

Updated 05/15/2020

STATE PROJECT

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, (if required), and f) any other certifications or Bid requirements listed in the Bid Documents as due by Bid opening.

For an Electronic Bid:

NOTE: Not all projects accept Electronic Bids. Please review the Notice to Contractors and see if it specifically states that Electronic Bids will be accepted.

- a) a completed Bid using Expedite® software and submitted via the Bid Express™ web-based service, b) an electronic Bid Guaranty (if required) 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 items in the Schedule of Items (excluding non-selected alternates).
4. 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 or
 - c) an electronic bid bond submitted with an electronic bid.
5. If a paper Bid is to be sent, "FedEx First Overnight" delivery is suggested as the package is delivered directly to the DOT Headquarters Building located at 16 Child Street in Augusta. Other means, such as U.S. Postal Service's Express Mail has proven not to be reliable.
6. **Bidder's Technical Capability:** The bidder must demonstrate that it has the qualifications, experience and facilities to complete this vessel. The bidder must provide in sufficient detail information regarding the items listed below. This information shall be provided to the Department by the apparent lowest responsive bidder, at the request of the Department, before an award is made. The bidder will have twenty (20) days in which to submit the following information after the request has been made:
 - a. Bidder's ability to meet the Specifications, including but not limited to shipyard facilities, organization, and key personnel.
 - b. Experience constructing similar passenger / vehicle ferries that have been reviewed and inspected by the United States Coast Guard or projects of higher complexity.
 - c. Contact names and telephone numbers of at least 3 previous customers that have had similar work performed at the shipyard.
 - d. Bidder's understanding of the project (include a copy of the Preliminary Master Schedule). A detailed master construction schedule shall be provided after award per Special Provision 853 Ferry Vessel Construction.

e. Statement of the technical expertise, safety plan, years of service and other qualification that the bidder's yard brings to shipyard services.

7. **Schedule of Values:** The apparent lowest and responsive bidder shall provide a schedule of values to the Department's Project Manager prior to award of the contract per Special Provision 853 Ferry Vessel Construction, Basis of Payment.

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

For complete bidding requirements, refer to Section 102 of the Maine Department of Transportation, Standard Specifications, March 2020 Edition.

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 an optional plan holders 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 fill out the on-line plan holder registration form and provide an email address to 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 contact Rebecca Snowden at rebecca.snowden@maine.gov or Diane Barnes at diane.barnes@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 information:

Bid Enclosed: Do Not Open

PIN:

Town:

Name of Contractor:

October 16, 2001

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, executors, 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:

WITNESS

PRINCIPAL:

By _____

By: _____

By: _____

SURETY:

By _____

By: _____

Name of Local Agency: _____

NOTICE

Bidders:

Please use the attached “Request for Information” form when submitting questions concerning specific Contracts that have been advertised for Bid, include additional numbered pages as required. RFI’s may be faxed to 207-624-3431, submitted electronically through the Departments web page of advertised projects by selecting the RFI tab on the project details page or via e-mail to RFI-Contracts.MDOT@maine.gov.

These are the only allowable mechanisms for answering Project specific questions. MaineDOT will not be bound to any answers to Project specific questions received during the Bidding phase through other processes.

When submitting RFIs by Email please follow the same guidelines as stated on the “Request for Information” form and include the word “RFI” along with the Project name and Identification number in the subject line.

RFI No: _____

Date _____ **Time** _____

WIN(S): _____ **Town(s):** _____ **Bid Date:** _____

Question(s):_____

Request by: _____
Company Name:_____ **Phone:**(_____)_____

Email: _____ **Fax:** (____) _____

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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 Matinicus Island Ferry Replacement for Rockland Terminal" will be received from contractors at the Reception Desk, MaineDOT Building, Capitol Street, Augusta, Maine, until 11:00 a.m. (prevailing time) on Wednesday, June 15, 2022 and at that time and place publicly opened and read. Bids will be accepted from all bidders. The lowest responsive bidder will be required to demonstrate their ability to perform the work per the Instructions to Bidders, Bidder's Technical Capability.

MaineDOT accepts electronic bids for bid packages posted on the bidx.com website. Electronic bids do not have to be accompanied by paper bids. MaineDOT will accept a facsimile of the bid bond, but the original bid bond must be received at the MaineDOT Contracts Section within 72 hours of the bid opening. Until further notice, dual bids (one paper, one electronic) will be accepted, with the paper copy taking precedence.

Description: WIN: 024897.10

Location: In Knox County, project delivery at Maine State Ferry Service, Rockland Ferry Terminal.

Outline of Work: Construction of 104 Foot LOA, Passenger/Vehicle Ferry.

A Mandatory Pre-Bid Conference will be held from 10:00 am to 12:00 pm on Wednesday May 18, 2022. Please email Nate.Benoit@maine.gov to register for this virtual meeting.

For general information regarding Bidding and Contracting procedures, contact George Macdougall at (207) 624-3410. Our webpage at <http://www.maine.gov/mdot/contractors/> contains a copy of the Schedule of Items, Plan Holders List, written portions of bid amendments, drawings, bid results and an electronic form for RFI submittal. For Project-specific information, fax all questions to **Project Manager** at (207) 624-3431 using the electronic RFI form, or email questions to RFI-Contracts.MDOT@maine.gov, with the project name and identification number in the subject line. Questions received after 12:00 noon of the Monday (or if that Monday is a state holiday, Friday) before the bid date will not be answered. Bidders shall not contact any other MaineDOT staff for clarification of Contract provisions, and the MaineDOT will not be responsible for any interpretations so obtained. TTY users call Maine Relay 711.

Plans, specifications and bid forms may be viewed at the MaineDOT Headquarters Building in Augusta, Maine. They may be purchased from MaineDOT from 8:00 a.m. to 4:00 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 phone at (207) 624-3536 from 8:00 a.m. to 4:00 p.m. Full size plans are **\$65.00 (\$70.50 by mail)**. Half size plans are **\$32.50 (\$35.75 by mail)**, Bid Book is \$10 (\$13 by mail), Single Sheets are \$2, payment in advance, all non-refundable.

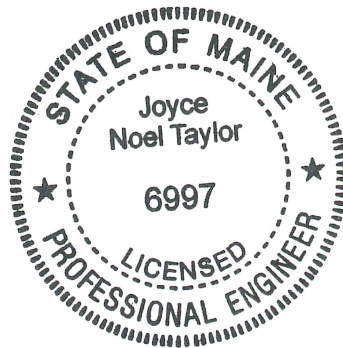
Each Bid must be made upon blank forms provided by MaineDOT and must be accompanied by a bid bond of 5% of the bid amount or an official bank check, cashier's check, certified check, certificate of deposit, or United States postal money order in the amount of \$250,000.00 payable to "Treasurer, State of Maine" as a Bid guarantee. A Contract Performance Surety Bond and a Contract Payment Surety Bond, each for 100 percent of the Contract price, will be required of the successful Bidder.

This Contract is subject to all applicable laws of the State of Maine.

All work shall be governed by *State of Maine Department of Transportation, Standard Specifications, March 2020 Edition*, price \$10 [\$15 by mail], and *Standard Details, March 2020 Edition*, price \$10 [\$15 by mail]. They also may be purchased by phone at (207) 624-3536 from 8:00 a.m. to 4:00 p.m. Updates to these two publications can be found at <http://www.maine.gov/mdot/contractors/publications/>.

The right is hereby reserved to the MaineDOT to reject any or all bids.

Augusta, Maine
April 27, 2022



JOYCE NOEL TAYLOR P. E.
CHIEF ENGINEER

Vendor Registration

Prospective Bidders must register as a vendor with the State of Maine Department of Administrative & Financial Services if the vendor is awarded a contract. Vendors will not be able to receive payment without first being registered. Vendors/Contractors will find information and register through the following link –
<http://www.maine.gov/purchases/venbid/index.shtml>

NOTICE

(COVID-19 Pandemic)

The Department considers the COVID-19 Pandemic an Uncontrollable Event as defined in Section 101.2 of the Department's Standard Specifications.

Accordingly, any documented delay to the project's Critical Path due to COVID-19 related issues, such as impacted workforce, subcontracts, or material supply, will be considered an Excusable Delay as defined in Section 109.5(A)(3) of the Department's Supplemental Specifications.

As an Excusable Delay, the Contractor is entitled to an extension of time provided that other associated notification, documentation, and procedural requirements set forth in the Contract are met.

TOWN: _____

WIN: _____

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 _____. It is the responsibility of the Bidder to determine if there are Amendments, to download them, to incorporate them into its Bid Package, and to reference the Amendment number and the date on the form below. The Municipality 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)

3/31/2022

Maine Department of Transportation

Proposal Schedule of Items

Page 1 of 1

Proposal ID: 024897.10

Project(s): 024897.10

SECTION: 1 INITIAL GROUP

Alt Set ID: Alt Mbr ID:

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
0010	853.20 FERRY VESSEL CONSTRUCTION	LUMP SUM	LUMP SUM		_____	_____
	Section: 1		Total:		_____	_____
			Total Bid:		_____	_____

CONTRACT AGREEMENT, OFFER & AWARD

This AGREEMENT is made on the date last signed below, by and between the State of Maine, acting through 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 of 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, **WIN 024897.10** for Matinicus Island Ferry Replacement in Rockland, County of Knox, Maine. The Work includes construction, maintenance during construction, warranty as provided in the Contract, and other incidental work.

The Contractor shall furnish all supervision, labor, equipment, tools, supplies, permanent materials and temporary materials required to perform the Work, including construction quality control consisting of 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 shall have Six Hundred (600) Calendar Days from issuance of the Notice to Proceed, to complete all Work, except warranty work, and deliver the vessel to MSFS Rockland Terminal. Furthermore, the Department may deduct from money 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, March 2020 Edition* 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, March 2020 Edition, Standard Details March 2020 Edition* as updated through advertisement, Supplemental Specifications, Special Provisions, Technical Specifications (D367), 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 March 2020 Edition, Standard Details March 2020 Edition* as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of:

WIN 024897.10, Matinicus Island Ferry Replacement, for MSFS Rockland Terminal.

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, March 2020 Edition*, 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 March 2020 Edition* and complete the Work within the time limits given in the Special Provisions of this Contract.

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 executes 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: Bruce A. Van Note, Commissioner

Witness

CONTRACT AGREEMENT, OFFER & AWARD

This AGREEMENT is made on the date last signed below, by and between the State of Maine, acting through 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 of 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, **WIN 024897.10** for Matinicus Island Ferry Replacement in Rockland, County of Knox, Maine. The Work includes construction, maintenance during construction, warranty as provided in the Contract, and other incidental work.

The Contractor shall furnish all supervision, labor, equipment, tools, supplies, permanent materials and temporary materials required to perform the Work, including construction quality control consisting of 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 shall have Six Hundred (600) Calendar Days from issuance of the Notice to Proceed, to complete all Work, except warranty work, and deliver the vessel to MSFS Rockland Terminal. Furthermore, the Department may deduct from money 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, March 2020 Edition* 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, March 2020 Edition, Standard Details March 2020 Edition* as updated through advertisement, Supplemental Specifications, Special Provisions, Technical Specifications (D367), 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 March 2020 Edition, Standard Details March 2020 Edition* as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of:

WIN 024897.10, Matinicus Island Ferry Replacement, for MSFS Rockland Terminal.

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, March 2020 Edition*, 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 March 2020 Edition* and complete the Work within the time limits given in the Special Provisions of this Contract.

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 executes 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: Bruce A. Van Note, 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.01 **12345.00**, for the **Hot Mix Asphalt Overlay** in the town/city of **South Nowhere**, 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, 2006**. 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, March 2020 Edition* 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 (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, March 2020 Edition, Standard Details March 2020 Edition*, 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 March 2020 Edition* (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, March 2020 Edition, Standard Details March 2020 Edition*, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of:

PIN 012345.00 South Nowhere, 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, March 2020 Edition*, 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 March 2020 Edition* 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 with their bid.

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.

Date

(Witness Sign Here)
Witness

CONTRACTOR

(Sign Here)
(Signature of Legally Authorized Representative
of the Contractor)

(Print Name Here)
(Name and Title Printed)

G. Award.

Your offer is hereby accepted.
documents referenced herein.

This award consummates the Contract, and the

MAINE DEPARTMENT OF TRANSPORTATION

Date

By: Bruce A. Van Note, Commissioner

(Witness)

BOND # _____

CONTRACT PERFORMANCE BOND
(Surety Company Form)

KNOW ALL MEN BY THESE PRESENTS: That _____
_____ **in 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:

Signature.....
Print Name Legibly

Signature
Print Name Legibly

SURETY ADDRESS:

.....
.....
.....

TELEPHONE.....

SIGNATURES:

CONTRACTOR:

.....
Print Name Legibly

SURETY:

.....
Print Name Legibly

NAME OF LOCAL AGENCY:

ADDRESS
.....
.....

BOND # _____

CONTRACT PAYMENT BOND
(Surety Company Form)

KNOW ALL MEN BY THESE PRESENTS: That _____
_____ **in 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

.....

NOTICE TO CONTRACTORS - PREFERRED EMPLOYEES

Sec. 1303. Public Works; minimum wage

In the employment of laborers in the construction of public works, including state highways, by the State or by persons contracting for the construction, preference must first be given to citizens of the State who are qualified to perform the work to which the employment relates and, if they can not be obtained in sufficient numbers, then to citizens of the United States. Every contract for public works construction must contain a provision for employing citizens of this State or the United States. The hourly wage and benefit rate paid to laborers employed in the construction of public works, including state highways, may not be less than the fair minimum rate as determined in accordance with section 1308. Any contractor who knowingly and willfully violates this section is subject to a fine of not less than \$250 per employee violation. Each day that any contractor employs a laborer at less than the wage and benefit minimum stipulated in this section constitutes a separate violation of this section. [1997, c. 757, §1 (amd).]

SPECIAL PROVISION

SECTION 107

PROSECUTION AND PROGRESS

(Contract Time)

The Date for Delivery of the Vessel to the Maine State Ferry Terminal in Rockland, Maine is 600 Calendar Days from the Notice to Proceed. After Award of the Contract and within 30 Days, the Shipyard shall attend a kickoff meeting with the Department. The Notice to Proceed will be issued immediately after the kickoff meeting.

Failure to meet the Date for Delivery of the Vessel will result in Liquidated Damages at the rate per Standard Specification 107.7.2 - Schedule of Liquidated Damages.

SPECIAL PROVISION
SECTION 108
PAYMENT
(Steel Cost Adjustment)

This Special Provision was developed to minimize some risk to the Contractor and steel fabricator(s) associated with current volatile fluctuations in the cost of steel materials. Only a portion of the steel required for the project is used for adjustment. The plating and steel shapes for the steel structure of the ferry are included; items not provided include piping, handrails, stairs, steering fears, tillers, and rudders.

Description Steel cost adjustments will be made to provide additional compensation to the Contractor, or a credit to the Department, for fluctuations in steel prices. All prices and costs are in U.S. Dollars (USD).

Types of Steel Products An adjustment will be made for fluctuations in the cost of plate and rolled-shape steel used in the fabrication of steel for Contract pay items covered under the following sections of the Standard Specification:

- Section 504, Structural Steel

The adjustments shall apply to the above items when they are part of the original Contract or Extra Work added by Contract Modification and paid for by agreed unit prices. The adjustments shall not apply when the item is Extra Work added by Contract Modification and paid for at a lump sum price or by Force Account.

Documentation Sufficient documentation shall be furnished to the Department to verify the following:

1. The dates on which steel was shipped from the mill to the fabricator, and quantity of steel, in pounds, shipped on those dates.
2. The quantity of steel, in pounds, incorporated into the various pay items covered by this Special Provision. The Department reserves the right to verify submitted quantities.

Method of Adjustment Steel cost adjustments shall be computed as follows:

$$SCA = Q \times D$$

Where: SCA = steel cost adjustment, in USD
 Q = quantity of steel incorporated into the work, in pounds
 D = price factor, in USD per pound

$$D = MP_B - MP_A$$

Where: **MP_B** = The Platts Steel Spot Market Prices for Plate, as published by the Engineering News- Record, for the month the steel is shipped from the mill. The price will be converted from USD per ton to USD per pound.

MP_A = The Platts Steel Spot Market Prices for Plate, as published by the Engineering News- Record for the month prior to the bid opening, for work paid for at the Contract price; or for the month the Contract Modification is signed by the Contractor for Extra Work that is paid for by agreed unit prices. The price will be converted from USD per ton to USD per pound.

The total weight of the steel that will be used to calculate the steel cost adjustment for the respective Pay Items is shown in the following table:

Standard Specification Section	Total Weight of Steel (lbs.)
504, Structural Steel Plating	225,120
504, Steel Shapes	54,880

No steel cost adjustment will be made for any products manufactured from steel having a mill shipping date prior to the Contract Bid date.

If the Contractor fails to provide the required documentation, the method of adjustment will be calculated as described above; however, the **MP_B** will be based on the date the steel arrives at the jobsite. In this case, an adjustment will only be made when there is a decrease in steel costs.

Basis of Payment Steel cost adjustments may be positive or negative but will only be made when there is a difference between the **MP_A** and **MP_B** in excess of five percent, as calculated by:

$$\text{Percent Difference} = \{(\text{MP}_B - \text{MP}_A) / \text{MP}_A\} \times 100$$

Steel cost adjustments will be calculated by the Department and will be paid or deducted when all other Contract requirements for the applicable items of work are satisfied. Adjustments will only be made for fluctuations in the cost of the steel as described herein. No adjustments will be made for changes in the cost of manufacturing, fabrication, shipping, storage, etc.

The steel cost adjustments shall not apply during any time after the Contract Completion Date when the Contractor is being assessed Liquidated Damages.

Cost adjustments, if any, shall be made by Contract Modification in accordance with this Special Provision.

SPECIAL PROVISION
SECTION 853
(Ferry Vessel Construction)

853.01 Description

Contractor shall furnish all plant facilities, labor, material, and equipment, and shall perform all work necessary to construct, launch, outfit, test and deliver the Vessel. Contractor shall develop additional plans, sketches and technical data which are necessary to construct the Vessel in a seaworthy manner, but which are not specifically set forth in the Plans and Specifications. Contractor shall also be responsible for the receipt, storage and installation of outfitting and equipment required.

853.02 Plans and Specifications

The Plans and technical specifications for the construction of the Vessel are designated in the document titled (Specifications) “Maine State Ferry Service Contract Specifications (D367-T8) 104-foot LOA Passenger/Vehicle Ferry”, and (Plans) Drawing Series No. D367, Title Sheet and Referenced Drawings.

853.03 Hull Number

Contractor shall establish a hull number for the vessel at project kickoff.

853.04 Construction Schedule

Within three weeks of execution of the contract, the Contractor shall provide a master construction schedule and bar chart; all trades, main equipment deliveries and key events shall be included. The schedule shall be updated bi-weekly or at each progress meeting.

853.05 Inspection of work and approval or plans

All material, equipment, and workmanship relative to the construction of the Vessel and facilities shall be subject to inspection by the Department, the United States Coast Guard (USCG), or any governmental entity at any and all reasonable times during the performance of the work. All working drawings, shop drawings, blueprints, samples, working plans, progress photographs, progress reports, production schedules and other documentation shall be submitted to the Resident for review. The review of those documents will be in accordance with the Maine Department of Transportation’s Standard Specifications, March 2020 Edition, Section 105.7 Working Drawings. The Resident shall inspect all material, equipment and workmanship as set forth in the Plans and Specifications to determine whether they conform to the contract. All material, equipment and workmanship rejected by the Resident shall be corrected, repaired, or replaced at the expense of the Contractor and to the satisfaction of the Resident.

The Resident and inspectors will oversee and may inspect, examine, and test the work to be performed. The Contractor shall provide access and customary telephone, hi-speed internet, e-mail, administrative and other facilities during normal working hours, or at other times by arrangement, to the Resident, all other representatives of the Department, regulatory authorities, surveyors, and to any other person for all necessary and reasonable purposes, to all premises where work under these presents is being carried out or components stored, including those of

subcontractors. At all times and places where work is being carried out in accordance with the Contract, the Contractor shall have a responsible person to superintend the carrying out thereof (who may be an employee of the Contractor, or a supplier or subcontractor responsible to the Contractor), and any directions given in writing to such person shall be deemed to have been given to the Contractor, except that where variation to this Contract is involved, the procedure laid down elsewhere in this Contract shall be observed.

853.06 Test and Trials

The Contractor shall as soon as possible after the execution of the Contract submit to the Resident a complete schedule of all tests and trials (the "Schedule of Tests and Trials") to include sea trials and delivery of the Vessel to Rockland Ferry Terminal, Rockland, Maine, at Contractor's expense and to be carried out on the Vessel before the Vessel is declared to be ready for acceptance by the Resident. The Resident and the Naval Architect shall have the right to include its personnel, crew, or other designees of their choice on all Tests and Trials, including the delivery of the Vessel to Rockland, Maine, and to reasonably alter, amend, extend, or reduce the said Schedule of Tests and Trials to ensure compliance with all applicable Governmental Rules and the Vessel's Coast Guard Certificate of Inspection, as of the effective date of the Contract. Upon completion of all construction the Contractor shall perform all tests and trials set forth in the Schedule of Tests and Trials. All expenses of such tests and trials shall be borne by the Contractor.

If, during said tests and trials, the Vessel fails to meet any requirement of the Plans and Specifications, Contractor shall, after taking appropriate corrective action, subject the Vessel to further tests and trials sufficient to demonstrate compliance with the Plans and Specifications. The cost of all such additional tests and trials shall be borne by the Contractor.

853.07 Delivery of Vessel

When the Vessel has passed all tests and trials and vessel construction is complete, or substantially complete as defined below, and after the Resident and Naval Architect have jointly issued a certificate (Certificate of Completion of Tests and Trials) of such satisfactory completion, it shall be delivered by the Contractor and accepted by the Resident at the Rockland Ferry Terminal in Rockland, Maine, free and clear of all liens except those in favor of a claimant arising out of the acts or omissions of the Department, with not less than five (5) days prior written notice to the Department of such delivery. "Substantially Complete" shall include issuance of a valid Coast Guard Certificate of Inspection to carry passengers, freight, and vehicles, and shall mean complete in every respect except for minor items not affecting safety, commercial utility, or efficient operation of the Vessel. The parties may agree to stipulate damages in lieu of the Contractor completing such minor items and the Contract Price shall be adjusted accordingly by modification.

The Department shall furnish to the Contractor at the time of delivery and acceptance a Delivery Certificate accepting the Vessel. Such acceptance does not relieve the Contractor of any of its remaining responsibilities under these presents, but acknowledges that the construction, fitting-out, trials and delivery phases of the Contract have been satisfactorily concluded in all material respects. Furthermore, the Contractor will, before delivery is taken, undertake to give adequate

familiarization courses in Rockland, Maine to the Maine State Ferry Service (MSFS) staff on the arrangements and working of the Vessel, her machinery and equipment.

853.08 Warranty provisions –Also see Standard Specification 106.9

Contractor guarantees to repair or replace to the reasonable satisfaction of the Department any defect in materials, equipment or workmanship provided by the Contractor or any defect resulting from Contractor provided Designs, which is discovered within twelve (12) months after such Vessel is delivered to the Department, provided that the Department shall within thirty (30) Calendar Days after discovery of such defect, provide written notice of claim for said defect to Contractor. The Contract requirement of 12 months governs. Department's failure to timely provide written notice of any defect to Contractor shall constitute a waiver of any and all claims arising out of such defect. With respect to Contractor's guaranty as set forth in this Article, the term "defect" shall not include defects resulting from design of the Vessel provided by the Department in the Plans and Specifications or the following which may result from use of the Vessel during said guaranty period: (1) ordinary wear and tear; (2) misuse; (3) improper stowage or loading; and (4) negligence of the Department, its agents or employees or the operator or crew of the Vessel.

The liability of the Contractor to the Department hereunder on account of defects shall include the actual repair or replacement thereof. Any work required to be performed pursuant to the provisions of this Section shall be carried out, if practicable, at the shipyard of the Contractor or by the Contractor's own personnel at the Vessel's home port, or at a shipyard of the contractor's choosing. If this causes undue delays or is not practicable in Department's sole discretion, then the Department may have such work performed at any shipyard and in that event the Contractor shall be liable to the Department for the documented expenses thereof at the commercial rate prevailing in such port area, including the cost of dockage of the Vessel, if necessary, with regard to the repair or correction of any defective workmanship or defective material, guaranteed hereunder. Contractor shall guarantee such repair or replacement for an additional period of ninety (90) days from the completion of such repair or replacement, unless such repair and replacement shall occur more than ninety (90) days prior to the expiration of the twelve (12) month guarantee period, in which case such repair or replacement shall be guaranteed until the end of said twelve (12) month period.

Prior to the expiration of the guaranty period, a final guaranty survey of the Vessel shall be conducted by the Department/MSFS. At such survey, Department/MSFS shall inspect the Vessel for any defects. Such survey shall be held at such port as Department shall designate. All material, equipment and workmanship guaranteed hereunder, which are found to be defective as a result of said inspection shall be corrected, repaired, or replaced by the Contractor at its expense to the reasonable satisfaction of the Department. Department shall give seven (7) calendar days prior written notice to Contractor of the time and place of the final guaranty survey and shall give Contractor an opportunity to have a representative present during the survey.

Any guaranties from subcontractors to Contractor in excess of the guaranty provisions of this Article shall be assigned by the Contractor to the Department at the end of the guaranty period.

The remedies contained in this provision shall be Department's sole and exclusive remedies for defects after delivery, whether under tort, contract, warranty or otherwise and no other guaranties or warranties, whether expressed or implied by law or otherwise are or will be deemed to have been made by the Contractor. All implied warranties, including warranties of merchantability or fitness for ordinary or intended use are specifically excluded. This guaranty is given in lieu of all other guaranties or warranties or actions in tort (including negligence or strict liability) or contract against Contractor. In no event shall Contractor's aggregate liability (whether in warranty, tort or contract) exceed the contract price. In no event shall Contractor be liable to Department for any incidental, punitive or consequential damages, including but not limited to, loss of use or loss of profits. Notwithstanding any provision contained herein, the Contractor shall remain liable for supplemental and/or Liquidated Damages.

853.09 Final Acceptance

The Vessel shall be finally accepted (Final Acceptance) by the Department after the final guaranty survey of the Vessel is found by the Department or its Representative to have been constructed in conformity with the Plans and Specifications, the Coast Guard Certificate of Inspection to carry passengers, freight, and vehicles, and any amendments thereto.

853.10 Insurance and loss – also see Standard Specification Section 110.

The Contractor shall at its own cost fully insure and keep insured in the joint names of the Department and the Contractor the Vessel and the machinery, materials and things used or intended for use in the construction and outfit thereof equivalent to the value of these or a sum of not less than the total of installments paid by the Department plus ten per cent (whichever is greater). Further, the Contractor shall at its own cost fully insure and keep insured in the joint names of the Department and the Contractor all modifications, spare parts, and additional equipment provided by the Department as may be agreed upon from time to time during the construction of the Vessel.

All Insurance Policies shall be placed with an insurance company or companies licensed or approved by the State of Maine, Department of Business Regulation, Bureau of Insurance, to do business in the State of Maine. Contractor shall provide the Department with Certificates of Insurance accompanied by the copies of the related policies. Said insurance policies shall protect the Vessel against losses resulting from fire, launching and all other risks, accidents and damages (excluding War Risks) during and after the construction of the Vessel, whilst she remains in the harbor or the port of construction, when she is engaged on, or in connection with, any trials or delivery made under this Contract and until the time the Vessel is accepted by the OWNER as evidenced by an executed Bill of Sale transferring title to the Department, a valid Coast Guard Certificate of Inspection to carry passengers, freight, and vehicles, and an executed Delivery Certificate. The Contractor shall from time to time renew the said insurance policies prior to their expiration and shall pay and continue to pay all premiums that become payable in respect of such insurance. Within seven days from the date when such renewed insurance becomes effective, or the premium paid, the Contractor shall deliver to the

Department certificates that prove the policy or policies of insurance have been purchased. If, however, the Contractor defaults on such insurance, fails to keep up the said insurance or fails to obtain any such renewal of insurance as aforesaid, then the Department shall be at liberty to procure insurance and thereupon the Contractor shall repay to the Department the amount of the premiums paid, or the Department shall be at liberty, at its option, to deduct the amount thereof from any sums payable to the Contractor under this Contract. Nothing herein contained nor anything done or omitted to be done by the Department in pursuance thereof shall diminish or affect the Contractor's obligation to keep the Vessel, machinery, material, and things insured to the full amount of their value in accordance herewith until the vessel is accepted, nor shall it diminish or affect the liability of the Contractor in respect thereof. All such policies shall name the Department as additional insured and shall be non-cancelable except on ten (10) days prior written notice to the Department.

If any event shall happen giving rise to a claim under any insurance policy to be effected under this Section, or if the Vessel shall become a total or constructive total loss before acceptance by the Department, the Department (without prejudice to its rights to have this Contract performed within such extended time and at such price as may be mutually agreed) shall receive the moneys which shall become payable under whichever of the policies the claim shall arise and retain the same, paying the Contractor the difference between the aggregate of such sums as they may have previously paid the Contractor under this Contract and such total amount as the Naval Architect may certify would have been payable to the Contractor if this Contract had been terminated at the time of the event giving rise to the claim. The Department may, at its discretion, instruct the Contractor to arrange War Risk insurance, and the Contractor is then obliged to do so without delay, but such costs incurred are at Department's expense.

In the event the Contractor defaults on such insurance, fails to maintain the insurance or fails to obtain any renewal of insurance as aforesaid, the Department may terminate this contract for construction of any further portion of the Vessel and the Department shall not be obligated to pay any damages or additional money to the Contractor pursuant to this Contract.

