, on 12" centers and two studs, 1/2"x2" long. These inserts provide three connection points for the endwall, and the two outer connections also double as side wall connections. The floor panel side inserts are made from a 5"x5"x5/16" angle with one side up and one side out, and extend the entire length of the shelter. They are also similar to the wall corner inserts in design by having a minimum of 6 studs, 1/2"x4" long, on 12" centers and four # 6 x 30" rebar splices. These inserts provide three or more connection points for the sidewall. By inspection these inserts are highly integrated into the floor structure. A failure would require much more than the shear cone failures as provided by the stud design manual. Therefore, the connections will be considered as equivalent to the analysis of the wall corner insert (sec 3.6.1).

3.8 CAPACITY OF WELDS AT CONNECTION PLATES

Welds to be made with SMAW, E70XX electrodes.
All standard connection plates will have a 3/16" weld, 3 inches long.
E70XX welds are good for .928 kips per inch per sixteenth inch of weld.
Weld capacity is then:

Pw = (0.928 k/inch/sixteenth) x (3 inches) x (3 sixteenths)

Pw = 8.352 kips
CAPACITY OF ALL STANDARD CONNECTION PLATE WELDS

3.9 CAPACITY OF TIE-DOWN CONNECTION PLATES

Three failure modes are noted:

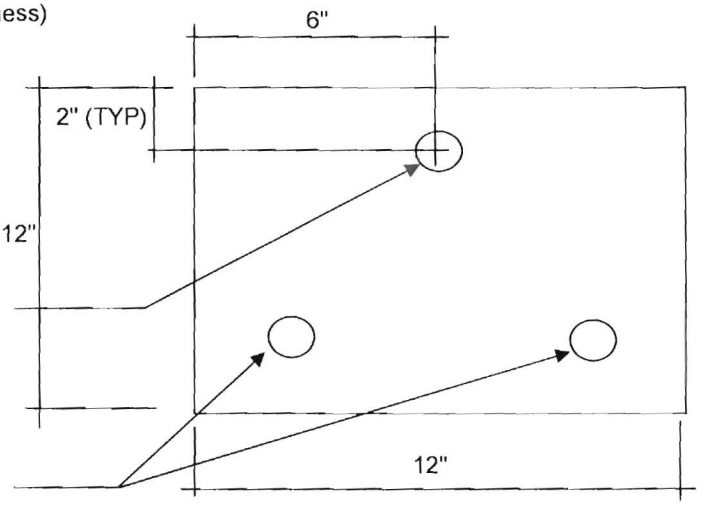
A: Failure of the connection plate.
B: Failure of the bolts connecting the plate to the shelter.
C: Failure of the expansion anchor connecting the plate to the foundation.

t = 0.25 " (plate thickness)

Fy = 36 ksi
Fu = 58 ksi

Bolt DIA = 1.00 "
1.25 "

anchor DIA = 0.75 "
0.875 "



A: Shear through edge of plate at one hole is:

HoleArea(bolt)= D(top) x t	=	0.3125 in^2	
HoleArea(anchor)= D(bot) x t	=	0.21875 in^2	
PL-Area = t x (2" - (.5 x 1.25"))	=	0.34375 in^2	
cannot exceed t x 4t	=	0.25 in^2	CONTROLS

OK [exceeds 2/3 hole area, AISC, 360-05, D3.2]

Bearing on hole area: Apl(bolt)= 0.25 in^2
Apl(anchor)= 0.1875 in^2
Fp(hole) = 1.0 Fu = 58 ksi
PL-bearing = 14.50 kips/ bolt hole
PL-bearing = 10.88 kips/ anchor hole
Transient load factor: 1.333
Capacity of connection plate is: 19.33 kips (using 1 bolt and 2 anchors)
19333 lbs per connection

B: 1" bolt capacity: Use A307 bolts or better
Fv = 10.0 ksi
A(bolt) = 0.785 in^2
Transient load factor: 1.333
P(bolt) = 10.47 kips / bolt = 10472 lbs per connection

C: Expansion anchor capacity from Hilti charts:
Reference ICC report #ESR-1385 & Tables 2 & 5
Anchor is Hilti Stainless Steel Kwik Bolt 3, 3/4" x 6.5"
Shear in horizontal direction (due to sliding of shelter):
See Table 5, 3000 psi normal weight concrete, in ICC report.
Embedment depth: 4.75 in OK
Allowable load: 4225 lbs per anchor
See Table 2, 3000 psi normal weight concrete, in ICC report.
Edge distance for max load: 9.75 in OK (in direction of load)
Spacing req'd for full load: 10.75 in
Min. spacing allowed: 4.75 in (10% reduction per note 4, table 2)
Actual spacing: 8 in
Interpolated reduction for spacing: 4.6 %
Transient load factor: 1.333
Modified allowable horizontal shear load: 5375 lbs per anchor
times 2 = 10750 lbs per connection
Shear in vertical direction (due to uplift of shelter):
Hilti Kwik Bolt 3 requirements
4.75" embedment
4.875" min. edge dist. allowed => use 50% of chart loads (note 6, table 2)
9.75" required for full load strength
6" edge distance => 38.46% Interpolated reduction
Allowable vertical load in 3000 psi concrete:
61.54% x 4225 lbs = 2600 lbs per anchor
Reduction for spacing (same as above): 4.6 %
Transient load factor: 1.333
Modified allowable vertical shear load: 3308 lbs per anchor
times 2 = 6615 lbs per connection

Controlling loads for tie-down connections:
Horizontal (sliding): 10472 lbs
Vertical (uplift): 6615 lbs

4 CONCRETE BUILDING WEIGHT CALCULATOR

		Concrete Density =	110	pcf
		Concrete Required =	10.7	yards
4.1	**Shelter Dimensions:**		shelter dimensions	
	Width:		11.667	ft
	Length:		16.000	ft
	Height:		9.250	ft,(wall height)
			Weight, lbs	
	Material			
4.2	**ROOF**	CONCRETE	8281	
		2.25" INSULATION	66	
		7/16" OSB PANELING	248	
		3/8" OSB W/FINISH	211	
		Total Roof Wt.	**8806**	
		Avg. Dead Load, psf	43.9	
4.3	**WALLS**	CONCRETE	16352	
		1.75" INSULATION	138	
		7/16" OSB PANELING	460	
		3/8" OSB W/FINISH	395	
		Total Wall Wt.	**17345**	
		Avg. Dead Load, psf	34.7	
4.4	**FLOOR**	CONCRETE	7089	
		L5x5x5/16 PERIMETER BEAM	570	
		STYROFOAM (2 PCF DENSITY)	50	
		TILE, 1/8"	224	
		Total Floor Wt.	**7933**	
		Avg. Dead Load, psf	42.5	

				Building width, ft	Building length, ft	wall height, ft
4.5	**WEIGHT SUMMARY:**					
		Total Overall : lbs	**34084**	**11.667**	**16.000**	**9.250**

AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**275 ft. Guyed Tower**
ATC Site Name	:	**Portland ME, ME**
ATC Site Number	:	**10047**
Proposed Carrier	:	**U.S. Customs and Border Protection**
Carrier Site Name	:	**N/A**
Carrier Site Number	:	**N/A**
County	:	**Cumberland**
Eng. Number	:	**45668921**
Date	:	**August 20, 2010**
Usage	:	**90% Legs, 94% Diagonals, 72% Horizontals, and 82% Guys**

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City of Portland Maine

Submitted by:
Robert Keith
Project Engineer

STATE OF MAINE
RAPHAEL I. MOHAMED
No. 11611
LICENSED PROFESSIONAL ENGINEER
8/23/10

American Tower Engineering Services
8505 Freeport Parkway
Suite 135
Irving, TX 75063
Phone: 972-999-8900

Introduction

The purpose of this report is to summarize results of the structural analysis performed on the 275 ft. guyed tower located at Portland ME, ME, Cumberland County (ATC site #10047). The tower was originally designed and manufactured by Pirod (Drawing #87-07-131 dated July 18, 1987).

Analysis

The existing tower was analyzed using Semaan Engineering Solutions, Inc., Software. The analysis assumes that the tower is in good, undamaged, and non-corroded condition. A 5% overstress is allowed in the existing structural members to account for program variances.

Basic wind speed: 80 mph (Fastest Mile)
Radial Ice: 69 mph (Fastest Mile) with ½" radial ice concurrent
Standard/Code: ANSI/TIA-222-F / 2003 IBC Section 1609.1.1, Exception (5) and Section 3108.4

Antenna Loads

The following antenna loads were used in the tower analysis.

Existing Antennas

Elev. (ft)	Qty	Antennas	Mount	Coax	Carrier
271.0	6	Antel LPA-185080/8CF	(3) Sector Frames	(12) 1-5/8"	Verizon Wireless
	6	Antel WPA-80080/4CF			
258.0	1	Radio Waves G3-2.4	(3) Sector Frames	(12) 1-5/8" (1) 1/2"	T-Mobile
	6	RFS APX16DWV-16DWV-S-E			
	3	Ericsson KRY 112 144/1			
	3	RFS ATMAA1412D-1A20			
255.0	1	8' HP MW Dish	Dish Mount	(2) EW52	Verizon Wireless
241.0	1	8' HP MW Dish	Dish Mount	(3) 1/2"	
220.0	1	8' HP MW Dish	Dish Mount	(2) EW52	
193.0	3	KMW HB-X-WM-17-65-00T	Clearwire Mount (Side Arms)	(6) 1-5/8"	Clearwire Corporation
	3	KMW HB-X-WM-17-65-00T-TLNA			
190.0	1	10' Omni	Standoff Mount	(1) 1-1/4"	City of Portland
180.0	6	Antel BSA-185065/10CF	(3) Sector Frames	(6) 1-5/8"	US Cellular
170.0	1	10' Omni	Standoff Mount	(1) 7/8" (1) 1/2"	City of Portland
	1	TTA			
155.0	1	4' HP MW Dish	Dish Mount	(2) EW90	Verizon Wireless
120.0	2	2' Omni	(2) Standoff Mounts	(1) 7/8, (1) 1/2"	City of Portland
96.0	1	10' Omni	Standoff Mount	(1) 1-5/8"	Ron Dorler (landlord)
36.0	1	GPS	Standoff Mount	(1) 1/2"	

Antenna Loads (Continued)

Proposed Antennas

Elev. (ft)	Qty	Antennas	Mount	Coax	Carrier
250.0	1	Bird BA40-41-DIN	Leg Mount	(1) 7/8"	U.S. Customs and Border Protection
225.0	1	Bird BA40-41-DIN		(1) 7/8"	
	1	Radio Waves HPD6-4.7NS		(1) 7/8"	
75.0	1	Radio Waves HPD4-4.7		(1) 7/8"	

The proposed coax is to be installed on the tower face with the least number of existing exposed lines.

Results

The existing 275 ft. Pirod guyed tower with the existing and the proposed antennas is structurally acceptable per TIA/EIA-222-F and the 2003 IBC. The maximum structure usage is: 90% legs, 94% diagonals, 72% horizontals, and 82% guys.

Foundation (Location)	Reactions (kips)	Original Design Reaction (kips)	Current Analysis Reactions (kips)	% Of Original Design
Tower Base	Compression	256.4	259.4	101.2
	Horizontal	4.8	0.7	14.6
Inner Anchor **(115 ft. Radius)**	Uplift	122.7	108.2	88.2
	Horizontal	83.3	71.4	85.7

The structure foundation reactions resulting from the current analysis do not exceed the ones shown on the original structural drawings. No modification to the existing foundations will be required.

Conclusion

The existing tower and its foundations were found to be adequate to support the existing and proposed antennas with the transmission lines distributed as described above while meeting the requirements of the code or standard as specified in this report.

If you have any questions or require additional information, please call (972) 999-8900.

Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

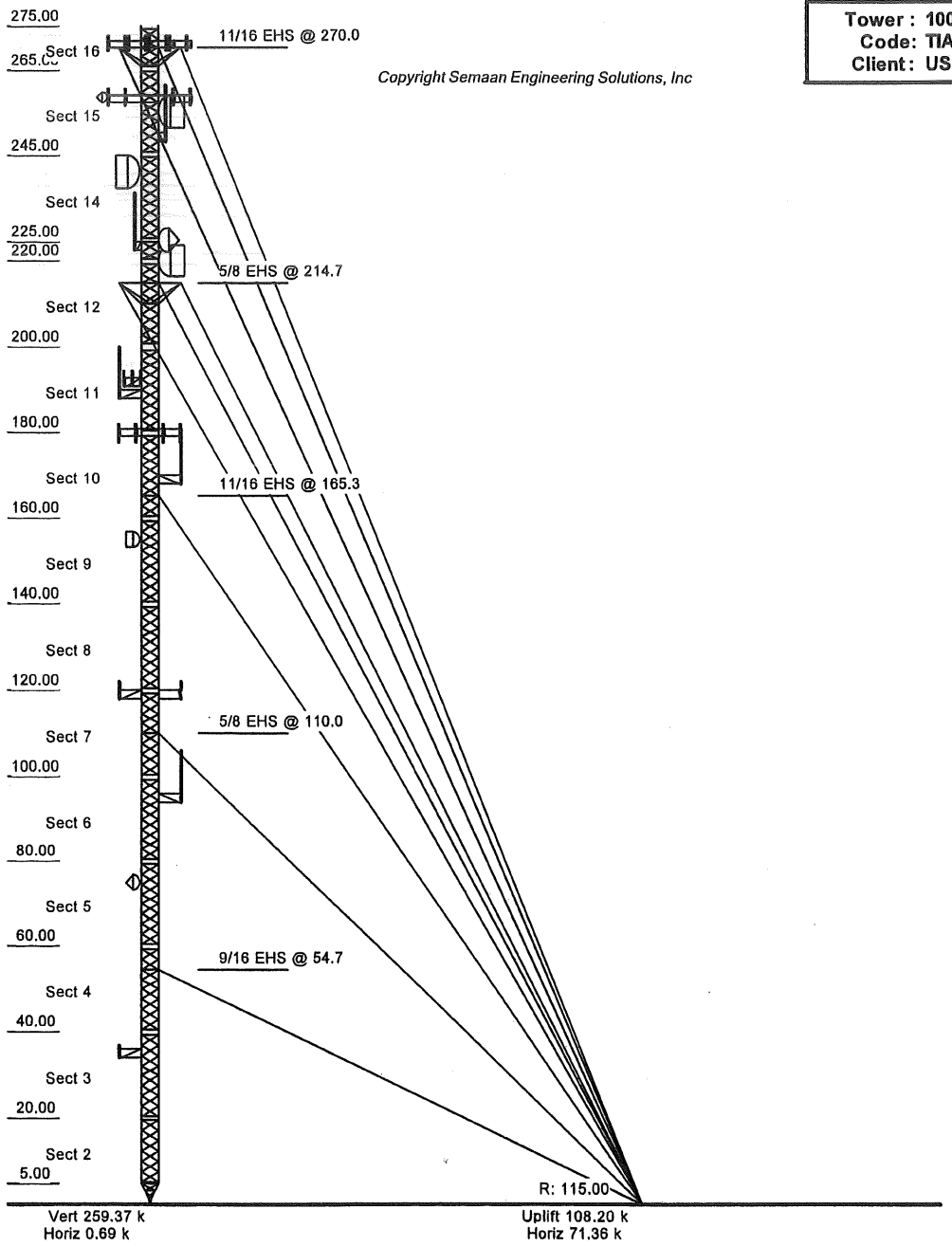
-- Information supplied by the client regarding the structure itself, the antenna and feed line loading on the structure and its components, or other relevant information.

-- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to ATC Engineering Services and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated; and we, therefore, assume that their capacity has not significantly changed from the "as new" condition.

All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/EIA-222.

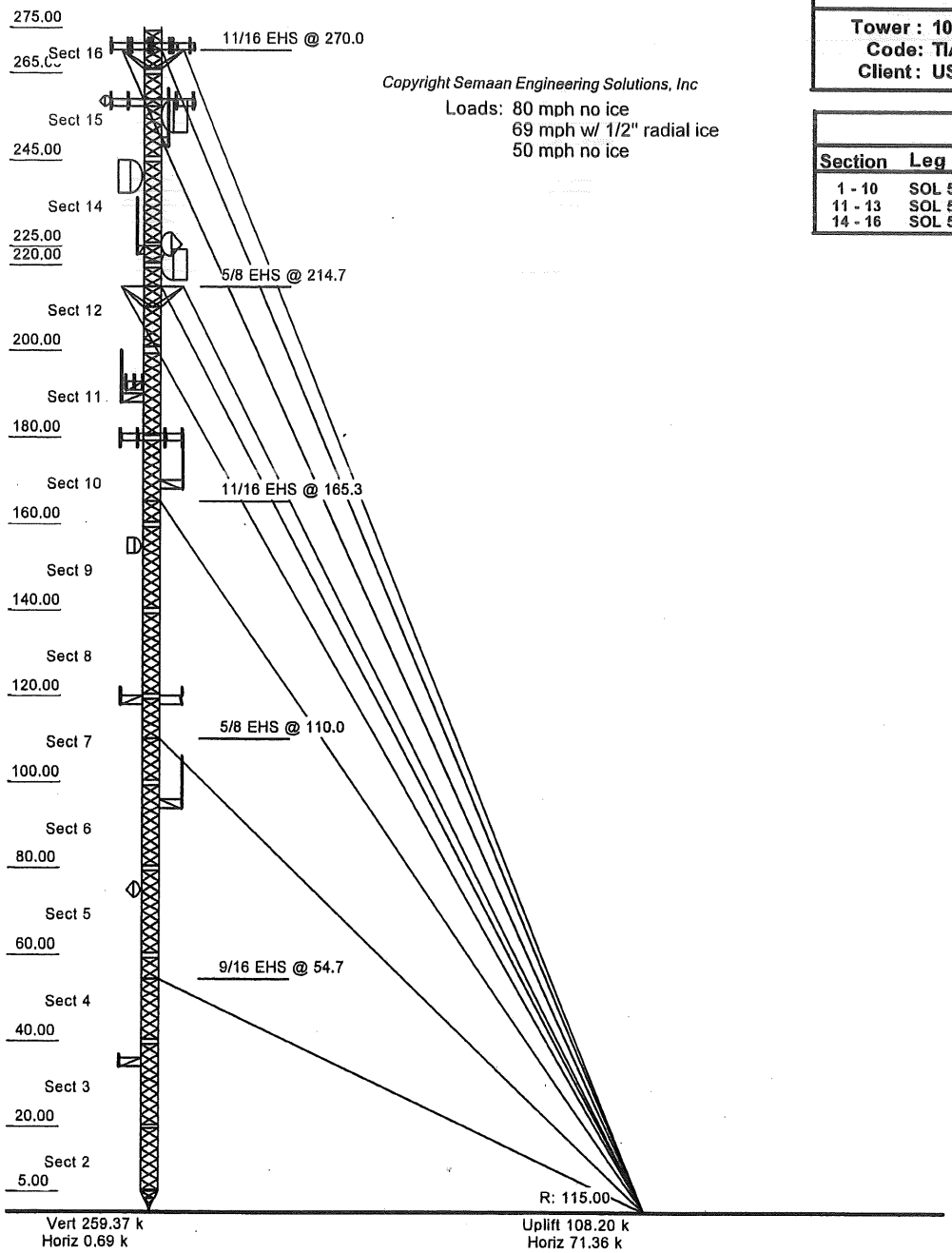
All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. ATC Engineering Services is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.



Job Information

Tower : 10047	Location : Portland ME, ME	
Code: TIA/EIA-222 Rev F	Shape : Triangle	Base Width : 3.50 ft
Client : US Customs and Border Protecti		

10.000	120.00	1	7/8" Coax
0.000	120.00	1	1/2" Coax
10.000	96.000	1	1 5/8" Coax
0.000	75.000	1	7/8" Coax
10.000	36.000	1	1/2" Coax



Loads: 80 mph no ice
69 mph w/ 1/2" radial ice
50 mph no ice

Job Information

Tower : 10047	**Location :** Portland ME, ME	
Code: TIA/EIA-222 Rev F	**Shape :** Triangle	**Base Width :** 3.50 ft
Client : US Customs and Border Protecti		

Sections Properties

Section	Leg Members		Diagonal Members	Horizontal Members
1 - 10	SOL 50ksi	2 1/4" SOLID	SOL 50ksi 3/4" SOLID	SOL 50ksi 3/4" SOLID
11 - 13	SOL 50ksi	2" SOLID	SOL 50ksi 3/4" SOLID	SOL 50ksi 3/4" SOLID
14 - 16	SOL 50ksi	1 3/4" SOLID	SOL 50ksi 3/4" SOLID	SOL 50ksi 3/4" SOLID

Discrete Appurtenance

Elev (ft)	Type	Qty	Description
271.00	Panel	6	Antel WPA-80080/4CF
271.00	Panel	6	Antel LPA-185080/8CF
271.00	Mounting Frame	3	Flat Light Sector Frame
260.00	Other	1	Ice Shield
258.00	Mounting Frame	3	Round Sector Frame
258.00	Dish	1	Radio Waves G3-2.4
258.00	Panel	6	RFS APX16DWV-16DWV-S-E-ACU
258.00		3	Ericsson KRY 112 144/1
258.00		3	RFS ATMAA1412D-1A20
255.00	Dish	1	8' HP MW Dish
250.00	Whip	1	Bird BA40-41-DIN
244.00	Other	1	Ice Shield
241.00	Dish	1	8' HP MW Dish
225.00	Dish	1	Radio Waves HPD6-4.7NS
225.00	Whip	1	Bird BA40-41-DIN
225.00	Other	1	Ice Shield
220.00	Dish	1	8' HP MW Dish
193.00		3	KMW HB-X-WM-17-65-00T-TTLNA
193.00	Panel	3	KMW HB-X-WM-17-65-00T
193.00	Straight Arm	1	Clearwire Mount
190.00	Whip	1	10' Omni
190.00	Straight Arm	1	Standoff Mount
180.00	Panel	6	Antel BSA-185065/10CF
180.00	Mounting Frame	3	Round Sector Frame
170.00		1	TTA
170.00	Whip	1	10' Omni
170.00	Straight Arm	1	Standoff Mount
155.00	Dish	1	4' HP MW Dish
120.00	Whip	2	2' Omni
120.00	Straight Arm	2	Standoff Mount
96.00	Whip	1	10' Omni
96.00	Straight Arm	1	Standoff Mount
75.00	Dish	1	Radio Waves HPD4-4.7
36.00	Whip	1	GPS
36.00	Straight Arm	1	Standoff Mount

Linear Appurtenance

Elev (ft) From	To	Qty	Description
10.000	271.00	2	1 5/8" Coax
10.000	271.00	10	1 5/8" Coax
10.000	260.00	1	1/2" Coax
10.000	260.00	12	1 5/8" Coax
10.000	255.00	2	EW52
0.000	250.00	1	7/8" Coax
10.000	241.00	3	1/2" Coax
0.000	225.00	2	7/8" Coax
10.000	220.00	2	EW52
10.000	193.00	6	1 5/8" Coax
10.000	190.00	1	1 1/4" Coax
10.000	180.00	6	1 5/8" Coax
10.000	170.00	1	1/2" Coax
0.000	170.00	1	7/8" Coax
10.000	155.00	2	EW90

Site Number: 10047
Location: Portland ME, ME

Code: TIA/EIA-222 Rev F

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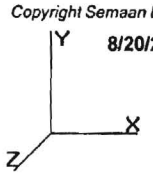


Gh : 1.09

Section Forces

LoadCase Normal No Ice — 80.00 mph Wind Normal To Face with No Ice

Allow Stress Inc: 1.333
Dead LF: 1.000
Wind LF: 1.000

Sect Seq	Wind Height (ft)	qz	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face
16	270.0	29.87	0.00	11.13	0.00	0.32	2.25	1.00	1.00	0.62	6.92	0.00	0.00	484.7	0.0	508.24	0.00	508.24	3
15	255.0	29.39	0.00	30.73	0.00	0.44	1.99	1.00	1.00	0.67	20.54	0.00	0.00	1,239.1	0.0	1,314.21	0.00	1,314.21	3
14	235.0	28.71	0.00	32.09	0.00	0.46	1.96	1.00	1.00	0.68	21.73	0.00	0.00	1,313.1	0.0	1,336.81	0.00	1,336.81	3
13	222.5	28.26	0.00	9.45	0.00	0.54	1.85	1.00	1.00	0.72	6.79	0.00	0.00	391.6	0.0	388.76	0.00	388.76	3
12	210.0	27.80	0.00	36.56	0.00	0.52	1.87	1.00	1.00	0.71	25.93	0.00	0.00	1,502.0	0.0	1,475.57	0.00	1,475.57	3
11	190.0	27.02	0.00	36.56	0.00	0.52	1.87	1.00	1.00	0.71	25.93	1.29	0.00	1,572.5	0.0	1,433.97	45.78	1,479.74	3
10	170.0	26.17	0.00	39.36	0.00	0.56	1.83	1.00	1.00	0.73	28.78	17.22	0.00	1,929.3	0.0	1,508.91	591.10	2,100.01	1
9	150.0	25.25	0.00	39.14	0.00	0.56	1.83	1.00	1.00	0.73	28.56	21.95	0.00	1,928.0	0.0	1,446.46	727.13	2,173.59	1
8	130.0	24.24	0.00	39.14	0.00	0.56	1.83	1.00	1.00	0.73	28.56	23.05	0.00	1,931.2	0.0	1,388.51	732.98	2,121.50	1
7	110.0	23.11	0.00	39.36	0.00	0.56	1.83	1.00	1.00	0.73	28.78	25.92	0.00	1,956.5	0.0	1,332.44	785.72	2,118.16	1
6	90.00	21.82	0.00	40.03	0.00	0.57	1.82	1.00	1.00	0.74	29.50	25.92	0.00	1,953.9	0.0	1,283.67	741.94	2,025.60	3
5	70.00	20.31	0.00	42.06	0.00	0.60	1.80	1.00	1.00	0.75	31.71	25.92	0.00	1,962.1	0.0	1,270.02	690.53	1,960.55	3
4	50.00	18.45	0.00	42.73	0.00	0.61	1.80	1.00	1.00	0.76	32.48	25.92	0.00	1,979.5	0.0	1,177.64	627.24	1,804.87	3
3	30.00	16.38	0.00	43.35	0.00	0.62	1.79	1.00	1.00	0.77	33.19	25.92	0.00	1,966.2	0.0	1,066.04	557.02	1,623.07	3
2	12.50	16.38	0.00	26.77	0.00	0.51	1.89	1.00	1.00	0.70	18.80	13.67	0.00	1,288.7	0.0	635.74	293.91	929.66	3
1	2.50	16.38	0.00	5.00	0.00	0.57	1.82	1.00	1.00	0.74	3.69	0.72	0.00	311.9	0.0	120.45	15.40	135.85	3
														23,710.3	0.0			23,496.20	

LoadCase 60 deg No Ice — 80.00 mph Wind at 60 deg From Face with No Ice

Allow Stress Inc: 1.333
Dead LF: 1.000
Wind LF: 1.000

Sect Seq	Wind Height (ft)	qz	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face
16	270.0	29.87	0.00	11.13	0.00	0.32	2.25	0.80	1.00	0.62	6.92	0.00	0.00	484.7	0.0	508.24	0.00	508.24	3
15	255.0	29.39	0.00	30.73	0.00	0.44	1.99	0.80	1.00	0.67	20.54	0.00	0.00	1,239.1	0.0	1,314.21	0.00	1,314.21	3
14	235.0	28.71	0.00	32.09	0.00	0.46	1.96	0.80	1.00	0.68	21.73	0.00	0.00	1,313.1	0.0	1,336.81	0.00	1,336.81	3
13	222.5	28.26	0.00	9.45	0.00	0.54	1.85	0.80	1.00	0.72	6.79	0.00	0.00	391.6	0.0	388.76	0.00	388.76	3
12	210.0	27.80	0.00	36.56	0.00	0.52	1.87	0.80	1.00	0.71	25.93	0.00	0.00	1,502.0	0.0	1,475.57	0.00	1,475.57	3
11	190.0	27.02	0.00	36.56	0.00	0.52	1.87	0.80	1.00	0.71	25.93	1.29	0.00	1,572.5	0.0	1,433.97	45.78	1,479.74	3
10	170.0	26.17	0.00	39.36	0.00	0.56	1.83	0.80	1.00	0.73	28.78	17.22	0.00	1,929.3	0.0	1,508.91	591.10	2,100.01	1
9	150.0	25.25	0.00	39.14	0.00	0.56	1.83	0.80	1.00	0.73	28.56	21.95	0.00	1,928.0	0.0	1,446.46	727.13	2,173.59	1
8	130.0	24.24	0.00	39.14	0.00	0.56	1.83	0.80	1.00	0.73	28.56	23.05	0.00	1,931.2	0.0	1,388.51	732.98	2,121.50	1
7	110.0	23.11	0.00	39.36	0.00	0.56	1.83	0.80	1.00	0.73	28.78	25.92	0.00	1,956.5	0.0	1,332.44	785.72	2,118.16	1
6	90.00	21.82	0.00	40.03	0.00	0.57	1.82	0.80	1.00	0.74	29.50	25.92	0.00	1,953.9	0.0	1,283.67	741.94	2,025.60	3
5	70.00	20.31	0.00	42.06	0.00	0.60	1.80	0.80	1.00	0.75	31.71	25.92	0.00	1,962.1	0.0	1,270.02	690.53	1,960.55	3
4	50.00	18.45	0.00	42.73	0.00	0.61	1.80	0.80	1.00	0.76	32.48	25.92	0.00	1,979.5	0.0	1,177.64	627.24	1,804.87	3
3	30.00	16.38	0.00	43.35	0.00	0.62	1.79	0.80	1.00	0.77	33.19	25.92	0.00	1,966.2	0.0	1,066.04	557.02	1,623.07	3
2	12.50	16.38	0.00	26.77	0.00	0.51	1.89	0.80	1.00	0.70	18.80	13.67	0.00	1,288.7	0.0	635.74	293.91	929.66	3
1	2.50	16.38	0.00	5.00	0.00	0.57	1.82	0.80	1.00	0.74	3.69	0.72	0.00	311.9	0.0	120.45	15.40	135.85	3
														23,710.3	0.0			23,496.20	

Site Number: 10047
Location: Portland ME, ME

Code: TIA/EIA-222 Rev F

8/20/2010 2:09:37 PM

Gh : 1.09

Section Forces

LoadCase 90 deg No Ice — 80.00 mph Wind at 90 deg From Face with No Ice

Allow Stress Inc: 1.333
Dead LF: 1.000
Wind LF: 1.000

Sect Seq	Wind Height (ft)	qz	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face	
16	270.0	29.87	0.00	11.13	0.00	0.32	2.25	0.85	1.00	0.62	6.92	0.00	0.00	484.7	0.0	508.24	0.00	508.24	3	
15	255.0	29.39	0.00	30.73	0.00	0.44	1.99	0.85	1.00	0.67	20.54	0.00	0.00	1,239.1	0.0	1,314.21	0.00	1,314.21	3	
14	235.0	28.71	0.00	32.09	0.00	0.46	1.96	0.85	1.00	0.68	21.73	0.00	0.00	1,313.1	0.0	1,336.81	0.00	1,336.81	3	
13	222.5	28.26	0.00	9.45	0.00	0.54	1.85	0.85	1.00	0.72	6.79	0.00	0.00	391.6	0.0	388.76	0.00	388.76	3	
12	210.0	27.80	0.00	36.56	0.00	0.52	1.87	0.85	1.00	0.71	25.93	0.00	0.00	1,502.0	0.0	1,475.57	0.00	1,475.57	3	
11	190.0	27.02	0.00	36.56	0.00	0.52	1.87	0.85	1.00	0.71	25.93	1.29	0.00	1,572.5	0.0	1,433.97	45.78	1,479.74	3	
10	170.0	26.17	0.00	39.36	0.00	0.56	1.83	0.85	1.00	0.73	28.78	17.22	0.00	1,929.3	0.0	1,508.91	591.10	2,100.01	1	
9	150.0	25.25	0.00	39.14	0.00	0.56	1.83	0.85	1.00	0.73	28.56	21.95	0.00	1,928.0	0.0	1,446.46	727.13	2,173.59	1	
8	130.0	24.24	0.00	39.14	0.00	0.56	1.83	0.85	1.00	0.73	28.56	23.05	0.00	1,931.2	0.0	1,388.51	732.98	2,121.50	1	
7	110.0	23.11	0.00	39.36	0.00	0.56	1.83	0.85	1.00	0.73	28.78	25.92	0.00	1,956.5	0.0	1,332.44	785.72	2,118.16	1	
6	90.00	21.82	0.00	40.03	0.00	0.57	1.82	0.85	1.00	0.74	29.50	25.92	0.00	1,953.9	0.0	1,283.67	741.94	2,025.60	3	
5	70.00	20.31	0.00	42.06	0.00	0.60	1.80	0.85	1.00	0.75	31.71	25.92	0.00	1,962.1	0.0	1,270.02	690.53	1,960.55	3	
4	50.00	18.45	0.00	42.73	0.00	0.61	1.80	0.85	1.00	0.76	32.48	25.92	0.00	1,979.5	0.0	1,177.64	627.24	1,804.87	3	
3	30.00	16.38	0.00	43.35	0.00	0.62	1.79	0.85	1.00	0.77	33.19	25.92	0.00	1,966.2	0.0	1,066.04	557.02	1,623.07	3	
2	12.50	16.38	0.00	26.77	0.00	0.51	1.89	0.85	1.00	0.70	18.80	13.67	0.00	1,288.7	0.0	635.74	293.91	929.66	3	
1	2.50	16.38	0.00	5.00	0.00	0.57	1.82	0.85	1.00	0.74	3.69	0.72	0.00	311.9	0.0	120.45	15.40	135.85	3	
														23,710.3	0.0			23,496.20		

LoadCase Normal Ice — 69.28 mph Wind Normal To Face with Ice

Allow Stress Inc: 1.333
Dead LF: 1.000
Wind LF: 1.000

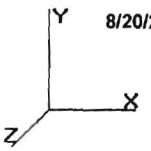
Sect Seq	Wind Height (ft)	qz	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face	
16	270.0	22.40	0.00	18.84	7.70	0.54	1.86	1.00	1.00	0.72	13.52	0.00	0.00	718.5	233.8	614.24	0.00	614.24	3	
15	255.0	22.04	0.00	50.67	19.94	0.72	1.78	1.00	1.00	0.84	42.43	0.00	0.00	1,948.7	709.5	1,818.85	0.00	1,818.85	3	
14	235.0	21.53	0.00	54.15	26.09	0.77	1.80	1.00	1.00	0.88	47.40	0.00	0.00	2,122.2	809.1	2,006.70	0.00	2,006.70	2	
13	222.5	21.20	0.00	15.98	6.54	0.91	1.94	1.00	1.00	1.00	15.91	0.00	0.00	619.2	227.6	716.71	0.00	716.71	3	
12	210.0	20.85	0.00	61.09	24.53	0.87	1.89	1.00	1.00	0.96	58.54	0.00	0.00	2,434.6	932.6	2,518.95	0.00	2,518.95	3	
11	190.0	20.26	0.00	61.09	24.53	0.87	1.89	1.00	1.00	0.96	58.54	1.29	0.83	2,635.8	1,063.3	2,447.94	56.48	2,504.42	3	
10	170.0	19.63	0.00	64.18	24.82	0.92	1.95	1.00	1.00	1.00	64.10	17.22	10.00	3,284.4	1,355.0	2,680.49	700.78	3,003.89	1	**
9	150.0	18.94	0.00	63.67	24.53	0.91	1.94	1.00	1.00	0.99	63.16	21.95	14.17	3,324.9	1,397.0	2,533.92	897.27	2,898.36	1	**
8	130.0	18.18	0.00	63.67	24.53	0.91	1.94	1.00	1.00	0.99	63.16	23.05	15.00	3,339.2	1,408.1	2,432.40	907.43	2,782.25	1	**
7	110.0	17.33	0.00	64.18	24.82	0.92	1.95	1.00	1.00	1.00	64.10	25.92	18.33	3,405.9	1,449.3	2,367.00	1,006.1	2,652.57	1	**
6	90.00	16.37	0.00	65.89	25.86	0.94	1.99	1.00	1.00	1.00	65.89	25.92	18.33	3,419.4	1,465.6	2,344.34	950.04	2,504.77	3	**
5	70.00	15.23	0.00	69.50	27.44	0.99	2.09	1.00	1.00	1.00	69.50	25.92	18.33	3,448.3	1,486.2	2,413.16	884.21	2,331.22	3	**
4	50.00	13.84	0.00	70.88	28.15	1.00	2.10	1.00	1.00	1.00	70.88	25.92	18.33	3,478.6	1,499.1	2,251.42	803.17	2,117.54	3	**
3	30.00	12.29	0.00	72.54	29.19	1.00	2.10	1.00	1.00	1.00	72.54	25.92	18.33	3,468.2	1,502.1	2,046.30	713.26	1,880.50	3	**
2	12.50	12.29	0.00	45.75	18.99	0.87	1.89	1.00	1.00	0.96	43.80	13.67	10.00	2,141.4	852.8	1,109.86	381.61	1,410.38	3	**
1	2.50	12.29	0.00	9.12	4.12	1.00	2.10	1.00	1.00	1.00	9.12	0.72	0.83	409.5	97.6	257.31	24.98	235.07	3	**
														40,198.8	16,488.4			31,996.41		

** = 2QzGhAg Controls

Site Number: 10047
Location: Portland ME, ME

Code: TIA/EIA-222 Rev F

8/20/2010 2:09:37 PM



Gh : 1.09

Section Forces

LoadCase 60 deg Ice

69.28 mph Wind at 60 deg From Face with Ice

Allow Stress Inc: 1.333
Dead LF: 1.000
Wind LF: 1.000

Sect Seq	Wind Height (ft)	qz	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face	
16	270.0	22.40	0.00	18.84	7.70	0.54	1.86	0.80	1.00	0.72	13.52	0.00	0.00	718.5	233.8	614.24	0.00	614.24	3	
15	255.0	22.04	0.00	50.67	19.94	0.72	1.78	0.80	1.00	0.84	42.43	0.00	0.00	1,948.7	709.5	1,818.85	0.00	1,818.85	3	
14	235.0	21.53	0.00	54.15	26.09	0.77	1.80	0.80	1.00	0.88	47.40	0.00	0.00	2,122.2	809.1	2,006.70	0.00	2,006.70	2	
13	222.5	21.20	0.00	15.98	6.54	0.91	1.94	0.80	1.00	1.00	15.91	0.00	0.00	619.2	227.6	716.71	0.00	716.71	3	
12	210.0	20.85	0.00	61.09	24.53	0.87	1.89	0.80	1.00	0.96	58.54	0.00	0.00	2,434.6	932.6	2,518.95	0.00	2,518.95	3	
11	190.0	20.26	0.00	61.09	24.53	0.87	1.89	0.80	1.00	0.96	58.54	1.29	0.83	2,635.8	1,063.3	2,447.94	56.48	2,504.42	3	
10	170.0	19.63	0.00	64.18	24.82	0.92	1.95	0.80	1.00	1.00	64.10	17.22	10.00	3,284.4	1,355.0	2,680.49	700.78	3,003.89	1	**
9	150.0	18.94	0.00	63.67	24.53	0.91	1.94	0.80	1.00	0.99	63.16	21.95	14.17	3,324.9	1,397.0	2,533.92	897.27	2,898.36	1	**
8	130.0	18.18	0.00	63.67	24.53	0.91	1.94	0.80	1.00	0.99	63.16	23.05	15.00	3,339.2	1,408.1	2,432.40	907.43	2,782.25	1	**
7	110.0	17.33	0.00	64.18	24.82	0.92	1.95	0.80	1.00	1.00	64.10	25.92	18.33	3,405.9	1,449.3	2,367.00	1,006.1	2,652.57	1	**
6	90.00	16.37	0.00	65.89	25.86	0.94	1.99	0.80	1.00	1.00	65.89	25.92	18.33	3,419.4	1,465.6	2,344.34	950.04	2,504.77	3	**
5	70.00	15.23	0.00	69.50	27.44	0.99	2.09	0.80	1.00	1.00	69.50	25.92	18.33	3,448.3	1,486.2	2,413.16	884.21	2,331.22	3	**
4	50.00	13.84	0.00	70.88	28.15	1.00	2.10	0.80	1.00	1.00	70.88	25.92	18.33	3,478.6	1,499.1	2,251.42	803.17	2,117.54	3	**
3	30.00	12.29	0.00	72.54	29.19	1.00	2.10	0.80	1.00	1.00	72.54	25.92	18.33	3,468.2	1,502.1	2,046.30	713.26	1,880.50	3	**
2	12.50	12.29	0.00	45.75	18.99	0.87	1.89	0.80	1.00	0.96	43.80	13.67	10.00	2,141.4	852.8	1,109.86	381.61	1,410.38	3	**
1	2.50	12.29	0.00	9.12	4.12	1.00	2.10	0.80	1.00	1.00	9.12	0.72	0.83	409.5	97.6	257.31	24.98	235.07	3	**
														40,198.8	16,488.4			31,996.41		

** = 2QzGhAg Controls

LoadCase 90 deg Ice

69.28 mph Wind at 90 deg From Face with Ice

Allow Stress Inc: 1.333
Dead LF: 1.000
Wind LF: 1.000

Sect Seq	Wind Height (ft)	qz	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face	
16	270.0	22.40	0.00	18.84	7.70	0.54	1.86	0.85	1.00	0.72	13.52	0.00	0.00	718.5	233.8	614.24	0.00	614.24	3	
15	255.0	22.04	0.00	50.67	19.94	0.72	1.78	0.85	1.00	0.84	42.43	0.00	0.00	1,948.7	709.5	1,818.85	0.00	1,818.85	3	
14	235.0	21.53	0.00	54.15	26.09	0.77	1.80	0.85	1.00	0.88	47.40	0.00	0.00	2,122.2	809.1	2,006.70	0.00	2,006.70	2	
13	222.5	21.20	0.00	15.98	6.54	0.91	1.94	0.85	1.00	1.00	15.91	0.00	0.00	619.2	227.6	716.71	0.00	716.71	3	
12	210.0	20.85	0.00	61.09	24.53	0.87	1.89	0.85	1.00	0.96	58.54	0.00	0.00	2,434.6	932.6	2,518.95	0.00	2,518.95	3	
11	190.0	20.26	0.00	61.09	24.53	0.87	1.89	0.85	1.00	0.96	58.54	1.29	0.83	2,635.8	1,063.3	2,447.94	56.48	2,504.42	3	
10	170.0	19.63	0.00	64.18	24.82	0.92	1.95	0.85	1.00	1.00	64.10	17.22	10.00	3,284.4	1,355.0	2,680.49	700.78	3,003.89	1	**
9	150.0	18.94	0.00	63.67	24.53	0.91	1.94	0.85	1.00	0.99	63.16	21.95	14.17	3,324.9	1,397.0	2,533.92	897.27	2,898.36	1	**
8	130.0	18.18	0.00	63.67	24.53	0.91	1.94	0.85	1.00	0.99	63.16	23.05	15.00	3,339.2	1,408.1	2,432.40	907.43	2,782.25	1	**
7	110.0	17.33	0.00	64.18	24.82	0.92	1.95	0.85	1.00	1.00	64.10	25.92	18.33	3,405.9	1,449.3	2,367.00	1,006.1	2,652.57	1	**
6	90.00	16.37	0.00	65.89	25.86	0.94	1.99	0.85	1.00	1.00	65.89	25.92	18.33	3,419.4	1,465.6	2,344.34	950.04	2,504.77	3	**
5	70.00	15.23	0.00	69.50	27.44	0.99	2.09	0.85	1.00	1.00	69.50	25.92	18.33	3,448.3	1,486.2	2,413.16	884.21	2,331.22	3	**
4	50.00	13.84	0.00	70.88	28.15	1.00	2.10	0.85	1.00	1.00	70.88	25.92	18.33	3,478.6	1,499.1	2,251.42	803.17	2,117.54	3	**
3	30.00	12.29	0.00	72.54	29.19	1.00	2.10	0.85	1.00	1.00	72.54	25.92	18.33	3,468.2	1,502.1	2,046.30	713.26	1,880.50	3	**
2	12.50	12.29	0.00	45.75	18.99	0.87	1.89	0.85	1.00	0.96	43.80	13.67	10.00	2,141.4	852.8	1,109.86	381.61	1,410.38	3	**
1	2.50	12.29	0.00	9.12	4.12	1.00	2.10	0.85	1.00	1.00	9.12	0.72	0.83	409.5	97.6	257.31	24.98	235.07	3	**
														40,198.8	16,488.4			31,996.41		

** = 2QzGhAg Controls

Site Number: 10047
Location: Portland ME, ME

Code: TIA/EIA-222 Rev F

8/20/2010 2:09:37 PM

Gh : 1.09

Section Forces

LoadCase Normal — 50.00 mph Wind Normal To Face with No Ice

Allow Stress Inc: 1.333
Dead LF: 1.000
Wind LF: 1.000

Sect Seq	Wind Height (ft)	qz	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face
16	270.0	11.67	0.00	11.13	0.00	0.32	2.25	1.00	1.00	0.62	6.92	0.00	0.00	484.7	0.0	198.53	0.00	198.53	3
15	255.0	11.48	0.00	30.73	0.00	0.44	1.99	1.00	1.00	0.67	20.54	0.00	0.00	1,239.1	0.0	513.37	0.00	513.37	3
14	235.0	11.21	0.00	32.09	0.00	0.46	1.96	1.00	1.00	0.68	21.73	0.00	0.00	1,313.1	0.0	522.19	0.00	522.19	3
13	222.5	11.04	0.00	9.45	0.00	0.54	1.85	1.00	1.00	0.72	6.79	0.00	0.00	391.6	0.0	151.86	0.00	151.86	3
12	210.0	10.86	0.00	36.56	0.00	0.52	1.87	1.00	1.00	0.71	25.93	0.00	0.00	1,502.0	0.0	576.39	0.00	576.39	3
11	190.0	10.55	0.00	36.56	0.00	0.52	1.87	1.00	1.00	0.71	25.93	1.29	0.00	1,572.5	0.0	560.14	17.88	578.03	3
10	170.0	10.22	0.00	39.36	0.00	0.56	1.83	1.00	1.00	0.73	28.78	17.22	0.00	1,929.3	0.0	589.42	230.90	820.32	1
9	150.0	9.86	0.00	39.14	0.00	0.56	1.83	1.00	1.00	0.73	28.56	21.95	0.00	1,928.0	0.0	565.02	284.04	849.06	1
8	130.0	9.47	0.00	39.14	0.00	0.56	1.83	1.00	1.00	0.73	28.56	23.05	0.00	1,931.2	0.0	542.39	286.32	828.71	1
7	110.0	9.03	0.00	39.36	0.00	0.56	1.83	1.00	1.00	0.73	28.78	25.92	0.00	1,956.5	0.0	520.48	306.92	827.41	1
6	90.00	8.52	0.00	40.03	0.00	0.57	1.82	1.00	1.00	0.74	29.50	25.92	0.00	1,953.9	0.0	501.43	289.82	791.25	3
5	70.00	7.93	0.00	42.06	0.00	0.60	1.80	1.00	1.00	0.75	31.71	25.92	0.00	1,962.1	0.0	496.10	269.74	765.84	3
4	50.00	7.21	0.00	42.73	0.00	0.61	1.80	1.00	1.00	0.76	32.48	25.92	0.00	1,979.5	0.0	460.01	245.02	705.03	3
3	30.00	6.40	0.00	43.35	0.00	0.62	1.79	1.00	1.00	0.77	33.19	25.92	0.00	1,966.2	0.0	416.42	217.59	634.01	3
2	12.50	6.40	0.00	26.77	0.00	0.51	1.89	1.00	1.00	0.70	18.80	13.67	0.00	1,288.7	0.0	248.34	114.81	363.15	3
1	2.50	6.40	0.00	5.00	0.00	0.57	1.82	1.00	1.00	0.74	3.69	0.72	0.00	311.9	0.0	47.05	6.02	53.07	3
** = 2QzGhAg Controls														23,710.3	0.0			9,178.20	

LoadCase 60 deg — 50.00 mph Wind at 60 deg From Face with No Ice

Allow Stress Inc: 1.333
Dead LF: 1.000
Wind LF: 1.000

Sect Seq	Wind Height (ft)	qz	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face
16	270.0	11.67	0.00	11.13	0.00	0.32	2.25	0.80	1.00	0.62	6.92	0.00	0.00	484.7	0.0	198.53	0.00	198.53	3
15	255.0	11.48	0.00	30.73	0.00	0.44	1.99	0.80	1.00	0.67	20.54	0.00	0.00	1,239.1	0.0	513.37	0.00	513.37	3
14	235.0	11.21	0.00	32.09	0.00	0.46	1.96	0.80	1.00	0.68	21.73	0.00	0.00	1,313.1	0.0	522.19	0.00	522.19	3
13	222.5	11.04	0.00	9.45	0.00	0.54	1.85	0.80	1.00	0.72	6.79	0.00	0.00	391.6	0.0	151.86	0.00	151.86	3
12	210.0	10.86	0.00	36.56	0.00	0.52	1.87	0.80	1.00	0.71	25.93	0.00	0.00	1,502.0	0.0	576.39	0.00	576.39	3
11	190.0	10.55	0.00	36.56	0.00	0.52	1.87	0.80	1.00	0.71	25.93	1.29	0.00	1,572.5	0.0	560.14	17.88	578.03	3
10	170.0	10.22	0.00	39.36	0.00	0.56	1.83	0.80	1.00	0.73	28.78	17.22	0.00	1,929.3	0.0	589.42	230.90	820.32	1
9	150.0	9.86	0.00	39.14	0.00	0.56	1.83	0.80	1.00	0.73	28.56	21.95	0.00	1,928.0	0.0	565.02	284.04	849.06	1
8	130.0	9.47	0.00	39.14	0.00	0.56	1.83	0.80	1.00	0.73	28.56	23.05	0.00	1,931.2	0.0	542.39	286.32	828.71	1
7	110.0	9.03	0.00	39.36	0.00	0.56	1.83	0.80	1.00	0.73	28.78	25.92	0.00	1,956.5	0.0	520.48	306.92	827.41	1
6	90.00	8.52	0.00	40.03	0.00	0.57	1.82	0.80	1.00	0.74	29.50	25.92	0.00	1,953.9	0.0	501.43	289.82	791.25	3
5	70.00	7.93	0.00	42.06	0.00	0.60	1.80	0.80	1.00	0.75	31.71	25.92	0.00	1,962.1	0.0	496.10	269.74	765.84	3
4	50.00	7.21	0.00	42.73	0.00	0.61	1.80	0.80	1.00	0.76	32.48	25.92	0.00	1,979.5	0.0	460.01	245.02	705.03	3
3	30.00	6.40	0.00	43.35	0.00	0.62	1.79	0.80	1.00	0.77	33.19	25.92	0.00	1,966.2	0.0	416.42	217.59	634.01	3
2	12.50	6.40	0.00	26.77	0.00	0.51	1.89	0.80	1.00	0.70	18.80	13.67	0.00	1,288.7	0.0	248.34	114.81	363.15	3
1	2.50	6.40	0.00	5.00	0.00	0.57	1.82	0.80	1.00	0.74	3.69	0.72	0.00	311.9	0.0	47.05	6.02	53.07	3
** = 2QzGhAg Controls														23,710.3	0.0			9,178.20	

