Updated 01/06/06

STATE PROJECT

July 6, 2005
Supersedes August 4, 2004

BIDDING INSTRUCTIONS

FOR ALL PROJECTS:

1. Use pen and ink to complete all paper Bids.

2. As a minimum, the following must be received prior to the time of Bid opening:

   For a Paper Bid:
   a) a copy of the Notice to Contractors, b) the completed Acknowledgement of Bid Amendments form, c) the completed Schedule of Items, d) two copies of the completed and signed Contract Offer, Agreement & Award form, e) a Bid Guaranty, and f) any other certifications or Bid requirements listed in the Bid Documents as due by Bid opening.

   For an Electronic Bid:
   a) a completed Bid using Expedite® software and submitted via the Bid Express™ web-based service, b) a Bid Guaranty (as described below) or a faxed copy of a Bid Bond (with original to be delivered within 72 hours), and c) any other certifications or Bid requirements listed in the Bid Documents as due by Bid opening.

3. Include prices for all required items in the Schedule of Items. ("Zero is not considered a Bid price.")

4. Include a Bid Guaranty. Acceptable forms are:

   a. a properly completed and signed Bid Bond on the Department's prescribed form (or on a form that does not contain any significant variations from the Department's form as determined by the Department) for 5% of the Bid Amount or

   b. an Official Bank Check, Cashier's Check, Certified Check, U.S. Postal Money Order or Negotiable Certificate of Deposit in the amount stated in the Notice to Contractors.

5. If a paper Bid is to be sent, Federal Express overnight delivery is suggested as the package is delivered directly to the DOT Headquarters Building in Augusta. Other means, such as U.S. Postal Service's Express Mail has proven not to be reliable.

IN ADDITION, FOR FEDERAL AID PROJECTS:

6. Complete the DBE Proposed Utilization form in the proper amounts, and deliver to the Contracts section by 4:30 PM on bid opening day

If you need further information regarding Bid preparation, call the DOT Contracts Section at (207)624-3410.

For complete bidding requirements, refer to Section 102 of the Maine Department of Transportation, Standard Specifications, Revision of December 2002.

January 30, 2004
Supercedes February 11, 2003

NOTICE

The Maine Department of Transportation is attempting to improve the way Bid Amendments/Addendums are handled, and allow for an electronic downloading of bid packages from our website, while continuing to maintain a planholders list.

Prospective bidders, subcontractors or suppliers who wish to download a copy of the bid package and receive a courtesy notification of project specific bid amendments, must provide an email address to Diane Barnes or Mike Babb at the MDOT Contracts mailbox at: MDOT.contracts@maine.gov. Each bid package will require a separate request.

Additionally, interested parties will be responsible for reviewing and retrieving the Bid Amendments from our web site, and acknowledging receipt and incorporating those Bid Amendments in their bids using the Acknowledgement of Bid Amendment Form.

The downloading of bid packages from the MDOT website is not the same as providing an electronic bid to the Department. Electronic bids must be submitted via http://www.BIDX.com. For information on electronic bidding contract Larry Childs at Larry.Childs@maine.gov.

NOTICE

For security and other reasons, all Bid Packages which are mailed, shall be provided in double (one envelope inside the other) envelopes. The *Inner Envelope* shall have the following information provided on it:

Bid Enclosed - Do Not Open
PIN:
Town:
Date of Bid Opening:
Name of Contractor with mailing address and telephone number:

In Addition to the usual address information, the *Outer Envelope* should have written or typed on it:

Double Envelope: Bid Enclosed
PIN:
Town:
Date of Bid Opening:
Name of Contractor:
This should not be much of a change for those of you who use Federal Express or similar services.

Hand-carried Bids may be in one envelope as before, and should be marked with the following infrormation:

Bid Enclosed: Do Not Open
PIN:
Town:
Name of Contractor:

STATE OF MAINE DEPARTMENT OF TRANSPORTATION

Bid Guaranty-Bid Bond Form

KNOW ALL MEN BY THESE PRESENTS THAT_____

_____, of the City/Town of _____and State of_____

as Principal, and _____as Surety, a

Corporation duly organized under the laws of the State of_____and having a usual place of

Business in _____and hereby held and firmly bound unto the Treasurer of

the State of Maine in the sum of_____,for payment which Principal and Surety bind

themselves, their heirs, executers, administrators, successors and assigns, jointly and severally.

The condition of this obligation is that the Principal has submitted to the Maine Department of Transportation, hereafter Department, a certain bid, attached hereto and incorporated as a part herein, to enter into a written contract for the construction of _____

_____

_____and if the Department shall accept said bid and the Principal shall execute and deliver a contract in the form attached hereto (properly completed in accordance with said bid) and shall furnish bonds for this faithful performance of said contract, and for the payment of all persons performing labor or furnishing material in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said bid, then this obligation shall be null and void; otherwise it shall remain in full force, and effect.

Signed and sealed this_____day of _____20_____

WITNESS:

_____

_____

_____

PRINCIPAL:

By_____

By:_____

By:_____

WITNESS

_____

_____

_____

SURETY:

By_____

By:_____

Name of Local Agency: _____

NOTICE

Bidders:

Please use the attached “Request for Information” form when faxing questions and comments concerning specific Contracts that have been Advertised for Bid. Include additional numbered pages as required. Questions are to be faxed to the number listed in the Notice to Contractors. This is the only allowable mechanism for answering Project specific questions. Maine DOT will not be bound to any answers to Project specific questions received during the Bidding phase through other processes.

State of Maine
Department of Transportation

REQUEST FOR INFORMATION

Date _____ Time _____

Information Requested: **PIN: _____ Town(s): _____**

Request by: _____ Phone: (_____)_____
Bid Date: _____ Fax: (_____)_____

Complete top portion of form and transmit to the number listed in the Notice to Contractors

RFI No: _____ RFI received: _____

Response:_____

Response By:_____ Date: _____

State of Maine

VENDOR FORM

For New Vendors & for Updates on Current Vendors

Special Instructions:

PLEASE PRINT CLEARLY

Return this form to:

*** = MUST BE COMPLETED TO PROCESS**

ONLY ONE NAME/VENDOR PER FORM

New Vendor	Address Change	Multi Address	Name Change	Contact Update	ID # Change

Social Security Number*
Individual or Sole Proprietor

S

Business name in "DBA" field below.

OR

Please fill in ONE.

Federal Taxpayer ID Number*
Corporation

E

Business name in "Name" field below.

This form will affect all transactions with ALL state agencies.

NEW:* **Remit to Address:** Individual or Business Name.	**OLD:** Old number:
Name*	Name
DBA or C/O	DBA or C/O
Address*	Address
Tel #*	Tel #

	Is this the same name on your Social Security card?	Acct #	
	If not, have you told Social Security about your name change?	Provider #	

Signature*

Contact Name

Print Name or Title

Accounts Receivable Contact Name

Date* (within 3 months)

Phone # if Different or for Contact Info

Vendor Indicators: Enter Y (Yes) For All Categories Listed Below That Apply To This Vendor

Dealer:		Manufacturer:		Factory Rep:	
Jobber:		Retailer:		Commodity:	
Individual:		Partnership:		Incorporated:	
Minority:		Small Business:		In-State:	

Information on State Agency Submitting Vendor Form

State Agency* & SHS #

Contact Person Name & Title*

Telephone #*

Send to: Maine Department of Transportation/ Contracts 16 SHS, Augusta, ME 04333-0014 Attn: Pat Brown

May-04

INSTRUCTIONS FOR COMPLETING VENDOR FORM

1. **Print Clearly**
2. **All sections marked with an * must be completed for processing**
3. **Send completed form to requesting State agency OR remit to address at bottom of form.**
4. **Do NOT send by Fax. Only originals will be accepted.**

FIELDS	**INFORMATION NEEDED FOR FIELD**
Special Instructions	*Instructions to Vendor from Agency requesting information.*
Return to	*The location of agency where the form is to be mailed back to. If none use address at bottom of form.*
Boxes above SSN/EIN Fields	Please check mark all that apply to the vendor. If other, please specify. If it's a new vendor only one will apply: "New Vendor"
Social Security Number	Individuals, individuals "doing business as", and individuals without a Federal Taxpayer ID #. Use if not using EIN
Federal Taxpayer ID Number*	Businesses or professionals providing services. (ID # needs to be use for REMITTANCE purposes.) Use if not using SSN
New	Current Information
Old	Old information (If another ID# had been used please put it next to "OLD")
Name	Individual's Name or Business Name. ONLY ONE name per a form.
DBA or C/O	"Doing business as" or "In Care Of"
Address	REMITTANCE ADDRESS - Street Address OR PO Box (one or the other)
Tel #	Phone Number of individual or business
Signature	Individual or authorized representative of individual or authorized representative of the business
Date	Current Date (no more than 3 months old)
Contact Name	Contact person at business
Accounts Receivable Contact Name	Contact person at business for accounts receivables.
Phone #	Phone for Act Rec Contact
Vendor Indicators	Indicate all that apply for the vendor, as needed
Agency Info	For Agency personnel submitting the form. Contact info incase of questions.

STATE OF MAINE DEPARTMENT OF TRANSPORTATION
NOTICE TO CONTRACTORS

Sealed Bids addressed to the Maine Department of Transportation, Augusta, Maine 04333 and endorsed on the wrapper "Bids for a **Radio Communications Tower** in the town of Bar Harbor" will be received from contractors at the Reception Desk, Maine DOT Building, Child Street, Augusta, Maine, until 11:00 o'clock A.M. (prevailing time) on March 28, 2007, and at that time and place publicly opened and read. Bids will be accepted from contractors prequalified by the Department of Transportation for Similar projects. All other Bids may be rejected. MDOT provides the option of electronic bidding. We now accept electronic bids for those bid packages posted on the bidx.com website. Electronic bids do not have to be accompanied by paper bids. Please note: the Department will accept a facsimile of the bid bond; however, the original bid bond must then be received at the MDOT Contract Section within 72 hours of the bid opening. During this transition, dual bids (one paper, one electronic) will be accepted, with the paper copy taking precedence.

Description: State Project, PIN 14276.00

Location: In Hancock County, on Cadillac Mountain in Bar Harbor, Maine.

Outline of Work: Installation of reinforced concrete slab, prefabricated shelter, generator, radio tower and equipment, and other incidental work.

Contractor's bid package must include a list of 3 examples of successful completion of similar turn-key projects. This list shall include names, addresses and phone numbers of the owner for who the work was performed for.

For general information regarding Bidding and Contracting procedures, contact Scott Bickford at (207)624-3410. Our webpage at http://www.state.me.us/mdot/project/design/homepg.htm contains a copy of the schedule of items, Plan Holders List, written portions of bid amendments (not drawings), and bid results. For Project-specific information fax all questions to **Project Manager Clifton Curtis** at (207)624-3431. Questions received after 12:00 noon of Monday prior to bid date will not be answered. Bidders shall not contact any other Departmental staff for clarification of Contract provisions, and the Department will not be responsible for any interpretations so obtained. Hearing impaired persons may call the Telecommunication Device for the Deaf at (207) 624-3007.

Plans, specifications and bid forms may be seen at the Maine DOT Building in Augusta, Maine. They may be purchased from the Department between the hours of 8:00 a.m. to 4:30 p.m. by cash, credit card (Visa/Mastercard) or check payable to Treasurer, State of Maine sent to Maine Department of Transportation, Attn.: Mailroom, 16 State House Station, Augusta, Maine 04333-0016. They also may be purchased by telephone at (207)624-3536 between the hours of 8:00 a.m. to 4:30 p.m. Bid Book $10 ($13 by mail), Single Sheets $2, payment in advance, all non-refundable.

Each Bid must be made upon blank forms provided by the Department and must be accompanied by a bid bond at 5% of the bid amount or an official bank check, cashier's check, certified check, certificate of deposit, or United States postal money order in the amount of $12,000 payable to Treasurer, State of Maine as a Bid guarantee. A Contract Performance Surety Bond and a Contract Payment Surety Bond, each in the amount of 100 percent of the Contract price, will be required of the successful Bidder.

This Contract is subject to all applicable Federal Laws. This contract is subject to compliance with the Disadvantaged Business Enterprise program requirements as set forth by the Maine Department of Transportation.

All work shall be governed by "State of Maine, Department of Transportation, Standard Specifications, Revision of December 2002", price $10 [$13 by mail], and Standard Details, Revision of December 2002, price $20 [$25 by mail] Standard Detail updates can be found at http://www.state.me.us/mdot/project/design/homepg.htm

The right is hereby reserved to the MDOT to reject any or all Bids.

Augusta, Maine
March 14, 2007

JOHN E. DORITY
CHIEF ENGINEER

SCHEDULE OF ITEMS REVISED:

CONTRACT ID: 014276.00 PROJECT(S): 14276.00

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
	SECTION 0001 PROJECT ITEMS					
0010	643.97 RADIO COMMUNICATIONS TOWER--SELF-SUPPORTING	LUMP	LUMP			
0020	643.971 RADIO COMMUNICATIONS TOWER--INSPECTION & ACCEPTANCE FIELD INSPECTION	LUMP	LUMP			
0030	643.972 RADIO COMMUNICATIONS TOWER--INSPECTION & ACCEPTANCE- FINAL ACCEPTANCE	LUMP	LUMP			
0040	643.973 RADIO COMMUNICATIONS TOWER--INSPECTION & ACCEPTANCE TRAINING	LUMP	LUMP			
0050	643.98 EMERGENCY POWER GENERATOR SYSTEM	LUMP	LUMP			
0060	643.981 EMERGENCY POWER GENERATOR--INSPECTION & ACCEPTANCE FIELD INSPECTION	LUMP	LUMP			
0070	643.982 EMERGENCY POWER GENERATOR--INSPECTION & ACCEPTANCE TESTING	LUMP	LUMP			
0080	643.983 EMERGENCY POWER GENERATOR--INSPECTION & ACCEPTANCE FINAL ACCEPTANCE	LUMP	LUMP			

SCHEDULE OF ITEMS REVISED:

CONTRACT ID: 014276.00 PROJECT(S): 14276.00

CONTRACTOR :_____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS	UNIT PRICE CTS	BID AMOUNT DOLLARS	BID AMOUNT CTS
0090	643.99 COMMUNICATIONS EQUIPMENT SHELTER: MODULAR, PRE-FABRICATED PRE-OUTFITTED	LUMP	LUMP			
0100	643.991 COMMUNICATIONS EQUIPMENT SHELTER--INSPECTION & ACCEPTANCE FIELD INSPECTION	LUMP	LUMP			
0110	643.992 COMMUNICATIONS EQUIPMENT SHELTER--INSPECTION & ACCEPTANCE FINAL ACCEPTANCE	LUMP	LUMP			
0120	643.993 COMMUNICATIONS EQUIPMENT SHELTER--INSPECTION & ACCEPTANCE TRAINING	LUMP	LUMP			
0130	659.10 MOBILIZATION	LUMP	LUMP			
	SECTION 0001 TOTAL					
	TOTAL BID					

Bar Harbor
14276.00
August 3, 2004
Supercedes March 17, 2004

SPECIAL PROVISION 102.7.3
ACKNOWLEDGMENT OF BID AMENDMENTS

With this form, the Bidder acknowledges its responsibility to check for all Amendments to the Bid Package. For each Project under Advertisement, Amendments are located at http://www.maine.gov/mdot/comprehensive-list-projects/project-information.php It is the responsibility of the Bidder to determine if there are Amendments to the Project, to download them, to incorporate them into their Bid Package, and to reference the Amendment number and the date on the form below. The Maine DOT will not post Bid Amendments any later than noon the day before Bid opening without individually notifying all the planholders.

Amendment Number	Date

The Contractor, for itself, its successors and assigns, hereby acknowledges that it has received all of the above referenced Amendments to the Bid Package.

CONTRACTOR

Date

Signature of authorized representative

(Name and Title Printed)

CONTRACT AGREEMENT, OFFER & AWARD

AGREEMENT made on the date last signed below, by and between the State of Maine, acting through and by its Department of Transportation (Department), an agency of state government with its principal administrative offices located at Child Street, Augusta, Maine, with a mailing address at 16 State House Station, Augusta, Maine 04333-0016, and

_____

a corporation or other legal entity organized under the laws of the State of _____, with its principal place of business located at _____

_____

The Department and the Contractor, in consideration of the mutual promises set forth in this Agreement (the "Contract"), hereby agree as follows:

A. The Work.

The Contractor agrees to complete all Work as specified or indicated in the Contract including Extra Work in conformity with the Contract, PIN No. **14276.00** for **Radio Communications Tower** in the town of **Bar Harbor**, County of **Hancock**, Maine. The Work includes construction, maintenance during construction, warranty as provided in the Contract, and other incidental work.

The Contractor shall be responsible for furnishing all supervision, labor, equipment, tools supplies, permanent materials and temporary materials required to perform the Work including construction quality control including inspection, testing and documentation, all required documentation at the conclusion of the project, warranting its work and performing all other work indicated in the Contract.

The Department shall have the right to alter the nature and extent of the Work as provided in the Contract; payment to be made as provided in the same.

B. Time.

The Contractor agrees to complete all Work, except warranty work, on or before **July 1, 2007.** Further, the Department may deduct from moneys otherwise due the Contractor, not as a penalty, but as Liquidated Damages in accordance with Sections 107.7 and 107.8 of the State of Maine Department of Transportation Standard Specifications, Revision of December 2002 and related Special Provisions.

C. Price.

The quantities given in the Schedule of Items of the Bid Package will be used as the basis for determining the original Contract amount and for determining the amounts of the required Performance Surety Bond and Payment Surety Bond, and that the amount of this offer is _____

_____

$_ _____ Performance Bond and Payment Bond each being 100% of the amount of this Contract.

D. Contract.

This Contract, which may be amended, modified, or supplemented in writing only, consists of the Contract documents as defined in the Plans, Standard Specifications, Revision of December 2002, Standard Details Revision of December 2002 as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds. It is agreed and understood that this Contract will be governed by the documents listed above.

E. Certifications.

By signing below, the Contractor hereby certifies that to the best of the Contractor's knowledge and belief:

1. All of the statements, representations, covenants, and/or certifications required or set forth in the Bid and the Bid Documents, including those in the Federal Contract Provisions Supplement, and the Contract are still complete and accurate as of the date of this Agreement.

2. The Contractor knows of no legal, contractual, or financial impediment to entering into this Contract.

3. The person signing below is legally authorized by the Contractor to sign this Contract on behalf of the Contractor and to legally bind the Contractor to the terms of the Contract.

F. Offer.

The undersigned, having carefully examined the site of work, the Plans, Standard Specifications Revision of December 2002, Standard Details Revision of December 2002 as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of:

PIN 14276.00 - Radio Communications Tower - in the town of Bar Harbor, State of Maine, on which bids will be received until the time specified in the "Notice to Contractors" do(es) hereby bid and offer to enter into this contract to supply all the materials, tools, equipment and labor to construct the whole of the Work in strict accordance with the terms and conditions of this Contract at the unit prices in the attached "Schedule of Items".

The Offeror agrees to perform the work required at the price specified above and in accordance with the bids provided in the attached "Schedule of Items" in strict accordance with the terms of this solicitation, and to provide the appropriate insurance and bonds if this offer is accepted by the Government in writing.

As Offeror also agrees:

First: To do any extra work, not covered by the attached "Schedule of Items", which may be ordered by the Resident, and to accept as full compensation the amount determined upon a "Force Account" basis as provided in the Standard Specifications, Revision of December 2002, and as addressed in the contract documents.

Second: That the bid bond at 5% of the bid amount or the official bank check, cashier's check, certificate of deposit or U. S. Postal Money Order in the amount given in the "Notice to Contractors", payable to the Treasurer of the State of Maine and accompanying this bid, shall be forfeited, as liquidated damages, if in case this bid is accepted, and the undersigned shall fail to abide by the terms and conditions of the offer and fail to furnish satisfactory insurance and Contract bonds under the conditions stipulated in the Specifications within 15 days of notice of intent to award the contract.

Third: To begin the Work as stated in Section 107.2 of the Standard Specifications Revision of December 2002 and complete the Work within the time limits given in the Special Provisions of this Contract.

Fourth: The Contractor will be bound to the Disadvantaged Business Enterprise (DBE) Requirements contained in the attached Notice (Additional Instructions to Bidders) and submit a completed Contractor's Disadvantaged Business Enterprise Utilization Plan by 4:30pm on the day of bid opening to the Contracts Engineer.

Fifth: That this offer shall remain open for 30 calendar days after the date of opening of bids.

Sixth: The Bidder hereby certifies, to the best of its knowledge and belief that: the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with its bid, and its subsequent contract with the Department.

IN WITNESS WHEREOF, the Contractor, for itself, its successors and assigns, hereby execute two duplicate originals of this Agreement and thereby binds itself to all covenants, terms, and obligations contained in the Contract Documents.

CONTRACTOR

_____	_____
Date	(Signature of Legally Authorized Representative of the Contractor)
_____	_____
Witness	(Name and Title Printed)

G. Award.

Your offer is hereby accepted. This award consummates the Contract, and the documents referenced herein.

MAINE DEPARTMENT OF TRANSPORTATION

_____	_____
Date	By: David A. Cole, Commissioner
_____	
Witness	

CONTRACT AGREEMENT, OFFER & AWARD

AGREEMENT made on the date last signed below, by and between the State of Maine, acting through and by its Department of Transportation (Department), an agency of state government with its principal administrative offices located at Child Street, Augusta, Maine, with a mailing address at 16 State House Station, Augusta, Maine 04333-0016, and

_____

a corporation or other legal entity organized under the laws of the State of _____, with its principal place of business located at _____

_____

The Department and the Contractor, in consideration of the mutual promises set forth in this Agreement (the "Contract"), hereby agree as follows:

A. The Work.

The Contractor agrees to complete all Work as specified or indicated in the Contract including Extra Work in conformity with the Contract, PIN No. **14276.00** for **Radio Communications Tower** in the town of **Bar Harbor**, County of **Hancock**, Maine. The Work includes construction, maintenance during construction, warranty as provided in the Contract, and other incidental work.

The Contractor shall be responsible for furnishing all supervision, labor, equipment, tools supplies, permanent materials and temporary materials required to perform the Work including construction quality control including inspection, testing and documentation, all required documentation at the conclusion of the project, warranting its work and performing all other work indicated in the Contract.

The Department shall have the right to alter the nature and extent of the Work as provided in the Contract; payment to be made as provided in the same.

B. Time.

The Contractor agrees to complete all Work, except warranty work, on or before **July 1, 2007.** Further, the Department may deduct from moneys otherwise due the Contractor, not as a penalty, but as Liquidated Damages in accordance with Sections 107.7 and 107.8 of the State of Maine Department of Transportation Standard Specifications, Revision of December 2002 and related Special Provisions.

C. Price.

The quantities given in the Schedule of Items of the Bid Package will be used as the basis for determining the original Contract amount and for determining the amounts of the required Performance Surety Bond and Payment Surety Bond, and that the amount of this offer is _____

_____

$_ _____ Performance Bond and Payment Bond each being 100% of the amount of this Contract.

D. Contract.

This Contract, which may be amended, modified, or supplemented in writing only, consists of the Contract documents as defined in the Plans, Standard Specifications, Revision of December 2002, Standard Details Revision of December 2002 as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds. It is agreed and understood that this Contract will be governed by the documents listed above.

E. Certifications.

By signing below, the Contractor hereby certifies that to the best of the Contractor's knowledge and belief:

1. All of the statements, representations, covenants, and/or certifications required or set forth in the Bid and the Bid Documents, including those in the Federal Contract Provisions Supplement, and the Contract are still complete and accurate as of the date of this Agreement.

2. The Contractor knows of no legal, contractual, or financial impediment to entering into this Contract.

3. The person signing below is legally authorized by the Contractor to sign this Contract on behalf of the Contractor and to legally bind the Contractor to the terms of the Contract.

F. Offer.

The undersigned, having carefully examined the site of work, the Plans, Standard Specifications Revision of December 2002, Standard Details Revision of December 2002 as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of:

PIN 14276.00 - Radio Communications Tower - in the town of Bar Harbor, State of Maine, on which bids will be received until the time specified in the "Notice to Contractors" do(es) hereby bid and offer to enter into this contract to supply all the materials, tools, equipment and labor to construct the whole of the Work in strict accordance with the terms and conditions of this Contract at the unit prices in the attached "Schedule of Items".

The Offeror agrees to perform the work required at the price specified above and in accordance with the bids provided in the attached "Schedule of Items" in strict accordance with the terms of this solicitation, and to provide the appropriate insurance and bonds if this offer is accepted by the Government in writing.