853.11 Title

Title to the Vessel under construction and title to materials, machinery, equipment, fittings, or supplies delivered, bought, or ordered for use in the construction of said Vessel shall vest in the Department to the extent of any payments made thereon, at the point when such materials, equipment, fittings and supplies are delivered to the Contractor's plant or other offsite place of storage approved by the Department. Accumulated payments by the Department to the Contractor shall be deemed sufficient to cover the value of all material, machinery, equipment, fittings and supplies located at the Contractor's plant or in storage elsewhere, provided, however, that the risk of loss or damage to such materials, machinery, equipment, fittings and supplies and the Vessel itself shall remain with the Contractor, and the Department shall not be deemed to have waived the right to require Contractor to repair or replace defects at Contractor's expense and to deliver the Vessel with all contract work completed as required by this specification. The Contractor shall have equity in such materials, machinery, equipment, fittings and supplies and completed contract work to the extent not paid for by the Department. The Department may, by

written direction, require that title vest in the Department upon delivery of such materials, machinery, equipment, fittings, or supplies to the carrier for transportation to Contractor's plant or approved offsite storage. Title to all scrap material and to all material which is surplus to the requirements of this Agreement shall vest in the Contractor. Notwithstanding the provisions of this specification, the Contractor shall be subject to the risk of loss of the Vessel and all materials, machinery, equipment, fittings, or supplies until the Vessel is by the Department as evidenced by an executed Bill of Sale transferring title to the Department, a valid Coast Guard Certificate of Inspection to carry passengers, freight, and vehicles, and an executed Delivery Certificate.

Contractor shall procure a release(s) from any party holding a UCC security interest or other liens covering the Vessel, all materials, supplies, and parts which are used or intended to be used for the construction of the Vessel and any insurance proceeds (the "Department's Property").

Without impairing or releasing the title vested in the Department, to fully ensure that title to the Department's Property for which Department has paid rests with the Department, this specification constitutes the grant of a UCC security interest by Contractor to the Department covering the Department's Property.

The Contractor hereby irrevocably authorizes the Department from time to time to file in any Uniform Commercial Code jurisdiction any initial financing statements and amendments or addendums thereto that: (a) indicate the Department's Property is the property of the Department; and (b) contain any other information required by Part 5 of Article 9 of the applicable Uniform Commercial Code for the sufficiency or filing office acceptance, including (a) whether the Contractor is an organization, the type of organization and any organization identification number issued to the Contractor. The Contractor agrees to furnish any such information to the Department promptly upon request.

The Contractor covenants with the Department that without providing at least 30 days prior written notice to the Department, (a) Contractor will not change its name, its place of organization or incorporation or, its mailing address or organizational identification number if it has one, (b) if Contractor does not have an organizational identification number and later obtains one, Contractor shall forthwith notify the Department of such organizational identification number, and (c) Contractor will not change its type of organization, jurisdiction of organization, or other legal structure without Department's prior written consent. Contractor will promptly execute any financing statements or other instruments deemed necessary by the Department to prevent any filed financing statement from becoming misleading or losing its perfected status. The information contained in this Section is provided in order that this specification shall comply with the requirements of the Uniform Commercial Code, as enacted in the State in which the Vessel is being constructed, for instruments to be filed as financing statements.

The remedies for any violation of the covenants, terms and conditions of the security agreement herein contained shall be (i) as prescribed herein, or (ii) as prescribed by general law, or (iii) as prescribed by the specific statutory consequences now or hereafter enacted and specified in said

Uniform Commercial Code, all at the Department's sole election. Contractor and the Department agree that the filing of such financing statement(s) shall never be construed as in any way derogating from or impairing the Department's title to the Department's Property.

853.12 Rights to the Design and Drawings

No part of the Plans or Drawings or other relevant information is to be made available by the Contractor to any other party, except as required to fulfill the contract obligations, without the prior written approval of the Department and Naval Architect. The Contractor shall not use, or allow the use of, all or any portion of the design of the vessel, or of all or any portion of the Specifications, Plans, or Drawings (including but not limited to the Bid Documents and the As-Built Drawings), without the prior written approval of both the Department and Naval Architect, which approval can be withheld for any or no reason.

853.13 Liens

At the time Contractor requests any payment under this Agreement, Contractor must give written guaranty to the Department that the Vessel, its materials, equipment, fittings and supplies and every part thereof is free and clear of any and all liens or rights in rem of any kind, except such liens in rem arising from Department's other contractors, suppliers, and materialmen, or arising because of the Department's default in payment to Contractor. Contractor shall furnish evidence satisfactory to the Department that the Vessel, materials, equipment, fittings, or supplies are free and clear of such liens or rights in rem.

If such a lien or right in rem as Contractor is required to guaranty against hereunder is filed or asserted against or attached upon the Vessel, any materials, equipment, fittings or supplies, Contractor shall promptly notify the Department of such lien or right in rem and shall no later than fifteen (15) calendar days thereafter secure the discharge or release of such lien or right in rem. If such release or discharge is not available under the law, Contractor shall immediately take such steps as in the opinion of the Department shall prevent such lien or right in rem from delaying the contract work, and shall indemnify and hold harmless the Department from all costs, charges, and damages by reason of such lien or right in rem.

Upon completion of the Vessel consistent with the Plans and Specifications, and upon delivery of the Vessel to the Department for its acceptance, the Contractor shall warrant that the Vessel and all its appurtenances are free and clear of all liens, maritime or otherwise, and shall further agree to indemnify and hold harmless the Department from all costs, charges, and damages, including but not limited to, attorney's fees associated therewith, by reason of such lien or right in rem.

The Department, at its option, may satisfy a claim based upon such lien or right in rem as the Contractor is required to guaranty against hereunder in order to secure its discharge or release. In such event, the Department shall deduct such sum from any payments due or to become due the Contractor. Should the cost of satisfying such lien or right in rem be in excess of the amount

which is due or to become due to the Contractor, Contractor shall pay the amount of such excess to the Department upon demand.

The Department may also, at its option, without securing the discharge or release of such lien or right in rem as provided above, withhold any payments due or to become due to the Contractor in an amount which is determined by the Department to be required to secure the release or discharge of such lien or right in rem, which amount shall include the estimated amount of all expenses reasonably expected to be incurred by the Department in connection therewith; provided, however, that the Contractor has not released or discharged such lien or right in rem.

853.14 Reporting of Subcontracts

Upon delivery of the Vessel to the Department, the Contractor shall submit to the Department in writing, an accounting of the total dollar amount of all subcontracts and purchase orders placed by it under this Agreement with organizations not affiliated with it. Said writing shall include an itemized list of each subcontractor who performed work on or provided services, materials, equipment, fittings, or supplies for the Vessel prior to delivery to the Department and the final cost to Contractor of the services, materials, equipment, fittings and supplies provided by each subcontractor.

853.15 Other Requirements

Contractor shall comply with all laws, rules, regulations, and requirements of the United States affecting the construction and testing of the Vessel, as set forth in this Agreement, the Plans and Specifications. Contractor shall also comply with all laws, rules, regulations, and requirements of any state in which the Vessel is constructed, tested or repaired, with all laws, rules, regulations, and requirements of local authorities, with all applicable laws of the State of Maine and rules and regulations of the State of Maine, Department of Transportation. Contractor shall procure, at its own expense, any permits required under federal, state, or local law as may be necessary in connection with any contract work set forth in this Agreement.

Applicability to Subcontractors: Vendor shall ensure and shall cause the foregoing provisions to be inserted in any subcontract for any work covered by this specification so that such provisions shall be binding upon each subcontractor and each of its subcontractors' subcontractors, etc.

The Vessel, with its inventory, equipment, and machinery, shall be built strictly in accordance with all applicable statutes, rules, and regulations (and directives issued pursuant thereto) of the United States Coast Guard.

The Contractor must pay at the very least the State minimum wage rates, submit weekly certified payroll statements, and comply with all other Department of Labor laws.

853.16 Method of Measurement

New Ferry Vessel Construction will be measured for payment by Lump Sum, complete, and accepted.

853.17 Basis of Payment

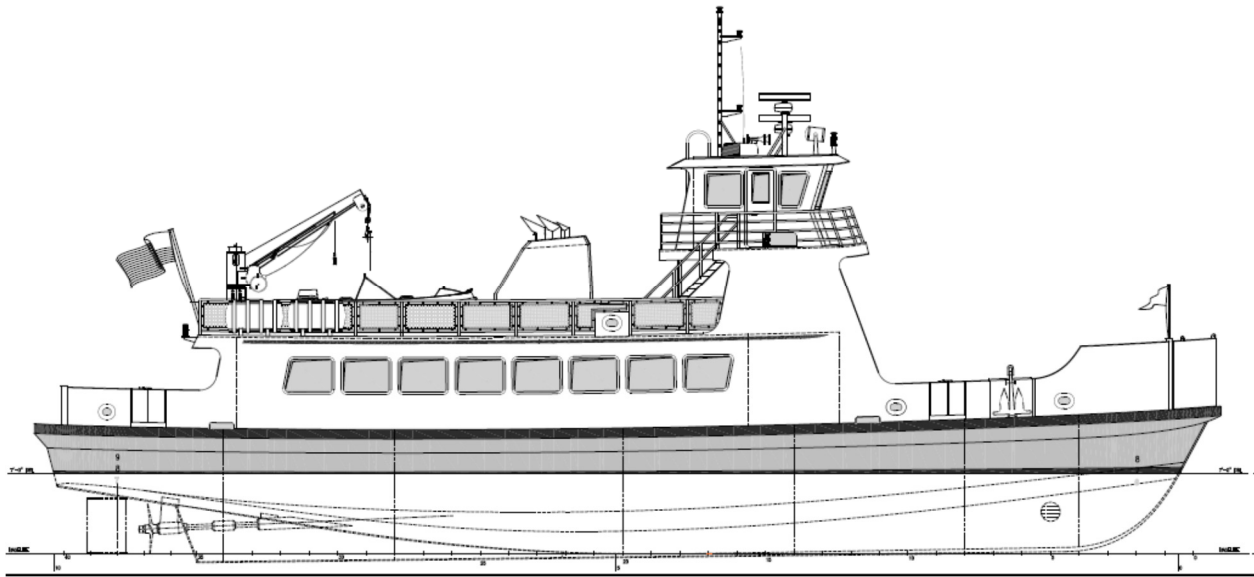
The quantity of Ferry Vessel Construction will be full compensation to furnish all plant facilities, labor, material, and equipment, and shall perform all work necessary to construct, launch, outfit, test and deliver the vessel to Rockland, Maine, as shown in the Plans, and Specifications. The cost of a portion of the steel will be adjusted per Special Provision 108.

Payment on this project will be made following the payment provisions outlined in Section 108 – Payment found in the Maine Department of Transportation, Standard Specifications, March 2020 Edition as amended. The bidder shall provide a schedule of values to the Department prior to an award being made. This schedule will be reviewed and approved by the Department at the time of the award and will form the basis from which to make progress payments on the project. The schedule of values should have sufficient detail to cover all major components or areas of construction for the vessel as well as provide an amount for mobilization, bonds, and insurance. All areas listed should be measurable and may require receipt of invoices at time of payment for materials and equipment. It is proposed to make payments monthly, unless the amount of work warrants a quicker schedule, and such quicker schedule is agreed to by the Department in writing. Payments will not be made more frequently than twice monthly. The making of partial payments shall in no way prevent the Department from asserting any right or remedy accruing to them under this specification because of the failure of Contractor to perform the work or deliver the completed Vessel. When the Contractor determines that an installment payment is about to fall due, the Contractor will give the Resident fourteen (14) days' notice thereof. The Contractor will then prepare an invoice addressed to the Resident who will, on being satisfied that the relevant work has been completed, certify the invoice for payment. All payments made by the Department to the Contractor are so made strictly on the condition that all sums due by the Contractor to its suppliers and subcontractors are promptly and fully paid. The Department reserves the right to request executed waivers of liens and other claims of any or all such suppliers and subcontractors as a condition of making any of the required payments.

Payment will be made under the following pay items:

<u>Pay Item</u>	<u>Pay Unit</u>
853.20 Ferry Vessel Construction	Lump Sum

MAINE DEPARTMENT OF TRANSPORTATION
CONTRACT SPECIFICATIONS (D367-T8)
104 FT LOA PASSENGER/VEHICLE FERRY



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April 12, 2022

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SECTION 000 GENERAL PROVISIONS

0.1 INTRODUCTION

0.1.1 GENERAL SCOPE

These Technical Specifications are Performance Based and provide the requirements of a Request for Proposal for the construction of a 104 foot LOA Passenger/Vehicle Ferry for the State of Maine Department of Transportation (MaineDOT); 16 State House Station; Augusta, ME 04333-0016. The Maine State Ferry Service (MSFS); P.O. Box 645; Rockland, ME 04841, operates the vessels as a division of MaineDOT.

The Maine State Ferry Service (hereinafter MSFS) operates year-round ferry service from mainland ports to the islands of Islesboro, Vinalhaven, North Haven, Swan's, Frenchboro, and Matinicus. Route distances range from three miles (Lincolnville to Islesboro) to 23 miles (Rockland to Matinicus). Fleet vessels have Stability Letters for and Certificates of Inspection for Partially Protected Route; Lakes, Bays & Sounds; Cold Water Service.

The vessel shall have a main propulsion plant consisting of two CAT C-18 600 hp @1800 RPM diesel engines that meet the applicable EPA Emission Standards for newly manufactured marine engines of their class at such time that the construction of the vessel commences (in conformance with EPA Emissions Standards "keel laying" requirements); and two Twin Disc MGX 516 4.04:1 ratio reverse/reduction gears. Generators, which also meet the applicable EPA Emission Standards, shall consist of two CAT C4.4 constant speed 99 KW maximum ship's service generator sets (SSDGs). The two generators shall be fitted with clutched hydraulic PTO motors for powering the bow thruster. The vessel shall have a Veth VT-50 transverse tunnel bow thruster, powered by a hydraulic motor mounted on thruster unit. The vessel shall conform to all regulations that apply to a 46 CFR Subchapter "T" Passenger Vessel. The vessel is designed to have a Gross Regulatory Tonnage of less than 100 GT.

The Intended Service Life of this vessel shall be (25) Twenty-five years. All products and equipment provided, whether referenced in these SPECIFICATIONS or not, shall be "supported" by the manufacturer for a minimum (10) ten year life span.

The CONTR shall make delivery of the vessel to the OWNER's Rockland, ME facility. Upon delivery, all vessel systems shall be in operation and ready for service. The CONTR shall assist MaineDOT in attaining a valid USCG Certificate of Inspection for a 46 CFR Subchapter "T" passenger vessel for the service intended. The contractual requirements shall not be considered to be complete until this USCG Certificate is obtained.

The Specification term "Provide and Install" means that the piece of equipment or system shall be purchased and installed on the vessel in working condition. For example, floodlights or navigation lights that are to be "provided and installed" will be provided with foundations, wired, powered, switched, and tested complete. If cable is required to bring power to a light that is to

be “provided and installed,” that cable shall be provided and installed as part and parcel of the light installation. If a kick-pipe is required, that kick-pipe shall be part of the installation.

0.2 ABBREVIATIONS

As used throughout these Specifications, the following partial list of terms and abbreviations shall have the meanings stated:

ABS	American Bureau of Shipping (classification society)
ADA	Americans with Disabilities Act
ADAAG	ADA Accessibility Guidelines
AIS	Automatic Identification System
AMR	Auxiliary Machinery Room
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing and Materials
CCTV	Closed Circuit Television
CFR	Code of Federal Regulations
CHT	Sewage Tank “Collection & Holding Tank”
COI	Certificate of Inspection
COLREGS	International Regulations for Preventing Collisions at Sea
CONTR	CONTRACTOR, YARD, or SHIPYARD
CONTRACT	Contract between MaineDOT and the CONTR
CuNi	Copper Nickel Alloy
CRES	Stainless Steel (SST)
DESIGN AGENT	Gilbert Associates Inc. (Naval Architect)
DGPS	Differential Global Positioning System
DFT	Dry Film Thickness
DNV	Det Norske Veritas (classification society)
DOJ	U.S. Dept. of Justice
DOT	U.S. Dept. of Transportation
DWG	Contract Drawing or Drawings
E-LIGHT	Emergency Light
ECM	Engine Control Module
EDM	Electronic Display Module
EPA	Environmental Protection Agency
EPIRB	Emergency Position Indicating Radio Beacon
ER	Engine Room
FCC	Federal Communications Commission
FMEA	Failure Mode Effect Analysis
FO	Fuel Oil (in US gallons)
FRP	Fiber Reinforced Plastic
FTA	Federal Transit Administration
FW	Freshwater (in US gallons)
GPM	Gallons per Minute
GT	Gross Ton (Regulatory volume measurement unit)

MAINE DEPARTMENT OF TRANSPORTATION FERRY SPECIFICATIONS

HP	Horsepower
HVAC	Heating, Ventilation, and Air Conditioning
IAW	Image Analysis Workstation
IBA	Inflatable Buoyant Apparatus
IEEE	Institute of Electrical & Electronics Engineers
ITC	International Tonnage Convention
IWO	In Way Of
LCG	Longitudinal Center of Gravity
LT	Long Ton 2240 Lbs.
MARPOL	International Convention for Prevention of Pollution from Ships
MDOT	Maine Department of Transportation, OWNER
ME	Main Engine
MSFS	Maine State Ferry Service, Division of MaineDOT
MSO	Marine Safety Office, USCG
MSC	Marine Safety Center, USCG (Washington, DC)
MSFS	Maine State Ferry Service (part of MaineDOT)
NEMA	National Electrical Manufacturer's Association
NACE	National Association of Corrosion Engineers
NFPA	National Fire Protection Association
NPS	National Pipe Schedule
NT	Net Ton (Regulatory volume measurement unit)
NUC	Not Under Command
NVIC	Navigation and Vessel Inspection Circular
OCMI	Officer in Charge of Marine Inspection
OF or OFE	Owner Furnished or Owner Furnished Equipment (MaineDOT furnished equipment)
OREP	Owner's Representative (On-site MaineDOT Representative)
OSHA	Occupational Safety and Health Administration
OWNER	Maine Department of Transportation (MaineDOT)
P	Port (port side)
PFD	Personal Flotation Device
PLC	Programmable Logic Controllers
POC	Point of Contact
P&S	Port and Starboard (sides)
PTO	Power Take Off
QA	Quality Assurance
QAWT	Quick Acting Watertight (door)
QC	Quality Control
RFP	Request for Proposal
S	Starboard (side)
SEAL WELD	Structure which is double continuously welded
SHIPYARD	CONTR, CONTRACTOR, or YARD
SNAME	Society of Naval Architects & Marine Engineers
SSDG	Ship's Service Diesel Generator
SSPC	Society for Protective Coatings
SST	Stainless Steel (CRES)

SWBS	Ship Work Breakdown Structure (numbering system)
TWIC	Transportation Workers Identity Card
UL	Underwriters Laboratories
USCG	United States Coast Guard
USG	U.S. Gallons
USPHS	United States Public Health Service
USSG	United States Standard Gauge
UV	Ultra-violet
VCG	Vertical Center of Gravity
VESSEL	Ship Under Contract
WC	Water closet (toilet)
WTD	Watertight Door(s)
YARD	Contracting Shipyard (same as CONTR)

0.3 EXPANDED DEFINITIONS

0.3.1 OWNER FURNISHED

All equipment herein specified as MaineDOT furnished (OFE) is to be installed by the YARD in such condition that it is completely operational and serviceable under normal conditions of vessel operations. Such installations are to adhere to all applicable specifications of Regulatory Agencies and are to be to the satisfaction of the MaineDOT. This includes, but is not limited to, the following:

1. Time and materials for assembly
2. Time and materials for positioning and proper securing
3. Time and materials for connections of piping, wiring, etc.
4. Time and materials for operational testing

OFE equipment, when specified, shall be new equipment in current production. It shall be supplied to the CONTR with installation instructions, vendor references, and vendor POC. All equipment, which is not herein specified as MaineDOT furnished (OFE), shall be provided and installed by the CONTR.

0.3.2 GOOD SHIPBUILDING PRACTICE

The term "good shipbuilding practice" means construction practices which are in accordance with soundly engineered and detailed drawings approved by the MaineDOT and USCG. These drawings are to meet the requirements contained within this document of SPECIFICATIONS. Construction and testing shall conform to regulatory agency and industry accepted standards so as to ensure that each vessel will meet the general and particular design requirements.

0.3.3 QUALITY CONTROL

Inspections by MaineDOT are for the purpose of verifying the CONTR's Quality Control Program. These Inspections are not to be used as a substitute for in-process control of quality by the CONTR. The CONTR shall provide MaineDOT, as a part of the CONTR's Proposal, an outline with pertinent details of their current Quality Control Program and Procedures.

0.3.4 SOLE SOURCE/BID SUBSTITUTIONS

It is not necessary to quote machinery and equipment as "sole source" unless expressly stated in these SPECIFICATIONS as such or designated as "Proprietary" by MaineDOT.

The CONTR is permitted to submit bids containing substitutions ("or approved equals") as long as such substitutions are clearly stated and detailed. Any substitution must be equal to the specified model, must be sufficiently documented to prove equality, and must meet the performance requirements of the vessel. If a substitution is proposed, the CONTR shall present for MaineDOT's review and approval written documentation of "equality".

The CONTR is responsible for all additional costs associated with proposed substitutions including, but not limited to, required engineering expenses, and modifications to foundations, connection sizes, electrical interfaces, etc. which will render the substitution fully compatible with other installed equipment. In this regard, the SPECIFICATIONS herein are guidelines for minimum performance requirements. If those SPECIFICATIONS are not offered by a particular manufacturer, product, or model, the CONTR will be expected to include a separate list of all discrepancies. Substituted manufacturers, products, or models will not be considered unless they have been demonstrated to be equal to or exceeding the quality, durability and design and the minimum performance functions of the specified equipment.

Proposed substitutions shall not adversely affect any other component or system in the vessel; adversely affect the vessel's total performance; or relieve the CONTR from any obligation related to performance, warranty, etc. Any proposed substitution shall function as effectively as the equipment specified with no increase in required maintenance or need for premature replacement.

0.3.5 IN PROGRESS SUBSTITUTIONS

It is the intent of these SPECIFICATIONS that all equipment shall be provided as specified herein. Substitutions may be considered on a "case by case" basis upon timely written notice from the CONTR to MaineDOT; or, in the case of a MaineDOT generated substitution, upon timely written notice from MaineDOT to the CONTR. Such written notice shall include written documentation that the equipment and/or components proposed qualify as equal to those specified and that spare parts and service for them are readily available. MaineDOT or the CONTR is under no obligation to accept substitutions by either party of any materials or equipment unless this written process is adhered to and both have signed off in agreement. MaineDOT has the final decision concerning the acceptance of substitutions.

0.3.6 SUBSTITUTION CHECK LIST

The following list may be used as a guide for parameters to consider when bidding substitutions or proposing in progress substitutions:

- Regulatory Body approval
- Dimensional characteristics
- Conformance to salient features
- Electrical characteristics
- Weight
- Capacities (GPM, pressure, volume, wattage, HP, etc.)
- Materials of Construction (high quality marine grade)
- Quality of fabrication, welding, and construction details
- Constructed to recognized standards (UL, IEEE, ANSI, ASTM, etc.)
- Functional characteristics
- Safety features
- Rate service duty life
- Manufacturer's ability to support
- Industry performance
- Maintenance life cycle

0.4 GENERAL SPECIFICATION REQUIREMENTS

0.4.1 GENERAL

These TECHNICAL SPECIFICATIONS provide details of an RFP for the Construction and Delivery of a 104 foot LOA, Subchapter "T" passenger/vehicle ferry. The vessel shall have a main propulsion plant consisting of (2) main propulsion CAT C-18 600 hp @1800 RPM diesel engines that meet the applicable EPA Emission Standards for newly manufactured marine engines of their class at such time that the construction of the vessel commences (in conformance with EPA Emissions Standards "keel laying" requirements); and (2) Twin Disc MGX 516 4.04:1 ratio reverse/reduction gears. Generators shall meet the EPA Emission Standards which apply to their HP and service and shall consist of (2) CAT C4.4 constant speed 99 KW maximum ship's service generator sets (SSDGs). Each generator shall be fitted with clutched hydraulic PTO motor. The vessel shall have a Veth VT-50 transverse tunnel bowthruster, powered by a Parker F12-080-MF-IV-K-000-0000-P0 hydraulic motor. The vessel shall conform to all regulations that apply to a 46 CFR Subchapter "T" Passenger Vessel (46 CFR Subchapter "T" and 46 CFR Subchapter "S"). The vessel Gross Regulatory Tonnage shall not exceed 100 GT. The vessel is designed for and will be certified for "Lakes, Bays, and Sounds Cold Water Service." These SPECIFICATIONS and the accompanying CONTRACT DRAWINGS are intended to give the CONTR all necessary information for the completion of and submittal to MaineDOT of a Construction Proposal. The submitted Construction Proposal shall provide for the delivery to

MaineDOT of a completely constructed, outfitted, seaworthy, and operational vessel that meet all applicable requirements of the applicable regulatory bodies.

0.4.2 GENERAL VESSEL DESCRIPTION

The vessel described by these SPECIFICATIONS will be a diesel propelled, twin screw, Passenger/Vehicle ferry designed and constructed to comply with the requirements of 46CFR Subchapter “T” Lakes, Bays, & Sounds for service on MaineDOT routes serving the State of Maine coastal islands.

Frame numbers are bow to stern, FR0 to FR40. Passenger boarding and vehicle loading will be on the Main Deck bow or stern loading over shore side ramps which are landed on the vessel’s deck. The vessel will have (3) Main Deck lanes for a capacity of approximately 7 cars or a mix of trucks and cars. The centerline vehicle lane is capable of accommodating trucks of legal over-the-road height limits. CONTR shall ensure that an overhead clearance of 14’-3” is maintained along the center vehicle lane, and that the inboard longitudinal bulkheads port and starboard of the center vehicle lane are clear of any obstructions or mounted equipment up to a height of 14’-3” above the Main Deck.

It is the responsibility of the CONTR to maintain open communication with MaineDOT as to the particular details of passenger and vehicle loading and off-loading requirements.

0.4.3 GENERAL CHARACTERISTICS

Length Overall	104'-0"
Length between Perpendiculars (LBP)	98' - 6 1/2"
Beam Molded	28'-6"
Depth Molded	11' - 0"
Displacement	230 LT at 7'-0" Waterline
Fuel Oil Capacity (100%)	3200 USG (one 3200 Gal. tank)
Potable Water Capacity (100%)	1900 USG (one 1900 Gal. tank)
Lube Oil Capacity (100%)	300 USG (one 300 Gal. tanks)
Dirty Oil Capacity (100%)	300 USG (one 300 Gal. tank)
Bilge Slops Capacity (100%)	300 USG (one 300 Gal. tank)
Sewage (CHT) Capacity (100%)	600 USG (one 600 Gal. tank)
Classification:	USCG Subchapter "T"
Passenger Capacity:	149 total
Crew Complement:	Per USCG C.O.I.
Service Speed	13.0 knots.

0.4.4 MANUFACTURERS' REPRESENTATIVES

Whether or not it is specifically stated in these SPECIFICATIONS, when it is required by the equipment manufacturer, by the specialized technical nature of the installation, for warranty purposes, or when work is outside the normal scope of the CONTR's work force, the CONTR is to provide the services of Manufacturers' Representatives, at the CONTR's cost for such assistance and expertise as is required for the proper installation, on-line testing, calibration, adjustments, etc. of CONTR Furnished and OFE equipment. At a minimum, Manufacturers' Representatives shall be employed for supervision of the installation and testing of main engines, gears, generators, PTO motors, propulsion and auxiliary control systems, bowthruster, steering, and electronic navigation equipment.

0.5 CORRESPONDENCE & COMMUNICATIONS

The CONTR shall provide MaineDOT with a copy of all communications relating to vessel construction which the CONTR has with Regulatory Bodies, in particular, the USCG Marine Safety Center (MSC) Washington, and the Local OCMI.

The CONTR shall invite MaineDOT to be present during all discussions relating to this vessel which they may have with the Representatives of Regulatory Bodies and, in particular, with the Local USCG OCMI or representatives of that office.

These documents and discussions may include, but are not limited to, the design, construction, installation of equipment and machinery, testing, sea trials, delivery, and operation of the vessel.

Requirements for planning, scheduling, material specifications, instruction manuals, etc. are detailed herein. The CONTR shall submit their proposed Correspondence and Communication Procedures to MaineDOT for approval within 30 days following Contract Award.

0.6 REGULATIONS, DOCUMENTATION, CERTIFICATION

0.6.1 COMPLIANCE

The vessel, as delivered, shall comply with the requirements of applicable Local, State and Federal Regulatory Agencies. These shall include, but may not be limited to:

- USCG: 46 CFR Subchapter "T" Passenger Vessel (Lakes, Bays & Sounds; Partially Protected Waters; Cold Water Service)
- USPHS: Publication No.393, "Handbook on Sanitation of Vessel Construction"
- Federal Communications Commission (FCC)
- United States Access Board (USAB) ADA Accessibility Guidelines (ADAAG) and Revised Draft Passenger Vessel Accessibility Guidelines, July 2013, USDOT 49 CFR Parts 39, Transportation for Individuals with Disabilities: Passenger Vessels
- For guidance: ABS Rules for Building and Classing Steel Vessels Under 61 Meters (200 ft) in Length 1983 & ABS Rules for Building and Classing Marine Vessels 2021 (vessel shall NOT be classed).
- I-EEEE45 Recommended Practice for Electric Installations on Shipboard in Institute of Electrical & Electronics Engineers Standards #45 (IEEE)
- USCG NVIC 12-82 Recommendations on Control of Excessive Noise
- IES Recommended Practice for Marine Lighting
- Admeasurement Rules Regulatory (US Domestic). Vessel to receive both US Regulatory and ITC tonnage admeasurement.
- UL Applicable Standards for Marine Electrical Equipment & Lighting Fixtures
- NDAA Section 889 for onboard electronic security systems and telecommunication systems
- ASTM F1155 Standard Practice for Selection of Piping System Materials
- ASTM F1321 Standard Guide for Conducting a Stability Test

- Maine Department of Transportation Standard Specifications, Current Edition

If a conflict exists between State and Federal accessibility requirement/code the more stringent code must be followed. In addition, all design elements shall comply with the minimum Federal requirements/code even if a State requirement/code is less stringent.