Site Number: 10047
Location: Portland ME, ME

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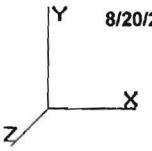

Gh : 1.09

Section Forces

LoadCase 90 deg — **50.00 mph Wind at 90 deg From Face with No Ice**

Allow Stress Inc: 1.333
Dead LF: 1.000
Wind LF: 1.000

Sect Seq	Wind Height (ft)	qz	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Rr	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)	Eff Face
16	270.0	11.67	0.00	11.13	0.00	0.32	2.25	0.85	1.00	0.62	6.92	0.00	0.00	484.7	0.0	198.53	0.00	198.53	3
15	255.0	11.48	0.00	30.73	0.00	0.44	1.99	0.85	1.00	0.67	20.54	0.00	0.00	1,239.1	0.0	513.37	0.00	513.37	3
14	235.0	11.21	0.00	32.09	0.00	0.46	1.96	0.85	1.00	0.68	21.73	0.00	0.00	1,313.1	0.0	522.19	0.00	522.19	3
13	222.5	11.04	0.00	9.45	0.00	0.54	1.85	0.85	1.00	0.72	6.79	0.00	0.00	391.6	0.0	151.86	0.00	151.86	3
12	210.0	10.86	0.00	36.56	0.00	0.52	1.87	0.85	1.00	0.71	25.93	0.00	0.00	1,502.0	0.0	576.39	0.00	576.39	3
11	190.0	10.55	0.00	36.56	0.00	0.52	1.87	0.85	1.00	0.71	25.93	1.29	0.00	1,572.5	0.0	560.14	17.88	578.03	3
10	170.0	10.22	0.00	39.36	0.00	0.56	1.83	0.85	1.00	0.73	28.78	17.22	0.00	1,929.3	0.0	589.42	230.90	820.32	1
9	150.0	9.86	0.00	39.14	0.00	0.56	1.83	0.85	1.00	0.73	28.56	21.95	0.00	1,928.0	0.0	565.02	284.04	849.06	1
8	130.0	9.47	0.00	39.14	0.00	0.56	1.83	0.85	1.00	0.73	28.56	23.05	0.00	1,931.2	0.0	542.39	286.32	828.71	1
7	110.0	9.03	0.00	39.36	0.00	0.56	1.83	0.85	1.00	0.73	28.78	25.92	0.00	1,956.5	0.0	520.48	306.92	827.41	1
6	90.00	8.52	0.00	40.03	0.00	0.57	1.82	0.85	1.00	0.74	29.50	25.92	0.00	1,953.9	0.0	501.43	289.82	791.25	3
5	70.00	7.93	0.00	42.06	0.00	0.60	1.80	0.85	1.00	0.75	31.71	25.92	0.00	1,962.1	0.0	496.10	269.74	765.84	3
4	50.00	7.21	0.00	42.73	0.00	0.61	1.80	0.85	1.00	0.76	32.48	25.92	0.00	1,979.5	0.0	460.01	245.02	705.03	3
3	30.00	6.40	0.00	43.35	0.00	0.62	1.79	0.85	1.00	0.77	33.19	25.92	0.00	1,966.2	0.0	416.42	217.59	634.01	3
2	12.50	6.40	0.00	26.77	0.00	0.51	1.89	0.85	1.00	0.70	18.80	13.67	0.00	1,288.7	0.0	248.34	114.81	363.15	3
1	2.50	6.40	0.00	5.00	0.00	0.57	1.82	0.85	1.00	0.74	3.69	0.72	0.00	311.9	0.0	47.05	6.02	53.07	3
** = 2QzGhAg Controls														23,710.3	0.0			9,178.20	

Site Number: 10047
Location: Portland ME, ME

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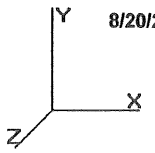

Tower Loading

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	No Ice CaAa Factor	Ice Weight (lb)	Ice CaAa (sf)	Ice CaAa Factor	Distance From Face (ft)	X Angle (deg)	Vert Ecc (ft)
271.0	Antel WPA-80080/4CF	6	10.00	5.160	0.71	25.00	5.570	0.71	0.000	0.00	0.000
271.0	Antel LPA-185080/8CF	6	7.00	2.790	1.00	25.00	3.250	1.00	0.000	0.00	0.000
271.0	Flat Light Sector Frame	3	400.00	17.900	0.75	510.00	22.200	0.75	0.000	0.00	0.000
260.0	Ice Shield	1	150.00	6.000	1.00	350.00	7.500	1.00	0.000	0.00	0.000
258.0	Round Sector Frame	3	300.00	14.400	0.75	415.00	19.200	0.75	0.000	0.00	0.000
258.0	Radio Waves G3-2.4	1	40.00	4.200	1.00	80.00	11.760	1.00	0.000	0.00	0.000
258.0	RFS APX16DWV-16DWV-S-E-	6	39.60	6.700	0.67	69.38	7.350	0.67	0.000	0.00	0.000
258.0	Ericsson KRY 112 144/1	3	11.00	0.410	0.67	14.10	0.550	0.67	0.000	0.00	0.000
258.0	RFS ATMAA1412D-1A20	3	13.00	1.170	0.67	20.60	1.390	0.67	0.000	0.00	0.000
255.0	8' HP MW Dish	1	470.00	63.420	1.00	1010.00	64.750	1.00	0.000	0.00	0.000
250.0	Bird BA40-41-DIN	1	32.00	5.050	1.00	108.00	7.870	1.00	0.000	0.00	5.750
244.0	Ice Shield	1	150.00	6.000	1.00	350.00	7.500	1.00	0.000	0.00	0.000
241.0	8' HP MW Dish	1	470.00	63.420	1.00	1010.00	64.750	1.00	0.000	0.00	0.000
225.0	Radio Waves HPD6-4.7NS	1	281.00	35.670	1.00	484.50	36.670	1.00	0.000	0.00	0.000
225.0	Bird BA40-41-DIN	1	32.00	5.050	1.00	108.00	7.870	1.00	0.000	0.00	5.750
225.0	Ice Shield	1	150.00	6.000	1.00	350.00	7.500	1.00	0.000	0.00	0.000
220.0	8' HP MW Dish	1	470.00	63.420	1.00	1010.00	64.750	1.00	0.000	0.00	0.000
193.0	KMW HB-X-WM-17-65-00T-	3	15.90	1.140	0.76	23.30	1.370	0.76	0.000	0.00	0.000
193.0	KMW HB-X-WM-17-65-00T	3	30.00	1.950	1.00	50.90	2.260	1.00	0.000	0.00	0.000
193.0	Clearwire Mount	1	350.00	8.500	1.00	450.00	10.500	1.00	0.000	0.00	0.000
190.0	10' Omni	1	25.00	3.000	1.00	40.00	4.000	1.00	0.000	0.00	5.000
190.0	Standoff Mount	1	150.00	4.000	1.00	250.00	6.000	1.00	0.000	0.00	0.000
180.0	Antel BSA-185065/10CF	6	9.10	3.910	0.67	27.95	4.490	0.67	0.000	0.00	0.000
180.0	Round Sector Frame	3	300.00	14.400	0.75	415.00	19.200	0.75	0.000	0.00	0.000
170.0	TTA	1	10.00	1.400	1.00	20.34	1.640	1.00	0.000	0.00	0.000
170.0	10' Omni	1	25.00	3.000	1.00	40.00	4.000	1.00	0.000	0.00	5.000
170.0	Standoff Mount	1	150.00	4.000	1.00	250.00	6.000	1.00	0.000	0.00	0.000
155.0	4' HP MW Dish	1	170.00	15.860	1.00	280.00	16.520	1.00	0.000	0.00	0.000
120.0	2' Omni	2	10.00	0.680	1.00	19.00	0.940	1.00	0.000	0.00	1.500
120.0	Standoff Mount	2	150.00	4.000	1.00	250.00	6.000	1.00	0.000	0.00	0.000
96.00	10' Omni	1	25.00	3.000	1.00	40.00	4.000	1.00	0.000	0.00	5.000
96.00	Standoff Mount	1	150.00	4.000	1.00	250.00	6.000	1.00	0.000	0.00	0.000
75.00	Radio Waves HPD4-4.7	1	170.00	15.860	1.00	261.70	16.520	1.00	0.000	0.00	0.000
36.00	GPS	1	10.00	1.000	1.00	18.24	1.210	1.00	0.000	0.00	0.500
36.00	Standoff Mount	1	150.00	4.000	1.00	250.00	6.000	1.00	0.000	0.00	0.000
	Totals	71	7553.90			12779.46			Number of Appurtenances : 35		

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	Pct In Wind	Spread On Faces	Bundling Arrangement
10.00	271.0	1 5/8" Coax	10	1.98	1.04	60.00	3	Separate
10.00	271.0	1 5/8" Coax	2	1.98	1.04	100.00	2	Separate
10.00	260.0	1 5/8" Coax	12	1.98	0.82	66.60	2	Bundled
10.00	260.0	1/2" Coax	1	0.65	0.16	100.00	2	Separate
10.00	255.0	EW52	2	2.25	0.59	100.00	1	Separate
0.00	250.0	7/8" Coax	1	1.09	0.33	100.00	3	Separate

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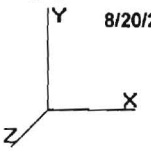

Tower Loading

10.00	241.0	1/2" Coax	3	0.63	0.15	66.60	1	Separate
0.00	225.0	7/8" Coax	2	1.09	0.33	100.00	3	Separate
10.00	220.0	EW52	2	2.25	0.59	100.00	1	Separate
10.00	193.0	1 5/8" Coax	6	1.98	0.82	50.00	1	Separate
10.00	190.0	1 1/4" Coax	1	1.55	0.66	100.00	Lin App	Separate
10.00	180.0	1 5/8" Coax	6	1.98	1.04	66.60	Lin App	Separate
0.00	170.0	7/8" Coax	1	1.09	0.33	100.00	Lin App	Separate
10.00	170.0	1/2" Coax	1	0.63	0.15	100.00	Lin App	Separate
10.00	155.0	EW90	2	1.32	0.32	100.00	Lin App	Separate
0.00	120.0	1/2" Coax	1	0.63	0.15	100.00	Lin App	Separate
10.00	120.0	7/8" Coax	1	1.09	0.33	100.00	Lin App	Separate
10.00	96.00	1 5/8" Coax	1	1.98	0.82	100.00	3	Separate
0.00	75.00	7/8" Coax	1	1.09	0.33	100.00	3	Separate
10.00	36.00	1/2" Coax	1	0.63	0.15	100.00	3	Separate

Site Number: 10047
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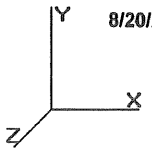

Force/Stress Summary

Section: 1 PIROD42B Bot Elev (ft): 0.00 Height (ft): 5.000

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-95.38	Normal Ice	1.80	100	100	100	38.3	34.7	138.15	0	0	0.00	0.00	69	Member X
HORIZ	0.00		0.000	0	0	0	0.0	0.0	0.00	0	0	0.00	0.00	0	
DIAG SOL - 3/4" SOLID	-4.23	Normal Ice	2.440	50	50	50	78.1	25.9	11.42	0	0	0.00	0.00	37	Member X

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	0.00		0	0.00	0	0	0.00	0.00	0	
HORIZ SOL - 3/4" SOLID	12.79	Normal Ice	50	17.67	0	0	0.00	0.00	72	Member
DIAG SOL - 3/4" SOLID	2.01	Normal Ice	50	17.67	0	0	0.00	0.00	11	Member

Section: 2 PIROD42 Bot Elev (ft): 5.00 Height (ft): 15.000

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-87.34	Normal Ice	2.39	100	100	100	51.0	32.3	128.28	0	0	0.00	0.00	68	Member X
HORIZ	0.00		0.000	0	0	0	0.0	0.0	0.00	0	0	0.00	0.00	0	
DIAG SOL - 3/4" SOLID	-0.83	Normal Ice	4.238	50	50	50	135.6	10.8	4.78	0	0	0.00	0.00	17	Member X

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	0.00		0	0.00	0	0	0.00	0.00	0	
HORIZ SOL - 3/4" SOLID	5.68	Normal Ice	50	17.67	0	0	0.00	0.00	32	Member
DIAG SOL - 3/4" SOLID	0.54	60 deg Ice	50	17.67	0	0	0.00	0.00	3	Member

Section: 3 1 Bot Elev (ft): 20.00 Height (ft): 20.000

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-93.18	Normal Ice	2.33	100	100	100	49.8	32.5	129.27	0	0	0.00	0.00	72	Member X
HORIZ SOL - 3/4" SOLID	-0.21	Normal Ice	3.500	100	100	100	224.0	4.0	1.75	0	0	0.00	0.00	11	Member X
DIAG SOL - 3/4" SOLID	-1.78	Normal Ice	4.206	50	50	50	134.6	11.0	4.85	0	0	0.00	0.00	36	Member X

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	0.00		0	0.00	0	0	0.00	0.00	0	
HORIZ SOL - 3/4" SOLID	0.88	90 deg Ice	50	17.67	0	0	0.00	0.00	5	Member
DIAG SOL - 3/4" SOLID	0.92	Normal Ice	50	17.67	0	0	0.00	0.00	5	Member

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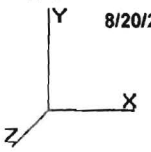

Force/Stress Summary

Section: 4 1 Bot Elev (ft): 40.00 Height (ft): 20.000

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-109.06	Normal Ice	2.33	100	100	100	49.8	32.5	129.27	0	0	0.00	0.00	84	Member X
HORIZ SOL - 3/4" SOLID	-0.27	60 deg No Ice	3.500	100	100	100	224.0	4.0	1.75	0	0	0.00	0.00	15	Member X
DIAG SOL - 3/4" SOLID	-2.19	90 deg Ice	4.206	50	50	50	134.6	11.0	4.85	0	0	0.00	0.00	45	Member X

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	0.00		0	0.00	0	0	0.00	0.00	0	
HORIZ SOL - 3/4" SOLID	1.11	Normal Ice	50	17.67	0	0	0.00	0.00	6	Member
DIAG SOL - 3/4" SOLID	1.42	90 deg Ice	50	17.67	0	0	0.00	0.00	8	Member

Section: 5 1 Bot Elev (ft): 60.00 Height (ft): 20.000

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-102.50	Normal Ice	2.33	100	100	100	49.8	32.5	129.27	0	0	0.00	0.00	79	Member X
HORIZ SOL - 3/4" SOLID	-0.24	Normal Ice	3.500	100	100	100	224.0	4.0	1.75	0	0	0.00	0.00	13	Member X
DIAG SOL - 3/4" SOLID	-1.92	90 deg Ice	4.206	50	50	50	134.6	11.0	4.85	0	0	0.00	0.00	39	Member X

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	0.00		0	0.00	0	0	0.00	0.00	0	
HORIZ SOL - 3/4" SOLID	0.92	60 deg Ice	50	17.67	0	0	0.00	0.00	5	Member
DIAG SOL - 3/4" SOLID	1.07	90 deg Ice	50	17.67	0	0	0.00	0.00	6	Member

Section: 6 1 Bot Elev (ft): 80.00 Height (ft): 20.000

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-94.06	Normal Ice	2.33	100	100	100	49.8	32.5	129.27	0	0	0.00	0.00	72	Member X
HORIZ SOL - 3/4" SOLID	-0.15	Normal No Ice	3.500	100	100	100	224.0	4.0	1.75	0	0	0.00	0.00	8	Member X
DIAG SOL - 3/4" SOLID	-1.48	60 deg Ice	4.206	50	50	50	134.6	11.0	4.85	0	0	0.00	0.00	30	Member X

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	0.00		0	0.00	0	0	0.00	0.00	0	
HORIZ SOL - 3/4" SOLID	0.95	60 deg Ice	50	17.67	0	0	0.00	0.00	5	Member
DIAG SOL - 3/4" SOLID	0.90	60 deg No Ice	50	17.67	0	0	0.00	0.00	5	Member

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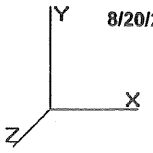

Force/Stress Summary

Section: 7 1 Bot Elev (ft): 100.0 Height (ft): 20.000

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-102.74	Normal Ice	2.33	100	100	100	49.8	32.5	129.27	0	0	0.00	0.00	79	Member X
HORIZ SOL - 3/4" SOLID	-0.62	60 deg Ice	3.500	100	100	100	224.0	4.0	1.75	0	0	0.00	0.00	35	Member X
DIAG SOL - 3/4" SOLID	-3.17	90 deg Ice	4.206	50	50	50	134.6	11.0	4.85	0	0	0.00	0.00	65	Member X

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	0.00		0	0.00	0	0	0.00	0.00	0	
HORIZ SOL - 3/4" SOLID	1.47	Normal Ice	50	17.67	0	0	0.00	0.00	8	Member
DIAG SOL - 3/4" SOLID	2.35	90 deg Ice	50	17.67	0	0	0.00	0.00	13	Member

Section: 8 1 Bot Elev (ft): 120.0 Height (ft): 20.000

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-81.10	Normal Ice	2.33	100	100	100	49.8	32.5	129.27	0	0	0.00	0.00	62	Member X
HORIZ SOL - 3/4" SOLID	-0.71	Normal Ice	3.500	100	100	100	224.0	4.0	1.75	0	0	0.00	0.00	40	Member X
DIAG SOL - 3/4" SOLID	-2.84	90 deg Ice	4.206	50	50	50	134.6	11.0	4.85	0	0	0.00	0.00	58	Member X

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	0.00		0	0.00	0	0	0.00	0.00	0	
HORIZ SOL - 3/4" SOLID	1.15	60 deg Ice	50	17.67	0	0	0.00	0.00	6	Member
DIAG SOL - 3/4" SOLID	2.11	90 deg Ice	50	17.67	0	0	0.00	0.00	11	Member

Section: 9 1 Bot Elev (ft): 140.0 Height (ft): 20.000

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-74.26	Normal Ice	2.33	100	100	100	49.8	32.5	129.27	0	0	0.00	0.00	57	Member X
HORIZ SOL - 3/4" SOLID	-0.01	Normal No Ice	3.500	100	100	100	224.0	4.0	1.75	0	0	0.00	0.00	0	Member X
DIAG SOL - 3/4" SOLID	-1.62	60 deg Ice	4.206	50	50	50	134.6	11.0	4.85	0	0	0.00	0.00	33	Member X

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	0.00		0	0.00	0	0	0.00	0.00	0	
HORIZ SOL - 3/4" SOLID	0.72	60 deg Ice	50	17.67	0	0	0.00	0.00	4	Member
DIAG SOL - 3/4" SOLID	1.00	60 deg No Ice	50	17.67	0	0	0.00	0.00	5	Member

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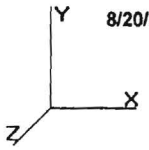

Force/Stress Summary

Section: 10 1 Bot Elev (ft): 160.0 Height (ft): 20.000

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-71.15	Normal Ice	2.33	100	100	100	49.8	32.5	129.27	0	0	0.00	0.00	55	Member X
HORIZ SOL - 3/4" SOLID	-0.63	60 deg Ice	3.500	100	100	100	224.0	4.0	1.75	0	0	0.00	0.00	36	Member X
DIAG SOL - 3/4" SOLID	-2.76	90 deg Ice	4.206	50	50	50	134.6	11.0	4.85	0	0	0.00	0.00	56	Member X

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	0.00		0	0.00	0	0	0.00	0.00	0	
HORIZ SOL - 3/4" SOLID	1.23	Normal Ice	50	17.67	0	0	0.00	0.00	6	Member
DIAG SOL - 3/4" SOLID	2.50	90 deg Ice	50	17.67	0	0	0.00	0.00	14	Member

Section: 11 2 Bot Elev (ft): 180.0 Height (ft): 20.000

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 2" SOLID	-67.70	Normal Ice	2.33	100	100	100	56.0	31.2	97.96	0	0	0.00	0.00	69	Member X
HORIZ SOL - 3/4" SOLID	-0.07	Normal Ice	3.500	80	80	80	179.2	6.2	2.74	0	0	0.00	0.00	2	Member X
DIAG SOL - 3/4" SOLID	-1.62	90 deg Ice	4.206	47	47	47	126.5	12.4	5.49	0	0	0.00	0.00	29	Member X

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	0.00		0	0.00	0	0	0.00	0.00	0	
HORIZ SOL - 3/4" SOLID	0.67	60 deg Ice	50	17.67	0	0	0.00	0.00	3	Member
DIAG SOL - 3/4" SOLID	0.96	60 deg Ice	50	17.67	0	0	0.00	0.00	5	Member

Section: 12 2 Bot Elev (ft): 200.0 Height (ft): 20.000

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 2" SOLID	-65.07	Normal Ice	2.33	100	100	100	56.0	31.2	97.96	0	0	0.00	0.00	66	Member X
HORIZ SOL - 3/4" SOLID	-1.86	60 deg Ice	3.500	80	80	80	179.2	6.2	2.74	0	0	0.00	0.00	68	Member X
DIAG SOL - 3/4" SOLID	-5.19	60 deg Ice	4.206	47	47	47	126.5	12.4	5.49	0	0	0.00	0.00	94	Member X

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 2" SOLID	6.39	60 deg No Ice	50	125.65	0	0	0.00	0.00	5	Member
HORIZ SOL - 3/4" SOLID	2.00	Normal Ice	50	17.67	0	0	0.00	0.00	11	Member
DIAG SOL - 3/4" SOLID	5.08	60 deg No Ice	50	17.67	0	0	0.00	0.00	28	Member

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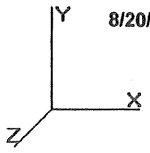

Force/Stress Summary

Section: 13 2 - 5' Bot Elev (ft): 220.0 Height (ft): 5.000

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 2" SOLID	-34.40	90 deg Ice	2.17	100	100	100	52.0	32.0	100.67	0	0	0.00	0.00	34	Member X
HORIZ SOL - 3/4" SOLID	-1.17	60 deg Ice	3.500	80	80	80	179.2	6.2	2.74	0	0	0.00	0.00	42	Member X
DIAG SOL - 3/4" SOLID	-4.21	60 deg Ice	4.117	50	50	50	131.7	11.5	5.07	0	0	0.00	0.00	83	Member X

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG	0.00		0	0.00	0	0	0.00	0.00	0	
HORIZ SOL - 3/4" SOLID	1.30	Normal Ice	50	17.67	0	0	0.00	0.00	7	Member
DIAG SOL - 3/4" SOLID	4.08	60 deg No Ice	50	17.67	0	0	0.00	0.00	23	Member

Section: 14 3 Bot Elev (ft): 225.0 Height (ft): 20.000

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 1 3/4" SOLID	-57.90	60 deg Ice	2.33	100	100	100	64.0	29.4	70.62	0	0	0.00	0.00	81	Member X
HORIZ SOL - 3/4" SOLID	-1.13	Normal Ice	3.500	80	80	80	179.2	6.2	2.74	0	0	0.00	0.00	41	Member X
DIAG SOL - 3/4" SOLID	-3.24	60 deg Ice	4.206	50	50	50	134.6	11.0	4.85	0	0	0.00	0.00	66	Member X

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 1 3/4" SOLID	12.29	Normal No Ice	50	96.20	0	0	0.00	0.00	12	Member
HORIZ SOL - 3/4" SOLID	1.43	60 deg Ice	50	17.67	0	0	0.00	0.00	8	Member
DIAG SOL - 3/4" SOLID	3.11	60 deg No Ice	50	17.67	0	0	0.00	0.00	17	Member

Section: 15 3 Bot Elev (ft): 245.0 Height (ft): 20.000

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 1 3/4" SOLID	-63.62	60 deg Ice	2.33	100	100	100	64.0	29.4	70.62	0	0	0.00	0.00	90	Member X
HORIZ SOL - 3/4" SOLID	-1.13	Normal Ice	3.500	80	80	80	179.2	6.2	2.74	0	0	0.00	0.00	41	Member X
DIAG SOL - 3/4" SOLID	-2.87	60 deg No Ice	4.206	50	50	50	134.6	11.0	4.85	0	0	0.00	0.00	59	Member X

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 1 3/4" SOLID	16.36	Normal No Ice	50	96.20	0	0	0.00	0.00	17	Member
HORIZ SOL - 3/4" SOLID	1.17	60 deg No Ice	50	17.67	0	0	0.00	0.00	6	Member
DIAG SOL - 3/4" SOLID	2.62	60 deg No Ice	50	17.67	0	0	0.00	0.00	14	Member

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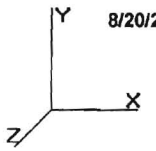

Force/Stress Summary

Section: 16 Top **Bot Elev (ft): 265.0** **Height (ft): 10.000**

Max Compression Member	Force (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fa (ksi)	Member Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 1 3/4" SOLID	-53.19	60 deg Ice	0.67	100	100	100	18.3	38.0	91.32	0	0	0.00	0.00	58	Member X
HORIZ	0.00		0.000	0	0	0	0.0	0.0	0.00	0	0	0.00	0.00	0	
DIAG SOL - 3/4" SOLID	-3.69	60 deg Ice	4.116	50	50	50	131.7	11.5	5.07	0	0	0.00	0.00	72	Member X

Max Tension Member	Force (kip)	Load Case	Fy (ksi)	Cap (kip)	Num Bolts	Num Holes	Shear Cap (kip)	Bear Cap (kip)	Use %	Controls
LEG SOL - 1 3/4" SOLID	5.74	Normal No Ice	50	96.20	0	0	0.00	0.00	5	Member
HORIZ SOL - 3/4" SOLID	0.04	Normal No Ice	50	17.67	0	0	0.00	0.00	0	Member
DIAG SOL - 3/4" SOLID	3.36	90 deg Ice	50	17.67	0	0	0.00	0.00	19	Member

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Location: Portland ME, ME

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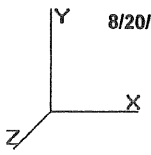

Support Forces Summary

Load Case	Node	FX (kip)	FY (kip)	FZ (kip)
90 deg	A1b	5.62	-10.52	-3.58
	A1a	-23.37	-40.85	-13.14
	A1	-0.69	-25.64	16.73
	1	-0.36	113.52	-0.01
60 deg	A1b	9.25	-17.21	-5.98
	A1a	-24.64	-43.47	-14.24
	A1	-0.57	-17.15	11.00
	1	-0.32	114.30	-0.18
Normal	A1b	18.92	-33.68	-11.59
	A1a	-18.92	-33.68	-11.59
	A1	0.00	-7.61	4.90
	1	0.00	111.53	-0.38
90 deg Ice	A1b	4.21	-14.14	-4.08
	A1a	-62.75	-108.20	-33.98
	A1	-3.64	-61.20	38.68
	1	0.08	246.16	-0.63
60 deg Ice	A1b	11.18	-26.81	-9.64
	A1a	-61.64	-108.16	-35.63
	A1	-2.78	-26.70	14.58
	1	-0.56	224.01	-0.37
Normal Ice	A1b	50.63	-92.72	-33.08
	A1a	-50.62	-92.72	-33.08
	A1	0.00	-11.03	3.59
	1	0.00	259.37	0.49
90 deg No Ice	A1b	2.81	-8.70	-2.48
	A1a	-48.76	-86.44	-26.96
	A1	-1.95	-47.57	29.80
	1	-0.23	179.24	-0.36
60 deg No Ice	A1b	7.90	-18.18	-6.21
	A1a	-47.56	-85.44	-27.51
	A1	-1.45	-18.11	10.02
	1	-0.59	158.12	-0.37
Normal No Ice	A1b	39.97	-73.80	-25.14
	A1a	-39.97	-73.80	-25.14
	A1	0.00	-6.63	2.32
	1	0.00	190.91	0.01

(-) = Uplift (+) = Down

Max Reactions (kip)

	Base	Anch1
Vertical	259.37	-108.20
Horizonal	0.69	71.36

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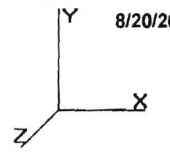

Cable Forces Summary

Load Case	Elevation (ft)	Cable	Node 1	Node 2	Allow Tension (kip)	Applied Tension (kip)	Use %
Normal No Ice	54.67	9/16 EHS	A1	29	17.50	0.32	1
		9/16 EHS	A1b	29a	17.50	6.93	39
		9/16 EHS	A1a	29b	17.50	6.93	39
	110.00	5/8 EHS	A1	57	21.20	0.10	0
		5/8 EHS	A1b	57a	21.20	10.41	49
		5/8 EHS	A1a	57b	21.20	10.40	49
	165.33	11/16 EHS	A1	85	25.00	0.52	2
		11/16 EHS	A1b	85a	25.00	13.20	52
		11/16 EHS	A1a	85b	25.00	13.20	52
	214.67	5/8 EHS	A1	109	21.20	0.94	4
		5/8 EHS	A1b	109a	21.20	10.39	49
		5/8 EHS	A1a	109b	21.20	10.40	49
		5/8 EHS	A1	T5	21.20	0.94	4
		5/8 EHS	A1a	T5b	21.20	10.37	48
		5/8 EHS	A1b	T5a	21.20	10.32	48
		5/8 EHS	A1b	T5	21.20	10.44	49
		5/8 EHS	A1a	T5a	21.20	10.41	49
		5/8 EHS	A1	T5b	21.20	0.95	4
	270.00	11/16 EHS	A1	139	25.00	1.70	6
		11/16 EHS	A1b	139a	25.00	10.95	43
		11/16 EHS	A1a	139b	25.00	10.94	43
		5/8 EHS	A1	T7	21.20	1.60	7
		5/8 EHS	A1a	T7b	21.20	9.78	46
		5/8 EHS	A1b	T7a	21.20	8.59	40
		5/8 EHS	A1b	T7	21.20	9.68	45
		5/8 EHS	A1a	T7a	21.20	8.48	39
		5/8 EHS	A1	T7b	21.20	1.59	7
60 deg No Ice	54.67	9/16 EHS	A1	29	17.50	1.59	9
		9/16 EHS	A1b	29a	17.50	1.53	8
		9/16 EHS	A1a	29b	17.50	7.92	45
	110.00	5/8 EHS	A1	57	21.20	1.59	7
		5/8 EHS	A1b	57a	21.20	1.51	7
		5/8 EHS	A1a	57b	21.20	11.76	55
	165.33	11/16 EHS	A1	85	25.00	2.14	8
		11/16 EHS	A1b	85a	25.00	2.06	8
		11/16 EHS	A1a	85b	25.00	15.20	60
	214.67	5/8 EHS	A1	109	21.20	2.44	11
		5/8 EHS	A1b	109a	21.20	2.43	11
		5/8 EHS	A1a	109b	21.20	12.19	57
		5/8 EHS	A1	T5	21.20	2.60	12
		5/8 EHS	A1a	T5b	21.20	12.68	59
		5/8 EHS	A1b	T5a	21.20	2.51	11
		5/8 EHS	A1b	T5	21.20	2.36	11
		5/8 EHS	A1a	T5a	21.20	11.67	55
		5/8 EHS	A1	T5b	21.20	2.28	10
	270.00	11/16 EHS	A1	139	25.00	3.58	14
		11/16 EHS	A1b	139a	25.00	3.69	14
		11/16 EHS	A1a	139b	25.00	12.72	50
		5/8 EHS	A1	T7	21.20	3.55	16
		5/8 EHS	A1a	T7b	21.20	10.79	50
		5/8 EHS	A1b	T7a	21.20	3.24	15

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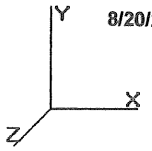

		5/8 EHS	A1b	T7	21.20	3.42	16
		5/8 EHS	A1a	T7a	21.20	10.17	47
		5/8 EHS	A1	T7b	21.20	2.96	13
90 deg No Ice	54.67	9/16 EHS	A1	29	17.50	4.52	25
		9/16 EHS	A1b	29a	17.50	0.43	2
		9/16 EHS	A1a	29b	17.50	8.11	46
	110.00	5/8 EHS	A1	57	21.20	6.50	30
		5/8 EHS	A1b	57a	21.20	0.44	2
		5/8 EHS	A1a	57b	21.20	12.28	57
	165.33	11/16 EHS	A1	85	25.00	8.11	32
		11/16 EHS	A1b	85a	25.00	0.81	3
		11/16 EHS	A1a	85b	25.00	15.62	62
	214.67	5/8 EHS	A1	109	21.20	6.58	31
		5/8 EHS	A1b	109a	21.20	1.19	5
		5/8 EHS	A1a	109b	21.20	12.28	57
		5/8 EHS	A1	T5	21.20	7.05	33
		5/8 EHS	A1a	T5b	21.20	12.73	60
		5/8 EHS	A1b	T5a	21.20	1.19	5
		5/8 EHS	A1b	T5	21.20	1.20	5
		5/8 EHS	A1a	T5a	21.20	11.80	55
		5/8 EHS	A1	T5b	21.20	6.09	28
	270.00	11/16 EHS	A1	139	25.00	7.35	29
		11/16 EHS	A1b	139a	25.00	2.06	8
		11/16 EHS	A1a	139b	25.00	12.67	50
		5/8 EHS	A1	T7	21.20	7.11	33
		5/8 EHS	A1a	T7b	21.20	10.31	48
		5/8 EHS	A1b	T7a	21.20	1.88	8
		5/8 EHS	A1b	T7	21.20	1.94	9
		5/8 EHS	A1a	T7a	21.20	10.61	50
		5/8 EHS	A1	T7b	21.20	5.57	26
Normal Ice	54.67	9/16 EHS	A1	29	17.50	0.56	3
		9/16 EHS	A1b	29a	17.50	8.65	49
		9/16 EHS	A1a	29b	17.50	8.65	49
	110.00	5/8 EHS	A1	57	21.20	0.20	0
		5/8 EHS	A1b	57a	21.20	13.53	63
		5/8 EHS	A1a	57b	21.20	13.52	63
	165.33	11/16 EHS	A1	85	25.00	0.85	3
		11/16 EHS	A1b	85a	25.00	17.28	69
		11/16 EHS	A1a	85b	25.00	17.28	69
	214.67	5/8 EHS	A1	109	21.20	1.59	7
		5/8 EHS	A1b	109a	21.20	13.22	62
		5/8 EHS	A1a	109b	21.20	13.23	62
		5/8 EHS	A1	T5	21.20	1.60	7
		5/8 EHS	A1a	T5b	21.20	13.39	63
		5/8 EHS	A1b	T5a	21.20	12.92	60
		5/8 EHS	A1b	T5	21.20	13.44	63
		5/8 EHS	A1a	T5a	21.20	12.99	61
		5/8 EHS	A1	T5b	21.20	1.61	7
	270.00	11/16 EHS	A1	139	25.00	2.75	10
		11/16 EHS	A1b	139a	25.00	13.55	54
		11/16 EHS	A1a	139b	25.00	13.54	54
		5/8 EHS	A1	T7	21.20	2.70	12
		5/8 EHS	A1a	T7b	21.20	12.29	57
		5/8 EHS	A1b	T7a	21.20	10.84	51
		5/8 EHS	A1b	T7	21.20	12.23	57
		5/8 EHS	A1a	T7a	21.20	10.76	50
		5/8 EHS	A1	T7b	21.20	2.69	12

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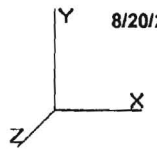

60 deg Ice	54.67	9/16 EHS	A1	29	17.50	2.41	13
		9/16 EHS	A1b	29a	17.50	2.32	13
		9/16 EHS	A1a	29b	17.50	10.01	57
	110.00	5/8 EHS	A1	57	21.20	2.35	11
		5/8 EHS	A1b	57a	21.20	2.25	10
		5/8 EHS	A1a	57b	21.20	15.42	72
	165.33	11/16 EHS	A1	85	25.00	3.05	12
		11/16 EHS	A1b	85a	25.00	2.97	11
		11/16 EHS	A1a	85b	25.00	20.14	80
	214.67	5/8 EHS	A1	109	21.20	3.71	17
		5/8 EHS	A1b	109a	21.20	3.70	17
		5/8 EHS	A1a	109b	21.20	15.59	73
		5/8 EHS	A1	T5	21.20	3.89	18
		5/8 EHS	A1a	T5b	21.20	15.94	75
		5/8 EHS	A1b	T5a	21.20	3.70	17
		5/8 EHS	A1b	T5	21.20	3.70	17
		5/8 EHS	A1a	T5a	21.20	15.16	71
		5/8 EHS	A1	T5b	21.20	3.53	16
	270.00	11/16 EHS	A1	139	25.00	5.23	20
		11/16 EHS	A1b	139a	25.00	5.35	21
		11/16 EHS	A1a	139b	25.00	15.88	63
		5/8 EHS	A1	T7	21.20	5.24	24
		5/8 EHS	A1a	T7b	21.20	13.49	63
		5/8 EHS	A1b	T7a	21.20	4.88	23
		5/8 EHS	A1b	T7	21.20	5.19	24
		5/8 EHS	A1a	T7a	21.20	13.06	61
		5/8 EHS	A1	T7b	21.20	4.62	21
90 deg Ice	54.67	9/16 EHS	A1	29	17.50	5.86	33
		9/16 EHS	A1b	29a	17.50	0.76	4
		9/16 EHS	A1a	29b	17.50	10.12	57
	110.00	5/8 EHS	A1	57	21.20	8.56	40
		5/8 EHS	A1b	57a	21.20	0.71	3
		5/8 EHS	A1a	57b	21.20	15.96	75
	165.33	11/16 EHS	A1	85	25.00	10.55	42
		11/16 EHS	A1b	85a	25.00	1.27	5
		11/16 EHS	A1a	85b	25.00	20.51	82
	214.67	5/8 EHS	A1	109	21.20	8.59	40
		5/8 EHS	A1b	109a	21.20	1.99	9
		5/8 EHS	A1a	109b	21.20	15.55	73
		5/8 EHS	A1	T5	21.20	9.15	43
		5/8 EHS	A1a	T5b	21.20	15.73	74
		5/8 EHS	A1b	T5a	21.20	1.97	9
		5/8 EHS	A1b	T5	21.20	2.02	9
		5/8 EHS	A1a	T5a	21.20	15.28	72
		5/8 EHS	A1	T5b	21.20	7.99	37
	270.00	11/16 EHS	A1	139	25.00	9.40	37
		11/16 EHS	A1b	139a	25.00	3.28	13
		11/16 EHS	A1a	139b	25.00	15.60	62
		5/8 EHS	A1	T7	21.20	9.15	43
		5/8 EHS	A1a	T7b	21.20	12.74	60
		5/8 EHS	A1b	T7a	21.20	3.14	14
		5/8 EHS	A1b	T7	21.20	3.23	15
		5/8 EHS	A1a	T7a	21.20	13.40	63
		5/8 EHS	A1	T7b	21.20	7.56	35
Normal	54.67	9/16 EHS	A1	29	17.50	1.61	9
		9/16 EHS	A1b	29a	17.50	4.13	23

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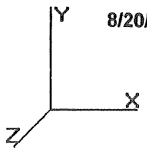

		9/16 EHS	A1a	29b	17.50	4.13	23
	110.00	5/8 EHS	A1	57	21.20	1.05	4
		5/8 EHS	A1b	57a	21.20	4.90	23
		5/8 EHS	A1a	57b	21.20	4.90	23
	165.33	11/16 EHS	A1	85	25.00	0.66	2
		11/16 EHS	A1b	85a	25.00	5.58	22
		11/16 EHS	A1a	85b	25.00	5.58	22
	214.67	5/8 EHS	A1	109	21.20	0.78	3
		5/8 EHS	A1b	109a	21.20	4.62	21
		5/8 EHS	A1a	109b	21.20	4.62	21
		5/8 EHS	A1	T5	21.20	0.81	3
		5/8 EHS	A1a	T5b	21.20	4.63	21
		5/8 EHS	A1b	T5a	21.20	4.54	21
		5/8 EHS	A1b	T5	21.20	4.65	21
		5/8 EHS	A1a	T5a	21.20	4.57	21
		5/8 EHS	A1	T5b	21.20	0.83	3
	270.00	11/16 EHS	A1	139	25.00	1.76	7
		11/16 EHS	A1b	139a	25.00	5.34	21
		11/16 EHS	A1a	139b	25.00	5.34	21
		5/8 EHS	A1	T7	21.20	1.74	8
		5/8 EHS	A1a	T7b	21.20	4.73	22
		5/8 EHS	A1b	T7a	21.20	4.35	20
		5/8 EHS	A1b	T7	21.20	4.70	22
		5/8 EHS	A1a	T7a	21.20	4.32	20
		5/8 EHS	A1	T7b	21.20	1.70	8
60 deg	54.67	9/16 EHS	A1	29	17.50	2.44	13
		9/16 EHS	A1b	29a	17.50	2.43	13
		9/16 EHS	A1a	29b	17.50	4.89	27
	110.00	5/8 EHS	A1	57	21.20	2.25	10
		5/8 EHS	A1b	57a	21.20	2.22	10
		5/8 EHS	A1a	57b	21.20	6.23	29
	165.33	11/16 EHS	A1	85	25.00	2.40	9
		11/16 EHS	A1b	85a	25.00	2.37	9
		11/16 EHS	A1a	85b	25.00	7.46	29
	214.67	5/8 EHS	A1	109	21.20	2.28	10
		5/8 EHS	A1b	109a	21.20	2.28	10
		5/8 EHS	A1a	109b	21.20	6.08	28
		5/8 EHS	A1	T5	21.20	2.42	11
		5/8 EHS	A1a	T5b	21.20	6.20	29
		5/8 EHS	A1b	T5a	21.20	2.32	10
		5/8 EHS	A1b	T5	21.20	2.23	10
		5/8 EHS	A1a	T5a	21.20	5.92	27
		5/8 EHS	A1	T5b	21.20	2.13	10
	270.00	11/16 EHS	A1	139	25.00	3.09	12
		11/16 EHS	A1b	139a	25.00	3.14	12
		11/16 EHS	A1a	139b	25.00	6.68	26
		5/8 EHS	A1	T7	21.20	2.98	14
		5/8 EHS	A1a	T7b	21.20	5.68	26
		5/8 EHS	A1b	T7a	21.20	2.66	12
		5/8 EHS	A1b	T7	21.20	2.88	13
		5/8 EHS	A1a	T7a	21.20	5.50	25
		5/8 EHS	A1	T7b	21.20	2.49	11
90 deg	54.67	9/16 EHS	A1	29	17.50	3.29	18
		9/16 EHS	A1b	29a	17.50	1.81	10
		9/16 EHS	A1a	29b	17.50	4.70	26
	110.00	5/8 EHS	A1	57	21.20	3.62	17
		5/8 EHS	A1b	57a	21.20	1.28	6

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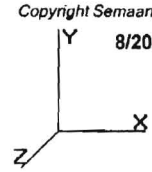

	5/8 EHS	A1a	57b	21.20	5.90	27
165.33	11/16 EHS	A1	85	25.00	4.06	16
	11/16 EHS	A1b	85a	25.00	1.17	4
	11/16 EHS	A1a	85b	25.00	6.98	27
214.67	5/8 EHS	A1	109	21.20	3.49	16
	5/8 EHS	A1b	109a	21.20	1.30	6
	5/8 EHS	A1a	109b	21.20	5.69	26
	5/8 EHS	A1	T5	21.20	3.69	17
	5/8 EHS	A1a	T5b	21.20	5.83	27
	5/8 EHS	A1b	T5a	21.20	1.35	6
	5/8 EHS	A1b	T5	21.20	1.27	5
	5/8 EHS	A1a	T5a	21.20	5.51	25
	5/8 EHS	A1	T5b	21.20	3.27	15
270.00	11/16 EHS	A1	139	25.00	4.22	16
	11/16 EHS	A1b	139a	25.00	2.19	8
	11/16 EHS	A1a	139b	25.00	6.31	25
	5/8 EHS	A1	T7	21.20	3.95	18
	5/8 EHS	A1a	T7b	21.20	5.26	24
	5/8 EHS	A1b	T7a	21.20	1.98	9
	5/8 EHS	A1b	T7	21.20	2.06	9
	5/8 EHS	A1a	T7a	21.20	5.32	25
	5/8 EHS	A1	T7b	21.20	3.33	15

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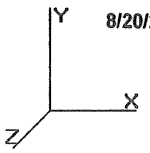

Deflections and Rotations

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)
50.00 mph Wind Normal To Face with No Ice	37.00	0.0377	-0.0027	0.0520
	74.67	0.0729	-0.0001	0.0609
	97.00	0.0938	-0.0002	0.0674
	120.00	0.1161	0.0000	0.1361
	154.67	0.1555	0.0000	0.0516
	170.00	0.1687	0.0000	0.0752
	180.00	0.1800	0.0000	0.1033
	190.00	0.1897	0.0000	0.0713
	192.33	0.1917	0.0000	0.0481
	220.00	0.2158	0.0002	0.2933
	225.00	0.2251	0.0002	0.2980
	242.00	0.2481	0.0001	0.0233
	244.33	0.2492	0.0001	0.1098
	250.33	0.2547	0.0001	0.0340
	255.00	0.2539	0.0000	0.0261
	257.33	0.2526	0.0001	0.0444
	259.67	0.2492	0.0000	0.0665
	270.00	0.2305	0.0001	0.1010
50.00 mph Wind at 60 deg From Face with No Ice	37.00	0.0436	0.1594	0.0492
	74.67	0.0776	0.0903	0.0599
	97.00	0.0992	0.0595	0.0553
	120.00	0.1247	0.0383	0.1402
	154.67	0.1741	0.0207	0.0718
	170.00	0.1926	0.0173	0.0893
	180.00	0.2077	0.0154	0.1536
	190.00	0.2218	0.0138	0.0661
	192.33	0.2248	0.0134	0.0756
	220.00	0.2607	0.0113	0.3362
	225.00	0.2728	0.0113	0.3032
	242.00	0.3034	0.0073	0.0489
	244.33	0.3052	0.0069	0.1007
	250.33	0.3105	0.0060	0.0312
	255.00	0.3107	0.0054	0.0149
	257.33	0.3100	0.0051	0.0321
	259.67	0.3081	0.0049	0.0579
	270.00	0.2893	0.0045	0.0885
50.00 mph Wind at 90 deg From Face with No Ice	37.00	0.0480	0.2701	0.0510
	74.67	0.0834	0.2158	0.0628
	97.00	0.1057	0.1793	0.0503
	120.00	0.1316	0.1504	0.1370
	154.67	0.1796	0.1146	0.0668
	170.00	0.1965	0.1050	0.0820
	180.00	0.2102	0.0976	0.1440
	190.00	0.2225	0.0841	0.0421
	192.33	0.2251	0.0849	0.0673
	220.00	0.2555	0.0599	0.3274
	225.00	0.2665	0.0607	0.2739
	242.00	0.2929	0.0440	0.0428

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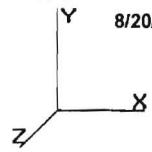
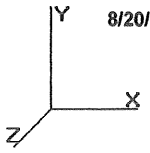


	244.33	0.2940	0.0426	0.0620
	250.33	0.2969	0.0432	0.0333
	255.00	0.2958	0.0412	0.0346
	257.33	0.2943	0.0403	0.0518
	259.67	0.2919	0.0361	0.0752
	270.00	0.2702	0.0370	0.1040
69.28 mph Wind Normal To Face with Ice	37.00	0.1811	-0.0123	0.3131
	74.67	0.4267	-0.0071	0.4796
	97.00	0.6233	-0.0069	0.5861
	120.00	0.8652	-0.0050	1.0180
	154.67	1.2798	-0.0023	0.6317
	170.00	1.4443	-0.0011	0.6682
	180.00	1.5549	-0.0004	0.8242
	190.00	1.6534	0.0007	0.5757
	192.33	1.6750	0.0010	0.5027
	220.00	1.8843	0.0041	1.0386
	225.00	1.9305	0.0050	1.0508
	242.00	2.0507	0.0048	0.2365
	244.33	2.0608	0.0050	0.4388
	250.33	2.0912	0.0049	0.2456
	255.00	2.1004	0.0048	0.0798
	257.33	2.1026	0.0048	0.0283
	259.67	2.0988	0.0047	0.0559
	270.00	2.0675	0.0045	0.1588
69.28 mph Wind at 60 deg From Face with Ice	37.00	0.1450	0.7539	0.1913
	74.67	0.2859	0.8667	0.2668
	97.00	0.3918	0.9339	0.2916
	120.00	0.5246	0.9925	0.6435
	154.67	0.7692	1.0771	0.3680
	170.00	0.8650	1.1151	0.4109
	180.00	0.9360	1.1320	0.6382
	190.00	1.0013	1.1594	0.3176
	192.33	1.0149	1.1637	0.3351
	220.00	1.1590	1.2110	0.9963
	225.00	1.1991	1.2199	0.9197
	242.00	1.3043	1.2187	0.1927
	244.33	1.3125	1.2186	0.4096
	250.33	1.3360	1.2183	0.1482
	255.00	1.3422	1.2158	0.0553
	257.33	1.3429	1.2144	0.0515
	259.67	1.3407	1.2130	0.1008
	270.00	1.3007	1.2095	0.1935
69.28 mph Wind at 90 deg From Face with Ice	37.00	0.1861	0.6890	0.2750
	74.67	0.4027	0.7253	0.4274
	97.00	0.5763	0.6185	0.4629
	120.00	0.7896	0.5981	0.8682
	154.67	1.1504	0.5713	0.5386
	170.00	1.2887	0.7147	0.5479
	180.00	1.3825	0.7139	0.7651
	190.00	1.4659	0.5477	0.3754
	192.33	1.4830	0.7137	0.4274
	220.00	1.6532	0.6383	1.0192
	225.00	1.6940	0.7127	0.8684
	242.00	1.7951	0.5305	0.1967
	244.33	1.8022	0.5301	0.3076

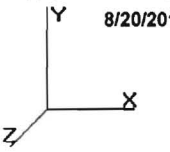


	250.33	1.8194	0.7110	0.0532
	255.00	1.8227	0.7098	0.0372
	257.33	1.8218	0.7093	0.0581
	259.67	1.8181	0.5260	0.1241
	270.00	1.7710	0.7064	0.2148
80.00 mph Wind Normal To Face with No Ice	37.00	0.1501	-0.0131	0.2433
	74.67	0.3314	-0.0037	0.3354
	97.00	0.4651	-0.0036	0.4073
	120.00	0.6269	-0.0019	0.6817
	154.67	0.9160	-0.0004	0.4552
	170.00	1.0371	0.0001	0.5169
	180.00	1.1228	0.0003	0.6308
	190.00	1.2025	0.0007	0.4906
	192.33	1.2206	0.0008	0.4270
	220.00	1.4180	0.0023	1.0074
	225.00	1.4634	0.0030	1.0114
	242.00	1.5875	0.0017	0.2674
	244.33	1.5989	0.0019	0.4590
	250.33	1.6328	0.0014	0.2746
	255.00	1.6457	0.0012	0.1262
	257.33	1.6498	0.0011	0.0780
	259.67	1.6480	0.0009	0.0107
	270.00	1.6292	0.0004	0.0880
80.00 mph Wind at 60 deg From Face with No Ice	37.00	0.1221	0.8258	0.1446
	74.67	0.2253	0.9069	0.1868
	97.00	0.2965	0.9553	0.1902
	120.00	0.3838	0.9983	0.4320
	154.67	0.5514	1.0606	0.2572
	170.00	0.6193	1.0887	0.3061
	180.00	0.6722	1.1013	0.4827
	190.00	0.7225	1.1216	0.2505
	192.33	0.7334	1.1247	0.2742
	220.00	0.8638	1.1581	0.9578
	225.00	0.9019	1.1647	0.8787
	242.00	1.0019	1.1611	0.1913
	244.33	1.0095	1.1607	0.3490
	250.33	1.0305	1.1596	0.1330
	255.00	1.0364	1.1569	0.0467
	257.33	1.0368	1.1554	0.0459
	259.67	1.0347	1.1540	0.0979
	270.00	0.9958	1.1502	0.1774
80.00 mph Wind at 90 deg From Face with No Ice	37.00	0.1578	0.7345	0.2109
	74.67	0.3164	0.7633	0.2973
	97.00	0.4339	0.6674	0.3034
	120.00	0.5762	0.6463	0.5799
	154.67	0.8276	0.6169	0.3877
	170.00	0.9292	0.7412	0.4193
	180.00	1.0016	0.7393	0.5977
	190.00	1.0691	0.5887	0.3077
	192.33	1.0836	0.7361	0.3683
	220.00	1.2490	0.6549	1.0141
	225.00	1.2909	0.7273	0.8710
	242.00	1.4003	0.5587	0.2400
	244.33	1.4088	0.5577	0.2812
	250.33	1.4292	0.7200	0.0871

Site Number: 10047
Location: Portland ME, ME

Code: TIA/EIA-222 Rev F

8/20/2010 2:09:38 PM



255.00	1.4368	0.7190	0.0625
257.33	1.4379	0.7184	0.0309
259.67	1.4367	0.5520	0.0691
270.00	1.4014	0.7163	0.1483
	0.0000	0.0000	0.0000

Accessibility Building Code Certificate

Designer: Steve Portnoy CFE Telecom

Address of Project: 225 Riverside Industrial Pkwy.