As Offeror also agrees:

First: To do any extra work, not covered by the attached "Schedule of Items", which may be ordered by the Resident, and to accept as full compensation the amount determined upon a "Force Account" basis as provided in the Standard Specifications, Revision of December 2002, and as addressed in the contract documents.

Second: That the bid bond at 5% of the bid amount or the official bank check, cashier's check, certificate of deposit or U. S. Postal Money Order in the amount given in the "Notice to Contractors", payable to the Treasurer of the State of Maine and accompanying this bid, shall be forfeited, as liquidated damages, if in case this bid is accepted, and the undersigned shall fail to abide by the terms and conditions of the offer and fail to furnish satisfactory insurance and Contract bonds under the conditions stipulated in the Specifications within 15 days of notice of intent to award the contract.

Third: To begin the Work as stated in Section 107.2 of the Standard Specifications Revision of December 2002 and complete the Work within the time limits given in the Special Provisions of this Contract.

Fourth: The Contractor will be bound to the Disadvantaged Business Enterprise (DBE) Requirements contained in the attached Notice (Additional Instructions to Bidders) and submit a completed Contractor's Disadvantaged Business Enterprise Utilization Plan by 4:30pm on the day of bid opening to the Contracts Engineer.

Fifth: That this offer shall remain open for 30 calendar days after the date of opening of bids.

Sixth: The Bidder hereby certifies, to the best of its knowledge and belief that: the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with its bid, and its subsequent contract with the Department.

IN WITNESS WHEREOF, the Contractor, for itself, its successors and assigns, hereby execute two duplicate originals of this Agreement and thereby binds itself to all covenants, terms, and obligations contained in the Contract Documents.

CONTRACTOR

_____	_____
Date	(Signature of Legally Authorized Representative of the Contractor)
_____	_____
Witness	(Name and Title Printed)

G. Award.

Your offer is hereby accepted. This award consummates the Contract, and the documents referenced herein.

MAINE DEPARTMENT OF TRANSPORTATION

_____	_____
Date	By: David A. Cole, Commissioner
_____	
Witness	

CONTRACT AGREEMENT, OFFER & AWARD

AGREEMENT made on the date last signed below, by and between the State of Maine, acting through and by its Department of Transportation (Department), an agency of state government with its principal administrative offices located at Child Street Augusta, Maine, with a mailing address at 16 State House Station, Augusta, Maine 04333-0016, and **(Name of the firm bidding the job)** a corporation or other legal entity organized under the laws of the State of Maine, with its principal place of business located at **(address of the firm bidding the job)**

The Department and the Contractor, in consideration of the mutual promises set forth in this Agreement (the "Contract"), hereby agree as follows:

A. The Work.

The Contractor agrees to complete all Work as specified or indicated in the Contract including Extra Work in conformity with the Contract, PIN No. **1224.00**, for the **Hot Mix Asphalt Overlay** in the town/city of **West Eastport**, County of **Washington**, Maine. The Work includes construction, maintenance during construction, warranty as provided in the Contract, and other incidental work.

The Contractor shall be responsible for furnishing all supervision, labor, equipment, tools supplies, permanent materials and temporary materials required to perform the Work including construction quality control including inspection, testing and documentation, all required documentation at the conclusion of the project, warranting its work and performing all other work indicated in the Contract.

The Department shall have the right to alter the nature and extent of the Work as provided in the Contract; payment to be made as provided in the same.

B. Time.

The Contractor agrees to complete all Work, except warranty work, on or before **November 15**, 2003**.** Further, the Department may deduct from moneys otherwise due the Contractor, not as a penalty, but as Liquidated Damages in accordance with Sections 107.7 and 107.8 of the State of Maine Department of Transportation Standard Specifications, Revision of December 2002.

C. Price.

The quantities given in the Schedule of Items of the Bid Package will be used as the basis for determining the original Contract amount and for determining the amounts of the required Performance Surety Bond and Payment Surety Bond, and that the amount of this offer is **____(Place bid here in alphabetical form such as One Hundred and Two dollars and 10 cents)_____ $_ (repeat bid here in numerical terms, such as $102.10)_____** Performance Bond and Payment Bond each being 100% of the amount of this Contract.

D. Contract.

This Contract, which may be amended, modified, or supplemented in writing only, consists of the Contract documents as defined in the Plans, Standard Specifications, Revision of December 2002, Standard Details Revision of December 2002, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds. It is agreed and understood that this Contract will be governed by the documents listed above.

E. Certifications.

By signing below, the Contractor hereby certifies that to the best of the Contractor's knowledge and belief:

1. All of the statements, representations, covenants, and/or certifications required or set forth in the Bid and the Bid Documents, including those in Appendix A to Division 100 of the Standard Specifications Revision of December 2002 (Federal Contract Provisions Supplement), and the Contract are still complete and accurate as of the date of this Agreement.

2. The Contractor knows of no legal, contractual, or financial impediment to entering into this Contract.

3. The person signing below is legally authorized by the Contractor to sign this Contract on behalf of the Contractor and to legally bind the Contractor to the terms of the Contract.

F. Offer.

The undersigned, having carefully examined the site of work, the Plans, Standard Specifications, Revision of December 2002, Standard Details Revision of December 2002, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of:

PIN 1234.00 West Eastport, Hot Mix Asphalt Overlay,

State of Maine, on which bids will be received until the time specified in the "Notice to Contractors" do(es) hereby bid and offer to enter into this contract to supply all the materials, tools, equipment and labor to construct the whole of the Work in strict accordance with the terms and conditions of this Contract at the unit prices in the attached "Schedule of Items".

The Offeror agrees to perform the work required at the price specified above and in accordance with the bids provided in the attached "Schedule of Items" in strict accordance with the terms of this solicitation, and to provide the appropriate insurance and bonds if this offer is accepted by the Government in writing.

As Offeror also agrees:

First: To do any extra work, not covered by the attached "Schedule of Items", which may be ordered by the Resident, and to accept as full compensation the amount determined upon a "Force Account" basis as provided in the Standard Specifications, Revision of December 2002, and as addressed in the contract documents.

Second: That the bid bond at 5% of the bid amount or the official bank check, cashier's check, certificate of deposit or U. S. Postal Money Order in the amount given in the "Notice to Contractors", payable to the Treasurer of the State of Maine and accompanying this bid, shall be forfeited, as liquidated damages, if in case this bid is accepted, and the undersigned shall fail to abide by the terms and conditions of the offer and fail to furnish satisfactory insurance and Contract bonds under the conditions stipulated in the Specifications within 15 days of notice of intent to award the contract.

Third: To begin the Work on the date specified in the Engineer's "Notice to Commence Work" as stated in Section 107.2 of the Standard Specifications Revision of 2002 and complete the Work within the time limits given in the Special Provisions of this Contract.

Fourth: The Contractor will be bound to the Disadvantaged Business Enterprise (DBE) Requirements contained in the attached Notice (Additional Instructions to Bidders) and submit a completed Contractor's Disadvantaged Business Enterprise Utilization Plan by 4:30pm on the day of bid opening to the Contracts Engineer.

Fifth: That this offer shall remain open for 30 calendar days after the date of opening of bids.

Sixth: The Bidder hereby certifies, to the best of its knowledge and belief that: the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with its bid, and its subsequent contract with the Department.

IN WITNESS WHEREOF, the Contractor, for itself, its successors and assigns, hereby execute two duplicate originals of this Agreement and thereby binds itself to all covenants, terms, and obligations contained in the Contract Documents.

CONTRACTOR

_____ **(Sign Here)**

Date (Signature of Legally Authorized Representative of the Contractor)

(Witness Sign Here) **(Print Name Here)**

Witness (Name and Title Printed)

G. Award.

Your offer is hereby accepted. This award consummates the Contract, and the documents referenced herein.

MAINE DEPARTMENT OF TRANSPORTATION

Date By: David A. Cole, Commissioner

(Witness)

BOND # _____

CONTRACT PERFORMANCE BOND
(Surety Company Form)

KNOW ALL MEN BY THESE PRESENTS: That _____ _____ **and the State of** _____, as principal, and……....., a corporation duly organized under the laws of the State of ..... and having a usual place of business ...., as Surety, are held and firmly bound unto the Treasurer of the State of Maine in the sum of _____ **and 00/100 Dollars ($)**, to be paid said Treasurer of the State of Maine or his successors in office, for which payment well and truly to be made, Principal and Surety bind themselves, their heirs, executors and administrators, successors and assigns, jointly and severally by these presents.

The condition of this obligation is such that if the Principal designated as Contractor in the Contract to construct Project Number _____ in the Municipality of _____ promptly and faithfully performs the Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the State of Maine.

Signed and sealed this ..... day of ....., 20…. .

WITNESSES:	SIGNATURES: CONTRACTOR:
Signature.....	.....….....
Print Name Legibly	Print Name Legibly ...….....
	SURETY:
Signature	....….....
Print Name Legibly	Print Name Legibly .....
SURETY ADDRESS:	NAME OF LOCAL AGENCY:
.....	ADDRESS .....
.....	..….....
.....	.....….....
TELEPHONE.....	.....….....

BOND # _____

CONTRACT PAYMENT BOND
(Surety Company Form)

KNOW ALL MEN BY THESE PRESENTS: That _____
_____ **and the State of** _____, as principal, and.....
a corporation duly organized under the laws of the State of ..... and having a usual place of business in .....,
as Surety, are held and firmly bound unto the Treasurer of the State of Maine for the use and benefit of claimants as herein below defined, in the sum of _____ **and 00/100 Dollars ($)** for the payment whereof Principal and Surety bind themselves, their heirs, executors and administrators, successors and assigns, jointly and severally by these presents.

The condition of this obligation is such that if the Principal designated as Contractor in the Contract to construct Project Number _____ in the Municipality of _____ promptly satisfies all claims and demands incurred for all labor and material, used or required by him in connection with the work contemplated by said Contract, and fully reimburses the obligee for all outlay and expense which the obligee may incur in making good any default of said Principal, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

A claimant is defined as one having a direct contract with the Principal or with a Subcontractor of the Principal for labor, material or both, used or reasonably required for use in the performance of the contract.

Signed and sealed this ..... day of ....., 20 ... .

WITNESS:	SIGNATURES:
	CONTRACTOR:
Signature…….....	.....….....
Print Name Legibly .....……..	Print Name Legibly …....
	SURETY:
Signature.....	...….....
Print Name Legibly	Print Name Legibly …....
SURETY ADDRESS:	NAME OF LOCAL AGENCY:
...….....	ADDRESS ….....
.....	…….....
TELEPHONE	…….....

State of Maine
Department of Labor
Bureau of Labor Standards
Technical Services Division
Augusta, Maine 04333-0045
Telephone (207) 624-6445

Wage Determination - In accordance with 26 MRSA §1301 et. seq., this is a determination by the Bureau of Labor Standards, of the fair minimum wage rate to be paid laborers and workers employed on the below titled project.

Title of Project -------- Cadillac Mountain Radio Tower Project – 14276.00

Location of Project -- Bar Harbor, Maine in Hancock County

2007 Fair Minimum Wage Rates
Building 2 Hancock County
(other than 1 or 2 family homes)

Occupation Title	Minimum Wage	Minimum Benefit	Total	Occupation Title	Minimum Wage	Minimum Benefit	Total
Asbestos Abatement Wrkr	$16.00	$0.73	$16.73	Ironworker - Reinforcing	$20.15	$10.00	$30.15
Assembler - Metal Bldg	$12.00	$3.32	$15.32	Ironworker - Structural	$21.25	$1.70	$22.95
Backhoe Loader Operator	$14.00	$2.24	$16.24	Laborers/Helper/Tender	$12.00	$0.84	$12.84
Boilermaker	$19.75	$4.21	$23.96	Laborer - Skilled	$12.50	$0.94	$13.44
Boom Truck Operator	$16.50	$2.66	$19.16	Loader Op - Front End	$14.75	$2.28	$17.03
Bricklayer	$23.00	$2.72	$25.72	Mechanic - Maintenance	$19.00	$2.52	$21.52
Bulldozer Operator	$16.00	$2.87	$18.87	Mechanic - Refrigeration	$17.38	$3.11	$20.49
Cable Splicer	$20.25	$3.35	$23.60	Millwright	$21.00	$11.15	$32.15
Carpenter	$16.00	$2.33	$18.33	Oil/Fuel Burner Serv & Instr	$19.00	$6.09	$25.09
Carpenter - Acoustical	$13.00	$2.15	$15.15	Painter	$14.00	$0.23	$14.23
Carpenter - Rough	$14.00	$1.08	$15.08	Paperhanger	$13.00	$0.00	$13.00
Cement Mason/Finisher	$15.00	$1.02	$16.02	Paver - Bituminous	$14.88	$1.27	$16.15
Commun Equip Installer	$19.50	$4.24	$23.74	Pile Driver Operator	$19.00	$5.55	$24.55
Concrete Mixing Plant Op	$14.55	$3.70	$18.25	Pipe/Stm/Sprkler Fitter	$21.00	$5.27	$26.27
Concrete Pump Operator	$18.50	$2.38	$20.88	Pipelayer	$20.75	$5.45	$26.20
Crane Operator =>15 Tons	$19.50	$4.70	$24.20	Plumber (Licensed)	$19.50	$5.43	$24.93
Crusher Plant Operator	$14.48	$3.27	$17.75	Plumber Hlpr/Trainee (Lic)	$13.00	$2.72	$15.72
Diver	$21.00	$0.75	$21.75	Roller Operator - Earth	$12.43	$4.49	$16.92
Driller - Well	$13.00	$1.94	$14.94	Roofer	$13.00	$0.78	$13.78
Dry-Wall Applicator	$18.00	$0.91	$18.91	Screed Operator	$15.50	$3.42	$18.92
Dry-Wall Taper & Finisher	$18.00	$3.25	$21.25	Sheet Metal Worker	$15.00	$1.91	$16.91
Electrician	$19.00	$4.12	$23.12	Sider	$14.00	$0.60	$14.60
Electrician Hlpr (Licensed)	$13.00	$1.84	$14.84	Stone Mason	$16.24	$2.04	$18.28
Elevator Constrctr/Installer	$40.32	$14.77	$55.09	Tile Setter	$16.75	$2.93	$19.68
Excavator Operator	$14.75	$2.36	$17.11	Truck Driver - Light	$13.25	$0.98	$14.23
Fence Setter	$12.50	$1.08	$13.58	Truck Driver - Medium	$10.38	$0.81	$11.19
Floor Layer	$15.00	$1.35	$16.35	Truck Driver - Heavy	$12.50	$2.10	$14.60
Glazier	$13.67	$1.97	$15.64	Truck Driver - Tractor Trailer	$12.95	$2.10	$15.05
Insulation Installer	$14.00	$2.10	$16.10				

The Laborer classifications include a wide range of work duties. Therefore, if any specific occupation to be employed on this project is not listed in this determination, call the Bureau of Labor Standards at the above number for further clarification.

Welders are classified in the trade to which the welding is incidental.

Apprentices - The minimum wage rate for registered apprentices are those set forth in the standards and policies of the Maine State Apprenticeship and Training Council for approved apprenticeship programs.

Posting of Schedule - Posting of this schedule is required in accordance with 26 MRSA §1301 et. seq., by any contractor holding a State contract for construction valued at $50,000 or more and any subcontractors to such a contractor.

Appeal - Any person affected by the determination of these rates may appeal to the Commissioner of Labor by filing a written notice with the Commissioner stating the specific grounds of the objection within ten (10) days from the filing of these rates with the Secretary of State.

Determination No: B2-021-2007

Filing Date: February 28, 2007

Expiration Date: 12-31-2007

A true copy

Attest: _____
William A. Peabody
Director
Bureau of Labor Standards

State of Maine
Department of Labor
Bureau of Labor Standards
Technical Services Division
Augusta, Maine 04333-0045
Telephone (207) 624-6445

Wage Determination - In accordance with 26 MRSA §1301 et. seq., this is a determination by the Bureau of Labor Standards, of the fair minimum wage rate to be paid laborers and workers employed on the below titled project.

Title of Project -------- Cadillac Mountain Radio Tower Project – 14276.00

Location of Project -- Bar Harbor, Maine in Hancock County

2007 Fair Minimum Wage Rates
Heavy & Bridge Hancock County

Occupation Title	Minimum Wage	Minimum Benefit	Total	Occupation Title	Minimum Wage	Minimum Benefit	Total
Asphalt Raker	$12.50	$0.23	$12.73	Insulation Installer	$17.25	$5.05	$22.30
Backhoe Loader Operator	$14.00	$2.24	$16.24	Ironworker - Reinforcing	$20.15	$10.00	$30.15
Boilermaker	$18.75	$3.57	$22.32	Ironworker - Structural	$19.00	$3.64	$22.64
Boom Truck Operator	$16.50	$2.66	$19.16	Laborers/Helper/Tender	$12.00	$1.26	$13.26
Bricklayer	$21.00	$2.62	$23.62	Laborer - Skilled	$14.88	$3.41	$18.29
Bulldozer Operator	$16.00	$2.87	$18.87	Line Erector, Power	$18.01	$3.88	$21.89
Cable Splicer	$18.50	$3.56	$22.06	Loader Op, Front-End	$15.63	$2.09	$17.72
Carpenter	$16.50	$1.84	$18.34	Mechanic - Maintenance	$16.25	$3.19	$19.44
Carpenter - Rough	$17.00	$2.72	$19.72	Millwright	$19.50	$4.07	$23.57
Cement Mason/Finisher	$15.00	$0.76	$15.76	Painter	$20.91	$6.09	$27.00
Commun Equip Installer	$21.25	$2.60	$23.85	Paver - Bituminous	$14.88	$1.27	$16.15
Commun Trans Erectr	$16.50	$6.51	$23.01	Pile Driver Operator	$19.00	$5.07	$24.07
Concrete Pump Operator	$15.40	$9.40	$24.80	Pipe/Stm/Sprkler Fitter	$21.00	$5.73	$26.73
Crane Op =>15 Tons	$20.13	$4.49	$24.62	Pipelayer	$20.00	$3.77	$23.77
Crusher Plant Operator	$14.48	$3.27	$17.75	Plumber (Licensed)	$20.00	$3.80	$23.80
Diver	$21.00	$10.67	$31.67	Pump Installer	$15.50	$1.48	$16.98
Driller - Rock	$14.50	$3.28	$17.78	Roller Op - Pavement	$15.00	$3.36	$18.36
Electrician, Licensed	$22.00	$4.19	$26.19	Sheet Metal Worker	$15.45	$3.18	$18.63
Electrician Hlpr (Licensed)	$15.25	$3.50	$18.75	Truck Driver - Light	$13.25	$0.98	$14.23
Excavator Operator	$19.11	$2.71	$21.82	Truck Driver - Medium	$12.85	$2.06	$14.91
Fence Setter	$13.00	$1.64	$14.64	Truck Driver, Heavy	$14.00	$0.82	$14.82
Hot Top Plant Operator	$17.33	$6.98	$24.31	Truck Driver, Tractor Trlr	$12.95	$2.10	$15.05

The Laborer classifications include a wide range of work duties. Therefore, if any specific occupation to be employed on this project is not listed in this determination, call the Bureau of Labor Standards at the above number for further clarification.

Welders are classified in the trade to which the welding is incidental.

Apprentices - The minimum wage rate for registered apprentices are those set forth in the standards and policies of the Maine State Apprenticeship and Training Council for approved apprenticeship programs.

Posting of Schedule - Posting of this schedule is required in accordance with 26 MRSA §1301 et. seq., by any contractor holding a State contract for construction valued at $50,000 or more and any subcontractors to such a contractor.

Appeal - Any person affected by the determination of these rates may appeal to the Commissioner ~~of Labor~~ by filing a written notice with the Commissioner stating the specific grounds of the objection within ten (10) days from the filing of these rates with the Secretary of State.

Determination No: HB-010-2007

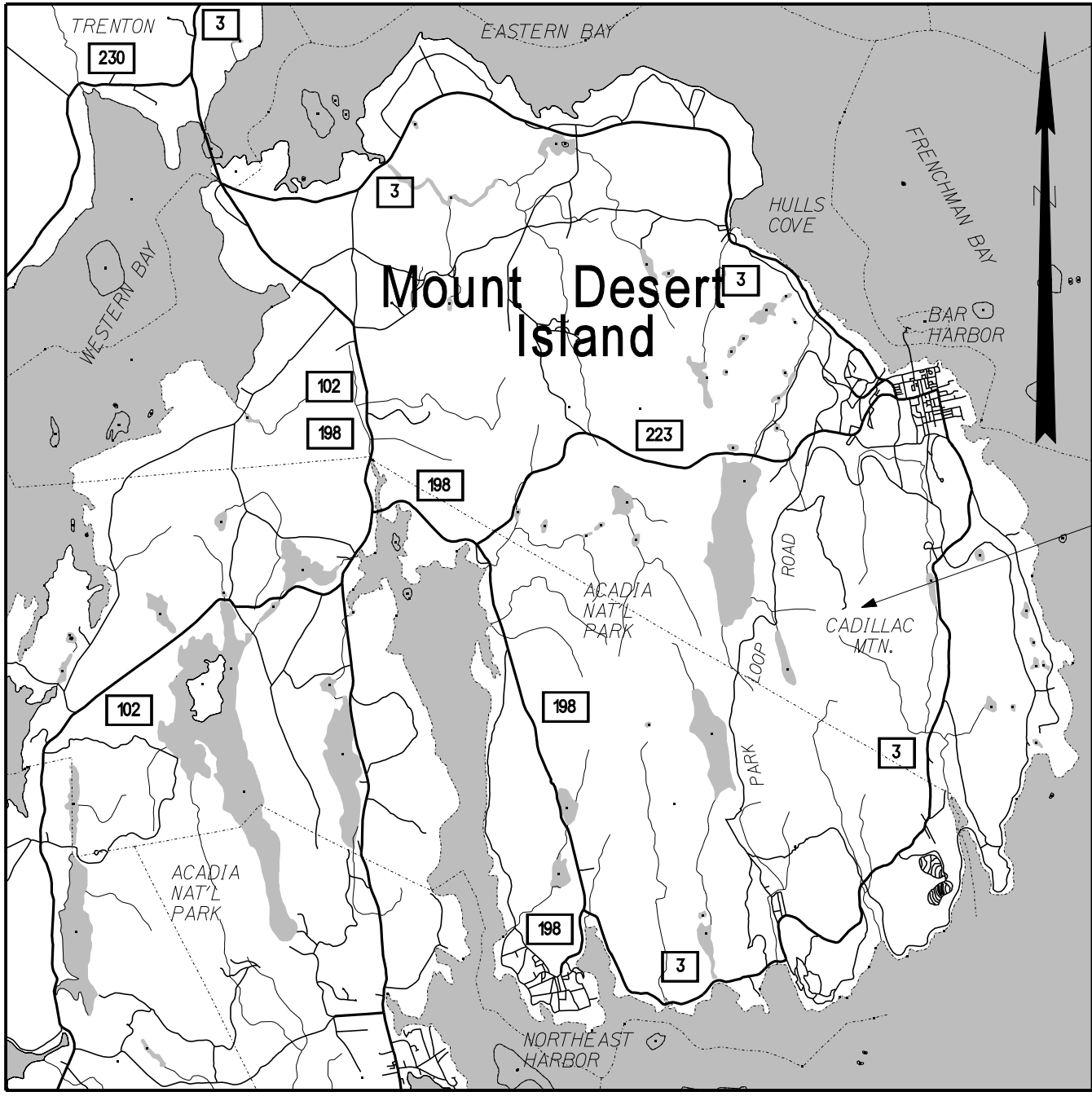
Filing Date: February 28, 2007

Expiration Date: 12-31-2007

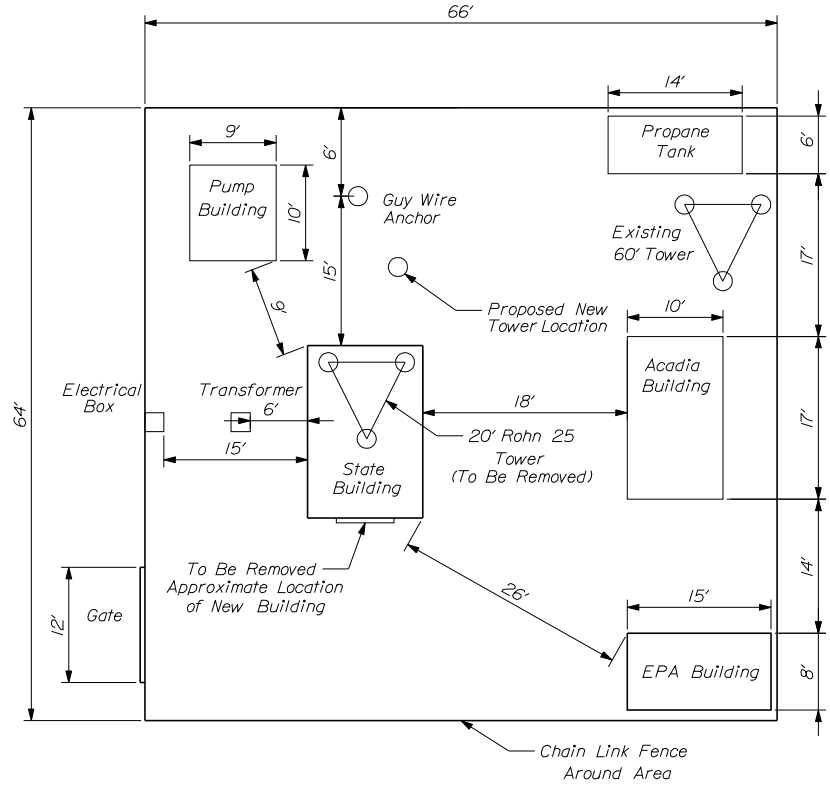
A true copy

Attest: _____
William A. Peabody
Director
Bureau of Labor Standards

BLS 424HB (R2007) (Heavy & Bridge Hancock)


TRENTON
230
3
EASTERN BAY
FRENCHMAN BAY
HULLS COVE
WESTERN BAY
Mount Desert Island
BAR HARBOR
N
102
198
223
198
ACADIA NAT'L PARK
CADILLAC MTN.
LOOP ROAD
102
198
3
PARK
ACADIA NAT'L PARK
198
3
NORTHEAST HARBOR
PROJECT LOCATION
PIN NO. 14276.00

NOTE: All Dimensions were hand-measured in the field and are not meant to be scaled.