0.6.2 DOCUMENTATION

All necessary certifications and/or documents covering the approval of, and indicating compliance with, applicable regulations shall be obtained by the CONTR and supplied to MaineDOT. MaineDOT shall provide the CONTR the vessel name, Port of Documentation, and Company name upon the CONTR's request so that the CONTR may complete and submit the Application for Initial Documentation (CG-1258) and the application for Official Number. It is MaineDOT's responsibility to provide the CONTR with a receipt for documents received and to retain these documents for presentation to Regulatory inspectors as and when required. When MaineDOT receives Bills of Sale and Builder's Certificates, MaineDOT shall be responsible for obtaining the final Certificates of Documentation.

0.6.3 CERTIFICATION

The vessel will be designed, constructed, and outfitted to meet the regulations of 46 CFR Subchapter "T" Passenger Vessels. Vessel shall be certified for "Lakes, Bays, and Sounds; Partially Protected Waters; Cold Water Service. MaineDOT is responsible to notify the CONTR of any special USCG requirements which may be imposed by the USCG Local OCMI in MaineDOT's operating venue. A notification of any such requirement shall be made prior to Contract Award.

The CONTR shall provide MaineDOT with the following Documentation (with exception of Officer's USCG licenses). These documents shall be posted in (2) aluminum, Plexi-glass (or equivalent) window cases with hinged door(s) and lock provided and installed for this purpose and approved by the OREP. Specific locations shall be to the approval of the OREP.

1. Stability Letter (pilothouse)
2. Certificate of Documentation (pilothouse)
3. Regulatory and ITC Tonnage Certificate (pilothouse)
4. FCC Radio License (pilothouse)
3. Compass Deviation Card (pilothouse)
4. MARPOL placard (pilothouse)
5. Certificate of Sanitary Construction (pilothouse)
6. Fire Safety Instructions (passenger space, pilothouse, EOS)
7. Certificate of Inspection (passenger space)
8. USCG Officer's Licenses (passenger space)
9. Emergency Evacuation Plan (passenger space)
10. Fire Safety Plan (passenger space)

The latest amendments to all laws, regulations, rules and conventions, which are in force at the time of Contract Award, are to be considered as part of the CONTRACT. Any amendment to such requirements or any new laws, regulations, rules or conventions that come into force after Contract Award, shall be treated as a change to the CONTRACT if not otherwise covered by these Specifications.

0.6.4 SUBSEQUENT REGULATORY CHANGES

IF: CONTRACT changes are required by modifications or additions to the Laws or Regulations of the State of Maine, the United States, the Regulatory Agencies listed in 0.6.1, or any Governmental body or board thereafter organized or created;

AND: Such changes require an increase or decrease in the cost of the vessel;

THEN: It is agreed by the CONTR and MaineDOT to re-negotiate the CONTRACT PRICE and/or DELIVERY DATE in light of such changes.

0.7 PROPOSAL & CONTRACT DRAWINGS, PHOTOS

0.7.1 GENERAL

The OWNER's Design Agent, Gilbert Associates, Inc., Braintree, MA, will submit the Contract Drawings to USCG/MSC for review, comments, and approval. Subsequent re-submittals to address comments will be accomplished by Gilbert Associates. Upon receiving the drawings returned from USCG/MSC as approved, Gilbert Associates will forward the approved drawings to MaineDOT, the CONTR, and to the Local OCMI as may be directed by USCG MSC. Gilbert Associates will keep MaineDOT apprised of USCG comments and shall provide MaineDOT and the CONTR with copies of all USCG communications of "Approval", "Examined", and "Returned for Revision". USCG approvals prevail over MaineDOT approvals.

0.7.2 INTERFERENCES & ACCESSES

The elimination of all equipment interferences; and the location of machinery, pumps, piping, wiring, ductwork and misc. equipment; so that proper access for operation and maintenance can be readily achieved, is the CONTR's responsibility. CONTR shall check manufacturer's drawings prior to ordering equipment to ensure that final equipment selection does not cause unforeseen interferences. CONTR shall notify MaineDOT and Design Agent of any such differences. It is essential that the CONTR is aware of these obligations. The CONTR is responsible to see that all installations are arranged and constructed using "good shipbuilding practice" and that they adhere to the requirements of the SPECIFICATIONS, CONTRACT, and the CFR. The CONTR and MaineDOT are mutually responsible for the maintenance of ongoing communications, inspections, and approvals during construction.

0.7.3 ENGINEERING

The CONTR is responsible to provide competent and professional construction engineering to construct the vessel. Construction details that are not shown on the Contract Plans and that may be required for fabrication and/or construction guidance (commonly referred to as “working drawings” or “yard sketches”) shall be developed by the CONTR and shall be approved by MaineDOT, Gilbert Associates, and, if required, by the USCG/MSD.

The CONTR shall provide sufficient shop drawings for review to MaineDOT prior to the construction of the specific area in question.

Within 30 days of Contract award, the CONTR shall designate an individual as the CONTR’s Representative for this CONTRACT and shall notify MaineDOT of the individual’s contact information. This individual shall serve as the contact person (POC) between MaineDOT and the CONTR in matters of engineering and design until another individual is so designated.

Notwithstanding any requirements of these SPECIFICATIONS, it shall be the CONTR’s sole responsibility to determine and develop working drawings, which may be necessary to complete the construction and delivery of the vessel. Working drawings shall be made available for timely inspection, comments, and approval by MaineDOT.

When a CONTR is authorized to install a different (or equal) piece of equipment other than specified under the terms and conditions of Section 0.3.4 or 0.3.5, the CONTR shall be responsible to revise any and all drawings associated with the installation of this equipment. All revised or original design and engineering drawings submitted to MaineDOT by the CONTR for review shall be in both PDF and AutoCAD format. The AutoCAD version (release) used shall be mutually agreed upon by MaineDOT and CONTR.

The CONTR shall provide an independent Noise & Vibration Surveyor to attend Sea Trials (see Section 982.4.11); Noise Control Engineering, Billerica, MA, or approved equal.

0.7.6 INSTRUCTION SHEETS & MANUALS

The CONTR shall provide MaineDOT with (1) complete electronic set of vendor instruction manuals, maintenance manuals, parts lists, and cut sheets for all equipment and machinery provided on a portable flash drive. An index of all the information on the drive shall be provided with the drive. Categories in index shall be in groupings such as “Navigation Electronics”, “Pumps”, “Electrical Components”, etc.

0.7.7 PHOTOGRAPHS

The CONTR shall provide MaineDOT with a photographic record of the vessel construction process. General photos of progress shall be taken bi-weekly. Photos of special events shall be taken at the time of the event. All photos shall be indexed and placed on a portable flash drive or uploaded to a mutually agreed upon secure cloud storage location and provided to the MaineDOT OREP for inclusion in the vessel construction records.

0.7.8 DOCKING PLAN

The CONTR shall generate a Docking Plan in AutoCad format and submit in PDF to the OREP and Design Agent for review and approval. The approved plan shall be, in turn, provided to the OREP and Design Agent as “As-Built” in AutoCAD, PDF, and paper copy.

The Docking Plan shall include, but is not limited to, blocking, rudders, shafts, propellers, grid coolers, transducer locations, bow thruster tunnel, anode locations, sea chests, and tank boundaries.

0.7.9 PURCHASE ORDERS

The CONTR shall provide copies of purchase orders for equipment and machinery to the OREP. This file will give the OWNER future reference for ordering replacements, parts, etc. during the life of the vessel.

0.8 WEIGHT AND CENTER OF GRAVITY

0.8.1 WEIGHT ESTIMATE

The CONTR shall be responsible for maintaining the weight, VCG, and LCG characteristics described in the Proposed Design Initial Weight Estimate (adjusted for authorized departures). Departures from the Contract vessel modifications which affect the weight, VCG, and LCG shall not be undertaken until the CONTR has submitted to MaineDOT an estimate of the effect that such departures will have on the Weight Estimate. MaineDOT is responsible to provide the CONTR written approval for such departures.

The CONTR shall be responsible to track the vessel’s weight by updating the Weight Estimate monthly throughout the construction process. Each updated Weight Estimate shall be provided to MaineDOT for review.

0.9 STABILITY AND SUBDIVISION

0.9.1 SUBDIVISION

The construction of the vessel shall be designed to meet the subdivision, intact stability, and damage stability requirements of 46 CFR Subchapter “T” and Subchapter “S”. The CONTR shall obtain and post the Stability Letter (Reference Section 0.6.3).

0.9.2 ACCESS AND LOGISTICAL REQUIRMENTS – STABILITY AND SUBDIVISION TESTS

The CONTR shall prepare and make the vessel available for the surveys called for in Section 0.14. The CONTR shall provide adequate ventilation and access to all spaces and shall provide a “Competent Person” with equipment to ascertain the gas free condition of spaces and adequacy of oxygen levels. The CONTR shall provide adequate temporary lighting and necessary incidental labor as required.

0.10 ADMEASUREMENT TONNAGE

0.10.1 GENERAL

The CONTR shall be responsible to have the vessel admeasured for Domestic Regulatory and ITC tonnages. The CONTR shall arrange for a major classification society tonnage surveyor to perform this work and shall assist the tonnage surveyor to Survey the vessel. All fees associated with the issuance of new tonnage documents will be the responsibility of the CONTR.

0.11 ACCESS & MAINTENANCE REQUIREMENTS

0.11.1 GENERAL

The arrangement of all machinery and equipment shall be designed, so far as possible, to permit ready access to all parts for operation, inspection, maintenance and repair without removal or disturbance of other structure or equipment. Ladders, doors, manholes, scuttles, bolted plates, etc. shall be provided as required for access.

In no case may grating/floor plate support, hangers, wireway supports or other miscellaneous structure be attached by welding to any equipment or machinery unless specifically approved by the respective manufacturer and by the MaineDOT OREP. Equipment such as switchboards, transformers, pumps, etc., shall not be welded to deck structure unless specifically approved as described above.

0.11.2 PIPES, VALVES, ETC.

Restriction of access openings by pipes, valves, wires, etc. is unacceptable. Pipes, ventilation ducts, controls, valves, etc., shall not be located in areas rendered inaccessible by the positioning of other fittings. All systems including piping, ductwork, hangers, etc., in way of areas designated as temporary access will be installed so that they may be readily removed without burning or cutting. Wireways shall not block temporary access areas. CONTR shall pay particular attention to the routing of pipes and wireways through tonnage deep floors, so that the lightening hole proximity requirements contained in USCG MTN 01-99 are not violated.

Where valves or other equipment that requires frequent attention are installed or relocated below floor plates, those floor plates or portions thereof shall be fitted with hinges so as to provide easy and safe access.

0.11.3 REMOVAL OF EQUIPMENT/MACHINERY

Main Engine and generator exhaust pipe runs, silencers, and lagging shall be installed with bolted flanges and reusable insulation blankets to facilitate efficient removal and replacement.

CONTR shall provide and install 24 padeye lift points in convenient locations throughout the Engine Room and above the access stairway for handling the removal of machinery and equipment.

0.11.4 DRAINAGE

In places where the lodgment of water or oil is unavoidable, adequate drainage shall be provided. Particular attention shall be paid to avoiding water lodgment along hull longitudinal frames, horizontal deck beams and stiffeners. Flanges shall be located to face downwards wherever possible and where not possible shall be fitted with adequate limber holes for drainage.

0.11.5 LIGHTENING HOLES, MANWAYS, LIMBER HOLES

Lightening holes and manways in swash bulkheads, tanks, voids, double bottoms, tonnage bulkheads, etc., shall be arranged to facilitate physical inspection and maintenance access. Hand grabs shall be provided above at least one set of lightening holes in each deep floor to provide safe transition from space to space, on each side of deep floor. So far as practicable and within the criteria of tonnage regulations, all areas of tanks and voids shall be accessible. Limber holes shall be located so that liquid can drain freely to bilge or tank suction locations. No limber holes shall be smaller than ¾" radius, unless that diameter is greater than 50% of the web depth. Limber holes shall be provided as shown in bar keel to provide drainage across centerline. It is the CONTR's responsibility to see that the basic requirements of reasonable access and liquid drainage are met.

0.12 ACCESS TO YARD/VESSEL/DOCUMENTS

0.12.1 ACCESS TO YARD/VESSEL

MaineDOT shall be afforded access to the CONTR's shipyard, the OREP's on-site office, and the vessel during YARD working hours, to include all shifts, thru and until the vessel's departure for the OWNER's venue.

MaineDOT reserves the right, at no additional cost to the CONTR, to witness ALL work at any point in the performance of the CONTRACT and/or to audit and verify that the performance of all work is in compliance with the documentation, policies, and procedures which are a part of this CONTRACT.

0.12.2 ACCESS TO DOCUMENTS

MaineDOT shall have ready access during normal working hours to all documentation concerning the vessel including, but not necessarily limited to: Drawings; Specifications; Technical Information; engineering calculations; Schedules; Test & Inspection Reports; Relevant Subcontract Documents; Regulatory Body Reports; Approvals; Recommendations; and the CONTR's Detailed Contract Estimate. The CONTR's Detailed Contract Estimate shall be viewed only in the presence of the CONTR's representative, shall not be copied, and shall not be removed from the CONTR's possession.

0.13 OFFICE

MaineDOT shall be provided with a private office space at the fabrication plant as described herein for the Department's inspection personnel. The office space described in 0.13.1 should be located in close proximity to the vessel fabrication site. The office shall be climate controlled to maintain the temperature between 68° F and 75° F and have the exit(s) closed by a door(s) equipped with a lock and 3 keys which shall be furnished to the Inspector(s). Contractor shall make allowance for 3 inspectors.

0.13.1 MaineDOT OFFICE

The MaineDOT office shall meet the following minimum requirements:

Description	Quantity
Office area (minimum ft2)	125 per inspector
Drafting Table Surface (ft2)	35 “ “
Drafting stools-each	1 “ “
Office Desk	1 “ “
Ergonomic Swivel Chairs	1 “ “
Folding Chairs	2 per office
High-speed internet connection (ports) or wireless	1
Fluorescent Lighting of 100 foot-candles minimum for all work areas	2 per office
110 Volt 60 Cycle Electric Wall Outlets	3 “ “
Wall Closet	1
Waste Basket with trash bags	1 per office
Broom	1
Dustpan	1
Water Cooler	1

The Contractor will be responsible for disposing of trash and supplying commercially bottled water for the water cooler. Contractor shall supply cleaning materials for floor, surfaces, windows for the duration of the project.

MaineDOT has the option to reject any furniture or supplies provided to the inspector's office, based on general poor condition.

Contractor shall provide parking spaces for the Inspector(s) in close proximity to the entrance to the MaineDOT office. Maintain the pathway between the parking area and the MaineDOT office so that it is free of obstacles, debris, snow and ice.

The facilities and all furnishings shall remain the property of the Contractor upon completion of the Contract. Payment for the facilities, heating, lighting, telephone installation, internet

connection, basic monthly telephone and internet charges and all furnishings shall be incidental to the Contract.

Failure to comply with the above requirements will be considered denial of access to the work for the purpose of inspection. The Department will reject all work done when access for inspection is denied.

Contractor shall provide access to a nearby men's and women's (or unisex) restroom facility for the duration of the Contract. Restroom facility shall be kept in cleaned status by CONTR. If deemed unacceptable by Inspector(s), a lockable restroom shall be provided by CONTR for MaineDOT personnel only.

0.13.2 CONFERENCE AREA

Upon prior notice and specific reservation request, the CONTR shall make available a Conference Area, which provides adequate space for meeting with vendors, yard personnel, and MaineDOT employees or designated subcontractors.

0.13.3 PARKING

Convenient parking space will be provided for MaineDOT employees, and Technical Reps. A minimum of two designated parking spots shall be marked as reserved for this construction project.

0.14 INSPECTIONS

0.14.1 GENERAL

All materials and workmanship shall be subject to inspection by MaineDOT, the USCG, and other regulatory bodies having jurisdiction. MaineDOT OREP or personnel will attend all inspections.

MaineDOT shall promptly approve all work and material conforming to the requirements of this Specification and shall promptly reject all work and materials which do not conform. Such rejected work or material shall be marked and isolated until satisfactorily corrected.

0.14.2 SCHEDULING & ATTENDANCE

The CONTR is responsible for scheduling and presenting all completed work for Acceptance Inspections and for giving written (email sufficient) advance notice (normally one week) to MaineDOT, USCG, and other required inspection agencies that such work is complete, has been passed by the CONTR's Quality Control (QC) department, and is ready for inspection. Inspections shall, when possible, be scheduled and accomplished during normal workdays on the CONTR's day shift and shall not constitute a delay to the CONTR's production schedule.

Contractor shall make formal requests for weekend and holiday work in a timely manner with MaineDOT. Formal requests must be made in writing a minimum of four days in advance. See MaineDOT Standard Specifications for applicable holiday schedule.

MaineDOT will make every effort to maintain communications with the parties involved and to report to the inspection site per agreed schedule. If MaineDOT is unable to keep the schedule, they shall notify the CONTR as soon as possible and reschedule for a mutually agreeable time. Failure of MaineDOT to attend an inspection does not constitute an acceptance of the work. Inspections by the Coast Guard or other agency do not eliminate these requirements for inspection and acceptance by MaineDOT.

0.14.3 PREPARATIONS

Work presented for inspection shall be complete in all respects, clean, free of debris, scrap, lines, welding wire ends, and all temporary gear. Reasonable accommodations shall have been made for access, lighting, and fresh air supply in advance of the inspection party.

0.14.4 COVERINGS

Prior to the application/installation of paint, deck covering, insulation, sheathing, joiner work, ceilings, etc., all structure and weld that is to be covered will be given final inspection and will be signed off by the MaineDOT OREP. Welds not passing visual inspection shall be repaired as required by these SPECIFICATIONS.

MaineDOT has the right and option to require removal of any or all coverings for inspection in areas that have not been previously inspected and passed. Work areas are NOT to be covered or concealed until inspected and approved by MaineDOT.

0.14.5 RE-INSPECTIONS

Any welding, burning, heat shrinking, etc. which is performed as rework, repair, or on change orders after an inspection has been completed, may require (at MaineDOT's option) the removal of any or all coverings for re-inspection of plate, welds, etc. An initial inspection in no way negates the requirement for re-inspection if an area is reworked in any manner.

0.14.6 COMPARTMENT COMPLETIONS

Tanks and voids, passenger spaces, work and machinery spaces shall be inspected and certified complete by the MaineDOT OREP and the CONTR's Representative. Machinery spaces shall include documented tests for all machinery and equipment. A compartment shall not be considered accepted until the checklist is complete, deficiencies are corrected, and the MaineDOT OREP and the CONTR have signed off on the space. At this time, so far as is possible, the compartment shall be secured and no further work shall be conducted within the space unless approved by the mutual consent of the MaineDOT OREP and the CONTR.

The intent of the foregoing paragraph is to guarantee that MaineDOT will receive, at delivery, a fully operational vessel which is immediately capable of entering regular on-line service.

0.14.7 TANKS

Prior to the final closing of any tank, the MaineDOT OREP shall have inspected and signed off that:

- a) Structure and welding is complete
- b) Air or hydro test has been passed and witnessed by the OCMI
- c) Filling and suction piping is complete and tested
- d) Vents, sounding tubes, striking plates, level indicators, and hi/low level alarms are properly installed and tested
- e) Coatings have been applied per the paint schedule
- f) The tank is clean and free of all debris

0.14.8 PIPING – FLUSH TESTING

All hydraulic fluid, lube oil, and fuel piping systems shall be thoroughly cleaned and flushed of all foreign matter with the appropriate system medium or an approved substitute. Hydraulic and lube oil piping shall be “pickled” with samples lab tested.

Waste oil piping and suction piping must be pressure tested for leaks at 5 to 10 PSI depending upon the system component pressure ratings.

Piping shall be tested, signed off, and approved by the CONTR and the MaineDOT OREP. The CONTR must determine the maximum permissible test pressure for each system component according to the applicable regulations. System flushing shall be conducted at the applicable system’s maximum operating pressure and temperature, and at normal line velocity. Extreme care should be used to prevent over-pressurization of piping systems undergoing testing.

All systems shall be flushed for a period of one hour (or longer as required) to achieve and ensure system is thoroughly cleaned and flushed. Flushing shall be accomplished using a CONTR furnished pump to circulate appropriate medium and CONTR furnished filters to collect all contaminants.

Prior to flushing any system, proper care and attention must be given to systems that will require to be blocked off, removed or bypassed, due to in-line mechanisms, valves or machinery that may be capable of trapping debris or foreign matter.

Summary – Basic Test Procedure for Pressure Test Required Systems

- Fill system with appropriate medium
- Run system at maximum operating pressure and operating velocity for minimum of one hour
- Drain system and blow out with fresh air for 10 minutes
- Flush with clean oil

- Refill and secure system

0.14.9 FUEL LINE PRESSURE TESTING – MAIN AND GENERATOR ENGINES

- Engine fuel systems will be pressurized for a minimum of one hour and all piping, fittings, and hoses checked for leaks.

0.14.10 TESTING PROCEDURE

- Pressurize system to 150% of normal operating pressure (CONTR shall supply pump, fittings, and gauges).
- Keep system under specified pressure for a minimum of one hour.
- Check all piping, fittings, hoses, and piping in areas of pipe mounts for leaks.
- Acceptable leakage: None
- Secure system, bleed air, and return to operational status.

0.14.11 VENDOR SITE VISITS

At the request of MaineDOT, the CONTR shall make arrangements for MaineDOT and/or other MaineDOT designated personnel to visit vendor's or sub-contractor's sites to witness equipment tests, inspect facilities, etc. These visits shall be at MaineDOT's expense.

0.15 PROGRESS REVIEW MEETINGS

The CONTR, MaineDOT, and their OREP shall hold progress review meetings every one (1) to two (2) weeks. These meetings may be conference calls, or held at the CONTR's facility, or such other location as mutually approved by both parties. Meetings will commence no later than two (2) weeks after Contract Award. The primary purpose of Progress Review Meetings is to discuss, report, and resolve problems relative to progress and/or anticipated delays.

0.16 WARRANTIES

All warranties shall be as detailed in the Contract. The completed vessel shall be warranted for parts and labor for one year (12 months) beginning with the delivery date.

0.17 MATERIALS AND WORKMANSHIP

0.17.1 MATERIAL -- GENERAL

Material, unless otherwise specified herein, shall be of commercial quality; suitable for marine environment; and shall conform to ASTM, SAE, ABS or DNV, and USCG (CFR) requirements. This material shall be so designated on Bills of Material and on Construction Drawings. All materials shall be new and of first class quality. All materials shall be free from imperfections of manufacture and from defects, which adversely affect appearance or serviceability.

All steel used for construction of hull, superstructure, and deckhouses, including forgings, shall be of open hearth mild steel, of uniform quality, the chemical and physical properties of which shall conform to the requirements of the American Bureau of Shipping for Grade A steel or ASTM A-36 certified steel.

0.17.2 WORKMANSHIP AND MATERIALS - GENERAL

All workmanship and materials shall be to the highest commercial standard, in compliance with MaineDOT, USCG, ABS, and AWS Standards.

0.17.3 STORAGE/PROTECTION

All material and equipment intended for the vessel in any form, whether CONTR or OFE, shall be adequately stored and protected from the elements and shall be given appropriate security by the CONTR. Due consideration shall be given to the nature of particular equipment or material with storage and security mutually agreed upon by MaineDOT and CONTR. Inside storage shall be provided for all equipment and material that will be located on the interior of the vessel and for equipment such as radar antennas, floodlights, spotlights, etc. that could be sensitive to damage.

The CONTR shall be responsible during construction and prior to vessel delivery for the protection of all items with finished surfaces, such as joiner panels, door frames, deck coverings, carpeting, joiner ceilings, countertops, furniture, etc.

Any soft material areas, such as (but not limited to) upholstery and carpeting, damaged by the CONTR or CONTR's Agents during course of this Contract, will be replaced at the CONTR's expense.

0.17.4 WELDING

Welding shall be of electric pulse arc Metal Inert Gas "MIG", Tungsten Inert Gas "TIG", or Shielded Metal Arc type process, as appropriate. Welding preparation and execution shall be in compliance with USCG or Class Society requirements and be performed by USCG "certified" welders.

Welding machine power sources shall be calibrated and maintained in accordance with manufacture or certification standards whichever is more frequent. At a minimum, Contractor shall calibrate welding machines on an annual basis, and provide the required documentation.

All welding shall be overseen by a CWI or equivalent. WPS, PQR's and certification shall be submitted to the MaineDOT Fabrication Engineer for review prior to commencement of any welding in the field. Non-destructive testing (NDT) shall be performed to ABS guidelines. CONTR shall submit the NDT plan to MaineDOT for approval. Additional testing may be required by MaineDOT based on the NDT results.

0.18 CONTRACTOR'S OBLIGATION

The CONTR is responsible to carefully review the Specifications and Contract Drawings. An item of work or equipment that is shown on the Drawings but omitted in the Specifications, or vice versa, shall be provided by the CONTR without a cost increase as though the item had been detailed or required in both documents. Precedence of Specifications or Contract Drawings shall be resolved as provided for in the CONTRACT.

The CONTR is to provide all plant infrastructure, labor, and transportation for shipyard employees, supplies as required, fuel for vehicles and machinery, water, power, lighting, air, steam, crane and forklift services, CONTR communications, line handling, wharfage, towing and shifting services. This obligation shall include equipment and power services to prevent cold weather freeze up, as well as adequate hot weather ventilation. This obligation shall also encompass all requirements of the vessel delivery as detailed in Section 983.

0.19 HULL AND STRUCTURE PROTECTION

0.19.1 WELDING

Rigid Control of welding and grounding shall be maintained for the protection of hull and hull appendages. Care shall be taken that the welding polarity and ground connections of welding machines used on this vessel, other vessels in the immediate vicinity, or on the dock to which the vessel is moored shall be such as not to damage any parts of the vessel. The CONTR shall adequately protect, in all respects, the underwater part of the hulls prior to delivery. The CONTR shall ensure that all Control system and sensitive electronics have been electrically isolated as per the manufacturer's requirements prior to any welding taking place.

0.19.2 UNDERWATER HULL INSPECTION (AS APPLICABLE)

If at any time prior to the MaineDOT's acceptance of the vessel, there is reason to believe that the underwater portion of the vessel may have been damaged, that coatings may have failed, or that equipment or appendages require out of water maintenance due to the CONTR's or a Sub-contractor's negligence or due to an evolution conducted in good faith by the CONTR but resulting in damage, the CONTR shall contract for an independent certified diver's inspection of the underwater hull.

A copy of the diver's inspection report shall be provided to the MaineDOT OREP and USCG Inspector. In consideration of this report, the circumstances surrounding the damage, and the

extent of damage which determine the damage to be a “warranted reason”, the CONTR shall “haul out” (drydock) the vessel and adequately repair, clean and paint the damaged areas at the CONTR’s expense. A protest by MaineDOT filed with the USCG Local OCMI and sustained by them, shall be deemed a "warranted reason" for requesting dry-docking.

If said Underwater Inspection is requested by MaineDOT, yet deemed unnecessary by CONTR, the cost of inspection will be borne by OWNER if the inspection report finds no discrepancies. If warranted discrepancies are found, the cost of inspection, as well as the cost of haul out (drydocking) and the cost of repairs, shall be borne by CONTR.

0.20 OPERATOR’S MANUAL

The CONTR shall provide MaineDOT with an Operator’s Manual for the vessel based on USCG and MaineDOT guidelines and standards. The Manual shall include step by step start up and shut down procedures; operation procedures of all auxiliary equipment; system and equipment maintenance tasks; and a preventative maintenance schedule. (1) electronic copy of the Operator’s Manual shall be provided on portable flash drive or mutually agreed upon secure cloud storage location.

0.21 SPARES

The following list shall serve as a Reference to the SPECIFICATION requirements for spare equipment and components. The CONTR shall include all requirements for spares in their bid proposal.

1. Main Engines Section 233.1.3
2. Shaft Line and Propeller Components Section 242.1.1
3. Generator Sections 311.1.1, 311.2.1, 311.3.1
4. Electrical Section 324.1.4
5. Lamps (Lighting) Section 331.1.14
6. Steering System Section 561.0.1
7. Bow Thruster Section 568.2
8. Seating Section 645.1.5

SWBS SPECIFICATIONS

The following Technical Specifications are arranged by Ship Work Breakdown Structure (SWBS) numbers in Sections:

- 100 Vessel Structure
- 200 Mechanical
- 300 Electrical
- 400 Alarms, Internal Communications, Navigation
- 500 Insulation, HVAC, Piping, Fire Detection & Suppression
- 600 Markings, Access, Vessel Protection
- 900 Tests & Trials, Services

GENERAL NOTE

These Technical SPECIFICATIONS describe the criteria and parameters that the Maine Department of Transportation (MaineDOT) requires for the construction of a 104 foot, twin screw, passenger/vehicle ferry to service MaineDOT routes between the mainland and Maine coastal islands. MaineDOT will accept, review, and award a Contract for construction and delivery as detailed herein and in the accompanying Contract documents. MaineDOT's Contract Award will be predicated on a thorough examination of the Bidder's response to the IFB.