Nature of Project: Unmanned telecommunications equipment building (precast concrete on slab)

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)

Signature:

Title: Project Mgr.

Firm: CFE Telecom

Address: 4544 S. Lamar Blvd. G300
Austin Tx 78745

Phone: (512) 674-9484

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: 4.4.11

From: Steve Portnoy CFE Telecom

These plans and / or specifications covering construction work on:

U.S. Customs and Border Protect Public Safety Communications Facility

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

(SEAL)

Signature: _____

Title: Project Mgr

Firm: CFE Telecom

Address: 4544 S. Lamar Blvd. E-300
Austin, TX 78745

Phone: (512) 674-9434

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

ATTACHMENT X. FIRE DEPARTMENT REQUIREMENTS

PROJECT NAME: US Customs and Border Protection Communications Project

PROJECT ADDRESS: Riverside Industrial Parkway **CHART/BLOCK/LOT:** 330/--/5

CONTACT INFORMATION:

OWNER/APPLICANT		**CONSULTANT/AGENT**	
Name:	US Customs and Border Protection	**Name:**	Steve Portnoy, CFE Telecom
Address:	7501 Boston Blvd Springfield, VA 20229	**Address:**	4544 South Lamar Blvd. G-300 Austin, TX 78745
Work #:	(703) 921-7393	**Work #:**	512-674-9484
Cell #:	(571) 241-1604	**Cell #:**	512-415-5890
Fax #:		**Fax #:**	
Home #:		**Home #:**	
E-mail:	barry.k.bracken@ cbp.dhs.gov	**E-mail:**	sportnoy@cfeamerica.com

This building permit application is for the addition of antenna and microwave dishes to an existing tower, a 16 X 12 (192 ft^2) equipment shelter, and the installation of a 500 gallon propane tank. The NFPA classification is: unknown and the IBC classification is: unknown

On-site fire detection and suppression consists of: extinguishers inside the shelter.

The applicant respectfully requests an exemption from the Life Safety Plan requirements.

Maine Collaborative Planning

April 8, 2011

Gail Guertin
Inspections Services Program
City of Portland
389 Congress St. Rm. 315
Portland, ME 04101

Dear Gail:

As discussed, please find enclosed completed administrative authorization and building permit application forms for the U.S. Customs and Border Protection project on Riverside Industrial Parkway provided by CFE Telecom. Each set of forms is attached to a set of plans for the project.

Please let me know if you need additional information to process the permits.

Best regards,

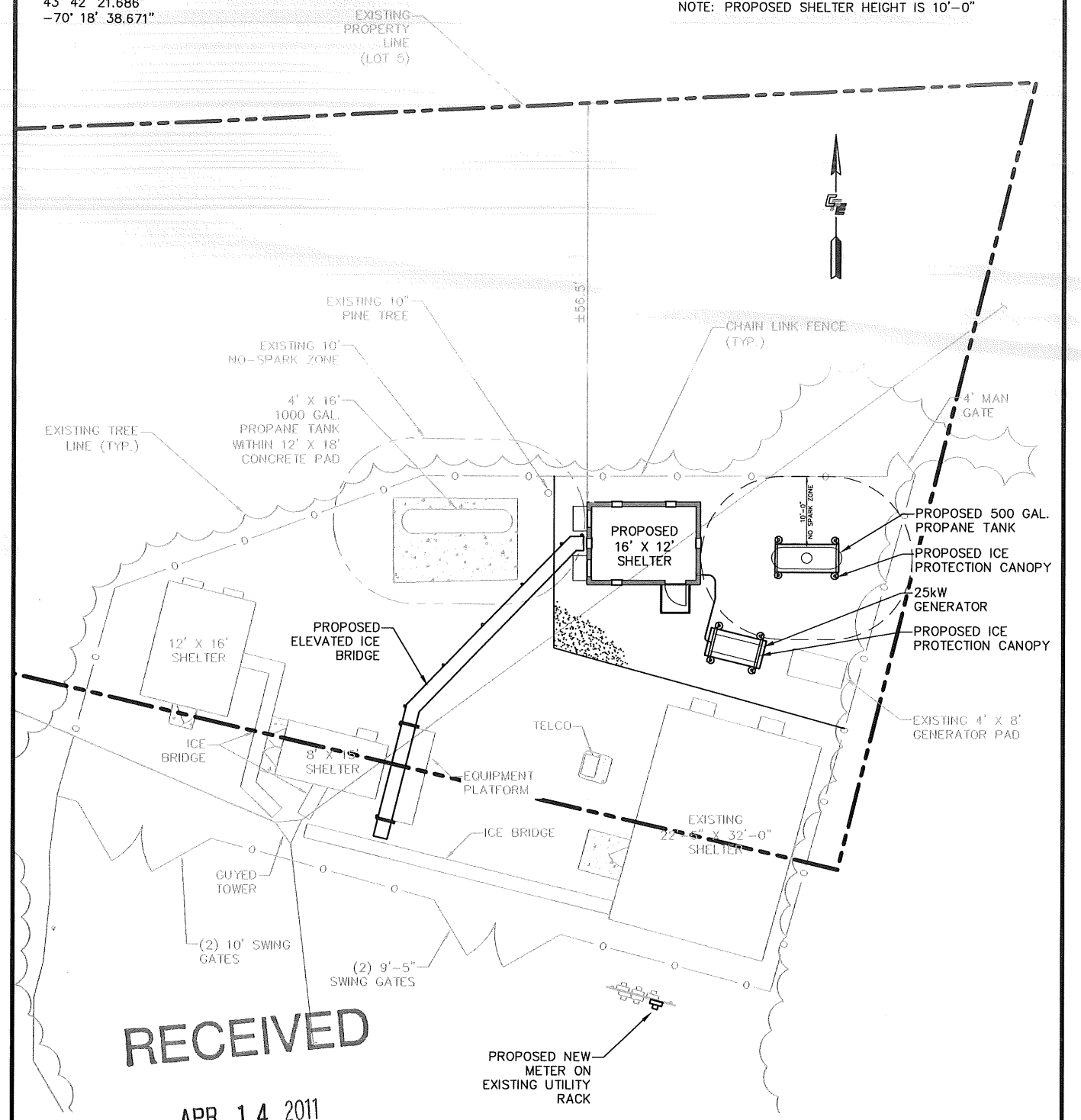
Stacy Benjamin

Stacy Benjamin

95 Main Street South
Searsmont, ME 04973
(207)342-2929
sbenjamin@mainecollaborativeplanning.com

SITE COORDINATES:
43° 42' 21.686"
-70° 18' 38.671"

NOTE: PROPOSED SHELTER HEIGHT IS 10'-0"



RECEIVED
APR 14 2011
Dept. of Building Inspections
City of Portland Maine

SITE LAYOUT PLAN

20 0 10 20

1 INCH = 20 FT.

TELECOM
4544 S. Lamar Blvd. Bldg G-300
Austin, Texas 78745
P: 512.495.9470
F: 512.495.9473
P.O. Box 2110
Round Rock, Texas 78680
www.cfeamerica.com

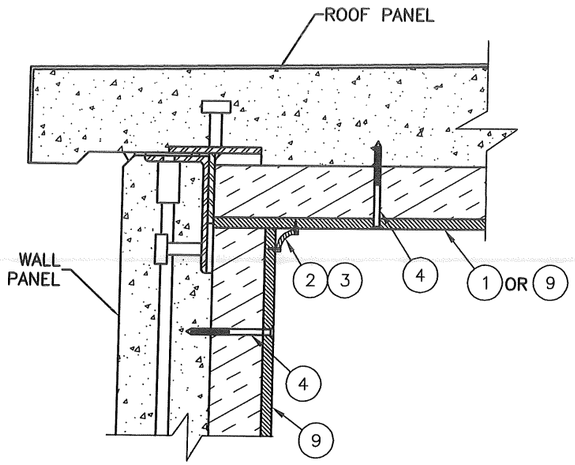
MOTOROLA SOLUTIONS

SOUTH PORTLAND
(ATC 10047)

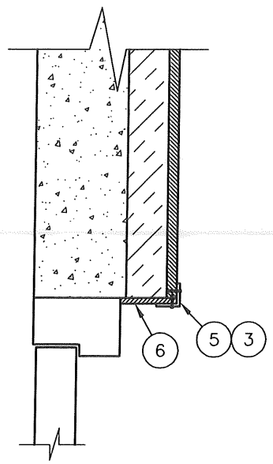
SITE PLAN

04/13/11

1



WALL/ROOF SECTION

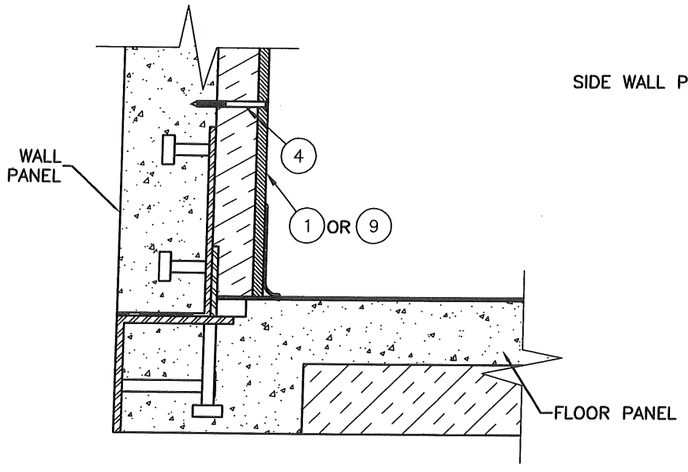


TYP DOOR SECTION
TRIM DETAIL

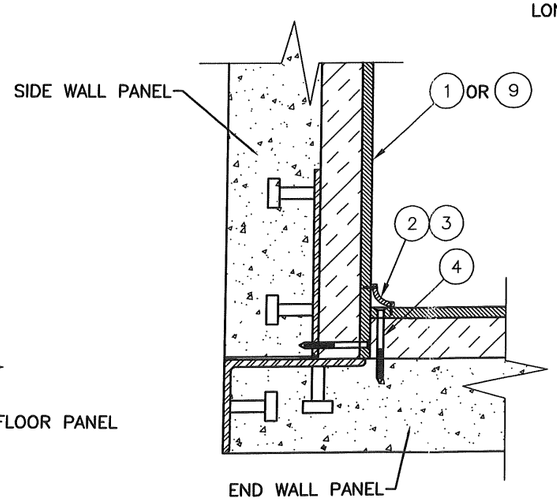
Parts List			
ITEM	U/M	P/N	DESCRIPTION
1	EA.	300033	INSULATION,2.25"RMAX TSX,48"X144"
2	EA.	320002	TRIM,COVE,VINYL,10'0",WHITE
3	EA.	168009	BRAD,WHITE 3/4",44241
4	EA.	168294	SCREW,CONCRETE,3/16"X3 3/4"
5	EA.	320020	TRIM,CORNER,WOOD,1-3/8"X1-3/8"OUTSI
6	EA.	300028	PANELING,POLY.030,W/3/8"OSB,4'X9'1"
7	EA.	320023	TRIM,FRP,VINYL,10'0",WHITE,2 PCS,2"
8	EA.	320024	TRIM,FRP,VINYL,12'0",WHITE,2 PCS,2"
9	EA.	300036	INSULATION,2.25"RMAX TSX,48"X113"

NOTES:

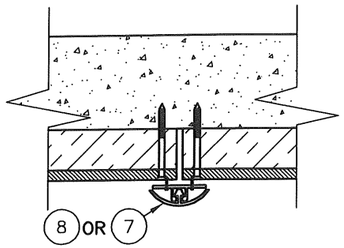
1. INSTALL INTERIOR PANELS W/ TAPCONS (LENGTH MAY VARY) 24" O.C. MAX ALONG LENGTH OF PANELS. (NO FASTENERS REQUIRED ALONG SHORT SIDE OF PANELS IF PANEL EDGE IS AT A CORNER)
2. MAX GAP BETWEEN PANELS TO BE $\frac{1}{4}$"
3. USE COVE TRIM IN ALL CORNERS AND AROUND TOP PERIMETER. INSTALL USING $\frac{3}{4}$" BRAD NAILS.
4. TRIM ALL EXPOSED OPENINGS W/ OUTSIDE CORNER TRIM.
5. USE 10 FT TRIM, P/N 320023 FOR JOINT LENGTHS 10FT AND UNDER, USE P/N 320024 FOR JOINT LENGTHS OVER 10FT.
6. USE 12FT PANELS FOR WALLS AND CEILING ON SURFACES LONGER THAN 113".



WALL/FLOOR SECTION



WALL/WALL SECTION



JOINT DETAIL
PLAN VIEW SECTION

REV	BY	DATE	DESCRIPTION	APP.BY	DATE
D	CC	5/4/06	REV SHT 2	KB	5/4/06
C	CC	3/27/06	ADDED NOTE #6	KB	3/27/06
B	CC	3/16/06	REVISED SHT 2	KB	3/16/06
A	CC	10/11/05	CHG TITLE TO BE 9'-9" WALL HEIGHT	VGH	10/11/05

CellXion
A Division of Sabre Industries, Inc.
5031 Hazel Jones Road
Bossier City, Louisiana 71111
voice: (318) 213-2900
fax: (318) 213-2919
www.cellxion.com

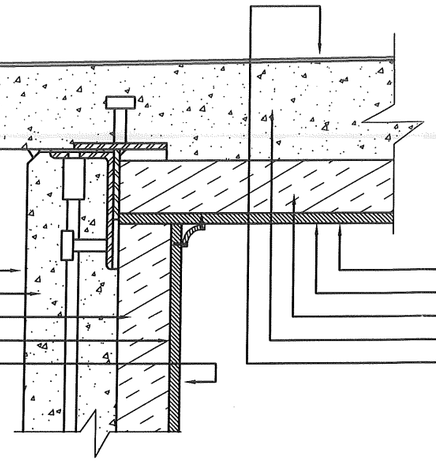
CUSTOMER:
ENGINEERING STANDARD

PROJECT:
CONCRETE SHELTER
INT. PANELING INSTALL
(1) LAYER
WALL HEIGHT 9'-9"

FILENAME: 108-036	
SCALE: 3/16"=1"	TOLERANCE:
DRWN. BY: C. CASINGER	DATE: 10/6/05
CHK. BY: V. HASSELL	DATE: 10/6/05
ENG. BY: K. BARNETT	DATE: 10/6/05
APP. BY:	DATE:
SHEET NO.: 1 OF 2	
DRAWING NO.: 108-036	D

WALL

(HEAT CAPACITY = 8 BTU/°F)

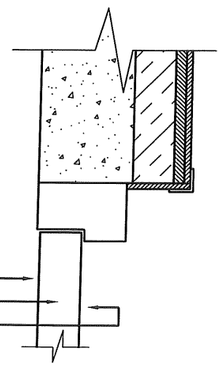


0.25	OUTSIDE AIR FILM
1.36	4" L.W. CONCRETE
14.40	2½" R–MAX INSUL
0.54	7/16" PANELING
1.70	INSIDE AIR FILM
18.25	OVERALL R–VALUE
0.055	OVERALL U–FACTOR

CEILING

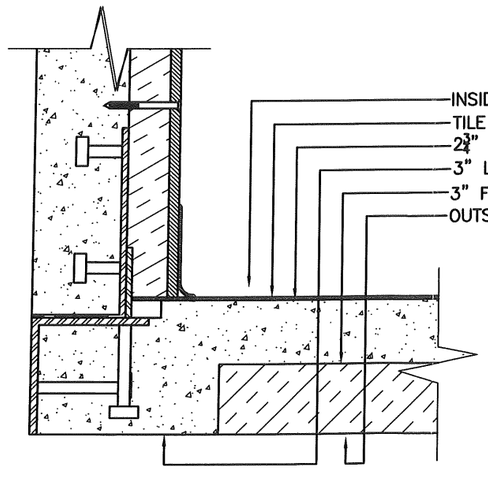
INSIDE AIR FILM	4.55
7/16" PANELING	0.54
2½" R–MAX INSUL.	14.40
4.5"(AVG) L.W. CONCRETE	1.53
OUTSIDE AIR FILM	0.25
21.27	OVERALL R–VALUE
0.047	OVERALL U–FACTOR

METAL DOOR



0.25	OUTSIDE AIR FILM
7.00	BEAD BOARD INSUL.
1.35	INSIDE AIR FILM
8.60	OVERALL R–VALUE
0.116	OVERALL U–FACTOR

FLOOR



	RIB	DECK
INSIDE AIR FILM	1.10	1.10
TILE	0.05	0.05
2½" L.W. CONCRETE (DECK)	0.94	0.94
3" L.W. CONCRETE (RIB)	1.02	––
3" FOAM INSERT	––	15.00
OUTSIDE AIR FILM	0.25	0.25
	3.36	17.34 TOTAL 'R'
	0.298	0.058 TOTAL 'U'
	0.286	0.714 SURFACE AREA RATIO
	0.085	0.041 U–FACTOR PER SURFACE AREA
	0.126	OVERALL U–FACTOR
	7.93	OVERALL R–VALUE

REV	BY	DATE	DESCRIPTION	APP.BY	DATE
D	CC	5/4/06	REVISED FLOOR CALCS	KB	5/4/06
B	CC	3/16/06	REVISED FLOOR CALCS	KB	3/16/06

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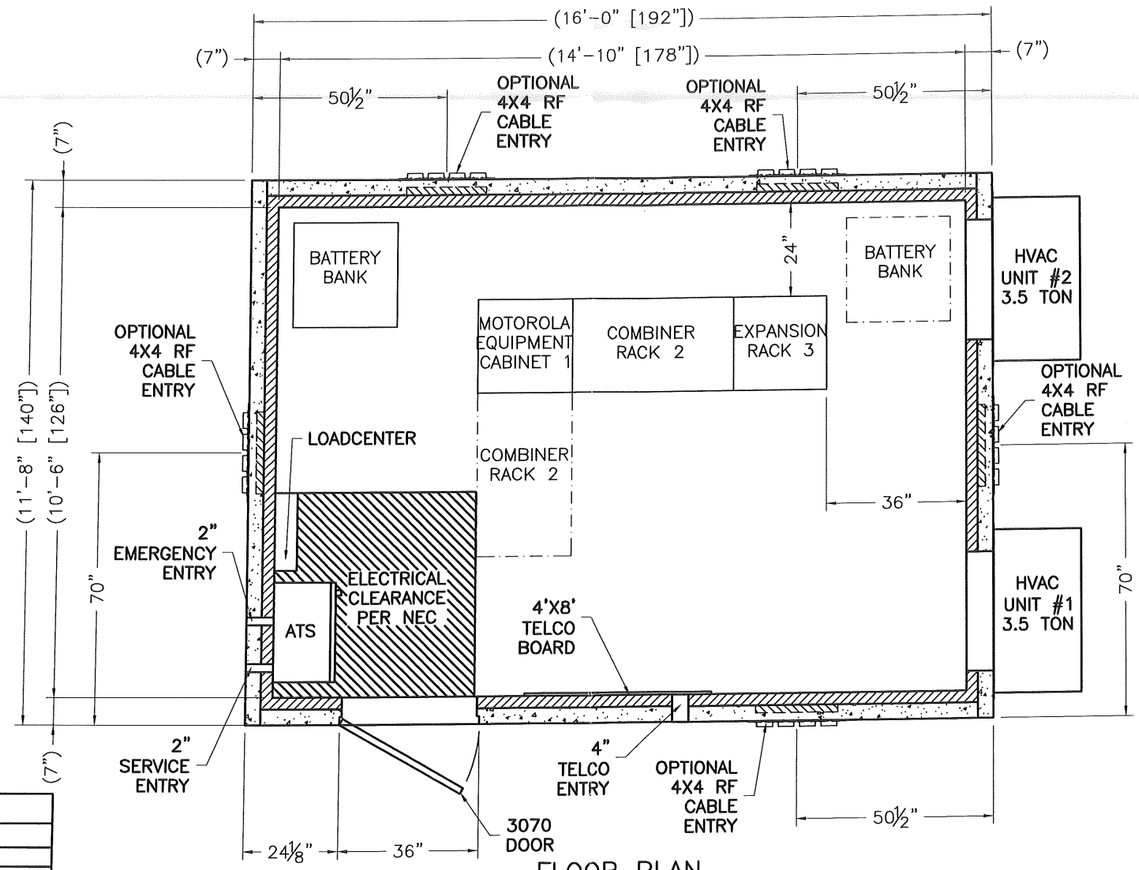
5031 Hazel Jones Road
Bossier City, Louisiana 71111
voice: (318) 213–2900
fax: (318) 213–2919
www.cellxion.com

CUSTOMER:
ENGINEERING STANDARD

PROJECT:
CONCRETE SHELTER
INT. PANELING INSTALL
(1) LAYER
R/U CALCULATIONS

FILENAME: 108–036	
SCALE:	TOLERANCE:
DRWN. BY: C. CASINGER	DATE: 10/6/05
CHK. BY: V. HASSELL	DATE: 10/6/05
ENG. BY: K. BARNETT	DATE: 10/6/05
APP. BY:	DATE:
SHEET NO.: 2 OF 2	
DRAWING NO.: 108–036	D

NOTE:
1. SHELTER ESTIMATED WEIGHT : 42,100 LBS.
2. FOR SLAB FOUNDATION, BEARING AREA COVERS ENTIRE SLAB (REFER TO DRAWING 108–001).
3. FOR PIER FOUNDATION, BEARING POINTS ARE DETERMINED BY PIER LOCATIONS (REFER TO DRAWING 108–003).



FLOOR PLAN
186.67 SQ. FT. EXTERIOR AREA
155.75 SQ. FT. INTERIOR AREA

SITE LIST
DESCRIPTION
MOUNT HARRIS
PORTSMOUTH – POE
BUCKS HARBOR
ELLSWORTH
PORTLAND ATC 10047
PEEK A BOO MOUNTAIN

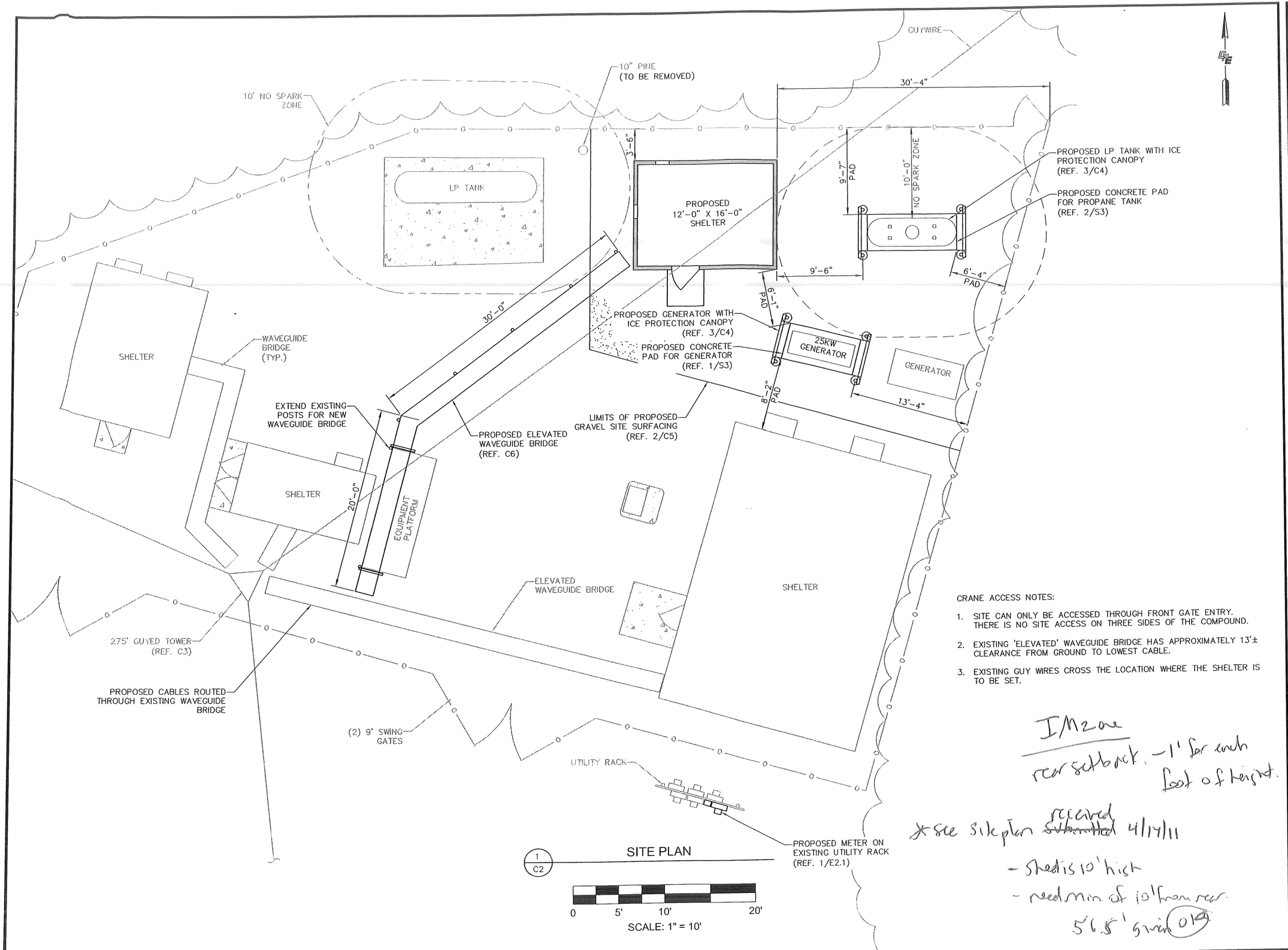
cellXion
A Division of Sabre Industries, Inc.
5031 Hazel Jones Road
Bossier City, Louisiana 71111
voice: (318) 213–2900
fax: (318) 213–2919
www.cellxion.com

CUSTOMER:
MOTOROLA
U.S. FEDERAL GOVERNMENT MARKETS DIVISION

PROJECT:
U.S. CUSTOMS & BORDER PROTECTION
FLOOR PLAN

FILENAME: CBP/SCBP1111	
SCALE:	TOLERANCE:
DRWN. BY: G. BRINKMAN	DATE: 03/24/11
CHK. BY: L. DROZDZ	DATE: 03/24/11
ENG. BY:	DATE:
APP. BY: M. TAYLOR	DATE: 03/24/11
SHEET NO.: 2–0	
DRAWING NO.: SCBP11	

PRELIMINARY-2



1/C2 SITE PLAN

SCALE: 1" = 10'

0 5' 10' 20'

CRANE ACCESS NOTES:

1. SITE CAN ONLY BE ACCESSED THROUGH FRONT GATE ENTRY. THERE IS NO SITE ACCESS ON THREE SIDES OF THE COMPOUND.
2. EXISTING 'ELEVATED' WAVEGUIDE BRIDGE HAS APPROXIMATELY 13'± CLEARANCE FROM GROUND TO LOWEST CABLE.
3. EXISTING GUY WIRES CROSS THE LOCATION WHERE THE SHELTER IS TO BE SET.

IM zone
rear setback. -1' for each foot of height.

*see site plan ~~submitted~~ received 4/14/11
- shed is 10' high
- need min of 10' from rear
5'6.5' given OK

NOT FOR CONSTRUCTION

CFE TELECOM
4544 S. Lamar Blvd., Bldg G-300
Austin, Texas 78745
P: 512.495.9470
F: 512.495.9473
P.O. Box 2110
Austin, Texas 78680
www.cfeamerica.com

MOTOROLA SOLUTIONS

SOUTH PORTLAND
(ATC #10047)

SET ISSUED FOR: REVIEW
DATE: 02/15/11

REVISIONS

NO.	DATE	DESCRIPTION

DETAILED SITE PLAN

C2.1

SITE DATA

SITE INFORMATION

COUNTY: CUMBERLAND
JURISDICTION: CITY OF PORTLAND
CODE: 2009 IBC
OCCUPANCY: N/A
ZONING: N/A
USE: UNMANNED PUBLIC SAFETY TELECOMMUNICATIONS FACILITY

SITE ACCESS

TOM BURGOYNE

(M) (508) 922-6233
(tom.burgoyne@americantower.com)

PROJECT TYPE

COLLOCATION ON AN EXISTING 275' GUYED TOWER AND NEW COMMUNICATION EQUIPMENT IN A NEW EQUIPMENT SHELTER WITHIN AN EXISTING FENCED COMPOUND
NEW 25KW GENERATOR
NEW 500 GAL. L.P. TANK

APPLICANT

U.S. CUSTOMS AND BORDER PROTECTION
CONTACT: BARRY BRACKEN
PROJECT MANAGER
CBP/OIT/ENTS/WTP
PHONE: 703.921.7393
MOBILE: 571.241.1604

MOTOROLA SOLUTIONS

U.S. CUSTOMS & BORDER PROTECTION
P25 TACCOMM MODERNIZATION PROJECT
HOULTON FOCUS AREA

THIS DOCUMENT IS RELEASED FOR THE PURPOSES OF REVIEW UNDER THE AUTHORITY OF NICHOLAS G. KEHL, P.E. 12493 ON 02/15/11 . IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.

SITE NAME

SOUTH PORTLAND
(ATC #10047)

SITE ADDRESS

225 RIVERSIDE INDUSTRIAL PARKWAY
PORTLAND, MAINE 04103

PROJECT TEAM

TOWER OWNER

AMERICAN TOWER CORPORATION
10 PRESIDENTIAL WAY
WOBURN, MA 01801

PROJECT MANAGER

MOTOROLA
CONTACT: CURT HESS
MOBILE: 410.627.57004
EMAIL: CURTHESS@MOTOROLA.COM

ENGINEER

CFE TELECOM
CONTACT: NICHOLAS G. KEHL, P.E.
4544 S. LAMAR BLVD., BLDG. G-300
AUSTIN, TEXAS 78745
PHONE: 512.495.9470
FAX: 512.495.9473

SITE LOCATION

LAT: 43° 42' 21.69"

LONG: -70° 18' 38.67"

ELEV: 68.2' (AMSL)

UTILITIES

ONE CALL
CONTRACTOR TO CALL BEFORE DIGGING!!!!
PHONE: 1 (888) DIG-SAFE
1 (888) 344-7233

CENTRAL MAINE POWER
PHONE: 800.565.3181

VERIZON
PHONE: 866.323.1773

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ATTACHMENTS

APPROVALS

MOTOROLA PROJECT MANAGER — DATE

MOTOROLA RF ENGINEER — DATE

CBP TACCOMM PROJECT MANAGER — DATE

NOT FOR CONSTRUCTION

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MOTOROLA SOLUTIONS

SOUTH PORTLAND
(ATC #10047)

SET ISSUED FOR: REVIEW — DATE: 02/15/11

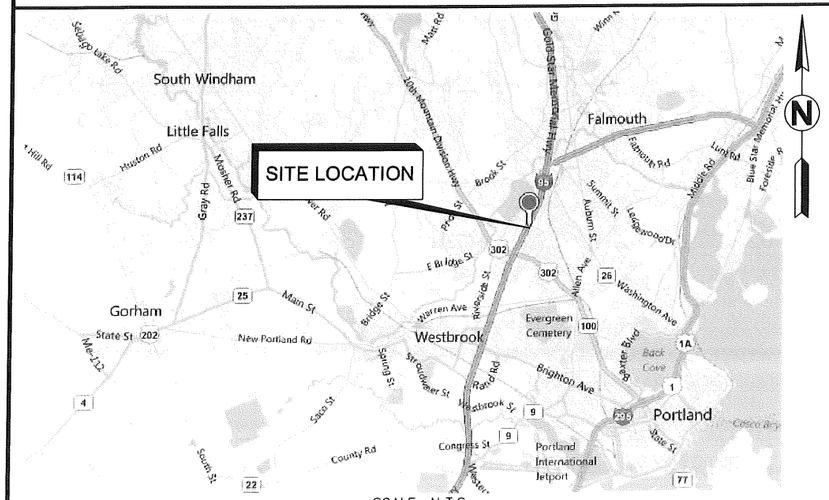
REVISIONS

NO.	DATE	DESCRIPTION

TITLE SHEET

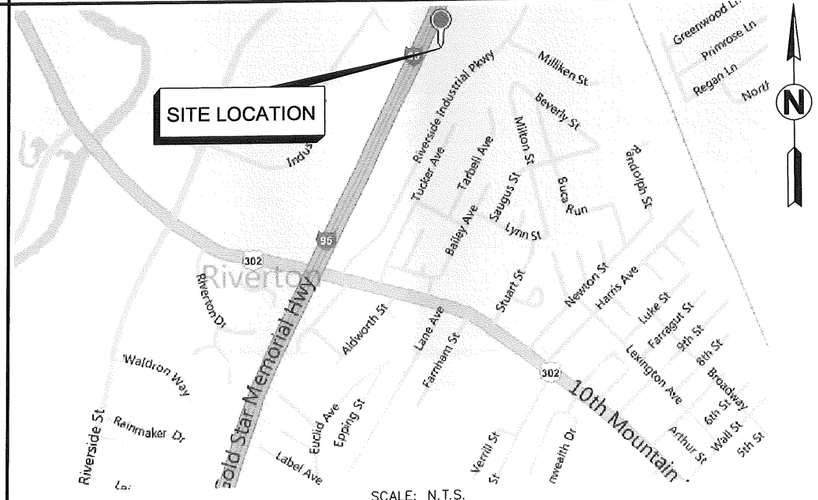
T1

REGIONAL MAP



SCALE: N.T.S.

VICINITY MAP



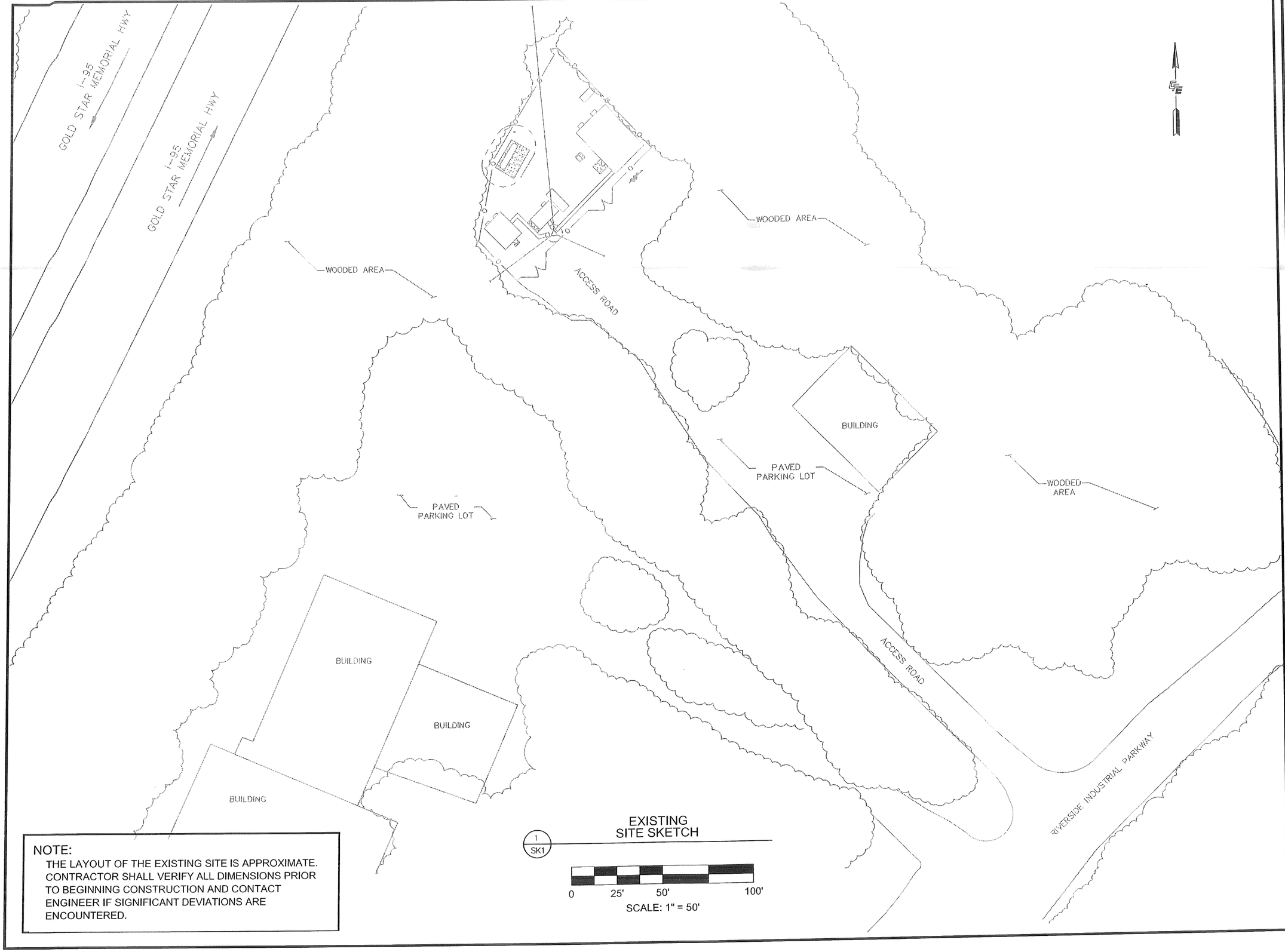
SCALE: N.T.S.

DRIVING DIRECTIONS

(FROM PORTLAND) DEPART CONGRESS ST. TOWARD EXCHANGE ST. TURN RIGHT ONTO FOREST AVE. KEEP STRAIGHT ONTO SR-100/ FOREST AVE. KEEP STRAIGHT ONTO US-302/SR-100/10TH MOUNTAIN DIVISION HWY/FOREST AVE. TAKE RAMP RIGHT I-295 SOUTH/US-1 SOUTH TOWARD SOUTH PORTLAND. AT EXIT 1, TAKE RAMP RIGHT FOR MAINE TURNPIKE AUTHORITY APPROACH RD TOWARD MAINE TURNPIKE NORTH/ MAINE MALL ROAD. TAKE RAMP RIGHT FOR I-95 NORTH/GOLD STAR MEMORIAL HWY/MAINE TURNPIKE TOWARD AUGUSTA/LEWISTON ARRIVE AT THE DESTINATION ON THE RIGHT.

LEGAL DESCRIPTION

THENCE IN A WESTERLY DIRECTION A DISTANCE OF 141 FEET TO A POINT ON THE SOUTHWESTERLY BOUNDARY OF THE LAND OF OWNER WHICH POINT IS LOCATED S45°44'28"E A DISTANCE OF 75 FEET FROM SAID EASTERLY SIDELINE OF THE MAINE TURNPIKE AUTHORITY LAND; THENCE N45°44'28"W ALONG SAID SOUTHWESTERLY BOUNDARY OF THE LAND OF OWNER A DISTANCE OF 75 FEET TO SAID EASTERLY SIDELINE OF THE MAINE TURNPIKE AUTHORITY; THENCE N25°44'02"E ALONG SAID MAINE TURNPIKE AUTHORITY LAND A DISTANCE OF 151.82 FEET TO THE POINT OF BEGINNING.



EXISTING
SITE SKETCH
1
SK1

0 25' 50' 100'

SCALE: 1" = 50'

NOTE:
THE LAYOUT OF THE EXISTING SITE IS APPROXIMATE. CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO BEGINNING CONSTRUCTION AND CONTACT ENGINEER IF SIGNIFICANT DEVIATIONS ARE ENCOUNTERED.

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EXISTING SITE SKETCH

SK1

DIVISION 1 STANDARD PROVISIONS
PART 1 GENERAL

1.1 INTENT

A. THESE SPECIFICATIONS AND THE CONSTRUCTION DRAWINGS ACCOMPANYING THEM DESCRIBE THE WORK TO BE DONE AND THE MATERIALS TO BE FURNISHED FOR THE CONSTRUCTION OF THIS PROJECT.

B. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE FULLY EXPLANATORY AND SUPPLEMENTARY. HOWEVER, SHOULD ANYTHING BE SHOWN, INDICATED OR SPECIFIED ON ONE AND NOT THE OTHER, IT SHALL BE DONE THE SAME AS IF SHOWN, INDICATED OR SPECIFIED IN BOTH.

C. THE INTENTION OF THESE DOCUMENTS IS TO INCLUDE ALL LABOR AND MATERIALS REASONABLY NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK AS STIPULATED IN THE CONTRACT.

D. THE PURPOSE OF THE SPECIFICATIONS IS TO INTERPRET THE INTENT OF THE DRAWINGS AND TO DESIGNATE THE METHOD OF THE PROCEDURE, TYPE AND QUALITY OF MATERIALS REQUIRED TO COMPLETE THE WORK.

E. MINOR DEVIATIONS FROM THE DESIGN LAYOUT ARE ANTICIPATED AND SHALL BE CONSIDERED AS PART OF THE WORK. NO CHANGES THAT ALTER THE CHARACTER OF THE WORK WILL BE MADE OR PERMITTED BY MOTOROLA WITHOUT ISSUING A CHANGE ORDER.

1.2 CONFLICTS

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL MEASUREMENTS AT THE SITE BEFORE ORDERING ANY MATERIALS OR DOING ANY WORK. NO EXTRA CHARGE OR COMPENSATION SHALL BE ALLOWED DUE TO DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND DIMENSIONS INDICATED ON THE CONSTRUCTION DRAWINGS. ANY SUCH DISCREPANCY IN DIMENSIONS, WHICH MAY BE FOUND, SHALL BE SUBMITTED TO MOTOROLA FOR CONSIDERATION BEFORE THE CONTRACTOR PROCEEDS WITH THE WORK IN THE AFFECTED AREAS.

1.3 STORAGE

A. ALL MATERIALS MUST BE STORED IN A LEVEL AND DRY FASHION AND IN A MANNER THAT DOES NOT NECESSARILY OBSTRUCT THE FLOW OF OTHER WORK. ANY STORAGE METHOD MUST MEET ALL RECOMMENDATIONS OF THE ASSOCIATED MANUFACTURER.

1.4 CLEAN UP

A. THE CONTRACTOR SHALL AT ALL TIMES KEEP THE SITE FREE FROM ACCUMULATION OF WASTE MATERIALS OR RUBBISH CAUSED BY HIS EMPLOYEES AT WORK AND AT THE COMPLETION OF THE WORK, HE SHALL REMOVE ALL RUBBISH FROM AND ABOUT THE BUILDING AREA, INCLUDING ALL HIS TOOLS, SCAFFOLDING, AND SURPLUS MATERIALS AND SHALL LEAVE HIS WORK CLEAN AND READY FOR USE.

B. EXTERIOR: VISUALLY INSPECT EXTERIOR SURFACES AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER.

C. REMOVE ALL TRACES OF SPLASHED MATERIALS FROM ADJACENT SURFACES.

D. IF NECESSARY TO ACHIEVE A UNIFORM DEGREE OF CLEANLINESS, HOSE DOWN THE EXTERIOR OF THE STRUCTURE.

1.5 QUALITY ASSURANCE

A. ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS. THESE SHALL INCLUDE BUT NOT BE LIMITED TO THE LATEST VERSION OF THE FOLLOWING:

TIA/EIA – 222 – G – 2006
INTERNATIONAL BUILDING CODE (IBC) 2009
BUILDING OFFICIALS AND CODE ADMINISTRATORS (BOCA) 1990
NATIONAL ELECTRICAL CODE (NEC) WITH LOCAL AMENDMENTS 2006
UNDERWRITER LABORATORIES APPROVED ELECTRICAL PRODUCTS
AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATIONS (AISC)
ANSI/NFPA – 70 LIFE SAFETY CODE NFPA – 101 – 1990

B. ALL WORK SHALL BE DONE IN ACCORDANCE WITH MOTOROLA'S R56 STANDARDS AND GUIDELINES FOR COMMUNICATIONS SITES.

1.6 ADMINISTRATION

A. BEFORE THE COMMENCEMENT OF ANY WORK, THE CONTRACTOR WILL ASSIGN A PROJECT MANAGER WHO WILL ACT AS A SINGLE POINT OF CONTACT FOR ALL PERSONNEL INVOLVED IN THE PROJECT. THIS PROJECT MANAGER WILL DEVELOP A MASTER SCHEDULE FOR THE PROJECT WHICH WILL BE SUBMITTED TO MOTOROLA PRIOR TO THE COMMENCEMENT OF ANY WORK.

B. SUBMIT A BAR CHART TYPE PROGRESS SCHEDULE NOT MORE THAN 3 DAYS AFTER THE DATE ESTABLISHED FOR COMMENCEMENT OF THE WORK ON THE SCHEDULE. INDICATE A TIME BAR FOR EACH MAJOR CATEGORY OR UNIT OF WORK TO BE PERFORMED AT SITE, PROPERLY SEQUENCED AND COORDINATED WITH OTHER ELEMENTS OF WORK. SHOW COMPLETION OF THE WORK SUFFICIENTLY IN ADVANCE OF THE DATE ESTABLISHED FOR SUBSTANTIAL COMPLETION OF THE WORK.

C. PRIOR TO COMMENCING CONSTRUCTION, MOTOROLA SHALL SCHEDULE AN "ON–SITE" MEETING WITH ALL MAJOR PARTIES. THIS SHALL INCLUDE (THOUGH NOT LIMITED TO) THE PROPERTY OWNER, POWER COMPANY, MOTOROLA AND THE CONTRACTOR.

D. CONTRACTOR SHALL BE EQUIPPED WITH SOME MEANS OF CONSTANT COMMUNICATIONS, SUCH AS A MOBILE PHONE OR A BEEPER. THIS EQUIPMENT WILL NOT BE SUPPLIED BY MOTOROLA NOR WILL CELLULAR SERVICE BE ARRANGED.

E. DURING CONSTRUCTION, CONTRACTOR MUST ENSURE THAT EMPLOYEES AND SUBCONTRACTORS WEAR HARD HATS AND SAFETY GLASSES AT ALL TIMES. THE CONTRACTOR MUST COMPLY WITH ALL APPLICABLE OSHA REQUIREMENTS.

F. PROVIDE DAILY UPDATES ON SITE PROGRESS, EITHER VERBAL OR WRITTEN.

G. COMPLETE INVENTORY OF CONSTRUCTION MATERIALS AND EQUIPMENT IS REQUIRED PRIOR TO START OF CONSTRUCTION.

H. MOTOROLA SHALL BE NOTIFIED NO LESS THAN 48 HOURS IN ADVANCE OF CONCRETE POURS, TOWER ERECTIONS, AND SHELTER PLACEMENTS.

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GENERAL NOTES

GN1

DIVISION 2 - SITE WORK:
WORK AND DRAINAGE

PART 1 GENERAL

2.1 WORK INCLUDED

A. SITE WORK AND DRAINAGE DETAILS ARE WRITTEN TO COVER A VARIETY OF POSSIBLE SITE CONFIGURATIONS. SPECIFIC SERVICES WILL BE PERFORMED AS INDICATED IN THE SITE PLAN AND AGREED UPON BY CUSTOMER AND MOTOROLA PROJECT MANAGERS.

B. REFER TO COMPLETE DRAWING SET AND REFERENCED SPECIFICATIONS / STANDARDS FOR WORK INCLUDED.

2.2 RELATED WORK

A. CONSTRUCTION FOR BUILDING FOUNDATION
B. PLACEMENT OF SHELTER
C. INSTALLATION OF GROUNDING & ELECTRICAL SYSTEM
D. INSTALLATION OF ANTENNA SYSTEM

2.3 DESCRIPTIONS

A. ACCESS ROAD, TURNAROUND AREAS, AND COMPOUND AREAS ARE CONSTRUCTED TO PROVIDE A WELL-DRAINED, EASILY MAINTAINED, EVEN SURFACE FOR MATERIAL AND EQUIPMENT DELIVERIES AND MAINTENANCE PERSONNEL ACCESS.

2.4 QUALITY ASSURANCE

A. APPLY SOIL STERILIZER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION (USE AS NEEDED).

B. VEGETATION AND LANDSCAPING, IF REQUIRED WITHIN THE CONTRACT, WILL BE PLACED AND MAINTAINED AS RECOMMENDED BY NURSERY INDUSTRY STANDARDS.

2.5 SEQUENCING

A. CONFIRM SURVEY STAKES AND SET ELEVATION STAKES PRIOR TO ANY CONSTRUCTION. PLACE SILT FENCE OR OTHER REQUIRED EROSION CONTROLS DOWN GRADIENT OF CONSTRUCTION AREA.

B. THE COMPLETED ROAD AND SITE AREA WILL BE CLEARED OF HEAVY GROWTH OF GRASS, TREES, SHRUBS AND TOPSOIL PRIOR TO FOUNDATION CONSTRUCTION OR PLACEMENT OF BACKFILL OR SUB-BASE MATERIAL.

C. CONSTRUCT TEMPORARY CONSTRUCTION ZONE ALONG ACCESS DRIVE WHEN REQUIRED FOR NEW TOWERS.

D. THE SITE AREA WILL BE BROUGHT TO SUB-BASE COURSE ELEVATION AND THE ACCESS ROAD TO BASE COURSE ELEVATION PRIOR TO FORMING FOUNDATIONS.

E. APPLY SOIL HERBICIDE PRIOR TO PLACING BASE MATERIALS.

F. IF REQUIRED, GRADE, SEED, FERTILIZE AND MULCH DISTURBED AREA IMMEDIATELY AFTER BRINGING THE SITE AND ACCESS ROAD TO BASE COURSE ELEVATION. WATER TO ENSURE GROWTH.