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
Cadillac Mountain
PIN 14278.00
PROPOSED PLANS

SHEET NUMBER
1
OF 1

Filename: ...\HIGHWAY\MSTA\01_HDP\pn1.dgn Division: HIGHWAY Username: stephen.bodge Date:3/12/2007

SPECIAL PROVISION
SECTION 104.3.8.B.1
(State of Maine Wage Rates Apply)

104.3.8.B.1 State Wage Rate

Wages. This Project is not being constructed with federal funds and is not subject to the jurisdiction of the Davis-Bacon or other Federal Act that requires the Secretary of Labor to establish the minimum wages and benefits. The State of Maine minimum wage and benefits apply to the construction of this Radio Tower Project (PIN 14276.00). See the provisions in 26 MRSA §§ 1304 to 1313. Federal wage rates do not apply.

SPECIAL PROVISION
SECTION 104.2.1
(Furnishing of Right-of-Way)

Section 104.2.1, entitled, "Furnishing of Right-of-Way," of Division 100 of the Maine Department of Transportation's Standard Specifications, Revision of December 2002, is hereby deleted and replaced by the following Special Provision.

104.2.1 Furnishing of Right-of-Way The Department and the National Park Service will secure all necessary rights to real property within the Project Limits. No Right-of-way information will be shown on the Contract Plans.

SPECIAL PROVISION
SECTION 105
GENERAL SCOPE OF WORK

The Scope of work for the project consists of complete construction, installation, testing and commissioning of a radio tower, radio equipment/generator building, and emergency generator on Cadillac Mountain as shown in the project plans and outlined in the special provisions.

Cadillac Mountain
PIN 14276.00
3-12-07

Special Provision
Section 107.1.1
Time
Contract Completion Date
And
Section 107.8
Supplemental Liquidated Damages

The Cadillac construction site will be made available and accessible for contractors on April 30, 2007.

With the exception of the documentation, all contractor's physical work at the site shall be completed by May 26, 2007. Supplemental liquidated damages will be assessed the Contractor at $500 per day for every calendar day that work at the site remains incomplete.

The site shall be totally available to the Department for their sole use by June 1, 2007.

The Contract Completion Date is July 1, 2007.

STANDARD DETAIL UPDATES

Standard Details and Standard Detail updates are available at:
http://www.maine.gov/mdot/contractor-consultant-information/ss_standard_details_updates.php

Detail #	Description	Revision Date
504(15)	Diaphragms	12/30/02
507(04)	Steel Bridge Railing	2/05/03
526(33)	Concrete Transition Barrier	8/18/03
645(06)	H-Beam Posts – Highway Signing	7/21/04
645(09)	Installation of Type II Signs	7/21/04
626(09)	Electrical Junction Box for Traffic Signals and Lighting	2/25/05
604(01)	Catch Basins	11/16/05
604(05)	Type “A” & “B” Catch Basin Tops	11/16/05
604(06)	Type “C” Catch Basin Tops	11/16/05
604(07)	Manhole Top “D”	11/16/05
604(09)	Catch Basin Type “E”	11/16/05
606(02)	Multiple Mailbox Support	11/16/05
606(07)	Reflectorized Beam Guardrail Delineator Details	11/16/05
609(06)	Vertical Bridge Curb	11/16/05
504(23)	Hand-Hold Details	12/08/05
609(03)	Curb Type 3	6/27/06
609(07)	Curb Type 1	6/27/06
535(01)	Precast Superstructure - Shear Key	10/12/06
535(02)	Precast Superstructure - Curb Key & Drip Notch	10/12/06

535(03)	Precast Superstructure - Shear Key	10/12/06
535(04)	Precast Superstructure - Shear Key	10/12/06
535(05)	Precast Superstructure - Post Tensioning	10/12/06
535(06)	Precast Superstructure - Sections	10/12/06
535(07)	Precast Superstructure - Precast Slab & Box	10/12/06
535(08)	Precast Superstructure - Sections	10/12/06
535(09)	Precast Superstructure - Sections	10/12/06
535(10)	Precast Superstructure - Sections	10/12/06
535(11)	Precast Superstructure - Sections	10/12/06
535(12)	Precast Superstructure - Sections	10/12/06
535(13)	Precast Superstructure - Sections	10/12/06
535(14)	Precast Superstructure - Stirrups	10/12/06
535(15)	Precast Superstructure - Plan	10/12/06
535(16)	Precast Superstructure - Reinforcing	10/12/06
535(17)	Precast Superstructure - Notes	10/12/06
801(01)	Drives on Sidewalk Sections	2/06/07
801(02)	Drives on Non-Sidewalk Sections	2/06/07

SUPPLEMENTAL SPECIFICATION

(Corrections, Additions, & Revisions to Standard Specifications - Revision of December 2002)

SECTION 101
CONTRACT INTERPRETATION

101.2 Definitions

Closeout Documentation Replace the sentence "A letter stating the amount….. DBE goals." with "DBE Goal Attainment Verification Form"

Add "Environmental Information Hazardous waste assessments, dredge material test results, boring logs, geophysical studies, and other records and reports of the environmental conditions. For a related provision, see Section 104.3.14 - Interpretation and Interpolation."

Add "Fabrication Engineer The Department's representative responsible for Quality Assurance of pre-fabricated products that are produced off-site."

Geotechnical Information Replace with the following: "Boring logs, soil reports, geotechnical design reports, ground penetrating radar evaluations, seismic refraction studies, and other records of subsurface conditions. For a related provision, see Section 104.3.14 - Interpretation and Interpolation."

SECTION 102
DELIVERY OF BIDS

102.7.1 Location and Time Add the following sentence "As a minimum, the Bidder will submit a Bid Package consisting of the Notice to Contractors, the completed Acknowledgement of Bid Amendments form, the completed Schedule of Items, 2 copies of the completed Agreement, Offer, & Award form, a Bid Bond or Bid Guarantee, and any other Certifications or Bid Requirements listed in the Bid Book."

102.11.1 Non-curable Bid Defects Replace E. with "E. The unit price and bid amount is not provided or a lump sum price is not provided or is illegible as determined by the Department."

SECTION 103
AWARD AND CONTRACTING

103.3.1 Notice and Information Gathering Change the first paragraph to read as follows: "After Bid Opening and as a condition for Award of a Contract, the Department may require an Apparent Successful Bidder to demonstrate to the Department's satisfaction that the Bidder is responsible and qualified to perform the Work."

SECTION 104
GENERAL RIGHTS AND RESPONSIBILITIES

104.3.14 Interpretation and Interpolation In the first sentence, change "…and Geotechnical Information." to "…Environmental Information, and Geotechnical Information."

Delete the entire Section 104.5.9 and replace with the following:

104.5.9 Landscape Subcontractors The Contractor shall retain only Landscape Subcontractors that are certified by the Department's Environmental Office Landscape Unit.

SECTION 105
GENERAL SCOPE OF WORK

Delete the entire Section 105.6 and replace with the following:

105.6.1 Department Provided Services The Department will provide the Contractor with the description and coordinates of vertical and horizontal control points, set by the Department, within the Project Limits, for full construction Projects and other Projects where survey control is necessary. For Projects of 1,500 feet in length, or less: The Department will provide three points. For Projects between 1,500 and 5,000 feet in length: The Department will provide one set of two points at each end of the Project. For Projects in excess of 5,000 feet in length, the Department will provide one set of two points at each end of the Project, plus one additional set of two points for each mile of Project length. For non-full construction Projects and other Projects where survey control is not necessary, the Department will not set any control points and, therefore, will not provide description and coordinates of any control points. Upon request of the Contractor, the Department will provide the Department's survey data management software and Survey Manual to the Contractor, or its survey Subcontractor, for the exclusive use on the Department's Projects.

105.6.2 Contractor Provided Services Utilizing the survey information and points provided by the Department, described in Subsection 105.6.1, Department Provided Services, the Contractor shall provide all additional survey layout necessary to complete the Work. This may include, but not be limited to, reestablishing all points provided by the Department, establishing additional control points, running axis lines, providing layout and maintenance of all other lines, grades, or points, and survey quality control to ensure conformance with the Contract. The Contractor is also responsible for providing construction centerline, or close reference points, for all Utility Facilities relocations and adjustments as necessary to complete the Work. When the Work is to connect with existing Structures, the Contractor shall verify all dimensions before proceeding with the Work. The Contractor shall employ or retain competent engineering and/or surveying personnel to fulfill these responsibilities.

The Contractor must notify the Department of any errors or inconsistencies regarding the data and layout provided by the Department as provided by Section 104.3.3 - Duty to Notify Department If Ambiguities Discovered.

105.6.2.1 Survey Quality Control The Contractor is responsible for all construction survey quality control. Construction survey quality control is generally defined as, first, performing initial field survey layout of the Work and, second, performing an independent check of the initial layout using independent survey data to assure the accuracy of the initial layout; additional iterations of checks may be required if significant discrepancies are discovered in this process. Construction survey layout quality control also requires written documentation of

the layout process such that the process can be followed and repeated, if necessary, by an independent survey crew.

105.6.3 Survey Quality Assurance It is the Department's prerogative to perform construction survey quality assurance. Construction survey quality assurance may, or may not, be performed by the Department. Construction survey quality assurance is generally defined as an independent check of the construction survey quality control. The construction survey quality assurance process may involve physically checking the Contractor's construction survey layout using independent survey data, or may simply involve reviewing the construction survey quality control written documentation. If the Department elects to physically check the Contractor's survey layout, the Contractor's designated surveyor may be required to be present. The Department will provide a minimum notice of 48 hours to the Contractor, whenever possible, if the Contractor's designated surveyor's presence is required. Any errors discovered through the quality assurance process shall be corrected by the Contractor, at no additional cost to the Department.

105.6.4 Boundary Markers The Contractor shall preserve and protect from damage all monuments or other points that mark the boundaries of the Right-of-Way or abutting parcels that are outside the area that must be disturbed to perform the Work. The Contractor indemnifies and holds harmless the Department from all claims to reestablish the former location of all such monuments or points including claims arising from 14 MRSA § 7554-A. For a related provision, see Section 104.3.11 - Responsibility for Property of Others.

SECTION 106
QUALITY

106.4.3 Testing Change the first sentence in paragraph three from "…maintain records of all inspections and tests." to "…maintain original documentation of all inspections, tests, and calculations used to generate reports."

106.6 Acceptance Add the following to paragraph 1 of A: "This includes Sections 401 - Hot Mix Asphalt, 402 - Pavement Smoothness, and 502 - Structural Concrete - Method A - Air Content."

Add the following to the beginning of paragraph 3 of A: "For pay factors based on Quality Level Analysis, and"

106.7.1 Standard Deviation Method Add the following to F: "Note: In cases where the mean of the values is equal to either the USL or the LSL, then the PWL will be 50 regardless of the computed value of s."

Add the following to H: "Method C Hot Mix Asphalt: PF = [55 + (Quality Level *0.5)] * 0.01"

SECTION 107
TIME

107.3.1 General Add the following: "If a Holiday occurs on a Sunday, the following Monday shall be considered a Holiday. Sunday or Holiday work must be approved by the Department,

except that the Contractor may work on Martin Luther King Day, President's Day, Patriot's Day, the Friday after Thanksgiving, and Columbus Day without the Department's approval."

107.7.2 Schedule of Liquidated Damages Replace the table of Liquidated Damages as follows:

From More Than	Up to and Including	Amount of Liquidated Damages per Calendar Day
$0	$100,000	$100
$100,000	$300,000	$200
$300,000	$500,000	$400
$500,000	$1,000,000	$575
$1,000,000	$2,000,000	$750
$2,000,000	$4,000,000	$900
$4,000,000	and more	$1,875

SECTION 108
PAYMENT

108.4 Payment for Materials Obtained and Stored First paragraph, second sentence, delete the words "…Delivered on or near the Work site at acceptable storage places."

SECTION 109
CHANGES

109.1.1 Changes Permitted Add the following to the end of the paragraph: "There will be no adjustment to Contract Time due to an increase or decrease in quantities, compared to those estimated, except as addressed through Contract Modification(s)."

109.1.2 Substantial Changes to Major Items Add the following to the end of the paragraph: "Contract Time adjustments may be made for substantial changes to Major Items when the change affects the Critical Path, as determined by the Department"

109.4.4 Investigation / Adjustment Third sentence, delete the words "subsections (A) - (E)"

109.5.1 Definitions - Types of Delays

B. Compensable Delay Replace (1) with the following; "a weather related Uncontrollable Event of such an unusually severe nature that a Federal Emergency Disaster is declared. The Contractor will only be entitled to an Equitable Adjustment if the Project falls within the geographic boundaries prescribed under the disaster declaration."

109.7.2 Basis of Payment Replace with the following: "Equitable Adjustments will be established by mutual Agreement for compensable items listed in Section 109.7.3-Compensable Items, based upon Unit or Lump Sum Prices. If Agreement cannot be reached, the Contractor shall accept payment on a Force Account basis as provided in Section 109.7.5 - Force Account Work, as full and complete compensation for all Work relating to the Equitable Adjustment."

109.7.3 Compensable Items Replace with the following: "The Contractor is entitled to compensation for the following items, with respect to agreed upon Unit or Lump Sum Prices:

1. Labor expenses for non-salaried Workers and salaried foremen.

2. Costs for Materials.

3. A 15 % markup on the totals of Items 1 and 2 of this subsection 109.7.3 for home office overhead and profit of the Contractor, its Subcontractors and suppliers, and any lower tier Subcontractors or suppliers, with no mark-ups on mark-ups.

4. Cost for Equipment, based on Blue Book Rates or leased rates, as set forth in Section 109.7.5(C), or the Contractor's Actual Costs if determined by the Department to be lower.
5. Costs for extended job-site overhead.
6. Time.

7. Subcontractor quoted Work, as set forth below in Section 109.7.5 (F)."

109.7.5 Force Account Work

C. Equipment

Paragraph 2, delete sentence 1 which starts; "Equipment leased…."

Paragraph 6, change sentence 2 from "The Contractor may furnish…" to read "If requested by the Department, the Contractor will produce cost data to assist the Department in the establishment of such rental rate, including all records that are relevant to the Actual Costs including rental Receipts, acquisition costs, financing documents, lease Agreements, and maintenance and operational cost records."
Add the following paragraph; "Equipment leased by the Contractor for Force Account Work and actually used on the Project will be paid for at the actual invoice amount plus 10% markup for administrative costs."

Add the following section;

"F. Subcontractor Quoted Work When accomplishing Force Account Work that utilizes Subcontractors, the Contractor will be allowed a maximum markup of 5% for profit and overhead on the Subcontractor's portion of the Force Account Work."

SECTION 110
INDEMNIFICATION, BONDING, AND INSURANCE

Delete the entire Section 110.2.3 and replace with the following:

110.2.3 Bonding for Landscape Establishment Period The Contractor shall provide a signed, valid, and enforceable Performance, Warranty, or Maintenance Bond complying with the Contract, to the Department at Final Acceptance.

The bond shall be in the full amount for all Pay Items for work pursuant to Sec 621, Landscape, payable to the "Treasurer - State of Maine," and on the Department's forms, on exact copies thereof, or on forms that do not contain any significant variations from the Department's forms as solely determined by the Department.

The Contractor shall pay all premiums and take all other actions necessary to keep said bond in effect for the duration of the Landscape Establishment Period described in Special Provision 621.0036 - Establishment Period. If the Surety becomes financially insolvent, ceases to be licensed or approved to do business in the State of Maine, or stops operating in the United States, the Contractor shall file new bonds complying with this Section within 10 Days of the date the Contractor is notified or becomes aware of such change.

All Bonds shall be procured from a company organized and operating in the United States, licensed or approved to do business in the State of Maine by the State of Maine Department of Business Regulation, Bureau of Insurance, and listed on the latest Federal Department of the Treasury listing for "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies."

By issuing a bond, the Surety agrees to be bound by all terms of the Contract, including those related to payment, time for performance, quality, warranties, and the Department's self-help remedy provided in Section 112.1 - Default to the same extent as if all terms of the Contract are contained in the bond(s).

Regarding claims related to any obligations covered by the bond, the Surety shall provide, within 60 Days of Receipt of written notice thereof, full payment of the entire claim or written notice of all bases upon which it is denying or contesting payment. Failure of the Surety to provide such notice within the 60-day period constitutes the Surety's waiver of any right to deny or contest payment and the Surety's acknowledgment that the claim is valid and undisputed.

SECTION 202
REMOVING STRUCTURES AND OBSTRUCTIONS

202.02 Removing Buildings Make the following change to the last sentence in the final paragraph, change "…Code of Maine Regulations 401." to "…Department of Environmental Protection Maine Solid Waste Management Rules, 06-096 CMR Ch. 401, Landfill Siting, Design and Operation."

SECTION 203
EXCAVATION AND EMBANKMENT

203.01 Description Under b. Rock Excavation; add the following sentence: "The use of perchlorate is not allowed in blasting operations."

SECTION 502
STRUCTURAL CONCRETE

502.05 Composition and Proportioning; TABLE #1; NOTE #2; third sentence; Change "…alcohol based saline sealer…" to "alcohol based silane sealer…". Add NOTE #6 to Class S Concrete.

502.0502 Quality Assurance Method A - Rejection by Resident Change the first sentence to read: "For an individual sublot with test results failing to meet the criteria in Table #1, or if the calculated pay factor for Air Content is less than 0.80……"

502.0503 Quality Assurance Method B - Rejection by Resident Change the first sentence to read: "For material represented by a verification test with test results failing to meet the criteria in Table #1, the Department will……"

502.0505 Resolution of Disputed Acceptance Test Results Combine the second and third sentence to read: "Circumstances may arise, however, where the Department may ……"
502.10 Forms and False work

D. Removal of Forms and False work 1., First paragraph; first, second, and third sentence; replace "forms" with "forms and false work"

502.11 Placing Concrete

G. Concrete Wearing Surface and Structural Slabs on Precast Superstructures Last paragraph; third sentence; replace "The temperature of the concrete shall not exceed 24° C [75° F} at the time of placement." with "The temperature of the concrete shall not exceed 24° C [75° F} at the time the concrete is placed in its final position."

502.15 Curing Concrete First paragraph; replace the first sentence with the following; "All concrete surfaces shall be kept wet with clean, fresh water for a curing period of at least 7 days after concrete placing, with the exception of vertical surfaces as provided for in Section 502.10 (D) - Removal of Forms and False work."

Second paragraph; delete the first two sentences.

Third paragraph; delete the entire paragraph which starts "When the ambient temperature…."

Fourth paragraph; delete "approved" to now read "…continuously wet for the entire curing period…"

Fifth paragraph; second sentence; change "…as soon as it is possible to do so without damaging the concrete surface." to "…as soon as possible."

Seventh paragraph; first sentence; change "…until the end of the curing period." to "…until the end of the curing period, except as provided for in Section 502.10(D) - Removal of Forms and False work."

502.19 Basis of Payment First paragraph, second sentence; add "pier nose armor" to the list of items included in the contract price for concrete.

SECTION 503
REINFORCING STEEL

503.06 Placing and Fastening Change the second paragraph, first sentence from: "All tack welding shall be done in accordance with Section 504, Structural Steel." to "All tack welding shall be done in accordance with AWS D1.4 Structural Welding Code - Reinforcing Steel."

SECTION 504
STRUCTURAL STEEL

504.09 Facilities for Inspection Add the follow as the last paragraph: "Failure to comply with the above requirements will be consider to be a denial to allow access to work by the Contractor. The Department will reject any work done when access for inspection is denied."

504.18 Plates for Fabricated Members Change the second paragraph, first sentence from: "…ASTM A 898/A 898 M…" to "…ASTM A 898/A 898 M or ASTM A 435/A 435 M as applicable and…"

504.31 Shop Assembly Add the following as the last sentence: "The minimum assembly length shall include bearing centerlines of at least two substructure units."

504.64 Non Destructive Testing-Ancillary Bridge Products and Support Structures Change the third paragraph, first sentence from "One hundred percent…" to "Twenty five percent…"

SECTION 535
PRECAST, PRESTRESSED CONCRETE SUPERSTRUCTURE

535.02 Materials Change "Steel Strand for Concrete Reinforcement" to "Steel Strand." Add the following to the beginning of the third paragraph; "Concrete shall be Class P conforming to the requirements in this section. 28 day compressive strength shall be as stated on the plans. Coarse aggregate…."

535.05 Inspection Facilities Add the follow as the last paragraph: "If the above requirements are not met, the Contractor shall be considered to be in violation of Standard Specification 104.2.5 – Right to Inspect Work. All work occurring during a violation of this specification will be rejected."

535.26 Lateral Post-Tensioning Replace the first paragraph; "A final tension…" with "Overstressing strands for setting losses cannot be accomplished for chuck to chuck lengths of 7.6 m [25 ft] and less. In such instances, refer to the Plans for all materials and methods. Otherwise, post-tensioning shall be in accordance with PCI standards and shall provide the anchorage force noted in the Plans. The applied jacking force shall be no less than 100% of the design jacking force."

SECTION 603
PIPE CULVERTS AND STORM DRAINS

603.0311 Corrugated Polyethylene Pipe for Option III Replace the Minimum Mandrel Diameter Table with the following:

Nominal Size US Customary (in)	Minimum Mandrel Diameter (in)	Nominal Size Metric (mm)	Minimum Mandrel Diameter (mm)
12	11.23	300	280.73
15	14.04	375	350.91
18	16.84	450	421.09
24	22.46	600	561.45
30	28.07	750	701.81
36	33.69	900	842.18
42	39.30	1050	982.54
48	44.92	1200	1122.90

SECTION 604
MANHOLES, INLETS, AND CATCH BASINS

604.02 Materials Add the following:

"Tops and Traps	712.07
Corrugated Metal Units	712.08
Catch Basin and Manhole Steps	712.09"

SECTION 605
UNDERDRAINS

605.05 Underdrain Outlets Make the following change:

In the first paragraph, second sentence, delete the words "metal pipe".

SECTION 606
GUARDRAIL

606.02 Materials Delete the entire paragraph which reads "The sole patented supplier of multiple mailbox…." and replace with "Acceptable multiple mailbox assemblies shall be listed on the Department's Approved Products List and shall be NCHRP 350 tested and approved."
Delete the entire paragraph which reads "Retroreflective beam guardrail delineators…." and replace with "Reflectorized sheeting for Guardrail Delineators shall meet the requirements of Section 719.01 - Reflective Sheeting. Delineators shall be fabricated from high-impact, ultraviolet and weather resistant thermoplastic.