SWBS SECTION 100 VESSEL STRUCTURE

The following specifications and drawings referenced provide for the Construction of Hull, Superstructure and Deckhouse Structures required to be performed under this contract:

- 100.1 REFERENCE DRAWINGS
- 100.2 GENERAL SCOPE
- 110.1 HULL
- 123.1 TANKS
- 130.1 DECKS, FRAMING
- 150.1 SUPERSTRUCTURE
- 150.2 ENGINE FOUNDATIONS
- 167.1 WATERTIGHT HATCHES & SCUTTLES
- 168.1 WEATHERTIGHT DOORS
- 171.1 MASTS

100.1 REFERENCE DRAWINGS

D367-A1	GENERAL ARRANGEMENTS
D367-A2	INBOARD PROFILE
D367-A3	OUTBOARD PROFILE
D367-A12	BULWARK & MOORING ARRGTs & DETAILS
D367-S1	STRUCTURAL PROFILE
D367-S2	CONSTRUCTION SECTIONS BELOW MAIN DECK
D367-S3	CONSTRUCTION SECTIONS ABOVE MAIN DECK
D367-S4	TRANSVERSE AND LONGITUDINAL BULKHEADS BELOW MAIN DECK
D367-S5	TRANSVERSE & LONGITUDINAL BHDS ABOVE MAIN DECK
D367-S6	SHELL EXPANSION
D367-S7	DECK SCANTLINGS
D367-S9	MAIN ENGINE FOUNDATIONS, ARRGTs., & DETAILS
D367-S12	RAILINGS, LADDERS AND STAIRWAY DETAILS & ARRANGEMENTS

If any discrepancy, difference, or conflict is found to exist between the Plans and the Specifications, then to the extent of such discrepancy, difference, or conflict only, the matter shall be resolved as provided for in the CONTRACT. Any work called for by the Specifications and not shown on the Plans and any work shown on the Plans but not called for in the Specifications shall be performed by the Contractor as part of the contract work.

100.2 GENERAL SCOPE

The vessel is to be constructed in accordance with the Contract Drawings and Specifications submitted as an integral part of the Invitation for Bid. These documents have been developed by MaineDOT's Design Agent, Gilbert Associates, Inc. of Braintree, MA.

100.2.1 SUPERSTRUCTURE/ACCOMMODATIONS

The Superstructure shall comprise:

- 02-DECK: Pilothouse
- 01-DECK: Open deck passenger seating, stairs to PH, stack, IBAs, rescue boat, and rescue boat davit
- MAIN DECK: Exhaust uptake P, ER air supply S, deck lockers, hull access stairtrunks P&S, passenger cabins P&S, passenger heads P&S

100.2.3 CLASSIFICATION

The vessel shall conform to all of the regulations that apply to a 46 CFR Subchapter "T" Passenger Vessel with a Gross Regulatory Tonnage not to exceed 100 GT. The vessel will not be classed; however, it shall be constructed in compliance with ABS Rules for Building and Classing Steel Vessels Under 61 Meters (200 ft) in Length 1983 & ABS Rules for Building and Classing Marine Vessels 2021, where applicable and shall, in all respects, be constructed and outfitted according to good shipbuilding practices.

110.1 HULL

110.1.1 MATERIALS AND DESIGN

The Contract design is a welded steel, twin screw, conventional diesel powered vessel. The vehicle deck extends from bow to stern. A steel bar rub rail guard surrounds the entire perimeter at the main deck edge.

123.1 TANKS

Tanks are supported by surrounding bulkhead / deck structure and not integral with the shell plating. Fuel Oil (Ref: Section 261.1), Potable Water, Lube Oil, Bilge Slops, Sewage, and Dirty Oil tanks provide capacities as listed in this Section and Section 0.4.3.

123.1.1 POTABLE WATER TANK

The design incorporates (1) 1900 gallon Potable Water tank located FR18-FR20. This tank shall be fitted with piping, valves, and fittings in accordance with Contract DWG D367-P5. Tank shall have non-tight centerline swash bulkhead.

123.1.2 FUEL OIL TANK

The design incorporates one (1) 3200 gallon Fuel Oil tank at 100% capacity. It is located centerline FR14-FR16. This tank shall be fitted with piping, valves, and fittings in accordance with Contract DWG D367-P4. Tank shall have non-tight centerline longitudinal swash bulkhead.

123.1.3 LUBE OIL TANKS

The design incorporates (1) 300 gallon Lube Oil Tank located to port of the dirty oil tank FR28-FR30. This tank shall be fitted with piping, valves, and fittings in accordance with the Contract DWG D367-P11.

123.1.4 BILGE SLOPS TANK

The design incorporates (1) 300 gallon Bilge Slops Tank located to starboard of the dirty oil tank FR28-FR30. This tank shall be fitted with piping valves, and fittings in accordance with Contract DWG D367-P11.

123.1.5 DIRTY OIL TANK

The design incorporates (1) 300 gallon Dirty Oil Tank located on centerline FR28-FR30. This tank shall be fitted with piping, valves, and fittings in accordance with the Contract DWG D367-P11.

123.1.6 SEWAGE TANK

The design incorporates (1) 600 gallon Sewage Tank located near centerline FR16-FR17. This tank shall be fitted with piping, valves, and fittings in accordance with the Contract DWG D367-P6. Tank shall have non-tight longitudinal swash bulkhead.

130.1 HULL STRUCTURE

130.1.1 DESIGN and CONSTRUCTION

The CONTR shall use the Contract Drawings and Vendor Drawings, as appropriate, for guidance. Where required, the CONTR shall be responsible for developing construction working drawings.

All hull plating shall be of steel, the thicknesses and extents as shown on the Contract Drawings. Hull shall be framed with steel transverse bulkheads, transverse deep floors, and transverse floors with flanged plate and angle bottom and side frames. Additionally, longitudinal girders intercostal to bulkheads and deep floors shall be fitted on bottom and side shell between transverses. The arrangement of intercostals and equivalent construction shall be as required by USCG MTN 01-99 "Tonnage Technical Policy", current edition. Main Deck shall be framed as shown on the Contract Drawings, with transverse web frames where shown, and with longitudinal angle frames intercostal to transverse deep floors, transverse web frames and transverse bulkheads.

Arrangement of deep floors, lightening holes, and miscellaneous openings in deep floors shall be as shown on the Contract Plans and according to USCG MTN 01-99, current edition.

150.1 SUPERSTRUCTURE AND DECKHOUSE STRUCTURE

The CONTR shall use the Contract Drawings and Vendor Drawings, as appropriate, for guidance. Where required, the CONTR shall be responsible for developing construction working drawings.

The superstructure and deckhouse plating shall be steel, the thicknesses and extents as shown on the Contract Drawings. The superstructure and deckhouses shall generally be framed transversely, with steel flanged plates and angles, as shown on the Contract Drawings, supported by transverse and longitudinal bulkheads.

150.2 ENGINE AND AUXILIARY MACHINERY FOUNDATIONS

Engine foundations shall be as shown on the Contract DWG D367-S9.

Engine foundations shall be formed of heavy plate, the thicknesses and extents as shown on the Contract Drawings. Heavy top plate rider bars shall be fitted as shown. Longitudinal engine foundations shall be fitted with transverse flanged plate brackets, as shown on the Contract Drawings.

Auxiliary equipment foundations shall generally consist of angles and plate, suitably secured to hull frames and with top bars of suitable size for attachment of the equipment. Where drip pans are needed, they may be formed of flanged plates with welded corners, and acting as part of the foundation. All auxiliary foundations shall be braced to prevent vibration. Floor plates may be extended to form part of the foundations.

167.1 WATERTIGHT HATCHES & SCUTTLES

167.1.1 GENERAL

The CONTR shall provide and install flush mounted, steel, watertight hatches in the Main Deck accessing all hull spaces P&S. Access to voids not accessed by stairways shall be via hatches and vertical ladders installed with bolts.

167.1.2 HATCHES (SCUTTLES)

The CONTR shall provide and install flush-mounted watertight, hatches to provide access to Hold Deck void, machinery spaces, and tanks as shown on the Contract DWGS. Main Deck hatches shall be by Freeman Marine, Model 2481-0107, or approved equal (Ref. D367-A7). See Section 623.1.1 for drip tray requirement below main deck hatches.

The CONTR shall provide (2) two portable fiberglass safety gratings to set into open hatches when personnel are working within a space with the hatch cover removed or hinged open.

The CONTR shall provide and install one (1) Cen-Tex Model 223-MS quick acting spring loaded flush mounted watertight escape hatch at FR 21 Main Deck Starboard.

The CONTR shall provide and install five (5) Cen-Tex Model 302-MS tank mounted WT/OT hatches as shown on DWG D367-A7 to provide access to tanks for inspection and cleaning.

The CONTR shall provide and install one (1) Cen-Tex Model 303-MS flush mounted oil tight hatch to fuel oil tank at FR 15.5 Main Deck Starboard/CL.

168.1 WEATHER-TIGHT DOORS

The CONTR shall provide and install Main Deck and Pilot House weather-tight doors. Doors shall be by Dean Steel, Pacific Coast Marine, Beclawat, Freeman Marine, or approved equal, and shall address accesses as shown on Dwg. D367-A7. Doors opening against bulkheads shall be fitted with rubber bumpers. Doors accessible by passengers shall be fitted with hinge-end finger guards. Also see Section 611.1.1.

171.1 MASTS

The CONTR shall provide and install appropriate masts and foundations to mount radar antennas, required navigational lights, miscellaneous antennas, flags, and day shapes in accordance with the Contract DWGS (Ref: D367-A3 and A8).

- A mast shall be located on the Pilothouse top for navigation lights, flag hoists and day shapes. Mast shall be fitted with ladder rungs, as shown, and transverse yardarm for flag hoists, day shapes, and anemometer (Ref. D367-A8)
- Two (2) masts shall support radar antennas on the Pilothouse top.

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- A mast located on the Main Deck bulwark cap forward at FR 1 shall be fitted with hardware and halyards to accommodate a “Steering Pennant”.
- A mast located on the 01-deck, starboard at the aft end of the rail near FR 34/35 shall be fitted with hardware and halyards to accommodate the ensign.

SWBS SECTION 200 MECHANICAL

The following specifications and drawings referenced provide for the Mechanical Installations required to be performed under this contract:

- 200.1 REFERENCE DRAWINGS
- 233.1 PROPULSION – DIESEL ENGINES
- 241.1 REVERSE/REDUCTION GEARS
- 242.1 COUPLINGS, SHAFTING, SEALS
- 252.1 PROPULSION CONTROLS SYSTEM
- 259.1 EXHAUST SYSTEMS
- 261.1 FUEL OIL SYSTEM
- 262.1 LUBE OIL SYSTEM
- 263.1 DIRTY OIL SYSTEM

200.1 REFERENCE DRAWINGS

D367-M1	SHAFT ARRGTs AND DETAILS
D367-M2	RUDDER & STEERING ARRGT & DETAILS
D367-M5	RESCUE BOAT & DAVIT DETAILS
D367-M7	ENGINE ROOM VENTILATION PLAN
D367-M9	HVAC ARRGTs & DETAILS
D367-M10	KEEL COOLER ARRANGEMENTS & DETAILS
D367-P1	M.E. & SSDG EXHAUST ARRGT & DETAILS
D367-P4	FUEL OIL PIPING SCHEMATIC
D367-P11	LUBE OIL & WASTE OIL PIPING SCHEMATIC
D367-P13	HVAC BOILER WATER PIPE SCHEMATIC
D367-P14	KEEL COOLER PIPING SCHEMATIC

233.1 PROPULSION – DIESEL ENGINES

233.1.1 GENERAL

Main propulsion machinery shall be provided and installed in accordance with USCG requirements and ABS Classification Society standards.

The CONTR shall maintain communication throughout the construction process with vendors who are providing engines, gears, couplings, shafting, seals, bearings, etc., to make sure that all parties are in mutual agreement and that the provided components of the propulsion system are fully compatible. MainedOT shall be copied on all electronic and written communication between the CONTR and vendors and between the CONTR and USCG concerning the installation of the Propulsion System.

The CONTR shall be responsible for aligning all drive line components installed to the Manufacturer's requirements. Alignments shall be performed in the presence of the main engine manufacturer's Tech Rep and shall be approved by this Tech Rep. Final alignments shall take place after floating the vessel and prior to engine start-up and Dock Trials. Alignment procedures shall be presented to MainedOT and the Engine Manufacturer's Tech Rep prior to the completion of shaft line component installations.

233.1.2 MAIN PROPULSION DIESEL ENGINES

The (2) Main Propulsion Diesel Engines shall be Caterpillar C-18 ACERT series; 600 bhp at 1800 rpm; EPA Tier 3/IMO II compliant, A-rated for continuous service. The CONTR shall install the Main Propulsion Engines and all associated equipment. The Main Engine package is being quoted by Milton CAT Inc., Milford, MA for this project.

Each Main Propulsion engine shall be supplied with the following standard and optional equipment:

- SCAC Separate Circuit After-cooled
- Keel cooling for Jacket Water and Separate Aftercooler Circuits (See Section 520.1)
- Dry air filter element w/ service indicator
- Turbocharger, jacket water cooled
- Turbocharger inlet 6 in straight connection
- Programmable Low Idle
- Electronic Diagnostics, Fault Logging
- Engine speed, temperature, pressure monitoring
- Electronic fuel/air ratio control
- Engine Protection Mode
- 70 pin connector
- Throttle inputs
- ECM shutdowns for High jacketwater coolant temp, low oil pressure, overspeed
- SCAC pump, gear driven
- JW pump, gear driven

- SCAC and JW shunt tanks
- Water cooled exhaust manifold & turbocharger
- 6 in flanged exhaust outlet
- SAE No. 1 flywheel housing
- SAE No. 1 flywheel
- Front service simplex fuel system
- Gear driven fuel transfer pump
- Manual fuel priming pump
- Hybrid fuel line design
- Front service lube simplex system
- Deep sump oil pan
- Oil filler locations front & top
- Front service dipstick
- Oil pump, gear driven
- Resilient engine mount system, four-point
- Front damper guard
- Front service engine
- Common electrical ground point
- Front service for lube, fuel filters
- 24 VDC alternator, 105 A, belt-driven
- Hydraulic pump drive
- Jacket water heater, 1.5 kw
- Engine Control Panel, remote MECP-2b with local speed control
- Pilot House Panel Color Marine Display (one panel for both main engines)
- Fuel cooler
- USCG approved flexible fuel lines
- SOLAS spray shielding for fuel filter and fuel lines
- Lube oil drain lines
- Pressure cap and filler neck kit
- Closed crankcase ventilation
- Green Passport documentation
- IMO EIAPP certification
- Commercial paint finish, Cat yellow
- Torsional Vibration Analysis (TVA)
- Factory supplied fluids
- Parts & Service Manuals (one electronic copy)
- Factory test run witness for one or both main engines at MaineDOT's discretion (Witness expenses shall be to MaineDOT's account)

233.1.3 MAIN ENGINE SPARES

The (2) Main Propulsion Engines shall be provided with enough filters for two complete changes of all filters required for each engine.

241.1 REVERSE/ REDUCTION GEARS

The CONTR shall install Reverse/Reduction Gears and all associated equipment/controls. Gears shall be Twin Disc Model MGX-516, close-coupled 4.04:1 vertical offset gears.

Each gearbox shall be supplied with:

- Remote heat exchanger
- SAE 1 housing
- 14” torsional coupling
- Main oil pump with duplex filters and cooler
- 24 VDC Shift Control Valve
- Pressure and Temperature sensors.
- Rigid Mounting Brackets
- Propeller Shaft Output companion flange
- Oil sump drain hose, valve, and quick disconnect
- Twin Disc standard automation for unattended engine room
- Parts & Service Manuals (1 electronic copy)
- Factory endorsed commissioning, startup, and sea trials

242.1 COUPLINGS, SHAFTING, SEALS, PROPELLERS

The CONTR shall provide and install all required couplings, shafting, propellers, seals, bearings, and foundations, in accordance with the Contract DWGS to make complete driveline installation.

CONTR shall install Twin Disc companion flange shaft couplings that are provided as part of the reduction gear package and in accordance with manufacturer design and installation instructions.

CONTR shall provide and install line shafts and tail shafts. Line shafts and tail shafts shall be 5” diameter stainless steel Aqualoy 22, or approved equal fitted with machined tapers and keyways as shown on the Contract DWGS.

CONTR shall provide and install stern and strut tube bearings and stuffing boxes as shown on the Contract DWGS. Provide and install Thordon TG100-Seal size #03 shaft seal and Duramax Model 500 or approved equal cutless bearings at the forward end of the stern tube and a Duramax “Earth” or approved equal cutless bearing at the aft end of the stern tube. Provide and install strut bearings, Duramax “Earth” or approved equal cutless bearings in the strut barrels (Ref: D367-M1).

CONTR shall provide and install Kahlenberg “muff” couplings or approved equal between line shafts and tail shafts.

CONTR shall provide and install propellers by Sound Propeller Services, Seattle, WA or approved equal: 4 bladed, 52" Diameter, Pitched per final recommendations, DAR 0.80, CF3 stainless, Style Sound B, one RH and one LH. The CONTR is to verify the propeller characteristics with the propeller vendor and shall provide the MaineDOT OREP and DESIGN AGENT with the vendor's written verification response. Propellers shall be arranged to be outboard turning, i.e., the starboard propeller will rotate clockwise when looking from aft of propeller, and port propeller will rotate counterclockwise when looking from aft of propeller.

242.1.1 SPARE SHAFT LINE COMPONENTS

- (1) Tail Shaft, 5" diameter, Aqualoy 22 or approved equal
- (2) Propellers, Sound Propeller or approved equal, 4 bladed, 52" Diameter, pitched per final recommendation, DAR 0.80, CF3 stainless, Style Sound B, one RH and one LH
- (1) Kahlenberg or approved equal Muff coupling

252.1 PROPULSION CONTROL SYSTEM

The CONTR shall provide and install an electronic propulsion control system by Twin Disc EC600. The electronic control system shall provide control of the main engine governors and reverse/reduction gears. The system shall be provided with redundant power supplies and automatic power transfer. A back-up control system shall be incorporated. A failure alarm system shall be provided for the control and hydraulic system functions. The CONTR shall provide a Tech Rep for commissioning, startup, and sea trials. Propulsion Control System shall comply with 46 CFR 184.620.

Main Engine control shall include ahead, reverse, and speed functions for each engine separately at the Pilothouse conning position. See Section 982.3 for propulsion and steering control PSTP and DVTP requirements.

259.1 EXHAUST SYSTEMS

The CONTR shall provide and install main propulsion engines, generators, and heating boiler exhaust systems, in accordance with the Contract DWGS. The components of the system shall be as detailed on Dwg D367-P1 and on the Exhaust System Bill of Materials DWG D367-P1, or approved equal. The specified silencers have been selected with a performance minimum of 25 dB attenuation each. Exhaust will discharge through the uptake located in the port side ER access near FR 23. The exhaust systems shall include manifolds, silencers, removable flex connectors, expansion joints, hangers, and associated hardware to comprise complete and operational exhaust systems. Risers and pipe shall be schedule 40 carbon steel. Hot piping shall be fitted with high-temperature, approved, fiberglass blanket insulation (Ref: D367-P1).

261.1 FUEL OIL SYSTEM

261.1.1 SYSTEM

The CONTR will fabricate and install a fuel oil system which will include (1) 3200 gallon steel F.O. tank located centerline FR14 to FR 16. Main tank piping will include 1-1/2" fill line; a fill station (FR24 inboard side of port cabin) with residential-style terminal fitting; a fill station containment; 2" vent line; plugged valve drain fitting for sludge and water removal; and fuel oil suction lines.

The main engine and generator fuel oil suction lines shall be fitted with manual and remote actuators. All piping, valves, fittings, and connections shall conform to USCG requirements.

CONTR shall provide and install fuel centrifuge system complete with foundation, drip tray, and all piping and valves shown on DWG D367-P4. Centrifuge shall be Alfa Laval MAB-103, 240VAC, 60 Hz, 3-phase model or approved equal. Centrifuge shall be fitted with remote shutdown from outside the engine room.

261.1.2 FILTERS

The main engines fuel oil supply shall be fitted with Racor, or approved equal, duplex primary filters and secondary particle filters. The ship service generators and boiler burner fuel oil supply lines shall be fitted with Racor, or approved equal duplex filters.

261.1.3 FUEL SOUNDING

The main fuel oil tank shall be fitted with GEMS Suresite sight gauges or approved equal. Manual sounding tube with plug and striker plate shall also be fitted to tank.

261.1.4 SHUT DOWNS

Mechanical reach rods shall be installed on fuel shut off valves in compliance with USCG requirements.

261.1.5 VENTS

Fuel tank vent shall be run to the retention box and be fitted with audible whistle alarms.

262.1 LUBE OIL SYSTEM

The CONTR shall fabricate and install a lube oil system with one 300 gallon clean lube oil tank located outboard to port of the dirty oil tank FR 28-30. A Lube Oil Tank fill and vent station shall be provided and installed on the main deck inboard port side of the superstructure FR 25. The fill and vent station shall be equipped with an oil retention box containment. Fill pipe shall be fitted with a cam lock fitting and cap (Ref: DWG D367-P11).

The lube oil tank shall be fitted with an Alemite pneumatic diaphragm pump in the engine room connected to a BHD mounted oil reel, filter, meter, and nozzle with drip pan located to the

approval of the MaineDOT OREP. The hose on the reel shall be long enough to reach the main machinery fills.

263.1 WASTE OIL SYSTEM

The CONTR will fabricate and install a waste oil system with a 300 gallon waste oil tank located FR28-30 on centerline, inboard of the starboard bilge slops tank. CONTR shall provide and install a dirty lube oil pump. Pump shall be a Viking model GG4193 rated 10 GPM, or approved equal. A pump-off station and tank vent shall be provided and installed on the main deck inboard side of the superstructure FR25. The suction pump-off station shall be equipped with an oil retention box containment. The suction pump-off shall be fitted with a cam lock fitting and cap (Ref: DWG D367-P11).

Waste oil suction lines and valves shall be provided and installed for the (2) generator engine sumps and (2) main engine sumps, and flexible hose connection (Ref: DWG D367-P11).

SWBS SECTION 300 ELECTRICAL

The following specifications and drawings referenced provide for the Electrical System Installation required to be performed under this contract:

- 300.1 REFERENCE DRAWINGS
- 300.2 GENERAL SCOPE
- 311.1 SHIPS SERVICE DIESEL GENERATORS (SSDG)
- 313.1 BATTERIES & CHARGERS
- 321.1 POWER DISTRIBUTION
- 324.1 SWITCHBOARDS & POWER PANELS
- 331.1 LIGHTING FIXTURES & ILLUMINATION
- 332.0 ELECTRICAL SYSTEM TESTS

300.1 REFERENCE DRAWINGS

D367-E1 ELECTRICAL ONE-LINE DIAGRAM

D367-E2 LIGHTING GUIDANCE PLAN

300.2 GENERAL SCOPE

The CONTR shall provide and install complete AC and DC electrical systems in accordance with the Contract DWGS. The electrical systems shall conform to the requirements of USCG 46 CFR Subchapter T, Subchapter J where applicable, ABS standards, and IEEE 45 requirements. Bulkhead and deck penetrations shall be made with watertight strain relief fittings and multi-cable RISE brand transits or approved equal. Wireways, wire hangers, and tie wraps will be installed so as to prevent sags or chafes.

Electrical equipment and components shall be located in a manner that most readily facilitates operation and allows for ease of maintenance. Doors and panels must be capable of being fully opened. In accordance with Subchapter “T” 46 CFR 183.330, sufficient clear space in shall be provided in front and back of the main switchboard and power panels to allow for removal of components within. Primary access to the switchboard shall be from the front.

All electrical cables shall be clearly labeled with circuit number designation at each end of cable run.

For Electronic Propulsion Control Specifications see Section 252.1.

311.1 SHIP SERVICE DIESEL GENERATORS (SSDG)

The CONTR shall provide and install two (2) Caterpillar C4.4 constant speed ship's service diesel generators in accordance with the Contract DWGS. The gensets shall comply with applicable EPA emission standards for newly manufactured marine engines of their class and shall be installed complete with all systems. They shall each be Caterpillar marine engine model C4.4 coupled with Caterpillar generator (three phase, 240 VAC, 60 Hz, 99 KW). Each generator shall be fitted with Logan electric clutch coupled to a hydraulic PTO pump for powering the bow thruster.

Each Generator Set will be supplied with:

- Keel Cooling for Engine and ISG circuits with Fernstrum grid coolers (See Section 520.1).
- Single turbocharger, jacket water cooled
- Turbocharger inlet, 4 in. straight connection
- Programmable low idle
- Electronic diagnostics and fault logging
- Engine monitoring – speed, temperature, pressure
- 70 pin connector
- Jacket water pump, belt driven
- Dry exhaust, 4" flanged turbocharger outlet
- Common rail fuel pump, gear driven
- Coolant block heater
- Lube oil filter
- 24V starter and alternator w/isolated ground for Generator #1 and Compressed air starter for Generator #2
- Engine gauge and control panel
- Start/Stop at main switchboard & Pilothouse w/remote alarm panel located in pilothouse console.
- USCG Approved shutdowns and safety features including overspeed, low oil pressure, and high temperature shutdowns
- Steel base w/resilient sound mounts and drip tray
- Factory certified Tech Rep for commissioning, startup, and sea trials

311.1.1 SPARE GENERATOR PARTS

- Belt, idler pulley
- Thermostat, thermostat gasket, thermostat seal
- Fuel pump w/sealing washer
- Water Pump, water pump gasket, water pump seal
- Air, Oil, and Fuel Filters
- 24V starter motor
- Voltage Regulator

- Filter Head Assembly w/ pump
- Fuel/Water Separator

Spares shall be crated for storage and shipped directly to a MaineDOT storage facility as designated by MaineDOT.

The Ship's Service generator engines are being quoted by Milton CAT, Milford, MA.

313.1 BATTERIES & CHARGERS

313.1.2 12/24V DC Power Systems

The CONTR shall provide and install 12/24V DC service and emergency systems in compliance with 46 CFR Part 183 and the Contract DWGS (Ref: DWG D367-E1, E2). The systems shall include Optima 31M batteries or approved equal (sized per load requirements), 150 amp-hour batteries connected in series supplying engine room electronics, running lights, designated alarms, and pilothouse electronics. These battery banks shall be charged by 24V battery chargers, Newmar, or approved equal, fed from a 120V and 240V AC circuits as shown. All requirements of 46 CFR 183 shall be met.

313.1.3 ANTICIPATED 12/24V DC LOADS

- Main Engine and Reduction Gear Control power
- Pilothouse DC 12V and 24V panels
- Propulsion Control and monitoring systems
- Ship's service generators Control power
- PA and Alarm Systems

313.1.5 GENERATOR STARTING 24V DC

The CONTR shall provide and install dedicated 24V generator starting battery bank for one ship service generator engine. Batteries shall be sized as per the engine manufacturer's recommendations and charged by Newmar, or approved equal, battery chargers fed from 120V AC circuits.

321.1 POWER DISTRIBUTION

321.1.1 SHORE POWER

The main switchboard shall be capable of distributing and transferring between shore power and generator inputs. All USCG requirements for safety, indicators, etc., shall be adhered to. A shore power receptacle compatible with MaineDOT's existing shore power connectors shall be provided and installed as per the Contract DWGS. The shore power connection shall be fitted with a watertight cap and shall be located so as to provide easy access for the shore power cable connection.

321.1.2 POWER REQUIREMENTS

The available Shore Power service is 200 Amp, 240V, 3-phase. The CONTR shall provide a properly sized, one-hundred (100') foot long shore power cable with connections at each end to match the vessel and shore end power connections. MaineDOT will provide a specification for the shore end connector to be compatible with the shore power plug to be used. The CONTR is responsible to provide and install this connector.

The Shore Power system shall supply the main switchboard. Distribution to lighting, electrical outlets, engine block heaters, battery chargers, etc. shall be in accordance with Electrical One-Line diagram (Ref: DWG D367-E1).

324.1 SWITCHBOARDS & POWER PANELS

324.1.1 MAIN SWITCHBOARD

The CONTR shall provide and install a non-paralleling, marine switchboard, Electronic Power Design, Houston, TX, or approved equal, capable of distributing and transferring between shore power and generator inputs. An electrical interlock shall be installed between the shore power and generator breakers to prevent paralleling of the input sources.

The switchboard shall be located in the engine room as per DWGS D367-A1-1 and D367-A9. Metering and indicators for current, voltage, ground fault, and power available will be provided as per USCG requirements.

Switchboard shall be designed primarily for front access.

324.1.2 POWER PANELS

Distribution breaker panels shall be Square "D", or approved equal, and must meet the requirements of IEEE STD 45, Section 23.1. The electrical distribution scheme designates panel locations. At a minimum, distribution panels shall include a main distribution panel, engine room AC power panel, engine room AC lighting panel, engine room DC control distribution panels, pilothouse AC lighting panels, and pilothouse DC electronics distribution panels.

Power and lighting panels which are accessible to passengers shall have latches with locks keyed alike. Labels are to be provided on each panel showing designation, voltage, and bus rating. A circuit directory card mounted in a plastic faced holder shall be completed and posted inside each panel door. Panels located in the Engine Room shall be NEMA 12 with doors fitted with gaskets. A panel located in interior spaces such as the passenger cabin may be NEMA 1.

324.1.3 CIRCUIT BREAKERS

Each breaker shall have sufficient interrupting capacity to safely interrupt the maximum fault current obtainable at its point of application.

Circuit breakers shall be by Square "D" (or approved equal) and shall be of the commercial molded case type, quick-make, quick-break, with inverse time tripping characteristics on

overloads and instantaneous trip device for short circuits, except as noted. Two and three pole breakers shall have common trip handles. Breakers shall clearly show when they have been tripped by over-current. All circuit breakers shall be UL 489 listed.

The CONTR shall provide panels with one spare circuit breaker and space for one additional breaker for every ten active circuits or fraction thereof. Spares shall be representative of the breaker sizes used in that panel.