G. REMOVE GRAVEL FROM TEMPORARY CONSTRUCTION ZONE.

H. AFTER APPLICATIONS OF FINAL SURFACES, APPLY SOIL HERBICIDE TO THE STONE SURFACE.

PART 2 PRODUCTS

2.8 MATERIALS

A. ROAD AND SITE MATERIALS: FILL MATERIAL – ACCEPTABLE SELECT FILL SHALL BE IN ACCORDANCE WITH LOCAL DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.

B. SOIL HERBICIDE SHALL BE EPA REGISTERED OF LIQUID COMPOSITION AND OF PRE-EMERGENCE DESIGN.

C. SOIL STABILIZER FABRIC SHALL BE MIRAFI – 500X.

2.9 EQUIPMENT

A. COMPACTION SHALL BE ACCOMPLISHED BY MECHANICAL MEANS.

B. ALL LARGER AREAS SHALL BE COMPACTED BY SHEEPS FOOT, VIBRATORY OR RUBBER TIRED ROLLERS WEIGHING AT LEAST FIVE TONS.

C. SMALLER AREAS SHALL BE COMPACTED BY POWER- DRIVER, HAND HELD TAMPERS.

PART 3 EXECUTION

2.10 INSPECTIONS

A. LOCAL BUILDING INSPECTION SHALL RECEIVE ADEQUATE NOTIFICATION IN ADVANCE OF CONCRETE POURS WHEN REQUIRED.

2.11 PREPARATION

A. CLEAR TREES, BRUSH AND DEBRIS FROM SITE AREA AND ACCESS ROAD RIGHT OF WAY (IF REQUIRED).

B. PRIOR TO OTHER EXCAVATION AND CONSTRUCTION EFFORTS CLEAR SITE OF ORGANIC MATERIAL TO MINIMUM OF SIX INCHES BELOW ORIGINAL GROUND LEVEL.

C. DO NOT REMOVE TREES, BRUSH, OR DEBRIS FROM THE PROPERTY WITHOUT MOTOROLA APPROVAL.

D. PRIOR TO PLACEMENT OF FILL OR BASE MATERIALS, PROOF ROLL THE SOIL.

E. WHERE UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED, COVER CLEARED AREAS WITH STABILIZER MAT PRIOR TO PLACEMENT OF FILL OR BASE MATERIAL.

2.12 INSTALLATION

A. THE COMPOUND AND TURNAROUND AREAS SHALL BE AT THE SUB-BASE COURSE ELEVATION PRIOR TO FORMING FOUNDATIONS. GRADE OR FILL THE SITE AND ACCESS ROAD AS REQUIRED IN ORDER THAT THERE IS EVEN DISTRIBUTION OF SPOILS RESULTING FROM FOUNDATION EXCAVATIONS. THE RESULTING GRADE WILL CORRESPOND WITH SAID SUB-BASE COURSE, ELEVATIONS ARE TO BE CALCULATED FROM FINISHED GRADES OR SLOPES, AS INDICATED.

B. IF ANY, EXCESS SPOILS WILL BE CLEARED FROM JOB SITE AND NOT SPREAD BEYOND THE LIMITS OF OWNER/LEASED PROPERTY UNLESS AUTHORIZED BY PROJECT MANAGER.

C. THE ACCESS ROAD SHALL BE BROUGHT TO BASE COURSE ELEVATION PRIOR TO FOUNDATION CONSTRUCTION TO PERMIT USE. COMPACTION SHALL BE DONE DURING CONSTRUCTION OF THE SITE.

D. AVOID CREATING DEPRESSIONS WHERE WATER MAY POND.

E. WHEN IMPROVING AN EXISTING ACCESS ROAD, GRADE THE EXISTING ROAD TO REMOVE ANY ORGANIC MATTER AND SMOOTH THE SURFACE BEFORE PLACING FILL OR STONE.

F. THE FINISH GRADE, INCLUDING TOP SURFACE COURSE, SHALL EXTEND A MINIMUM OF ONE FOOT BEYOND THE SITE FENCE AND SHALL COVER THE AREA AS INDICATED.

G. RIPRAP SHALL BE APPLIED TO THE SIDES OF DITCHES OR DRAINAGE SWALES.

H. RIPRAP SHALL BE APPLIED TO THE SIDE SLOPES OF ALL FENCED SITE AREAS, PARKING AREAS AND TO ALL OTHER SLOPES GREATER THAN 2:1.

I. RIPRAP ENTIRE DITCH FOR SIX FEET IN ALL DIRECTIONS AT CULVERT OPENINGS OR AS INDICATED IN THE DRAWINGS.

J. SEED, FERTILIZER AND STRAW COVER SHALL BE APPLIED TO ALL OTHER DISTURBED AREAS AND DITCHES, DRAINAGE, SWALES NOT OTHERWISE RIPRAPPED.

K. UNDER NO CIRCUMSTANCES WILL DITCHES, SWALES NOR CULVERTS BE PLACED SO THEY DIRECT WATER TOWARDS, OR PERMIT STANDING WATER IMMEDIATELY ADJACENT TO SITE. IF DESIGN OR ELEVATIONS CONFLICT WITH THIS GUIDANCE, MOTOROLA SHOULD BE ADVISED IMMEDIATELY.

L. IF DITCH LIES WITH SLOPES GREATER THAN TEN PERCENT, MOUND DIVERSIONARY HEADWALLS IN THE DITCH AT CULVERT ENTRANCES 45 DEGREES OFF THE DITCH LINE. RIPRAP THE UPSTREAM SIDE OF THE HEADWALL AS WELL AS THE DITCH FOR SIX FEET ABOVE THE CULVERT ENTRANCE.

M. SEED AND FERTILIZER SHALL BE APPLIED TO SURFACE CONDITIONS, WHICH WILL ENCOURAGE ROOTING. RAKE AREAS TO BE SEEDED TO EVEN THE SURFACE AND LOOSEN THE SOIL.

N. PLACE SEED AS DIRECTED BY THE SEED PRODUCER.

O. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE GROWTH OF SEEDED AND LANDSCAPED AREAS BY WATERING UP TO THE POINT OF RELEASE FROM THE CONTRACT. CONTINUE TO RE-WORK BARE AREAS UNTIL COMPLETE COVERAGE IS OBTAINED.

2.13 FIELD QUALITY CONTROL

A. COMPACTION SHALL BE AT LEAST 95% OF MAXIMUM DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH ASTM D-1557.

B. ALL TREES PLACED IN CONJUNCTION WITH A LANDSCAPE CONTRACT WILL BE WRAPPED, TIED WITH HOSE-PROTECTED WIRE AND SECURED.

C. ALL EXPOSED AREAS SHALL BE PROTECTED AGAINST WASHOUTS AND SOIL EROSION. STRAW BALES WILL BE PLACED AT THE INLET APPROACH TO ALL NEW OR EXISTING CULVERTS.

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CIVIL NOTES

C1

DIVISION 4 ANTENNA SYSTEM
PART 1 GENERAL

4.1 WORK INCLUDED

A. INSTALL WAVEGUIDE BRIDGE AS INDICATED ON DRAWINGS. INSTALL NEW COAX, ANTENNAS, AND MOUNTS AS INDICATED ON DRAWINGS AND VERIFIED BY RF ENGINEER.

B. SUPPLY AND INSTALL GROUND BARS AND GROUNDING SUPPLIES AS INDICATED IN THE DRAWINGS.

C. LABEL CABLES.

D. MICROWAVE INSTALLATION WILL BE PERFORMED BY OTHERS.

4.2 RELATED WORK

A. FURNISH THE FOLLOWING WORK AS SPECIFIED UNDER CONSTRUCTION DOCUMENTS, BUT COORDINATE WITH OTHER TRADES PRIOR TO BID.

1. FLASHING OPENING INTO OUTSIDE WALLS.
2. SEALING AND CAULKING ALL OPENINGS.
3. PAINTING.
4. CUTTING AND PATCHING.
5. ENTRY PORT/PORT HOLE CUSHIONS.
6. ANTENNNA/CABLE GROUNDING.

4.3 REQUIREMENTS OF REGULATORY AGENCIES

A. FURNISH U.L. LISTED EQUIPMENT WHERE SUCH LABEL IS AVAILABLE AND INSTALL IN CONFORMANCE WITH U.L. STANDARDS WHERE APPLICABLE.

B. INSTALL ANTENNA CABLES AND GROUNDING SYSTEM IN ACCORDANCE WITH DRAWINGS AND SPECIFICATION IN EFFECT AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL BUILDING CODES, SPECIAL CODES HAVING JURISDICTION OVER SPECIFIC PORTIONS OF WORK. THIS INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:

1. EIA—ELECTRICAL INDUSTRIES ASSOCIATION RS-222, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

2. FAA—FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 70/7460-1H, OBSTRUCTION MARKING AND LIGHTING.

3. FCC—FEDERAL COMMUNICATIONS COMMISSION RULES AND REGULATIONS FORM 715, OBSTRUCTION MARKING AND LIGHTING SPECIFICATION FOR ANTENNA STRUCTURES AND FORM 715A, HIGH INTENSITY OBSTRUCTION LIGHTING SPECIFICATION FOR ANTENNA STRUCTURES.

4. AISC—AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS.

5. NEC—NATIONAL ELECTRICAL CODE—ON TOWER LIGHTING KITS.

6. UL—UNDERWRITERS' LABORATORIES APPROVED.

7. IN ALL CASES, PART 77 OF THE FAA RULES AND PARTS 17 AND 22 OF THE FCC RULES ARE APPLICABLE AND IN THE EVENT OF CONFLICT, SUPERSEDE ANY OTHER STANDARDS OF SPECIFICATIONS.

8. 2000 LIFE SAFETY CODE NFPA-101.

4.4 MATERIALS

A. ALL MATERIALS/HARDWARE SHALL BE HOT-DIPPED GALVANIZED OR STAINLESS STEEL UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

4.5 LABELING

A. ANTENNA AND LINE CONTRACTOR SHALL MARK CABLES WITH 1" WIDE UV-RESISTANT COLORED TAPE. THE CABLES SHALL BE MARKED AT THE END OF THE TRANSMISSION LINE NEAREST EACH ANTENNA, AT THE THE BASE OF THE TOWER/STRUCTURE CLOSEST TO THE ENTRY PORT AND IMMEDIATELY INSIDE THE ENTRY PORT.

B. CABLES SHALL BE TAGGED IMMEDIATELY INSIDE THE SHELTER WITH ANTENNA MODEL, HEIGHT, OWNER, AND USE.

C. MOTOROLA ANTENNA INSTALLATION AND IDENTIFICATION MATRIX (REF. MOTOROLA R56 APPENDIX B-7) SHALL BE FILLED OUT AND SUBMITTED TO MOTOROLA PROJECT MANAGER.

4.6 GROUNDING

A. ANTENNA AND CABLE GROUNDING SHALL BE INSTALLED CONTEMPORANEOUSLY WITH INSTALLATION. NO UNGROUNDED COAX SHALL BE ROUTED INTO THE SHELTER OR CONNECTED TO EQUIPMENT.

B. REFERENCE SEPARATE GROUNDING NOTES SHEET E1 FOR ADDITIONAL NOTES.

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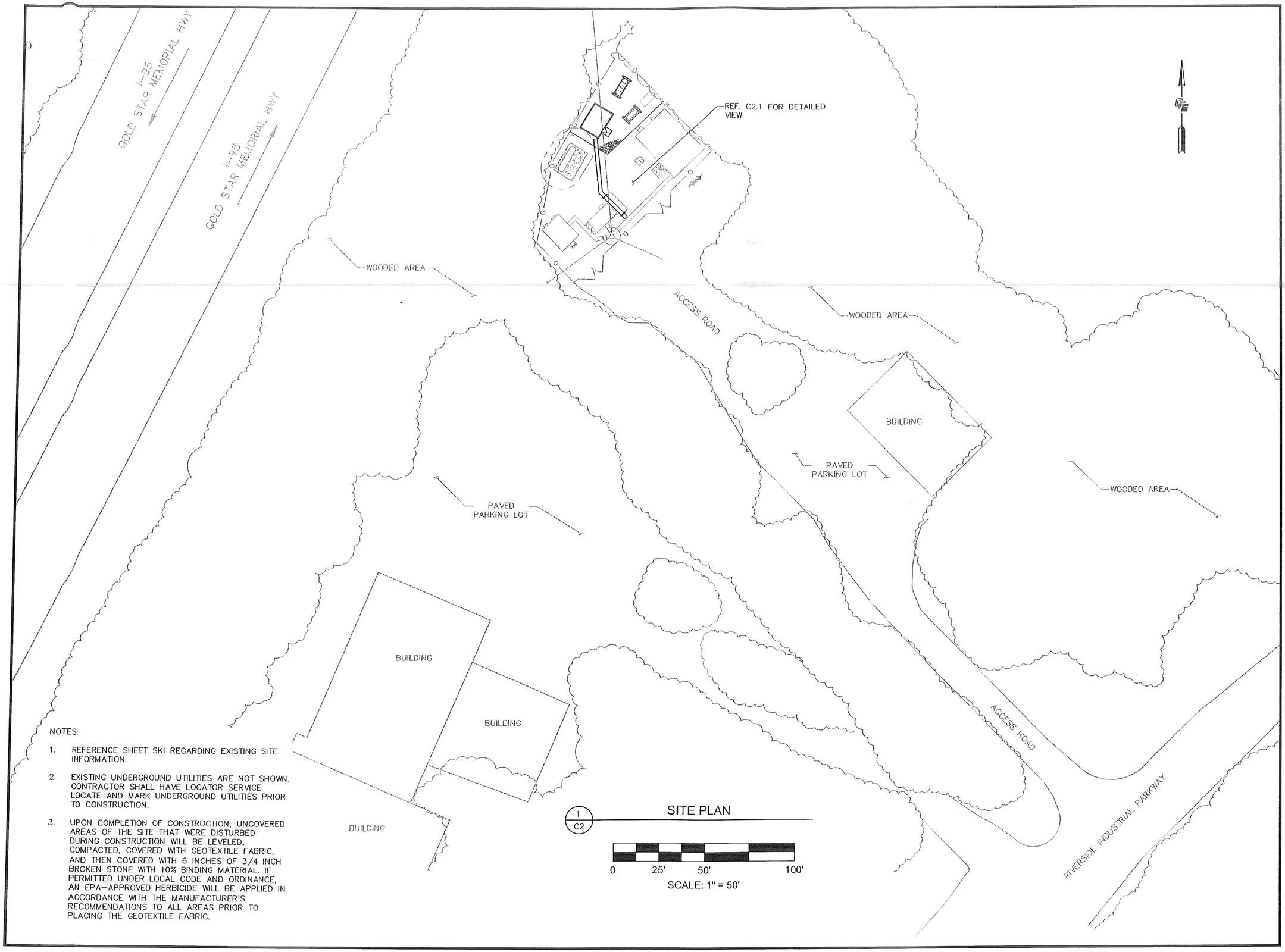
CIVIL NOTES

C1.1



NOTES:

1. REFERENCE SHEET SKI REGARDING EXISTING SITE INFORMATION.
2. EXISTING UNDERGROUND UTILITIES ARE NOT SHOWN. CONTRACTOR SHALL HAVE LOCATOR SERVICE LOCATE AND MARK UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.
3. UPON COMPLETION OF CONSTRUCTION, UNCOVERED AREAS OF THE SITE THAT WERE DISTURBED DURING CONSTRUCTION WILL BE LEVELED, COMPACTED, COVERED WITH GEOTEXTILE FABRIC, AND THEN COVERED WITH 6 INCHES OF 3/4 INCH BROKEN STONE WITH 10% BINDING MATERIAL. IF PERMITTED UNDER LOCAL CODE AND ORDINANCE, AN EPA–APPROVED HERBICIDE WILL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS TO ALL AREAS PRIOR TO PLACING THE GEOTEXTILE FABRIC.

1/C2 SITE PLAN

0 25' 50' 100'

SCALE: 1" = 50'

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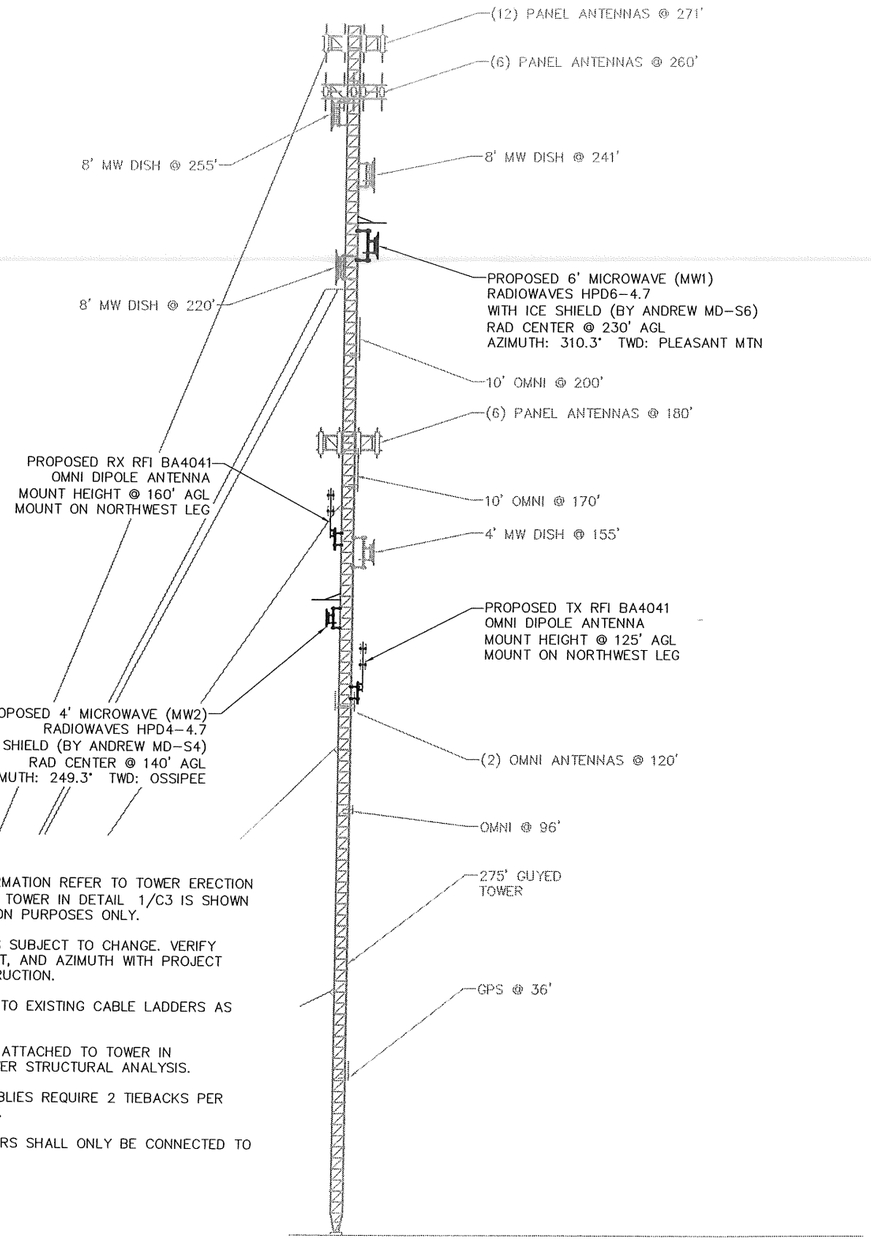
SITE PLAN

C2

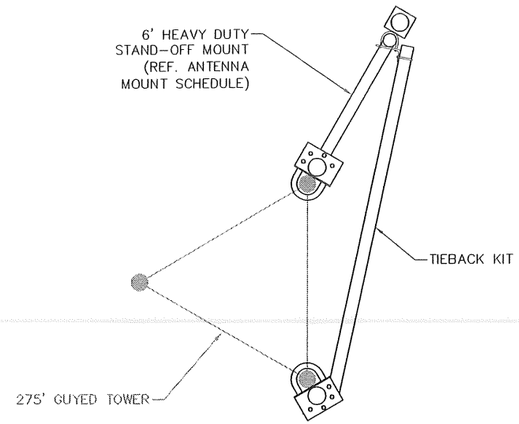
ANTENNA MOUNT SCHEDULE							
ELEVATION	ANTENNA	RAD CENTER	AZIMUTH	MOUNT KIT (1)	MOUNT KIT (2)	TIEBACK KIT	FEEDLINES
23'	HPD6-4.7	230'	310.3°	SABRE C10-153-202	SABRE C10-158-001	-	CAT5E
16'	RFI BA4041	-	-	SABRE C10-172-998	SABRE C10-151-906	SABRE C10-179-201	LDF4-50A
14'	HPD4-4.7	140'	249.3°	SABRE C10-153-202	SABRE C10-158-001	-	CAT5E
12'	RFI BA4041	-	-	SABRE C10-172-998	SABRE C10-151-906	SABRE C10-179-201	LDF4-50A



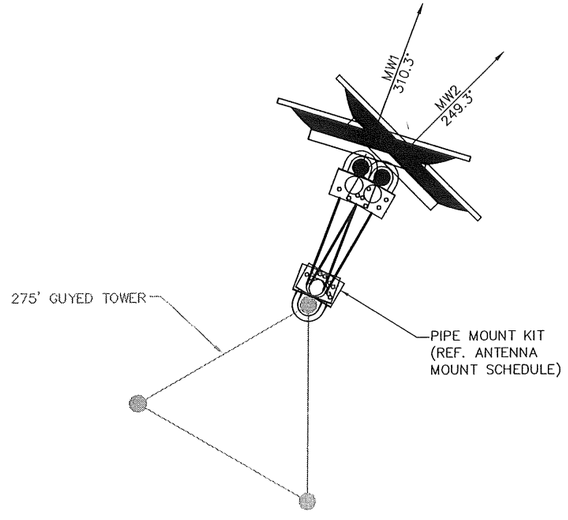
TOWER NOTES

1. FOR DETAILED TOWER INFORMATION REFER TO TOWER ERECTION DRAWINGS BY OTHERS. THE TOWER IN DETAIL 1/C3 IS SHOWN FOR GENERAL CONFIGURATION PURPOSES ONLY.
2. ANTENNA CONFIGURATION IS SUBJECT TO CHANGE. VERIFY ANTENNA HEIGHT, DOWN TILT, AND AZIMUTH WITH PROJECT MANAGER PRIOR TO CONSTRUCTION.
3. COAX SHALL BE ATTACHED TO EXISTING CABLE LADDERS AS SHOWN.
4. ANTENNAS COAX SHALL BE ATTACHED TO TOWER IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS.
5. ALL 6 FT. SIDE ARM ASSEMBLIES REQUIRE 2 TIEBACKS PER MOUNT, VERITICALLY OFFSET.
6. MOUNTS AND STABILIZER BARS SHALL ONLY BE CONNECTED TO TOWER LEGS.

1/C3 TOWER ELEVATION
SCALE: N.T.S.



2/C3 BIRD ANTENNA MOUNT DETAIL
SCALE: N.T.S.



3/C3 MICROWAVE DISH MOUNT DETAIL
SCALE: N.T.S.

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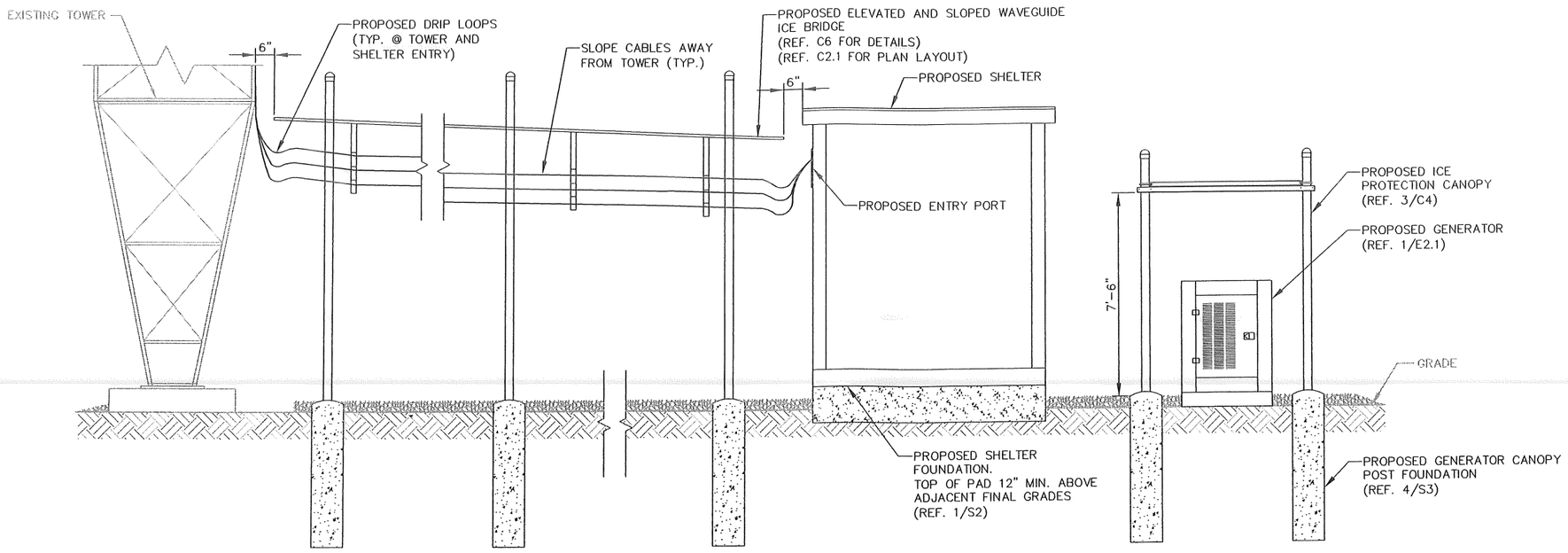
TOWER ELEVATION

C3



1/C4 TYPICAL TOWER COMPOUND PROFILE

SCALE: N.T.S.

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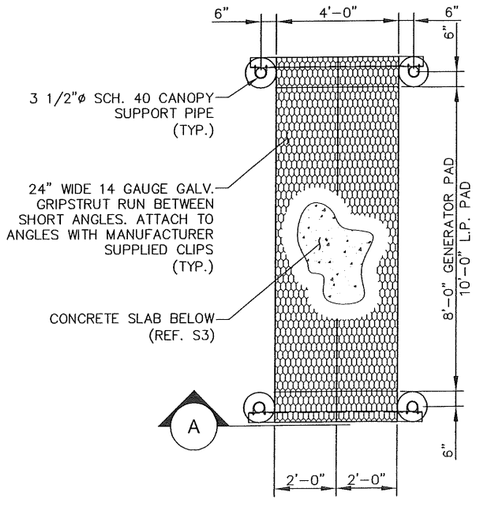
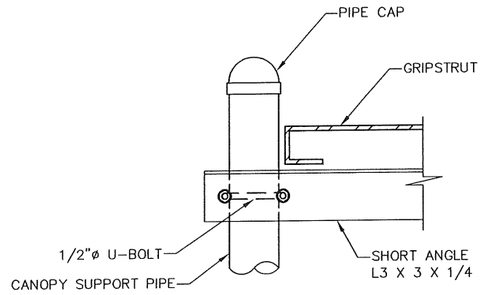


3/C4 ICE PROTECTION CANOPY PLAN AND DETAILS

SCALE: N.T.S.



SECTION – A

SCALE: N.T.S.

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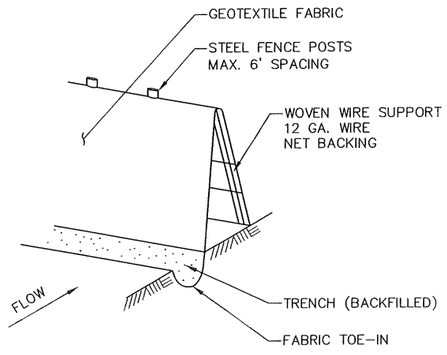
COMPOUND PROFILE, TRAPEZE & COAX CONFIGURATION

C4

SOIL AND EROSION CONTROL

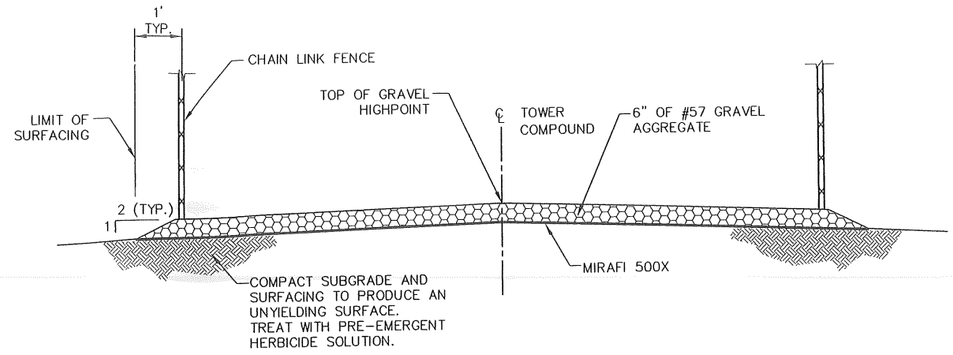
1. THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS FOR SOIL EROSION AND SEDIMENT CONTROL, AND OTHER REQUIREMENTS OF GOVERNMENTAL AUTHORITIES HAVING JURISDICTION.
2. CONSTRUCTION AT THE SITE WILL BEGIN WITH THE INSTALLATION OF EROSION CONTROL MEASURES SUFFICIENT TO CONTROL SEDIMENT DEPOSITS AND EROSION.
3. EROSION CONTROL DEVICES SHALL BE INSTALLED BEFORE GROUND DISTURBANCE OCCURS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ACCOMPLISH EROSION CONTROL FOR ALL DRAINAGE PATTERNS CREATED AT VARIOUS STAGES DURING CONSTRUCTION. ANY DIFFICULTY IN CONTROLLING EROSION DURING ANY PHASE OF CONSTRUCTION SHALL BE REPORTED TO THE CONSTRUCTION MANAGER IMMEDIATELY.
4. ALL SILT BARRIERS MUST BE PLACED AS ACCESS IS OBTAINED DURING CLEARING. NO GRADING SHALL BE DONE UNTIL SILT BARRIER IS INSTALLED.
5. CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL MEASURES UNTIL PERMANENT VEGETATION HAS BEEN ESTABLISHED. CONTRACTOR SHALL INSPECT EROSION CONTROL MEASURES AT THE END OF EACH WORKING DAY TO ENSURE MEASURES ARE FUNCTIONING PROPERLY.
6. THE CONTRACTOR SHALL REMOVE ACCUMULATED SILT WHEN THE SILT REACHES 12" IN HEIGHT WITHIN SILT FENCE BARRIERS.
7. FAILURE TO INSTALL, OPERATE OR MAINTAIN ALL EROSION CONTROL MEASURES MAY RESULT IN ALL CONSTRUCTION BEING STOPPED ON THE JOB SITE UNTIL SUCH MEASURES ARE CORRECTED.
8. A COPY OF THE APPROVED LAND DISTURBANCE PLAN AND PERMIT IF REQUIRED SHALL BE PRESENT ON THE JOB SITE WHENEVER LAND DISTURBANCE ACTIVITY IS IN PROGRESS.
9. ANY AREA OF DISTURBANCE LEFT EXPOSED OR THAT IS ANTICIPATED TO BE EXPOSED BEYOND THE EXPOSURE PERIOD REQUIRED BY LOCAL AUTHORITIES SHALL BE STABILIZED WITH TEMPORARY SEEDING.
10. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROVIDED IF REQUIRED UPON INSPECTION BY AND DIRECTION FROM LOCAL AUTHORITIES.
11. UPON COMPLETION OF WORK, OR AS DIRECTED BY EROSION CONTROL AUTHORITIES, ALL DISTURBED AREAS NOT IMPROVED WITH GRAVEL SHALL BE SEEDED WITH PERMANENT SEEDING MATERIAL SUITABLE FOR THE LOCAL GROWING AREA.

TRENCH CROSS SECTION



SILT FENCE

1/C5 SILT FENCE DETAIL
SCALE: N.T.S.



2/C5 SITE COMPOUND SURFACING DETAIL
SCALE: N.T.S.

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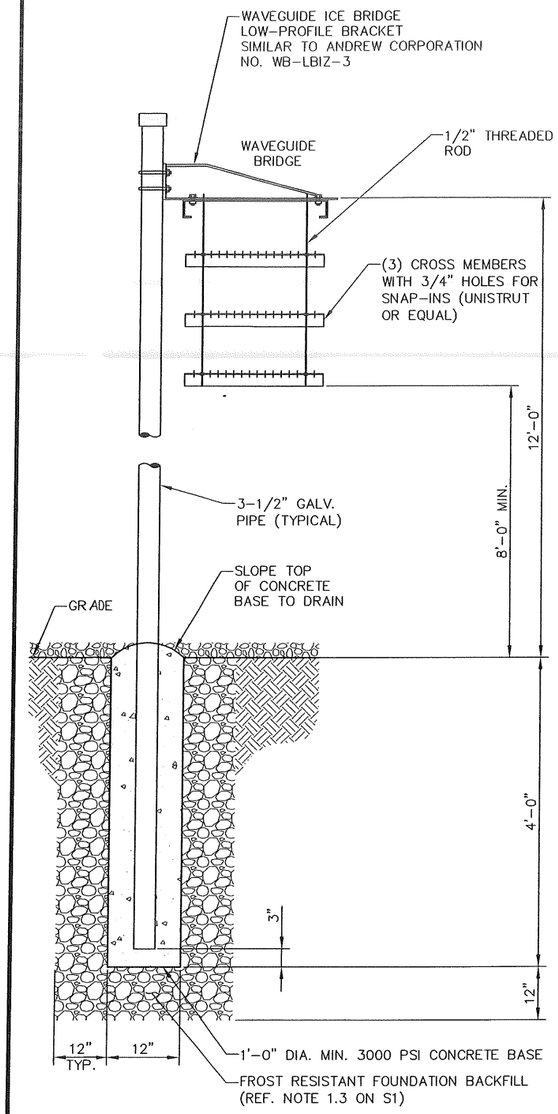
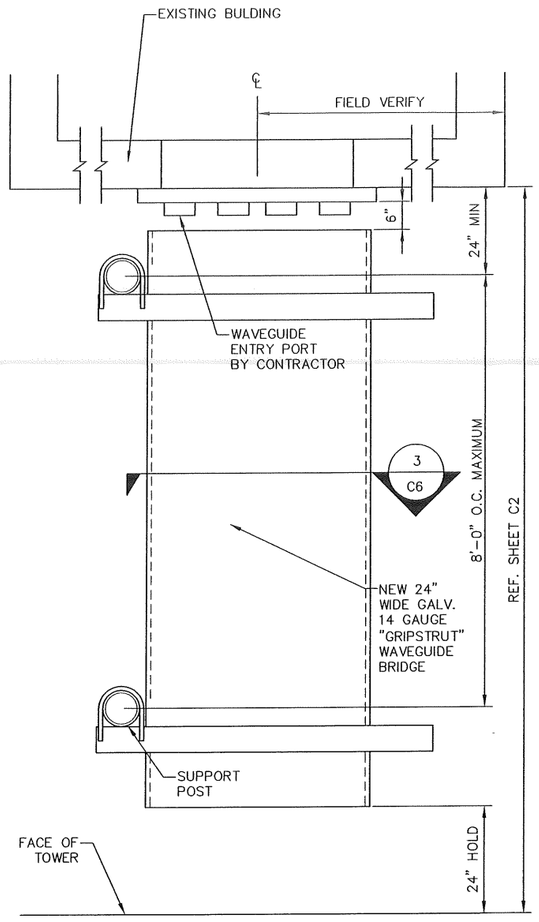
C5



SECTION VIEW @ WAVEGUIDE BRIDGE

1 / C6

SCALE: N.T.S.



NOTES:

1. ADJUST CENTERLINE OF WAVEGUIDE PORT ON BUILDING

2. REF. DETAIL 1/E3.3 FOR WAVEGUIDE BRIDGE GROUNDING DETAIL.

3. ALL MATERIALS USED FOR WAVEGUIDE SHALL BE HOT-DIPPED GALVANIZED. ALL FIELD CUTS OR DRILLED OPENINGS SHALL BE RESEALED WITH 3 COATS OF COLD-GALVANIZING COMPOUND TO CLEANED SURFACES.

4. ADDITIONAL SECTIONS OF WAVEGUIDE BRIDGE MAY BE REQUIRED AS INDICATED IN SITE PLAN. SUPPORT EACH 10' SECTION WITH A MINIMUM OF TWO POSTS WITH A MAXIMUM SPACING OF 8'.

DUAL COLUMN WAVEGUIDE BRIDGE PLAN

2 / C6

SCALE: N.T.S.

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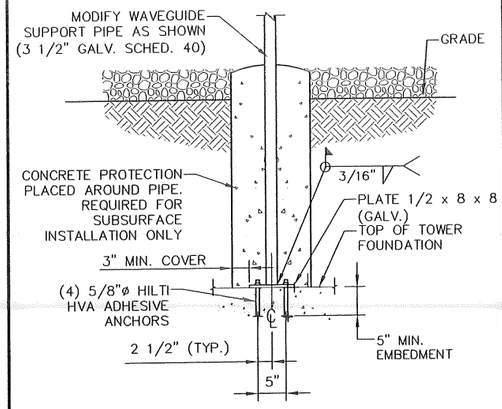

ALL WELDS AND DAMAGED AREAS OF GALVANIZING SHALL BE COATED WITH THREE COATS OF GALVANOX COLD GALVANIZING COMPOUND.

CONDITIONAL WAVEGUIDE POST ANCHORAGE

4 / C6

SCALE: N.T.S.

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WAVEGUIDE ICE BRIDGE DETAILS

C6

STRUCTURAL NOTES

1.1 CODES

A. 2009 INTERNATIONAL BUILDING CODE.

1.2 GENERAL

A. THE DETAILS DESIGNATED AS "TYPICAL DETAILS" APPLY GENERALLY TO THE DRAWINGS IN ALL AREAS WHERE CONDITIONS ARE SIMILAR TO THOSE DESCRIBED IN THE DETAILS.

B. ALL DIMENSIONS AND CONDITIONS OF EXISTING CONSTRUCTION SHALL BE VERIFIED BY THE CONTRACTOR AT THE JOB SITE PRIOR TO BEGINNING WORK. DIFFERENCES BETWEEN EXISTING CONSTRUCTION AND THE DRAWINGS SHALL BE REFERRED TO THE OWNER AND THE ENGINEER.

C. THE DESIGN AND PROVISION OF ALL TEMPORARY SUPPORTS – SUCH AS GUYS, BRACES, FALSE WORK, SUPPORTS, AND ANCHORS FOR SAFETY LINES, CRIBBING OR ANY OTHER TEMPORARY ELEMENTS REQUIRED FOR THE EXECUTION OF THE CONTRACT ARE NOT INCLUDED IN THE DRAWINGS AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. TEMPORARY SUPPORTS SHALL NOT RESULT IN THE OVERSTRESS OR DAMAGE OF THE ELEMENTS TO BE BRACED OR ANY ELEMENTS USED AS BRACE SUPPORTS.

D. THE CONTRACT STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE, AND, EXCEPT WHERE SPECIFICALLY SHOWN, DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, PROCEDURES, TECHNIQUES, SEQUENCE, AND SAFETY.

E. THE ENGINEER SHALL NOT HAVE CONTROL OF, AND SHALL NOT BE RESPONSIBLE FOR, CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, OR PROCEDURES, FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK, FOR THE ACTS OR OMISSION OF THE CONTRACTOR, SUBCONTRACTOR, OR ANY OTHER PERSON PERFORMING ANY OF THE WORK, OR FOR THE FAILURE OF ANY OF THEM TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

F. CONTRACTOR SHALL VERIFY EQUIPMENT SIZE AND LOCATION. NOTIFY OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES FROM PLANS.

G. THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE 48 HOURS IN ADVANCE OF THE TIME WHEN A SIGNIFICANT PORTION OF THE REINFORCING HAS BEEN TIED AND WHEN THE CONCRETE IS TO BE POURED FOR SCHEDULING SITE INSPECTIONS.

H. POSITIVE DRAINAGE SHALL BE PROVIDED ADJACENT TO ALL FOUNDATIONS SO PONDING OF RAINFALL NEAR THE FOUNDATIONS DOES NOT OCCUR.

I. DURING CONSTRUCTION, TEMPORARY GRADES SHALL BE ESTABLISHED TO PREVENT RUNOFF FROM ENTERING THE FOUNDATION AND ANCHORAGE EXCAVATIONS.

J. DRAINAGE PATTERNS APPROVED AT THE TIME OF FINISH GRADING SHALL BE MAINTAINED THROUGHOUT THE LIFE OF THE TOWER.

1.3 FOUNDATION BACKFILL

FROST–RESISTANT STRUCTURAL FILL

1. PRIOR TO PLACING REQUIRED FILL MATERIAL, REMOVE FROM THE SITE ALL COBBLES, BOULDERS, AND VEGETATION, AS WELL AS OTHER DELETERIOUS MATERIALS, INCLUDING ANY LOOSE OR EXCESSIVELY ORGANIC MATERIAL FROM THE EXISTING SUBGRADE. THIS MATERIAL SHOULD BE STRIPPED TO A MINIMUM DEPTH OF 6 INCHES AND REMOVED FROM THE SITE. ALL EXPOSED SURFACES SHALL THEN BE INSPECTED BY PROBING, AND TESTING.

2. THE EXPOSED SUBGRADE SHOULD NOT BE ALLOWED TO DRY OUT PRIOR TO PLACING SELECT STRUCTURAL FILL.

3. ALL FILL UNDER THE SLAB SHALL BE COMPACTED FROST–RESISTANT STRUCTURAL FILL MATERIAL. 24" MINIMUM THICKNESS.

4. SELECT STRUCTURAL FILL MATERIAL SHALL MEET THE FOLLOWING GRADATION:

   NO PARTICLES GREATER THAN 6 INCHES
   PERCENT PASSING 3" SIEVE 100%
   PERCENT PASSING 1/4" SIEVE 25% – 70%
   PERCENT PASSING NO. 40 SIEVE 0% – 30%
   PERCENT PASSING NO. 200 SIEVE 0% – 5%

5. FROST–RESISTANT STRUCTURAL FILL SHALL BE PLACED IN LIFTS BETWEEN 9 INCHES AND 12 INCHES THICK, WATERED AS REQUIRED AND COMPACTED TO A MINIMUM OF 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DEFINED IN ASTM TEST METHOD D1557 AT A MOISTURE CONTENT WITHIN 3 PERCENT OF THE OPTIMUM MOISTURE CONTENT.

6. COMPACTION AND MOISTURE CONTENT OF SUBGRADE AND EACH LIFT OF SELECT STRUCTURAL FILL SHALL BE INSPECTED AND APPROVED BY A QUALIFIED ENGINEERING TECHNICIAN, SUPERVISED BY A GEOTECHNICAL ENGINEER.

1.4 MOISTURE MANAGEMENT

A. EVERY EFFORT SHALL BE MADE TO KEEP EXCAVATIONS DRY SHOULD GROUNDWATER BE ENCOUNTERED.

B. SEEPAGE CAN BE EFFECTIVELY HANDLED BY SIMPLE DEWATERING METHODS, SUCH AS PERIPHERY DITCHES AND SUMPS. A SUITABLE SUMP COULD CONSIST OF A LARGE DIAMETER PIPE SET VERTICALLY WITH A COARSE SAND AND GRAVEL MIXTURE PLACED IN THE BOTTOM TO ACT AS A FILTER.

C. CARE SHALL BE EXERCISED IN PUMPING DIRECTLY FROM THE EXCAVATION SINCE THIS MAY CAUSE DETERIORATION OF THE EXCAVATION BASE.

D. THE TRAFFIC OF HEAVY EQUIPMENT (INCLUDING HEAVY COMPACTION EQUIPMENT) MAY CREATE PUMPING AND GENERAL DETERIORATION OF THE SHALLOWER SOILS.

1.5 SLAB-ON-GRADE

A. SLAB–ON–GRADE FOUNDATIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE ENGINEERING DESIGN FOR SITE PREPARATION, DRAINAGE, AND MAINTENANCE.

B. WITHIN THE AREA OF THE PROPOSED SLAB–ON–GROUND, REMOVE AND DISPOSE OF ALL SURFACE VEGETATION, ANY DELETERIOUS MATERIALS WHICH MAY BE PRESENT, AND ALL SOIL REQUIRED TO PROVIDE FOUNDATION BACKFILL BELOW AND ADJACENT TO THE SLAB AS INDICATED IN THE DRAWINGS. IF SOFT, WEAK, OR UNSTABLE SOIL CONDITIONS ARE REVEALED, OVER EXCAVATE THE AREA AND BRING BACK TO GRADE WITH FOUNDATION BACKFILL.

C. PLACE A 10 MIL POLYOLEFIN, ASTM E 1745 (CLASS A), VAPOR BARRIER OVER COMPACTED SOIL PRIOR TO PLACING FOUNDATION SLAB.

D. REFER TO PLANS FOR STIFFENED SLAB–ON–GRADE DIMENSIONS, THICKNESS, AND REINFORCING.

E. THE TROWELED FINISHED CONCRETE SLAB–ON–GRADE FLOOR PROFILE SHALL COMPLY WITH THE FOLLOWING FLATNESS AND LEVELNESS VALUES AS DEFINED IN THE ASTM E 1155:

	SPECIFIED OVERALL	MINIMUM LOCAL
FLATNESS (FF)	25	17
LEVELNESS (FL)	20	15

F. HORIZONTAL WING AND VERTICAL INSULATION SHALL BE USED TO PROTECT SHALLOW FOUNDATIONS PER "DESIGN GUIDE FOR FROST PROTECTION OF SHALLOW FOUNDATIONS." U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, JUNE 1994. REF. SITE DETAILS.

1.6 CONCRETE

A. CONCRETE DESIGN AND REINFORCEMENT SHALL BE IN ACCORDANCE WITH "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE", ACI 318–20 AND WITH SP–66(04): ACI DETAILING MANUAL – 2004.

B. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH "STANDARD SPECIFICATIONS FOR STRUCTURAL CONCRETE, ACI 301–05."

C. ALL CONCRETE SHALL HAVE SAND FINE AGGREGATE, NORMAL WEIGHT COARSE AGGREGATE, AND TYPE I OR III PORTLAND CEMENT. SLABS ON GRADE AND ALL OTHER CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH (F'C) OF 4000 PSI IN 28 DAYS. SEE CIVIL FOR SIDEWALKS, PAVING, AND SITE WORK CONCRETE STRENGTH REQUIREMENTS.

D. NO PIPE SLEEVES SHALL PASS THROUGH STRUCTURAL CONCRETE WITHOUT PRIOR APPROVAL OF THE STRUCTURAL ENGINEER. CAST IN SLEEVES SHALL BE CAST IRON OR SCHEDULE 40 STEEL PIPE.

E. CONTRACTOR SHALL BE RESPONSIBLE FOR THE ADEQUACY OF THE FORMS AND SHORING AND FOR SAFE PRACTICE IN THEIR USE AND REMOVAL.

1.7 REINFORCING STEEL

A. REINFORCING STEEL SHALL BE DEFORMED BILLET–STEEL BARS CONFORMING TO THE REQUIREMENTS OF ASTM A615, GRADE 60.

B. DETAILING OF CONCRETE REINFORCEMENT AND ACCESSORIES SHALL BE IN ACCORDANCE WITH ACI PUBLICATION SP–66(04): ACI DETAILING MANUAL – 2004.

C. ALL HOOKS SHALL BE A.C.I. STANDARD 90–DEGREE HOOKS, UNLESS DETAILED OTHERWISE.

D. PROVIDE CORNER BARS FOR ALL HORIZONTAL BARS AT THE INSIDE AND OUTSIDE FACES AND TOP AND BOTTOM OF INTERSECTING BEAMS OR WALLS. CORNER BARS ARE NOT REQUIRED IF HORIZONTAL BARS ARE HOOKED. LAP CORNERS 2'–0".

E. THE WELDING OF REINFORCING STEEL WILL NOT BE PERMITTED.

F. HEAT SHALL NOT BE USED IN THE FABRICATION OR INSTALLATION OF REINFORCEMENT.

G. MINIMUM CONCRETE PROTECTION FOR REINFORCEMENT (SEE ACI 318, LATEST EDITION, FOR CONDITIONS NOT NOTED).

   GRADE BEAMS ..... AS DETAILED
   SLAB ON GRADE ..... 1 1/2" TOP

H. BARS IN SLABS ON GRADE SHALL BE SUPPORTED ON SMALL PIECES OF MASONRY OR ACCESSORIES WITH "SAND" PLATES WHICH PROVIDE 1 1/2" AT THE TOP.

1.8 MISCELLANEOUS

A. ALL GROUT FOR STEEL BEARING AND LEVELING SHALL BE NON–SHRINK AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI.

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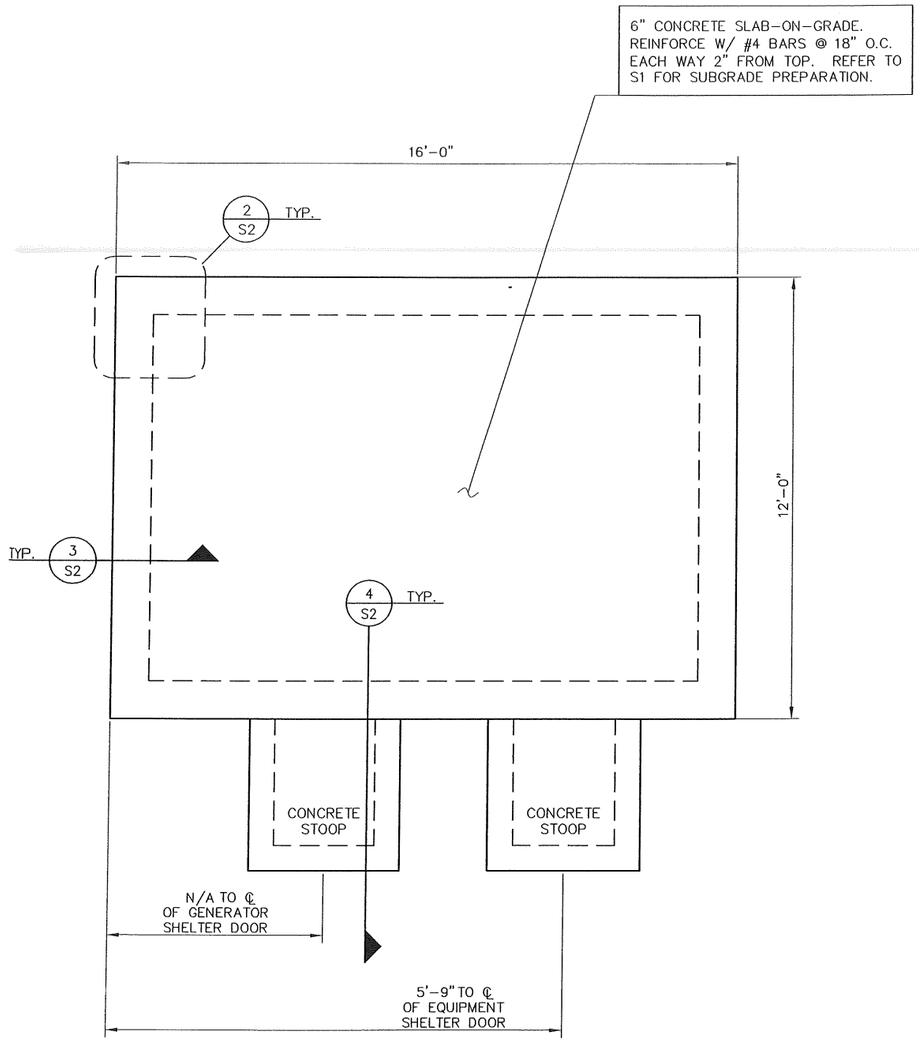
S1

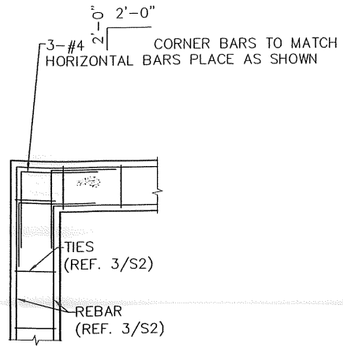
PLAN NOTES:

1. REFER TO CIVIL DRAWINGS FOR PLAN NORTH.
2. REFER TO EQUIP. BUILDING MANUFACTURER'S DRAWINGS FOR INFORMATION ON HOW TO ATTACH SHELTER TO FOUNDATION.