606.09 Basis of Payment First paragraph; delete the second and third sentence in their entirety and replace with "Butterfly-type guardrail reflectorized delineators shall be mounted on all W-beam guardrail at an interval of every 10 posts [62.5 ft] on tangents sections and every 5 posts [31.25 ft] on curved sections as directed by the Resident. On divided highways, the delineators shall be yellow on the left hand side and silver/white on the right hand side. On two-way

roadways, the delineators shall be silver/white on the right hand side. All delineators shall have retroreflective sheeting applied to only the traffic facing side. Reflectorized guardrail delineators will not be paid for directly, but will be considered incidental to the guardrail items."

SECTION 609
CURB

609.04 Bituminous Curb f., Delete the requirement "Color Natural (White)"

SECTION 615
LOAM

615.02 Materials Make the following change:

Organic Content	Percent by Volume
Humus	"5% - 10%", as determined by Ignition Test

SECTION 618
SEEDING

618.01 Description Change the first sentence to read as follows: "This work shall consist of furnishing and applying seed ….." Also remove ",and cellulose fiber mulch" from 618.01(a).
618.03 Rates of Application In 618.03(a), remove the last sentence and replace with the following: "These rates shall apply to Seeding Method 2, 3, and Crown Vetch."

In 618.03(c) "1.8 kg [4 lb]/unit." to "1.95 kg [4 lb]/unit."

618.09 Construction Method In 618.09(a) 1, sentence two, replace "100 mm [4 in]" with "25 mm [1 in] (Method 1 areas) and 50 mm [2 in] (Method 2 areas)"

618.15 Temporary Seeding Change the Pay Unit from Unit to Kg [lb].

SECTION 620
GEOTEXTILES

620.03 Placement Section (c)
Title: Replace "Non-woven" in title with "Erosion Control".
First Paragraph: Replace first word "Non-woven" with "Woven monofilament".
Second Paragraph: Replace second word "Non-woven" with "Erosion Control".

620.07 Shipment, Storage, Protection and Repair of Fabric Section (a)
Replace the second sentence with the following: "Damaged geotextiles, as identified by the Resident, shall be repaired immediately."

620.09 Basis of Payment
Pay Item 620.58: Replace "Non-woven" with "Erosion Control"

Pay Item 620.59: Replace "Non-woven" with "Erosion Control"

SECTION 621
LANDSCAPING

621.0036 Establishment Period In paragraph 4 and 5, change "time of Final Acceptance" to "end of the period of establishment". In Paragraph 7, change "Final Acceptance date" to ""end of the period of establishment" and change "date of Final Acceptance" to "end of the period of establishment".

SECTION 626
HIGHWAY SIGNING

626.034 Concrete Foundations Add to the following to the end of the second paragraph: "Pre-cast and cast-in-place foundations shall be warranteed against leaning and corrosion for two years after the project is completed. If the lean is greater than 2 degrees from normal or the foundation is spalling within the first two years, the Contractor shall replace the foundation at no extra cost."

SECTION 627
PAVEMENT MARKINGS

627.10 Basis of Payment Add to the following to the end of the third paragraph: "If allowed by Special Provision, the Contractor may utilize Temporary Bi-Directional Yellow and White(As required) Delineators as temporary pavement marking lines and paid for at the contract lump sum price. Such payment will include as many applications as required and removal."

SECTION 637
DUST CONTROL

637.06 Basis of Payment Add the following after the second sentence of the third paragraph: "Failure by the Contractor to follow Standard Specification or Special Provision - Section 637 and/or the Contractor's own Soil Erosion and Pollution Control Plan concerning Dust Control and/or the Contractor's own Traffic Control Plan concerning Dust Control and/or visible evidence of excessive dust problems, as determined by the Resident, will result in a reduction in payment, computed by reducing the Lump Sum Total by 5% per occurrence per day. The Department's Resident or any other representative of the Department reserves the right to suspend the work at any time and request a meeting to discuss violations and remedies. The Department shall not be held responsible for any delay in the work due to any suspension under this item. Additional penalties may also be assessed in accordance with Special Provision 652 - Work Zone Traffic Control and Standard Specification 656 - Temporary Soil Erosion and Water Pollution Control."

SECTION 639
ENGINEERING FACILITIES

639.04 Field Offices Change the forth to last paragraph from: "The Contractor shall provide a fully functional desktop copier…" to "….desktop copier/scanner…"

SECTION 652
MAINTENANCE OF TRAFFIC

652.2.3 Flashing Arrow Board Delete the existing 5 paragraphs and replace with the following:
Flashing Arrow Panels (FAP) must be of a type that has been submitted to AASHTO's National Transportation Product Evaluation Program (NTPEP) for evaluation and placed on the Maine Department of Transportations' Approved Products List of Portable Changeable Message Signs & Flashing Arrow Panels.

FAP units shall meet requirements of the current Manual on Uniform Traffic Control Devices (MUTCD) for Type "C" panels as described in Section 6F.56 - Temporary Traffic Control Devices. An FAP shall have matrix of a minimum of 15 low-glare, sealed beam, Par 46 elements capable of either flashing or sequential displays as well as the various operating modes as described in the MUTCD, Chapter 6-F. If an FAP consisting of a bulb matrix is used, each element should be recess-mounted or equipped with an upper hood of not less than 180 degrees. The color presented by the elements shall be yellow.

FAP elements shall be capable of at least a 50 percent dimming from full brilliance. Full brilliance should be used for daytime operation and the dimmed mode shall be used for nighttime operation. FAP shall be at least 2.4 M x 1.2 M [96" x 48"] and finished in non-reflective black. The FAP shall be interpretable for a distance not less than 1.6 km [1 mile].

Operating modes shall include, flashing arrow, sequential arrow, sequential chevron, flashing double arrow, and flashing caution. In the three arrow signals, the second light from the arrow point shall not operate.

The minimum element on-time shall be 50 percent for the flashing mode, with equal intervals of 25 percent for each sequential phase. The flashing rate shall be not less than 25 nor more than 40 flashes per minute. All on-board circuitry shall be solid state.

Primary power source shall be 12 volt solar with a battery back-up to provide continuous operation when failure of the primary power source occurs, up to 30 days with fully charged batteries. Batteries must be capable of being charged from an onboard 110 volt AC power source and the unit shall be equipped with a cable for this purpose.

Controller and battery compartments shall be enclosed in lockable, weather-tight boxes.
The FAP shall be mounted on a pneumatic-tired trailer or other suitable support for hauling to various locations, as directed. The minimum mounting height of an arrow panel should be 2.1 M [7 feet] from the roadway to the bottom of the panel.

The face of the trailer shall be delineated on a permanent basis by affixing retro-reflective material, known as conspicuity material, in a continuous line as seen by oncoming drivers.

A portable changeable message sign may be used to simulate an arrow panel display."

652.2.4 Other Devices Delete the last paragraph and add the following:
"652.2.5 Portable Changeable Message Sign Trailer mounted Portable Changeable Message Signs (PCMS) must be of a type that has been submitted to AASHTO's National

Transportation Product Evaluation Program (NTPEP) for evaluation and placed on the Maine Department of Transportations' Approved Products List of Portable Changeable Message Signs & Flashing Arrow Panels. The PCMS unit shall meet or exceed the current specifications of the Manual on Uniform Traffic Control Devices (MUTCD), 6F.55.

The front face of the sign should be covered with a low-glare protective material. The color of the LED elements shall be amber on a black background. The PCMS should be visible from a distance of 0.8 km [0.5 mile] day and night and have a minimum 15º viewing angle. Characters must be legible from a distance of at least 200 M [650 feet].

The message panel should have adjustable display rates (minimum of 3 seconds per phase), so that the entire message can be read at least twice at the posted speed, the off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed. Each message shall consist of either one or two phases. A phase shall consist of up to eight characters per line. The unit must be capable of displaying at least three lines of text with eight characters per line. Each character shall be 457 mm [18"] high. Each character module shall use at least a five wide and seven high pixel matrix. The text of the messages shall not scroll or travel horizontally or vertically across the face of the sign.

Units shall automatically adjust their brightness under varying light conditions to maintain legibility.

The control system shall include a display screen upon which messages can be reviewed before being displayed on the message sign. The control system shall be capable of maintaining memory when power is unavailable. Message must be changeable with either a notebook computer or an on-board keypad. The controller shall have the capability to store a minimum of 200 user-defined and 200 pre-programmed messages. Controller and battery compartments shall be enclosed in lockable, weather-tight boxes.

PCMS units shall have the capability of being made programmable by means of wireless communications. PCMS units shall also be fully capable of having an on-board radar system installed if required for a particular application.

PCMS' primary power source shall be solar with a battery back-up to provide continuous operation when failure of the primary power source occurs. Batteries must be capable of being charged from a 110 volt AC power source. The unit must also be capable of being operated solely from a 110 volt AC power source and be equipped with a cable for this purpose.

The PCMS shall be mounted on a trailer in such a way that the bottom of the message sign panel shall be a minimum of 2.1 M [7 ft] above the roadway in urban areas and 1.5 M [5 ft] above the roadway in rural areas when it is in the operating mode. PCMS trailers should be of a heavy duty type with a 51 mm [2"] ball hitch and a minimum of four leveling jacks (at each corner). The sign shall be capable of being rotated 360° relative to the trailer. The face of the trailer shall be delineated on a permanent basis by affixing retro-reflective material, known as conspicuity material, in a continuous line as seen by oncoming drivers."

652.3.3 Submittal of Traffic Control Plan In item e. change "A list of all certified flaggers…" to "A list of all the Contractor's certified flaggers…"

In the last paragraph add the following as the second sentence: "The Department will review and provide comments to the Contractor within 14 days of receipt of the TCP."

652.3.5 Installation of Traffic Control Devices In the first paragraph, first sentence; change "Signs shall be erected…" to "Portable signs shall be erected.." In the third sentence; change "Signs must be erected so that the sign face…" to "Post-mounted signs must also be erected so that the sign face…"

652.4 Flaggers Replace the first paragraph with the following; "The Contractor shall furnish flaggers as required by the TCP or as otherwise specified by the Resident. All flaggers must have successfully completed a flagger test approved by the Department and administered by a Department-approved Flagger-Certifier who is employing that flagger. All flaggers must carry an official certification card with them while flagging that has been issued by their employer. Flaggers shall wear safety apparel meeting ANSI 107-1999 Class 2 risk exposure and clearly identify the wearer as a person, shall be visible at a minimum distance of 300 m [1000 ft], and shall wear a hardhat with retroreflectivity. For nighttime conditions, Class 3 apparel should be considered, retroreflective or flashing SLOW/STOP paddles shall be used, and except in emergency situations the flagger station shall be illuminated to assure visibility."

Second paragraph, first sentence; change "…have sufficient distance to stop before entering the workspace." to "…have sufficient distance to stop at the intended stopping point." Third sentence; change "At a spot obstruction…" to "At a spot obstruction with adequate sight distance,…"

Fourth paragraph, delete and replace with "Flaggers shall be provided as a minimum, a 10 minute break, every 2 hours and a 30 minute or longer lunch period away from the work station. Flaggers may only receive 1 unpaid break per day; all other breaks must be paid. Sufficient certified flaggers shall be available onsite to provide for continuous flagging operations during break periods. Breaker flaggers will not be paid for separately, but shall be considered incidental to the appropriate pay item."

652.8.2 Other Items Replace the last paragraph with the following: "There will be no payment made under any 652 pay items after the expiration of the adjusted total contract time."

SECTION 653
POLYSTYRENE PLASTIC INSULATION

653.05 Placing Backfill In the second sentence; change "…shall be not less than 150 mm [6 in] loose measure." to "…shall be not less than 250 mm [10 in] loose measure." In the third sentence; change "…crawler type bulldozer of not more than 390 kg/m^2 [80 lb/ft^2] ground contact pressure…" to "…crawler type bulldozer of not more than 4875 kg/m^2 [2000 lb/ft^2] ground contact pressure…"

653.06 Compaction In the last sentence; change "…not more than 390 kg/m^2 [80 lb/ft^2] ground contact…" to "…not more than 4875 kg/m^2 [2000 lb/ft^2] ground contact…"

SECTION 656
TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL

656.5.1 If Pay Item 656.75 Provided Replace the second paragraph with the following: "Failure by the Contractor to follow Standard Specification or Special Provision - Section 656 and/or the Contractor's own Soil Erosion and Pollution Control Plan will result in a reduction in payment, computed by reducing the Lump Sum Total by 5% per occurrence per day. The Department's Resident or any other representative of the Department reserves the right to suspend the work at any time and request a meeting to discuss violations and remedies. The Department shall not be held responsible for any delay in the work due to any suspension under this item."

SECTION 701
STRUCTURAL CONCRETE RELATED MATERIALS

701.10 Fly Ash - Chemical Requirements Change all references from "ASTM C311" to "ASTM C114".

SECTION 703
AGGREGATES

703.05 Aggregate for Sand Leveling Change the percent passing the 9.5 mm [3/8 in] sieve from "85 – 10" to "85 – 100"

703.06 Aggregate for Base and Subbase Delete the first paragraph: "The material shall have…" and replace with "The material shall have a minimum degradation value of 15 as determined by Washington State DOT Test Method T113, Method of Test for Determination of Degradation Value (March 2002 version), except that the reported degradation value will be the result of testing a single specimen from that portion of a sample that passes the 12.5 mm [½ in] sieve and is retained on the 2.00 mm [No. 10] sieve, minus any reclaimed asphalt pavement used."

703.07 Aggregates for HMA Pavements Delete the forth paragraph: "The composite blend shall have…" and replace with "The composite blend, minus any reclaimed asphalt pavement used, shall have a Micro-Deval value of 18.0 or less as determined by AASHTO T 327. In the event the material exceeds the Micro Deval limit, a Washington Degradation test shall be performed. The material shall be acceptable if it has a value of 30 or more as determined by Washington State DOT Test Method T 113, Method of Test for Determination of Degradation Value (March 2002 version) except that the reported degradation value will be the result of testing a single composite specimen from that portion of the sample that passes the 12.5mm [1/2 inch] sieve and is retained on the 2.00mm [No 10] sieve, minus any reclaimed asphalt pavement used."

703.18 Common Borrow Replace the first paragraph with the following: "Common borrow shall consist of earth, suitable for embankment construction. It shall be free from frozen material, perishable rubbish, peat, and other unsuitable material including material currently or

previously contaminated by chemical, radiological, or biological agents unless the material is from a DOT project and authorized by DEP for use."

703.22 Underdrain Backfill Material Change the first paragraph from "…for Underdrain Type B…" to "…for Underdrain Type B and C…"

SECTION 706
NON-METALLIC PIPE

706.06 Corrugated Polyethylene Pipe for Underdrain, Option I and Option III Culvert Pipe Change the first sentence from "…300 mm diameters to 900 mm" to "…300 mm diameters to 1200 mm" Delete, in it's entirety, the last sentence which begins "This pipe and resins…" and replace with the following; "The manufacturing plants of polyethylene pipe shall be certified by the Eastern States Consortium. Polyethylene pipe shall be accepted based on third party certification by the AASHTO's National Transportation Product Evaluation Program."

SECTION 709
REINFORCING STEEL AND WELDED STEEL WIRE FABIC

709.03 Steel Strand Change the second paragraph from "…shall be 12mm [½ inch] AASHTO M203M/M203 (ASTM A416/A416M)…" to "…shall be 15.24 mm [0.600 inch] diameter AASHTO M203 (ASTM A416)…"

SECTION 710
FENCE AND GUARDRAIL

710.03 Chain Link Fabric Add the following sentence: "Chain Link fabric for PVC coated shall conform to the requirements of AASHTO M181, Type IV-Class B."

710.07 Guardrail Posts Section b. change "…AASHTO M183/M183M…" to "…AASHTO M 270M/M 270 Grade 250 (36)…"

SECTION 712
MISCELLANEOUS HIGHWAY MATERIALS

712.06 Precast Concrete Units In the first paragraph, change "…ASTM C478M…" to "…AASHTO M199…" Delete the second paragraph and replace with the following; "Approved structural fibers may be used as a replacement of 6 x 6 #10 gauge welded wire fabric when used at an approved dosage rate for the construction of manhole and catch basin units. The material used shall be one of the products listed on the Maine Department of Transportation's Approved Product List of Structural Fiber Reinforcement." Delete the fifth paragraph and replace with the following; "The concrete mix design shall be approved by the Department. Concrete shall contain 6% air content, plus or minus 1½% tolerance when tested according to AASHTO T152. All concrete shall develop a minimum compressive strength of 28 MPa [4000 psi] in 28 days when tested according to AASHTO T22. The absorption of a specimen, when tested according to AASHTO T280, Test Method "A", shall not exceed nine percent of the dry mass."

Add the following:
"712.07 Tops, and Traps These metal units shall conform to the plan dimensions and to the following specification requirements for the designated materials.

Gray iron or ductile iron castings shall conform to the requirements of AASHTO M306 unless otherwise designated.

712.08 Corrugated Metal Units The units shall conform to plan dimensions and the metal to AASHTO M36/M36M. Bituminous coating, when specified, shall conform to AASHTO M190 Type A.

712.09 Catch Basin and Manhole Steps Steps for catch basins and for manholes shall conform to ASTM C478M [ASTM C478], Section 13 for either of the following material:

(a) Aluminum steps-ASTM B221M, [ASTM B211] Alloy 6061-T6 or 6005-T5.

(b) Reinforced plastic steps Steel reinforcing bar with injection molded plastic coating copolymer polypropylene. Polypropylene shall conform to ASTM D 4101.

712.23 Flashing Lights Flashing Lights shall be power operated or battery operated as specified.

(a) Power operated flashing lights shall consist of housing, adapters, lamps, sockets, reflectors, lens, hoods and other necessary equipment designed to give clearly visible signal indications within an angle of at least 45 degrees and from 3 to 90 m [10 to 300 ft] under all light and atmospheric conditions.

Two circuit flasher controllers with a two-circuit filter capable of providing alternate flashing operations at the rate of not less than 50 nor more than 60 flashes per minute shall be provided.

The lamps shall be 650 lumens, 120 volt traffic signal lamps with sockets constructed to properly focus and hold the lamp firmly in position.
The housing shall have a rotatable sun visor not less than 175 mm [7 in] in length designed to shield the lens.

Reflectors shall be of such design that light from a properly focused lamp will reflect the light rays parallel. Reflectors shall have a maximum diameter at the point of contact with the lens of approximately 200 mm [8 in].

The lens shall consist of a round one-piece convex amber material which, when mounted, shall have a visible diameter of approximately 200 mm [8 in]. They shall distribute light and not diffuse it. The distribution of the light shall be asymmetrical in a downward direction. The light distribution of the lens shall not be uniform, but shall consist of a small high intensity portion with narrow distribution for long distance throw and a larger low intensity portion with wide distribution for short distance throw. Lenses shall be marked to indicate the top and bottom of the lens.

(b) Battery operated flashing lights shall be self- illuminated by an electric lamp behind the lens. These lights shall also be externally illuminated by reflex-reflective elements built into the lens to enable it to be seen by reflex-reflection of the light from the headlights of oncoming traffic. The batteries must be entirely enclosed in a case. A locking device must secure the case. The light shall have a flash rate of not less than 50 nor more than 60 flashes per minute from minus 30 °C [minus 20 °F] to plus 65 °C [plus 150 °F]. The light shall have an on time of not less than 10 percent of the flash cycle. The light beam projected upon a surface perpendicular to the axis of the light beam shall produce a lighted rectangular projection whose minimum horizontal dimension shall be 5 degrees each side of the horizontal axis. The effective intensity shall not have an initial value greater than 15.0 candelas or drop below 4.0 candelas during the first 336 hours of continuous flashing. The illuminated lens shall appear to be uniformly bright over its entire illuminated surface when viewed from any point within an angle of 9 degrees each side of the vertical axis and 5 degrees each side of the horizontal axis. The lens shall not be less than 175 mm [7 in] in diameter including a reflex-reflector ring of 13 mm [½ in] minimum width around the periphery. The lens shall be yellow in color and have a minimum relative luminous transmittance of 0.440 with a luminance of 2854° Kelvin. The lens shall be one-piece construction. The lens material shall be plastic and meet the luminous transmission requirements of this specification. The case containing the batteries and circuitry shall be constructed of a material capable of withstanding abuse equal to or greater than 1.21 mm thick steel [No. 18 U.S. Standard Gage Steel]. The housing and the lens frame, if of metal shall be properly cleaned, degreased and pretreated to promote adhesion. It shall be given one or more coats of enamel which, when dry shall completely obscure the metal. The enamel coating shall be of such quality that when the coated case is struck a light blow with a sharp tool, the paint will not chip or crack and if scratched with a knife will not powder. The case shall be so constructed and closed as to exclude moisture that would affect the proper operation of light. The case shall have a weep hole to allow the escape of moisture from condensation. Photoelectric controls, if provided, shall keep the light operating whenever the ambient light falls below 215 lx [20 foot candles]. Each light shall be plainly marked as to the manufacturer's name and model number.

If required by the Resident, certification as to conformance to these specifications shall be furnished based on results of tests made by an independent testing laboratory. All lights are subject to random inspection and testing. All necessary random samples shall be provided to the Resident upon request without cost to the Department. All such samples shall be returned to the Contractor upon completion of the tests.

712.32 Copper Tubing Copper tubing and fittings shall conform to the requirements of ASTM B88M Type A [ASTM B88, Type K] or better.

712.33 Non-metallic Pipe, Flexible Non-metallic pipe and pipe fittings shall be acceptable flexible pipe manufactured from virgin polyethylene polymer suitable for transmitting liquids intended for human or animal consumption.

712.34 Non-metallic Pipe, Rigid Non-metallic pipe shall be Schedule 40 polyvinylchloride (PVC) that meets the requirement of ASTM D1785. Fittings shall be of the same material.

712.341 Metallic Pipe Metallic pipe shall be ANSI, Standard B36.10, Schedule 40 steel pipe conforming to the requirements of ASTM A53 Types E or S, Grade B. End plates shall be steel conforming to ASTM A36/A36M.

Both the sleeve and end plates shall be hot dip galvanized. Pipe sleeve splices shall be welded splices with full penetration weld before galvanizing.

712.35 Epoxy Resin Epoxy resin for grouting or sealing shall consist of a mineral filled thixotropic, flexible epoxy resin having a pot life of approximately one hour at 10°C [50°F]. The grout shall be an approved product suitable for cementing steel dowels into the preformed holes of curb inlets and adjacent curbing. The sealant shall be an approved product, light gray in color and suitable for coating the surface.

712.36 Bituminous Curb The asphalt cement for bituminous curb shall be of the grade required for the wearing course, or shall be Viscosity Grade AC-20 meeting the current requirements of Subsection 702.01 Asphalt Cement. The aggregate shall conform to the requirements of Subsection 703.07. The coarse aggregate portion retained on the 2.36 mm [No. 8] sieve may be either crushed rock or crushed gravel.

The mineral constituents of the bituminous mixture shall be sized and graded and combined in a composite blend that will produce a stable durable curbing with an acceptable texture.

Bituminous material for curb shall meet the requirements of Section 403 - Hot Bituminous Pavement.

712.37 Precast Concrete Slab Portland cement concrete for precast slabs shall meet the requirements of Section 502 - Structural Concrete, Class A.

The slabs shall be precast to the dimension shown on the plans and cross section and in accordance with the Standard Detail plans for Concrete Sidewalk Slab. The surface shall be finished with a float finish in accordance with Subsection 502.14(c). Lift devices of sufficient strength to hold the slab while suspended from cables shall be cast into the top or back of the slab.

712.38 Stone Slab Stone slabs shall be of granite from an acceptable source, hard, durable, predominantly gray in color, free from seams which impair the structural integrity and be of smooth splitting character. Natural color variations characteristic of the deposit will be permitted. Exposed surfaces shall be free from drill holes or indications of drill holes. The granite slabs in any one section of backslope must be all the same finish.

The granite slabs shall be scabble dressed or sawed to an approximately true plane having no projections or depressions over 13 mm [½ in] under a 600 mm [2 ft] straightedge or over 25 mm [1 in] under a 1200 mm [4 ft] straightedge. The arris at the intersection of the top surface and exposed front face shall be pitched so that the arris line is uniform throughout the length of the installed slabs. The sides shall be square to the exposed face unless the slabs are to be set on a radius or other special condition which requires that the joints be cut to fit, but in any case shall be so finished that when the stones are placed side by side no space more than 20 mm [3/4 in] shall show in the joint for the full exposed height.

Liftpin holes in all sides will be allowed except on the exposed face.

SECTION 717
ROADSIDE IMPROVEMENT MATERIAL

717.03 C. Method #3 - Roadside Mixture #3 Change the seed proportions to the following:

Crown Vetch	25%
Perennial Lupine	25%
Red Clover	12.5%
Annual Rye	37.5%

717.05 Mulch Binder Change the third sentence to read as follows:

"Paper fiber mulch may be used as a binder at the rate of 2.3 kg/unit [5 lb/unit]."