324.1.4 ELECTRICAL SPARES

The following electrical spares shall be provided:

Qty (1) Main Generator Breaker

Qty (1) Shore Power Breaker

Main Switchboard Breakers:

Qty (1) 3 pole, 125AF/40AT

Qty (1) 3 pole, 125AF/100AT

Qty (1) 3 pole, 125 AF for steering hyd. pump

Main Switchboard Lighting Section Breakers:

Qty (1) 3 pole, 125AF/100AT

Qty (1) 2 pole, 125AF/20AT

Qty (1) 2 pole, 125 AF/15AT

331.1 LIGHTING FIXTURES & ILLUMINATION

331.1.1 GENERAL

The vessel shall be adequately lighted throughout with approved lighting fixtures. Fixtures shall comply with the requirements of Publication UL595, UL1598 and UL1598A. The CONTR is responsible to see that all facets of lighting, particularly in public spaces, are complete, and fully adequate for the service intended.

All lighting fixtures shall be provided and installed by the CONTR. The CONTR is responsible to develop working DWGS for installations as required. These DWGS shall be in compliance with the requirements of CFR Subchapters “T” and “J” where applicable. Please reference Specification Section 0.7.3 for CONTR Working Drawing requirements.

Public spaces shall be supplied by at least two circuits so that the failure of one circuit will not leave a space without lighting. Flush mounted ceiling fixtures shall be provided and all wiring shall be concealed. Switches, where provided, shall be flush mounted. Switch plates shall be color coordinated with the space where installed.

Fixtures shall be designed for the particular location and service required and shall be installed in interior and exterior locations as specified below.

- Passenger Cabin downlights shall be Pauluhn LRS22L LED panel, or approved equal. Lighting circuit to be powered by an Pauluhn 120VAC/24DC or approved equal converter unless otherwise noted.
- Freight Deck under the superstructure house center lane shall be Pauluhn DFLA LED floodlights DFLA13L, or approved equal.
- Primary Machinery Spaces (Engine Room and Bow Thruster Machinery Room) and Hold Deck voids and miscellaneous work areas that have no drop ceiling shall be Pauluhn Intrepid Linear LED 24" FPS2L, or approved equal.
- Pilothouse downlights shall be Pauluhn Meridian DL compact fluorescent, or approved equal.

331.1.2 INTERIOR LIGHTING

The CONTR shall provide and install adequate lighting for all passenger spaces, crew spaces, stairways and passageways, work spaces, machinery spaces, voids, and storage spaces. Lighting levels shall comply with the Illumination Engineering Society (IES) Publication RP-12, "Recommended Practice for Marine Lighting". Interior superstructure lighting shall be switched from the distribution panel as shown on the Electrical One-line DWG. Engine Room lighting shall be switched locally from just inside the Main Deck Engine Room Access Door at FR26. Interior hull void lighting shall be switched locally at access points.

Passenger cabins on Main Deck, Port and Starboard shall be fitted with USB outlets (4 per unit) along the side bulkheads at 6' intervals (approx.) where seating is installed.

The following types and quantities of lighting fixtures are provided as a guide only. Lighting shall be LED wherever possible. Lighting power shall be in accordance with DWG D367-E1 and shall conform to UL1598A – Luminaires for Marine Vessels. As much as possible, provide lighting fixtures by Pauluhn or equal. The provided lighting shall not be less than this guide:

PILOTHOUSE

- | | |
|----------|--|
| (3 each) | Pilothouse -- Pauluhn Meridian DL-EM-DIM-RV-F-14 compact fluorescent bi color light with emergency battery backup, or approved equal. Lights Dimmable in Pilothouse. |
| (6 each) | Pilothouse -- Pauluhn Meridian DL-EM-DIM-F-14 compact fluorescent light with emergency battery backup, or approved equal. Lights Dimmable in Pilothouse. |
| (1 each) | Pilothouse – Pauluhn FE215CV/2 Chart lamp or approved equal w/red filter (to the approval of the MaineDOT OREP) |

MAIN DECK PASSENGER CABIN (Port):

- (15 each) Pauluhn LRS22L LED panel, or equal; in accordance with IES recommended foot candle specifications; (6) with battery backup.
- (2 each) Exit Lights, Crouse-Hinds Ex-Lite ZE 12191130005 LED or equal with battery backup
- (1 each) Main-Deck Port Passenger Head – Pauluhn LRS22L LED, or equal, with battery backup.
- (1 each) Main-Deck Port Passenger Head – Imtra F-30.1 LED no switch mirror light or equal
- (1 each) Main-Deck ER Access – Pauluhn Intrepid FPS2L EM2 LED 24”, or equal; with battery backup
- (1 each) Main-Deck ER Access – Crouse-Hinds Champ Pak CPMVFB Bulkhead Mount, or equal with battery backup
- (2 each) Main-Deck Port exterior access points –Crouse-Hinds Champ Pak CPMVFB Bulkhead Mount, or equal
- (2 each) Main-Deck Lockers Port – Crouse-Hinds LED Downlight Vaporgard V3L, or equal

MAIN DECK PASSENGER CABIN (Starboard):

- (16 each) Pauluhn LRS22L LED panel, or equal; in accordance with IES recommended foot candle specifications; (6) with battery backup in accordance with IES recommended foot candle specifications;
- (2 each) Exit Lights, Crouse-Hinds Ex-Lite ZE 12191130005 LED or equal with battery backup
- (2 each) Main Deck starboard Passenger Head – Pauluhn LRS22L LED panel, or equal, one with battery backup
- (2 each) Main-Deck Emergency Escape Trunk & Fire Suppression Locker – Crouse-Hinds Champ Pak CPMVFB Bulkhead Mount, or equal with battery backup
- (1 each) Main-Deck Starboard Passenger Head – Imtra F-30.1 LED no switch mirror light or equal
- (3 each) Main-Deck Starboard exterior access points –Crouse-Hinds Champ Pak CPMVFB Bulkhead Mount, or equal with battery backup

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(1 each) Main-Deck Starboard Aft exterior access point – Crouse-Hinds LED Downlight Vaporgard V3L, or equal

FOREPEAK

(2 each) Pauluhn Intrepid Linear LED 24” FPS2L, or equal (switched locally inside access hatch) one with battery backup

BOW THRUSTER ROOM

(3 each) Pauluhn Intrepid Linear LED 24” FPS2L, or equal (switched locally inside access hatch) two with battery backup

VOID FR8 – FR14

(3 each) Pauluhn Intrepid Linear LED 24” FPS2L, or equal (switched locally inside access hatch) one with battery backup

VOID FR14 – FR20

(6 each) Pauluhn Intrepid Linear LED 24” FPS2L, or equal (switched locally inside access hatch) three with battery backup

ENGINE ROOM

(14 each) Pauluhn Intrepid Linear LED 24” FPS2L, or equal, eight with battery backup, (switched at head of ladder FR26 port)

VOID FR28 - FR34

(4 each) Pauluhn Intrepid Linear LED 24” FPS2L, or equal (switched locally inside access hatch) three with battery backup

STEERING GEAR FLAT

(3 each) Pauluhn Intrepid Linear LED 24” FPS2L, or equal (switched locally inside access hatch) three with battery backup

The CONTR shall provide LED spare lamps (6) of each type. Lights equipped with battery backup shall be labeled with red ‘E’ symbol.

331.1.3 EXTERIOR LIGHTING

The CONTR shall provide and install navigation lights; floodlights to illuminate main deck, vehicle and passenger transit areas; weather deck lighting; and searchlights.

Exterior lights shall be switched from the pilothouse panel, pilothouse console, or pilothouse navigation light panel as appropriate. IBA lights and Rescue Boat floods shall have battery back-up and be labeled with red 'E' symbol.

RAILINGS & BULWARKS

(32 each) Eaton Vienza Marine Deck Light, or equal (switched from pilothouse), (model per approval of MaineDOT OREP)

MAIN DECK FLOOD LIGHTING

(11 each) Pauluhn DFLA LED floodlights DFLA13L, or approved equal.

NOTE: All Main Deck floodlighting shall be switched from Pilothouse to the approval of the OREP. Lighting may be grouped in accordance with superstructure sides (ie. Lights on port outboard side on one switch).

331.1.7 EMERGENCY LIGHTING

Emergency Lighting shall be provided and installed in accordance with DWGs D367-E1 and D367-E2. Emergency lighting shall furnish adequate levels of illumination to allow for emergency operations and movement throughout the vessel, and activate automatically upon failure of the main lighting system. Emergency Lighting fixtures shall be fed from individual battery packs on the lighting fixtures and be in compliance with 46 CFR 183.432. Emergency lights shall be labeled with red 'E' symbol.

331.1.8 EXIT LIGHTS

Exit lighting shall have battery back-up. Fixtures shall be Crouse-Hinds Ex-Lite ZE 12191130005 LED or equal with battery backup, ceiling or wall mount as appropriate at each exit location. Use of ceiling mounted exit lights may be limited by required headroom in interior cabins.

331.1.9 FLOODLIGHTS

Floodlights shall be Pauluhn DFLA LED floodlights DFLA13L, or approved equal. Locate above 14'-3" truck clearance height where applicable. Floodlights shall be mounted on suitable welded platforms (including a support gusset) attached to a bulkhead or the junction of the top PH-Deck rail as appropriate. Locations shall be approved by the OREP. Each floodlight shall be equipped with a cord and watertight plug. Floodlight installations are to include all cabling to power panel; penetrations; kick-pipes as required, and hardware, switches, etc. to make the lights fully

operational in conformance with the CFR and operational testing performance for OREP and USCG approval.

331.1.9.2 RESCUE BOAT CRADLE & LAUNCH FLOODLIGHTS

A floodlight for illumination of the Rescue Boat Cradle area shall be mounted on the port side of the stack and switched locally. A floodlight for illumination of the Rescue Boat launch area shall be provided and installed on the 01-Deck rail and switched locally.

331.1.10 SEARCHLIGHTS

(1) Carlisle & Finch Model XY3EDE-24ARF3 with anti-icing heater, CFX350 lamp, C4-1-1 master station, and 3PS115 power supply, or approved equal.

331.1.11 NAVIGATION LIGHTS & PANEL

See Section 422.1

331.1.12 ILLUMINATION LEVELS

In addition to satisfying the general illumination requirements for all compartments, particular attention shall be given to the installation of detail illumination for such items and areas as gauges, instruments, and switchboards.

Fixtures in work areas shall be arranged so that shadows are not cast on work surfaces and glare is not reflected off gauges or instruments. Illumination shall be so that gauges, sight glasses, etc. may be accurately read from usual and convenient operating positions. Fixtures shall be shaded to prevent glare as required.

331.1.13 JUNCTION BOXES

All junction boxes shall be accessible as per 46 CFR 56.4.2.

331.1.14 LIGHTING SPARES

The CONTR shall provide spares for lighting fixtures as follows:

- (4) LED down-light fixture “cans”
- (4) LED down-light trim pieces
- (6) LED down-light lamps (one case)
- (6) LED 24” panel light
- (6) LED 24” Intrepid Linear LED

332.0 ELECTRICAL SYSTEM TESTS

- Insulation resistance (megger) test all power distribution cables, insulated motor and generator windings in accordance with the applicable requirements of the CFR.
- Visually inspect motor alignment with driven load (in instances where the load is not close-coupled).
- Manually operate all circuit breakers, disconnect switches, mode selectors, and pushbuttons to demonstrate correct operation.
- Bump test to verify that motors operate in the correct direction of rotation.
- Demonstrate correct system operation in all modes.

SWBS SECTION 400 ALARMS, INTERNAL COMMUNICATIONS, NAVIGATION

The following specifications and drawings referenced provide for the Alarms, Navigation Systems, and Internal Communications Systems Modifications required to be performed under this contract:

- 400.1 REFERENCE DRAWINGS
- 421.1 NAVIGATION SYSTEMS (NON-ELECTRICAL)
- 422.1 NAV LIGHTS & NAV LIGHT PANEL
- 423.1 NAV SYSTEMS (ELECTRONIC)
- 433.1 INTERNAL COMMUNICATIONS (PA, SP PHONE, GEN ALARM, LOUD Hailer)
- 436.1 SAFETY & SECURITY SYSTEMS
- 439.1 CCTV
- 441.1 EXTERNAL COMMUNICATION (RADIOS)
- 446.1 EXTERNAL COMMUNICATION (AIS)

400.1 REFERENCE DRAWINGS

D367-A1-1 GEN ARRGTS HOLD & MAIN DECK

D367-A1-2 GENERAL ARRGTS 01-DECK & PILOTHOUSE

D367-A8 COLREGS PLAN & NAVIGATION LIGHT MAST DETAILS

D367-P10 COMPRESSED AIR PIPING SCHEMATIC

421.1 NAVIGATION SYSTEMS (NON-ELECTRICAL)

421.1.1 FLAGS & SHAPES

The CONTR shall provide (2) black portable, nylon folding Not-Under-Command balls to comply with the Inland Rules of the Road (CalJune, or equal, 24" diameter). The CONTR shall provide (1) black portable, nylon folding Anchor ball (CalJune, or equal, 24" diameter). These day shapes shall be stowed in the pilothouse with line and hardware suitable for rapid deployment.

The CONTR shall provide (2) 3' x 5' US ensigns, (1) red "B" flag fueling pennant, and (2) steering pennants. Masts shall be rigged with flag halyards and hardware (blocks & clips) for the ensign, two signal pennant halyards, and two steering pennant halyards. See Section 171.

421.1.2 EMERGENCY SIGNALS

The CONTR shall provide (12) hand held, rocket propelled, red emergency flares in a watertight plastic box to be stowed in the pilothouse.

421.1.3 EPIRB

The CONTR shall provide and install a GPS capable EPIRB unit with bracket incorporating a hydrostatic release for vessel delivery (ACR, or equal).

421.1.4 ANCHOR SIGNAL BELL

The CONTR shall provide a removable 12" diameter bronze bell w/lanyard. The bell bracket shall be mounted on the exterior pilothouse bulkhead in a location approved by MaineDOT.

421.1.5 MAGNETIC COMPASS

The CONTR shall provide and install a Ritchie Model B-463 Globemaster magnetic compass, or equal, black, 6" diameter, w/red 24V light, w/quadrantal spheres and anti-vibration binnacle on centerline at the forward console steering station. The compass shall be "swung" and a deviation card provided as per Section 982 "Sea Trials".

421.1.6 FIRST AID KIT & AED

The CONTR shall provide a USCG approved first aid kit to be installed in a Pilothouse location to the approval of the MaineDOT OREP. The CONTR shall install an OFE AED in the pilothouse location to be approved by the MaineDOT OREP.

421.1.7 AIR HORN & CONTROLLER

The CONTR shall provide and install (1 set) air horn and timer, Kahlenberg D-2 with signal controller Model M522 or approved equal (Ref: Section 551.0 and DWG D367-P10).

421.1.8 CLOCKS

The CONTR shall provide and install two (2) Weems & Plath Model Admiral 290500 or approved equal, quartz clocks. Locations shall be to the approval of the MaineDOT OREP.

421.1.9 BAROMETER

The CONTR shall provide and install a Weems & Plath Model Admiral 290700 or approved equal, admiral barometer. Location shall be to the approval of the MaineDOT OREP.

421.1.10 ANEMOMETER

The CONTR shall provide and install a Maximum, Inc. Model Vigilant (black dial face w/white lettering) or approved equal, anemometer complete with mast mount sensor, AC adapter, and pilothouse display. Location of both sensor and display shall be to the approval of the MaineDOT OREP.

422.1 NAVIGATION LIGHTS & NAVIGATION LIGHT PANELS

Navigation lights shall be provided and arranged to comply with the requirements of the Inland Rules Of The Road (Ref: D367-A8) and 46 CFR 183.420. The CONTR shall provide and install a 120VAC navigation light panel that is compatible with Perko LED navigation lights (J-Box, Glamox, Loco-Light, or approved equal) in the pilothouse. The panel is to be compliant with IEEE Standard 45 Section 34.2 and USCG 46 CFR 111.75-17. Navigation lights shall be USCG approved by Perko or approved equal as shown on DWG D367-A8. Screens fitted behind navigation lights shall be painted matte black as required by USCG.

- (1 double) sidelight (red) 10-point, LED, Perko 1077R00BLK or equal
- (1 double) sidelight (green) 10-point, LED, Perko 1077G00BLK or equal
- (1 double) masthead light (white) 20-point, LED, Perko 1078000BLK or equal
- (1 double) stern light (white) 12-point, LED Perko 1079000BLK or equal
- (1 each) anchor light (white) 32-point, LED Perko 1380000BLK or equal
- (2 each) not under command (red) 32-point, LED Perko 1380R00BLK or equal

Reference: DWG D367-A8

423.1 NAVIGATION SYSTEMS (ELECTRONIC)

The CONTR shall provide and install the following electronic navigation systems. The manufacturers and models listed shall be considered to be OR APPROVED EQUAL and may differ depending upon MaineDOT's preferences to match existing fleet equipment. The CONTR shall provide a factory certified Tech Rep for Electronic Navigation Equipment commissioning, startup, and sea trials.

- RADAR: (2) Furuno FR8125 w/4 foot antennas, inter-switched, 115VAC and 24 VDC
- GPS UNIT: (1) Furuno GP170D
- VHF RADIO: (2) ICOM M510 (See Section 441.1)
- HAILER/INTERCOM: Furuno LH5000 (Locations: PH control, Main Deck (2) intercoms one each loading station)
- AIS: (1) Furuno FA170 (See Section 446.1)
- DEPTH SOUNDER: Furuno FCV588
- NAV COMPUTER – local CPU with (2) 24" dimmable monitors
- SAT COMPASS: Furuno SC70
- AUTOPILOT: Simrad AP70 Mk 2 to interface with the EMI steering system
NMEA Backbone system to link Electronic Navigation Systems

See Sections 439.1, 441.1, & 446.1 for additional pilothouse electronic equipment.

433.1 INTERNAL COMMUNICATIONS

433.1.1 PUBLIC ADDRESS & EMERGENCY NOTIFICATION SYSTEM

The CONTR shall provide and install a commercial quality Public Address System which incorporates an Emergency Notification System feature, Bogen, or equal. The System amplifier shall be located in the Pilothouse. System shall comply with 46 CFR 184.610, with announcements made from Pilothouse station.

The System shall be complete and shall incorporate the following equipment: Pilothouse microphone; amplifier; equalizer module; exterior and interior speakers; volume control module; and power conditioner module. The system shall provide a flashing light feature on speakers when notifications are being made, in addition to audible signal.

Interior speakers (ceiling mount style) shall be located to the approval of the MaineDOT OREP.

- Port passenger cabin (2)
- Starboard passenger cabin (2)
- Engine room (1)

Exterior speakers (trumpet style) shall be located to the approval of the MaineDOT OREP.

- (1) centerline on visor at PH-Deck level fwd
- (1) centerline on deck edge plate at PH-Deck level aft
- (1) port cabin aft on deck edge plate at 01 deck level
- (1) starboard cabin fwd on deck edge plate at 01 deck level

CONTR shall provide one set of bulkhead high-mounted electrical outlets in each cabin for installation of owner-furnished television screens for general informational announcements. CONTR shall provide proper structural supports at each location for owner-furnished screen mounting brackets.

433.1.2 LOUDHAILER

The CONTR shall provide and install a Loudhailer system, Furuno LH5000, or approved equal. The system shall include (2) loudhailer/intercom horns (1 each at Main Deck loading station) so that the Pilothouse can establish two-way communications with personnel manning the forward and aft docking/vehicle loading stations. Speakers shall be located to the approval of the OREP (Ref: Section 423.1).

433.1.3 SOUND POWERED PHONE SYSTEM

The CONTR shall provide and install a Sound Powered Phone System, Jotron or approved equal. The system shall comprise Sound Powered Phone stations:

- Pilothouse (on vertical face of console)
- Forward Main Deck loading station (exterior watertight box)

- Aft Main Deck loading station (exterior watertight box)
- Engine Room (located approval of OREP)
- Bowthruster Room (located approval of OREP)
- Steering gear flat, headset style (located approval of OREP)
- Rescue Boat Station

The engine room shall have a bell sound signal and remote mounted strobe light signal mounted in a location to the approval of the MaineDOT OREP. System shall comply with 46 CFR 184.602

433.1.4 CONTROL & ALARM CONSOLES

CONTR shall provide and install alarm and monitoring systems as required by 46 CFR 181.400(c), for fire detection system and fire alarm system, 46 CFR 182.530 for bilge level alarm system, and machinery alarm systems as required by these Specifications and as recommended by the machinery manufacturers.

CONTR shall plan for fire detection in the following spaces as a minimum:

- Bowthruster Room
- Engine Room (5)
- Main Deck Cabins (2)
- Passenger Heads Main Deck (2)
- Storerooms / Deck Lockers

The main consoles for gauges and alarm panel in the pilothouse will be by EMI Marine.

Alarm panels, at a minimum, shall provide alarm functions for:

For each main engine and gear:

- Low lube oil pressure alarm (audible and visible)
- Low lube oil level alarm “
- Low gear oil pressure alarm “
- High gear oil temp, alarm “
- High gear oil temp, alarm “
- Low coolant level alarm “
- High jacket water temp. alarm “
- High SCAC water temp. alarm “
- High exhaust temp alarm “

Note : Shutdowns shall be as per USCG requirements.

For each generator and generator engine:

- Generator running indicator light

- Low lube oil pressure alarm (audible and visible)
- Low lube oil level alarm (audible and visible)
- Low coolant level alarm (audible and visible)
- High jacket water temp. alarm (audible and visible)

Note : Shutdowns shall be as per USCG requirements.

436.1 SAFETY & SECURITY SYSTEMS

The CONTR shall provide and install approved life rings and brackets as required by USCG regulations 46 CFR 180.70 and at the direction of the OCMI.

- (4 each) Life rings: CalJune, or approved equal; 24" orange, w/brackets. One ring shall be located on each bridge wing. These two life rings shall be equipped with an approved strobe light. Two rings shall be located, one each, adjacent to the fore and aft Main Deck loading station areas and shall each be equipped with a lifeline. Life rings shall be stenciled with the vessel's name and hailing port.
- (175) PFD, type I Adult, stenciled with vessel name
- (15 each) PFD, type I Child, stenciled with vessel name.
- (1 each) MaineDOT shall provide an Automated External Defibrillator (AED) with bulkhead mount housing case for CONTR installation in a location as determined by the MaineDOT OREP.
- (3 each) Work Safety Vests, stenciled with vessel name (one with a 50' tether and snap shackle)
- (2 each) Inflatable Buoyant Apparatus – Viking or approved equal open reversible life raft - 101 persons, stenciled with vessel name including installation hardware bowsing lines, turning blocks, hydrostatic release units, and storage racks.

436.1.1 PFD STORAGE

PFD storage for a full complement of passengers, plus 15%, plus crew PFD's (190 total) shall be provided. Passenger PFD storage shall be in lockers and hinged top fiberglass deck boxes located in accordance with DWG D367-A1 and at the direction of the MaineDOT OREP.

Crew PFDs shall be located in Pilothouse.

439.1 CCTV

The CONTR shall provide and install a CCTV system consisting of Pilothouse located control equipment and display monitor. CCTV cameras shall be located to the approval of the MaineDOT OREP. Entire CCTV system shall be compliant with NDAA Section 889. Cameras

and recorder system shall be by Honeywell, Series 30, or approved equal. Approximate camera locations and general camera focus coverage locations are:

- PH Visor- FR15 starboard focus (exterior)
- PH Visor- FR15 port focus (exterior)
- PH-Deck FR12 focus fwd CL (exterior)
- PH-Deck FR 12 focus aft CL truck lane (exterior)
- PH-Deck FR20.5 focus aft CL (exterior)
- 01-Deck FR12 ceiling mount focus aft port weatherdeck (exterior)
- 01-Deck FR12 ceiling mount focus aft starboard weatherdeck (exterior)
- 01-Deck FR24 port stack focus aft rescue boat (exterior)
- Main Deck FR34 starboard ceiling mount focus aft inboard (exterior)
- Main Deck FR33 starboard focus fwd (interior)
- Main Deck FR33 port focus fwd (interior)
- Main Deck FR16 starboard focus aft (interior)
- Main Deck FR14 port focus aft (interior)
- Hold Deck Engine Room FR20 port focus aft and to starboard (interior)
- Hold Deck Engine Room FR26 starboard focus fwd to port (interior)

TOTAL (9) exterior (6) interior assuming 2 extra zones each interior and exterior determined on board to suit MaineDOT OREP.

441.1 EXTERNAL COMMUNICATIONS (RADIO)

The CONTR shall provide and install (2) ICOM Model 506 (or approved equal) VHF radios and (2) COMRAD AV 60 antennas. Power shall be supplied by DC circuits from pilothouse panel. Antennas shall be located on the Pilothouse top P&S as shown on DWG D367-A1 and A3 and as approved by the MaineDOT OREP.

446.1 EXTERNAL COMMUNICATIONS (AIS)

The electronic navigation and communication package shall include a USCG approved and operational AIS system. All components of this system shall meet the approval of MaineDOT. The system shall be Furuno FA170 AIS, or equal, and shall be fully integrated in the Pilothouse console (Ref: Section 423.1).

The AIS system shall be interfaced with pilothouse navigation and communication equipment. Power to all electronic navigation and communication equipment shall be supplied by a DC power circuit in pilothouse panel.

SWBS SECTION 500 INSULATION, HVAC, PIPING, FIRE SUPPRESSION

The following specifications and drawings referenced provide for the Piping Systems, HVAC, and Fire Suppression required to be performed under this contract:

- 500.1 REFERENCE DRAWINGS
- 500.2 PIPING SYSTEMS
- 508.1 INSULATION
- 511.1 HVAC
- 520.1 SEA CHESTS, KEEL COOLERS
- 521.1 FIRE MAIN & BILGE SYSTEMS
- 526.1 SCUPPERS & DECK DRAINS
- 528.1 SANITARY SYSTEM
- 529.2 BILGE SLOPS (OILY WATER) SYSTEM
- 533.1 POTABLE WATER SYSTEM
- 551.0 COMPRESSED AIR SYSTEM
- 555.1 FIRE EXTINGUISHING
- 561.1 STEERING SYSTEM
- 568.1 MANUEVERING & CONTROL
- 573.6 VEHICLE TIE DOWN SYSTEM
- 581.1 ANCHOR HANDLING & STOWAGE
- 582.1 MOORING SYSTEM
- 582.2 PIPING TESTS
- 583.1 RESCUE BOAT & DAVIT

500.1 REFERENCE DRAWINGS

D367-M2	RUDDER & STEERING ARRGT & DETAILS
D367-M9	HVAC MAIN DECK & HOLD
D367-A12	BULWARK & MOORING ARRGT
D367-P1	M.E. & GENERATOR EXHAUST ARRGTs & DETAILS
D367-P5	POTABLE WATER PIPING SCHEMATIC
D367-P6	DRAIN, WASTE, & FLUSHING WATER PIPING SCHEMATIC
D367-P7	FIRE MAIN SYSTEM PLAN
D367-P9	BILGE PIPE SCHEMATIC & SEA CHEST DETAILS
D367-P10	COMPRESSED AIR PIPING SCHEMATIC

D367-P12	TANK VENTS, FILLS & SOUNDING TUBE SCHEMATIC
D367-P13	PILOT HOUSE HVAC
D367-P14	KEEL COOLER PIPING SCHEMATIC
D367-P15	HVAC BOILER SCHEMATIC

500.2 PIPING SYSTEMS

Piping shall be installed in accordance with USCG requirements. Pipe runs shall, as far as possible, be kept clear of work or access areas. Pipes will be secured to structure by bolted clips and hangers. Pipe runs requiring regular maintenance shall be separated by flanges to facilitate removal. Bulkhead penetrations shall conform to USCG regulations. All pipe hangers shall be painted as directed by the MaineDOT Orep.

Exposed pipe runs or pipe runs located in unheated spaces shall be protected against freeze-up by heat-tape and insulation. All fresh water lines shall have drain cocks installed to allow for system drainage to prevent freeze-up during winter layup or repair periods.

All valves shall be clearly labeled and provided with permanent non-corroding metal tags.

All piping systems shall be marked with wraparound film pipe marking system complying with MSI (Marking Services Inc.) system, or approved equal. Markers MS-995 / MS-975 shall be applied to piping systems as directed by OREP. System shall indicate type of fluid and direction of flow in each pipe.

508.1 INSULATION

508.1.1 THERMAL

Exterior boundaries (sides and overheads) of main deck accommodation spaces and pilothouse bulkheads and overhead shall be thermally insulated. Thermal insulation arrangement and installation details and specification of products to be used are the responsibility of the Contractor in conjunction with the Maine OREP. Insulation materials shall be USCG type-approved "non-combustible material" under 46 CFR 164.009 for the intended use and shall be 100% free of asbestos-containing materials. The Contractor shall provide insulation arrangement and details, and proof of USCG certification of materials selected to the Owner for review prior to start of installation. Insulation fastening shall be USCG approved. Surfaces to which insulation will be applied must be prepared in accordance with Section 631 of this Specification.

The Contractor shall take the insulation thickness into account when installing piping, cable trays, and other systems along a bulkhead or deck to be insulated. Sufficient clearance must be maintained from the insulated surface to allow installation without compression of or gaps in the material.

Thermal insulation shall be Johns Manville Incombustible Microlite blanket 2" thickness, or equal batts, blankets, or mineral fiber board and shall be installed in accordance with manufacturer's instructions. Uninsulated portions of exterior bulkheads and deckheads shall be kept to an absolute minimum. Edges and joints shall be sealed with a tape recommended by the manufacturer to present a smooth, continuously sealed surface.