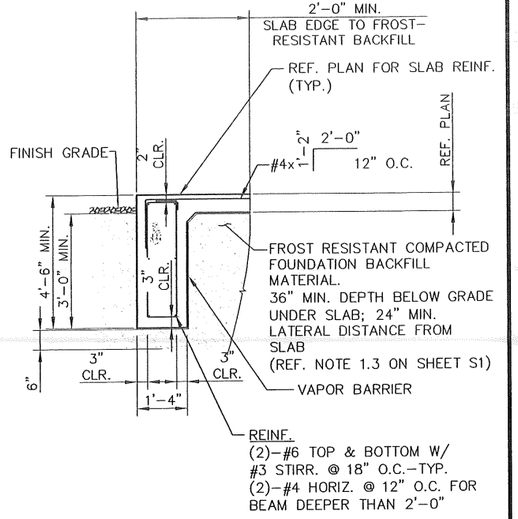
1 S2 SHELTER CONCRETE BASE PLAN

SCALE: N.T.S.



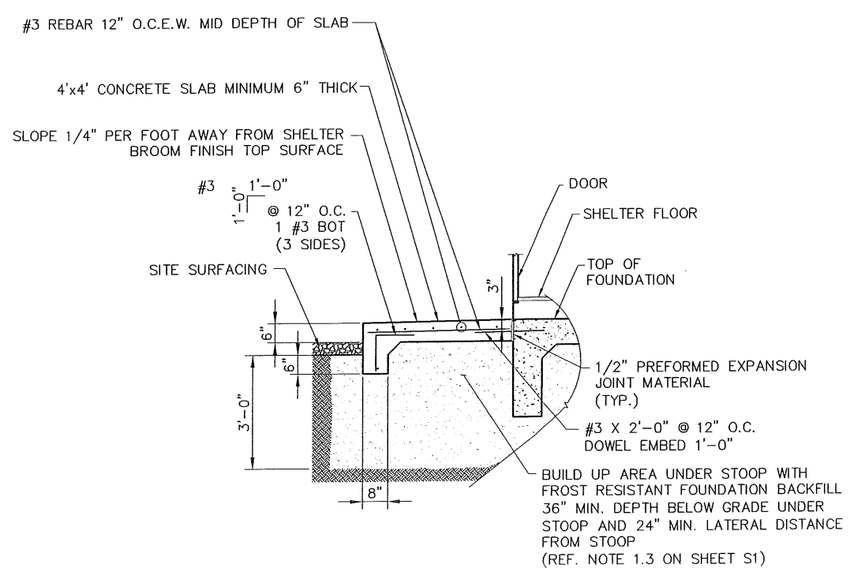
2 S2 TYPICAL CORNER BAR AT DOWN TURN

SCALE: N.T.S



3 S2 TYPICAL DOWN TURN SECTION

SCALE: N.T.S.



4 S2 CONCRETE STOOP

SCALE: N.T.S.

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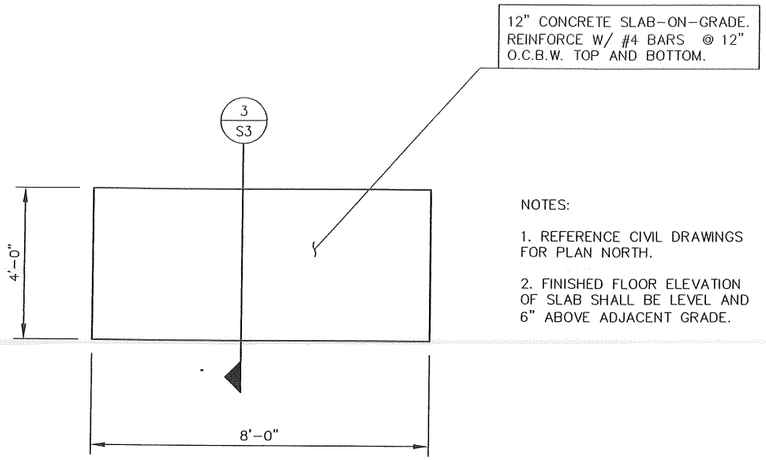
SHELTER FOUNDATION DETAILS

S2



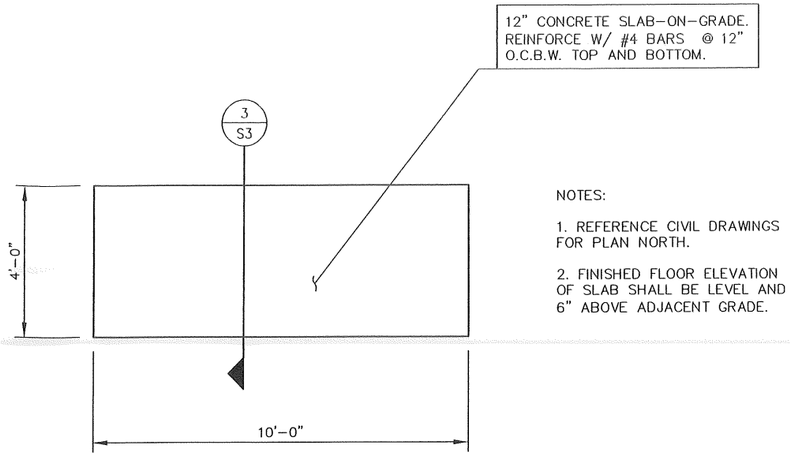
NOTES:

1. REFERENCE CIVIL DRAWINGS FOR PLAN NORTH.

2. FINISHED FLOOR ELEVATION OF SLAB SHALL BE LEVEL AND 6" ABOVE ADJACENT GRADE.

1 / S3 GENERATOR FOUNDATION PLAN

SCALE: 1/4" = 1'-0"



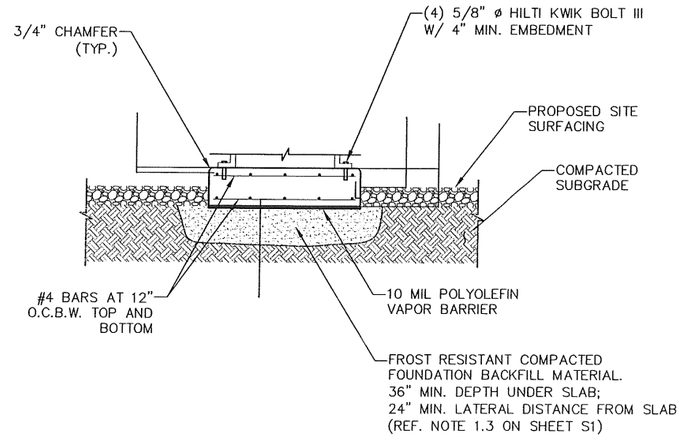
NOTES:

1. REFERENCE CIVIL DRAWINGS FOR PLAN NORTH.

2. FINISHED FLOOR ELEVATION OF SLAB SHALL BE LEVEL AND 6" ABOVE ADJACENT GRADE.

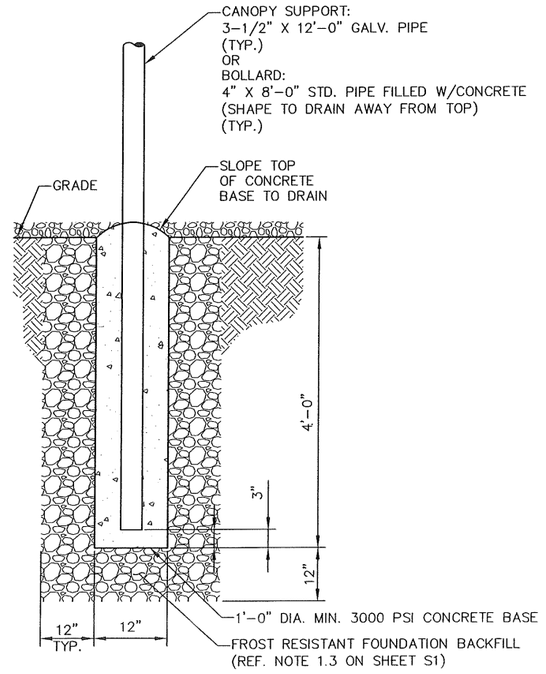
2 / S3 FUEL TANK FOUNDATION PLAN

SCALE: 1/4" = 1'-0"



3 / S3 GENERATOR/FUEL TANK CONCRETE PAD SECTION

SCALE: 1/4" = 1'-0"



4 / S3 SECTION VIEW @ CANOPY & BOLLARD BASE

SCALE: N.T.S.

NOT FOR CONSTRUCTION

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MOTOROLA SOLUTIONS

SOUTH PORTLAND (ATC #10047)

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REVISIONS

NO.	DATE	DESCRIPTION

EQUIPMENT PAD DETAILS

S3

ELECTRICAL SPECIFICATIONS:

GENERAL:

A. CONTRACTOR SHALL PROVIDE ALL ITEMS OF LABOR AND MATERIALS TO MAKE A COMPLETE INSTALLATION OF ELECTRICAL WORK, AS SHOWN ON DRAWINGS, AS SPECIFIED, AND AS NECESSARY FOR COMPLETE SYSTEMS, INCLUDING, BUT NOT LIMITED TO THE FOLLOWING:
1. MAIN POWER BRANCH/FEEDERS AS REQUIRED.
2. BRANCH FEEDER FOR POWER AND LIGHTING.
3. ALL ELECTRICAL CONDUCTORS AND CONDUIT.
4. ALL WIRING DEVICES, SAFETY SWITCHES.
5. ALL LIGHTING FIXTURES AND LAMPS.
6. ALL COMMUNICATION EMPTY CONDUIT SYSTEMS.
7. LIGHTNING SURGE PROTECTION DEVICE.
8. ANTENNA AND EQUIPMENT GROUNDING.

ELECTRICAL REQUIREMENTS

A. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL LOCAL AND NATIONAL ELECTRICAL CODES.

B. ALL WORK SHALL BE COMPLETED BY A CERTIFIED MASTER ELECTRICIAN.

C. ALL WORK SHALL CONFORM TO THE LATEST VERSION OF MOTOROLA R56 STANDARDS.

D. AFTER INSTALLATION TEST ALL CONDUCTORS FOR SHORTS AND GROUNDS BEFORE ENERGIZING.

GUARANTEE:

A. THE CONTRACTOR SHALL FURNISH A WRITTEN CERTIFICATE, GUARANTEEING ALL MATERIALS, EQUIPMENT AND LABOR FURNISHED BY CONTRACTOR TO BE FREE OF ALL DEFECTS FOR A PERIOD OF ONE YEAR FROM AND AFTER THE DATE OF FINAL ACCEPTANCE OF ELECTRICAL WORK. THE CONTRACTOR SHALL FURTHER GUARANTEE THAT IF ANY DEFECTS APPEAR WITHIN THE STIPULATED GUARANTEED PERIOD, SUCH WORK SHALL BE REPLACED WITHOUT COST TO THE OWNER.

FEEDERS, SWITCHES, METERING EQUIPMENT:

A. MAKE ARRANGEMENTS WITH OWNERS AS NEEDED TO BRING IN BRANCH FEEDERS FOR ELECTRICAL SERVICE AS SHOWN ON DRAWINGS. PAY ALL CHARGES INVOLVED THEREWITH. FURNISH, INSTALL FEEDER WIRE TO OWNER DISTRIBUTION PANEL. PROVIDE METER AS SHOWN ON DRAWINGS.

PANELBOARD CONSTRUCTION:

A. PANELBOARDS SHALL CONSIST OF A CAN, FRONT, INTERIOR AND CIRCUIT PROTECTIVE DEVICES AND SHALL BE MANUFACTURED IN ACCORDANCE WITH UNDERWRITER'S LABORATORIES. THE GAUGE OF METAL USED AND THE GUTTER SPACE SHALL BE IN ACCORDANCE WITH APPLICABLE UL STANDARDS. EACH PANEL SHALL HAVE A DOOR MOUNTED ON A SEMI-CONCEALED HINGES WITH A CYLINDER LOCK, INDEX CARD HOLDER PROPERLY FILLED IN AS TO CIRCUIT; ALL PANELS WITH MASTER KEY. ALL PANELS SHALL BE FINISHED WITH BAKED-ON GRAY ENAMEL, OVER RUST INHIBITOR COAT. PANEL BOARDS SHALL BE AS MANUFACTURED BY G.E., ITE, SQUARE "D" OR CUTLER HAMMER.

WIRING:

A. ALL CONDUCTORS SHALL BE MADE OF SOFT-DRAWN ANNEALED COPPER WITH A CONDUCTIVITY NOT LESS THAN THAT OF 90% PURE COPPER. ALL WIRE SIZE #10 AWG AND SMALLER SHALL BE SOLID CONDUCTOR TYPE; ALL #8 AWG AND LARGER SHALL BE STRANDED CONDUCTOR TYPE.

B. CONDUCTORS SHALL BE TYPE "THHN/THWN" INSULATION.

C. USE THE FOLLOWING COLOR CODES:

	120/208V SYSTEMS	120/240V SYSTEMS
PHASE A	BLACK	BLACK
PHASE B	RED	RED
PHASE C	BLUE	BLUE
NEUTRAL	WHITE	WHITE
GROUND	GREEN	GREEN

D. INSTALL CONDUCTORS IN CLEAN, DRY CONDUITS. USE UL APPROVED PULLING LUBRICANT WHERE REQUIRED.

E. USE #12 AS MINIMUM CONDUCTOR SIZE FOR POWER SYSTEMS. ALL CONTROL WIRES SHALL BE STRANDED AND TERMINATED WITH CRIMPED-ON LUGS.

F. MAKE CONNECTION, SPLICES AND TAPS ONLY IN APPROVED BOXES AND FITTINGS. FOR SMALL BRANCH CIRCUIT CONDUCTORS, FIRST TWIST CONDUCTORS TOGETHER, THEN INSTALL A "SCOTCHLOK" OR EQUAL SPRING CONNECTOR OF PROPER SIZE. FOR LARGE CONDUCTORS USE SPLIT-BOLT OR HYDRAULICALLY COMPRESSED CONNECTIONS, THEN APPLY ENOUGH LAYERS OF VINYL ELECTRICAL TAPE TO EQUAL THE INSULATION VALUE OF THE CONDUCTOR INSULATION.

G. WHERE FACTORY COLOR CODED CONDUCTORS ARE NOT AVAILABLE, INSTALL BANDS OF COLORED VINYL PLASTIC TAPE AT EACH END OF EACH CONDUCTOR.

CONDUIT:

A. PROVIDE A COMPLETE ASSEMBLY OF CONDUIT, TUBING OR DUCT WITH FITTINGS, INCLUDING, BUT NOT LIMITED TO, CONNECTORS, NIPPLES, COUPLINGS, LOCKNUTS, BUSHINGS, EXPANSION FITTINGS, OTHER COMPONENTS AND ACCESSORIES AS NEEDED. CONNECTIONS AND COUPLING MUST BE COMPRESSION TYPE TO MEET R56 FOR BONDING REQUIREMENTS.

B. FITTINGS SHALL BE DESIGNED AND APPROVED FOR THE SPECIFIC USE INTENDED. PROVIDE INSULATED THROATS OR BUSHINGS FOR ALL CONDUITS. GROUNDING BUSHINGS SHALL ALSO HAVE INSULATED THROATS.

C. MINIMUM CONDUIT SIZE IN ALL CASES SHALL BE 1/2" UNLESS MINIMUM SIZE IS SPECIFIED TO BE LARGER FOR SPECIFIC SYSTEMS SPECIFIED ELSEWHERE IN THE SPECIFICATIONS OR ON THE DRAWINGS.

D. RIGID STEEL CONDUIT SHALL BE HEAVY-WALL STEEL TUBE WITH METALLIC CORROSION-RESISTANT COATING ON INTERIOR AND EXTERIOR, HOT-DIPPED GALVANIZED, FREE FROM DEFECTS, MANUFACTURED IN ACCORDANCE TO ANSI STANDARDS, AND UL-LISTED. USE THREADED COUPLINGS. USE RIGID GALVANIZED STEEL CONDUIT IN ALL LOCATIONS UNLESS NOTED OTHERWISE.

E. UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 PVC (UNLESS NOTED OTHERWISE).

F. AS A MINIMUM, CONDUIT SIZES SHALL BE IN ACCORDANCE WITH NEC CONDUIT FILL REQUIREMENTS, REGARDLESS OF SIZE SCHEDULE OR INDICATED. IF LARGER SIZE IS SCHEDULED OR INDICATED, THE LARGER SIZE SHALL BE USED.

G. INSTALLATION:

1. ANCHOR CONDUIT WITH HANGERS, CONDUIT STRAPS OR OTHER DEVICES SPECIFICALLY DESIGNED FOR THE PURPOSE. WIRE TIES SHALL NOT BE PERMITTED. USE TRAPEZE HANGERS FOR MULTIPLE PARALLEL CONDUIT RUNS.

2. ALL CONCRETE INSERTS SHALL BE GALVANIZED OR CADMIUM PLATED; INDIVIDUAL HANGERS, TRAPEZE HANGERS AND RODS SHALL BE PRIME COATED.

3. INSTALL HORIZONTAL RUNS OF CONDUIT TO PROVIDE A NATURAL DRAIN TO PREVENT MOISTURE COLLECTING IN THE POCKETS OR TRAPS.

4. CAP CONDUIT ENDS UNTIL CONDUCTOR IS INSTALLED TO PREVENT FOREIGN OBJECTS FROM ENTERING CONDUIT.

5. FITTINGS AND CONDUITS SHALL BE APPROVED FOR GROUNDING PURPOSES OR SHALL BE JUMPERED WITH A COPPER GROUNDING CONDUCTOR OF PROPER AMPACITY. LEAVE TERMINATION OF SUCH JUMPERS EXPOSED.

6. INSTALL (2) 200 POUND NYLON PULL CORDS IN ROUGH-IN RACEWAYS.

7. INSTALL OFFSETS, PULL BOXES AND ELBOWS AS REQUIRED TO ACCOMPLISH A HARMONIOUS ROUTING OF THE SYSTEMS.

8. OPENINGS AROUND ELECTRICAL PENETRATIONS THROUGH FIRE RESISTANT RATED CONSTRUCTION SHALL BE FIRE-STOPPED USING APPROVED METHODS TO MAINTAIN THE FIRE RESISTANT RATING.

JUNCTION AND PULL BOXES:

A. USE GALVANIZED PULL AND JUNCTION BOXES THAT COMPLY WITH NEC AS TO SIZE AND CONSTRUCTION.

B. FOR JUNCTION AND PULL BOXES, USE BOXES NOT LESS THAN 4" SQUARE AND 1 1/2" DEEP WITH REMOVABLE COVERS.

C. IN WET AREAS OR OUTDOORS, USE CAST ALUMINUM OR CAST IRON BOXES WITH THREADED HUBS AND GASKETED COVERS.

D. INSTALL JUNCTION AND PULL BOXES IN ACCESSIBLE LOCATIONS. POSITION BOXES SO COVERS CAN BE REMOVED.

E. INSTALL BOXES ON CONCEALED CONDUITS WITH COVERS FLUSH WITH FINISH.

LP-GAS CONTAINERS

A. ALL ELECTRICAL EQUIPMENT AND WIRING WITHIN (5) FIVE FEET SHALL BE CLASS 1 DIVISION 1

B. ELECTRICAL WIRING AND EQUIPMENT (5) FIVE FEET TO (10) TEN FEET SHALL BE CLASS 1 DIVISION 2

GROUNDING

1.1 GENERAL

A. GROUNDING SHALL BE INSTALLED PER MOTOROLA R56 STANDARDS AND GUIDELINES FOR COMMUNICATIONS SITES.

1.2 CONNECTIONS

A. ALL EXTERNAL GROUNDING CONNECTIONS SHALL BE MADE BY THE EXOTHERMIC PROCESS, BY IRREVERSIBLE HIGH COMPRESSION, AND/OR BY 2-HOLE LONG BARREL LUGS. NO SINGLE-HOLE, CRIMP-ON, OR SOLDER CONNECTIONS SHALL BE USED. CONNECTIONS SHALL INCLUDE ALL CABLE TO CABLE SPLICE. ALL MATERIALS USED (MOLDS, WELDING METAL, TOOLS, ETC.) SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND PROCEDURES.

B. ALL INTERIOR GROUNDING AND BONDING CONDUCTORS SHALL BE CONNECTED BY TWO HOLE-TYPE (COMPRESSION) CONNECTIONS. MECHANICAL CONNECTIONS, FITTINGS OR CONNECTIONS THAT DEPEND SOLELY ON SOLDER SHALL NOT BE USED.

1.3 GROUND RODS

A. ALL GROUND RODS SHALL BE COPPER-CLAD STEEL 5/8" DIAMETER X 8'-0" LONG AND OF THE NUMBER AND AT LOCATIONS INDICATED. GROUND RODS SHALL BE DRIVEN FULL LENGTH VERTICALLY IN UNDISTURBED EARTH.

B. GROUND RODS SHALL BE LOCATED SO AS TO AVOID THE TOWER FOUNDATION.

C. IF ROCK IS ENCOUNTERED, GROUND RODS MAY BE DRIVEN AT AN OBLIQUE ANGLE OF NOT GREATER THAN 45 DEGREES FROM VERTICAL OR MAY BE BURIED HORIZONTALLY AND PERPENDICULAR TO THE BUILDING, IN A TRENCH AT LEAST 36" DEEP.

D. GROUND RODS SHALL BE BURIED TO A MINIMUM DEPTH OF 30 INCHES BELOW FINISHED GRADE, WHERE POSSIBLE, OR BURIED BELOW THE FREEZE LINE, WHICHEVER DEPTH IS GREATER.

E. GROUND RODS SHALL NOT BE INSTALLED MORE THAN 16 FEET APART (OR TWICE THE LENGTH OF THE ROD) AND NOT LESS THAN 6 FEET (PER NFPA 70, ARTICLE 250-56).

1.4 GROUND BARS

A. ALL GROUND BARS SHALL BE 1/4" THICK BARE COPPER PLATES AND OF SUFFICIENT SIZE TO GROUND ATTACHMENTS INDICATED IN THE DRAWINGS (MIN. 2" X 12"). HOLES SHALL BE 7/16" DIAMETER ON 3/4" CENTERS TO PERMIT THE CONVENIENT USE OF TWO-HOLE LUGS.

B. THE METHOD OF ATTACHMENT OF THE GROUNDING ELECTRODE CONDUCTOR TO EXTERIOR AND TOWER GROUND BARS SHALL BE EXOTHERMIC OR IRREVERSIBLE HIGH COMPRESSION.

1.5 CABLES

A. ALL EXTERIOR GROUNDING CABLES SHALL BE STANDARD #2 AWG TINNED SOLID BARE COPPER WIRE UNLESS INDICATED OTHERWISE ON DRAWINGS.

B. WHEN THE DIRECTION OF THE CONDUCTOR MUST CHANGE, IT SHALL BE DONE GRADUALLY. ALL BENDS SHALL BE MADE WITH THE GREATEST PRACTICAL RADIUS AND SHALL NOT BE LESS THAN 8".

C. ALL CONDUITS SHALL BE METALLICALLY SUPPORTED.

D. ALL CONDUITS USED AS RACEWAYS FOR GROUNDING CONDUCTORS SHALL BE BONDED AT BOTH ENDS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC).

E. PROVIDE WIRE PROTECTION PIPES AT ALL GROUND WIRES AT GRADE LEVEL PER DETAIL 7/E4.

1.6 GROUNDING RING

A. THE GROUND RING ENCIRCLING THE BUILDING SHALL BE A MINIMUM SIZE OF NO. 2 AWG BARE TINNED SOLID COPPER CONDUCTOR IN DIRECT CONTACT WITH THE EARTH AT A MINIMUM DEPTH OF 36 INCHES. CONDUCTOR BENDS SHALL HAVE A MINIMUM RADIUS OF 8 INCHES.

B. ALL EXTERNAL GROUND RINGS ARE TO BE JOINED TOGETHER AND ALL CONNECTIONS SHALL BE EXOTHERMIC OR IRREVERSIBLE HIGH COMPRESSION. NO LUGS OR CLAMPS WILL BE ACCEPTED.

1.7 FENCE/GATE

A. 1. GROUND ALL SECTIONS OF FENCE AND GATE AS INDICATED ON DRAWINGS. GROUND EACH GATE POST AND CORNER POST. ALL CONNECTIONS FOR THE FENCE GROUND SYSTEM SHALL BE EXOTHERMIC WELD AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND PROCEDURES.

1.8 DISSIMILAR METALS

A. BONDING OF TWO DISSIMILAR METALS MAY RESULT IN GALVANIC CORROSION, A REACTION THAT OCCURS AT THE JUNCTION OF DISSIMILAR METALS WHEN THEY ARE EXPOSED TO MOISTURE. THE DEGREE AND RATE OF CORROSION DEPENDS ON THE RELATIVE POSITION OF THE METALS IN THE ELECTROCHEMICAL SERIES. TO DETERMINE THE LIKELIHOOD OF TWO METALS REACTING REFERENCE SECTION 6.5.2 IN THE R56 SPECIFICATIONS.

1. THE SAME METAL SHALL BE USED THROUGHOUT THE SYSTEM WHEN POSSIBLE.

2. EXOTHERMICALLY WELD CONNECTIONS OF DIFFERENT METALS WHEN WELD MATERIAL IS AVAILABLE FOR THE METALS BEING BONDED.

3. COPPER CONDUCTORS SHALL NOT BE INSTALLED ON ALUMINUM ROOFING OR SIDING.

4. ALUMINUM AND COPPER SHALL NOT BE DIRECTLY CONNECTED TO EACH OTHER UNLESS USING EXOTHERMIC WELDING MATERIALS SPECIFICALLY INTENDED FOR THESE TWO METALS TO MAKE THE CONNECTION. ALUMINUM AND COPPER MAY BE JOINED WITH THE USE OF A LISTED BIMETALLIC TRANSITION CONNECTOR OF STAINLESS STEEL. THESE CONNECTORS SHALL BE LISTED FOR THE SIZE AND NUMBER OF CONDUCTORS AND MARKED WITH AL/CU. THESE CONNECTIONS SHALL BE LIBERALLY COATED WITH A CONDUCTIVE ANTIOXIDANT AT THE POINT OF INSERTION INTO THE CONNECTOR.

5. COPPER SHALL NOT COME IN CONTACT WITH GALVANIZED STEEL.

6. TINNED COPPER SHALL BE USED WHEN CONNECTING TO A GALVANIZED STEEL STRUCTURE.

1.9 ANTI-OXIDANT

A. ANTI-OXIDANT COMPOUND SHALL BE USED BETWEEN ALL EXTERNAL MECHANICAL CONNECTIONS. CARE SHALL BE TAKEN TO USE THE APPROPRIATE ANTI-OXIDANT TYPE. ZINC ANTI-OXIDANT (GRAY COLOR) SHALL BE USED WHEN CONNECTING TO GALVANIZED AND ALUMINUM OBJECTS AND COPPER ANTI-OXIDANT (COPPER COLOR) SHALL BE USED WHEN CONNECTING TO COPPER OBJECTS.

1.10 TEST PROCEDURE

A. THE GROUND SYSTEM RESISTANCE SHALL NOT EXCEED 10 OHMS. A DESIGN GOAL OF 5 OHMS IS RECOMMENDED. TESTING SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 6.6 IN MOTOROLA R56 SPECIFICATIONS (DATED 9-1-05).

B. GROUND TEST MUST BE PERFORMED PRIOR TO UTILITY CONNECTION AND GROUND CONNECTION TO EXISTING SITE COMMON GROUNDING ELECTRODE SYSTEM.

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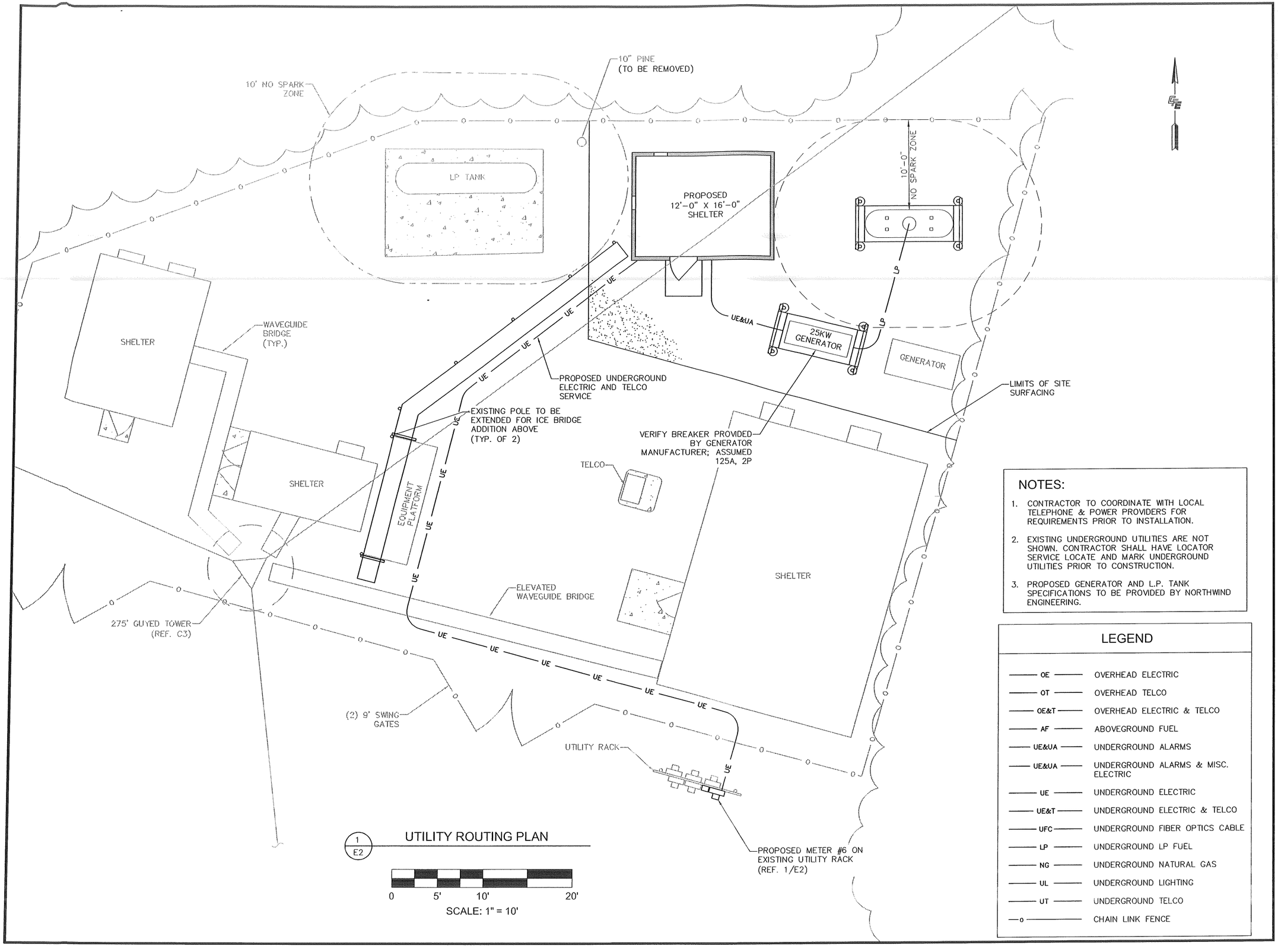
ELEC/TELCO GENERAL NOTES

E1



1/E2 UTILITY ROUTING PLAN

0 5' 10' 20'

SCALE: 1" = 10'

NOTES:

1. CONTRACTOR TO COORDINATE WITH LOCAL TELEPHONE & POWER PROVIDERS FOR REQUIREMENTS PRIOR TO INSTALLATION.
2. EXISTING UNDERGROUND UTILITIES ARE NOT SHOWN. CONTRACTOR SHALL HAVE LOCATOR SERVICE LOCATE AND MARK UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.
3. PROPOSED GENERATOR AND L.P. TANK SPECIFICATIONS TO BE PROVIDED BY NORTHWIND ENGINEERING.

LEGEND

OE	OVERHEAD ELECTRIC
OT	OVERHEAD TELCO
OE&T	OVERHEAD ELECTRIC & TELCO
AF	ABOVEGROUND FUEL
UE&UA	UNDERGROUND ALARMS
UE&UA	UNDERGROUND ALARMS & MISC. ELECTRIC
UE	UNDERGROUND ELECTRIC
UE&T	UNDERGROUND ELECTRIC & TELCO
UFC	UNDERGROUND FIBER OPTICS CABLE
LP	UNDERGROUND LP FUEL
NG	UNDERGROUND NATURAL GAS
UL	UNDERGROUND LIGHTING
UT	UNDERGROUND TELCO
o	CHAIN LINK FENCE

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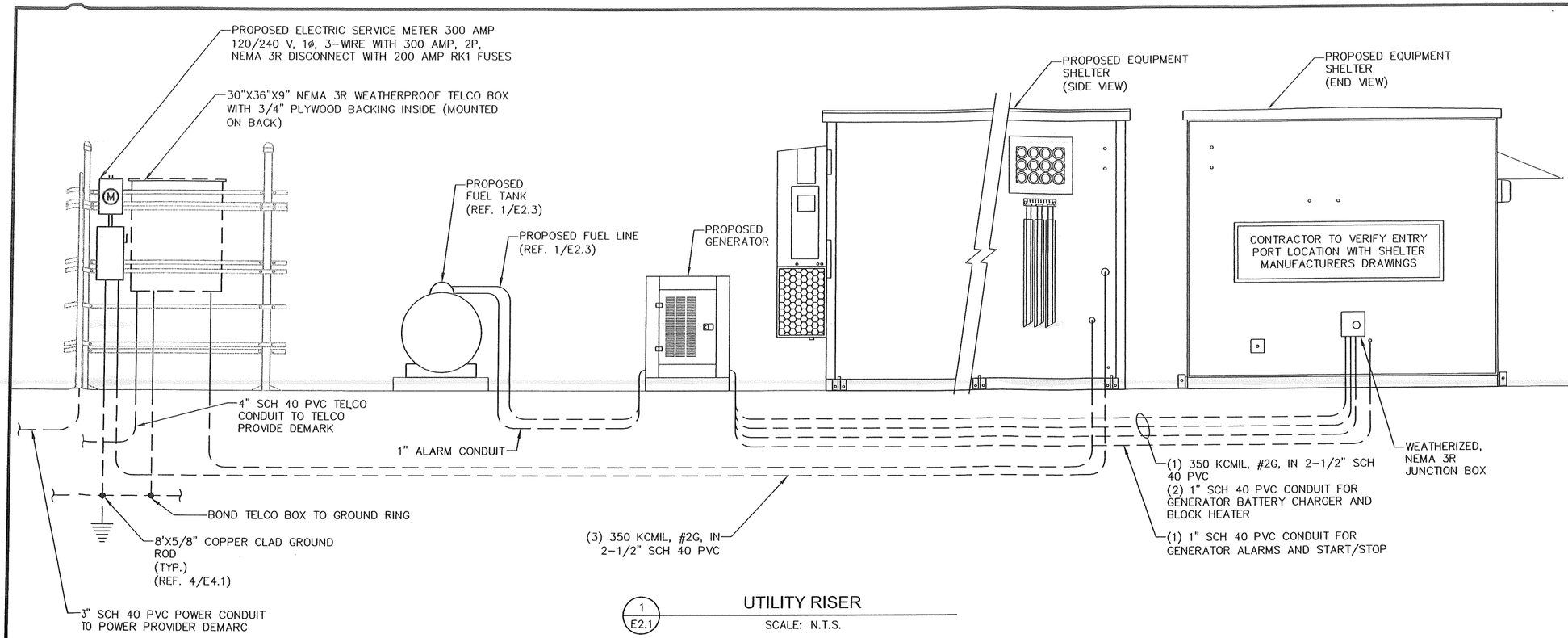
UTILITY ROUTING PLAN

E2

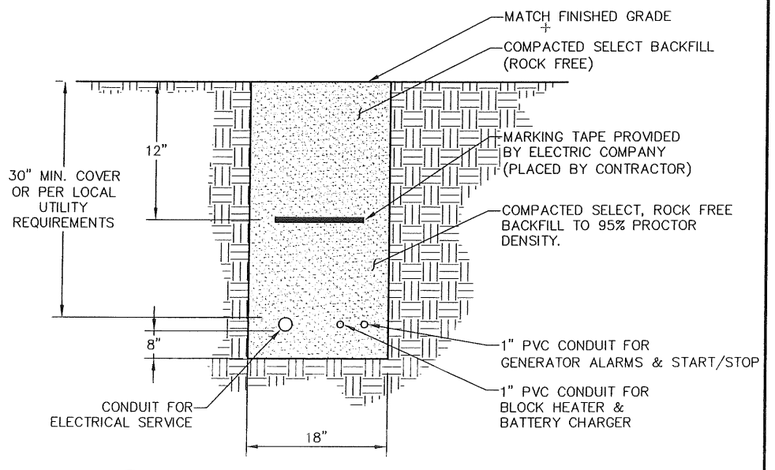


1 / E2.1 UTILITY RISER

SCALE: N.T.S.

NOTES:

1. ALL UNDERGROUND PRIMARY CABLE SHALL BE MARKED IN THE TRENCH USING MARKING TAPE PROVIDED BY UTILITY COMPANY.
2. THE MARKING TAPE SHALL BE PLACED APPROXIMATELY 12 INCHES BELOW FINISHED GRADE, AS SHOWN BELOW, WHILE BACKFILLING ELECTRICAL TRENCH.
3. SELECTED BACKFILL OF ROCK-FREE SOIL SHALL BE PLACED IN 6 INCH LAYERS AT A TIME AND EACH LAYER WELL TAMPED.
4. MINIMUM 30" COVER OVER CONDUIT.
5. ALL HORIZONTAL RUNS OF UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 PVC UNLESS INSTALLING UNDER ROAD BED OR ANY TRAFFIC AREAS WHERE IT SHALL BE SCHEDULE 80 PVC. CONDUIT SUPPLIED AND INSTALLED BY CONTRACTOR.
6. ALL CONDUIT BENDS SHALL BE LONG SWEEP TYPE.



2 / E2.1 TYPICAL ELECTRICAL TRENCH

N.T.S.

ONE LINE DIAGRAM TO BE PROVIDED BY SHELTER MANUFACTURER

3 / E2.1 ELECTRICAL ONE LINE DIAGRAM

SCALE: N.T.S.

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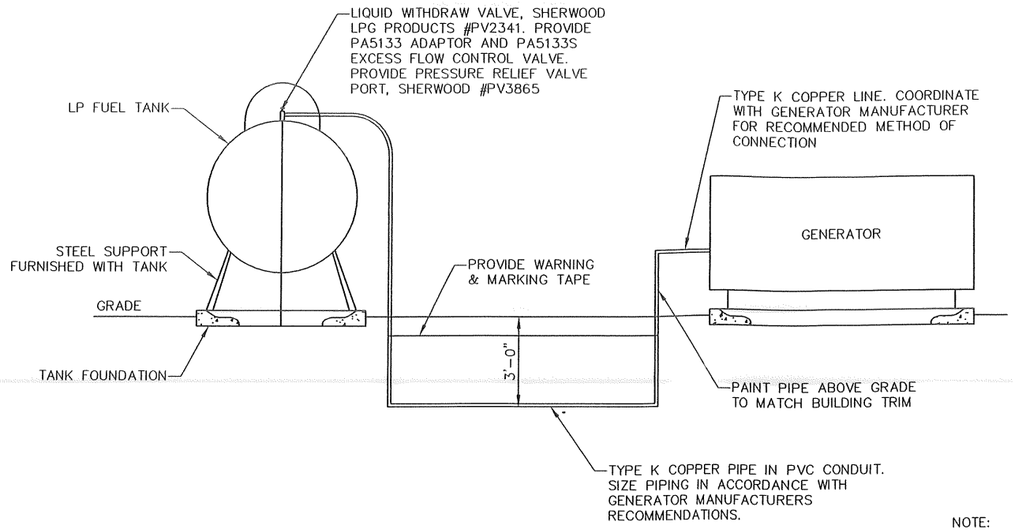
UTILITY DETAILS

E2.1

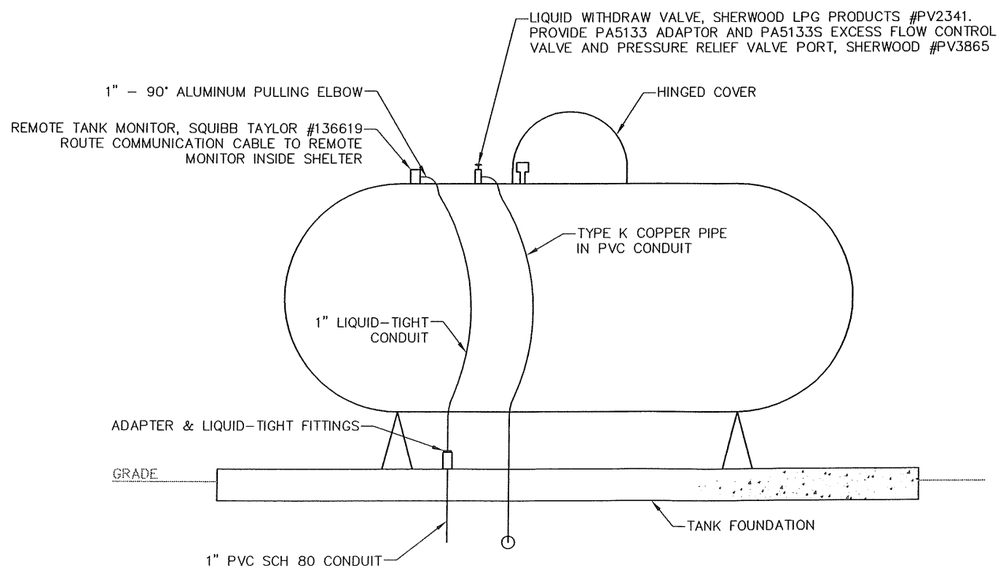


NOTE:

SECURE TANK AND GENERATOR TO FOUNDATIONS WITH GALV. OR S.S. HARDWARE

1 / E2.3 LIQUID PROPANE PIPING DETAIL

SCALE: N.T.S.



2 / E2.2 LIQUID PROPANE HARDWARE CONNECTION DETAIL

SCALE: N.T.S.

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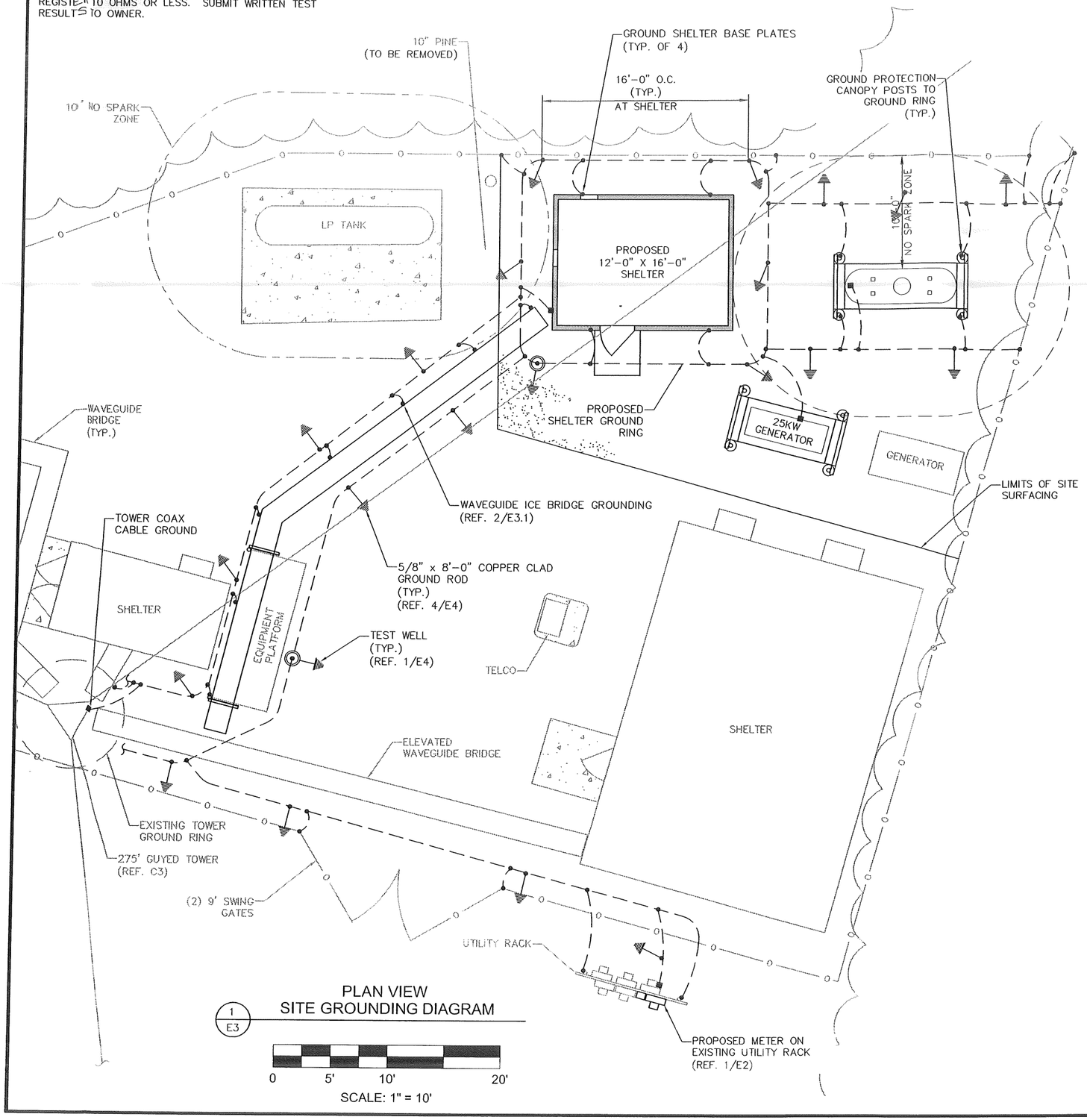
LP TANK DETAILS

E2.2

TESTING NOTE:
GROUNDING SYSTEM TO BE TESTED AFTER INSTALLATION AND WILL CONSIST OF THE THREE POINT, FALL-OF-POTENTIAL MEGGER TEST METHOD AND SHOULD REGISTER 10 OHMS OR LESS. SUBMIT WRITTEN TEST RESULTS TO OWNER.



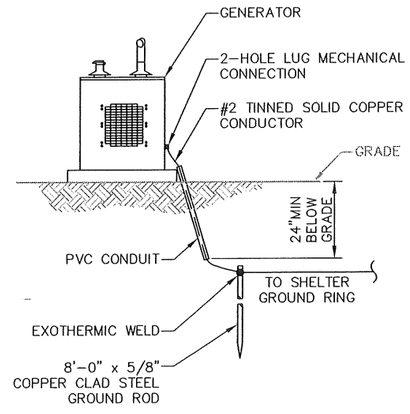
1 E3 PLAN VIEW
SITE GROUNDING DIAGRAM

0 5' 10' 20'

SCALE: 1" = 10'

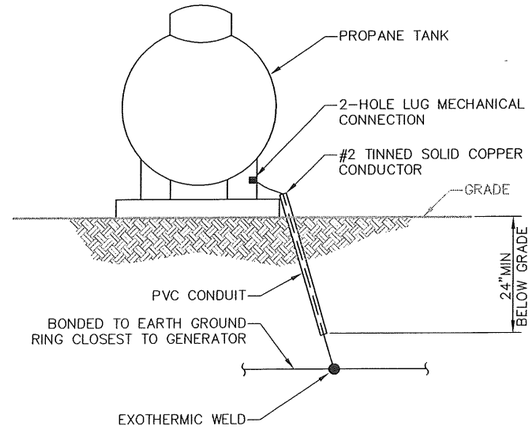
LEGEND

- EXOTHERMIC WELD
- MECHANICAL CONNECTION
- GROUND ROD WITH EXOTHERMIC WELD
- GROUND ROD WITH INSPECTION WELL
- #2 TINNED SOLID BARE COPPER GROUND WIRE
- FENCE



2 E3 GENERATOR GROUNDING DETAIL

N.T.S.



3 E3 LP TANK GROUNDING DETAIL

N.T.S.