SECTION 720
STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS

720.08 U-Channel Posts Change the first sentence from "…, U-Channel posts…" to "…, Rib Back U-Channel posts…"

SECTION 722
GEOTEXTILES

722.01 Stabilization/Reinforcement Geotextile Add the following to note #3; "The strengths specified in the columns labeled"<50%" and "≥ 50%" refer to the elongation at which the geotextile material was tested. For example; if a fabric is tested at 15% elongation then it must meet or exceed the minimum strength shown in the "<50%" column. Submittals must include the percent elongation at which the material was tested."

722.02 Drainage Geotextile Add the following to note #3; "The strengths specified in the columns labeled"<50%" and "≥ 50%" refer to the elongation at which the geotextile material was tested. For example; if a fabric is tested at 15% elongation then it must meet or exceed the minimum strength shown in the "<50%" column. Submittals must include the percent elongation at which the material was tested."

722.01 Erosion Control Geotextile Add the following note to Elongation in the Mechanical Property Table; "The strengths specified in the columns labeled"<50%" and "≥ 50%" refer to the elongation at which the geotextile material was tested. For example; if a fabric is tested at 15% elongation then it must meet or exceed the minimum strength shown in the "<50%" column. Submittals must include the percent elongation at which the material was tested."

SECTION 1

Specification for a

Radio Communications
Self-Supporting Tower

TABLE OF CONTENTS

1. General

1.1 Introduction

This specification covers the requirements for designing, furnishing, installing and commissioning a 40' galvanized-steel, lattice-type tower structure and associated components. The tower will be used to support radio communications antennas. The tower and associated components shall be new, of current production and as specified herein.

1.2 Description of Major Work Elements

A. Design, Furnish & Install:

1. Tower Antenna Support Structure.
2. Tower Reinforced Concrete Foundation.
3. Cable Runway/Ice Shield (CRIS).
4. Install fall arrest system (to must include safety harness and carabiners).

B. All site planning, preparation and development.

C. All engineering design certification and documentation.

D. Provide design and specifications stamped by a Maine licensed Maine State Professional Engineer of:

1. Tower Design.
2. Foundation Design.

E. Other work as specified elsewhere in this document.

1.3 Qualifications

A. General

1. The Contractor shall have demonstrated experience in design, furnishing and installing communications tower(s) on a turn-key basis.
2. The Contractor shall have demonstrated experience as one-source responsible for tower warranty, parts, and service.

B. Tower

1. The manufacturer shall have no less than 5 contiguous years in the fabrication of communications type towers.

2. All field-work associated with the tower shall be performed by a contractor having no less than 5 years experience in the erection of communications type poles or towers.

C. Foundation

1. All work associated with the tower foundation shall be performed by a contractor having no less than 5 years experience in the erection of communications type poles or towers.

D. Cable-Runway/Ice-Shield

1. The manufacturer shall have no less than 5 contiguous years in the fabrication of runway/shields.

1.4 Regulatory Requirements

A. Unless specified otherwise in this section, materials and installation shall conform to the applicable requirements of:

1. Local & National Codes.
2. Maine Electrical Code.
3. Electronics Industries Association (EIA).
4. American Society for Testing & Materials (ASTM).
5. American Concrete Institute (ACI).
6. American National Standards Institute (ANSI).
7. Federal Aviation Administration (FAA).
8. American Institute of Steel Construction (AISC).
9. American Iron and Steel Institute (AISI).
10. Occupational Safety & Health Administration (OSHA).
11. National Fire Protection Association (NFPA).
12. Institute of Electrical & Electronics Engineers (IEEE).
13. Underwriters Laboratories (UL)
14. MOTOROLA/ or approved equal
15. US Department of Interior (USDOI)
16. National Park Service (NPS)

1.5 Quantities & Locations

The single 40’ tower shall be located as shown on the plans.

2. Products

2.1 Tower

2.1.1 General

I. All structural members and associated hardware shall be manufactured of steel and hot-dipped galvanized at the manufacturer's facility.

2.1.2 Physical & Structural

A. Height of the tower shall be forty feet (40’).

B. The tower shall be of the self-support, lattice-type.

C. Wind and ice loading shall be per TIA/EIA-222, latest edition for this location.

2.1.3 Appurtenance Load

A. Land Mobile Radio (LMR) Antennas

1. The antenna shall be of the 620 series fiberglass-whip omni-directional antenna as manufactured by Radio Frequency Systems (RFS) or equivalent (800-437-3045 or www.rfsworld.com).
2. Each antenna fed by ANDREWS LDF 4-50A TRANSMISSION LINES.

B. Safety Margin

1. Design shall be based on two-times the appurtenance load specified.

C. Tower installation specifications for antenna and appurtenances.

Antenna 1

Community Receive VHF antenna, Andrew Decibel model DB601, wide bandwidth, fed to receiver multi- coupler/preselector panel.
Mounted at tower top, 40 foot AGL

Antenna 2

Transmitter band 1, VHF band, Andrew Decibel model ASP682, 152-158 mhz bandwidth.
Mounted at 25 foot level, west side of tower with 24 inch side bracket mount.

Antenna 3

Transmit band 2, VHF band, Andrew Decibel model ASP682, 156-162 mhz bandwidth. Mounted at 25 foot level, east side of tower with 24 inch side bracket mount.

Antenna 4

Transmit community antenna, UHF, Andrew Decibel model ASP633, 450-482 mhz bandwidth. Mounted at 35 foot level, north side of tower with minimum 12 inch side bracket mount. Antenna fed to receiver multicoupler/preselector panel.

Antenna 5

Receive community antenna, UHF, Andrew Decibel model ASP633, 450-482 mhz bandwidth. Mounted at 35 foot level, south side of tower with minimum 12 inch side bracket mount.

1. Roof Rail installation specifications for Antenna and app.

Antenna 6

Transmit and Receive antenna for MDEA, transmit frequency 158.790 mhz mounted on rail which is mounted on roof of equipment building.

Antenna 7

Transmit and Receive dish antenna, for 960 mhz band, antenna is currently on building and used for MEMA control link. Antenna is to be aimed to Augusta CMCC location.

2.1.4 Antenna Support Side Arms - Top Level

A. Furnish six (6) heavy-duty, 6-foot side arms for top level, spaced at 60° azimuth intervals.

B. Side arms shall be designed to support a single 620 series fiberglass-whip Omni-directional antenna as manufactured by Radio Frequency Systems (RFS) or equivalent. (800-437-3045 or www.rfswprld.com)

C. All side arms shall be identical in size, type, fabrication and finish.

D. All side arms shall include antenna pipe mounts.

2.1.5 Antenna Feed line & Waveguide Supports

A. Supports inside of structure for twelve (12) runs of 7/8" diameter coaxial antenna feed lines. Quantity of supports as required.

B. Supports inside of structure for two (2) runs of typical 6 GHz elliptical waveguide. Quantity of supports as required.

2.1.6 Ground Strap Bussbar

A. A copper ground bussbar and associated mounting hardware shall be furnished and installed at the base of the structure to facilitate connection of the antenna feed line and waveguide ground-straps.

2.1.7 Climbing Devices

A. The structure shall be equipped with a safety-cable climbing system on one of the structure legs.

B. The structure shall be equipped with climbing ladder and fall protection system.

2.2 Foundation

A. All foundation design, materials and construction practices shall be as required per Maine State Professional Engineer stamped drawings and specifications for the tower foundation.

2.3 Cable-Runway/Ice-Shield

2.3.1 General

A. An elevated cable-runway/ice-shield (CRIS) shall support, and protect from falling ice, LMR antenna feed lines and microwave antenna waveguides from the equipment shelter to the tower.

B. All structural members and associated hardware shall be manufactured of steel and hot-dipped galvanized at the manufacturer's facility.

2.3.2 Physical & Structural

A. The CRIS shall be no less than 18-inches in width and of solid design.

B. The CRIS shall span the length between the equipment shelter and the tower.

C. All antenna feed lines and waveguides shall be supported below the ice-shield.

D. The height of the CRIS above ground shall be such to allow, to the greatest extent, for straight horizontal runs of feed lines and waveguides.

E. The CRIS shall use support posts along its length as needed to preserve its support and falling-ice protection properties.

F. Impact Load: 50-lbs from a 250-foot height with no visible damage to CRIS.

3. Execution

3.1 Delivery & Storage of Materials

A. The contractor shall be responsible for all aspects of shipment and/or transportation of materials to their destination, as necessary.

B. The contractor shall be responsible for coordinating, unloading, inspecting, accepting and storing all material deliveries, as necessary.

C. All claims necessary as a result of damage or loss during shipment shall be the responsibility of the Contractor.

D. All stored materials shall remain the responsibility of the Contractor until final acceptance by the Department. Final acceptance is described later in this document.

3.2 Installation

3.2.1 General

A. Prior to installation, the Contractor shall coordinate and receive approval for the exact site placement and/or orientation of the following items with the Department and receive approval prior to contracting:

1. Tower Foundation.
2. Tower.
3. Cable-Runway/Ice-Shield.
4. Antenna Side Arms.
5. Ground Strap Bussbar
6. Fall arrest system

B. The contractor shall be responsible for:

1. Providing all materials, labor and tools to ensure a complete installation whether or not specified or shown.
2. All workmanship shall conform to applicable standards and prevailing practices.
3. Delivery of all materials to the site.
4. Remove the chain link fence, place with new chain link fence of the same height, and replace damaged pole(s).
5. Grading the site.

6. All access, road improvements, and clearing as necessary for delivery.
7. All access and site repairs after delivery. A new fence shall be installed around the site perimeter (Maine STD Spec. Section 607) Access and road shall be restored to original pre-installation condition as directed by the Department.
8. All electric utility service necessary for the installation.
9. Removing all rubbish and debris associated with all aspects of the installation.

3.2.2 Tower

A. All tower materials shall be installed in accordance with Maine State Professional Engineer stamped drawings and specifications.

B. The Contractor shall provide written certification to Department that tower was installed in accordance with a Maine State Professional Engineer's stamped drawings and specifications.

3.2.3 Foundation

A. The tower foundation shall be constructed and installed in accordance with Maine State Professional Engineer stamped drawings and specifications. See Section 1A Geotechnical Design Report.

B. Contractor shall provide written certification to Department that foundation was constructed in accordance with a Maine State Professional Engineer's stamped drawings and specifications.

3.2.4 Antenna Support Side Arms – Top Level

A. All materials shall be installed in accordance with the manufacturer's instructions as approved by the Department.

3.2.5 Cable-Runway/Ice-Shield (CRIS)

A. All materials shall be installed in accordance with the manufacturer's instructions as approved by the Department.

B. The height of the CRIS above ground shall be such to allow, to the greatest extent, for straight horizontal runs of feed lines and waveguides.

3.2.6 Ground Strap Bussbar

A. All materials shall be grounded and installed in accordance with prevailing grounding standards and practices, and as approved by the Department.

3.2.7 Grounding

A. General

1. Connection to the site's existing earth ground grid system (EGGS) shall be required.
2. All bonded welds shall be of the exothermal-type.
3. Wire conductors size shall be no less than 2/0 AWG.
4. Wire conductors shall be bare, tinned, solid copper.

B. Tower

1. The base of each tower leg shall be grounded to the EGGS.
2. Each leg shall use 2 separate wire conductors to the EGGS.
3. Conductors shall be weld-bonded to the closest EGGS ground rod.
4. Conductors shall be weld-bonded to the tower leg.

C. Cable-Runway/Ice-Shield (CRIS)

1. If the CRIS spans unsupported between the tower and equipment shelter, the Contractor shall use electrical isolation hardware to attach CRIS to tower.
2. Equipment shelter end of CRIS shall be weld-bonded to the shelter's exterior cable entry port ground (ECEPG).
3. At a minimum, the CRIS shall use 2 separate wire conductors to the ECEPG.
4. Each CRIS ground support post, if used, shall use a single wire conductor to the EGGS.
5. Each CRIS support post conductor shall be weld-bonded to the post.
6. Each CRIS support post conductor shall be weld-bonded to the EGGS.

D. Ground Strap Bussbar

1. The bussbar shall be grounded to the EGGS.
2. The bussbar shall use 2 separate wire conductors to the EGGS.
3. Conductors shall be weld-bonded to the EGGS.
4. Conductors shall be weld-bonded to the bussbar.

3.3 Inspection & Acceptance

3.3.1 Field Inspection

A. After installation of all the components furnished under this section, the Contractor along with the Department, at its discretion, shall perform a field inspection to verify that the installation of the components furnished under this contract has been performed and completed in accordance with the following, as applicable.

1. The Maine State Professional Engineer's design.
2. The manufacturer's instructions and recommendations.
3. The contract specifications.
4. The contractor's installation practices and standards as approved by the Department.

B. The Contractor shall provide all items, instrumentation, materials, equipment, and personnel necessary to conduct the inspection.

C. Prior to the commencement of this activity, the contractor shall deliver a preliminary field inspection plan to the Department for review and approval.

D. At the conclusion of this activity, the contractor shall present to the Department written certification that the inspection performed was in accordance with, and that the results of the inspection were in compliance with, the approved field inspection plan.

E. The Department's signature on the certification shall constitute acceptance by the Department of the inspection.

3.3.2 Final Acceptance

A. General

1. After acceptance of all the inspections and all the tests conducted under this section, the contractor shall present to the Department written certification that the activities were performed in accordance with, and that the results were in compliance with, the approved plans.
2. This certification shall include the original signed copy of the individual inspection and test certifications previously accepted by the Department.
3. Final acceptance will be deemed final when the Department's signature appears on this certification.

B. Post-Final Acceptance Documentation

1. After final system acceptance, the contractor shall deliver to the Department, in both printed and electronic form, the following documents, on a per-site basis, in one consolidated package.

   a. Copies of all signed certifications.

   b. Copies of all approved inspection and test plans.

3.4 Warranty

A. The Contractor shall include a copy of the manufacturer's standard commercial warranty for all furnished tower and associated components in their response.

3.5 Training

A. The Contractor shall conduct a single, on-site, hands-on training session for selected Department personnel.

B. The training location and schedule shall be by mutual agreement between the Department and Contractor.

C. The session shall be conducted after final acceptance.

D. The contents of the session shall include familiarizing the Department with special structure attributes, recommended inspection procedures, recommended maintenance procedures, ground connections, etc.

3.6 Documentation

3.6.1 With the Contractor's Bid

A. The Contractor's bid shall include specification sheets for the following items on this basis.

1. Tower
2. Accessories
3. Manufacturer's loading data for proposed built tower.

3.6.2 Post-Contract Award

A. General

1. Thorough documentation of all major tower components, and their respective installations, will be required from the Contractor. This documentation will be comprised of both factory-provided and field-generated documents and/or manuals.
2. Every document exchanged between Department and Contractor shall be in paper and/or electronic form, as mutually agreed. Electronic documents shall use the latest version of the application software or by a mutually agreed version. The following applications are required:
    a. Text - Microsoft Word
    b. Spreadsheets - Microsoft Excel
    c. Databases - Microsoft Access
    d. Scanned documents - Adobe Acrobat
    e. Simple Diagrams & Charts - Microsoft Visio or Excel
    f. Large Drawings – mutually agreed software program
    g. Schedules - Microsoft Project
3. The Department shall approve the contents and organization of all field-generated documents supplied by the contractor.

B. Factory Provided – Technical & Service Manuals

1. All factory-provided documentation shall be available on CD media.
2. All manuals shall be provided for the following components on a:
3. The following sets of manuals are to be furnished prior to project closeout on a:
    a. Five (5) complete paper-form sets
    b. Five (5) complete electronic-form sets

C. Field Generated - As-Built

1. All field-generated documentation shall be prepared in a format suitable for storage in loose-leaf 3-ring binders. This documentation shall also be supplied on CD media.
2. All field-generated drawings shall be prepared using a mutually agreed software program.
3. The following documentation shall be provided. Specification or catalog cut sheets for each of the major items illustrated in the documents shall be included with the submittals to the Department.

a. Tower & foundation – top view diagram.

b. Tower – side elevation view diagram with tower sections identified.

c. Foundation – side elevation view diagram illustrating both above and below grade portions.

d. A site plan illustrating the installed location of the components supplied under this contract relative to other existing major site components (e.g., shelters, fences, towers, etc.). Plan shall be to scale; and the new and existing components shall be contrasted by the use of a gray scale.

e. The site plan shall identify the interconnection between the tower legs or accessories to the site electrical ground grid system.

4. The following sets of field-generated documentation are to be furnished prior to project closeout:

a. Five (5) complete paper-form sets

b. Five (5) complete electronic-form sets

4. Measurement of Payment

4.1.1 4.1 Method of measurement

ITEM #	DESCRIPTION
643.97	Radio Communication Tower, Self-Supporting
643.971	Radio Communication Tower---Inspection and Acceptance, Field Inspection
643.972	Radio Communication Tower---Inspection and Acceptance, Final Acceptance
643.973	Radio Communication Tower---Inspection and Acceptance, Training

4.1.2 4.2 Basis of Payment

The accepted Radio Communication Tower items will be paid for at the contract lump sum prices which will include payment for all respective items as called for in the contract, designed, delivered, stored, constructed, installed, tested, documented, all clearing, preparation, disposal, materials, labor, equipment, training and incidentals necessary to complete the work.

Payment will be made under:

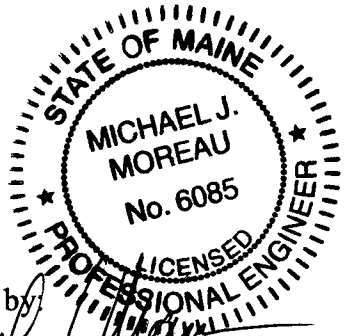
ITEM #	DESCRIPTION	UNIT
643.97	Radio Communication Tower, Self-Supporting	LS
643.971	Radio Communication Tower---Inspection and Acceptance, Field Inspection	LS
643.972	Radio Communication Tower---Inspection and Acceptance, Final Acceptance	LS
643.973	Radio Communication Tower---Inspection and Acceptance, Training	LS

END OF DOCUMENT

Maine Department of Transportation

Highway Program
Geotechnical Section

GEOTECHNICAL DESIGN REPORT
for
CADILLAC MOUNTAIN RADIO TOWER REPLACEMENT
TOWN OF BAR HARBOR
HANCOCK COUNTY, MAINE



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Hancock County | PIN 14276.00 | Soils Report 2007-02

March 2007

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Section Page

1.0 GEOTECHNICAL DESIGN SUMMARY

This report summarizes our geotechnical engineering evaluations for the Cadillac Mountain Radio Tower in the Town of Bar Harbor, Hancock County, Maine. The design and construction recommendations below are discussed in greater detail in Section 4.0, Evaluation and Recommendations.

1.1 Foundation Support

- A mat foundation or individual leg pier pad foundations, with or without rock anchors should be considered for design
- Use an allowable contact bearing pressure of 15 tons per square foot (tsf) for foundations constructed on competent bedrock
- Use a minimum footing width of 3 feet for pier pad foundations
- Settlement will be negligible and less than ½-inch for foundations constructed on competent bedrock and will occur as the tower is built
- Assume the groundwater table at the finished grade ground surface
- Foundations constructed on shallow, sound bedrock will satisfy frost depth requirements

1.2 Rock Anchors for Lateral and Uplift Load Resistance

- Use an allowable rock/grout bond stress of 175 psi or less for anchor design
- Limit rock anchor working loads to the allowable structural capacity for an anchor tendon (60 percent of the specified minimum tensile strength of the tendon steel) or the allowable geotechnical capacity, whichever is less.
- Use a minimum bond length of 10 feet and a free stressing length of 10 feet for bar tendons or 15 feet for strand tendons
- Use bar or strand anchor tendons furnished with double corrosion protection
- Provide anchor hole diameter in accordance with manufacturer's recommendations
- Use a rock engagement angle of 60 degrees
- Total unit weight of 165 pounds per cubic foot (pcf) for rock within the engagement cone
- Assumed groundwater level at the ground surface
- Performance test all installed rock anchors to 1.33 times the design load

1.3 Lateral and Uplift Load Resistance Without Rock Anchors

- Neglect passive earth pressure for lateral load resistance
- Use a concrete/rock interface coefficient of friction of 0.7. The resisting interface force is 0.7 times the normal load on the base of the foundation.
- The normal load should include the buoyant unit weight of concrete for the portion below the ground surface, regular weight concrete above ground surface, and the tower dead load

- Improve concrete/bedrock interface sliding resistance by anchoring, doweling, or benching if the prepared bedrock surface is sloped steeper than 4:1 (H:V) in any direction

1.4 Site Preparation

- Clean the bedrock surface to remove all soil, and loose or fractured rock using mechanical means
- Wash the bedrock surface with high pressure water jet for final preparation
- Divert surface water away from excavation and remove groundwater from excavation using sump pump
- Use backfill meeting the requirements of MaineDOT 703.20, Gravel Borrow compacted to 95 percent of Modified Proctor maximum dry density

1.5 Final Plan Review and Construction Monitoring

- The Radio Tower Project Team geotechnical engineer should review final plans and specifications
- A qualified geotechnical engineer or construction engineer should observe:
  - Foundation subgrade prior to placement of footing form work
  - Rock anchor installation and performance testing if rock anchors are used, and
  - Placement and compaction of backfill soils around the perimeter and/or the top of the tower foundation
- The radio tower shop drawings should be reviewed by the Maine Department of Transportation (MaineDOT) structures group to verify that loading criteria, load conditions, anchorage, performance criteria, and required factors of safety (FS) conform to current radio tower structural standards.

2.0 INTRODUCTION

MaineDOT plans to install a new 40-foot self supported radio tower at the existing radio tower facility on Cadillac Mountain, Bar Harbor, Maine, shown on the Site Location Map on Figure 1 in Appendix A. The proposed new tower will be located on a new foundation adjacent to the Older Generator Building shown on Figure 2 (exact location not yet known).

The new Cadillac Mountain tower is planned to be a self supporting tower. We understand that foundation design will be provided by the tower manufacturer selected by MaineDOT for this site.

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Site Conditions

The existing tower is a guyed tower approximately 40 feet high which sets atop the Older Generator Building. During preparation of this report no information was available concerning the design and construction of the existing tower, guy anchorages and support building foundations. Other than the Older and Newer Generator Buildings and the Pump House, the nearest existing structure to the proposed site is the Acadia National Park Visitor's Center located about 300 feet to the east.

The general vicinity of the proposed tower site is relatively flat and the local ground surface topography slopes moderately down and away from the tower site in all directions. Surficial drainage will generally follow the local topography and carry surface water away in all directions, although some rainfall will be retained in the thin surficial soils on the flatter areas of the site. Surficial geology maps of the region indicate thin surficial soils and many bedrock outcrops. The soil veneer is likely a glacial till erosion product consisting of sand, silt and some gravel, as well as some leveling fills within the developed radio tower site.

3.2 Subsurface Conditions

We investigated the subsurface conditions in the vicinity of the proposed tower site by drilling one boring to a depth of approximately 22.3 feet below ground surface (bgs) at the location shown on Figure 2. The test boring, designated B-1, was drilled on 11 January 2007 by Maine Test Borings, Inc. of Brewer, Maine, using a track-mounted Mobile B-53 drill rig.

MaineDOT technician Greg Lidstone was present throughout the field program to select the boring location, determine protocols for soil and rock sampling and log the conditions encountered. Drilling in soil was performed using Standard Penetration Test split spoon sampling protocols. Drilling in bedrock was performed using cased wash boring methods and diamond NQ2 rock coring with a double-tube core barrel, which produced a 3-inch diameter borehole and a 2-inch diameter rock core sample.

In the boring, we found 2.3 feet of fine to coarse sand with trace to some gravel and some silt over bedrock. The bedrock is consistently comprised of fresh to very slightly weathered, medium to coarse-grained biotite-hornblende granite with occasional open, silt in-filled joints. The observed rock quality designations (RQD's) ranged between 87 and 98 percent indicating that the observed rock quality ranged from good to excellent.

We did not encounter groundwater at the time the boring was conducted. We noted that the thin surficial soils were saturated demonstrated by their high water contents. However, the groundwater level will fluctuate with seasonal changes, runoff, and adjacent construction activities. For a more detailed description of the subsurface conditions, please refer to the boring log in Appendix B, Field Exploration and Test Data.

3.3 Laboratory Testing

We conducted a laboratory soil testing program on selected samples recovered from the test boring to assess physical property characteristics. Laboratory soils testing was performed by the MaineDOT soils lab in Bangor, Maine. We conducted grain size analysis and moisture content determinations on soil samples 1D (0.0-2.0 ft.) and 2D (2.0-2.1 ft.).