508.1.2 ENGINE ROOM COMPARTMENT INSULATION

The engine room overhead shall be insulated with 1" Soundown CGFG approved hull board with 2#/sf approved incombustible lead barrier laminated to the back surface, or mass loaded vinyl sound barrier equivalent. All insulation materials shall conform to requirements set forth in 46 CFR 164.009. The engine room overhead is to be finished with heavy duty sealed fabric cloth covering, fastened and with seams and edges taped in accordance with the manufacturer's recommendations.

508.1.3 EXHAUST LAGGING & INSULATION

All insulation materials and installation details shall be in accordance with ASTM Volume 01.07 "Shipbuilding" Standard F683 except as detailed herein.

The main engines, generator engines, and furnace exhaust systems shall be provided with high temperature, exhaust wrap, removable, sewn pads/blankets by GT Exhaust or approved equal (Ref: DWG D367-P1). Prepare surfaces by cleaning before applying insulation. Provide and install aluminum sheet metal covering in way of access areas where the insulation will be subject to damage or personnel contact to the satisfaction of MaineDOT. The exhaust systems shall be isolated from the hull with flexible stabilizers and raincap funnel. Exhaust isolation design and materials are to be provided by Soundown.

508.1.4 UPTAKE & INTAKE SOUND INSULATION

All uptake bulkheads shall be insulated with 2" Soundown CGFG approved vinyl foam barrier composite with ripstop mylar vapor barrier facing from the deck cutout to the engine room to 12" above the 01 deck plate. All insulation materials shall conform to requirements set forth in 46 CFR 164.009. The insulation material shall be fastened with seams and edges taped in accordance with the manufacturer's recommendations.

Bulkheads in the starboard main deck cabin that surround the engine room air intake trunk and ER escape will have a layer of Soundown Quiet Core acoustic insulation in addition to the joiner panel used on the other cabin bulkheads for a consistent appearance in the cabin.

511.1 HVAC

511.1.1 GENERAL

The CONTR shall provide and install HVAC equipment, ductwork, etc. in accordance with the Contract DWGS. HVAC calculations have been generated in the process of creating the HVAC Boiler Water Pipe Schematic DWG D367-P15.

511.1.2 HOT WATER HEATING

The CONTR shall provide and install a SIX zone hot water heating system consisting of a Weil McLain boiler Series 80 Model 380 or approved equal, (2) Gould circulation pumps or approved equal (1 backup), supply and return manifolds, system piping, fittings, heater units, and thermostats as detailed herein and on DWG D367-P15.

Bulkhead mounted ECO, Modine Unit Heaters, and Weil-McLain Snug Baseboard heaters or approved equal shall be provided and installed as follows (Sized according to D367-P15):

ZONE 1 (Modine)

- Engine Room (2)

ZONE 2 (Radiant Panel & Baseboard)

- Main-Deck Port Passenger Cabin (2 Panel + 20 ft baseboard)
- Main-Deck Port Passenger Head (1 Panel)

ZONE 3 (Radiant Panel & Baseboard)

- Main-Deck Starboard Passenger Cabin (1 Panel + 20.5 ft baseboard)
- Main-Deck Starboard Passenger Head (1 Panel)

ZONE 4 (Modine)

- Thruster Room (1)

ZONE 5 (Modine)

- Steering Gear Compartment (1)

ZONE 6 (H.O. Heater)

- Bow Thruster Hydraulic Oil Heater (1)

Hot water supply and return lines connect to the supply and return manifolds and thence to the Engine Room located Weil-McLain hot water heating boiler, or equal (Ref: D367-P15). Burner for the boiler will be Carlin EZ-3HP-W or Beckett CG10.1. (Quotation can be obtained from Steve Milligan / smilligan@srgirep.com / Office: 508-822-3939) Hot

water lines to radiant heaters shall be run to heaters from within the cabin to avoid running water lines in unheated spaces. The heating system fluid should have a 40% mixture of propylene glycol for freeze protection.

511.1.3 PILOTHOUSE HEATING

The CONTR shall provide and install two (2) VALAD RSDM Forced Air 3 kW Electric Heaters, or approved equal BHD mounted below level of windows in Pilothouse.

511.1.4 COOLING & VENTILATION

511.1.4.1 PILOTHOUSE

The CONTR shall provide and install (2) Coleman Marine Mach 13,500 BTU, 320 CFM AC Units, or approved equal on foundations located on the Pilothouse top. The Pilothouse AC system shall consist of AC Units, thermostat, piping, fittings, ductwork, shrouds, etc. as required. Ventilation will be provided by one (1) RenewAire EV Premium S ERV Energy recovery ventilator in the pilothouse overhead ducted to the exterior per manufacturer recommendations. Modifications to the ceiling grid in way of the unit may be required. The unit may be concealed in a soffit with vents to the space as needed and approved by the MaineDOT OREP.

511.1.4.2 MAIN-DECK P&S

The Main-deck cabins P&S will not be air conditioned. Ventilation will be provided in each cabin by two (2) RenewAire EV Premium S ERV Energy recovery ventilators ducted to the exterior per manufacturer recommendations. The units shall be located adjacent to the exterior bulkheads so that an extensive ducting network is not required. Modifications to the ceiling grid in way of the unit may be required. The unit may be concealed in a soffit with vents to the space as needed and approved by the MaineDOT OREP.

511.1.4.3 PASSENGER & CREW HEADS

The passenger heads shall be equipped with ceiling mounted exhaust air fans. Supply air shall be via louvers in the head entrance doors (Ref: D367-P9) Fans shall be McMaster-Carr 2213K31 50 CFM, or approved equal. The fans will be ducted to the exterior via 3" diameter 22 USSG duct in overhead to Stainless Steel exterior vent fittings with screen and weather closure.

511.1.4.3 MACHINERY SPACE VENTILATION

The Engine Room will be equipped with supply and exhaust ventilation trunks. The stbd side trunk shall be fitted with a supply fan as shown in DWG D367-M7. The fan shall be a Hartzell, vane-axial fan, 52 M, size 22, 7.5 HP, 3450 RPM, 9271 cfm @ 1.5" S.P., or approved equal, with diffuser below deck, as shown. Supply shall lead from a 36"x54" Ruskin LM6375D drainable, adjustable combination louver with bird and insect screen, or approved equal,

mounted on the inboard side of the starboard main deck cabin at FR 22. The supply fan shall be floor mounted on sheet rubber to limit structure born noise.

Exhaust air shall be natural, from the engine room to the uptake trunk located on the port side between FR22 to FR24 with a 30"x42" Ruskin ELC6375DXD drainable, adjustable combination louver with bird and insect screen, or approved equal, on the outboard side of the stack.

Louvers shall be stainless steel bolt in. Electric actuator shall be provided for intake and exhaust louvers with controls locally and in Pilothouse as required.

520.1 SEA CHESTS, KEEL COOLERS

520.1.2 SEA CHESTS

Two sea chests shall be provided and installed in the Engine Room as shown generally on D367-P9 for the Fire Main System suction and Bilge System priming. Sea chests will be located in the engine room P/S off centerline. The sea chests shall be fitted with bolted strainer plates flush with the hull plate and shall have anode cathodic protection installed (See Section 633). Suction and discharge piping will be connected with flanged couplings. Sea valves shall be steel body gate valves and shall be located to expedite servicing and disassembly.

520.1.3 KEEL COOLERS

Cooling systems shall be provided and installed for the (2) Main Engine Aftercooler & Gear Boxes, (2) Main Engine Jacket Water, (2) Generator Engine Aftercooler, and (2) Generator Engine Jacket Water. These shall be flange-type Fernstrum grid coolers, or approved equal, as called out on the equipment list DWG D367-M10. Guards shall be provided for each grid cooler that are adequate to protect against loose ice or flotsam strikes and are to be arranged to the approval of the MaineDOT OREP.

Grid coolers shall be provided with isolator washers and spool pieces to electrically isolate the coolers from the hull. Coolers shall be provided with their own anodes.

The cooling systems shall be filled with a 50% Glycol mix to the approval of the MaineDOT OREP.

521.1 FIRE MAIN & BILGE SYSTEMS

521.1.1 FIRE MAIN SYSTEM

The Fire Main System will be supplied by (1) fire pump, with bilge pump as backup. The Fire Pump (standby bilge) shall be a MP HHLF 15 model, self-priming, centrifugal, 2"x 2", 6.7" impeller, 110 GPM at 130 ft head, 7.5 HP at 3450 rpm, or approved equal.

The Fire/Bilge manifold is located in the Engine Room near centerline FR22. Fire Main suction shall be taken from the P&S sea chests in accordance with DWG D367-P9. The fire pump supply runs shall include duplex suction strainers, valves, and piping. The Fire/Bilge pumps

shall be cross-connected and capable of providing fire main pressure to all vessel fire stations (Ref: D367-P7).

The Fire/Bilge pumps shall be equipped with a pressure gauges and relief valves installed immediately after the pump discharge es. The pumps shall be sized and installed to provide the flow and pressure required by USCG regulations. The fire pump shall have both local and Pilothouse on/off control. Fire Main System piping shall be as called out on D367-P7-2 Material List.

Fire stations shall be provided and installed:

- Station #1: 01-Deck FR 23 stack port
- Station #2: 01-Deck FR 16 starboard
- Station #3: Main-Deck FR 30 cabin starboard
- Station #4: Main Deck FR 12 port
- Station #5: Engine Room FR 20 port
- Station #6: Engine Room FR 27 starboard

Each shall be equipped with approved equipment: Valve; 50-foot x 1-1/2" single jacket hose length; hose rack; combination nozzle; and spanner as required by USCG regulations.

Exterior and Interior Fire Stations will be located in surface or recessed mount steel cabinets as shown, Larsen Mfg., or equal, Exterior stations shall have a steel door. Interior stations shall have a clear Plexiglass "windows" in the door. Exterior fire stations shall be fitted with a local drain valve.

521.1.2 BILGE SYSTEM

The Fire/Bilge pumps shall have both local and Pilothouse on/off control and shall be piped to the bilge manifold and bilge piping system. System materials shall be as shown on DWG D367-P9. Bilge pump (backup fire) shall be MP HHLF 15 model, self-priming, centrifugal, 2"x 2", 6.7" impeller, 110 GPM at 130 ft head, 7.5 HP at 3450 rpm, or approved equal.

Individual bilge suctions shall be connected to the bilge manifold and shall be fitted with Flowmatic Model 357, or approved equal Foot Valves. Bilge pump (P-1) shall be piped for emergency overboard discharge. USCG approved bilge alarms shall be provided and installed in all compartments served by the bilge system with audible and visual digital readouts located on the pilothouse console.

526.1 SCUPPERS AND DECK DRAINS

526.1.1 GENERAL

The CONTR shall install scuppers, limber holes, and drains to prevent accumulation of water in the hull and to provide adequate drainage for the exterior decks. Particular attention shall be given to providing drainage of exterior decks in way of passenger foot traffic areas and at the top and bottom of exterior stairways (Ref: D367-P3).

528.1 SANITARY SYSTEM (DRAIN, WASTE, VENT & FLUSHING)

The CONTR shall provide and install a Sanitary System to include drain, waste, vent, and flushing systems in accordance with Contract DWG D367-P6. The Sanitary System shall include a 600 gallon sewage tank (FR16-17 centerline); vent line; drain & fill lines. The system shall have (1) suction pump-off station to deck connections located near FR25 port in the retention box. The pump-off station shall be fitted with a USCG approved containment and pump-off connection with Cam-lock fitting and cap. The vent line shall terminate out the top of the stack. The sewage tank shall be fitted with a Gems sight glass level gauge or approved equal.

Sea water shall be used for flushing. The flushing system will be pressurized by a Grundfos BMQE 15, or approved equal pressure set in accordance with the D367-P6 material list. System piping clean outs shall be as shown on DWG D367-P6.

529.2 BILGE SLOPS (OILY WATER) SYSTEM

The Bilge Slops Tank receives product from suctioned bilges via the bilge manifold and Bilge Pump. Discharge of the Bilge Slops tank is via the Main Deck pump-off connection by vacuum truck (Ref: DWG D367-P11).

533.1 POTABLE WATER SYSTEM

533.1.1 SYSTEM COMPONENTS

The CONTR shall provide and install (1) 1900 gallon Potable Water Tank (Hold Deck FR18-FR20) in accordance with the Contract DWG D367-P5. The Potable Water system shall include vent, fill, and supply lines, Main Deck fill station, inboard side of starboard superstructure FR17. The Main Deck fill station shall be 1-1/2" with cam lock fitting. The Potable Water System shall include a Grundfos BMQE 15, or approved equal pump; a 3M Aqua Pure SS4 EPE 316L, or approved equal water filter, pressure gage; valves; and (2) Bosch Tronic 3000 electric instant hot water heaters, or approved equal, and associated piping and fittings.

The Potable Water System services boiler feed; main engine and generator cooling make-up water; centrifuge, and passenger vanities. (Ref: D367-P5).

551.0 COMPRESSED AIR SYSTEM

551.0.1 SYSTEM COMPONENTS

The CONTR shall provide and install a Compressed Air System which shall include two (2) Quincy Model QR-25 Model #325HP, 5HP, 14.20 ACFM @ 200 psi or equal air compressors. The CONTR shall also provide two (2) Quincy 200 gallon x 300 psi MAWP horizontal air receivers. Note that vertical air receivers are not an approved equal for this vessel. The horizontal air receivers may require a longer lead time. Air dryers, air filters, controls, piping, valves, fittings, and air connections shall be as called out on DWG D367-P10.

A main deck and 01 deck service air station to be located to the approval of the OREP and sea chest blow down air shall be installed and serviced by compressed air through a pressure reducer. Compressed air shall be supplied through pressure reducers to the workbench in engine room (see DWG D367-P10).

Compressed air shall be supplied to the pneumatic lube oil pump in the engine room along with the associated valves, filter, gauges, and surge dampener (see DWG D367-P10 & P11).

Compressed air shall also be supplied through the pressure reducer to the Air Horn mounted on the Pilothouse top (See Section 421 and DWG D367-P10).

555.1 FIRE EXTINGUISHING

555.1.1 FM200 FIXED SYSTEMS

A USCG approved FM200 fire suppression system shall be installed for the engine room. The system shall include a manual release pull station, machinery shutdown switches, time delays, and alarms as required by USCG regulations. The CONTR shall engage the services of a manufacturer certified FM200 Service Shop for detailed system design and shall engage the services of a manufacturer certified FM200 Tech Rep for installation supervision of the fixed FM200 systems. The CONTR shall provide the required drawings and documentation to USCG/MSC in order to receive approval of the system and its installation. The FM200 cylinder storage area is located on the Main Deck, starboard side, FR29-FR31 under the stair.

555.1.2 PORTABLE EQUIPMENT

Portable fire extinguishers shall be provided and located in secure brackets in quantities and type categories as per the requirements of 46 CFR. Any fire extinguisher bracket which is located on joiner panels shall be mounted with stand-offs to structure. Additional fire suppression equipment which may be required by USCG regulations shall be provided and properly secured or stowed (See Section 436.1 for Safety Equipment).

CONTR shall provide and install a wheeled, semi-portable, 125-pound capacity dry chemical fire extinguisher on Main Deck as directed by the MaineDOT OREP. Extinguisher shall be Amerex 488, or approved equal, with 50 ft. hose.

555.1.4 FIRE, SMOKE, GAS DETECTION

CONTR shall provide and install a complete USCG-approved fire and smoke detection system as required by Subchapter T, Part 181.405. Spaces requiring detectors include propulsion machinery spaces, spaces with internal combustion engines of more than 50 hp, and spaces with oil fired furnaces. The thruster room, steering room, control spaces, and service spaces may also be included in the system per the direction of the MaineDOT OREP. Accommodation spaces require a manual alarm system connected to the pilot house panel. Additional requirements may be required by the local OCMI. The shipyard is responsible for the vessel's safety plan and coordination with the local USCG officials.

561.0 STEERING SYSTEM

The CONTR shall provide and install a steering system by Engine Monitor, Inc. (EMI) or approved equal. Steering shall be Pilothouse controlled from the Steering Station on centerline forward and from emergency station in lazarette. The Steering Stations shall incorporate a rudder angle indicator and rudder command indicator. The arrangement of rudder angle indicator and rudder command indicator shall be to the approval of the MaineDOT OREP. The forward steering station shall have both wheel follow-up (FFU) and jog lever non-follow-up (NFU) capability. The lazarette steering station shall have jog lever non-follow-up capability. The system shall be alarmed for pump failure and shall be capable of switching between the HPU #1 and HPU #2 pumps in the 3 hp dual hydraulic power unit.

The steering system design shall comply with Subchapter "T" and USCG MTN 01-09. Electrical power input is 240V, 3- phase. The rudders shall be capable of hard over 35 degrees to 35 degrees in 15 seconds at max speed of 13 knots.

Piping for steering system shall be run from the two pumps, inboard of beam/5 from sideshell and separated as much as possible from each other. The electrical wiring for steering control shall be similarly run separately for the two power units to pilothouse.

A complete description of the Steering System shall be generated by the vendor and provided for submittal to USCG/MSC. Documentation shall include a Design Verification Test Procedure (DVTP) and Periodic Safety Test Procedure (PSTP). The CONTR shall engage An EMI Tech Rep for steering systems commissioning tests and trials.

Contact: Tre' Wiebelt; Engine Monitor, Inc. (EMI) 191 James Drive West; St. Rose, Louisiana 70087; Tel: (504) 608-5409; Email: twiebelt@emi-marine.com

The rudder stocks are 5 ½" diameter stainless steel Aqualoy 22 by Western Branch Metals or approved equal. CONTR shall provide jockey bars system as shown on DWG D367-M2.

561.0.1 STEERING SYSTEM SPARES

The CONTR shall provide the spare parts for the steering system as recommended by EMI. Spare parts shall be labeled and crated for storage. Storage shall be at the direction of the

MaineDOT OREP either direct shipped to an MaineDOT warehouse or placed on the vessel. Spares to include complete cylinder w/crossover relief valve, HPU directional control valve, vane pump, rudder angle indicator for pilothouse and lazarette, steering lever potentiometer, motor starter contactor, motor starter contactor at a minimum.

568.0 BOW THRUSTER

The CONTR shall provide and install a Veth VT-50 64kW tunnel bow thruster, or approved equal. This unit will be hydraulic motor driven (Parker type F12-80). Veth will supply hydraulic motor as part of the tunnel thruster package. The thruster shall be powered and controlled from the Veth provided controls in the pilothouse console. The CONTR shall engage a Tech Rep for bow thruster commissioning tests and trials.

Bow thruster hydraulic proportional power system shall be by Engine Monitor Inc, (EMI), consisting of:

- 2 piston pumps, one clutched to each generator set
- Hydraulic tank with proportional valving
- Hydraulic manifold
- Hydraulic filter
- Interface panel to Veth control panel

The Veth Thruster shall be provided complete for installation and operation including, but not limited to:

- Fixed pitched CuNiAl 4-blade propeller
- Hydraulic Motor
- Sacrificial anodes
- Propeller shaft and seals
- Lubrication system
- Hydraulic oil expansion tank
- Tunnel w/stainless wear ring and outer guard flat bar grid system
- Control Panel
- Control jog levers in Pilothouse

Contact: Ron Leeuwesteijn Email: r.leeuwesteijn@veth.net

568.2 BOW THRUSTER SPARES

The CONTR shall provide the spare parts for the bow thruster system as recommended by Veth. Spare parts shall be labeled and crated for storage. Storage shall be at the direction of the MaineDOT OREP either direct shipped to an MaineDOT warehouse or placed on the vessel. Spares to include O-Rings, and Shaft Seals at a minimum.

573.6 VEHICLE TIE DOWNS

The CONTR shall provide and install a vehicle tie down system for the center truck lane.

573.6.1 TIE-DOWN SOCKETS

The CONTR shall provide and install twenty (20) main deck tie-down sockets in locations shown on D367-S7-1 and as designated by the OREP. The system shall consist of deck sockets formed of 8" Sch. 80 pipe caps, with 1" round bar attachment points, all continuously welded all around to the approval of the OREP and attending USCG Inspector. Pipe caps shall be fitted as flush as possible to main deck plate top surface.

573.6.2 TIE-DOWN CHAIN, BINDERS

The CONTR shall provide (20) sets of 3/8" Grade 80 tie down chain assemblies 15' long with 3/8" hooks at each end and (20) lever type 3/8" chain binders. Storage for the assemblies shall be provided on expanded metal shelves in the port deck locker to the approval of the OREP.

581.1 GROUND TACKLE

The CONTR shall provide and install an anchoring system consisting of the following components in accordance with DWG D367-M4:

- A bulwark anchor "pocket" main deck starboard FR6
- Anchor 500# snug stowing type or approved equal
- Chain 32 ft. of 3/4" Grade 1 stud link, galvanized
- Line 235 ft., 1-1/2" inch Cortland Co-Polmer 12 plaited rope or approved equal
- Hawse pipe, anchor rode retrieval drum starboard side hull void space
- (1 set) Shackles, swivel, thimbles, required and to the approval of the MaineDOT OREP
- Chain rode tray 48"x30" stbd side hull void space

582.1 MOORING SYSTEM

The CONTR shall provide and install, as appropriate, the following equipment:

582.1.1 LINES

(6) 50-foot (including eye splice) poly-Dacron dock lines, 1-1/4 inch diameter (18,750# avg. tensile strength), each with a 30-inch eye splice in one end.

582.1.2 KEVELS (CLEATS)

The CONTR shall provide and install mooring cleats and bulwark fairlead chocks to adequately moor the vessel for bow and stern loading and for side to pier docking. The CONTR shall

provide and install (8) 24" kevels in locations as shown on DWG D367-A12 & D367-A1. There shall be kevels on each side, (4) port and (4) starboard. Each kevel shall have an associated fairlead chock (4" Schedule 80 hawse pipe) located to the approval of the MaineDOT OREP to provide adequate line leads from the chock to the kevel.

The CONTR shall provide and install line hooks on the bulwarks in (5) places – P&S bow and stern to hang mooring lines on, Stbd fr 6 for anchor chain. These shall be flat bars shaped to accommodate the mooring lines – two hooks spaced appropriately at each of (4) mooring stations. Hooks and locations shall be to the approval of the MaineDOT OREP.

582.1.3 BULWARK SERVICE GATES

The CONTR shall provide and install (4) two-leaf hinged bulwark service gates in accordance with the locations and details of DWG D367-A12.

582.2 PIPING SYSTEM TESTS**Table 900-1: Hydrostatic Test Pressures/Fluids**

System	Test Pressure	Test Fluid
Fresh water	128 psig	fresh water
Fuel oil service and transfer	150 psig	oil and service fluid
Fire main	129 psig	fresh water
Bilge system	38 psig	fresh water
Hot water heating system	(reserved)	fresh water
Compressed air, service air	150 psig	fresh water
Compressed air, whistle air	285 psig	fresh water
Hydraulics, bow thruster	(reserved)	hydraulic oil
Hydraulics, steering gear	(reserved)	hydraulic oil

Manually operate all valves from stop to stop to demonstrate free operation without binding. Remote valve operators (reach rods, hydraulically actuated quick closing devices, etc.) shall be tested to demonstrate proper operation. Valve identification tags shall be checked for accuracy.

Manually operate all ventilation system balancing dampers and fire dampers to demonstrate free operation without binding. Check ventilation system filters for proper installation and cleanliness prior to system operation.

Demonstrate that all relief valves and pressure safety devices operate at their set pressure or provide current test certification. Provide all pressure gauges with lab calibration test and certification stickers along with certifying documents.

583.1 RESCUE BOAT & DAVIT

- 583.1.1: DAVIT: The CONTR shall provide and install a Coastal Marine Equipment, Inc. D39-11.5-11-24 (240V, 3-phase), or approved equal davit on the 01-Deck port side (Ref. D367-A1-2 and D367-M5). Handing of davit as shown on plans.
- 583.1.2: RESCUE BOAT: The CONTR shall provide and install a new Palfinger RSQ 450 rescue boat, or approved equal rescue boat with (25) HP electric start gasoline outboard motor and all standard equipment and optional boat and motor covers.
- 583.1.3: The CONTR shall provide and install a new rescue boat battery charger. The charger shall be a Pro SE, Sportsman Edition, or approved equal and shall be located in a position to be accessible to the rescue boat motor starting battery. Locate battery charger power to an appropriate source.

- 583.1.4: The CONTR shall provide and install aluminum cradle chocks, Palfinger, or approved equal. The cradle shall be ordered for the boat with the motor stored in a vertical position.
- 583.1.5: Dedicated floodlights for prep and launch illumination shall be provided and installed in accordance with Section 331.1.9.2.
- 583.1.6: TESTS: The installation shall be fully operational in radius swing and clearances past the rails. The davit and boat shall be weight tested and operationally tested to the approval of the OREP and the attending USCG Inspector.

584.1 BOW DOOR

The CONTR shall build and install the bow doors in accordance with the contract plans DWG D367-S-13. Doors shall be fabricated of steel. Door clear opening width shall be 13'-8".

585.1 AFT VEHICLE GATE

The CONTR shall build and install a chain link and safety netting vehicle gate across the opening in the aft deck bulwark. The gate shall be constructed of one top course of colored, rubber-coated Grade 100 chain attached to (3) 3" SCH 160 vertical pipe stanchions as shown in DWG D367-A1-1. Netting shall attach to side bulwarks and vertical stanchions. Netting shall be by Incord (formerly East Coast Lifting Supply).

SWBS SECTION 600 MARKINGS, ACCESS, & OUTFITTING

The following specifications and drawings referenced provide for Furnishings, Coatings, and Joiner work items required to be performed by this Contract:

- 600.1 REFERENCE DRAWINGS
- 602.1 SIGNAGE & MARKINGS
- 611.1 HULL FITTINGS
- 612.1 RAILS & STANCHIONS
- 622.1 FLOOR PLATES, GUARDS
- 623.1 LADDERS, STAIRS, ADA RAMPS
- 625.1 WINDOWS
- 631.1 COATINGS
- 631.2 SAMPLE COATING SCHEDULE
- 633.1 CATHODIC PROTECTION
- 634.1 INTERIOR DECK COVERINGS
- 634.2 EXTERIOR DECK COVERINGS
- 644.0 SANITARY SPACES & FIXTURES
- 645.1 PASSENGER, CREW & PILOTHOUSE SPACES
- 654.1 UTILITY SPACES

600.1 REFERENCE DRAWINGS

D367-A1	GENERAL ARRANGEMENTS
D367-A3	OUTBOARD PROFILE
D367-A7	DOOR & WINDOW SCHEDULE
D367-A10	PILOTHOUSE ARRANGEMENT
D367-S13	BULWARK & MOORING ARRGTs & DETAILS

602.1 SIGNAGE & MARKINGS

602.1.1 GENERAL

The CONTR shall provide and install all USCG required internal and external signage and markings. Access/Braille signage shall comply with 521 CMR 41.00. Additional signage will be provided as required by these Specifications.

602.1.2 REGULATORY MARKINGS

The following letters and numbers will be welded on and painted in contrasting color, sized in accordance with USCG regulations 46 CFR and positioned to the approval of MaineDOT:

- Vessel Name: TBD – Bow P&S Hull; transom
- Hailing Port: Beneath vessel name on transom
- Name Boards: Mounted P&S on Pilothouse above pilothouse doors. Mahogany boards, carved 6” letters painted yellow, boards finished with clear marine epoxy.
- Draft marks: FR2 and FR63 P&S (4 sets) – Numbers 9, 8, 7, 6 in four locations. Exact frame locations to the approval of the MaineDOT OREP.
- Official Number: The Official Documentation Number shall be welded to a transverse hull structure in accordance with 46 CFR and located to the approval of the MaineDOT OREP. A location such as at the bottom of the engine room access FR22 would be appropriate if approved by the OREP.

602.1.3 COMPANY NAME & LOGOS

At the option of MaineDOT, the MaineDOT logo shall be applied in decal material or paint on each side of the stack. If the option is exercised, MaineDOT shall provide the logo to the CONTR in electronic graphic form.

602.1.4 SAFETY & WARNING SIGNS

Signage for keeping off stairways during docking, no smoking, exits, general warnings, PFD stowage and access, lane height clearances, etc. shall be designated by the MaineDOT OREP and shall be in compliance with USCG CFR requirements.

602.1.4 BUILDER’S PLAQUE

A bronze, engraved Builder’s Plaque will be provided and installed in either the port or starboard Main-Deck passenger cabin in a location as approved by the MaineDOT OREP. At a minimum, the Builder’s Plaque shall identify the vessel Name, Builder, Designer, Owner, and delivery year.

611.1 HULL FITTINGS

611.1.1 DOORS, EXTERIOR WEATHER-TIGHT

Exterior marine weather-tight doors will be North American manufacture Pacific Coast Marine, Dean Steel, Freeman Marine, Beclawat, or approved equal. Doors shall be “bolt-in” frame type. All doors shall be steel, stainless steel, or aluminum as appropriate for the installation and as shown on the Contract DWGS. Doors and frames shall be painted by CONTR to match adjoining bulkheads and/or joinerwork. Door sill heights shall be no greater than as required by the ADA Guidelines, or as required by USCG downflooding and stability requirements. Exterior doors not insulated with mineral wool shall be filled with fiberglass thermal insulation.

Doors shall be handed as per DWG D367-A7. Doors opening against bulkheads shall be fitted with rubber bumpers. Hardware, lights, and special features shall be as described on D367-A7. A general reference list of WEATHER-TIGHT doors follows:

- Pilothouse weather-tight: (1) each P&S (fitted with holdbacks in 2 positions)
- Main-Deck Cabin Port weather tight FR 14 and FR 33.5
- Main Deck Locker Port weathertight FR 12.5
- Main Deck Engine Room Access Port FR 26
- Main Deck Cabin Starboard weathertight FR 16 and FR 33.5
- Main Deck FM 200 Locker Starboard weathertight FR 30

All doors accessible to passengers shall be fitted with finger guard protectors at the hinges.