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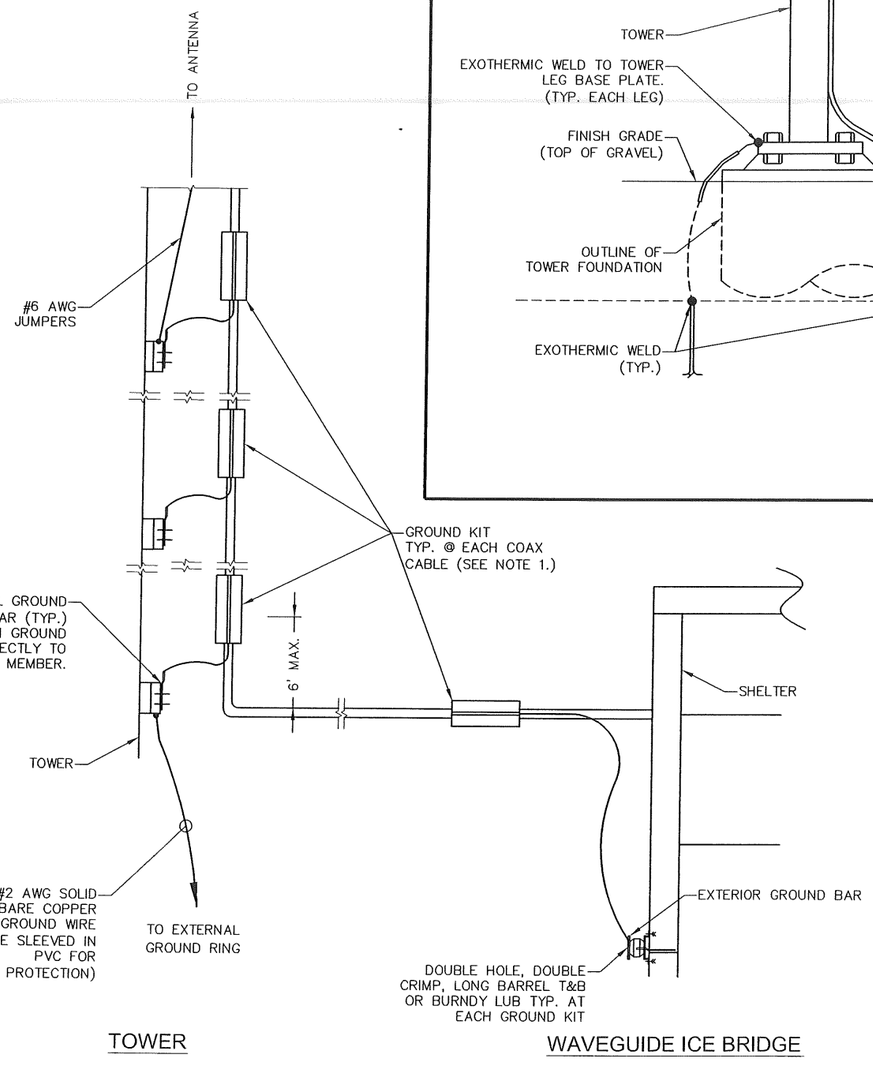
SITE GROUNDING PLAN

E3

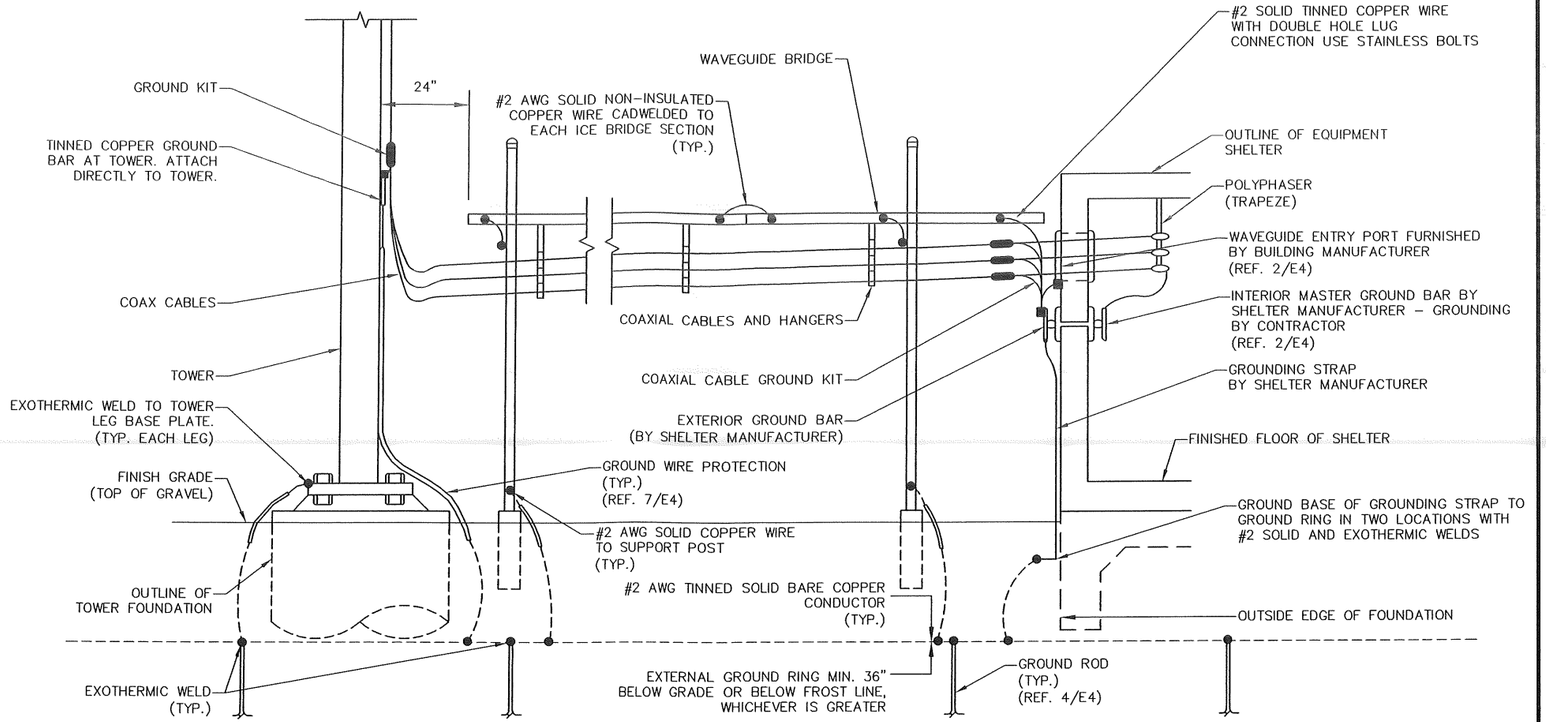
NOTE:

1. BUS BARS AND COAX GROUNDING SHALL BE REQUIRED AT MINIMUM INTERVALS OF 75' AS WELL AS AT THE TOP AND BASE OF THE TOWER.



1 E3.1 COAX CABLE GROUNDING DETAILS

SCALE: N.T.S.



2 E3.1 TYPICAL SHELTER/WAVEGUIDE BRIDGE/TOWER GROUNDING

SCALE: N.T.S.

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THIS SPACE HAS BEEN INTENTIONALLY LEFT BLANK

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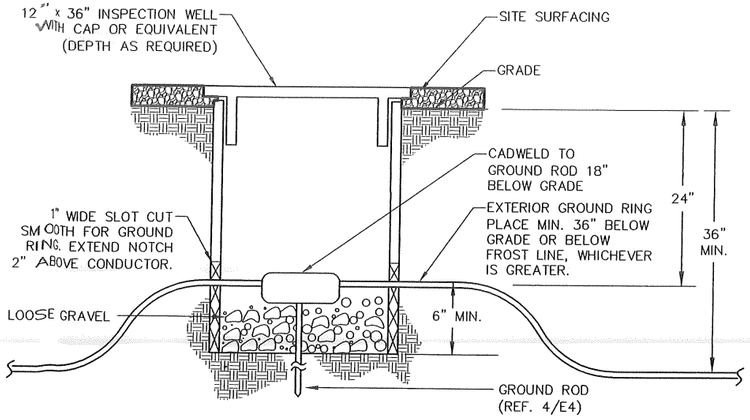
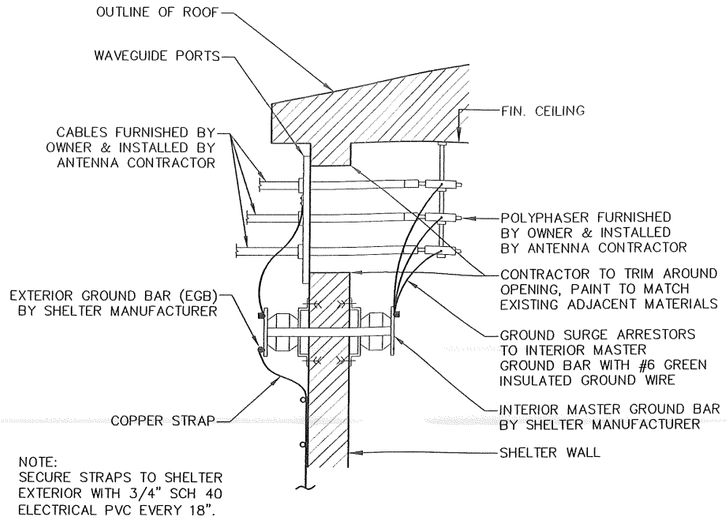
EQUIPMENT GROUNDING SYSTEM

E3.1



1/E4 INSPECTION WELL DETAIL

SCALE: N.T.S.

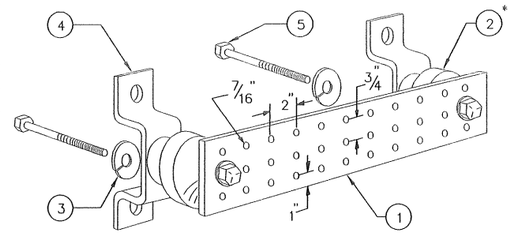


NOTE:
SECURE STRAPS TO SHELTER EXTERIOR WITH 3/4" SCH 40 ELECTRICAL PVC EVERY 18".

2/E4 GROUND AT PORT PLATE

SCALE: N.T.S.

* REMOVE INSULATORS AND USE ANGLE ADAPTORS FOR TOP-MOUNTED GROUND BARS

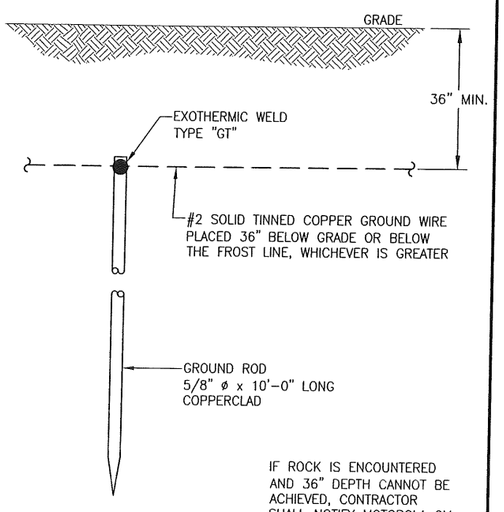


LEGEND

1 – COPPER GROUND BAR PLATE, 1/4"X 4"X 24", NEWTON INSTRUMENT CO. CAT. NO. B-6142. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION
2 – INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4
3 – 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8
4 – MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056
5 – 5/8-11 X 1" H.H.C.S. BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1

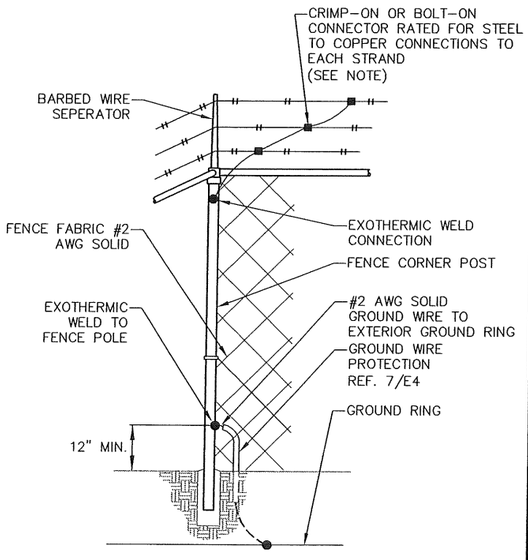
3/E4 TYPICAL GROUND BAR

N.T.S.



4/E4 GROUND ROD

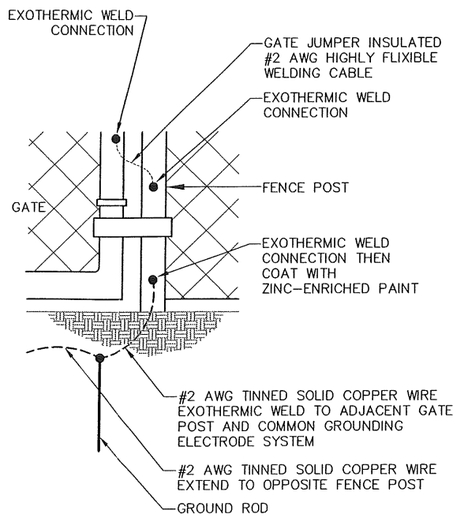
SCALE: N.T.S.



NOTE: MIN. BENDING RADIUS FOR ALL GROUND WIRES IS 8".

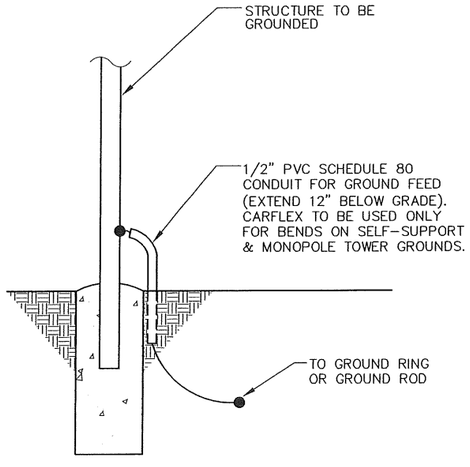
5/E4 CORNER POST FENCE GROUNDING DETAIL

SCALE: N.T.S.



6/E4 GATE GROUND DETAIL

N.T.S



NOTE: CONDUIT SHALL BE PROPERLY CAPPED AND SEALED AT ENDS.

7/E4 GROUND WIRE PROTECTION

SCALE: N.T.S.

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MOTOROLA SOLUTIONS

SOUTH PORTLAND (ATC #10047)

SET ISSUED FOR REVIEW — DATE 02/15/11

REVISIONS

NO.	DATE	DESCRIPTION

GROUNDING DETAILS

E4

SITE DATA

SITE INFORMATION

COUNTY: CUMBERLAND
JURISDICTION: CITY OF PORTLAND
CODE: 2009 IBC
OCCUPANCY: N/A
ZONING: N/A
USE: UNMANNED PUBLIC SAFETY TELECOMMUNICATIONS FACILITY

SITE ACCESS

TOM BURGOYNE

(M) (508) 922-6233
(tom.burgoyne@americantower.com)

PROJECT TYPE

COLLOCATION ON AN EXISTING 275' GUYED TOWER AND NEW COMMUNICATION EQUIPMENT IN A NEW EQUIPMENT SHELTER WITHIN AN EXISTING FENCED COMPOUND
NEW 25KW GENERATOR
NEW 500 GAL. L.P. TANK

APPLICANT

U.S. CUSTOMS AND BORDER PROTECTION
CONTACT: BARRY BRACKEN
PROJECT MANAGER
CBP/OIT/ENTS/WTP
PHONE: 703.921.7393
MOBILE: 571.241.1604

MOTOROLA SOLUTIONS

U.S. CUSTOMS & BORDER PROTECTION
P25 TACCOMM MODERNIZATION PROJECT
HOULTON FOCUS AREA

THIS DOCUMENT IS RELEASED FOR THE PURPOSES OF REVIEW UNDER THE AUTHORITY OF NICHOLAS G. KEHL, P.E. 12493 ON 02/15/11 . IT IS NOT TO BE USED FOR CONSTRUCTION PURPOSES.

SITE NAME

SOUTH PORTLAND
(ATC #10047)

SITE ADDRESS

225 RIVERSIDE INDUSTRIAL PARKWAY
PORTLAND, MAINE 04103

PROJECT TEAM

TOWER OWNER

AMERICAN TOWER CORPORATION
10 PRESIDENTIAL WAY
WOBURN, MA 01801

PROJECT MANAGER

MOTOROLA
CONTACT: CURT HESS
MOBILE: 410.627.57004
EMAIL: CURTHESS@MOTOROLA.COM

ENGINEER

CFE TELECOM
CONTACT: NICHOLAS G. KEHL, P.E.
4544 S. LAMAR BLVD., BLDG. G-300
AUSTIN, TEXAS 78745
PHONE: 512.495.9470
FAX: 512.495.9473

SITE LOCATION

LAT: 43° 42' 21.69"

LONG: -70° 18' 38.67"

ELEV: 68.2' (AMSL)

UTILITIES

ONE CALL
CONTRACTOR TO CALL BEFORE DIGGING!!!!
PHONE: 1 (888) DIG-SAFE
1 (888) 344-7233

CENTRAL MAINE POWER
PHONE: 800.565.3181

VERIZON
PHONE: 866.323.1773

SHEET INDEX

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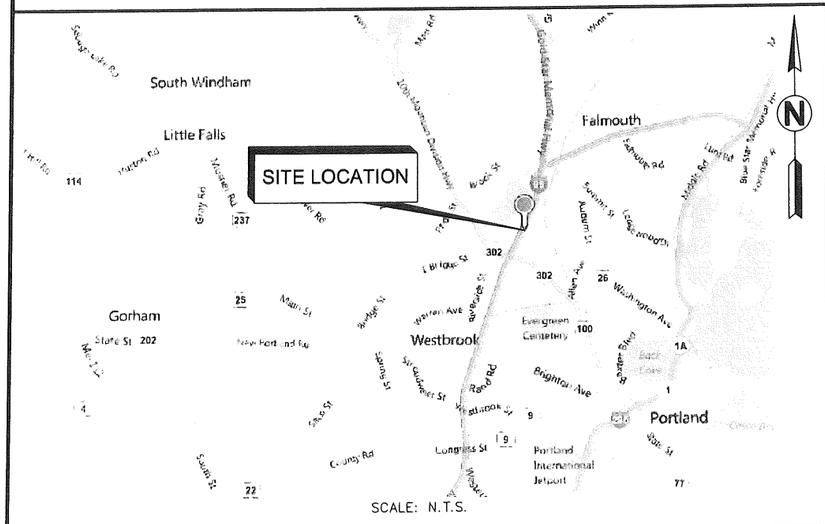
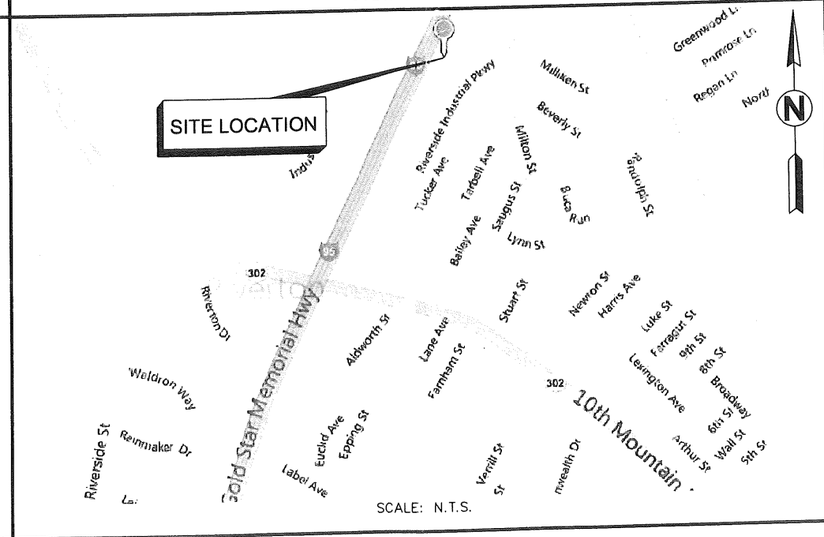
REGIONAL MAP



SCALE: N.T.S.

VICINITY MAP



SCALE: N.T.S.

DRIVING DIRECTIONS

(FROM PORTLAND) DEPART CONGRESS ST. TOWARD EXCHANGE ST. TURN RIGHT ONTO FOREST AVE. KEEP STRAIGHT ONTO SR-100/ FOREST AVE. KEEP STRAIGHT ONTO US-302/SR-100/10TH MOUNTAIN DIVISION HWY/FOREST AVE. TAKE RAMP RIGHT I-295 SOUTH/US-1 SOUTH TOWARD SOUTH PORTLAND. AT EXIT 1, TAKE RAMP RIGHT FOR MAINE TURNPIKE AUTHORITY APPROACH RD TOWARD MAINE TURNPIKE NORTH/ MAINE MALL ROAD. TAKE RAMP RIGHT FOR I-95 NORTH/GOLD STAR MEMORIAL HWY/MAINE TURNPIKE TOWARD AUGUSTA/LEWISTON ARRIVE AT THE DESTINATION ON THE RIGHT.

LEGAL DESCRIPTION

THENCE IN A WESTERLY DIRECTION A DISTANCE OF 141 FEET TO A POINT ON THE SOUTHWESTERLY BOUNDARY OF THE LAND OF OWNER WHICH POINT IS LOCATED S45°44'28"E A DISTANCE OF 75 FEET FROM SAID EASTERLY SIDELINE OF THE MAINE TURNPIKE AUTHORITY LAND; THENCE N45°44'28"W ALONG SAID SOUTHWESTERLY BOUNDARY OF THE LAND OF OWNER A DISTANCE OF 75 FEET TO SAID EASTERLY SIDELINE OF THE MAINE TURNPIKE AUTHORITY; THENCE N25°44'02"E ALONG SAID MAINE TURNPIKE AUTHORITY LAND A DISTANCE OF 151.82 FEET TO THE POINT OF BEGINNING.

ATTACHMENTS

APPROVALS

MOTOROLA PROJECT MANAGER — DATE

MOTOROLA RF ENGINEER — DATE

CBP TACCOMM PROJECT MANAGER — DATE

NOT FOR CONSTRUCTION

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MOTOROLA SOLUTIONS

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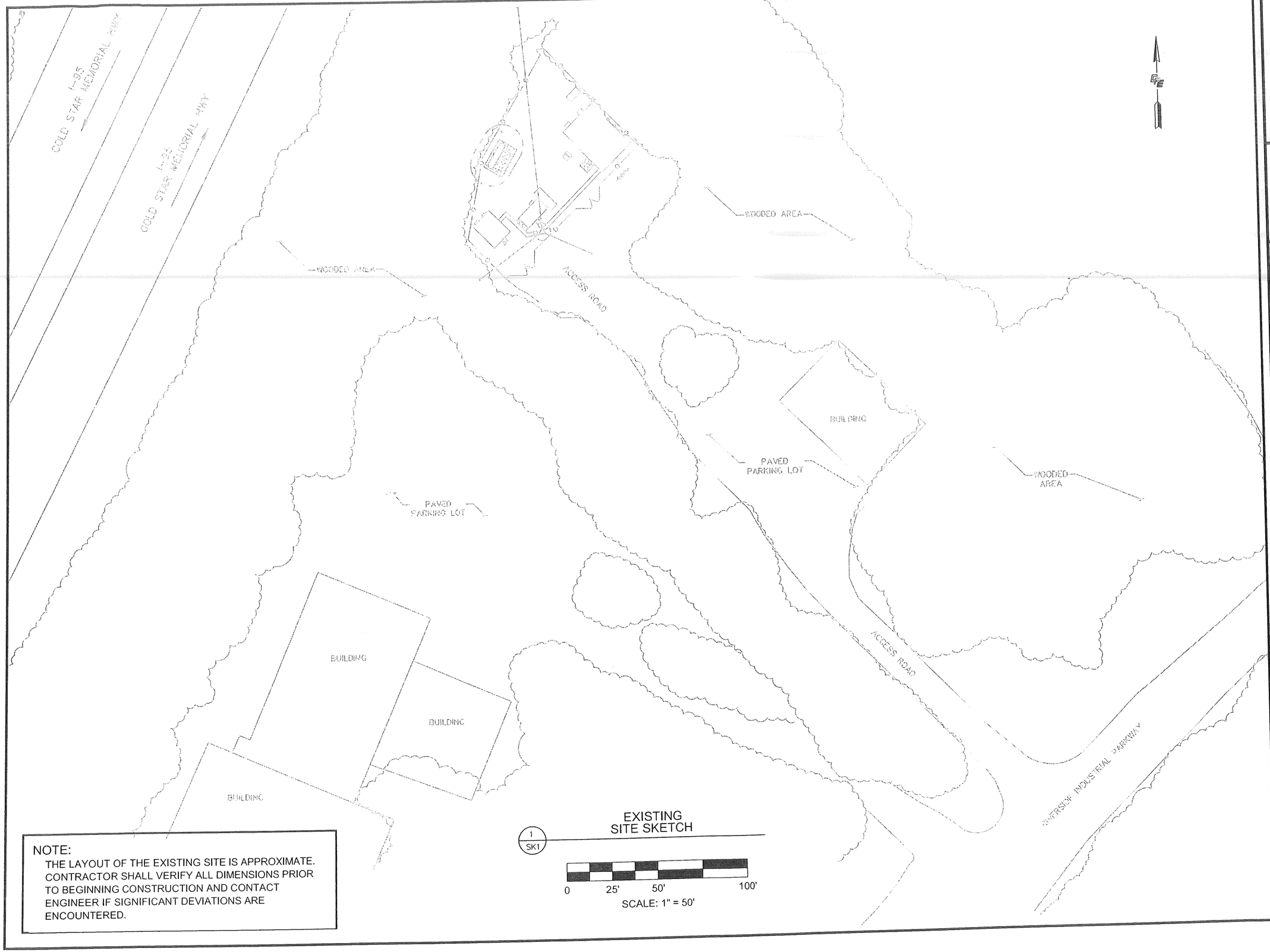
TITLE SHEET

T1



NOTE:
THE LAYOUT OF THE EXISTING SITE IS APPROXIMATE. CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO BEGINNING CONSTRUCTION AND CONTACT ENGINEER IF SIGNIFICANT DEVIATIONS ARE ENCOUNTERED.

1
SK1
EXISTING
SITE SKETCH

0 25' 50' 100'

SCALE: 1" = 50'

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EXISTING SITE SKETCH

SK1

DIVISION 1 STANDARD PROVISIONS
PART 1 GENERAL

1.1 INTENT

A. THESE SPECIFICATIONS AND THE CONSTRUCTION DRAWINGS ACCOMPANYING THEM DESCRIBE THE WORK TO BE DONE AND THE MATERIALS TO BE FURNISHED FOR THE CONSTRUCTION OF THIS PROJECT.

B. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE FULLY EXPLANATORY AND SUPPLEMENTARY. HOWEVER, SHOULD ANYTHING BE SHOWN, INDICATED OR SPECIFIED ON ONE AND NOT THE OTHER, IT SHALL BE DONE THE SAME AS IF SHOWN, INDICATED OR SPECIFIED IN BOTH.

C. THE INTENTION OF THESE DOCUMENTS IS TO INCLUDE ALL LABOR AND MATERIALS REASONABLY NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK AS STIPULATED IN THE CONTRACT.

D. THE PURPOSE OF THE SPECIFICATIONS IS TO INTERPRET THE INTENT OF THE DRAWINGS AND TO DESIGNATE THE METHOD OF THE PROCEDURE, TYPE AND QUALITY OF MATERIALS REQUIRED TO COMPLETE THE WORK.

E. MINOR DEVIATIONS FROM THE DESIGN LAYOUT ARE ANTICIPATED AND SHALL BE CONSIDERED AS PART OF THE WORK. NO CHANGES THAT ALTER THE CHARACTER OF THE WORK WILL BE MADE OR PERMITTED BY MOTOROLA WITHOUT ISSUING A CHANGE ORDER.

1.2 CONFLICTS

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL MEASUREMENTS AT THE SITE BEFORE ORDERING ANY MATERIALS OR DOING ANY WORK. NO EXTRA CHARGE OR COMPENSATION SHALL BE ALLOWED DUE TO DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND DIMENSIONS INDICATED ON THE CONSTRUCTION DRAWINGS. ANY SUCH DISCREPANCY IN DIMENSIONS, WHICH MAY BE FOUND, SHALL BE SUBMITTED TO MOTOROLA FOR CONSIDERATION BEFORE THE CONTRACTOR PROCEEDS WITH THE WORK IN THE AFFECTED AREAS.

1.3 STORAGE

A. ALL MATERIALS MUST BE STORED IN A LEVEL AND DRY FASHION AND IN A MANNER THAT DOES NOT NECESSARILY OBSTRUCT THE FLOW OF OTHER WORK. ANY STORAGE METHOD MUST MEET ALL RECOMMENDATIONS OF THE ASSOCIATED MANUFACTURER.

1.4 CLEAN UP

A. THE CONTRACTOR SHALL AT ALL TIMES KEEP THE SITE FREE FROM ACCUMULATION OF WASTE MATERIALS OR RUBBISH CAUSED BY HIS EMPLOYEES AT WORK AND AT THE COMPLETION OF THE WORK, HE SHALL REMOVE ALL RUBBISH FROM AND ABOUT THE BUILDING AREA, INCLUDING ALL HIS TOOLS, SCAFFOLDING, AND SURPLUS MATERIALS AND SHALL LEAVE HIS WORK CLEAN AND READY FOR USE.

B. EXTERIOR: VISUALLY INSPECT EXTERIOR SURFACES AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER.

C. REMOVE ALL TRACES OF SPLASHED MATERIALS FROM ADJACENT SURFACES.

D. IF NECESSARY TO ACHIEVE A UNIFORM DEGREE OF CLEANLINESS, HOSE DOWN THE EXTERIOR OF THE STRUCTURE.

1.5 QUALITY ASSURANCE

A. ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS. THESE SHALL INCLUDE BUT NOT BE LIMITED TO THE LATEST VERSION OF THE FOLLOWING:

TIA/EIA – 222 – G – 2006
INTERNATIONAL BUILDING CODE (IBC) 2009
BUILDING OFFICIALS AND CODE ADMINISTRATORS (BOCA) 1990
NATIONAL ELECTRICAL CODE (NEC) WITH LOCAL AMENDMENTS 2006
UNDERWRITER LABORATORIES APPROVED ELECTRICAL PRODUCTS
AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATIONS (AISC)
ANSI/NFPA – 70 LIFE SAFETY CODE NFPA – 101 – 1990

B. ALL WORK SHALL BE DONE IN ACCORDANCE WITH MOTOROLA'S R56 STANDARDS AND GUIDELINES FOR COMMUNICATIONS SITES.

1.6 ADMINISTRATION

A. BEFORE THE COMMENCEMENT OF ANY WORK, THE CONTRACTOR WILL ASSIGN A PROJECT MANAGER WHO WILL ACT AS A SINGLE POINT OF CONTACT FOR ALL PERSONNEL INVOLVED IN THE PROJECT. THIS PROJECT MANAGER WILL DEVELOP A MASTER SCHEDULE FOR THE PROJECT WHICH WILL BE SUBMITTED TO MOTOROLA PRIOR TO THE COMMENCEMENT OF ANY WORK.

B. SUBMIT A BAR CHART TYPE PROGRESS SCHEDULE NOT MORE THAN 3 DAYS AFTER THE DATE ESTABLISHED FOR COMMENCEMENT OF THE WORK ON THE SCHEDULE. INDICATE A TIME BAR FOR EACH MAJOR CATEGORY OR UNIT OF WORK TO BE PERFORMED AT SITE, PROPERLY SEQUENCED AND COORDINATED WITH OTHER ELEMENTS OF WORK. SHOW COMPLETION OF THE WORK SUFFICIENTLY IN ADVANCE OF THE DATE ESTABLISHED FOR SUBSTANTIAL COMPLETION OF THE WORK.

C. PRIOR TO COMMENCING CONSTRUCTION, MOTOROLA SHALL SCHEDULE AN "ON-SITE" MEETING WITH ALL MAJOR PARTIES. THIS SHALL INCLUDE (THOUGH NOT LIMITED TO) THE PROPERTY OWNER, POWER COMPANY, MOTOROLA AND THE CONTRACTOR.

D. CONTRACTOR SHALL BE EQUIPPED WITH SOME MEANS OF CONSTANT COMMUNICATIONS, SUCH AS A MOBILE PHONE OR A BEEPER. THIS EQUIPMENT WILL NOT BE SUPPLIED BY MOTOROLA NOR WILL CELLULAR SERVICE BE ARRANGED.

E. DURING CONSTRUCTION, CONTRACTOR MUST ENSURE THAT EMPLOYEES AND SUBCONTRACTORS WEAR HARD HATS AND SAFETY GLASSES AT ALL TIMES. THE CONTRACTOR MUST COMPLY WITH ALL APPLICABLE OSHA REQUIREMENTS.

F. PROVIDE DAILY UPDATES ON SITE PROGRESS, EITHER VERBAL OR WRITTEN.

G. COMPLETE INVENTORY OF CONSTRUCTION MATERIALS AND EQUIPMENT IS REQUIRED PRIOR TO START OF CONSTRUCTION.

H. MOTOROLA SHALL BE NOTIFIED NO LESS THAN 48 HOURS IN ADVANCE OF CONCRETE POURS, TOWER ERECTIONS, AND SHELTER PLACEMENTS.

NOT FOR CONSTRUCTION

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MOTOROLA SOLUTIONS

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(ATC #10047)

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GENERAL NOTES

GN1

DIVISION 2 – SITE WORK:
WORK AND DRAINAGE

PART 1 GENERAL

2.1 WORK INCLUDED

A. SITE WORK AND DRAINAGE DETAILS ARE WRITTEN TO COVER A VARIETY OF POSSIBLE SITE CONFIGURATIONS. SPECIFIC SERVICES WILL BE PERFORMED AS INDICATED IN THE SITE PLAN AND AGREED UPON BY CUSTOMER AND MOTOROLA PROJECT MANAGERS.

B. REFER TO COMPLETE DRAWING SET AND REFERENCED SPECIFICATIONS / STANDARDS FOR WORK INCLUDED.

2.2 RELATED WORK

A. CONSTRUCTION FOR BUILDING FOUNDATION
B. PLACEMENT OF SHELTER
C. INSTALLATION OF GROUNDING & ELECTRICAL SYSTEM
D. INSTALLATION OF ANTENNA SYSTEM

2.3 DESCRIPTIONS

A. ACCESS ROAD, TURNAROUND AREAS, AND COMPOUND AREAS ARE CONSTRUCTED TO PROVIDE A WELL–DRAINED, EASILY MAINTAINED, EVEN SURFACE FOR MATERIAL AND EQUIPMENT DELIVERIES AND MAINTENANCE PERSONNEL ACCESS.

2.4 QUALITY ASSURANCE

A. APPLY SOIL STERILIZER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION (USE AS NEEDED).

B. VEGETATION AND LANDSCAPING, IF REQUIRED WITHIN THE CONTRACT, WILL BE PLACED AND MAINTAINED AS RECOMMENDED BY NURSERY INDUSTRY STANDARDS.

2.5 SEQUENCING

A. CONFIRM SURVEY STAKES AND SET ELEVATION STAKES PRIOR TO ANY CONSTRUCTION. PLACE SILT FENCE OR OTHER REQUIRED EROSION CONTROLS DOWN GRADIENT OF CONSTRUCTION AREA.

B. THE COMPLETED ROAD AND SITE AREA WILL BE CLEARED OF HEAVY GROWTH OF GRASS, TREES, SHRUBS AND TOPSOIL PRIOR TO FOUNDATION CONSTRUCTION OR PLACEMENT OF BACKFILL OR SUB–BASE MATERIAL.

C. CONSTRUCT TEMPORARY CONSTRUCTION ZONE ALONG ACCESS DRIVE WHEN REQUIRED FOR NEW TOWERS.

D. THE SITE AREA WILL BE BROUGHT TO SUB–BASE COURSE ELEVATION AND THE ACCESS ROAD TO BASE COURSE ELEVATION PRIOR TO FORMING FOUNDATIONS.

E. APPLY SOIL HERBICIDE PRIOR TO PLACING BASE MATERIALS.

F. IF REQUIRED, GRADE, SEED, FERTILIZE AND MULCH DISTURBED AREA IMMEDIATELY AFTER BRINGING THE SITE AND ACCESS ROAD TO BASE COURSE ELEVATION. WATER TO ENSURE GROWTH.

G. REMOVE GRAVEL FROM TEMPORARY CONSTRUCTION ZONE.

H. AFTER APPLICATIONS OF FINAL SURFACES, APPLY SOIL HERBICIDE TO THE STONE SURFACE.

PART 2 PRODUCTS

2.8 MATERIALS

A. ROAD AND SITE MATERIALS: FILL MATERIAL – ACCEPTABLE SELECT FILL SHALL BE IN ACCORDANCE WITH LOCAL DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.

B. SOIL HERBICIDE SHALL BE EPA REGISTERED OF LIQUID COMPOSITION AND OF PRE–EMERGENCE DESIGN.

C. SOIL STABILIZER FABRIC SHALL BE MIRAFI – 500X.

2.9 EQUIPMENT

A. COMPACTION SHALL BE ACCOMPLISHED BY MECHANICAL MEANS.

B. ALL LARGER AREAS SHALL BE COMPACTED BY SHEEPS FOOT, VIBRATORY OR RUBBER TIRED ROLLERS WEIGHING AT LEAST FIVE TONS.

C. SMALLER AREAS SHALL BE COMPACTED BY POWER– DRIVER, HAND HELD TAMPERS.

PART 3 EXECUTION

2.10 INSPECTIONS

A. LOCAL BUILDING INSPECTION SHALL RECEIVE ADEQUATE NOTIFICATION IN ADVANCE OF CONCRETE POURS WHEN REQUIRED.

2.11 PREPARATION

A. CLEAR TREES, BRUSH AND DEBRIS FROM SITE AREA AND ACCESS ROAD RIGHT OF WAY (IF REQUIRED).

B. PRIOR TO OTHER EXCAVATION AND CONSTRUCTION EFFORTS CLEAR SITE OF ORGANIC MATERIAL TO MINIMUM OF SIX INCHES BELOW ORIGINAL GROUND LEVEL.

C. DO NOT REMOVE TREES, BRUSH, OR DEBRIS FROM THE PROPERTY WITHOUT MOTOROLA APPROVAL.

D. PRIOR TO PLACEMENT OF FILL OR BASE MATERIALS, PROOF ROLL THE SOIL.

E. WHERE UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED, COVER CLEARED AREAS WITH STABILIZER MAT PRIOR TO PLACEMENT OF FILL OR BASE MATERIAL.

2.12 INSTALLATION

A. THE COMPOUND AND TURNAROUND AREAS SHALL BE AT THE SUB–BASE COURSE ELEVATION PRIOR TO FORMING FOUNDATIONS. GRADE OR FILL THE SITE AND ACCESS ROAD AS REQUIRED IN ORDER THAT THERE IS EVEN DISTRIBUTION OF SPOILS RESULTING FROM FOUNDATION EXCAVATIONS. THE RESULTING GRADE WILL CORRESPOND WITH SAID SUB–BASE COURSE, ELEVATIONS ARE TO BE CALCULATED FROM FINISHED GRADES OR SLOPES, AS INDICATED.

B. IF ANY, EXCESS SPOILS WILL BE CLEARED FROM JOB SITE AND NOT SPREAD BEYOND THE LIMITS OF OWNER/LEASED PROPERTY UNLESS AUTHORIZED BY PROJECT MANAGER.

C. THE ACCESS ROAD SHALL BE BROUGHT TO BASE COURSE ELEVATION PRIOR TO FOUNDATION CONSTRUCTION TO PERMIT USE. COMPACTION SHALL BE DONE DURING CONSTRUCTION OF THE SITE.

D. AVOID CREATING DEPRESSIONS WHERE WATER MAY POND.

E. WHEN IMPROVING AN EXISTING ACCESS ROAD, GRADE THE EXISTING ROAD TO REMOVE ANY ORGANIC MATTER AND SMOOTH THE SURFACE BEFORE PLACING FILL OR STONE.

F. THE FINISH GRADE, INCLUDING TOP SURFACE COURSE, SHALL EXTEND A MINIMUM OF ONE FOOT BEYOND THE SITE FENCE AND SHALL COVER THE AREA AS INDICATED.

G. RIPRAP SHALL BE APPLIED TO THE SIDES OF DITCHES OR DRAINAGE SWALES.

H. RIPRAP SHALL BE APPLIED TO THE SIDE SLOPES OF ALL FENCED SITE AREAS, PARKING AREAS AND TO ALL OTHER SLOPES GREATER THAN 2:1.

I. RIPRAP ENTIRE DITCH FOR SIX FEET IN ALL DIRECTIONS AT CULVERT OPENINGS OR AS INDICATED IN THE DRAWINGS.

J. SEED, FERTILIZER AND STRAW COVER SHALL BE APPLIED TO ALL OTHER DISTURBED AREAS AND DITCHES, DRAINAGE, SWALES NOT OTHERWISE RIPRAPPED.

K. UNDER NO CIRCUMSTANCES WILL DITCHES, SWALES NOR CULVERTS BE PLACED SO THEY DIRECT WATER TOWARDS, OR PERMIT STANDING WATER IMMEDIATELY ADJACENT TO SITE. IF DESIGN OR ELEVATIONS CONFLICT WITH THIS GUIDANCE, MOTOROLA SHOULD BE ADVISED IMMEDIATELY.

L. IF DITCH LIES WITH SLOPES GREATER THAN TEN PERCENT, MOUND DIVERSIONARY HEADWALLS IN THE DITCH AT CULVERT ENTRANCES 45 DEGREES OFF THE DITCH LINE. RIPRAP THE UPSTREAM SIDE OF THE HEADWALL AS WELL AS THE DITCH FOR SIX FEET ABOVE THE CULVERT ENTRANCE.

M. SEED AND FERTILIZER SHALL BE APPLIED TO SURFACE CONDITIONS, WHICH WILL ENCOURAGE ROOTING. RAKE AREAS TO BE SEEDED TO EVEN THE SURFACE AND LOOSEN THE SOIL.

N. PLACE SEED AS DIRECTED BY THE SEED PRODUCER.

O. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE GROWTH OF SEEDED AND LANDSCAPED AREAS BY WATERING UP TO THE POINT OF RELEASE FROM THE CONTRACT. CONTINUE TO RE–WORK BARE AREAS UNTIL COMPLETE COVERAGE IS OBTAINED.

2.13 FIELD QUALITY CONTROL

A. COMPACTION SHALL BE AT LEAST 95% OF MAXIMUM DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH ASTM D–1557.

B. ALL TREES PLACED IN CONJUNCTION WITH A LANDSCAPE CONTRACT WILL BE WRAPPED, TIED WITH HOSE–PROTECTED WIRE AND SECURED.

C. ALL EXPOSED AREAS SHALL BE PROTECTED AGAINST WASHOUTS AND SOIL EROSION. STRAW BALES WILL BE PLACED AT THE INLET APPROACH TO ALL NEW OR EXISTING CULVERTS.

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REVISIONS

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CIVIL NOTES

C1

DIVISION 4 ANTENNA SYSTEM
PART 1 GENERAL

4.1 WORK INCLUDED

A. INSTALL WAVEGUIDE BRIDGE AS INDICATED ON DRAWINGS. INSTALL NEW COAX, ANTENNAS, AND MOUNTS AS INDICATED ON DRAWINGS AND VERIFIED BY RF ENGINEER.

B. SUPPLY AND INSTALL GROUND BARS AND GROUNDING SUPPLIES AS INDICATED IN THE DRAWINGS.

C. LABEL CABLES.

D. MICROWAVE INSTALLATION WILL BE PERFORMED BY OTHERS.

4.2 RELATED WORK

A. FURNISH THE FOLLOWING WORK AS SPECIFIED UNDER CONSTRUCTION DOCUMENTS, BUT COORDINATE WITH OTHER TRADES PRIOR TO BID.

1. FLASHING OPENING INTO OUTSIDE WALLS.
2. SEALING AND CAULKING ALL OPENINGS.
3. PAINTING.
4. CUTTING AND PATCHING.
5. ENTRY PORT/PORT HOLE CUSHIONS.
6. ANTENNNA/CABLE GROUNDING.

4.3 REQUIREMENTS OF REGULATORY AGENCIES

A. FURNISH U.L. LISTED EQUIPMENT WHERE SUCH LABEL IS AVAILABLE AND INSTALL IN CONFORMANCE WITH U.L. STANDARDS WHERE APPLICABLE.

B. INSTALL ANTENNA CABLES AND GROUNDING SYSTEM IN ACCORDANCE WITH DRAWINGS AND SPECIFICATION IN EFFECT AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL BUILDING CODES, SPECIAL CODES HAVING JURISDICTION OVER SPECIFIC PORTIONS OF WORK. THIS INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:

1. EIA–ELECTRICAL INDUSTRIES ASSOCIATION RS–222, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

2. FAA–FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 70/7460–IH, OBSTRUCTION MARKING AND LIGHTING.

3. FCC–FEDERAL COMMUNICATIONS COMMISSION RULES AND REGULATIONS FORM 715, OBSTRUCTION MARKING AND LIGHTING SPECIFICATION FOR ANTENNA STRUCTURES AND FORM 715A, HIGH INTENSITY OBSTRUCTION LIGHTING SPECIFICATION FOR ANTENNA STRUCTURES.

4. AISC–AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS.

5. NEC–NATIONAL ELECTRICAL CODE–ON TOWER LIGHTING KITS.

6. UL–UNDERWRITERS' LABORATORIES APPROVED.

7. IN ALL CASES, PART 77 OF THE FAA RULES AND PARTS 17 AND 22 OF THE FCC RULES ARE APPLICABLE AND IN THE EVENT OF CONFLICT, SUPERSEDE ANY OTHER STANDARDS OF SPECIFICATIONS.

8. 2000 LIFE SAFETY CODE NFPA–101.

4.4 MATERIALS

A. ALL MATERIALS/HARDWARE SHALL BE HOT–DIPPED GALVANIZED OR STAINLESS STEEL UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

4.5 LABELING

A. ANTENNA AND LINE CONTRACTOR SHALL MARK CABLES WITH 1" WIDE UV–RESISTANT COLORED TAPE. THE CABLES SHALL BE MARKED AT THE END OF THE TRANSMISSION LINE NEAREST EACH ANTENNA, AT THE THE BASE OF THE TOWER/STRUCTURE CLOSEST TO THE ENTRY PORT AND IMMEDIATELY INSIDE THE ENTRY PORT.

B. CABLES SHALL BE TAGGED IMMEDIATELY INSIDE THE SHELTER WITH ANTENNA MODEL, HEIGHT, OWNER, AND USE.

C. MOTOROLA ANTENNA INSTALLATION AND IDENTIFICATION MATRIX (REF. MOTOROLA R56 APPENDIX B–7) SHALL BE FILLED OUT AND SUBMITTED TO MOTOROLA PROJECT MANAGER.

4.6 GROUNDING

A. ANTENNA AND CABLE GROUNDING SHALL BE INSTALLED CONTEMPORANEOUSLY WITH INSTALLATION. NO UNGROUNDED COAX SHALL BE ROUTED INTO THE SHELTER OR CONNECTED TO EQUIPMENT.

B. REFERENCE SEPARATE GROUNDING NOTES SHEET E1 FOR ADDITIONAL NOTES.

NOT FOR CONSTRUCTION

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MOTOROLA SOLUTIONS

SOUTH PORTLAND
(ATC #10047)

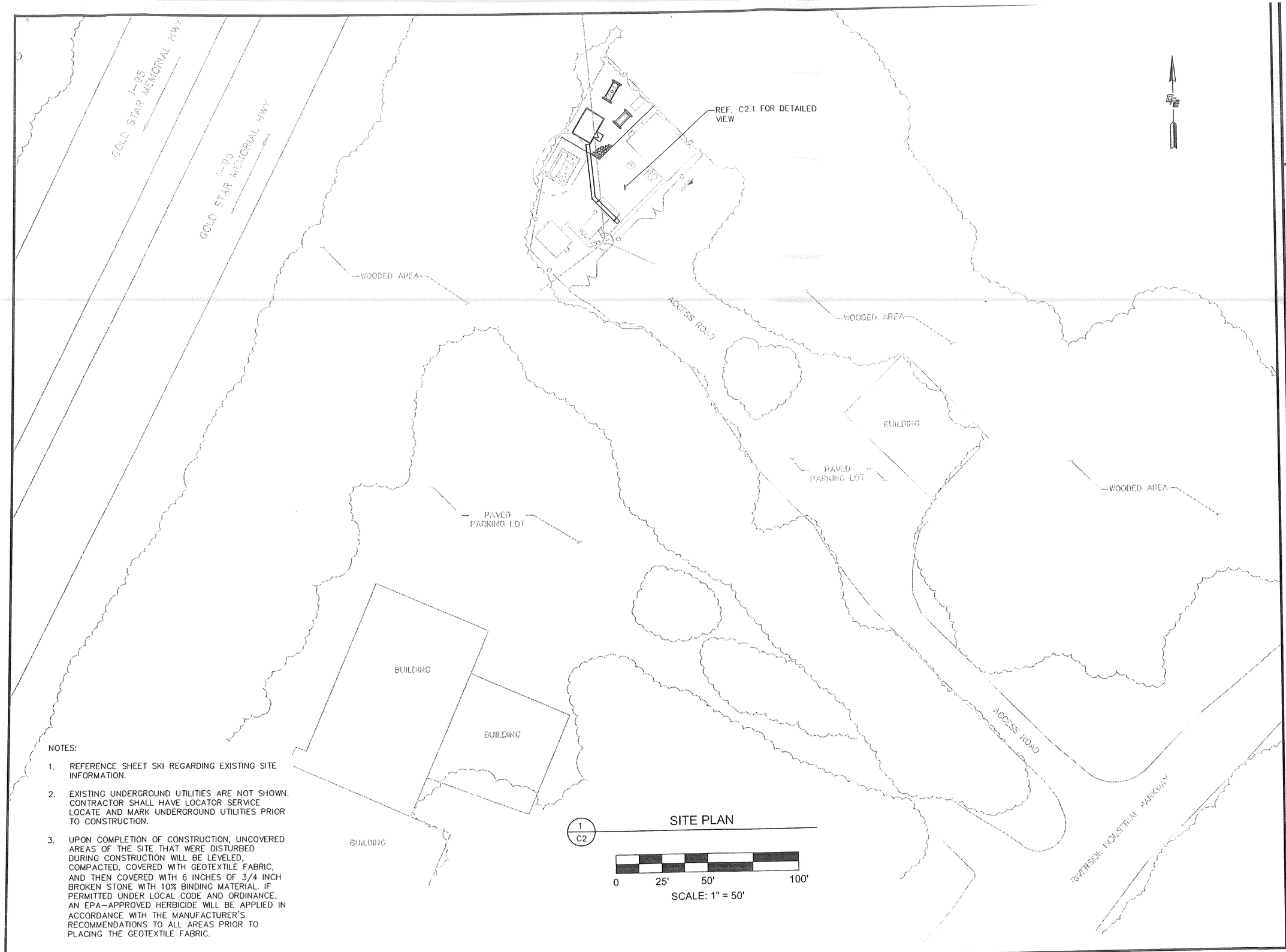
SET ISSUED FOR REVIEW — DATE 02/15/11

REVISIONS

NO.	DATE	DESCRIPTION

CIVIL NOTES

C1.1



NOTES:

1. REFERENCE SHEET SKI REGARDING EXISTING SITE INFORMATION.
2. EXISTING UNDERGROUND UTILITIES ARE NOT SHOWN. CONTRACTOR SHALL HAVE LOCATOR SERVICE LOCATE AND MARK UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.
3. UPON COMPLETION OF CONSTRUCTION, UNCOVERED AREAS OF THE SITE THAT WERE DISTURBED DURING CONSTRUCTION WILL BE LEVELED, COMPACTED, COVERED WITH GEOTEXTILE FABRIC, AND THEN COVERED WITH 6 INCHES OF 3/4 INCH BROKEN STONE WITH 10% BINDING MATERIAL. IF PERMITTED UNDER LOCAL CODE AND ORDINANCE, AN EPA–APPROVED HERBICIDE WILL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS TO ALL AREAS PRIOR TO PLACING THE GEOTEXTILE FABRIC.