Golder Associates, Inc., Brunswick, Maine, conducted a total of six point load tests on selected portions of bedrock core samples from Run R-1 (2.3-7.3 ft. bgs) and summarized the results in their report dated 15 February 2007 (Golder Associates, 2007). The point load tests were conducted using a Roc Test Pil-7 apparatus. Point load index test data can be used to assess variations in the rock unconfined compressive strength. The Golder point load test results estimate average rock compressive strengths of 22,000 pounds per square inch (psi) and 20,000 psi in diametrical and axial point load tests on intact portions of bedrock core, respectively.

Results of laboratory testing are presented in Appendix C, Laboratory Test Data. The AASHTO and USCS soil classification and water content data are also presented on the boring logs in Appendix B. The Golder Associates, Inc., rock test results have been excerpted from their report and have been placed in Appendix B.

4.0 EVALUATION and RECOMMENDATIONS

The tower and the foundation support requirements will be designed in accordance with the Standard TIA-222-F (Telecommunications Industry Association, June 1996, Reaffirmed March 2003). Although the design loads for a 40-foot tower are currently unknown, we understand loads for a triangular tower of this height can be on the order of 90 kips/leg compression and 70 kips/leg uplift. To provide resistance against lateral, overturning and uplift loads, the tower foundation typically consists of a large mat foundation or concrete pier pads for each leg. At shallow bedrock sites, rock anchor installation may be cost effective.

Green Mountain Communication provided information for a conceptual 30-foot tower design package in October 2006. The tower structure for the concept design included a 12X12 foot square, 4 foot thick mat foundation. The concept design considered founding on competent bedrock, 85 mph winds, ½-inch thick radial ice load, 6 side arms, and loading for 12 each 3-foot whips. Dimensions for a 40-foot tower and compatible foundation may be different depending on loading criteria, load conditions, anchorage, performance criteria, and required factors of safety (FS).

4.1 Foundation Support

We recommend that the new tower foundation be supported directly on sound bedrock. Based on our boring exploration, we expect sound, unweathered bedrock to occur either at the bedrock surface or within about one foot of the rock surface. We recommend consideration of both a mat foundation, and individual concrete pier pad foundations, with or without rock anchors as required by the design.

Typically, a concrete foundation pier pad without rock anchors for a three-legged self-supporting tower would have dimensions on the order of 10 to 15-foot square, 2 to 3 feet thick, and are founded 5 or 6 feet below the ground surface. However, the engineered foundation for this project may vary in dimensions and embedment, based on site-specific loading and performance criteria. Alternately, rock anchors could be designed to resist lateral and uplift loads for a shallower pier pad foundation beneath the entire structure, or for individual foundations for each tower leg.

4.1.1 Bearing Capacity

When correlated to the estimated rock compressive strengths determined from the point load tests, the allowable bearing pressure for foundations bearing directly on sound bedrock is much less (Bowles, 1982). Presumptive allowable bearing pressures for granite found in Fang, 1991, range between 30 and 60 tsf. However, based on our observations of the bedrock conditions and our experience at similar sites, we recommend an allowable contact bearing pressure of 15 tsf for compression loads used for design. We recommend a minimum footing width of 3 feet regardless of footing pressures for individual tower leg foundations if a large pier pad is not used. To verify that the foundation bearing conditions are consistent with our findings in the boring exploration, we recommend that the exposed footing subgrade be observed and approved by an experienced engineer or geologist.

4.1.2 Settlement

We expect that foundation settlement will be negligible and less than ½-inch for foundations bearing on sound bedrock and with bearing pressures less than or equal to 15 tsf. Any anticipated settlement will occur rapidly as the foundation and tower are constructed.

4.1.3 Groundwater Table

We did not encounter groundwater at the time of boring exploration. However, we noted that the thin surficial soils were saturated as demonstrated by their high water contents. Consequently, we recommend that the groundwater table be assumed at the ground surface for design purposes.

4.1.4 Frost Depth

The design freezing index for Bar Harbor, Maine, is 1100 F-degree days. Using correlations to frost penetration found in Table 5-1 of the MaineDOT Bridge Design Guide (MaineDOT, 2003) for a saturated coarse-grained soil, the design frost depth is approximately 4 feet for this site. Thus, we recommend that the base of a pier pad foundation should be founded at least 4 feet below the adjacent finished grade for frost protection. However, since sound rock is not frost-susceptible, we believe that foundations constructed on sound bedrock at approximately 2.5 feet bgs may be used. We recommend that the bedrock conditions be confirmed by an experienced engineer or geologist during construction.

4.2 Rock Anchors for Lateral and Uplift Load Resistance

We encountered competent granite bedrock at the site with an average unconfined compressive strength of about 20,000 psi. Consequently, permanent rock anchors incorporating ASTM A 722 150 psi thread bars or ASTM A 416 strand anchors may be used to provide uplift and lateral load resistance for the tower foundation. Bond stresses in Post-Tensioning Institute, 2004, indicate typical average ultimate rock/grout bond stresses in competent granite between 250 and 450 psi. Considering an ultimate rock/grout bond stress of 350 psi and a FS of 2, we recommend that a maximum allowable rock/grout bond stress of 175 psi should be used for design (PTI, 2004; NAVFAC, 1983).

Either bar type anchors such as Dywidag Threadbar or Williams mechanical anchors or strand type anchors may be used, however bar anchors are commonly used. Based on the findings of our exploration, laboratory testing, and rock anchor design guidance from several references (NAVFAC, DM 7.3, 1983; Post-Tensioning Institute, 2004; Fang, 1991), we recommend the following criteria for rock anchor design:

- Use anchor tendons furnished with double corrosion protection
- Size the anchor tendon for a design load less than 60 percent of the specified minimum tensile strength of the tendon steel, or the allowable geotechnical capacity, whichever is less
- Use a minimum rock/grout bond length of 10 feet regardless of the design load
- Provide anchor hole diameter in accordance with manufacturer's recommendations
- Limit the allowable rock/grout bond stress to 175 psi or less
- Assume a rock engagement angle of 60 degrees
- Assume a total unit weight of 165 pcf for rock within the engagement cone
- Assume the groundwater level at the ground surface

The free stressing length will depend on the type of anchor tendon used. We recommend minimum free stressing lengths of 10 feet for bar anchors and 15 feet for strand anchors.

We recommend that all of the rock anchors installed for the tower foundation be performance tested in accordance with the procedures described by the Post-Tensioning Institute. Specifically, we recommend a maximum test load of 1.33 times the design load, provided the maximum test load does not exceed 80 percent of the anchor tendon's specified minimum tensile strength. After testing, all anchors should be locked off at a load specified by the design engineer not exceeding 70 percent of the minimum specified tensile strength of the anchor tendon.

4.3 Lateral and Uplift Load Resistance Without Rock Anchors

Lateral loads may be resisted using concrete/bedrock interface friction. We do not recommend using passive earth pressure because surficial soils are thin and loose. For base friction, we recommend using a concrete/rock interface coefficient of friction of 0.7. The resisting interface force is 0.7 times the normal load on the base of the foundation (NAVFAC, 1983). This assumes a completely level or benched level bedrock surface and cast-in-place foundations. The normal load should include the buoyant weight of the tower foundation below the ground surface, regular weight concrete above ground surface, the buoyant weight of any overlying soil below the ground surface (if the foundation is embedded below ground surface), and the dead load of the tower. A minimum factor of safety of 1.5 against overturning is recommended for design (TIA-222-F).

In accordance with TIA-222-F, uplift resistance for a pier pad foundation may be provided by the weight of the concrete pier and, if the foundation is embedded, the weight of the soil overlying the foundation enclosed within an inverted pyramid whose sides form a 30 degree angle with the vertical. The unit weight of soil overlying the foundation is required to be assumed equal to 100 pcf per TIA-222-F. Similarly, the weight of the foundation concrete is required to be assumed equal to 150 pcf for this analysis. Based on our site explorations, buoyant unit weights should be used for soil and concrete for foundations constructed below the ground surface at this site.

4.4 Site Preparation

We anticipate that shallow excavations will be made to construct the tower foundation. The foundation subgrade should consist of sound bedrock. The bearing surface should be cleaned of all overburden soils, and loose, disturbed or visibly fractured bedrock should be removed by mechanical means. Mechanical means include expansive agents, use of hydraulic hoe ram, hydraulic splitters, or wedging and prying. We recommend final bedrock surface preparation by washing with a high pressure water jet.

The nature, slope, and degree of fracturing in the bedrock will not be evident until the foundation excavation is made. We recommend anchoring, doweling, benching or other means of improving sliding resistance if the prepared bedrock surface is steeper than 4:1 (H:V) in any direction.

Surface water should be diverted from the foundation excavation throughout the period of construction. We recommend removing any groundwater encountered at the base of the foundation excavation by using a sump pump located in a corner of the excavation outside of the foundation footprint.

The existing residual till soils have a fines content (percent passing the No. 200 sieve) on the order of 33 percent. Accordingly, this material is not suitable for reuse as backfill adjacent to the tower foundation. The contractor should use a backfill soil material meeting the requirements of MaineDOT Standard Specification 703.20, Gravel Borrow. The backfill soil should be placed in 8-inch thick loose lifts and compacted to 95 percent of the Modified Proctor (ASTM D 1557) maximum dry density.

4.5 Final Plan Review and Construction Monitoring

We recommend that the Radio Tower Project Team geotechnical engineer review the final drawings and specifications to confirm that the earthwork and foundation recommendations are properly interpreted and implemented in the design and specifications. We also recommend that a qualified geotechnical engineer or construction engineer observe and evaluate the following tower foundation construction phases:

- Foundation subgrade prior to placement of footing formwork
- Rock anchor installation and performance testing, if applicable, and
- Placement and compaction of backfill soils around the perimeter and/or the top of the tower foundation

Finally, we recommend that the radio tower shop drawings be reviewed by the Maine Department of Transportation structures group to verify that loading criteria, load conditions, anchorage, performance criteria, and required FS conform to current radio tower structural standards.

5.0 CLOSURE

This report has been prepared for use by the MaineDOT Radio Tower Replacement Team, for specific application to the Cadillac Mountain tower replacement. The report has been prepared in accordance with generally accepted soil and foundation engineering practices. No other intended use or warranty is expressed or implied.

In the event that any changes in the nature, design, or location of the proposed tower are planned, this report should be reviewed by a geotechnical engineer to assess the appropriateness of the conclusions and recommendations and to modify the recommendations as appropriate to reflect the changes in design. Further, the analyses and recommendations are based in part upon limited soil explorations completed at discrete locations on the project site. If variations from the conditions encountered during the investigation appear evident during construction, it may also become necessary to re-evaluate the recommendations made in this report.

REFERENCES

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Fang, Hsai-Yang (1991), Foundation Engineering Handbook, Second Edition, Van Nostrand Reinhold, New York, NY.

Golder Associates, Inc., (2007), Rock Core Testing Results, Four MaineDOT Radio Tower Sites, Contract U1210060676, Consultant, Brunswick, ME.

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NAVFAC, (1983), Soil Dynamics, Deep Stabilization, and Special Geotechnical Construction, Design Manual 7.3, Naval Facilities Engineering Command, Alexander, VA.

Post-Tensioning Institute, (2004), Recommendations for Prestressed Rock and Soil Anchors, Post-Tensioning Institute, Phoenix, AZ.

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APPENDIX - A

Figures

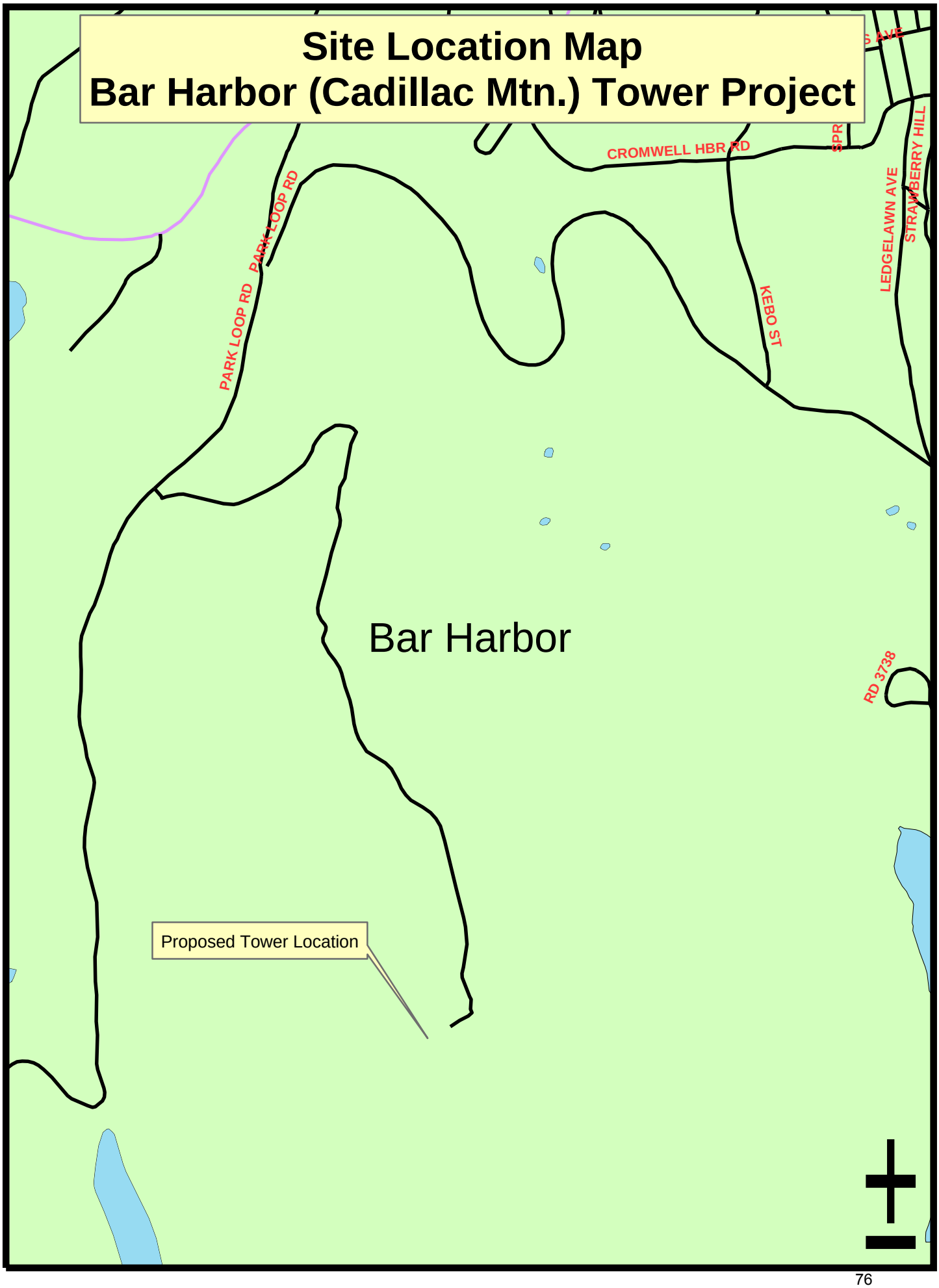
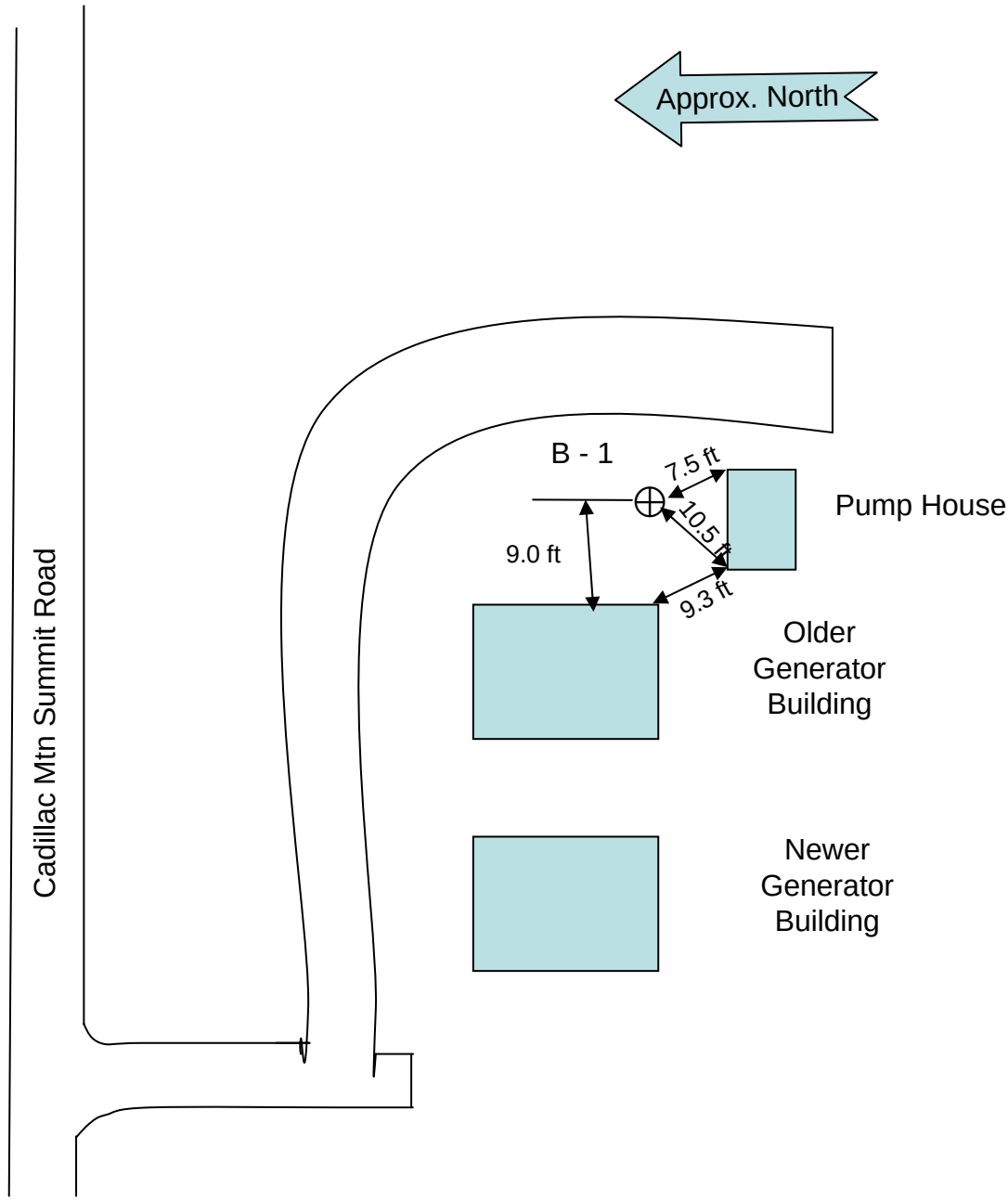

Site Location Map
Bar Harbor (Cadillac Mtn.) Tower Project
CROMWELL HBR RD
PARK LOOP RD
PARK LOOP RD
KEBO ST
LEDGELAWN AVE
STRAWBERRY HILL
Bar Harbor
RD 3738
Proposed Tower Location
0
0.125
0.25
0.5
0.75
1
Miles

Figure 1



Boring Location Plan
Bar Harbor (Cadillac Mtn) Radio Tower Project
PIN 14276

(Not To Scale)

Maine Department of Transportation	Figure 2

APPENDIX - B

Field Exploration and Test Data

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Cadillac Mountain Radio Tower
Location: Bar Harbor, Maine

Boring No.: B-1
PIN: 14276.00

Driller:	Maine Test Borings, Inc.	**Elevation (ft.)**	No Survey Available	**Auger ID/OD:**	N/A
Operator:	Jerry Rudnicki/Paul Hatch	**Datum:**		**Sampler:**	Standard Split Spoon
Logged By:	G. Lidstone	**Rig Type:**	Track Mounted Mobile B-53	**Hammer Wt./Fall:**	140#/30"
Date Start/Finish:	1/11/07; 10:00-12:30	**Drilling Method:**	Cased Wash Boring	**Core Barrel:**	NQ-2"
Boring Location:	See Boring Location Plan	**Casing ID/OD:**	NW	**Water Level*:**	None Observed

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample attempt
U = Thin Wall Tube Sample
R = Rock Core Sample
V = Insitu Vane Shear Test
SSA = Solid Stem Auger

Definitions:
S_u = Insitu Field Vane Shear Strength (psf)
T_v = Pocket Torvane Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
$S_{u(lab)}$ = Lab Vane Shear Strength (psf)
WOH = weight of 140lb. hammer
WOR = weight of rods

Definitions:
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-value	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	1D	24/7	0.0 - 2.0	1/1/3/15	4	SPUN NW			Brown, wet, very loose, fine to coarse SAND, trace to some gravel, trace organics.	G#207677 A-2-4, SM WC=30.9%
	2D	1.2/1.2	2.0 - 2.1	10(1.2")		NQ CORE			2.1	
	R1	60/58	2.3 - 7.3	RQD = 87%					Bedrock: Fresh to very slightly weathered, medium to coarse grained, massive, orange-pink biotite-hornblende GRANITE. Joints are horizontal to 20 degrees from horizontal and are close to moderately close between 2.3 feet and 7.9 feet, and then moderately close to 22.3 feet. Joints are open with very minor silt in-filling.	G#207678 A-2-4, SM WC=41.8%
5									2.3 R1:Core Times (min:sec) 2.3-3.3' (3:15) 3.3-4.3' (2:25) 4.3-5.3' (3:30) 5.3-6.3' (3:30) 6.3-7.3' (3:45) 97% Recovery	
	R2	60/60	7.3 - 12.3	RQD = 90%					7.3 R2:Core Times (min:sec) 7.3-8.3' (1:10) 8.3-9.3' (1:20) 9.3-10.3' (1:00) 10.3-11.3' (1:10) 11.3-12.3' (1:10) 100% Recovery Installed new core bit to start R2.	
10	R3	60/60	12.3 - 17.3	RQD = 92%					12.3 R3:Core Times (min:sec) 12.3-13.3' (1:23) 13.3-14.3' (1:21) 14.3-15.3' (1:29) 15.3-16.3' (1:35 16.3-17.3' (1:37) 100% Recovery	
15	R4	60/59	17.3 - 22.3	RQD = 98%					17.3 R4:Core Times (min:sec) 17.3-18.3' (1:22) 18.3-19.3' (1:30) 19.3-20.3' (1:28) 20.3-21.3' (1:27) 21.3-22.3' (1:26) 98% Recovery	
20									22.3 **Bottom of Exploration at 22.3 feet below ground surface.**	
25										

Remarks:

Safety hammer, drop winch.
Full water return throughout coring. After completion of coring, pumped hole dry and dumped concrete down hole and fill to ground surface.

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

APPENDIX - C

Laboratory Test Data

State of Maine - Department of Transportation

Laboratory Testing Summary Sheet

Town(s): Mt. Desert Island (Cadillac Mt. Radio Tower) Project Number 14276.00

Boring & Sample Identification Number	Station (Feet)	Offset (Feet)	Depth (Feet)	Reference Number	G.S.D.C. Sheet	W.C.	L.L.	P.I.	Classification		
									Unified	AASHTO	Frost
B-1, 1D	No Stationing		0.0-2.0	207677	1	30.9			SM	A-2-4	II
B-1, 2D	No Stationing		2.0-2.1	207678	1	41.8			SM	A-2-4	II

Classification of these soil samples is in accordance with AASHTO Classification System M-145-40. This classification is followed by the "Frost Susceptibility Rating" from zero (non-frost susceptible) to Class IV (highly frost susceptible). The "Frost Susceptibility Rating" is based upon the MDOT and Corps of Engineers Classification Systems.