611.1.2 DOORS, INTERIOR JOINER

Interior joiner doors shall be North American manufacture Dean Steel, Freeman Marine, Pacific Coast Marine, Beclawat, or approved equal. Doors shall be “bolt-in” frame type. All doors shall be steel, stainless steel, or aluminum as appropriate for the installation and as shown on the Contract DWGS. Doors and frames shall be painted by CONTR to match adjoining bulkheads and/or joinerwork. The clear opening tops of doors shall, in general, be not less than 6’-8” above the finished deck (Ref: D367-A7). Door sill heights in passenger areas shall be no greater than as required by the ADA Guidelines or USCG regulations. Self-closing door opening force shall not exceed ADA Guidelines or as required by USCG Regulations.

Doors shall be handed as per DWG D367-A7. Hardware, lights, and special features shall be as described on D367-A7. A general reference list of JOINER doors follows:

- Main Deck Cleaning Gear Locker Port FR 17.5
- Main Deck Unisex Head Port FR 21
- Main Deck Unisex Head Starboard FR 15.5

All doors accessible to passengers shall be fitted with finger guard protectors at the hinges. Doors opening against bulkheads shall be fitted with rubber bumpers.

612.1 RAILS & STANCHIONS

612.1.1 EXTERIOR RAILINGS

The CONTR shall provide and install welded steel pipe handrails and stanchions to meet 46 CFR requirements (Ref: D367-S12). Handrails shall be provided and installed around all perimeters of the 01 weather deck and pilothouse deck areas including 01-Deck inboard/forward/aft of the IBA storage racks and rescue boat storage/launch area. These pipe handrails shall be fitted with welded tabs and bolt-on stainless screen sections (See Section 612.1.2 below).

Perimeter exterior rails in way of passenger and crew accessible areas shall be of the following approximate dimensions.

1. Top course, and stanchions: 2" Schedule 40 pipe
2. Lower course: 1-1/2" Schedule 40 pipe
3. Second and third courses (crew): 1-1/2" Schedule 40 pipe
4. Deck to top of top course = 40"
5. Spacing of intermediate courses as shown on plans
6. Deck to bottom of bottom course = no greater than 6" (passenger areas)
7. Deck to bottom of bottom course = no greater than 9" (crew areas)
8. All passenger accessible openings are to be fitted with stainless steel screen panels

NOTE: Rails forward of the bridge wings and around the front of the pilothouse where passengers do NOT have accessibility shall not be fitted with screening.

Rail installations shall be in accordance with D367-S12 and shall in general be:

- 01-Deck: Passenger Access -- two courses & screens
- PH-Deck: Crew Only Access -- four courses; no screening panels

Pilothouse top shall be fitted with six attachment padeyes for crew to clip safety lines into when working on housetop. Aft end of pilothouse shall be fitted with tag line system for crew to clip safety lines into when working on lower housetop.

612.1.2 SAFETY FENCING

The CONTR shall provide and install stainless steel safety screen panels on perimeter rails on the 02 and 01 decks. Screens shall be McNichols or approved equal, woven 316 stainless steel lock crimp 2" square, 0.25" wire diameter (2-3/4 ga.) and must be approved by the OREP.

612.1.2 INTERIOR RAILS

"Sea Rails" shall be provided and installed in accordance with the requirements of the CFR, ADAAG, and to the approval of the USCG in the Main Deck passenger spaces P&S. The CONTR shall allow for 100 linear feet of sea rail installation to be allocated at the direction of the OREP and to the approval of the attending USCG Inspector. Interior sea rails shall be mild steel.

All interior hand rails shall be securely fastened back to structure to the approval of the OREP. Fastening to soft core joiner panels alone is not sufficient.

622.1 FLOOR PLATES, GUARDS

622.1.1 FLOOR PLATES

The CONTR shall provide and install patterned steel floor plate in the engine room. Steering gear flat, thruster room, tank voids, at the bottom of all vertical ladders, and void spaces where there is equipment which must be periodically inspected or serviced shall be provided with catwalks and side handrails to provide safe passage. Catwalks shall be installed with framed steel diamond plate base, angle supports and handrails on both sides.

622.1.2 GUARDS

Guards shall be installed in way of exposed shafting, other rotating machinery, and exposed hot pipes as appropriate to protect personnel.

623.1 LADDERS, STAIRS & ADA RAMPS

623.1.1 VERTICAL LADDERS

The CONTR shall provide and install vertical ladders in way of access and escape hatches, and for access to the top of the pilothouse. Handholds will be installed as required to aid personnel access. Steel diamond plate platforms shall be installed at the bottom of all vertical ladders in the Hold. Platforms 24"x 24" minimum, and arranged to provide a secure standing surface as well as for collection of road salt liquid dripping down and collecting in corners of bottom plate, stiffeners, etc. (See 622.1.1). Vertical ladders shall be no narrower than 16", have no obstructions behind centerlines of rungs closer than 7", and rungs shall be spaced no more than 12" apart. Ladders shall meet USCG regulations for Subchapter T passenger vessels (46 CFR 177.500).

623.1.2 INCLINED STAIRS

The CONTR shall provide and install inclined stairs leading from the Main Deck to the Engine Room, 01-Deck, and Pilothouse deck. Particular attention shall be paid to the maintenance of adequate headroom on stairways. Stairways shall be fitted with railings and stanchions to comply with USCG regulations and ADA Guidelines as applicable. Each stair riser in a stairway run shall measure vertically **exactly** equal to all other risers in that stair run. The MaineDOT OREP and CONTR shall ship check and confirm this requirement. All inclined stairs, interior and exterior shall be fitted with Wooster Products Stairmaster Type 500 non-skid safety treads or approved equal (See 634.1.5). Interior and Exterior passenger access stair rails shall comply with ADA Guidelines including rail extensions top and bottom (See ADAAG V503.10.2 and V503.10.3).

625.1 WINDOWS

625.1.1 PILOTHOUSE WINDOWS

The Pilothouse windows shall be clear, tempered Beclawat, Pacific Coast Marine, or approved equal, with aluminum clamp-ring frames. CONTR to provide and install pilothouse windows (10 total), six of which shall be electrically heated (30Watts/ft. sq.). Forward facing windows shall be installed on a slant (top forward) to limit reflection.

The CONTR shall provide and install heavy-duty Hepworth, Cornell-Carr, or approved equal, electric marine window wipers on (6) Pilothouse windows. Individual console-mounted switches at each console shall control On/Off/Intermittent wiper functions (Ref: DWGS D367-A7 and D367-A10).

All pilothouse windows shall be fitted with Sola-Cure Anti-Glare film shades.

625.1.2 01- DECK WINDOWS

The CONTR shall provide and install windows in the P&S Main-Deck passenger spaces (Ref: D367-A7). They shall be Beclawat, Pacific Coast Marine, FabTek, (or approved equal), aluminum, clamp-ring frame, with tinted tempered thermopane glass.

631.1 COATINGS

631.1.1 REFERENCES

1. PPG Paint and American Safety Technologies Technical Data Sheets
2. MaineDOT Standard Specification 506 – Shop Applied Protective Coating - Steel
3. ASTM D 4138-88 - Standard Test Method for Measurement of Dry Film Thickness of Protective Coating Systems by Destructive Means.
ASTM D 4414 - 90 - Standard Practice for Measurement of Wet Film Thickness by Notch.
5. ISO-8502-3 Assessment of dust on steel surfaces prepared for painting (pressure sensitive tape method)

631.1.2 GENERAL SCOPE

The CONTR shall apply a high-quality commercial marine paint system, PPG Inc., or approved equal. Prior to the commencement of coating applications, the CONTR shall provide MaineDOT with a detailed coating schedule for surface preparation and application of the coating system. The schedule shall be reviewed and approved by the MaineDOT OREP and shall be in compliance with the paint manufacturer's application and warranty requirements.

CONTR shall hold a current shop NACE NIICAP, or SSPC- QP3 certification or another coatings certification as approved by the State of Maine Fabrication Engineer. CONTR shall submit QC plan to MaineDOT for review.

631.1.3 INSPECTIONS

Acceptance of coatings shall be by the MaineDOT OREP as areas are presented for inspection. Construction primer need not be removed provided it is compatible with the paint system specified. The CONTR shall arrange for the Paint Manufacturer's Tech Rep to be present to the degree required by the CONTR and Paint Manufacturer to ascertain that the warranties on all major coating applications are enforceable.

The coating systems are to be agreed upon between the Paint Manufacturer's Rep, MaineDOT's OREP, and the CONTR prior to commencing any coating work. This agreement shall detail the Manufacturer's paint specifications and coating application Instructions. These Specifications and Instructions are to be followed for the duration of the contract. Any coating system listed in this specification is strictly a guideline. The exact specification will be agreed upon prior to commencing work.

All finish colors shall be as directed by the MaineDOT OREP.

Tank Divisions, superstructure, deckhouses, bulkheads, deck and hull inserts, and any other welds which are required to pass USCG inspection shall not be painted until the USCG Inspector assigned has witnessed and passed the required air test, water blast test, vacuum box test, dye-penetrant test or other test method applicable to the particular class of weld as required by the CFR. Coating of welds shall not commence before the attending USCG Inspector has passed the welds in question. If such areas are painted in advance of required tests, the CONTR shall remove all paint applied to either or both sides of the weld to the satisfaction of the attending USCG Inspector in preparation for proper testing.

631.1.4 PROTECTION/PREPARATION

Where blasting and/or grinding is performed, the CONTR shall mask or seal off sea valves, machinery, equipment and all openings as necessary to prevent damage. Windows, doors, antennas, wires, A/C units, battery boxes, cables, deck lights, navigation lights, etc. shall be properly protected and sealed. Any equipment damaged by blasting and coating (including overspray) shall be repaired at the CONTR's expense.

Coatings are only to be thinned with solvent for spray painting or other purposes as specifically approved by the Paint Manufacturer's Tech Rep.

Where necessary, scuppers, and overboard drains shall be sealed, plugged, or led clear overboard so that the hull will remain dry during the paint application. The CONTR shall keep a coating Weather Log and a DFT Mil Reading Log. These logs shall be available for inspection by MaineDOT's OREP during job progress. A copy shall be presented to the OREP and to the Paint Manufacturer's Tech Rep prior to delivery of the vessel to the OWNER.

All fixtures, deck coverings, joiner work, machinery, equipment, label plates, gages, instruments, etc. shall be protected during coating operations. Upon completion of work, all paint, smudges, sealant, bonding agents, etc. shall be removed from finish surfaces.

Welding in areas exposed to the weather or other conditions which may result in corrosion to the facing surfaces of attached members shall be continuous or shall be sealed between intermittent welds with an applied fillet of paintable marine grade epoxy or polyurethane-based caulking. Areas where continuous welding or caulking may be applied include bulwarks, curtain plates, exterior overhead structures, and pilot house top and visor.

631.1.5 MACHINERY SPACES

All machinery and void spaces shall receive a complete and thorough preparation and a full coating system. When work has been completed in a hull machinery or void space all areas and surfaces shall be thoroughly cleaned prior to commencement of coating application. The MaineDOT OREP and coating manufacturer's Rep shall inspect and sign off on each space.

Piping or lagging which is exposed to view shall be color banded and stenciled for identification. Standard safety colors (approved by the OREP) shall be used to distinguish machinery, pipes and fittings, which may present a hazard.

Wooden switchboard handles shall have a dull finish.

631.1.6 VEHICLE DECK (MAIN DECK)

The main vehicle deck shall be blasted, prepped, and shall receive a complete coating system (Ref: Section 631.2.A4).

631.1.7.1 GENERAL SCOPE

Prior to the application of coating materials on any surfaces, including those already coated with a shop coat, the surfaces shall be made clean and free from foreign matter such as: crayon marks, dirt, dust, grease, heat and mill scale, oil, residual abrasive from blasting, rust salt deposits, weld spatter, standing water, etc.

Surfaces shall be inspected in presence of MaineDOT inspectors for dust, using ISO-8502-3, pressure sensitive tape method. Surfaces shall meet Level 2 cleanliness at a minimum, as defined in ISO-8502-3.

All surface preparation shall be to the specifications and approval of the paint manufacturer's assigned Tech Rep and to the inspection and approval of the OREP.

631.1.8 HULL, DECK HOUSE MARKINGS

Paint for markings on the hull and deck house shall be compatible with the painted surfaces upon which they are applied.

631.1.9 PRE-CONSTRUCTION PRIMER

If the pre-construction primer applied to construction steel is not compatible with the paint system used, the pre-construction primer must be removed.

631.2 SAMPLE COATING SCHEDULE

The Sample Schedule below is based on PPG Paint preparation and coating recommendations. It is included in these Specifications as a guide for the CONTR to use in assessing coating Manufacturer's proposals. MaineDOT must approve final paint specification and any "or equal" coating provider proposals.

SAMPLE COATING SCHEDULE

ALL HULL COATINGS SHALL BE APPLIED, MAINTAINED, AND REMOVED CONSISTENT WITH FIFRA. ALL EXPOSED EXISTING OR NEW COATINGS SHALL CONTAIN ONLY APPROVED BIOCIDES AND/OR TOXICS

A.1 EXTERIOR HULL KEEL TO WATERLINE (curved height waterline per Outboard Profile Plan)

A.1.1: AREAS OF COMMERCIAL BLAST & NEW STEEL ONLY

- Sandblast welds to a SSPC-SP10 Near White Blast and sweep blast new steel plates
- Amerlock 2 (color contrast with next coat) 5 mils DFT
- Amerlock 2 (color contrast with previous coat) 5 mils DFT
- ABC 3 (color contrast with top coat) 5 mils DFT
- ABC 3 (black) 5 mils DFT
- ABC 3 (black) – WL down 4 ft. band 5 mils DFT

NOTE 1: DFT readings are to be taken on 1st coat. The first coat of anti-fouling shall be applied over a tack coat of Amerlock 2. DFT shall be taken and recorded after first coat of anti-fouling has dried.

NOTE 2: Keel to waterline – The finish coat shall be **black**. The first coat shall be a color that contrasts with the final coat. Follow application guidelines to insure proper inter-coat adhesion.

NOTE 3: First coat anti-fouling shall be applied over a tack coat of Amerlock 2 while still "thumb print" tacky.

A.2 FREEBOARD – WATERLINE TO & INCLUDING RUB RAIL GUARD ONLY

A.2.1: The waterline to the rub rail guard and including the guard to the side shell weld on the main deck is to be coated in accordance with the requirements:

Spot blast to approval of OREP damaged/corroded areas to SSPC-6 commercial blast and "scuff sand" all sound and intact gloss finish areas prior to coating application to provide a profile and fresh water rinse.

MAINE DEPARTMENT OF TRANSPORTATION FERRY SPECIFICATIONS

- Dimetcote 302H (Spot coat to blasted areas) 3 mils DFT
- Amerlock 2 (Full coat) 5 mils DFT
- PSX 700 (Full coat all areas) 5 mils DFT

(Color to be Red below Guard, Guard to be Black)

A.3 TOP SIDES

A.3.1: AREAS OF COMMERCIAL BLAST & NEW STEEL ONLY

- Dimetcoat 302H 3-4 mils DFT
- PSX 700 5-6 mils DFT

(Color to be White including mesh panels, lower handrail courses, and rail stanchions; Black for pinstripe at 01 Deck, Bulwark caps, top course of handrails all around vessel, and main deck mooring fittings)

A.3.4: STACK

- Schedule as in A.3.1 above for Dimetcoat 302H with the following exceptions
- Finish coat PSX 700 color White 5-6 mils DFT
- Finish coat stripe on cap and base PSX 700 color Black 4 mils DFT

A.4 FREIGHT DECK

A.4.1: AREAS OF COMMERCIAL BLAST AND NEW STEEL ONLY

- Dimetcoat 302H 3-4 mils DFT
- Amerlock 2 white (with aluminum oxide #24 cast by hand to the desired quantity) 5 mils DFT
- Amerlock 2 grey 5 mils DFT
- PSX 700 Color Grey 4 mils DFT
- Note: Apply 5' x 5' wet sample for approval by OREP.
- PSX 700 vehicle lane and ADA markings (white) 2-4 mils DFT

A.5 OTHER EXTERIOR DECKS INCLUDING PILOT HOUSE TOP

A.5.1: AREAS OF COMMERCIAL BLAST AND NEW STEEL

- Dimetcoat 302H 3-4 mils DFT
- Amerlock 2 white (with aluminum oxide #24 cast by hand to the desired Quantity per OREP) 5 mils DFT
- Note: Apply 5' x 5' wet sample for approval by OREP.
- PSX 700 Color per OREP 3-4 mils DFT

A.6 INTERIOR VOIDS & MACHINERY SPACES BELOW FLOOR PLATES

A.6.1: AREAS OF COMMERCIAL BLAST AND NEW STEEL ONLY

- Needle gun welds and disturbed steel to a SSPC-SP11 Power Tool Cleaning to Bare Metal
- Amerlock 2 Grey Stripe coat
- Amerlock 2 White 5 mils DFT
- Amerlock 2 Grey (color contrast with first coat) 5 mils DFT

A.7 INTERIOR MACHINERY SPACES ABOVE FLOOR PLATES

A.7.1: AREAS OF COMMERCIAL BLAST AND NEW STEEL ONLY

- Needle gun welds and disturbed steel to a SSPC-SP11 Power Tool Cleaning to Bare Metal
- Amerlock 2 Grey Stripe coat
- Amerlock 2 White or gray 5 mils DFT
- PSX 700 White 5 mils DFT

A.8 ACCOMMODATION & PUBLIC SPACES INCL. FREIGHT DK BULKHEADS – VISIBLE

A.8.1: AREAS OF NEW STEEL

- Amerlock 2 Grey Stripe coat
- Amerlock 2 Grey 5 mils DFT
- PSX 700 White 5 mils DFT

A.9 BEHIND INSULATION – ALL SPACES

A.9.1: AREAS OF NEW STEEL ONLY

- Amerlock 2 Grey Stripe coat
- Amerlock 2 White 5 mils DFT

A.10 MACHINERY SPACE FLOOR PLATES

A.10.1: COMMERCIAL BLAST AND NEW STEEL ONLY

- CONTR to research procurement of pre-blasted patterned steel floor plates
- PSX 700 color per OREP 5 mils DFT

A.11 POTABLE WATER TANKS

A.11.1: COMMERCIAL BLAST AND NEW STEEL ONLY

- Needle gun welds and disturbed steel to a SSPC-SP11 Power Tool Cleaning to Bare Metal
- Amercoat 133 White Stripe coat
- Amercoat 133 White 10 mils DFT

NOTE: 30 DAYS DRY TIME REQUIRED (vent & leave access open)

A.12 BILGE SLOPS TANK

A.12.1: COMMERCIAL BLAST AND NEW STEEL ONLY

- Amerlock 2 White 5 mils DFT
- Amerlock 2 Gray 5 mils DFT

A.13 SEWAGE TANK

A.13.1: COMMERCIAL BLAST AND NEW STEEL ONLY

- Light abrasive blast
- PPG Amercoat 240 Buff Stripe Coat
- PPG Amercoat 240 Buff 10 mils DFT
- PPG Amercoat 240 Grey Stripe Coat
- PPG Amercoat 240 Grey 10 mils DFT

A.14 ENGINE ROOM AIR INTAKE TRUNK

A.14.1: COMMERCIAL BLAST AND NEW STEEL ONLY

- Needle gun welds and disturbed steel to a SSPC-SP6/NACE No. 3
- Amerlock 2 Grey Stripe coat

A.15 REPAIR OF DISTURBED COATINGS

A.15.1: Minimum repair of disturbed existing coatings shall be (2) coats primer at 4 mils DFT each coat and (1) coat matching finish gray on Main Deck top surface; and (2) coats primer at 4 mils DFT on interior disturbed surfaces.

A.16 SHOP COAT

A.16.1: NEW STEEL PROVIDED WITH SHOP COAT

Proceed with specifications above. Normal steel procurement will include shop coat.

A.16.2: NEW STEEL NOT PROVIDED WITH SHOP COAT

All new steel that has not previously been shop coated shall receive a white metal blast to both sides prior to installation. The steel shall be shop coated with one coat of Interzinc 75V at 3-5 mils DFT.

633.1 CATHODIC PROTECTION

Aluminum alloy anodes will be stud bolted to the hull and underwater appendages, in particular, at critical areas that could generate electrolysis. Each sea chest shall be fitted with two anodes. Anodes shall be secured to stainless threaded studs with stainless Nyloc nuts having a minimum of 3-threads clear. Accurate stud spacing is essential for future replacement of anodes by divers. There shall be anodes provided of sufficient capacity to provide 24-month minimum protection for the hull, sea chests, and hull appendages. Anode count and location shall be to the approval of the OREP.

634.1 INTERIOR DECK COVERINGS

In general, the CONTR shall follow the Coatings guidance schedule.

634.1.2 MAIN-DECK

- Passenger Cabins: Paint with broadcast flake pattern, and clear top coat. Color and pattern to be approved by the MaineDOT OREP.
- Deck Locker and Storage Locker: Paint in accordance with schedule

634.1.4 PILOTHOUSE

- Pilothouse: Paint with broadcast flake pattern, and clear top coat. Color and pattern to be approved by the MaineDOT OREP. Heavy duty rubber matting shall be provided in way of console operational standing area.

634.1.4 SAFETY MATTING

In front of switchboard and electrical panels; Heavy duty rubber safety matting.

634.1.5 NON-SLIP STAIR TREADS

The CONTR shall provide and install non-slip stair treads on all interior and exterior inclined stair steps including the top landing of each run. Treads shall be Wooster Products, Stairmaster 500 model non-skid, abrasive-filled.

634.2 EXTERIOR DECK COVERINGS

634.2.1 MAIN DECK

Coating system in accordance with Schedule.

644.0 SANITARY SPACES & FIXTURES

644.0.1 GENERAL SCOPE

The CONTR shall provide and install plumbing fixtures and accessories in passenger heads per these Specifications and the Contract DWGS. Plumbing fixtures, fittings, and accessories shall be specifically manufactured for marine service with stainless steel or chrome plated cast brass trim. Furnish and install fixtures complete with valves, faucets, stops, drain fittings, vents, and hangers. Traps shall be chrome plated cast brass with cleanout plugs. Instant hot water heaters shall be mounted on bulkheads below lavatories.

All plumbing systems shall be tested for the approval of the OREP. This includes clean out of all flushometers after installation and flushing of the sanitary supply water system.

644.0.2 ADA COMPLIANCE

All fixtures in the Main-Deck starboard side passenger head, designated as ADA, shall be provided and installed in strict compliance with ADAAG 2010 regulations and requirements. The CONTR shall take particular care in horizontal and vertical locations for ADA compliance when installing grab rails, toilet, lavatory, mirror, paper holders, etc. All sanitary fixture locations must be approved by the OREP. All other heads not ADA compliant shall be fit with grab rails.

644.0.4 SANITARY FIXTURES

The CONTR shall provide and install all sanitary fixtures as per Contract DWG material lists and these Specifications unless changes are specifically approved by the OREP on a case by case basis.

- TOILETS (all heads): (2) Floor mounted, Kohler Model Highcliff K-96057, elongated bowl, white, ADA compliant, w/SEAT, Kohler Model Lustra K-4666, white, open front, no cover, or equal.
- FLUSHOMETER (all heads): (2) Sloan, salt water service, or equal.
- LAVATORY BOWL/FAUCET/SOAP DISPENSER (Stbd Main Deck) Best Sheet Metal Inc. Heavy Duty 14 gauge Type 304 Stainless Steel ADA Compliant Single Station Wash up Sink, 24", Electronic Faucets Wall Brackets (ADA-011E242066B) wall hung, w/overflow + strainer, or equal.
- LAVATORY BOWL/FAUCET/SOAP DISPENSER (Port Main Deck): Best Sheet Metal Inc. Heavy Duty 14 gauge Type 304 Stainless Steel Single-station Wash up Sink, 24", Electronic Faucet, Wall Brackets (011E24208B) wall hung, w/overflow + strainer, or equal.
- HAND DRYER (both heads): (2) Excel ThinAir TA-SB surface mount, or equal.
- PAPER TOWEL DISPENSER (both heads): (2) MaineDOT standard issue
- TOILET PAPER DISPENSER (2) MaineDOT standard issue
- VANITY MIRROR (both heads): (2) Bobrick Model B-165-2430, or equal.
- WASTE RECEPTACLE (all heads): Bobrick surface mounted Model B-279 or equal.
- GRAB BARS (all heads): (1 x 36" Bobrick B5806-36) and (1 x 42" Bobrick B5806-42), or equal.

644.0.6 PASSENGER HEADS

The design calls for (2) unisex passenger heads, one each on the port and starboard Main-Deck.

644.0.6.1 ADA STARBOARD SIDE MAIN-DECK HEAD

The STARBOARD side passenger head shall be ADA accessible and comply with ADAAG guidelines in all respects. Toilet transfer grab bars (Bobrick or equal) shall be installed in compliance with the ADAAG July 2013 requirements. The installation of the toilet shall adhere to ADAAG height and positioning dimensions. Hand dryers, vanity arrangement, lighting switches, mirror, etc. shall comply with ADAAG Guidelines.

645.1 PASSENGER, CREW, & PILOTHOUSE SPACES

645.1.1 GENERAL

The Main-Deck P/S Passenger Cabins, Passenger Heads, and Pilothouse shall be finished to a commercial standard with drop ceilings, finished lined side and ends joiner bulkheads from the

deck to overhead drop ceiling, painted decks, recessed lighting, and marine grade furnishings. Heads shall be fitted with stainless bulkhead linings. A USCG-approved type bulkhead and lining system shall be used. Final finishes shall be reviewed and approved by MaineDOT OREP. Sound insulation and isolation treatment shall be provided as necessary to assure that acceptable decibel levels are maintained in all crew and passenger spaces. Joiner system is to be by Rigidized Metals Corp., Ayres, or approved equal. All joiner system components shall be incombustible.

645.1.2 PILOTHOUSE

The Pilothouse shall be fitted with a forward navigation console similar to the consoles on existing MaineDOT fleet vessels. There shall be a fixed helm chair on center; chart table w/storage under; and a settee as directed by Maine OREP; publication rack; a frame for required USCG documents; and all navigation, control, and alarm equipment. The helm chairs shall be Llebroc Industries, or equal, (Color to be approved by the MaineDOT OREP).

The consoles shall be steel or aluminum framed, fabricated and sheathed with low reflective decorative laminate (Color to be approved by MaineDOT). The Pilothouse console shall be designed to accommodate an operator seated in the helm chair with control functions and navigational instrumentation within easy reach. All displays shall be readable in sunlight. All primary and safety Controls and equipment shall be provided with night backlighting and shall have brightness Controls dim to dark.

The CONTR shall fabricate a full scale mock-ups of the proposed consoles out of lightweight plywood or other suitable material and assemble this mock-up in an interior space made suitable for the purpose. Portable full-scale cutouts of all console mounted equipment including controls, instrumentation, alarm panels, screens, access panels, etc. shall be provided. The CONTR shall work with MaineDOT marine management and designated MaineDOT employees and/or Sub-contractors to verify the exact placement of all equipment, to eliminate possible interferences, to maximize maintenance accessibility, and to promote ergonomic and logical operational function.

When all equipment has been placed, photographs shall be taken of the arrangement and accurate dimensions shall be verified. The pilothouse consoles shall be constructed and equipment installed according to the approved mock-up plans.

645.1.2.1 PILOTHOUSE EQUIPMENT & FURNISHINGS

- CHAIRS – HELM: Fixed; LleBroc LX Series 1 w/pedestal package 4BRLX01 or equal
- CHART TABLE: Custom fabrication w/chart drawer and cabinet with doors under
- SETTEE: 3'-0" overall length, upholstered, w/stowage bin below, height to matched chairs
- MAIN MONITORING & ALARM CONSOLES: designed by EMI Marine

645.1.3 MAIN DECK PASSENGER CABINS

- 645.1.3.1: The Main - Deck passenger cabins P&S shall be fitted with interior seating for (12) passengers on the port side and (19) passengers on the starboard side. Seating shall be by Freedman Seating, Chicago, IL, Model Gemini, or approved equal. Interior seats are to have upholstered removable backs and seats. Installation shall be with stud welded to the deck and finish cap nuts. The seat bases will need to be custom built to accommodate the baseboard heaters along the perimeter of the bulkheads. Seating upholstery and frame finish colors shall be approved by MaineDOT.
- 645.1.3.2: Passenger heads P&S Main-Deck shall be fitted with toilet, lavatory, mirror with lighting, soap dispenser, hand dryer, grab rails, and stainless trash container. The starboard side Main-deck passenger head shall be ADA outfitted in all respects including grab rails, ADA compliant toilet, lavatory, hand dryer, and slanted mirror (See Section 644.0.1).
- 645.1.3.3: The CONTR shall provide and install (2) sets of wheel chair tie downs in the starboard Main-Deck passenger space to be located to the approval of the OREP. Tie downs shall be Q'Straint M Series, or equal.
- 645.1.3.4: All bulkhead and deck surface finishes shall be of non-combustible material with color/pattern approved by MaineDOT OREP.

645.1.4 SUPERSTRUCTURE EXTERIOR ACCOMMODATIONS

The exterior 01 deck port shall be fitted with exterior seating for (6) passengers. The exterior 01 deck starboard shall be fitted with exterior seating for (20) passengers. Seating shall be by Freedman Seating, Chicago, IL, Model Gemini or approved equal with rigid plastic backs and seats. Installation shall be with studs welded to the deck and finish cap nuts. Seating body and frame finish colors shall be approved by MaineDOT. Each exterior seat shall be provided with drain hole in center to drain out rainwater.

645.1.5 SPARE SEATING

CONTR shall supply (3) spare single passenger seats and (2) spare double seats. Spare seats shall be crated for storage and shipped directly to a MaineDOT storage facility as designated by MaineDOT.