1/C2 SITE PLAN

0 25' 50' 100'

SCALE: 1" = 50'

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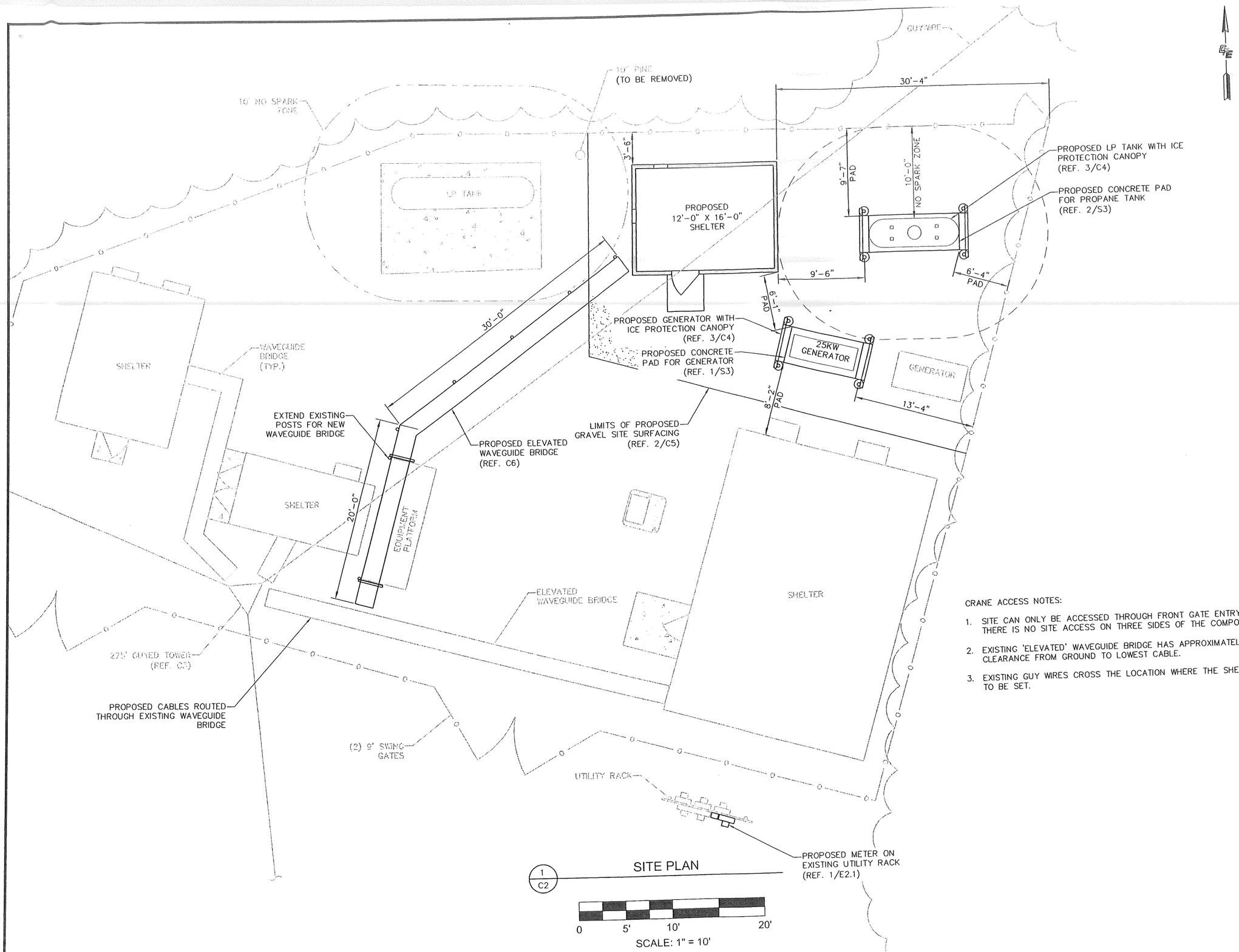
SITE PLAN

C2



CRANE ACCESS NOTES:

1. SITE CAN ONLY BE ACCESSED THROUGH FRONT GATE ENTRY. THERE IS NO SITE ACCESS ON THREE SIDES OF THE COMPOUND.
2. EXISTING 'ELEVATED' WAVEGUIDE BRIDGE HAS APPROXIMATELY 13'± CLEARANCE FROM GROUND TO LOWEST CABLE.
3. EXISTING GUY WIRES CROSS THE LOCATION WHERE THE SHELTER IS TO BE SET.

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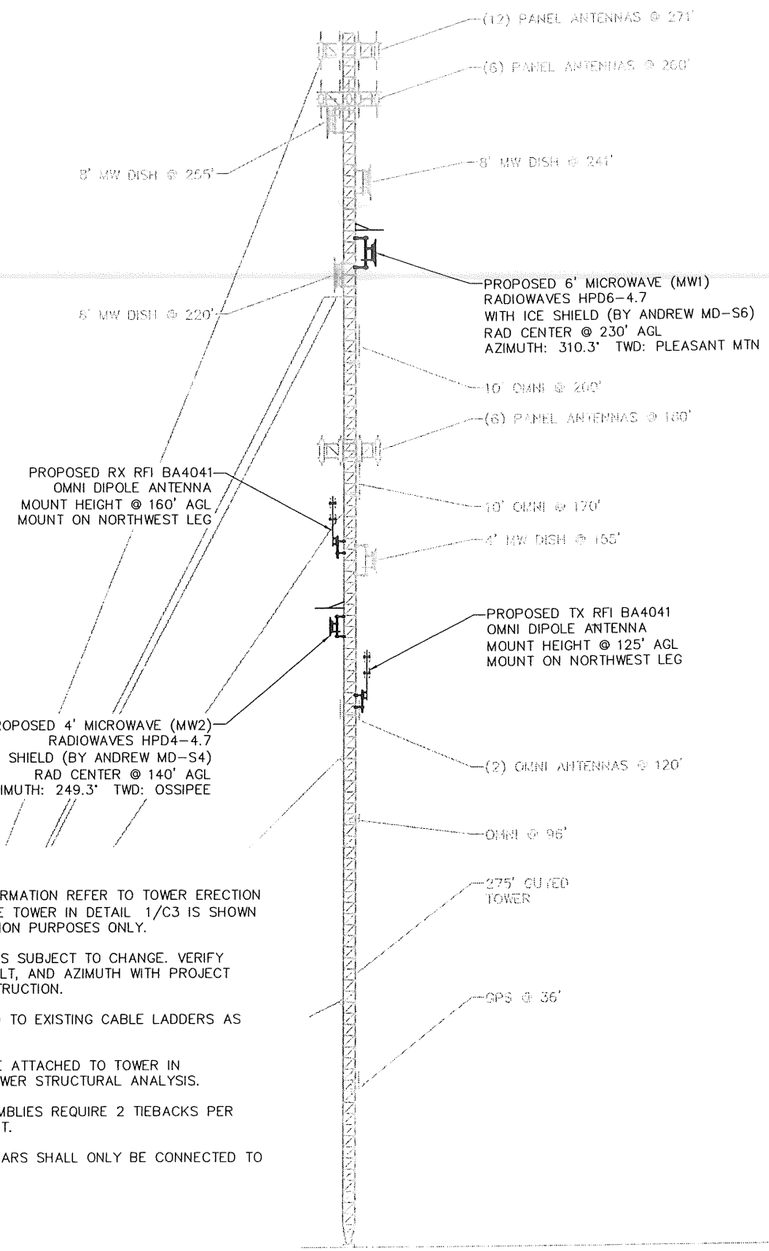
DETAILED
SITE PLAN

C2.1

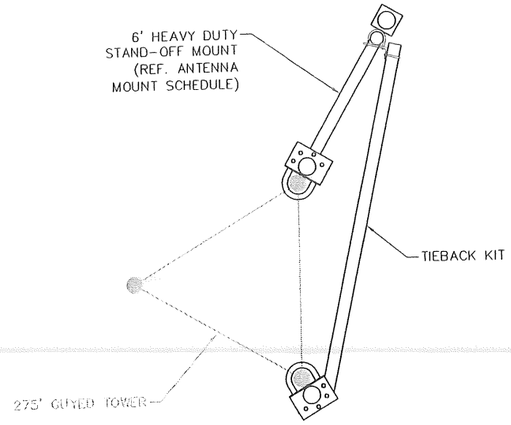
ANTENNA MOUNT SCHEDULE							
ELEVATION	ANTENNA	RAD CENTER	AZIMUTH	MOUNT KIT (1)	MOUNT KIT (2)	TIEBACK KIT	FEEDLINES
230'	HPD6-4.7	230'	310.3°	SABRE C10-153-202	SABRE C10-158-001	-	CAT5E
160'	RFI BA4041	-	-	SABRE C10-172-998	SABRE C10-151-906	SABRE C10-179-201	LDF4-50A
140'	HPD4-4.7	140'	249.3°	SABRE C10-153-202	SABRE C10-158-001	-	CAT5E
125'	RFI BA4041	-	-	SABRE C10-172-998	SABRE C10-151-906	SABRE C10-179-201	LDF4-50A



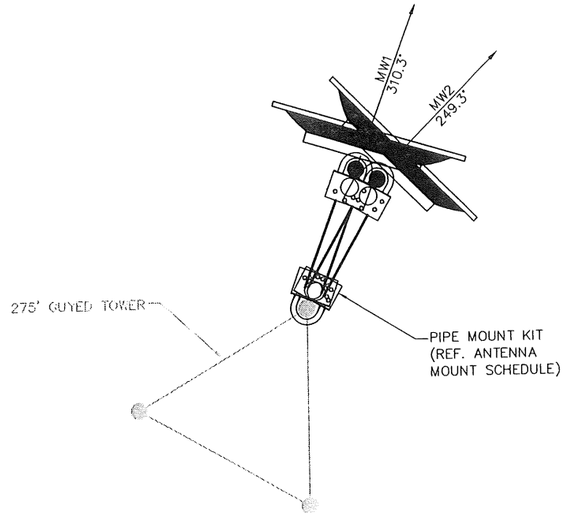
TOWER NOTES

1. FOR DETAILED TOWER INFORMATION REFER TO TOWER ERECTION DRAWINGS BY OTHERS. THE TOWER IN DETAIL 1/C3 IS SHOWN FOR GENERAL CONFIGURATION PURPOSES ONLY.
2. ANTENNA CONFIGURATION IS SUBJECT TO CHANGE. VERIFY ANTENNA HEIGHT, DOWN TILT, AND AZIMUTH WITH PROJECT MANAGER PRIOR TO CONSTRUCTION.
3. COAX SHALL BE ATTACHED TO EXISTING CABLE LADDERS AS SHOWN.
4. ANTENNAS COAX SHALL BE ATTACHED TO TOWER IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS.
5. ALL 6 FT. SIDE ARM ASSEMBLIES REQUIRE 2 TIEBACKS PER MOUNT, VERITICALLY OFFSET.
6. MOUNTS AND STABILIZER BARS SHALL ONLY BE CONNECTED TO TOWER LEGS.

1/C3 TOWER ELEVATION
SCALE: N.T.S.



2/C3 BIRD ANTENNA MOUNT DETAIL
SCALE: N.T.S.



3/C3 MICROWAVE DISH MOUNT DETAIL
SCALE: N.T.S.

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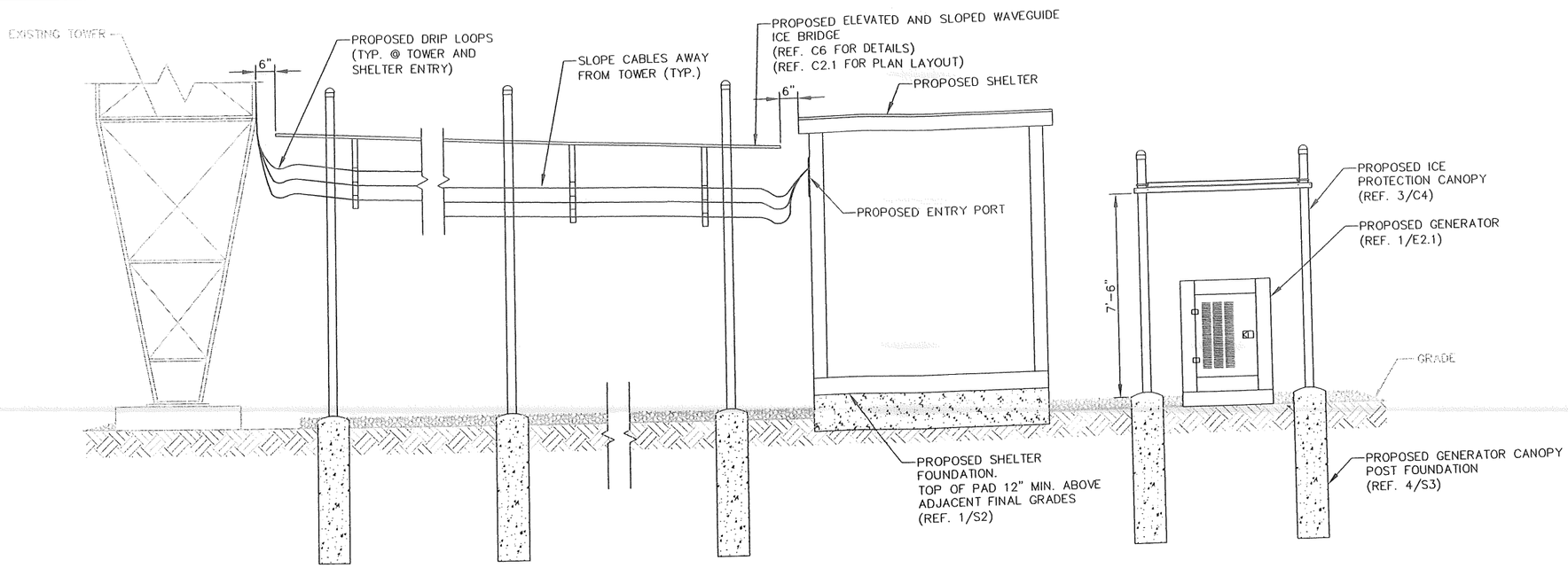
TOWER ELEVATION

C3



1/C4 TYPICAL TOWER COMPOUND PROFILE

SCALE: N.T.S.

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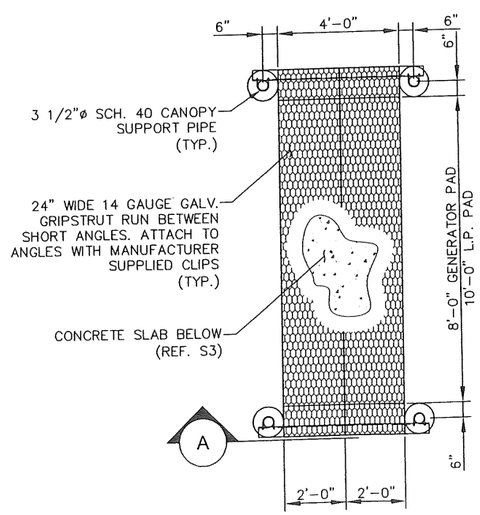
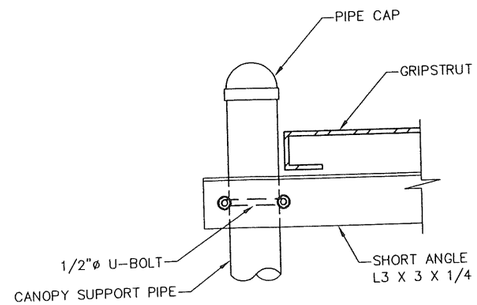


3/C4 ICE PROTECTION CANOPY PLAN AND DETAILS

SCALE: N.T.S.



SECTION – A

SCALE: N.T.S.

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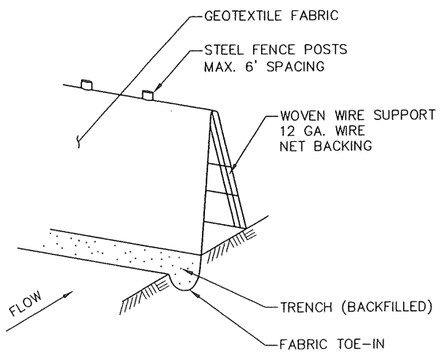
COMPOUND PROFILE, TRAPEZE & COAX CONFIGURATION

C4

SOIL AND EROSION CONTROL

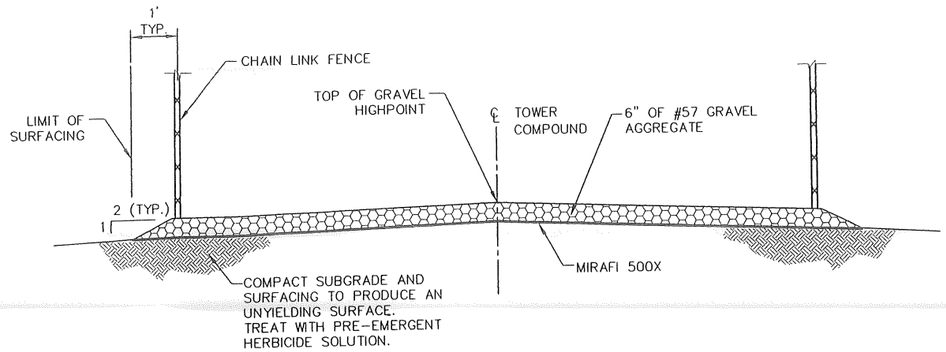
1. THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS FOR SOIL EROSION AND SEDIMENT CONTROL, AND OTHER REQUIREMENTS OF GOVERNMENTAL AUTHORITIES HAVING JURISDICTION.
2. CONSTRUCTION AT THE SITE WILL BEGIN WITH THE INSTALLATION OF EROSION CONTROL MEASURES SUFFICIENT TO CONTROL SEDIMENT DEPOSITS AND EROSION.
3. EROSION CONTROL DEVICES SHALL BE INSTALLED BEFORE GROUND DISTURBANCE OCCURS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ACCOMPLISH EROSION CONTROL FOR ALL DRAINAGE PATTERNS CREATED AT VARIOUS STAGES DURING CONSTRUCTION. ANY DIFFICULTY IN CONTROLLING EROSION DURING ANY PHASE OF CONSTRUCTION SHALL BE REPORTED TO THE CONSTRUCTION MANAGER IMMEDIATELY.
4. ALL SILT BARRIERS MUST BE PLACED AS ACCESS IS OBTAINED DURING CLEARING. NO GRADING SHALL BE DONE UNTIL SILT BARRIER IS INSTALLED.
5. CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL MEASURES UNTIL PERMANENT VEGETATION HAS BEEN ESTABLISHED. CONTRACTOR SHALL INSPECT EROSION CONTROL MEASURES AT THE END OF EACH WORKING DAY TO ENSURE MEASURES ARE FUNCTIONING PROPERLY.
6. THE CONTRACTOR SHALL REMOVE ACCUMULATED SILT WHEN THE SILT REACHES 12" IN HEIGHT WITHIN SILT FENCE BARRIERS.
7. FAILURE TO INSTALL, OPERATE OR MAINTAIN ALL EROSION CONTROL MEASURES MAY RESULT IN ALL CONSTRUCTION BEING STOPPED ON THE JOB SITE UNTIL SUCH MEASURES ARE CORRECTED.
8. A COPY OF THE APPROVED LAND DISTURBANCE PLAN AND PERMIT IF REQUIRED SHALL BE PRESENT ON THE JOB SITE WHENEVER LAND DISTURBANCE ACTIVITY IS IN PROGRESS.
9. ANY AREA OF DISTURBANCE LEFT EXPOSED OR THAT IS ANTICIPATED TO BE EXPOSED BEYOND THE EXPOSURE PERIOD REQUIRED BY LOCAL AUTHORITIES SHALL BE STABILIZED WITH TEMPORARY SEEDING.
10. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE PROVIDED IF REQUIRED UPON INSPECTION BY AND DIRECTION FROM LOCAL AUTHORITIES.
11. UPON COMPLETION OF WORK, OR AS DIRECTED BY EROSION CONTROL AUTHORITIES, ALL DISTURBED AREAS NOT IMPROVED WITH GRAVEL SHALL BE SEEDED WITH PERMANENT SEEDING MATERIAL SUITABLE FOR THE LOCAL GROWING AREA.

TRENCH CROSS SECTION



SILT FENCE

1/C5 SILT FENCE DETAIL
SCALE: N.T.S.



2/C5 SITE COMPOUND SURFACING DETAIL
SCALE: N.T.S.

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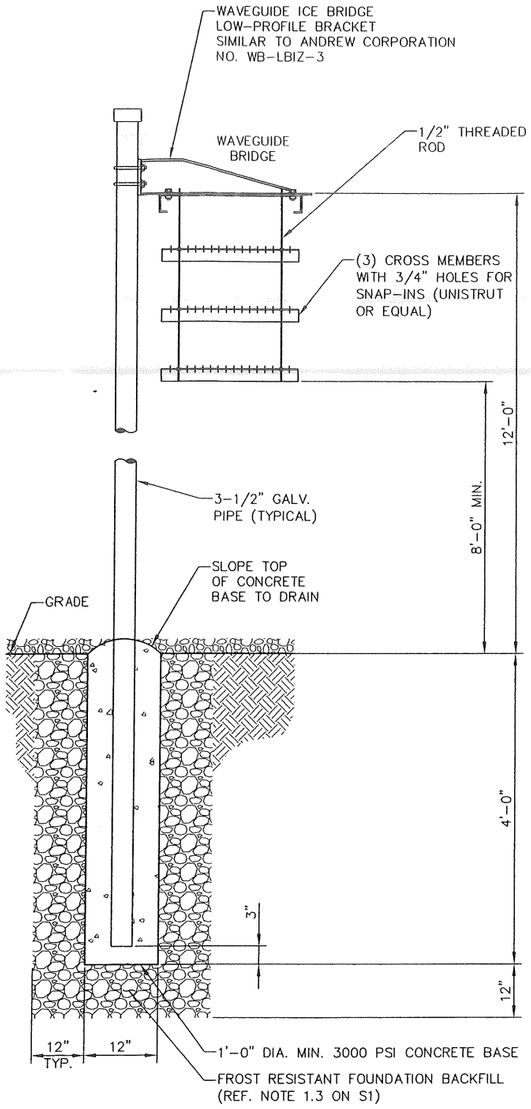
CONSTRUCTION DETAILS

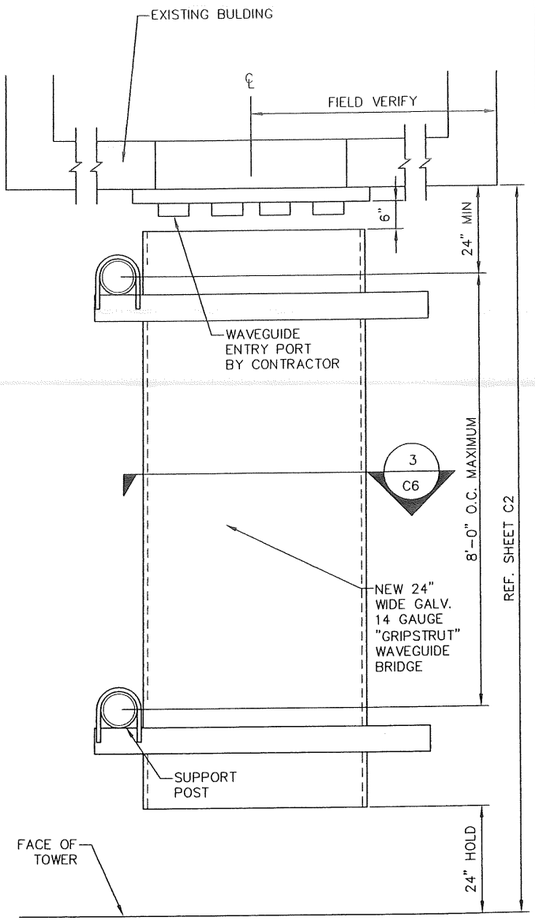
C5



SECTION VIEW @
WAVEGUIDE BRIDGE

1 / C6

SCALE: N.T.S.



NOTES:

1. ADJUST CENTERLINE OF WAVEGUIDE PORT ON BUILDING

2. REF. DETAIL 1/E3.3 FOR WAVEGUIDE BRIDGE GROUNDING DETAIL.

3. ALL MATERIALS USED FOR WAVEGUIDE SHALL BE HOT-DIPPED GALVANIZED. ALL FIELD CUTS OR DRILLED OPENINGS SHALL BE RESEALED WITH 3 COATS OF COLD-GALVANIZING COMPOUND TO CLEANED SURFACES.

4. ADDITIONAL SECTIONS OF WAVEGUIDE BRIDGE MAY BE REQUIRED AS INDICATED IN SITE PLAN. SUPPORT EACH 10' SECTION WITH A MINIMUM OF TWO POSTS WITH A MAXIMUM SPACING OF 8'.

DUAL COLUMN
WAVEGUIDE BRIDGE PLAN

2 / C6

SCALE: N.T.S.

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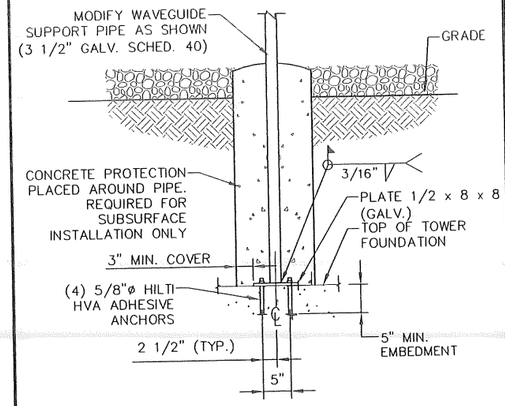

ALL WELDS AND DAMAGED AREAS OF GALVANIZING SHALL BE COATED WITH THREE COATS OF GALVANOX COLD GALVANIZING COMPOUND.

CONDITIONAL WAVEGUIDE
POST ANCHORAGE

4 / C6

SCALE: N.T.S.

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WAVEGUIDE ICE
BRIDGE DETAILS

C6

STRUCTURAL NOTES

1.1 CODES

A. 2009 INTERNATIONAL BUILDING CODE.

1.2 GENERAL

A. THE DETAILS DESIGNATED AS "TYPICAL DETAILS" APPLY GENERALLY TO THE DRAWINGS IN ALL AREAS WHERE CONDITIONS ARE SIMILAR TO THOSE DESCRIBED IN THE DETAILS.

B. ALL DIMENSIONS AND CONDITIONS OF EXISTING CONSTRUCTION SHALL BE VERIFIED BY THE CONTRACTOR AT THE JOB SITE PRIOR TO BEGINNING WORK. DIFFERENCES BETWEEN EXISTING CONSTRUCTION AND THE DRAWINGS SHALL BE REFERRED TO THE OWNER AND THE ENGINEER.

C. THE DESIGN AND PROVISION OF ALL TEMPORARY SUPPORTS – SUCH AS GUYS, BRACES, FALSE WORK, SUPPORTS, AND ANCHORS FOR SAFETY LINES, CRIBBING OR ANY OTHER TEMPORARY ELEMENTS REQUIRED FOR THE EXECUTION OF THE CONTRACT ARE NOT INCLUDED IN THE DRAWINGS AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. TEMPORARY SUPPORTS SHALL NOT RESULT IN THE OVERSTRESS OR DAMAGE OF THE ELEMENTS TO BE BRACED OR ANY ELEMENTS USED AS BRACE SUPPORTS.

D. THE CONTRACT STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE, AND, EXCEPT WHERE SPECIFICALLY SHOWN, DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, PROCEDURES, TECHNIQUES, SEQUENCE, AND SAFETY.

E. THE ENGINEER SHALL NOT HAVE CONTROL OF, AND SHALL NOT BE RESPONSIBLE FOR, CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, OR PROCEDURES, FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK, FOR THE ACTS OR OMISSION OF THE CONTRACTOR, SUBCONTRACTOR, OR ANY OTHER PERSON PERFORMING ANY OF THE WORK, OR FOR THE FAILURE OF ANY OF THEM TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

F. CONTRACTOR SHALL VERIFY EQUIPMENT SIZE AND LOCATION. NOTIFY OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES FROM PLANS.

G. THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE 48 HOURS IN ADVANCE OF THE TIME WHEN A SIGNIFICANT PORTION OF THE REINFORCING HAS BEEN TIED AND WHEN THE CONCRETE IS TO BE POURED FOR SCHEDULING SITE INSPECTIONS.

H. POSITIVE DRAINAGE SHALL BE PROVIDED ADJACENT TO ALL FOUNDATIONS SO PONDING OF RAINFALL NEAR THE FOUNDATIONS DOES NOT OCCUR.

I. DURING CONSTRUCTION, TEMPORARY GRADES SHALL BE ESTABLISHED TO PREVENT RUNOFF FROM ENTERING THE FOUNDATION AND ANCHORAGE EXCAVATIONS.

J. DRAINAGE PATTERNS APPROVED AT THE TIME OF FINISH GRADING SHALL BE MAINTAINED THROUGHOUT THE LIFE OF THE TOWER.

1.3 FOUNDATION BACKFILL

FROST–RESISTANT STRUCTURAL FILL

1. PRIOR TO PLACING REQUIRED FILL MATERIAL, REMOVE FROM THE SITE ALL COBBLES, BOULDERS, AND VEGETATION, AS WELL AS OTHER DELETERIOUS MATERIALS, INCLUDING ANY LOOSE OR EXCESSIVELY ORGANIC MATERIAL FROM THE EXISTING SUBGRADE. THIS MATERIAL SHOULD BE STRIPPED TO A MINIMUM DEPTH OF 6 INCHES AND REMOVED FROM THE SITE. ALL EXPOSED SURFACES SHALL THEN BE INSPECTED BY PROBING, AND TESTING.

2. THE EXPOSED SUBGRADE SHOULD NOT BE ALLOWED TO DRY OUT PRIOR TO PLACING SELECT STRUCTURAL FILL.

3. ALL FILL UNDER THE SLAB SHALL BE COMPACTED FROST–RESISTANT STRUCTURAL FILL MATERIAL. 24" MINIMUM THICKNESS.

4. SELECT STRUCTURAL FILL MATERIAL SHALL MEET THE FOLLOWING GRADATION:

   NO PARTICLES GREATER THAN 6 INCHES
   PERCENT PASSING 3" SIEVE 100%
   PERCENT PASSING 1/4" SIEVE 25% – 70%
   PERCENT PASSING NO. 40 SIEVE 0% – 30%
   PERCENT PASSING NO. 200 SIEVE 0% – 5%

5. FROST–RESISTANT STRUCTURAL FILL SHALL BE PLACED IN LIFTS BETWEEN 9 INCHES AND 12 INCHES THICK, WATERED AS REQUIRED AND COMPACTED TO A MINIMUM OF 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DEFINED IN ASTM TEST METHOD D1557 AT A MOISTURE CONTENT WITHIN 3 PERCENT OF THE OPTIMUM MOISTURE CONTENT.

6. COMPACTION AND MOISTURE CONTENT OF SUBGRADE AND EACH LIFT OF SELECT STRUCTURAL FILL SHALL BE INSPECTED AND APPROVED BY A QUALIFIED ENGINEERING TECHNICIAN, SUPERVISED BY A GEOTECHNICAL ENGINEER.

1.4 MOISTURE MANAGEMENT

A. EVERY EFFORT SHALL BE MADE TO KEEP EXCAVATIONS DRY SHOULD GROUNDWATER BE ENCOUNTERED.

B. SEEPAGE CAN BE EFFECTIVELY HANDLED BY SIMPLE DEWATERING METHODS, SUCH AS PERIPHERY DITCHES AND SUMPS. A SUITABLE SUMP COULD CONSIST OF A LARGE DIAMETER PIPE SET VERTICALLY WITH A COARSE SAND AND GRAVEL MIXTURE PLACED IN THE BOTTOM TO ACT AS A FILTER.

C. CARE SHALL BE EXERCISED IN PUMPING DIRECTLY FROM THE EXCAVATION SINCE THIS MAY CAUSE DETERIORATION OF THE EXCAVATION BASE.

D. THE TRAFFIC OF HEAVY EQUIPMENT (INCLUDING HEAVY COMPACTION EQUIPMENT) MAY CREATE PUMPING AND GENERAL DETERIORATION OF THE SHALLOWER SOILS.

1.5 SLAB-ON-GRADE

A. SLAB–ON–GRADE FOUNDATIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE ENGINEERING DESIGN FOR SITE PREPARATION, DRAINAGE, AND MAINTENANCE.

B. WITHIN THE AREA OF THE PROPOSED SLAB–ON–GROUND, REMOVE AND DISPOSE OF ALL SURFACE VEGETATION, ANY DELETERIOUS MATERIALS WHICH MAY BE PRESENT, AND ALL SOIL REQUIRED TO PROVIDE FOUNDATION BACKFILL BELOW AND ADJACENT TO THE SLAB AS INDICATED IN THE DRAWINGS. IF SOFT, WEAK, OR UNSTABLE SOIL CONDITIONS ARE REVEALED, OVER EXCAVATE THE AREA AND BRING BACK TO GRADE WITH FOUNDATION BACKFILL.

C. PLACE A 10 MIL POLYOLEFIN, ASTM E 1745 (CLASS A), VAPOR BARRIER OVER COMPACTED SOIL PRIOR TO PLACING FOUNDATION SLAB.

D. REFER TO PLANS FOR STIFFENED SLAB–ON–GRADE DIMENSIONS, THICKNESS, AND REINFORCING.

E. THE TROWELED FINISHED CONCRETE SLAB–ON–GRADE FLOOR PROFILE SHALL COMPLY WITH THE FOLLOWING FLATNESS AND LEVELNESS VALUES AS DEFINED IN THE ASTM E 1155:

	SPECIFIED OVERALL	MINIMUM LOCAL
FLATNESS (FF)	25	17
LEVELNESS (FL)	20	15

F. HORIZONTAL WING AND VERTICAL INSULATION SHALL BE USED TO PROTECT SHALLOW FOUNDATIONS PER "DESIGN GUIDE FOR FROST PROTECTION OF SHALLOW FOUNDATIONS." U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, JUNE 1994. REF. SITE DETAILS.

1.6 CONCRETE

A. CONCRETE DESIGN AND REINFORCEMENT SHALL BE IN ACCORDANCE WITH "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE", ACI 318–20 AND WITH SP–66(04): ACI DETAILING MANUAL – 2004.

B. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH "STANDARD SPECIFICATIONS FOR STRUCTURAL CONCRETE, ACI 301–05."

C. ALL CONCRETE SHALL HAVE SAND FINE AGGREGATE, NORMAL WEIGHT COARSE AGGREGATE, AND TYPE I OR III PORTLAND CEMENT. SLABS ON GRADE AND ALL OTHER CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH (F'C) OF 4000 PSI IN 28 DAYS. SEE CIVIL FOR SIDEWALKS, PAVING, AND SITE WORK CONCRETE STRENGTH REQUIREMENTS.

D. NO PIPE SLEEVES SHALL PASS THROUGH STRUCTURAL CONCRETE WITHOUT PRIOR APPROVAL OF THE STRUCTURAL ENGINEER. CAST IN SLEEVES SHALL BE CAST IRON OR SCHEDULE 40 STEEL PIPE.

E. CONTRACTOR SHALL BE RESPONSIBLE FOR THE ADEQUACY OF THE FORMS AND SHORING AND FOR SAFE PRACTICE IN THEIR USE AND REMOVAL.

1.7 REINFORCING STEEL

A. REINFORCING STEEL SHALL BE DEFORMED BILLET–STEEL BARS CONFORMING TO THE REQUIREMENTS OF ASTM A615, GRADE 60.

B. DETAILING OF CONCRETE REINFORCEMENT AND ACCESSORIES SHALL BE IN ACCORDANCE WITH ACI PUBLICATION SP–66(04): ACI DETAILING MANUAL – 2004.

C. ALL HOOKS SHALL BE A.C.I. STANDARD 90–DEGREE HOOKS, UNLESS DETAILED OTHERWISE.

D. PROVIDE CORNER BARS FOR ALL HORIZONTAL BARS AT THE INSIDE AND OUTSIDE FACES AND TOP AND BOTTOM OF INTERSECTING BEAMS OR WALLS. CORNER BARS ARE NOT REQUIRED IF HORIZONTAL BARS ARE HOOKED. LAP CORNERS 2'–0".

E. THE WELDING OF REINFORCING STEEL WILL NOT BE PERMITTED.

F. HEAT SHALL NOT BE USED IN THE FABRICATION OR INSTALLATION OF REINFORCEMENT.

G. MINIMUM CONCRETE PROTECTION FOR REINFORCEMENT (SEE ACI 318, LATEST EDITION, FOR CONDITIONS NOT NOTED).

   GRADE BEAMS ..... AS DETAILED
   SLAB ON GRADE ..... 1 1/2" TOP

H. BARS IN SLABS ON GRADE SHALL BE SUPPORTED ON SMALL PIECES OF MASONRY OR ACCESSORIES WITH "SAND" PLATES WHICH PROVIDE 1 1/2" AT THE TOP.

1.8 MISCELLANEOUS

A. ALL GROUT FOR STEEL BEARING AND LEVELING SHALL BE NON–SHRINK AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI.

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MOTOROLA SOLUTIONS

SOUTH PORTLAND
(ATC #10047)

SET ISSUED FOR REVIEW — DATE 02/15/11

REVISIONS

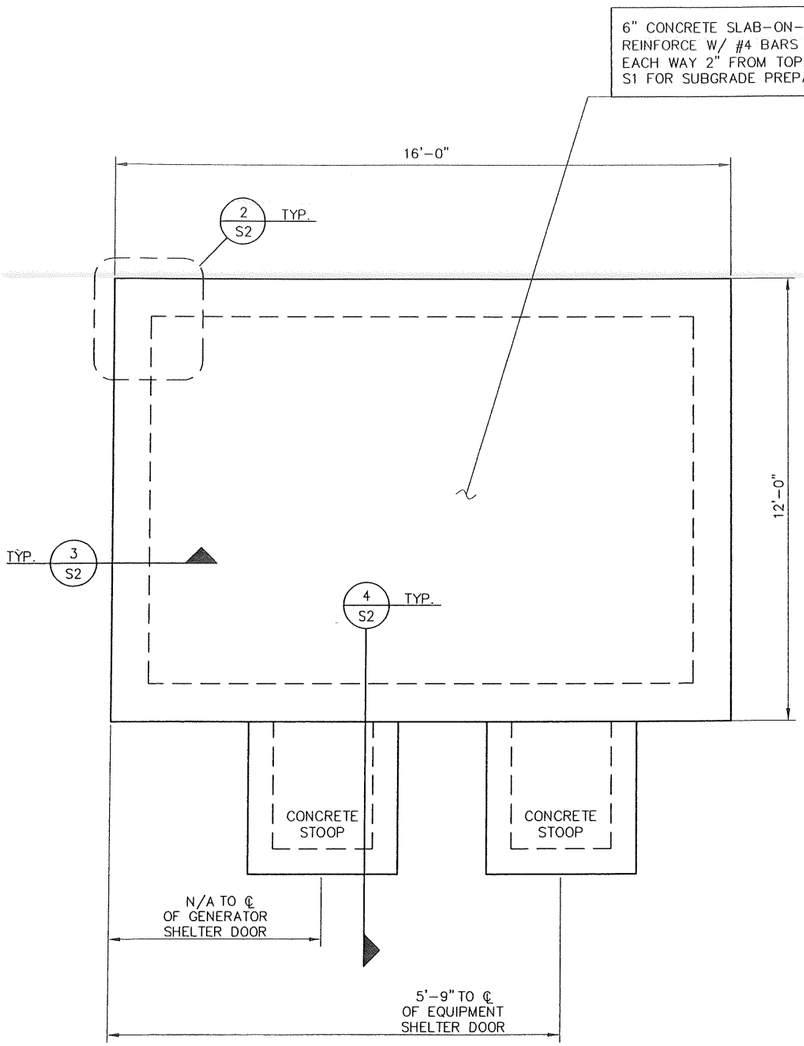
NO.	DATE	DESCRIPTION

STRUCTURAL NOTES

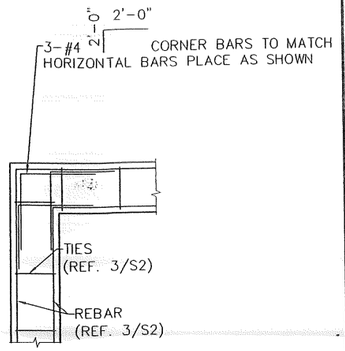
S1

PLAN NOTES:

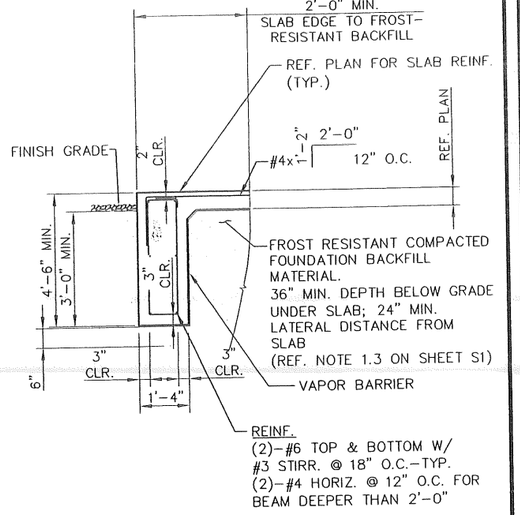
1. REFER TO CIVIL DRAWINGS FOR PLAN NORTH.
2. REFER TO EQUIP. BUILDING MANUFACTURER'S DRAWINGS FOR INFORMATION ON HOW TO ATTACH SHELTER TO FOUNDATION.



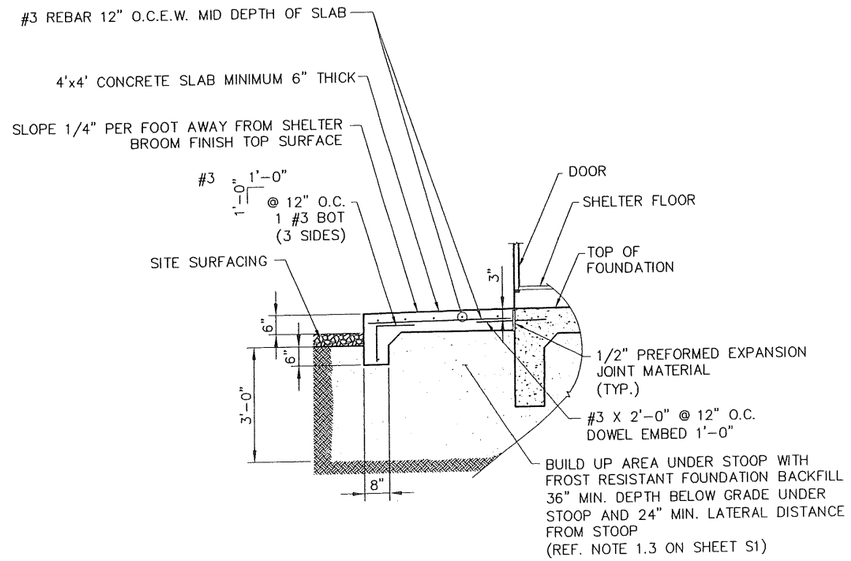
1 S2 SHELTER CONCRETE BASE PLAN
SCALE: N.T.S.



2 S2 TYPICAL CORNER BAR AT DOWN TURN
SCALE: N.T.S



3 S2 TYPICAL DOWN TURN SECTION
SCALE: N.T.S.



4 S2 CONCRETE STOOP
SCALE: N.T.S.

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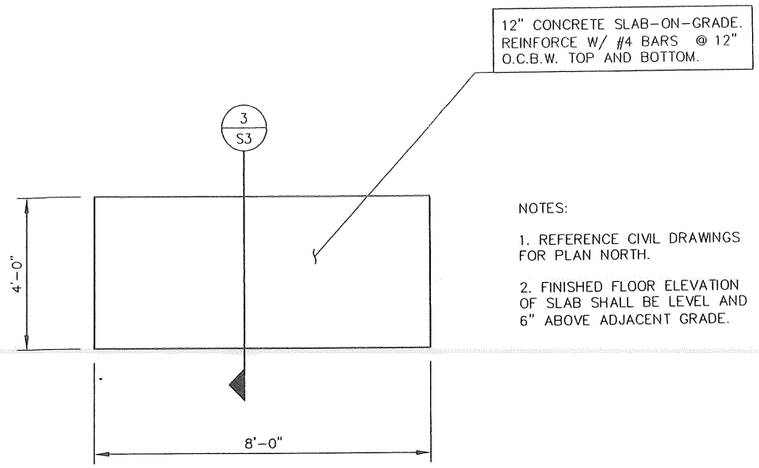
SHELTER FOUNDATION DETAILS

S2



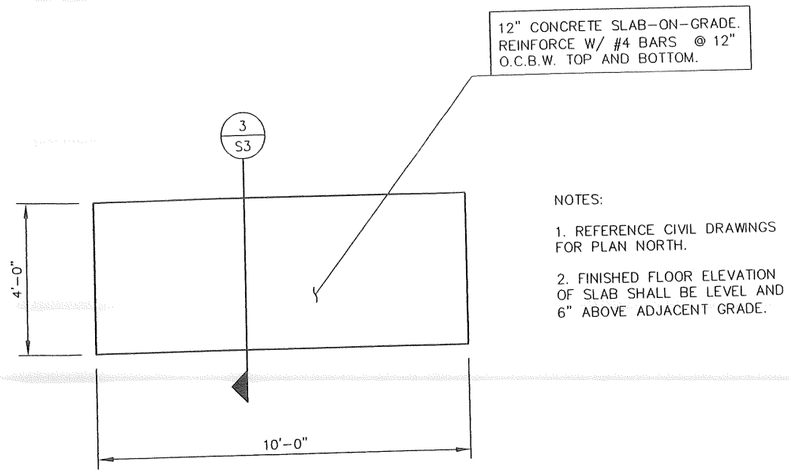
NOTES:

1. REFERENCE CIVIL DRAWINGS FOR PLAN NORTH.

2. FINISHED FLOOR ELEVATION OF SLAB SHALL BE LEVEL AND 6" ABOVE ADJACENT GRADE.

1 S3 GENERATOR FOUNDATION PLAN

SCALE: 1/4" = 1'-0"



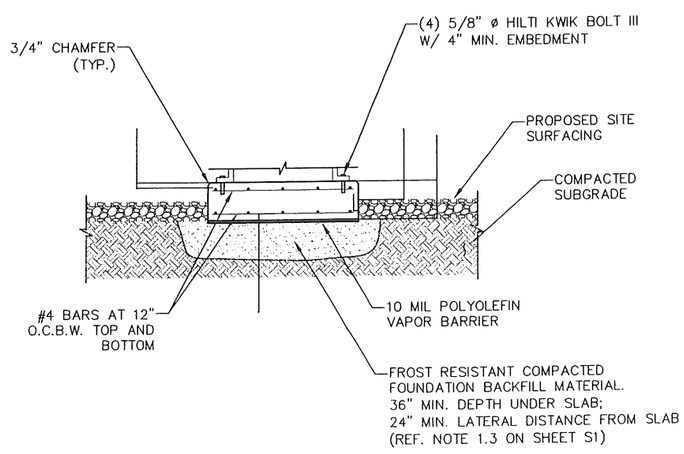
NOTES:

1. REFERENCE CIVIL DRAWINGS FOR PLAN NORTH.

2. FINISHED FLOOR ELEVATION OF SLAB SHALL BE LEVEL AND 6" ABOVE ADJACENT GRADE.

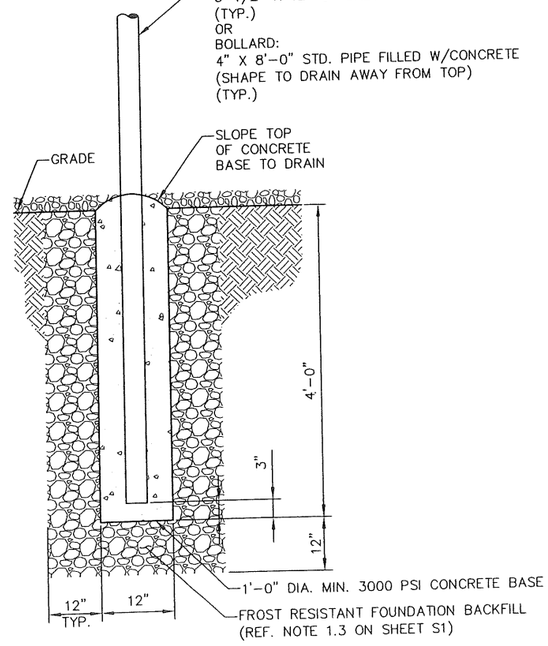
2 S3 FUEL TANK FOUNDATION PLAN

SCALE: 1/4" = 1'-0"



3 S3 GENERATOR/FUEL TANK CONCRETE PAD SECTION

SCALE: 1/4" = 1'-0"



4 S3 SECTION VIEW @ CANOPY & BOLLARD BASE

SCALE: N.T.S.

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EQUIPMENT PAD DETAILS

S3

ELECTRICAL SPECIFICATIONS:

GENERAL:

A. CONTRACTOR SHALL PROVIDE ALL ITEMS OF LABOR AND MATERIALS TO MAKE A COMPLETE INSTALLATION OF ELECTRICAL WORK, AS SHOWN ON DRAWINGS, AS SPECIFIED, AND AS NECESSARY FOR COMPLETE SYSTEMS, INCLUDING, BUT NOT LIMITED TO THE FOLLOWING:

1. MAIN POWER BRANCH/FEEDERS AS REQUIRED.
2. BRANCH FEEDER FOR POWER AND LIGHTING.
3. ALL ELECTRICAL CONDUCTORS AND CONDUIT.
4. ALL WIRING DEVICES, SAFETY SWITCHES.
5. ALL LIGHTING FIXTURES AND LAMPS.
6. ALL COMMUNICATION EMPTY CONDUIT SYSTEMS.
7. LIGHTNING SURGE PROTECTION DEVICE.
8. ANTENNA AND EQUIPMENT GROUNDING.

ELECTRICAL REQUIREMENTS

A. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL LOCAL AND NATIONAL ELECTRICAL CODES.

B. ALL WORK SHALL BE COMPLETED BY A CERTIFIED MASTER ELECTRICIAN.

C. ALL WORK SHALL CONFORM TO THE LATEST VERSION OF MOTOROLA R56 STANDARDS.

D. AFTER INSTALLATION TEST ALL CONDUCTORS FOR SHORTS AND GROUNDS BEFORE ENERGIZING.

GUARANTEE:

A. THE CONTRACTOR SHALL FURNISH A WRITTEN CERTIFICATE, GUARANTEEING ALL MATERIALS, EQUIPMENT AND LABOR FURNISHED BY CONTRACTOR TO BE FREE OF ALL DEFECTS FOR A PERIOD OF ONE YEAR FROM AND AFTER THE DATE OF FINAL ACCEPTANCE OF ELECTRICAL WORK. THE CONTRACTOR SHALL FURTHER GUARANTEE THAT IF ANY DEFECTS APPEAR WITHIN THE STIPULATED GUARANTEED PERIOD, SUCH WORK SHALL BE REPLACED WITHOUT COST TO THE OWNER.

FEEDERS, SWITCHES, METERING EQUIPMENT:

A. MAKE ARRANGEMENTS WITH OWNERS AS NEEDED TO BRING IN BRANCH FEEDERS FOR ELECTRICAL SERVICE AS SHOWN ON DRAWINGS. PAY ALL CHARGES INVOLVED THEREWITH. FURNISH, INSTALL FEEDER WIRE TO OWNER DISTRIBUTION PANEL. PROVIDE METER AS SHOWN ON DRAWINGS.