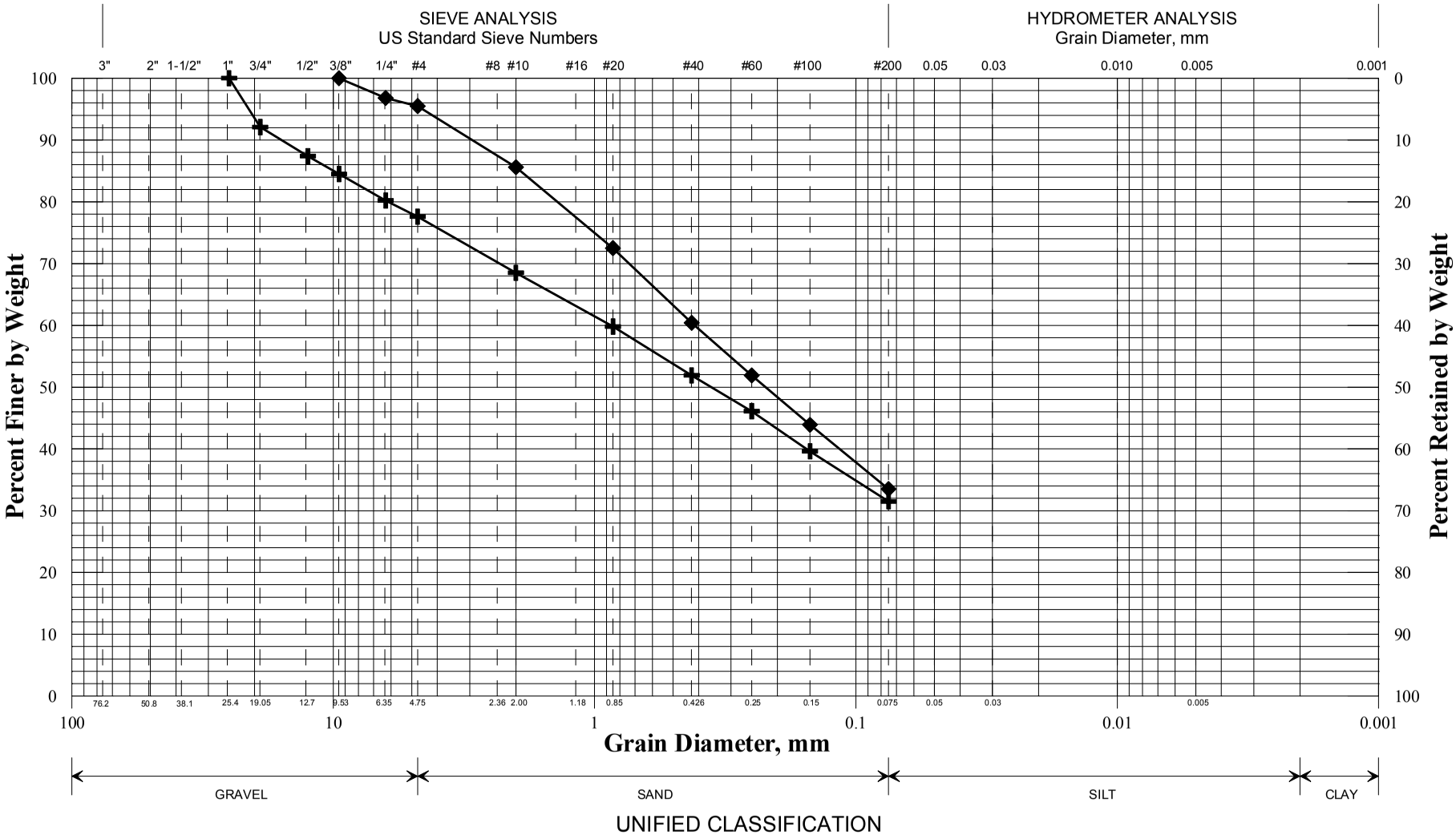
GSDC = Grain Size Distribution Curve as determined by AASHTO T 88-93 (1996) and/or ASTM D 422-63 (Reapproved 1998)

WC = water content as determined by AASHTO T 265-93 and/or ASTM D 2216-98

LL = Liquid limit as determined by AASHTO T 89-96 and/or ASTM D 4318-98

PI = Plasticity Index as determined by AASHTO 90-96 and/or ASTM D4318-98

State of Maine Department of Transportation
GRAIN SIZE DISTRIBUTION CURVE



	Boring/Sample No.	Station	Offset, ft	Depth, ft	Description	W, %	LL	PL	PI
✚	B-1/1D			0-2.0	SAND, some silt, some gravel.	30.9			
◆	B-1/2D			2.0-2.1	SAND, some silt, trace gravel.	41.8			
■									
●									
▲									
✕									

PIN
014276.00
Town
Bar Harbor
Reported by/Date
WHITE, TERRY A 2/7/2007

TABLE 1
SUMMARY OF POINT LOAD INDEX TEST RESULTS

MAINE DOT RADIO TOWER SITES
ROCK CORE TESTING

PROJECT	LOCATION	BORING NUMBER	CORE RUN NUMBER	DEPTH (ft)	TEST TYPE[2]	De EQUIV. CORE DIAMETER (in)	P FORCE AT FAILURE[3] (lb)	F SIZE CORRECTION (De/50)	Is POINT LOAD STRENGTH INDEX[4] (psi)	ESTIMATED UCS BASED ON CORRELATION WITH POINT LOAD INDEX[5] (psi)	ROCK TYPE
Cadillac Mountain Radio Tower	Mount Desert Island, ME	B-1	R1	3.2-4.2	D	2.00	3288	1.01	824	18,950	biotite-hornblende GRANITE
		B-1	R1	3.2-4.2	D	1.99	3964	1.00	1008	23,180	
		B-1	R1	3.2-4.2	D	2.01	4126	1.01	1034	23,770	
		B-1	R1	3.2-4.2	A	2.23	4780	1.06	1022	23,500	
		B-1	R1	3.2-4.2	A	2.29	2326	1.08	479	11,020	
		B-1	R1	3.2-4.2	A	2.20	5063	1.06	1107	25,470	
Ossipee Hill Tower	Waterboro, ME	B-WATE-101	R3	12.9-13.8	D	1.97	2275	1.00	587	13,500	muscovite-biotite GNEISS
		B-WATE-101	R3	12.9-13.8	D	1.97	2343	1.00	605	13,910	
		B-WATE-101	R3	12.9-13.8	D	1.97	2848	1.00	735	16,900	
		B-WATE-101	R3	12.9-13.8	A	2.22	4019	1.06	865	19,900	
		B-WATE-101	R3	12.9-13.8	A	2.27	3134	1.07	655	15,070	
		B-WATE-101	R3	12.9-13.8	A	2.04	3168	1.02	777	17,880	
		B-WATE-102	R1	4.1-5.0	D	1.97	2796	1.00	722	16,600	muscovite-biotite GNEISS
		B-WATE-102	R1	4.1-5.0	D	2.01	1330	1.01	333	7,660	
		B-WATE-102	R1	4.1-5.0	A	1.97	3660	1.00	945	21,720	
		B-WATE-102	R1	4.1-5.0	A	1.71	4019	0.93	1283	29,500	
Granite Hill Tower	Hallowell, ME	B-HALL-101	R3	18.9-19.9	D	2.01	3327	1.01	833	19,170	muscovite-plagioclase GRANITE
		B-HALL-101	R3	18.9-19.9	D	1.99	4460	1.00	1134	26,080	
		B-HALL-101	R3	18.9-19.9	A	2.28	5896	1.08	1223	28,140	
		B-HALL-101	R3	18.9-19.9	A	2.19	5101	1.05	1124	25,850	
		B-HALL-101	R5	29.7-30.6	D	1.99	4541	1.00	1154	26,550	muscovite-plagioclase GRANITE
		B-HALL-101	R5	29.7-30.6	D	1.97	4109	1.00	1060	24,390	
		B-HALL-101	R5	29.7-30.6	A	2.29	4716	1.08	972	22,360	
		B-HALL-101	R5	29.7-30.6	A	2.20	6059	1.06	1324	30,460	
Spruce Mountain Tower	Woodstock, ME	B-WOOD-101	R1	2.2-2.8	D	1.97	924	1.00	238	5,480	biotite-muscovite GNEISS
		B-WOOD-101	R1	2.2-2.8	D	1.97	1881	1.00	486	11,170	
		B-WOOD-101	R1	2.2-2.8	A	1.37	1244	0.83	553	12,730	
		B-WOOD-101	R1	2.2-2.8	A	2.13	2335	1.04	535	12,310	
		B-WOOD-101	R4	17.0-17.8	D	1.97	1039	1.00	268	6,170	biotite-muscovite GNEISS
		B-WOOD-101	R4	17.0-17.8	D	1.97	1569	1.00	405	9,310	
		B-WOOD-101	R4	17.0-17.8	A	1.94	3044	0.99	805	18,520	
		B-WOOD-101	R4	17.0-17.8	A	1.72	2057	0.93	650	14,940	

Notes:
1. All tests were performed in accordance with ASTM D 5731
2. D = Diametral / A = Axial
3. Force at Failure (P) calculated from Gauge reading at failure x Ram Area of Jack (1.474 in^2)
4. I_s = Point Load Strength Index = (P/D_e^2) x F
5. Estimated uniaxial compressive strength (UCS) values calculated from I_s x 23 based on correlation in "Rock Slope Engineering" Hoek and Bray, 1981.
6. ft = feet; in = inch; psi = pounds per square inch

Checked by: JRS
Reviewed by: MSP

SECTION 2

Special Provision

Communications Equipment Shelter
Modular, Pre-Fabricated, Pre-Outfitted

TABLE OF CONTENTS

1. General

Introduction

This specification covers the requirements for designing, furnishing, installing and commissioning a modular, pre-fabricated, pre-outfitted telecommunications-type shelter and other associated components. The shelter and associated components shall be new, of current production, and as specified herein.

Description of Major Work Elements

A. Design, Furnish & Install:

1. Shelter (12’ x 20’).
2. Other Shelter Components As Specified.
3. Shelter Foundation (13’ x 21’).

B. Furnish & Install:

1. In-Shelter Emergency Power Generator System. Refer to generator specifications under Section 3.
2. System will consist of the following major components:
   a. Generator.
   b. Fuel Sub-system.
   c. Automatic Transfer Switch.

C. All site preparation and development.

D. All engineering design certification and documentation.

E. Provide design and specifications stamped by a Maine licensed Professional Engineer of:

1. Shelter Foundation Design.

F. Other work as specified elsewhere in this document.

Qualifications

A. General

1. The Contractor shall have demonstrated experience in design, furnishing, and installing communication shelters on a turn-key basis.

2. The Contractor shall have demonstrated experience in furnishing and installing shelters on a turn-key basis.
3. The Contractor shall function as one-source responsible for shelter warranty, parts and service.

B. Shelter

1. The manufacturer shall have no less than 5 contiguous years in the fabrication of communications type shelters.
2. All field-work associated with the shelter shall be performed by a contractor having no less than 5 years experience in the installation of pre-fabricated communications equipment shelters.

C. Foundation

1. All work associated with the shelter foundation shall be performed by a contractor having no less than 5 years experience in the installation of pre-fabricated communications equipment shelters.

D. Generator

1. Refer to qualifications in the generator specifications under Section 3.

Regulatory Requirements

A. Unless specified otherwise, materials and installation shall conform to the applicable requirements of:

1. Local & National Codes.
2. Maine Electrical Code.
3. American Concrete Institute (ACI).
4. American Institute of Steel Construction (AISC).
5. American Iron and Steel Institute (AISI).
6. American National Standards Institute (ANSI).
7. American Society for Testing & Materials (ASTM).
8. Electronics Industries Association (EIA).
9. Institute of Electrical & Electronics Engineers (IEEE).
10. National Fire Protection Association (NFPA).
11. Occupational Safety & Health Administration (OSHA).

12. Underwriters Laboratories (UL)

13. U.S. Department of the Interior (USDOI)

14. U.S. National Park Service (USNPS)

15. Motorola R-56 standard or approved equal.

2. Products

Shelter

2.1.1 General

A. The shelter shall be 12' x 20', pre-fabricated, pre-outfitted design.

B. The shelter will be used to house radio communications equipment and an emergency power generator.

C. Communications equipment and generator will be located in separate rooms separated by a no-thru access partition.

D. The exact size of the communications equipment and generator room shall be approved by the Department.

E. The exact location of all shelter items and/or accessories shall be as approved by the Department.

2.1.2 Floor

A. Insulation: R-Value = 27, minimum.

B. Weight Load: 750-lbs per square foot.

C. Finish

1. Commercial grade, glued, inlaid vinyl covering.

2. Self-sticking tiles are not acceptable.

D. Fire Retardant: 2-hour rated, minimum.

E. A metal floor plan shall protect the underside of the floor

1. Design: solid metal, shall be either stainless steel or galvanized steel.

2.1.3 Roof

A. Weight Load: 100-lbs per square foot, distributed.

B. Impact Load: 50-lbs from a 250-foot height.

C. Pitch: sloped downward from shelter centerline for drainage, and as approved by the Department.

D. Wind load: to withstand wind gusts of 140 MPH

2.1.4 Railing

- 2 ½ inch galvanized pipe installed above roofline per OSHA standards.
- Railing tied in at four corners and extend to the foundation of the shelter.
- Railing verticals will be secured to the shelter.
- Railing will circumnavigate the shelter.
- Railing will be grounded with #2 wire at each corner to the foundation grounding halo.

2.1.5 Ceiling

A. Insulation: R-Value = 27, minimum.

B. Finish: fiberglass reinforced plastic laminate.

C. Interior Height: 9-feet, minimum.

D. Fire Retardant: 2-hour rated, minimum.

2.1.6 Walls

A. Insulation: R-Value = 11, minimum.

B. Wind Load: as specified by building codes for specific location

C. Interior Finish: fiberglass reinforced plastic laminate.

D. Exterior Finish: natural stone aggregate.

E. Fire retardant: 2-hour rated, minimum.

2.1.7 Interior Room Partition

A. This full height partition shall segregate the communications equipment room from the generator room.

B. Interior Finish: fiberglass reinforced plastic laminate.

C. Fire retardant: 2-hour rated, minimum.

2.1.8 Communications Equipment Room

A. Electrical

1. Interior

a. Interior main distribution panel.

b. 200-amp service, 120 VAC, single-phase.

c. 40-branch circuit capacity, equipped as needed.

d. Transient Voltage Surge Suppressor (TVSS).

e. Northern Technology Model DMK-B1253 or equivalent**.**

f. Dry contact closure alarm on each door provided with contacts (Nominally open or nominally closed).

2. Utility Outlets

a. QUAD receptacles.

b. Wall-mounted, 12-inches above finished floor.

c. As needed, 4-feet on-center spaced evenly.

3. Equipment Outlets – Wall Mounted

a. Quad, receptacles.

b. Rating: 20-amp.

c. Wall-mounted, 4-feet above finished floor.

d. Double quad receptacles, 4 feet on center, spaced evenly, on separate circuit breaker and labeled accordingly between the receptacle and the circuit breaker.

4. Equipment Outlets – Over Equipment Racks

a. Quad, twist-lock receptacles.

b. Rating: 20-amp.

c. Mounted above communications equipment racks.

d. As needed, 2-feet on center, spaced evenly.

e. Mounting of outlets to communications cable trays is not acceptable.

5. Interior Service Wiring

a. All electrical wiring shall be in conduit and raceways.

1. Conduit shall be either stainless steel or galvanized steel.

b. Service raceway shall be separate from any communications or antenna cable trays.

c. Service raceway shall be isolated from any communications or antenna cable trays.

d. All conduit, raceways, fittings, and hardware shall be of aluminum.

e. All wiring shall be per applicable electrical codes.

f. All service runs will be continuous.

B. Air Conditioning System

1. Two (2) self-contained, integrated wall mount units.
2. Units shall be of the high-energy efficient type.
3. Compressor Warranty: 5 years.
4. System shall be sized to provide an interior temperature of 65 degrees F during exterior temperature of +100 degrees F, no equipment heat load considered.
5. System shall be equipped with:

a. Auto-restart.

b. Economizer cycle.

c. Pre-wired thermostat.

d. Lead/lag controller.

e. Dry contact (Nominally open or nominally closed) closure alarm.

f. Configured so air conditioner and heater cannot operate simultaneously.

C. Heating System

1. Baseboard electric heat strips (in both generator and equipment room).
2. Units shall be of the high-energy efficient type.
3. System shall be sized to provide an interior temperature of 70 degrees F during exterior temperature of –30 degrees F, no equipment heat load considered.

4. Configured so air conditioner and heater cannot operate simultaneously.
5. System shall be equipped with:
    a. Auto-restart.
    b. Pre-wired thermostat.

D. Ventilation System

1. Motorized fan-type.
2. System shall be equipped with:
    a. 12-inch fan, minimum.
    b. Wall-mounted controls., shall be dual , parallel thermostats manually controlled.
    c. Programmable/adjustable start-up cycle timer.
    d. Programmable/adjustable run cycle timer.
3. Intake
    a. Mechanically activated louver/damper.
    b. Galvanized or stainless steel, or aluminum weather hood.
    c. Galvanized or stainless steel, or aluminum screen to prevent insect or rodent intrusion.
    d. Filtered.
    e. Intake shall be located for maximum separation from generator exhaust.
4. Exhaust
    a. Gravity-type louver/damper.
    b. Galvanized or stainless steel, or aluminum weather hood.
    c. Galvanized or stainless steel, or aluminum screen to prevent insect or rodent intrusion.
    d. Exhaust shall be located for maximum separation from generator exhaust.

E. Antenna Cable Accessories

1. Cable Entry Panel
    a. Size: 18-individual, 4-inch ports, minimum.
    b. Material: solid-copper, 1/8 inch thickness, minimum.
    c. Install exterior UV-protected weather-boots for all ports.

d. Install 2, 6-inch wide copper straps for grounding entry panel to exterior ground grid system.

e. Install panel with a mounted, pre-punched solid-copper ground bussbar frame.

f. Bussbar frame shall be designed and sized to accommodate cable surge arrestors.

g. As manufactured by PolyPhaser Corporation or equivalent (800-325-7170 or www.polyphaser.com).

h. All grounding must comply with Motorola R-56 standards or approved equal.

2. Interior Cable Tray

a. Type: Ladder style.

b. Width: 18-inches, minimum.

c. Length: as required to support equipment rack rows.

F. Communication Cable Accessories

1. Termination Backboard

a. Size: 4-feet x 8-feet x 3/4 inches.

b. Material: plywood sheet, 2-hour fire retardant rated.

c. Install backboard with 3-inch standoffs.

d. Painting: gray or black, fire retardant.

G. Door - Exterior

1. Fabrication

a. Door: steel – solid core.

b. 42-inches x 7-feet.

c. Frame: hi-strength steel.

d. Gasket Sealed.

2. Accessories

a. Lockset & deadbolt: steel; replaceable cores; keyed alike.

b. Exterior padlock hasp, hi-strength, galvanized or stainless steel.

c. Anti- prying exterior plate, hi-strength, galvanized or stainless steel.

d. Vandal resistant, non-removable hinge pins.

e. Full-open position latch.

f. Hydraulic door closer.

g. Over door exterior drip awning, galvanized or stainless steel, or aluminum.

h. Intrusion sensor with a dry-contact (Nominally open or nominally closed) closure alarm.

H. Lighting

1. Interior

a. Lighting shall be via fluorescent light fixtures.

b. Fixtures shall be 48-inches in length.

c. Fixtures shall use dual straight tube with polyvinyl sleeves over the tubes.

2. Interior - Emergency

a. Integrated, solid-state design emergency light fixture.

b. Self-contained in single wall-mountable housing.

c. Medium to heavy-duty industrial-use rated.

d. 1-hour operation rated, minimum.

e. 10-year operating life rated.

f. Dual light beams lamps.

g. Sealed maintenance-free rechargeable battery.

h. Battery viewport.

i. Automatic battery charger.

j. Low battery cutoff.

k. Voltmeter.

l. Indicators: 1) On; 2) Charging.

m. Test Switch, externally accessible.

n. Dry-contact (Nominally open or nominally closed) closure alarm.

3. Exterior

a. Incandescent light fixture for each exterior doorway.

b. 100 watt rating, minimum.

c. Shatter/tamper resistant lens.

d. Motion-sensor photocell control.

e. Interior light switch.

I. Heat/Smoke Detection & Fire Suppression

1. Heat

a. The shelter shall be equipped with heat detectors, as needed, spaced for maximum coverage.

b. Detectors shall be equipped with a dry-contact (Nominally open or nominally closed) closure alarm.

2. Smoke

a. The shelter shall be equipped with smoke detectors spaced for maximum coverage.

b. Detectors shall be of the photoelectric and ionization type.

c. Detectors shall be equipped with a dry-contact closure alarm.

d. Detectors shall be a combination of smoke and CO type.

3. Suppression

a. The shelter shall be equipped with one (1) wall-mounted fire extinguisher.

b. Type: Class ABC all purpose dry chemical.

c. Size: 10 lbs.

J. Ground System

1. Interior Perimeter Halo

a. Tinned-bare solid-copper conductor no less than #2 AWG.

b. Insulated standoffs as required.

c. Motorola R-56 standard or approved equal.

2.1.9 Generator Room

A. Size: to be coordinated with the department prior to ordering.

B. Electrical

1. Utility Outlets

a. Quad. Each quad shall be on separate breakers.

b. Wall-mounted, 12-inches above finished floor.

c. 4-feet on-center spaced evenly.

2. Interior Service Wiring

a. All electrical wiring shall be in conduit and raceways.

b. All conduit, raceways, fittings, and hardware shall be of aluminum.

c. All wiring shall be per applicable electrical codes.

C. Heating System

1. Baseboard electric heat strips.

2. Units shall be of the high-energy efficient type.

3. System shall be sized to provide an interior temperature of 70 degrees F during exterior temperature of –30 degrees F, no equipment heat load considered.

4. System shall be equipped with:

a. Auto-restart.

b. Pre-wired thermostat.

D. Ventilation System

1. Motorized fan-type.

2. System shall be equipped with:

a. 12-inch fan, minimum.

b. Wall-mounted controls.

c. Programmable/adjustable start-up cycle timer.

d. Programmable/adjustable run cycle timer.

3. Intake

a. Mechanically activated louver/damper.

b. Galvanized or stainless steel, or aluminum weather hood.

c. Galvanized or stainless steel, or aluminum screen to prevent insect or rodent intrusion.

d. Filtered.

e. Intake shall be located for maximum separation from generator exhaust

4. Exhaust

a. Gravity-type louver/damper.

b. Aluminum weather hood.

c. Aluminum screen to prevent insect or rodent intrusion.

d. Exhaust shall be located for maximum separation from generator exhaust.

E. Communication Cable Termination Backboard

1. Size: 4-feet x 8-feet x 3/4 inches.
2. Material: plywood sheet, 2-hour fire retardant rated.
3. Furnish backboard with 3-inch standoffs.
4. Painting: gray or black, fire retardant.

F. Door - Exterior

1. Fabrication
   a. Door: galvanized or stainless steel – solid core.
   b. 42-inches x 7-feet.
   c. Frame: hi-strength steel.
   d. Gasket Sealed.
2. Accessories
   a. Lockset & deadbolt: steel; replaceable cores; keyed alike.
   b. Exterior padlock hasp, hi-strength, galvanized or stainless steel.
   c. Anti- prying exterior plate, hi-strength, galvanized or stainless steel.
   d. Vandal resistant, non-removable hinge pins.
   e. Full-open position latch.
   f. Hydraulic closer.
   g. Over door exterior drip awning, galvanized steel or aluminum.
   h. Intrusion sensor with a dry-contact (Nominally open or nominally closed) closure alarm.

G. Lighting

1. Interior
   a. Lighting shall be via fluorescent light fixtures.
   b. Fixtures shall be 48-inches in length located either side of the generator.

c. Fixtures shall use dual straight tube with polyvinyl sleeves.

d. Interior - Emergency

a. Integrated, solid-state design emergency light fixture.

b. Self-contained in single wall-mountable housing.

c. Medium to heavy-duty industrial-use rated.

d. 1-hour operation rated, minimum.

e. 10-year operating life rated.

f. Dual light beams lamps.

g. Sealed maintenance-free rechargeable battery.

h. Battery viewport.

i. Automatic battery charger.

j. Low battery cutoff.

k. Voltmeter.

l. Indicators: 1) On; 2) Charging.

m. Test Switch, externally accessible.

n. Dry-contact (Nominally open or nominally closed) closure alarm.

2. Exterior

a. Incandescent light fixture for each exterior doorway.

b. 100 watt rating, minimum.

c. Shatter/tamper resistant lens.

d. Motion-sensor photocell control.

e. Interior light switch.

H. Heat/Smoke/CO Detection & Fire Suppression

1. Heat

a. The shelter shall be equipped with heat detectors, as needed, spaced for maximum coverage.

b. Detectors shall be equipped with a dry-contact closure alarm.

2. Smoke and CO

   a. The shelter shall be equipped with smoke and CO detectors spaced for maximum coverage.

   b. Detectors shall be of the photoelectric and ionization type.

   c. Detectors shall be equipped with a dry-contact (Nominally open or nominally closed) closure alarm.

3. Suppression

   a. The shelter shall be equipped with one (1) wall-mounted fire extinguishers.

   b. Type: Class ABC all purpose dry chemical.

   c. Size: 10 lbs.

I. Ground System

1. Interior Perimeter Halo

   a. Tinned-bare solid-copper conductor no less than #2 AWG.

   b. Furnish insulated standoffs as required.

   c. Motorola R-56 standard

Foundation

A. Foundation materials shall conform to the requirements of State of Maine Department of Transportation Standard Specifications, Revision of December 2002. Foundation design, plans and drawings shall be stamped by a professional engineer licensed in the state of Maine.

1. Dimensions: Shall be 13’ x 21’.

2. Materials: Concrete. Design shall be approved by the department.

3. Execution

Delivery & Storage of Materials

A. The contractor shall be responsible for all aspects of shipment and/or transportation of materials to their destination.

B. The contractor shall be responsible for coordinating, unloading, inspecting, accepting and storing all material deliveries.

C. All stored materials shall remain the responsibility of the contractor until final installation and acceptance by the Department.

Installation

3.1.1 General

A. Prior to installation, the contractor shall coordinate the exact site placement and/or orientation of the following items with the Department:

1. Shelter Foundation.
2. Shelter.

B. The contractor shall be responsible for:

1. Providing all materials, labor and tools to ensure a complete installation whether or not specified or shown.
2. All workmanship shall conform to applicable standards and prevailing practices as approved by the Department.
3. Delivery of all materials to the site.
4. Restoring the site to its original pre-installation condition.
5. All access road improvements and clearing as necessary for delivery as approved by the Department.
6. All access road repairs after delivery. Road shall be restored to original pre-installation condition as approved by the Department.
7. All commercial electric utility service necessary for the installation as approved by the Department.
8. Removing all rubbish and debris associated with all aspects of the installation.

3.1.2 Foundation

A. Construction shall be in accordance with State of Maine Department of Transportation Standard Specifications, Revision of December 2002.

3.1.3 Grounding

A. General

1. Connection to the site's existing earth ground grid system (EGGS) shall be required.
2. All bonded welds shall be of the exothermal-type.
3. Wire conductors size shall be no less than 2/0 AWG.

4. Wire conductors shall be bare, tinned, solid copper.

B. Shelter

1. Ground the shelter to the EGGS.
2. Conductors shall be weld-bonded to the closest EGGS ground rod.
3. Conductors shall be weld-bonded to the tower leg.

C. Generator

1. Ground generator to the EGGS.
2. Ground exterior fuel tank to the EGGS.
3. Ground automatic transfer switch to the EGGS.

Inspection & Acceptance

3.1.4 Field Inspection

A. After installation of all the components furnished under this section, the contractor along with the Department, at its discretion, shall perform a field inspection, to verify that the installation of the components furnished under this contract has been performed and completed in accordance with the following, as applicable.

1. The professional engineer's design.
2. The manufacturer's instructions and recommendations.
3. The Department's specifications.
4. The Contractor's installation practices and standards as approved by the Department.

B. The Contractor shall provide all items, instrumentation, materials, equipment, and personnel necessary to conduct the inspection.

C. Prior to the commencement of this activity, the contractor shall deliver a preliminary field inspection plan to the Department for review and approval.

D. At the conclusion of this activity, the contractor shall present to the Department written certification that the inspection performed was in accordance with, and that the results of the inspection was in compliance with, the approved field inspection plan.

E. The Department's signature on the certification shall constitute acceptance by the Department of the inspection.

3.1.5 Final Acceptance

A. General

1. After acceptance of all the inspections and all the tests.

2. Conducted under this section, the contractor shall present to the Department written certification that the activities were performed in accordance with, and that the results were in compliance with, the approved plans.

3. This certification shall include the original signed copy of the individual inspection and test certifications previously accepted by the Department.

4. Final acceptance will be deemed final when the Department's signature appears on this certification.

B. Post-Final Acceptance Documentation

1. After final system acceptance, the contractor shall deliver to the Department, in both printed and electronic form, the following documents, on a per-site basis, in one consolidated package.

a. Copies of all signed certifications.

b. Copies of all approved inspection and test plans.

Warranty

A. The Contractor shall include a copy of the manufacturer's standard commercial warranty for all furnished shelter and associated components in their response (excluding generator).

Training

A. The contractor shall conduct a single, on-site, hands-on training session for selected Department personnel.

B. The training location and schedule shall be by mutual agreement between the Department and contractor.

C. The session shall be conducted after final acceptance.

D. The contents of the session shall include familiarizing the Department with special structure attributes, recommended inspection procedures, recommended maintenance procedures, ground connections, etc.

E. Costs associated with the training defined in this section shall be clearly and individually identified in the pricing section of the response.

Documentation

3.1.6 With the Contractor's Bid

A. The Contractor's bid shall include a catalog or specification sheet for this site as described in Section 2.1.

3.1.7 Post-Contract Award

A. General

1. Thorough documentation of all major shelter components, and their respective installations, will be required from the Contractor. This documentation will be comprised of both factory-provided and field-generated documents and/or manuals.
2. Every document exchanged between Department and contractor shall be in paper and/or electronic form, as mutually agreed. Electronic documents shall use the latest version of the application software or by a mutually agreed version. The following applications are required:
    a. Text - Microsoft Word
    b. Spreadsheets - Microsoft Excel
    c. Databases - Microsoft Access
    d. Scanned documents - Adobe Acrobat
    e. Simple Diagrams & Charts - Microsoft Visio or Excel
    f. Large Drawings – mutually agreed software program
    g. Schedules - Microsoft Project
3. The Department shall approve the contents and organization of all field-generated documents supplied by the contractor.
4. Costs associated with documentation shall be clearly and individually identified in the pricing section of the response.

B. Factory Provided – Technical & Service Manuals

1. All factory-provided documentation shall be available on CD media.
2. Manuals shall be provided for the shelter.
3. The following sets of manuals are to be furnished prior to project closeout on a per-site basis:
    a. Five (5) complete paper-form sets
    b. Five (5) complete electronic-form sets

C. Field Generated - As-Built

1. All field-generated documentation shall be prepared in a format suitable for storage in loose-leaf 3-ring binders. This documentation shall also be supplied on CD media.
2. All field-generated drawings shall be prepared using a mutually agreed software program.
3. The following documentation shall be provided on a per-site basis. Specification or catalog cut sheets for each of the major items illustrated in the documents shall be included with the submittals to the Department.
    a. Shelter & foundation – top view diagram.
    b. Foundation – side elevation view diagram illustrating both above and below grade portions.
    c. Shelter – 4-sided elevation view diagram.
    d. Shelter – interior layout w/list of materials.
    e. A site plan illustrating the installed location of the components supplied under this contract relative to other existing major site components (e.g., towers, fences, generators, etc.). Plan shall be to scale; and the new and existing components shall be contrasted by the use of a gray scale.
    f. The site plan shall identify the interconnection between the shelter or accessories to the site electrical ground grid system.
4. The following sets of field-generated documentation are to be furnished prior to project closeout:
    a. Five (5) complete paper-form sets
    b. Five (5) complete electronic-form sets

D. Costs associated with the post-contract award documentation defined in this section shall be clearly and individually identified in the pricing section of the response.

4. MEASUREMENT AND PAYMENT

4.1 Method of measurement.

Method of Measurement: The following items will be paid for by the lump sum:

ITEM #	DESCRIPTION
643.99	Communications Equipment Shelter, Modular, Pre-fabricated, Pre-Outfitted
643.991	Communications Equipment Shelter---Inspection and Acceptance, Field Inspection
643.992	Communications Equipment Shelter---Inspection and Acceptance, Final

	Acceptance
643.993	Communications Equipment Shelter---Inspection and Acceptance, Training

4.2 Basis of payment.

The accepted Communications Equipment Shelter items will be paid for at the contract lump sum prices which will include payment for all respective items as called for in the contract, designed, delivered, stored, placed, constructed, installed, tested, documented, all clearing, demolition, removal and disposal, remediation, preparation, materials, labor, equipment, training and incidentals necessary to complete the work.

Payment will be made under:

ITEM #	DESCRIPTION	UNIT
643.99	Communications Equipment Shelter, Modular, Pre-fabricated, Pre-Outfitted	LS
643.991	Communications Equipment Shelter---Inspection and Acceptance, Field Inspection	LS
643.992	Communications Equipment Shelter---Inspection and Acceptance, Final Acceptance	LS
643.993	Communications Equipment Shelter---Inspection and Acceptance, Training	LS

END OF DOCUMENT

SECTION 3

Specification for an

Emergency Power Generator System

TABLE OF CONTENTS

1. General

1.1 Introduction

This specification identifies the requirements for designing, furnishing, installing and commissioning an emergency power generator system and associated components. The generator will be used to support radio communications equipment and as specified herein. The system and associated components shall be new, and of current production.

1.2 Description of Major Work Elements

A. Design, Furnish & Install:

1. Emergency Power Generator 18KW with electric start
2. Automatic Transfer Switch 200@
3. Fuel Line to Existing Sub-system

B. Fuel Line to Existing Tank

1. Connection of generator to the earth ground grid system.
2. Connection of transfer switch to the earth ground grid system.
3. Connection of fuel sub-system to the earth ground grid system.

C. All site planning, preparation and development.

D. All engineering design certification and documentation.

E. Provide design and specifications stamped by a Maine licensed Professional Engineer of:

1. Generator Mounting Design

F. Other work as specified elsewhere in this document.

1.3 Qualifications

A. General

1. The Contractor shall have demonstrated experience in furnishing, installing, testing and fully commissioning systems on a turn-key basis.

2. The Contractor shall have demonstrated experience as one-source responsible for generator warranty, parts, and service.

B. Contractor

1. The Contractor shall have been in the furnishing, installation and servicing of emergency power generator systems for no less than 5 contiguous years.

2. The Contractor shall be the generator manufacturer's authorized distributor.

C. Generator

1. The manufacturer shall have been in the manufacture of motor-driven generators for no less than 5 contiguous years.

2. All field work associated with the generator shall be performed by a contractor having no less than 5 contiguous years of experience in the installation of emergency power generators.

D. Automatic Transfer Switch

1. The manufacturer shall have been in the manufacture of automatic transfer switches for no less than 5 contiguous years.

1.4 Regulatory Compliance

The generator system shall meet or exceed all of the requirements of:

1. NFPA 110 (most recent edition).

2. Local and National Codes.

3. Underwriters Laboratory (UL).

4. U.S. Department of the Interior (USDOI).

5. National Park Service (NPS).

1.5 Quantities & Locations

a. Generator

1. Size: 18KW

- Installation: interior as approved by the Department.

b. Transfer Switch

1. Size: 200Amps

2. Installation: Inside the shelter as approved by the department

c. Fuel

1. Type: Propane

2. Products

2.1 Power Generator

2.1.1 Output Requirements

A. 120/240 VAC.

B. Single Phase.

C. Three Wire.

D. 60 Hertz.

E. Full single-phase output @ 1.0 pf.

F. Voltage regulation +/- 2% of rated voltage for constant load between no load and full load.

G. Frequency regulation 0.5 % from steady state no load to steady state rated load.

H. Single Step Load Pickup 100% of rated output power, less applicable derating factors, with the engine and generator at operating temperature.

I. The generator shall be equipped with an integral UL listed, thermal-magnetic type rated, main output circuit breaker.

2.1.2 Engine

2.1.2.1 General

A. The engine shall be of the internal combustion type.

B. The engine shall be of the stationary type.

C. The engine shall be mounted on vibration isolator dampers.

D. The engine shall be equipped with an engine block heater on thermostat.

E. Maximum rated speed: 1,800 RPM.

2.1.2.2 Starting System

A. Shall be electric, 12 VDC nominal, negative ground, sourced from storage batteries.

B. Batteries shall be gel cell maintenance free, mounted to the generator unit. Battery shall be insulated from both the generator and the floor.

C. A float/equalize battery charger shall be mounted to the generator unit.

D. The charger shall be of a constant voltage/current limiting design and sized appropriately.

E. At a minimum, the charger shall be equipped with the following:

1. On/Off Switch
2. DC Voltmeter
3. DC Ammeter
4. Equalizer-Charger Timer

2.1.2.3 Lubricating Oil System

A. Shall use either petroleum or synthetic-based motor oil.

B. Shall include an oil level dipstick.

C. Oil filter shall be of the replaceable type.

D. System shall provide a low oil pressure visual indicator on the generator's control panel.

E. Indicator shall remain active until reset by service personnel.

F. Activation of the low oil pressure indicator shall trigger a Form C dry alarm contact (NO or NC).

G. Auto oil fill float type

2.1.2.4 Cooling System

A. Shall be liquid-cooled using a fan radiator.

B. The radiator shall be mounted to the generator unit and in such a way that the fan's airflow is drawn over the engine.

C. System shall provide a high temperature visual indicator on the generator's control panel.

D. Indicator shall remain active until reset by service personnel.

E. Activation of the high temperature indicator shall trigger a Form C dry alarm contact (NO or NC).

F. For indoor installations, the radiator unit shall be equipped with the necessary flanges, adapters, and/or other hardware to allow ducting of heated air to the outside.

G. For indoor installations, the generator unit shall be equipped the necessary controls to activate motorized ventilation louvers or dampers

2.1.2.5 Exhaust System

A. A muffler shall be supplied with the unit.

B. The connection between the muffler and the exhaust manifold shall be of the flexible type.

C. The muffler shall be equipped with a condensation trap with a manual drain valve.

D. If oriented vertically, the exterior muffler exhaust stack shall be equipped with a rain cap.

2.1.2.6 Fuel System

A. The system shall be of the fuel-injection type.

B. Aspirated air shall be filtered through a replaceable dry-element filter.

C. The system shall include all necessary accessories for full functionality including, but not limited to, gauges, valves, fittings, filters, piping, insulation, wiring, and pumps.

2.1.2.6.1 Main Fuel Storage Tanks

A. Fuel pressure gauge installed in generator room with low pressure cut/off switch for generator. Low pressure cut/off switch will provide the NO or NC contact for low pressure alarm.

2.1.3 Engine Controls & Alarms

2.1.3.1 Master Control Panel

A. All controls, indicators, meters and alarms specified herein shall be consolidated into a single master control panel.

B. The control panel shall be either mounted on, or be capable of being mounted away from, the generator unit.

2.1.3.2 Run/Stop Switch

A. A manual run/stop switch shall be provided.

B. This switch shall be capable of being controlled remotely.

2.1.3.3 Gauges & Meters

A. The unit shall be equipped with the following:

1. Oil pressure gauge.
2. Temperature gauge.
3. Charge rate ammeter.
4. Running time meter.

2.1.3.4 Governor

A. The unit shall be equipped with a governor to maintain speed regulation to within 5% from no-load to full-load output.

B. The governor shall maintain frequency regulation to within +/- 0.25% of rated frequency under steady state load conditions.

C. The governor shall be of the mechanical or electronic-type.

2.1.3.5 Over-crank Control

A. The control unit shall provide a minimum of 3 cranking cycles of no less than 10 seconds before shutdown and activation of the over-crank alarm.

2.1.3.6 Automatic Shutdown

A. The unit shall be equipped for automatic engine shutdown for the following conditions:

1. Over-crank.
2. Over-speed.
3. Low Oil Pressure.
4. High Temperature.
5. Low Coolant Level.

2.1.3.7 Fault Reset

A. The unit shall be equipped with a manual reset switch to allow engine restart after any fault condition shutdown.

B. The unit shall be equipped with means to activate the manual fault reset switch remotely.

2.1.3.8 Condition Indicators

A. At a minimum, the following visual indicators shall be available on the master control panel:

1. Generator running.
2. Over-crank shutdown.
3. Over-speed shutdown.
4. Low oil pressure shutdown.
5. High temperature shutdown.
6. Low fuel level.
7. Low coolant level.

2.1.3.9 Alarms

4. A generator running condition shall activate a Form C dry contact (NO or NC).
5. A second Form C dry contact shall be activated, at a minimum, by any one of the following alarm conditions:
    1. Over-crank shutdown.
    2. Over-speed shutdown.
    3. Low oil pressure shutdown.
    4. High temperature shutdown.
    5. Low fuel level.
    6. Low coolant level.

2.1.4 Housing (Optional)

2.2 Automatic Transfer Switch

A. The switch shall be contained within a key-lockable, U.L. listed, wall mount, NEMA cabinet.

B. The switch shall be equipped with the following:

1. AC line under-voltage sensor.
2. Time delay on-start.
3. Time delay on-transfer.
4. Time delay on-retransfer.
5. Time delay on-stop.
6. Exerciser Clock.
7. Test Switch

C. The exerciser clock shall be equipped, at a minimum, with the following:

1. Day-of-week set.
2. Time-of-day set.
3. Duration-of-exercise set.

D. Form C dry contact closures on both the normal and emergency side shall be provided (NO or NC).

3. Execution

3.1 Delivery & Storage of Materials

A. The contractor shall be responsible for coordinating, unloading, inspecting, accepting and storing all material deliveries.

B. All claims necessary as a result of damage or loss during shipment shall be the responsibility of the Contractor.

C. All stored materials shall remain the responsibility of the contractor until final acceptance by the Department. Final acceptance is described later in this document.

3.2 Installation

A. The Contractor shall be fully responsible for the installation, wiring, testing and commissioning of the system.

B. The Contractor is responsible for providing all materials, labor and tools to ensure a complete installation.

C. Prior to installation, the Contractor shall coordinate the exact site placement of the following items with the Department:

1. Generator.
2. Fuel line from existing propane tank to equipment shelter.
3. Automatic Transfer Switch. The switch shall be installed inside of the equipment shelter.

D. The Contractor shall be responsible for:

1. Removing all rubbish and debris associated with all aspects of the installation.
2. All commercial electric utility improvements necessary for the installation
3. All engineering design certification and documentation.

3.2.1 Foundation Pad – Generator & Fuel Tank

A. Generator foundation shall be reinforced concrete, attached directly to the floor.

B. Fuel lines to/from generator shall:

1. Be installed in a protective device approved by the Department.
2. Exterior fuel line above grade shall be insulated.

3.3 Inspection, Testing & Acceptance

3.3.1 Field Inspection

A. After installation of all the components furnished under this section, the contractor along with the Department shall perform a field inspection, on a per-site basis, to verify that the installation of the components furnished under this contract has been performed and completed in accordance with the Department's specifications; the contractor's installation practices and standards; and that workmanship has been performed in a neat and professional manner.

B. The Contractor shall provide all items, instrumentation, materials, equipment, and personnel necessary to conduct the inspection.

C. Prior to the commencement of this activity, the contractor shall deliver a preliminary field inspection plan to the Department for review and approval.

D. At the conclusion of this activity, the contractor shall present to the Department written certification that the inspection performed was in accordance with, and that the results of the inspection was in compliance with, the approved field inspection plan.

E. The Department's signature on the certification shall constitute the Department's acceptance.

3.3.2 Testing

A. After installation of all the components furnished under this section, the Contractor along with the Department shall perform the test(s) described herein, on a per-site basis, to demonstrate that the emergency power generator system has been properly configured and optimized, and that it is operating fully and correctly.

B. The Contractor shall provide all items, instrumentation, materials, equipment, and personnel necessary to conduct the test(s).

C. This test(s) shall be performed after the inspection defined earlier in this section has been accepted.

D. Prior to the commencement of this activity, the Contractor shall deliver a preliminary test plan to the Department for review and approval.

E. At the conclusion of this activity, the Contractor shall present to the Department written certification that the test(s) performed were in accordance with, and that the results of the test(s) were in compliance with, the approved test plan.

F. The Department's signature on the certification shall constitute the Department's acceptance.

G. Costs associated with the test(s) defined in this section shall be clearly and individually identified in the pricing section of the response.

3.3.3 Final Acceptance

A. General

1. After acceptance of all the inspections and all the tests conducted under this section, the Contractor shall present to the Department written certification that the activities were performed in accordance with, and that the results were in compliance with, the approved plans.
2. This certification shall include the original copy of the individual inspection and test certifications previously accepted by the Department.
3. Final acceptance will be deemed final when the Department's signature appears on this certification.

B. Post-Final Acceptance Documentation

1. After final system acceptance, the contractor shall deliver to the Department, in both printed and electronic form, the following documents, on a per-site basis, in one consolidated package.
   a. Copies of all signed certifications.
   b. Copies of all approved inspection and test plans.

3.4 Warranty

A. System

1. The entire system, less genset batteries, shall be warranted to be free from defects in material and workmanship for a period of two (2) years after final acceptance.
2. The warranty shall include all costs for labor and materials, inclusive of travel.

B. Batteries

1. The batteries shall have a 10-year pro-rata warranty.

3.5 Training

A. The Contractor shall conduct a single, on-site, hands-on training session for selected Department personnel.

B. The training location and schedule shall be by mutual agreement between the Department and Contractor.

C. The session shall be conducted after final acceptance.

D. The contents of the session shall include demonstrations on the location, proper operation, and visual checks of all mechanical and electrical elements of the system.

3.6 Documentation

3.6.1 With the Contractor's Bid

A. The Contractor's bid shall include a catalog or specification sheet for the following items:

1. Generator
2. Automatic Transfer Switch

3.6.2 Post-Contract Award

A. General

1. Thorough documentation of all generator, transfer switch, gauges and switches, and any auxiliary components, and their respective installations, will be required from the Contractor. This documentation will be comprised of both factory-provided and field-generated documents and/or manuals.
2. Every document exchanged between Department and Contractor shall be in paper and electronic form, as appropriate. Electronic documents shall use the latest version of the application software or by a mutually agreed version. The following applications are preferred:
    a. Text - Microsoft Word
    b. Spreadsheets - Microsoft Excel
    c. Databases - Microsoft Access
    d. Scanned documents - Adobe Acrobat
    e. Simple Diagrams & Charts - Microsoft Visio or Excel
    f. Large Drawings – mutually agreed software program
    g. Schedules - Microsoft Project
3. The Department shall approve the contents and organization of all field-generated documents supplied by the Contractor.

B. Factory Provided – Technical & Service Manuals

1. All factory-provided documentation shall be available on CD media.
2. Manuals shall be provided for the following categories of equipment on a per-site basis:
    a. Generator
    b. Automatic Transfer Switch
3. The following sets of manuals are to be furnished prior to project closeout on a per-site basis:
    a. Five (5) complete paper-form sets

b. Five (5) complete electronic-form sets

C. Field Generated - As-Builts

1. All **field-generated documentation** shall be prepared in a format suitable for storage in loose-leaf 3-ring binders. This documentation shall also be supplied on CD media.

2. All field-generated drawings shall be prepared using a mutually agreed software program.

3. The following documentation shall be provided. Specification or catalog cut sheets for each of the major items illustrated in the diagrams shall be included with the submittals to the Department.

   a. Interconnection power wiring schematic diagram(s).

   b. Interconnection control wiring schematic diagrams(s).

   c. Alarm wiring schematic diagram(s).

   d. Interconnection ground wiring schematic diagram(s).

   e. Wiring between generator, transfer switch and electrical distribution panel(s).

   f. A simple floor plan illustrating the installed location of the equipment supplied under this contract relative to other existing major components (e.g., doors, HVAC units, electrical distribution panels, etc.). Plan shall be approximately to scale; and the new and existing components shall be contrasted by the use of a gray scale.

   g. A detailed inventory of each major equipment component installed. This shall include model and serial numbers

4. The following sets of field-generated documentation is to be furnished prior to project closeout on this site:

   a. Five (5) complete paper-form sets

   b. Five (5) complete electronic-form sets.

   c.

4. Measurement and Payment

4.1 **Method of Measurement:** The following items will be paid for by the lump sum:

ITEM #	DESCRIPTION
643.98	Emergency Power Generator
643.981	Emergency Power Generator-----Inspection and Acceptance, Field Inspection
643.982	Emergency Power Generator-----Inspection and Acceptance, Testing
643.983	Emergency Power Generator-----Inspection and Acceptance, Final Acceptance

4.2 Basis of Payment

The accepted Emergency Power Generator items will be paid for at the contract lump sum prices which will include payment for all respective items as called for in the contract, designed, delivered, stored, constructed, installed, tested, documented, all materials, labor, equipment, training and incidentals necessary to complete the work.

Payment will be made under:

ITEM #	DESCRIPTION	UNIT
643.98	Emergency Power Generator	LS
643.981	Emergency Power Generator-----Inspection and Acceptance, Field Inspection	LS
643.982	Emergency Power Generator-----Inspection and Acceptance, Testing	LS
643.983	Emergency Power Generator-----Inspection and Acceptance, Final Acceptance	LS

END OF DOCUMENT