PANELBOARD CONSTRUCTION:

A. PANELBOARDS SHALL CONSIST OF A CAN, FRONT, INTERIOR AND CIRCUIT PROTECTIVE DEVICES AND SHALL BE MANUFACTURED IN ACCORDANCE WITH UNDERWRITER'S LABORATORIES. THE GAUGE OF METAL USED AND THE GUTTER SPACE SHALL BE IN ACCORDANCE WITH APPLICABLE UL STANDARDS. EACH PANEL SHALL HAVE A DOOR MOUNTED ON A SEMI-CONCEALED HINGES WITH A CYLINDER LOCK, INDEX CARD HOLDER PROPERLY FILLED IN AS TO CIRCUIT; ALL PANELS WITH MASTER KEY. ALL PANELS SHALL BE FINISHED WITH BAKED-ON GRAY ENAMEL, OVER RUST INHIBITOR COAT. PANEL BOARDS SHALL BE AS MANUFACTURED BY G.E., ITE, SQUARE "D" OR CUTLER HAMMER.

WIRING:

A. ALL CONDUCTORS SHALL BE MADE OF SOFT-DRAWN ANNEALED COPPER WITH A CONDUCTIVITY NOT LESS THAN THAT OF 90% PURE COPPER. ALL WIRE SIZE #10 AWG AND SMALLER SHALL BE SOLID CONDUCTOR TYPE; ALL #8 AWG AND LARGER SHALL BE STRANDED CONDUCTOR TYPE.

B. CONDUCTORS SHALL BE TYPE "THHN/THWN" INSULATION.

C. USE THE FOLLOWING COLOR CODES:

120/208V	SYSTEMS	120/240V	SYSTEMS
PHASE A	BLACK	PHASE A	BLACK
PHASE B	RED	PHASE B	RED
PHASE C	BLUE	PHASE C	BLUE
NEUTRAL	WHITE	NEUTRAL	WHITE
GROUND	GREEN	GROUND	GREEN

D. INSTALL CONDUCTORS IN CLEAN, DRY CONDUITS. USE UL APPROVED PULLING LUBRICANT WHERE REQUIRED.

E. USE #12 AS MINIMUM CONDUCTOR SIZE FOR POWER SYSTEMS. ALL CONTROL WIRES SHALL BE STRANDED AND TERMINATED WITH CRIMPED-ON LUGS.

F. MAKE CONNECTION, SPLICES AND TAPS ONLY IN APPROVED BOXES AND FITTINGS. FOR SMALL BRANCH CIRCUIT CONDUCTORS, FIRST TWIST CONDUCTORS TOGETHER, THEN INSTALL A "SCOTCHLOK" OR EQUAL SPRING CONNECTOR OF PROPER SIZE. FOR LARGE CONDUCTORS USE SPLIT-BOLT OR HYDRAULICALLY COMPRESSED CONNECTIONS, THEN APPLY ENOUGH LAYERS OF VINYL ELECTRICAL TAPE TO EQUAL THE INSULATION VALUE OF THE CONDUCTOR INSULATION.

G. WHERE FACTORY COLOR CODED CONDUCTORS ARE NOT AVAILABLE, INSTALL BANDS OF COLORED VINYL PLASTIC TAPE AT EACH END OF EACH CONDUCTOR.

CONDUIT:

A. PROVIDE A COMPLETE ASSEMBLY OF CONDUIT, TUBING OR DUCT WITH FITTINGS, INCLUDING, BUT NOT LIMITED TO, CONNECTORS, NIPPLES, COUPLINGS, LOCKNUTS, BUSHINGS, EXPANSION FITTINGS, OTHER COMPONENTS AND ACCESSORIES AS NEEDED. CONNECTIONS AND COUPLING MUST BE COMPRESSION TYPE TO MEET R56 FOR BONDING REQUIREMENTS.

B. FITTINGS SHALL BE DESIGNED AND APPROVED FOR THE SPECIFIC USE INTENDED. PROVIDE INSULATED THROATS OR BUSHINGS FOR ALL CONDUITS. GROUNDING BUSHINGS SHALL ALSO HAVE INSULATED THROATS.

C. MINIMUM CONDUIT SIZE IN ALL CASES SHALL BE 1/2" UNLESS MINIMUM SIZE IS SPECIFIED TO BE LARGER FOR SPECIFIC SYSTEMS SPECIFIED ELSEWHERE IN THE SPECIFICATIONS OR ON THE DRAWINGS.

D. RIGID STEEL CONDUIT SHALL BE HEAVY-WALL STEEL TUBE WITH METALLIC CORROSION-RESISTANT COATING ON INTERIOR AND EXTERIOR, HOT-DIPPED GALVANIZED, FREE FROM DEFECTS, MANUFACTURED IN ACCORDANCE TO ANSI STANDARDS, AND UL-LISTED. USE THREADED COUPLINGS. USE RIGID GALVANIZED STEEL CONDUIT IN ALL LOCATIONS UNLESS NOTED OTHERWISE.

E. UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 PVC (UNLESS NOTED OTHERWISE).

F. AS A MINIMUM, CONDUIT SIZES SHALL BE IN ACCORDANCE WITH NEC CONDUIT FILL REQUIREMENTS, REGARDLESS OF SIZE SCHEDULE OR INDICATED. IF LARGER SIZE IS SCHEDULED OR INDICATED, THE LARGER SIZE SHALL BE USED.

G. INSTALLATION:

1. ANCHOR CONDUIT WITH HANGERS, CONDUIT STRAPS OR OTHER DEVICES SPECIFICALLY DESIGNED FOR THE PURPOSE. WIRE TIES SHALL NOT BE PERMITTED. USE TRAPEZE HANGERS FOR MULTIPLE PARALLEL CONDUIT RUNS.
2. ALL CONCRETE INSERTS SHALL BE GALVANIZED OR CADMIUM PLATED; INDIVIDUAL HANGERS, TRAPEZE HANGERS AND RODS SHALL BE PRIME COATED.
3. INSTALL HORIZONTAL RUNS OF CONDUIT TO PROVIDE A NATURAL DRAIN TO PREVENT MOISTURE COLLECTING IN THE POCKETS OR TRAPS.
4. CAP CONDUIT ENDS UNTIL CONDUCTOR IS INSTALLED TO PREVENT FOREIGN OBJECTS FROM ENTERING CONDUIT.
5. FITTINGS AND CONDUITS SHALL BE APPROVED FOR GROUNDING PURPOSES OR SHALL BE JUMPERED WITH A COPPER GROUNDING CONDUCTOR OF PROPER AMPACITY. LEAVE TERMINATION OF SUCH JUMPERS EXPOSED.
6. INSTALL (2) 200 POUND NYLON PULL CORDS IN ROUGH-IN RACEWAYS.
7. INSTALL OFFSETS, PULL BOXES AND ELBOWS AS REQUIRED TO ACCOMPLISH A HARMONIOUS ROUTING OF THE SYSTEMS.
8. OPENINGS AROUND ELECTRICAL PENETRATIONS THROUGH FIRE RESISTANT RATED CONSTRUCTION SHALL BE FIRE-STOPPED USING APPROVED METHODS TO MAINTAIN THE FIRE RESISTANT RATING.

JUNCTION AND PULL BOXES:

A. USE GALVANIZED PULL AND JUNCTION BOXES THAT COMPLY WITH NEC AS TO SIZE AND CONSTRUCTION.

B. FOR JUNCTION AND PULL BOXES, USE BOXES NOT LESS THAN 4" SQUARE AND 1 1/2" DEEP WITH REMOVABLE COVERS.

C. IN WET AREAS OR OUTDOORS, USE CAST ALUMINUM OR CAST IRON BOXES WITH THREADED HUBS AND GASKETED COVERS.

D. INSTALL JUNCTION AND PULL BOXES IN ACCESSIBLE LOCATIONS. POSITION BOXES SO COVERS CAN BE REMOVED.

E. INSTALL BOXES ON CONCEALED CONDUITS WITH COVERS FLUSH WITH FINISH.

LP-GAS CONTAINERS

A. ALL ELECTRICAL EQUIPMENT AND WIRING WITHIN (5) FIVE FEET SHALL BE CLASS 1 DIVISION 1

B. ELECTRICAL WIRING AND EQUIPMENT (5) FIVE FEET TO (10) TEN FEET SHALL BE CLASS 1 DIVISION 2

GROUNDING

1.1 GENERAL

A. GROUNDING SHALL BE INSTALLED PER MOTOROLA R56 STANDARDS AND GUIDELINES FOR COMMUNICATIONS SITES.

1.2 CONNECTIONS

A. ALL EXTERNAL GROUNDING CONNECTIONS SHALL BE MADE BY THE EXOTHERMIC PROCESS, BY IRREVERSIBLE HIGH COMPRESSION, AND/OR BY 2-HOLE LONG BARREL LUGS. NO SINGLE-HOLE, CRIMP-ON, OR SOLDER CONNECTIONS SHALL BE USED. CONNECTIONS SHALL INCLUDE ALL CABLE TO CABLE SPLICE. ALL MATERIALS USED (MOLDS, WELDING METAL, TOOLS, ETC.) SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND PROCEDURES.

B. ALL INTERIOR GROUNDING AND BONDING CONDUCTORS SHALL BE CONNECTED BY TWO HOLE-TYPE (COMPRESSION) CONNECTIONS. MECHANICAL CONNECTIONS, FITTINGS OR CONNECTIONS THAT DEPEND SOLELY ON SOLDER SHALL NOT BE USED.

1.3 GROUND RODS

A. ALL GROUND RODS SHALL BE COPPER-CLAD STEEL 5/8" DIAMETER X 8'-0" LONG AND OF THE NUMBER AND AT LOCATIONS INDICATED. GROUND RODS SHALL BE DRIVEN FULL LENGTH VERTICALLY IN UNDISTURBED EARTH.

B. GROUND RODS SHALL BE LOCATED SO AS TO AVOID THE TOWER FOUNDATION.

C. IF ROCK IS ENCOUNTERED, GROUND RODS MAY BE DRIVEN AT AN OBLIQUE ANGLE OF NOT GREATER THAN 45 DEGREES FROM VERTICAL OR MAY BE BURIED HORIZONTALLY AND PERPENDICULAR TO THE BUILDING, IN A TRENCH AT LEAST 36" DEEP.

D. GROUND RODS SHALL BE BURIED TO A MINIMUM DEPTH OF 30 INCHES BELOW FINISHED GRADE, WHERE POSSIBLE, OR BURIED BELOW THE FREEZE LINE, WHICHEVER DEPTH IS GREATER.

E. GROUND RODS SHALL NOT BE INSTALLED MORE THAN 16 FEET APART (OR TWICE THE LENGTH OF THE ROD) AND NOT LESS THAN 6 FEET (PER NFPA 70, ARTICLE 250-56).

1.4 GROUND BARS

A. ALL GROUND BARS SHALL BE 1/4" THICK BARE COPPER PLATES AND OF SUFFICIENT SIZE TO GROUND ATTACHMENTS INDICATED IN THE DRAWINGS (MIN. 2" X 12"). HOLES SHALL BE 7/16" DIAMETER ON 3/4" CENTERS TO PERMIT THE CONVENIENT USE OF TWO-HOLE LUGS.

B. THE METHOD OF ATTACHMENT OF THE GROUNDING ELECTRODE CONDUCTOR TO EXTERIOR AND TOWER GROUND BARS SHALL BE EXOTHERMIC OR IRREVERSIBLE HIGH COMPRESSION.

1.5 CABLES

A. ALL EXTERIOR GROUNDING CABLES SHALL BE STANDARD #2 AWG TINNED SOLID BARE COPPER WIRE UNLESS INDICATED OTHERWISE ON DRAWINGS.

B. WHEN THE DIRECTION OF THE CONDUCTOR MUST CHANGE, IT SHALL BE DONE GRADUALLY. ALL BENDS SHALL BE MADE WITH THE GREATEST PRACTICAL RADIUS AND SHALL NOT BE LESS THAN 8".

C. ALL CONDUITS SHALL BE METALLICALLY SUPPORTED.

D. ALL CONDUITS USED AS RACEWAYS FOR GROUNDING CONDUCTORS SHALL BE BONDED AT BOTH ENDS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC).

E. PROVIDE WIRE PROTECTION PIPES AT ALL GROUND WIRES AT GRADE LEVEL PER DETAIL 7/E4.

1.6 GROUNDING RING

A. THE GROUND RING ENCIRCLING THE BUILDING SHALL BE A MINIMUM SIZE OF NO. 2 AWG BARE TINNED SOLID COPPER CONDUCTOR IN DIRECT CONTACT WITH THE EARTH AT A MINIMUM DEPTH OF 36 INCHES. CONDUCTOR BENDS SHALL HAVE A MINIMUM RADIUS OF 8 INCHES.

B. ALL EXTERNAL GROUND RINGS ARE TO BE JOINED TOGETHER AND ALL CONNECTIONS SHALL BE EXOTHERMIC OR IRREVERSIBLE HIGH COMPRESSION. NO LUGS OR CLAMPS WILL BE ACCEPTED.

1.7 FENCE/GATE

A. 1. GROUND ALL SECTIONS OF FENCE AND GATE AS INDICATED ON DRAWINGS. GROUND EACH GATE POST AND CORNER POST. ALL CONNECTIONS FOR THE FENCE GROUND SYSTEM SHALL BE EXOTHERMIC WELD AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND PROCEDURES.

1.8 DISSIMILAR METALS

A. BONDING OF TWO DISSIMILAR METALS MAY RESULT IN GALVANIC CORROSION, A REACTION THAT OCCURS AT THE JUNCTION OF DISSIMILAR METALS WHEN THEY ARE EXPOSED TO MOISTURE. THE DEGREE AND RATE OF CORROSION DEPENDS ON THE RELATIVE POSITION OF THE METALS IN THE ELECTROCHEMICAL SERIES. TO DETERMINE THE LIKELIHOOD OF TWO METALS REACTING REFERENCE SECTION 6.5.2 IN THE R56 SPECIFICATIONS.

1. THE SAME METAL SHALL BE USED THROUGHOUT THE SYSTEM WHEN POSSIBLE.
2. EXOTHERMICALLY WELD CONNECTIONS OF DIFFERENT METALS WHEN WELD MATERIAL IS AVAILABLE FOR THE METALS BEING BONDED.
3. COPPER CONDUCTORS SHALL NOT BE INSTALLED ON ALUMINUM ROOFING OR SIDING.
4. ALUMINUM AND COPPER SHALL NOT BE DIRECTLY CONNECTED TO EACH OTHER UNLESS USING EXOTHERMIC WELDING MATERIALS SPECIFICALLY INTENDED FOR THESE TWO METALS TO MAKE THE CONNECTION. ALUMINUM AND COPPER MAY BE JOINED WITH THE USE OF A LISTED BIMETALLIC TRANSITION CONNECTOR OF STAINLESS STEEL. THESE CONNECTORS SHALL BE LISTED FOR THE SIZE AND NUMBER OF CONDUCTORS AND MARKED WITH AL/CU. THESE CONNECTIONS SHALL BE LIBERALLY COATED WITH A CONDUCTIVE ANTIOXIDANT AT THE POINT OF INSERTION INTO THE CONNECTOR.
5. COPPER SHALL NOT COME IN CONTACT WITH GALVANIZED STEEL.
6. TINNED COPPER SHALL BE USED WHEN CONNECTING TO A GALVANIZED STEEL STRUCTURE.

1.9 ANTI-OXIDANT

A. ANTI-OXIDANT COMPOUND SHALL BE USED BETWEEN ALL EXTERNAL MECHANICAL CONNECTIONS. CARE SHALL BE TAKEN TO USE THE APPROPRIATE ANTI-OXIDANT TYPE. ZINC ANTI-OXIDANT (GRAY COLOR) SHALL BE USED WHEN CONNECTING TO GALVANIZED AND ALUMINUM OBJECTS AND COPPER ANTI-OXIDANT (COPPER COLOR) SHALL BE USED WHEN CONNECTING TO COPPER OBJECTS.

1.10 TEST PROCEDURE

A. THE GROUND SYSTEM RESISTANCE SHALL NOT EXCEED 10 OHMS. A DESIGN GOAL OF 5 OHMS IS RECOMMENDED. TESTING SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 6.6 IN MOTOROLA R56 SPECIFICATIONS (DATED 9-1-05).

B. GROUND TEST MUST BE PERFORMED PRIOR TO UTILITY CONNECTION AND GROUND CONNECTION TO EXISTING SITE COMMON GROUNDING ELECTRODE SYSTEM.

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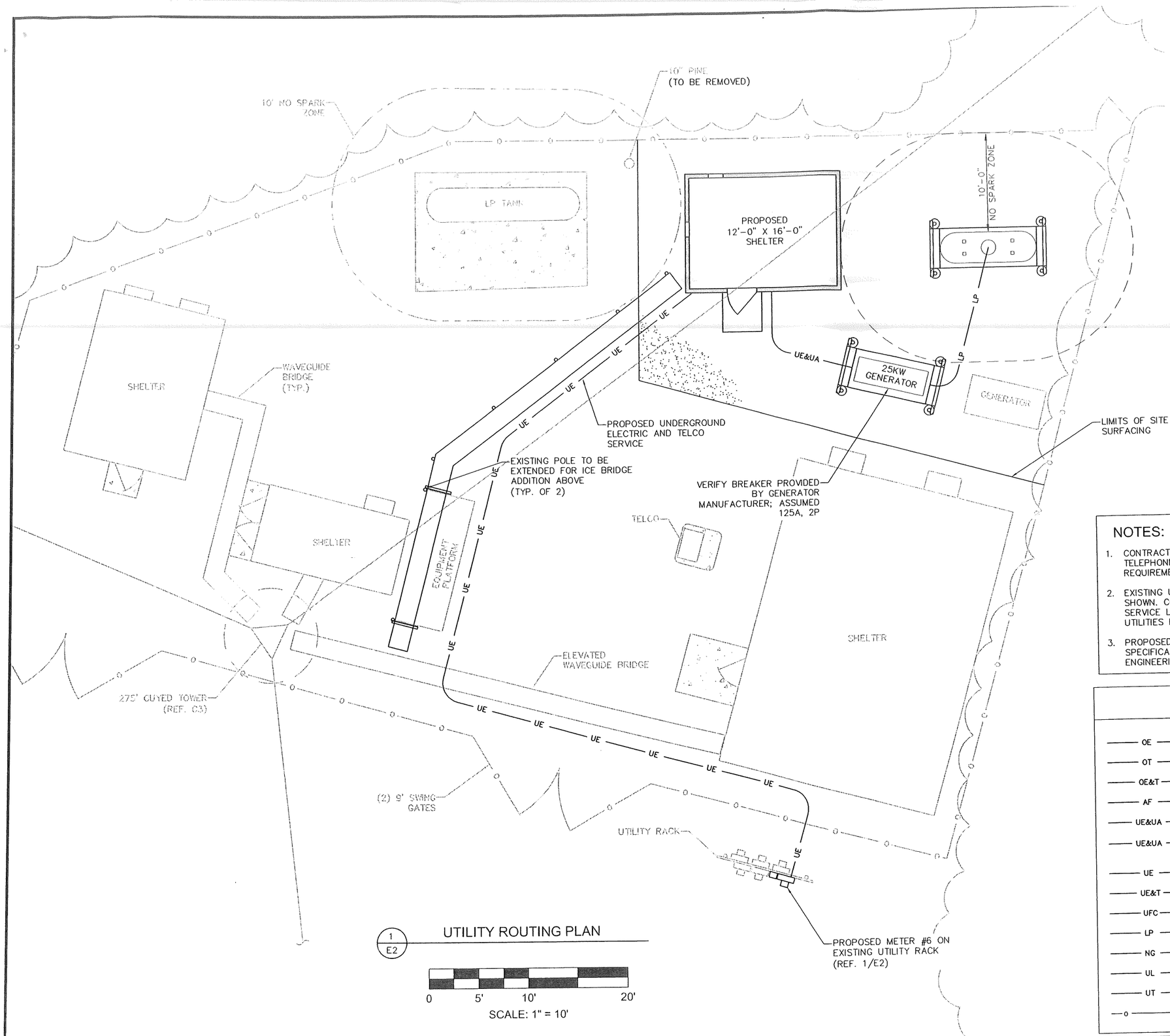
ELEC/TELCO GENERAL NOTES

E1



1/E2 UTILITY ROUTING PLAN

0 5' 10' 20'

SCALE: 1" = 10'

NOTES:

1. CONTRACTOR TO COORDINATE WITH LOCAL TELEPHONE & POWER PROVIDERS FOR REQUIREMENTS PRIOR TO INSTALLATION.
2. EXISTING UNDERGROUND UTILITIES ARE NOT SHOWN. CONTRACTOR SHALL HAVE LOCATOR SERVICE LOCATE AND MARK UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.
3. PROPOSED GENERATOR AND L.P. TANK SPECIFICATIONS TO BE PROVIDED BY NORTHWIND ENGINEERING.

LEGEND

OE	OVERHEAD ELECTRIC
OT	OVERHEAD TELCO
OE&T	OVERHEAD ELECTRIC & TELCO
AF	ABOVEGROUND FUEL
UE&UA	UNDERGROUND ALARMS
UE&UA	UNDERGROUND ALARMS & MISC. ELECTRIC
UE	UNDERGROUND ELECTRIC
UE&T	UNDERGROUND ELECTRIC & TELCO
UFC	UNDERGROUND FIBER OPTICS CABLE
LP	UNDERGROUND LP FUEL
NG	UNDERGROUND NATURAL GAS
UL	UNDERGROUND LIGHTING
UT	UNDERGROUND TELCO
o	CHAIN LINK FENCE

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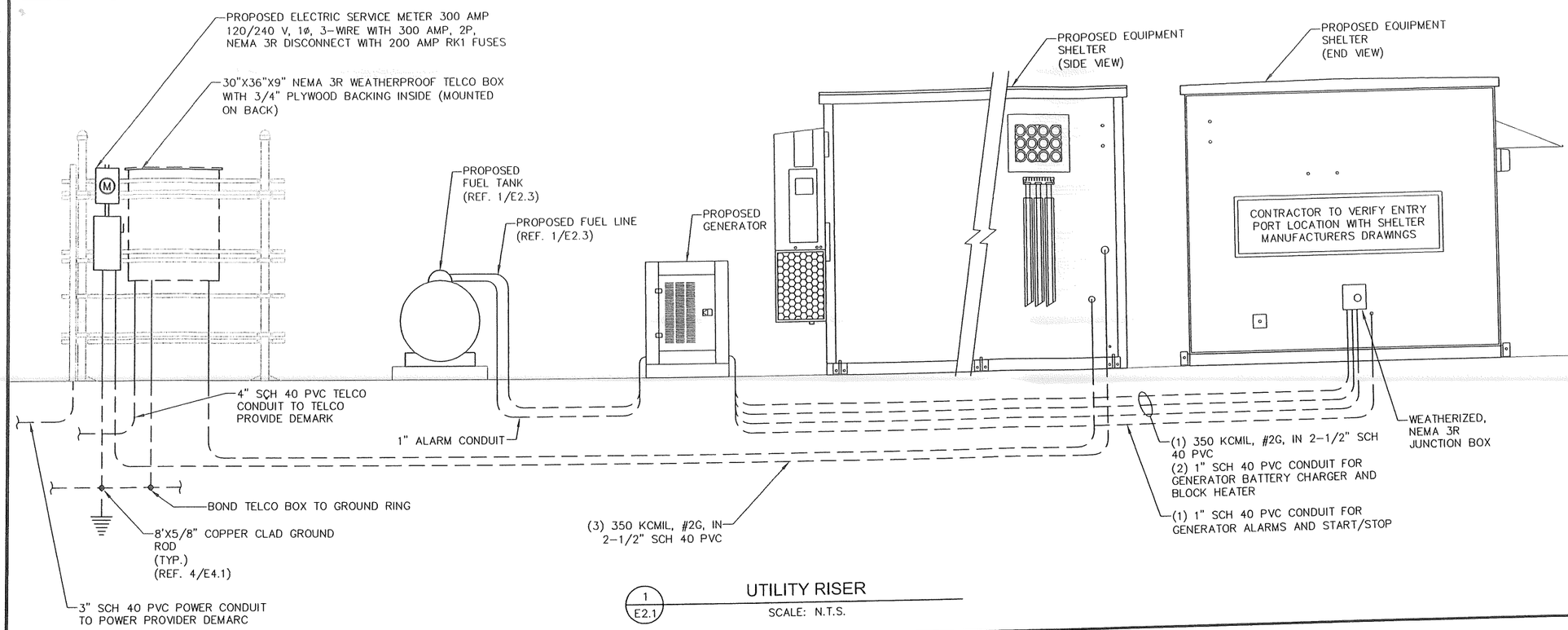
UTILITY ROUTING PLAN

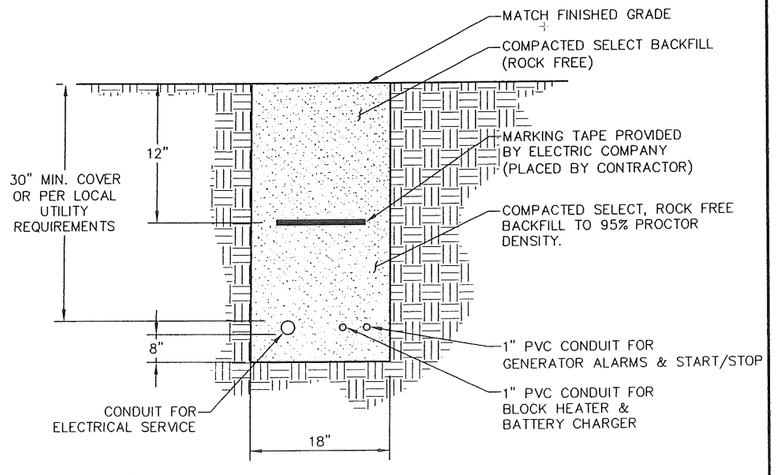
E2



1 / E2.1 UTILITY RISER
SCALE: N.T.S.

NOTES:

1. ALL UNDERGROUND PRIMARY CABLE SHALL BE MARKED IN THE TRENCH USING MARKING TAPE PROVIDED BY UTILITY COMPANY.
2. THE MARKING TAPE SHALL BE PLACED APPROXIMATELY 12 INCHES BELOW FINISHED GRADE, AS SHOWN BELOW, WHILE BACKFILLING ELECTRICAL TRENCH.
3. SELECTED BACKFILL OF ROCK-FREE SOIL SHALL BE PLACED IN 6 INCH LAYERS AT A TIME AND EACH LAYER WELL TAMPED.
4. MINIMUM 30" COVER OVER CONDUIT.
5. ALL HORIZONTAL RUNS OF UNDERGROUND CONDUIT SHALL BE SCHEDULE 40 PVC UNLESS INSTALLING UNDER ROAD BED OR ANY TRAFFIC AREAS WHERE IT SHALL BE SCHEDULE 80 PVC. CONDUIT SUPPLIED AND INSTALLED BY CONTRACTOR.
6. ALL CONDUIT BENDS SHALL BE LONG SWEEP TYPE.



2 / E2.1 TYPICAL ELECTRICAL TRENCH
N.T.S.

ONE LINE DIAGRAM TO BE PROVIDED BY SHELTER MANUFACTURER

3 / E2.1 ELECTRICAL ONE LINE DIAGRAM
SCALE: N.T.S.

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MOTOROLA SOLUTIONS

SOUTH PORTLAND (ATC #10047)

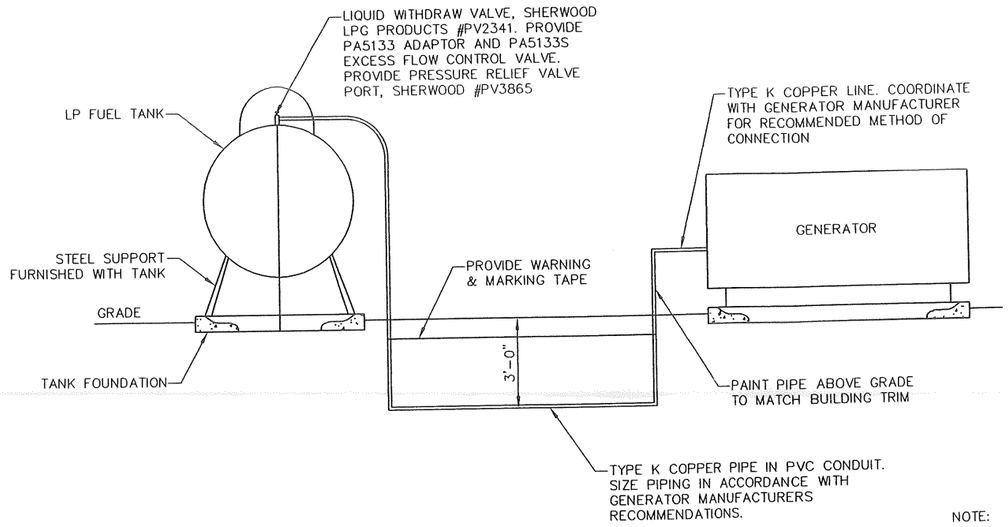
SET ISSUED FOR REVIEW — DATE 02/15/11

REVISIONS

NO.	DATE	DESCRIPTION

UTILITY DETAILS

E2.1

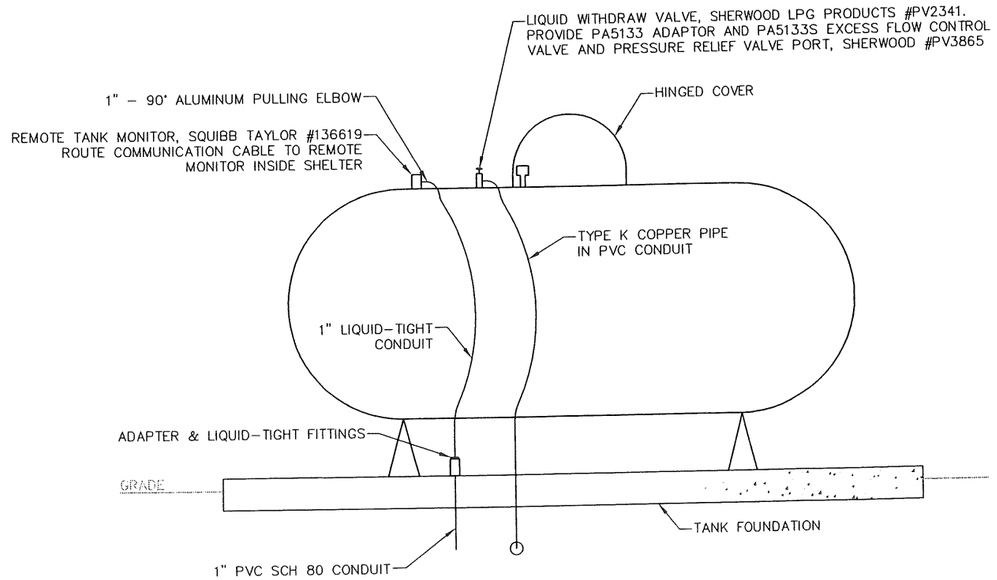


NOTE:

SECURE TANK AND GENERATOR TO FOUNDATIONS WITH GALV. OR S.S. HARDWARE

1 / E2.3 LIQUID PROPANE PIPING DETAIL

SCALE: N.T.S.



2 / E2.2 LIQUID PROPANE HARDWARE CONNECTION DETAIL

SCALE: N.T.S.

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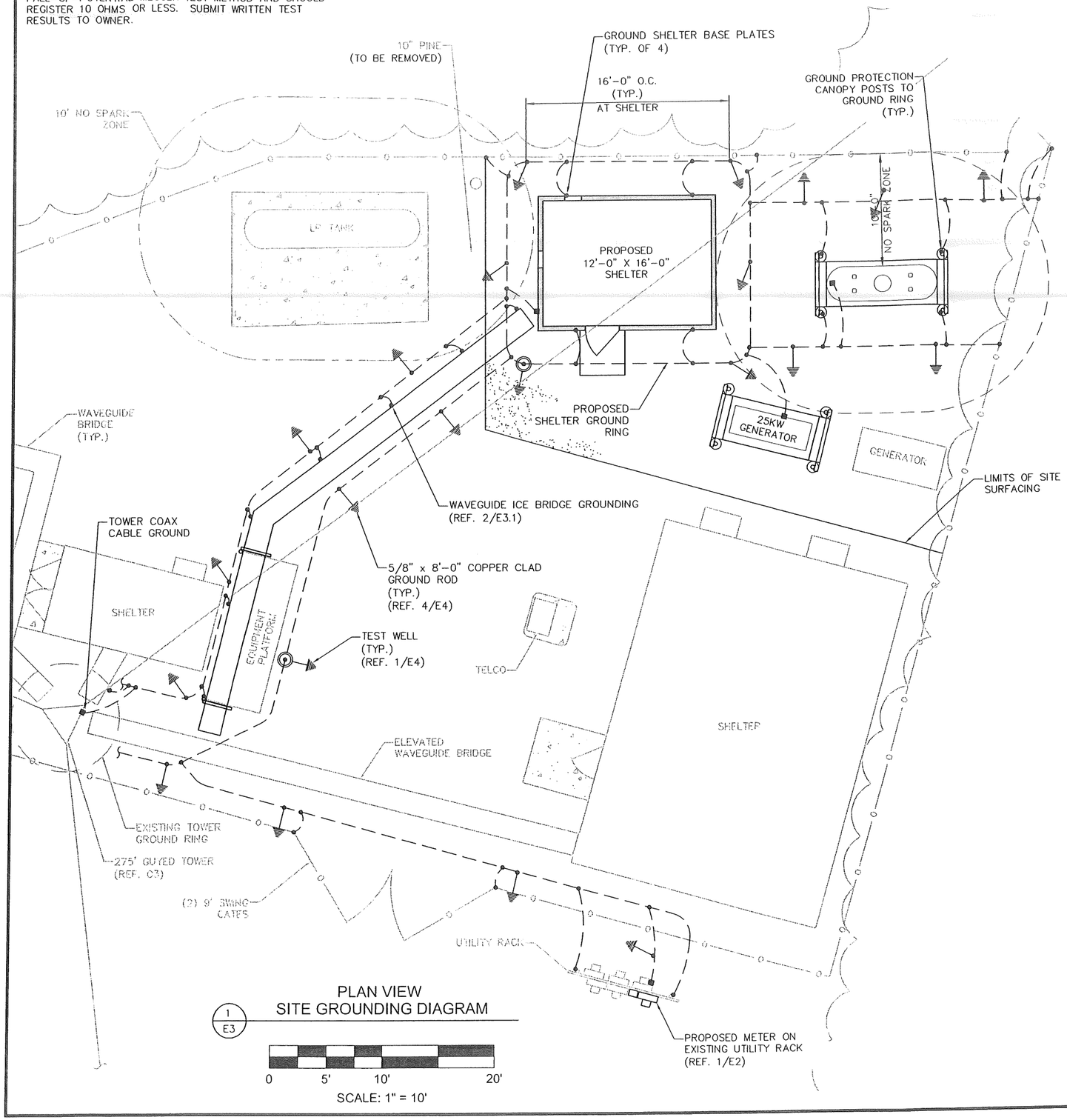
LP TANK DETAILS

E2.2

TESTING NOTE:
GROUNDING SYSTEM TO BE TESTED AFTER INSTALLATION AND WILL CONSIST OF THE THREE POINT, FALL-OF-POTENTIAL MEGGER TEST METHOD AND SHOULD REGISTER 10 OHMS OR LESS. SUBMIT WRITTEN TEST RESULTS TO OWNER.

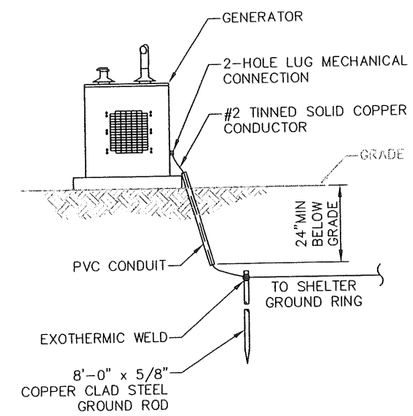


1/E3 PLAN VIEW
SITE GROUNDING DIAGRAM

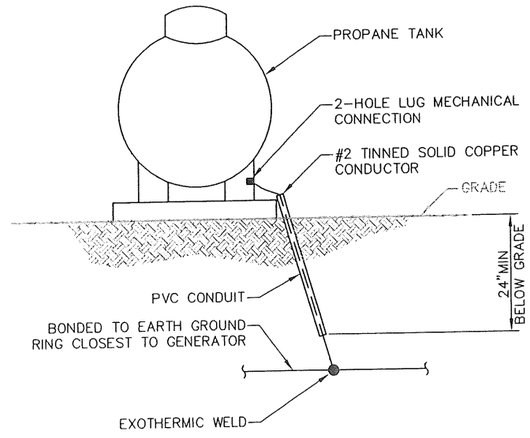
0 5' 10' 20'
SCALE: 1" = 10'

LEGEND

- EXOTHERMIC WELD
- MECHANICAL CONNECTION
- GROUND ROD WITH EXOTHERMIC WELD
- GROUND ROD WITH INSPECTION WELL
- #2 TINNED SOLID BARE COPPER GROUND WIRE
- FENCE



2/E3 GENERATOR GROUNDING DETAIL
N.T.S.



3/E3 LP TANK GROUNDING DETAIL
N.T.S.

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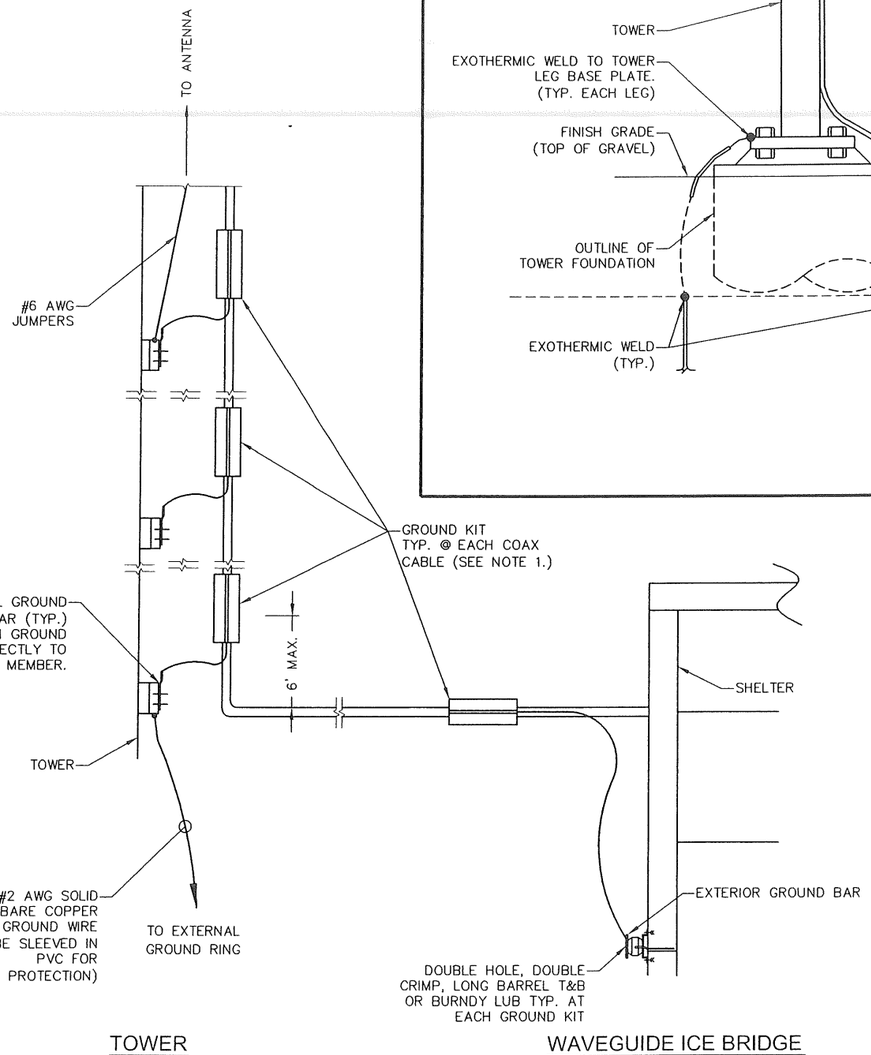
SITE GROUNDING PLAN

E3

NOTE:

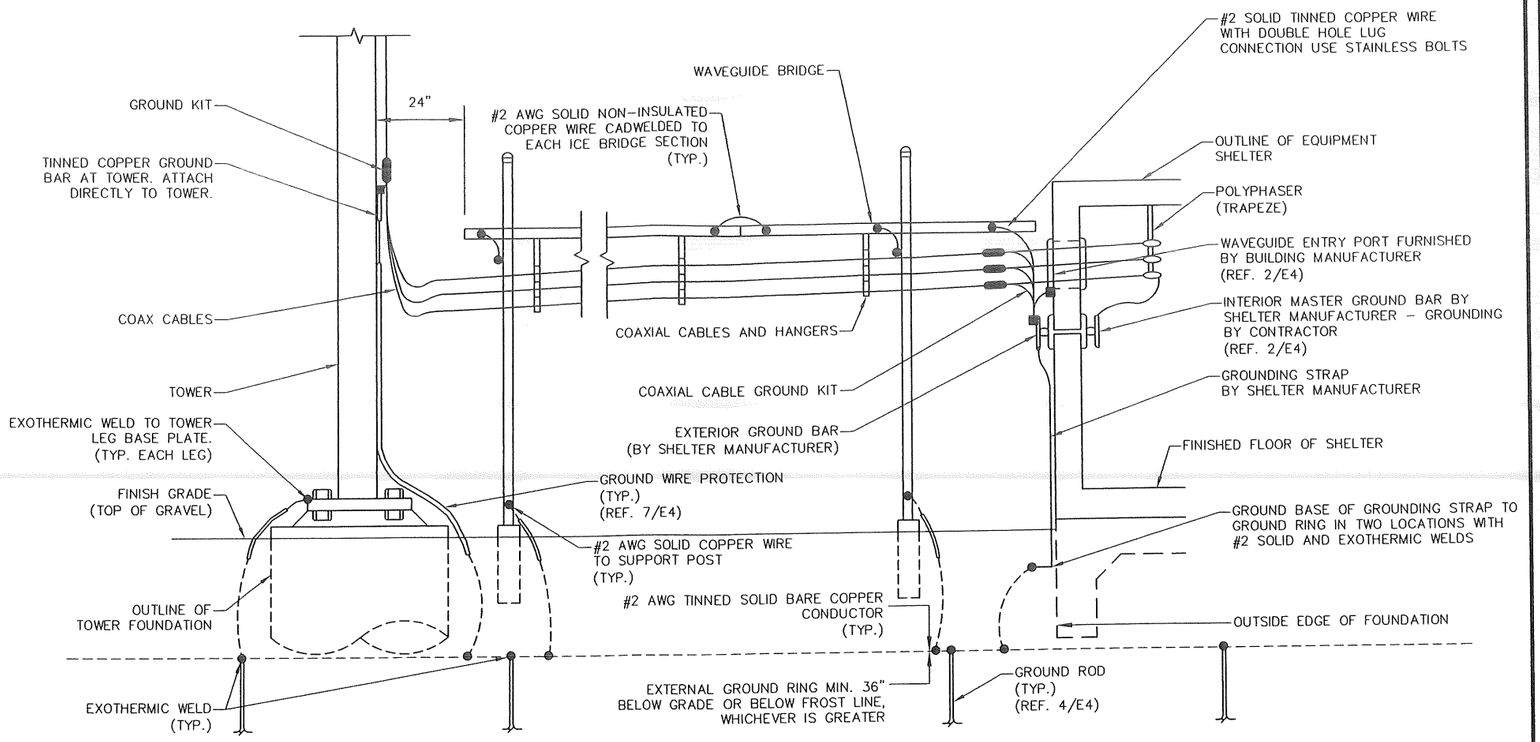
1. BUS BARS AND COAX GROUNDING SHALL BE REQUIRED AT MINIMUM INTERVALS OF 75' AS WELL AS AT THE TOP AND BASE OF THE TOWER.



COAX CABLE GROUNDING DETAILS

1 / E3.1

SCALE: N.T.S.



TYPICAL SHELTER/WAVEGUIDE BRIDGE/TOWER GROUNDING

2 / E3.1

SCALE: N.T.S.

THIS SPACE HAS BEEN INTENTIONALLY LEFT BLANK

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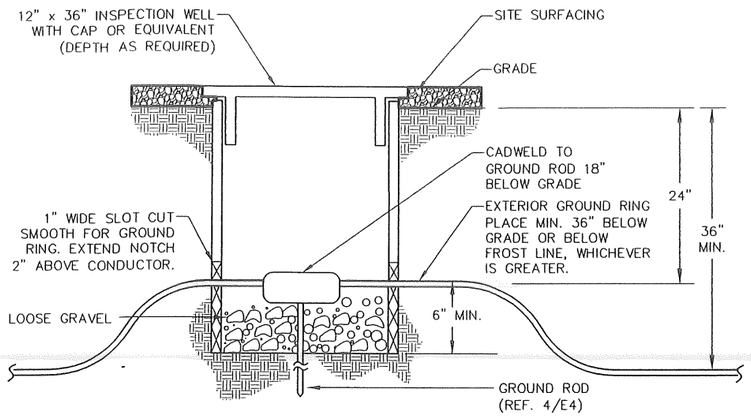
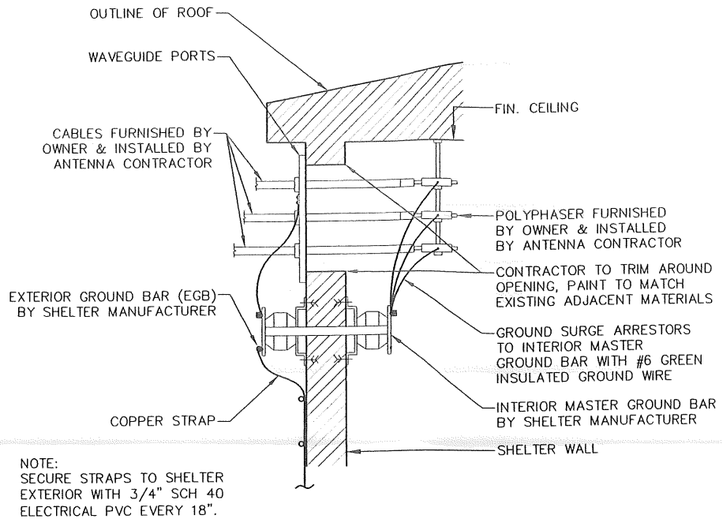
EQUIPMENT GROUNDING SYSTEM

E3.1



1/E4 INSPECTION WELL DETAIL

SCALE: N.T.S.

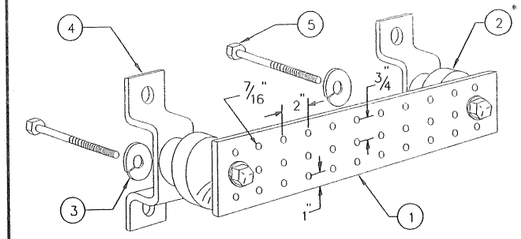


NOTE:
SECURE STRAPS TO SHELTER EXTERIOR WITH 3/4" SCH 40 ELECTRICAL PVC EVERY 18".

2/E4 GROUND AT PORT PLATE

SCALE: N.T.S.

* REMOVE INSULATORS AND USE ANGLE ADAPTORS FOR TOP-MOUNTED GROUND BARS

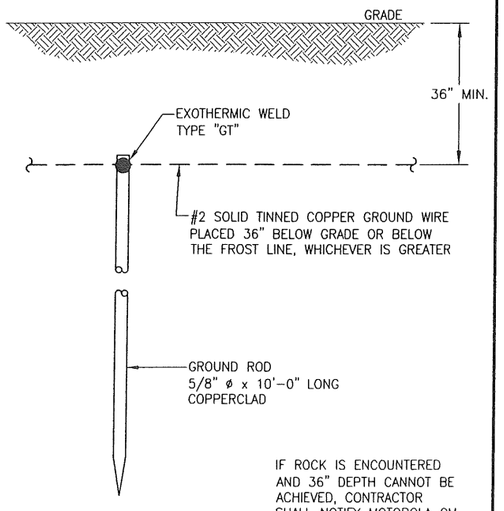


LEGEND

1 - COPPER GROUND BAR PLATE, 1/4"X 4"X 24", NEWTON INSTRUMENT CO. CAT. NO. B-6142. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION
2 - INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4
3 - 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8
4 - MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056
5 - 5/8-11 X 1" H.H.C.S. BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1

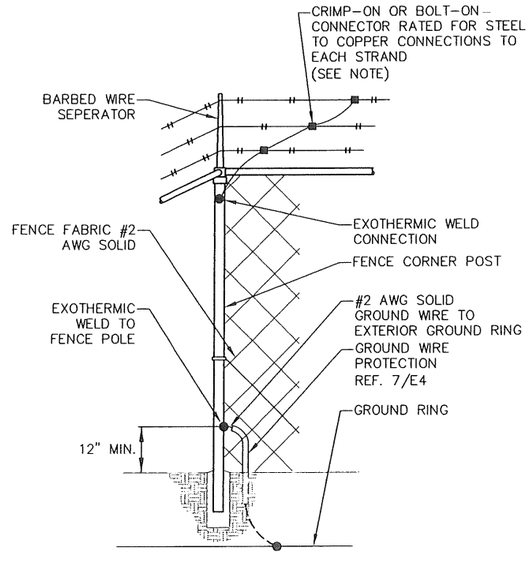
3/E4 TYPICAL GROUND BAR

N.T.S.



4/E4 GROUND ROD

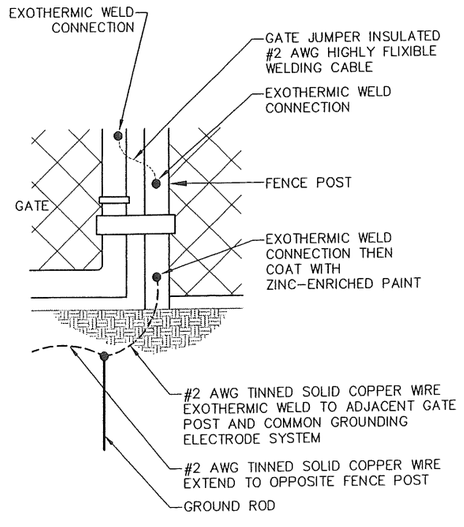
SCALE: N.T.S.



NOTE: MIN. BENDING RADIUS FOR ALL GROUND WIRES IS 8".

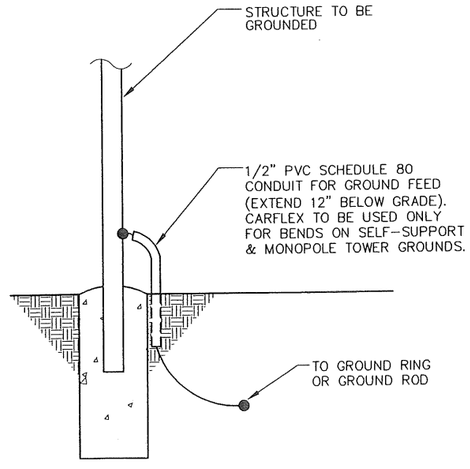
5/E4 CORNER POST FENCE GROUNDING DETAIL

SCALE: N.T.S.



6/E4 GATE GROUND DETAIL

N.T.S



NOTE: CONDUIT SHALL BE PROPERLY CAPPED AND SEALED AT ENDS.

7/E4 GROUND WIRE PROTECTION

SCALE: N.T.S.

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E4