654.1 UTILITY, CREW, & WORK SPACES

654.1.2: **MISCELLANEOUS ENGINE ROOM EQUIPMENT**

Rag bucket – metal with hinged top, red, to approval of the MaineDOT OREP

Trash bucket – metal to approval of the MaineDOT OREP

654.1.3: **DECK LOCKERS**

Steel shelving to the approval of the MaineDOT OREP

SECTION 800 INCLINING

The following specifications provide for items not covered elsewhere in these Specifications that are, however, required to be performed under this contract. A number of SWBS 800 Sections have been moved to Section 0.0 at the OWNER's option.

- 843.1 INCLINING EXPERIMENT

843.1 INCLINING EXPERIMENT

843.1.1 GENERAL SCOPE

MaineDOT, Gilbert Associates, and the CONTR shall schedule an Inclining Experiment for a mutually agreeable date. Prior to the test, Gilbert Associates will submit the Inclining Experiment procedure to USCG/MSD for approval. Thirty days must be allowed for the USCG/MSD submittal and approval; therefore the CONTR is obligated to stay in communication with Gilbert Associates, MaineDOT's Design Agent, as to schedules and particulars of the Inclining Experiment evolution.

843.1.2 PREPARATION & EQUIPMENT

The CONTR shall prepare the vessel in all respects for the Inclining Experiment. The CONTR shall provide all crane services, rigging, labor, certified weights, and materials to perform the Inclining Experiment in accordance with the Inclining Procedure which has been prepared and submitted to USCG/MSD by Gilbert Associates. The Inclining Procedure shall be written in accordance with the specifications of USCG (MSD), NVIC 15-81 and ASTM Volume 01.07 "Shipbuilding" Standard F1321. The CONTR shall supply all necessary Inclining Experiment apparatus including, but not limited to, required certified weights, (3) pendulums and oil filled troughs (or other approved apparatus), a small powered boat or powered float (with operator), and weight moving apparatus.

So far as possible, all tanks and voids shall be dry and opened for USCG inspection. Where this is not possible, tanks shall be accurately sounded and liquid levels recorded. A positive visual means of proving the tank levels in the presence of the USCG Inspector shall be prepared. This may mean removal of bolted plate scuttles and use of a sounding tape for direct reading.

NOTE: The Local USCG Inspector will require copies of the certified weights. These weights must have been certified within the time frame as required by the Inspector. It is the CONTR's responsibility to make sure that the weights and their certifications will be available to and acceptable to the observing USCG Inspector prior to the scheduled day of the Inclining Experiment.

843.1.3 PROCEDURES

Gilbert Associates shall supervise the Inclining Experiment, record results, and submit same to USCG/MS. A copy of the raw data derived from the Inclining Experiment must be submitted to the attending USCG Inspector at the completion of the test. On the day before the scheduled test, the CONTR and Gilbert Associates shall jointly inspect the condition of the vessel to certify that all preparations are complete in accordance with the Inclining Procedure as approved by USCG/MS.

No work or personnel movements on or off the vessel can be scheduled during the Inclining Experiment process. Weather conditions must be acceptable to the USCG Inspector. Berthing with slack lines and removed gangway will be a requirement.

SWBS SECTION 900 TESTS & TRIALS, SERVICES

The following specifications provide for Tests & Trials and services required to be performed under this contract:

- 982.0 GENERAL SCOPE
- 982.1 SHOP TESTS
- 982.2 DOCK & SEA TRIALS
- 983.3 DELIVERY
- 997.1 LAUNCHING & DRYDOCKING

982.0 TESTS & TRIALS GENERAL SCOPE

The CONTR shall develop a Test Schedule to demonstrate the installation, capability, and performance of all ship systems to the satisfaction of the attending USCG Inspector and the MaineDOT OREP. The testing requirements of 46 CFR Subchapter T and those as described in these Specifications shall be adhered to.

The Test Schedule shall include CONTR provided Test Report Sheets. These shall be filled out for each test and signed off by the MaineDOT OREP; the CONTR's representative; and, if applicable the attending USCG Inspector and/or the Manufacturer's Rep. Shop tests, ship installation tests, and trial tests shall be scheduled and completed to the satisfaction of the MaineDOT OREP and attending USCG Inspector.

Tests which are not completed successfully or do not pass the Specification criteria on the first attempt shall be repeated until such deficiencies are cleared. The test title and brief description; any deficiencies and/or corrections; and the date of satisfactory completion of each test shall be recorded.

The CONTR shall engage Tech Reps and/or utilize such additional equipment as necessary to accomplish successful tests at no cost to MaineDOT. The CONTR shall ensure that Tech Reps attend commissioning, tests, and trials for major machinery or system components. These shall include, but may not be limited to, switchboards, alarm and monitoring, steering gear, gensets, main propulsion engines, navigational electronics, and the fire suppression system.

Testing should occur in the following sequence:

1. Shop Tests
2. Installation Tests
3. Operational Tests
4. Dock Trials
5. Sea Trials

The Contractor shall provide all consumables required to accomplish testing and trials, including cooling system additives, lube oil, fuel oil, hydraulic oil, and other materials required to demonstrate the functioning and performance of ship systems and the vessel itself.

982.1 SHOP TESTS

Primary machinery and equipment shall have passed factory "shop" tests before delivery to the CONTR's facility. The manufacturer or vendor shall provide the CONTR with certificates demonstrating compliance with this requirement. Testing shall be in accordance with the recommendations of SNAME T&R 3-39 Guide for Shop and Installation Tests. Equipment to be Shop Tested shall include (but not be limited to) the following:

- Propulsion engine testing to demonstrate operation over the entire range of engine speeds and loads. Measurement of all relevant parameters to demonstrate engine performance. Testing of all safety and interlock devices. Post-run inspections of critical components.
- Reduction gear inspection and testing, including gear tooth contact and casing alignment inspection, operational testing of lube oil/hydraulic oil system operation, operation of the gear at rated speed for one hour, and post run inspections of critical components.
- Auxiliary engine and generator testing to demonstrate operation over the entire range of loads. Generator load shall be built up in 25% increments of 30 minutes each to 100%, which shall be maintained for four (4) hours, followed by 110% rated load for two (2) hours. Loading shall be based on current (Amperes) and a power factor of 0.8.
- Bow thruster, and bow thruster hydraulic motor, tested at a range of speeds from 0 to 100% of full load.
- The main switchboard shall be tested as required in accordance with the DVPT and Fault Current Analysis schedules.
- Testing and calibration of safety relief valves (furnace).
- Testing and calibration of all mechanical system field instruments; analog pressure/temperature gauges, continuous pressure/temperature signal transmitters, pressure/temperature switches.

Pipes, valves and fittings shall have material and pressure test certificates if required by the regulatory agencies.

982.2 DOCK & SEA TRIALS

982.2.1 GENERAL SCOPE

Dock and Sea Trials shall be performed to the satisfaction of the MaineDOT OREP and, as required, by the attending USCG Inspector. Trials shall be scheduled mutually by the CONTR, the MaineDOT OREP, and representatives of the Local OCMI.

The CONTR shall provide Check-Off forms for both Dock and Sea Trials. These forms shall be approved in advance of trials by the MaineDOT OREP. Dock trials shall commence only upon the approval of the MaineDOT OREP and the mutual agreement of the CONTR.

Sea Trials will be performed using the SNAME Technical & Research Bulletin #3-47 and these Specifications for guidance. All Dock and Sea Trial Data shall be recorded and provided to the MaineDOT OREP.

982.3 DOCK TRIALS

Dock trials shall be scheduled for a date and time mutually agreeable to the OWNER, CONTR, and the attending USCG Inspector. The OWNER may wish to have additional personnel on hand for these trials and, depending upon the CONTR's venue, it may be necessary to plan travel in advance. It is the CONTR's responsibility to provide the USCG Inspector assigned to the project with sufficient advance of dock trial schedules. The CONTR shall be responsible for all costs associated with Dock Trials

The purpose of Dock Trials is to test all equipment and systems under operational conditions prior to moving away from the security of the construction or fit-out berth. Some testing and approvals may be accomplished in advance of the Dock Trial schedule.

982.3.1 PRELIMINARY DOCK TRIAL SCHEDULE

The final dock trial schedule of test items shall be agreed upon in advance by the MaineDOT OREP and CONTR. The Dock Trial principle is to perform system and equipment operations so that Sea Trials will be completed without problems.

The vessel shall be fueled under the supervision of the CONTR's Project Manager and the MaineDOT OREP (or other designated MaineDOT representative) at a time mutually acceptable to the all parties. The CONTR shall provide fuel truck access to the vessel's fueling station and shall allow for labor and miscellaneous materials to assist with the fueling. Past experience has found that connection fittings, bucket, oil absorbent "diapers", etc. may be required. Fuel for tests, trials, and delivery is to the CONTR's account.

The following schedule is "preliminary" and only to serve as a guide. Any items that can be approved in advance can be eliminated; however, MaineDOT's management personnel may be on hand and may call for performance demonstrations of particular Contract task items.

- 1) Main Engines, Reverse/Reduction Gears, and PTO motors: Start up, forward & reverse control, shut downs
- 2) Generators: Start up, power load, shifts, shut downs, sensors. The CONTR shall allow for a Load Bank test.
- 3) Bow Thruster: Hydraulic motor, thruster operation and control
- 4) Main Switchboard: Operational performance, shift shore to ship's power and back
- 5) Rescue Boat, rescue boat motor, and Davit weight and operational
- 6) Electrical Systems: Compliance with 46 CFR Subchapter T and IEEE 45; Operational
- 7) Lighting and Receptacle Tests: Operational
- 8) Pilothouse: Navigation and communication equipment (all)
- 9) Pilothouse: Alarm systems (all)
- 10) Pilothouse: Security systems (all)
- 11) Steering gear: Operational performance, emergency operation (2 sets)
- 12) Fire Main System: Operational performance
- 13) Bilge System: Operational performance
- 14) Potable Water System: Operational Performance
- 15) Fuel Oil System: Operational Performance
- 16) Compressed Air System: Operational Performance

- 17) Vents, Fills, & Sounds: Operational
- 18) Engine cooling Systems: Operational
- 19) HVAC system: Operational performance (heating and cooling)
- 20) Engine room ventilation system: Operational performance
- 21) CCTV Security System: Operational
- 22) Noise Levels: Test and comparison to NVIC 12-82
- 23) Flushing Water: Operational at all points
- 24) Lube Oil: Nozzle Operational in ER
- 25) Bow Doors: Operational Performance

982.3.2 PIPING & MECHANICAL SYSTEMS

As a part of Dock Trials, the CONTR shall test the functions of the Piping & Mechanical Systems. The CONTR shall test all pumps, fans, the compressor, the boiler, heat exchangers, and equipment to demonstrate proper operational service. Equipment shall be run at steady state for a period of one (1) hour or one (1) full duty cycle, whichever is less. Prior to a pump test, the CONTR shall verify that the pump is primed with its service fluid.

The following steady state test conditions shall be measured and recorded:

- For centrifugal pumps: pump suction and discharge and flow rate, record motor current
- For positive displacement pumps: pump differential pressure and flow rate, record motor current
- For fans: fan static pressure and flow rate
- Fire Main test full pressure and record at the two highest fire stations in the system

All modes of control for a piece of equipment shall be tested (i.e., hand/off/auto, local/remote). Auto start/stop control shall be demonstrated to initiate action at the correct set points. Pressure and temperature settings of control instrumentation shall be adjusted as needed.

Pressure/temperature regulating valves or control features shall be tested to demonstrate that the correct set point is maintained. Set points shall be adjusted as needed to ensure proper system function. Mechanized control actuators for valves and dampers shall be tested for proper operation.

982.3.3 ELECTRICAL SYSTEMS

As a part of Dock Trials, the CONTR shall test the functions of the Electrical Systems. The CONTR shall demonstrate the operation of the electrical distribution system on both shore power and ship's power. All equipment shall be tested under normal operational load. Test all switches and control devices for proper function. Circuit breakers shall be tested by manually opening under load. Shore power available at the OWNER'S terminals is 240V, 3-phase, 200 Amp.

The CONTR shall test all motor controllers for proper function. Motors shall be operated at a steady state for a period of one (1) hour or one (1) full duty cycle, whichever is less. The

CONTR shall measure and record voltage and amperage at various phases of motor speed. Automatic thermal control devices, alarm devices, and indicator devices shall be checked and calibrated as required.

Electronic equipment shall be tested under the supervision of the manufacturer's Tech Rep. The RF electronic system shall not be considered complete until the FCC inspection and certification has been accomplished. The CONTR is responsible for attaining the FCC vessel station certification. The certificate shall be posted in the Pilothouse.

982.3.4 ALARM & MONITORING SYSTEMS

As a part of Dock Trials, the CONTR shall test the functions of the Alarm & Monitoring Systems. In accordance with the PSTP and DVTP, each alarm shall be tested to demonstrate actuation at the correct set points. Each alarm channel shall be tested independently to demonstrate that the required audible/visual alarm indication is given. For instance, pressure switches shall be subjected to a false pressure signal to test the internal pressure-sensing and switching capability. False electrical signals or the alteration of alarm system set-points to mimic alarm conditions are prohibited, except in cases where it is necessary to protect equipment from damage or is impractical to do otherwise.

The CONTR shall develop and perform the Periodic Safety Test Procedures (PSTP) and Design Verification Test Procedures (DVTP) as required in the CFRs. Testing shall be performed with the guidance of the on-site Tech Rep for the propulsion engines, reduction gears, steering systems, and alarm/monitoring system. Tests shall be accomplished in the presence of the MaineDOT OREP and the attending USCG Inspector.

Demonstrate that alarm circuits do not alarm under normal transient conditions when equipment is being started or shutdown, or during operator command changes such as rapid rpm reduction of the main propulsion system. Adjust delay timers and dead band settings as necessary to avoid nuisance alarms.

982.3.5 PROPULSION CONTROLS

As a part of Dock Trials, the CONTR shall test the functions of the Main Engine Propulsion Controls from the Pilothouse conning station and engine room console. Tests shall include:

- Engine starting and shutdowns
- Local engine speed controls
- Pilothouse and engine room engine speed controls
- Transfer of control functions
- Pilothouse emergency propulsion engine shutdown
- Proper operation of remote indicators for shaft rpm

982.3.6 STEERING GEAR

As a part of Dock Trials, the CONTR shall test the functions of the Steering gear systems from the Pilothouse and Lazarette conning stations. Tests shall include:

- Local/remote starting and stopping of steering gear HPU hydraulic pumps
- Rudder response to helm commands over the full range of motion (stop to stop) from the local control station and from each Pilothouse conning station
- Time rudder swing rates from hard over to hard over in both directions with each hydraulic pump
- Operation of the steering system in follow-up and non-follow-up modes
- Verify that the hydraulic system pressures and temperatures are within normal operating limits and those hydraulic system components such as pressure regulating valves, relief valves, etc. function properly.
- Operation and calibration of the Pilothouse and Lazarette rudder angle indicators

982.3.7 BOW THRUSTER

As a part of Dock Trials, the CONTR shall test the functions of the bow thruster systems from the Pilothouse conning station. Tests shall include:

- Local/remote starting and stopping of bow thruster motor.
- Bow thruster response to speed and directional controls

982.4 SEA TRIALS

982.4.1 GENERAL

A Sea Trial will be performed to generate a baseline measure of speed; maneuvering, steering; and handling characteristics. Sea trial results shall be recorded and all data shall be provided to MaineDOT. All main propulsion and auxiliary machinery equipment and systems shall be tested to full operational capability to the satisfaction of the USCG inspector, MaineDOT, and the major equipment Tech Reps, as appropriate. The CONTR shall be responsible for all costs associated with Sea Trials including, but not necessarily limited to: Crewing; Tech Rep attendance; consumables such as fuel, lubrications, etc.; bottled water, beverages, and light lunch for riding personnel; pilotage, if required; and line handlers.

Drafts, tank soundings, and the names of all personnel aboard shall be recorded for sea trials. The following trials shall be performed to the satisfaction of MaineDOT's OREP and the attending USCG Inspector.

All CONTR, Vendor, and MaineDOT personnel engaged on Sea Trials shall supply the CONTR, in advance of the date of Sea Trials, with identification (Identification may be TWIC) at the CONTR's direction and discretion.

982.4.2 ENDURANCE TRIAL

A four (4 total) hour endurance trial shall be performed to demonstrate the vessel's sustained operation at full speed (2 hours in each direction).

982.4.3 MANUEVERING TRIALS

A series of maneuvering tests shall be used to evaluate vessel maneuverability and to measure basic course-keeping and turning qualities. The following tests shall be carried out:

- Quick reversal from ahead to astern
- Quick reversal from astern to ahead
- Crash Stop from full speed ahead (time to stop and distance travelled recorded)
- Ahead and astern steering tests, steering system transfer, emergency steering
- Turning circles to both port and starboard at full speed
- Zig-zag maneuvering test to determine directional stability
- Bow thruster operational tests port and starboard

982.4.4 PERFORMANCE TRIALS

- Speed and Maneuvering Trials will be conducted in the vicinity of the CONTR's construction venue.
- Vessel speed will be measured in accordance with a Trial Plan proposed by the CONTR and mutually agreed to by the CONTR and MaineDOT. Reference shall be Guide for Sea Trials, SNAME Technical & Research Bulletin 3-47, 1989.
- Vessel speed will be measured by DGPS at approximately six (6) RPM points. If current, sea, or wind are factors during the trials, reciprocal runs shall be made and speed averaged.
- Results of the Speed Trials will be recorded and provided to MaineDOT.
- Sea Trial maneuvering tests shall include maneuvering tests, steering capabilities, and crash stops.
- If a re-trial is necessary as a result of a failure of OFE equipment, the cost of the re-trial shall be paid by MaineDOT. If re-trial is necessary as the result of a failure of CONTR provided equipment, the cost of the re-trial shall be paid by the CONTR.
- Prior to delivery, the ship's magnetic compasses shall be adjusted by a qualified compass adjuster and Deviation Cards shall be provided.
- The following parameters shall be measured and recorded:
 - Shaft rpms
 - Fuel rack position (or equivalent)
 - Fuel consumption (each engine)
 - Speed through water
 - Shaft bearing temperatures
 - After cooler circuit press/temp
 - Charge air system temp/pressure
 - Lube oil system temp/press
 - Fuel Oil System temp/press
 - Jacket water temp/press

- Reduction gear lube oil temp/press
- Exhaust temp/back press

982.4.5 PRELIMINARY SEA TRIAL SCHEDULE

The following schedule is “preliminary” and shall serve as a guide. The vessel Captain and Chief Engineer, the MaineDOT OREP, and/or the attending USCG Inspector may wish to modify this list according to the results of the Dock Trials and the circumstances prevalent at the time of Sea Trials.

- 1) Magnetic Compass adjustment
- 2) Endurance trials
- 3) Maneuvering trials
- 4) Communication Equipment and Systems
- 5) Navigation Equipment, Electronic
- 6) Navigation Equipment, non-Electronic
- 7) Propulsion control system
- 8) Steering Systems
- 9) Anchor System
- 10) Rescue Boat and Rescue Boat Davit
- 11) Emergency drills for delivery crew
- 12) Systems & equipment as required by the attending USCG Inspector

982.4.6 MAGNETIC COMPASSES

The magnetic compasses shall be “swung” by a compass adjuster. Compass adjustment shall be to the CONTR’s account. The compass adjuster shall provide new deviation cards.

982.4.7 RADAR HEADING FLASHERS

The Electronic Navigation Tech Rep may be able to calibrate radar heading flashers during Dock Trials or at another time prior to Sea Trials. If this is not the case, radar heading flasher calibrations shall be accomplished as a part of Sea Trials.

982.4.8 SAT COMPASS & AUTO PILOT

Demonstrate proper functioning of the sat compass and auto pilot system.

982.4.9 MAIN ENGINE PROPULSION CONTROL SYSTEM

Demonstrate proper functioning of the Propulsion Control System by running through the ranges of power settings for ahead and astern, and demonstrating emergency procedures.

982.4.10 STEERING GEAR

Start each test (#1 and #2 steering pumps) with the vessel underway at full RPM, rudders amidships. Test steering of the vessel through the full range of rudder angles. Test for

conformance with rudder speed requirements. Test steering controls in lazarette. Test emergency steering functions.

982.4.11 NOISE AND VIBRATION SURVEY

The CONTR shall provide for an independent Noise and Vibration Analysis Surveyor, Noise Control Engineering, Billerica, MA, or equal, to attend sea trials and to record noise and vibration levels in machinery spaces, crew work and living spaces, and passenger spaces. The written report of this survey shall be provided to the CONTR and to the OREP.

Maximum noise levels allowed shall be as determined by the recommendations detailed in NVIC 12-82.

982.4.11 POST TRIAL INSPECTIONS

Following underway sea trials oil samples shall be taken from main engines, gear boxes, and generator engines. Samples shall be sent to an approved lab for analysis. Written reports shall be provided to the OREP to establish a base line.

982.4.12 ADDITIONAL TESTS & TRIALS

The attending USCG Inspector may require additional tests and trials than the preliminary trials listed above. The CONTR is responsible for completing required tests and trials and shall allow time in the Dock & Seat Trial schedules for such eventuality.

983.0 DELIVERY

983.0.1 GENERAL SCOPE

The CONTR shall deliver the vessel to the OWNER in accordance with the Contract in a clean, operational condition and in all respects ready for sea. The CONTR shall provide properly licensed captain and crew for the delivery trip. The vessel shall be delivered ready to receive liquids, stores, supplies, vehicles, and passengers on revenue producing runs without further maintenance or housekeeping being required.

Particular emphasis shall be placed on the condition of all tanks. Special care shall be exercised to see that internal surfaces of tanks, pipelines, and machinery are clean and free from any foreign substance.

All USCG required safety gear shall be installed on board, inspected, and ready for use. The valid USCG Certificate of Inspection and Stability Letter shall be posted.

983.0.2 DEFICIENCIES

The existence of any major uncorrected deficiency which has been caused by the CONTR in the course of completing the Contract and which may affect the safe navigation or the immediate on-line use of the vessel will be sufficient cause to postpone or cancel delivery pending the correction of the item(s) concerned.

All major system tests shall be completed prior to Sea Trials, and ALL tests shall be completed prior to delivery. The existence of a large number of uncorrected minor deficiencies remaining will likewise be cause for postponement or cancellation of delivery until their number has been reduced to a level acceptable to MaineDOT.

983.0.3 FINAL SURVEY

To insure that the vessel is in a proper condition for delivery, a Final Joint Survey will be made by the MaineDOT OREP and the CONTR at least three (3) days prior to the scheduled delivery date. This Survey shall include a review of any outstanding deficiencies. An agreement based on this Survey shall be reached between the MaineDOT OREP and CONTR as to the extent of further cleaning and correction of minor deficiencies, which will be, required prior to delivery. This agreement shall also determine which work, if any, will be allowed to be deferred until after the time of delivery. In this regard, it must be recognized that the CONTR is required to deliver the vessel free of all known deficiencies and that deferral of corrective work is solely a temporary waiver of this responsibility.

The CONTR, therefore, must agree to perform corrective work at the earliest time, which will not interfere with the scheduled use of the vessel. The OWNER retains the option to come to a mutual agreement with the CONTR to accomplish this work at a future date under a plan of mutually agreeable compensation.

997.1 LAUNCHING & DRYDOCKING

The CONTR shall be responsible for the satisfactory launching of the vessel at a time to be mutually agreed upon by all parties concerned. The CONTR shall be responsible for dry docking the vessel, if drydocking is required subsequent to launching and prior to delivery to MaineDOT. If the vessel is launched into a salt water environment more than 90 days prior to delivery, the CONTR may be required, at the Owner's option, to dry dock the vessel for bottom inspection, cleaning, and coating repairs sufficient to maintain the coating warranty.

If underwater damage resulting from the launch, or other events, is observed or suspected the CONTR shall be responsible to dry dock the vessel in order to affect repairs. Suspected damage shall be first confirmed by a diver and video record. A decision to dry dock the vessel shall be made in accordance with the information gleaned from the launch events and by the diver's video. If the OWNER requires a dry docking, and no damage is found, the dry docking shall be on the OWNER's account. In any case, if the USCG OCMI requires a dry docking due to suspected launch damage or other events occurring prior to delivery, the CONTR shall comply with the OCMI's directive at the CONTR's expense.

END OF TECHNICAL SPECIFICATIONS

2020 STANDARD DETAIL UPDATES

Standard Details and Standard Detail updates are available at:
<http://maine.gov/mdot/contractors/publications/standarddetail/>

<u>Detail #</u>	<u>Description</u>	<u>Revision Date</u>
502(19)	Bridge Drains	12/08/2021
507(20)	Steel Approach Railing 3-Bar	2/11/2021
507(21)	Steel Approach Railing 3-Bar	2/11/2021
507(22)	Steel Approach Railing 3-Bar	2/11/2021
507(23)	Steel Approach Railing 3-Bar	2/11/2021
507(27)	Steel Approach Railing	2/11/2021
526(01)	Portable Concrete Barrier	1/14/2021
526(01A)	Portable Concrete Barrier	1/14/2021
526(01B)	Portable Concrete Barrier	1/14/2021
526(02)	Portable Concrete Barrier	1/14/2021
526(02A)	Portable Concrete Barrier	1/14/2021
526(03)	Portable Concrete Barrier	1/14/2021
526(04)	Portable Concrete Barrier	1/14/2021
526(04A)	Portable Concrete Barrier	1/14/2021
526(04B)	Portable Concrete Barrier	1/14/2021
603(10)	Concrete Pipe Ties	6/10/2021
605(01)	Underdrain	8/13/2021
606(23)	Standard Bridge Transition – Type “1”	2/11/2021
606(24)	Standard Bridge Transition – Type “1A”	2/11/2021
608(02)	Detectable Warnings	6/10/2021
609(09)	Precast Concrete Vertical Curb	2/11/2021
627(07)	Crosswalk	2/22/2022
627(08)	Crosswalk	2/22/2022
643(11)	ATCC Cabinet	12/14/2020
801(11)	Pedestrian Ramp Notes	6/10/2021
801(12)	Pedestrian Ramp Requirements	8/13/2021
801(13)	Ramp Length Table	6/10/2021
801(14)	Parallel Pedestrian Ramp	6/10/2021
801(15)	Perpendicular Pedestrian Ramp – Option 1	6/10/2021

801(16)	Parallel Pedestrian Ramp – Option 2A	6/10/2021
801(17)	Perpendicular Pedestrian Ramp – Option 2A	6/10/2021
801(18)	Parallel Pedestrian Ramp – Option 2B	6/10/2021
801(19)	Perpendicular Pedestrian Ramp – Option 2B	6/10/2021
801(20)	Parallel Pedestrian Ramp – Option 3	6/10/2021
801(21)	Perpendicular Pedestrian Ramp – Option 3	6/10/2021
801(22)	Side Street Pedestrian Ramp	6/10/2021
801(23)	Parallel Pedestrian Ramp – Esplanade	6/10/2021
801(24)	Perpendicular Pedestrian Ramp – Esplanade	6/10/2021
801(25)	Island Crossings	6/10/2021
801(26)	Blended Transition	6/10/2021
801(27)	Pedestrian Ramp Adjacent to Driveway or Entrance	6/10/2021
802(05)	Roadway Culvert End Slope Treatment	1/03/2017

SUPPLEMENTAL SPECIFICATIONS
(Corrections, Additions, & Revisions to Standard Specifications – March 2020)

SECTION 101
CONTRACT INTERPRETATION

101.2 Definitions

Holidays Amend this paragraph by adding “**Juneteenth**” between ‘Memorial Day’ and ‘Independence Day’.

SECTION 102
BIDDING

102.11 Bid Responsiveness Revise the paragraph that states
“The Bid is not signed by a duly authorized representative of the Bidder.” So that it reads:

“The Bid is not signed by a duly authorized representative of the Bidder.

- **Properly submitted electronic bids meet this requirement.**
- **Paper bids must include at least one signed copy of the Contract Agreement Offer & Award form.”**

SECTION 104
GENERAL RIGHTS AND RESPONSIBILITIES

104.2.1 Furnishing of Right-of-Way Revise the last sentence in the first paragraph by removing “105.4.5 – Special Detours” and replacing it with “**105.4.5 – Maintenance of Existing Structures.**”.

SECTION 105
GENERAL SCOPE OF WORK

105.10.2 Requirements Applicable to All Contracts Under section A, number 2, in the first sentence of the first paragraph, revise this Section by replacing the word “handicap” in two places with the word “disability” so it now reads:

“2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, State that all qualified applicants will receive consideration for employment without regard to race, color, sexual orientation, religious creed, sex, national origin, ancestry, age, physical disability, or mental disability.”

SECTION 106
QUALITY

106.6 Acceptance Revise this Subsection by replacing the paragraph beginning with “Acceptance of Hot Mix Asphalt Pavement will be based” with:

“Acceptance of Hot Mix Asphalt Pavement will be based on Method A or C Statistical Acceptance, or Method B or D Acceptance as specified. The method of acceptance for each item is defined in Special Provision, Section 403, Hot Mix Asphalt Pavement. When items of Hot Mix Asphalt Pavement are not so designated, Method A will be utilized whenever there are more than 1000 tons per Hot Mix Asphalt Pavement item, and Method B will be utilized when there are less than or equal to 1000 tons per Hot Mix Asphalt Pavement item.”

Revise Subsection “B” by removing it and replacing it with:

“B. Items not designated for Statistical Acceptance will utilize Method B or D Acceptance testing to validate the quality of the material incorporated into the Project. For material paid under Item 403.209 – Method D, or designated to be visually accepted, the Contractor shall provide the Department with a Certification Letter that indicates that the material supplied complies with the Specifications. Test results representative of the certified material shall be attached to the letter.

The Department will randomly sample and test the certified Material for properties noted in Table 1 of Section 502 - Structural Concrete or Table 14 of Section –401.21 Acceptance Method B & D. Material will be subject to rejection as noted in Structural Concrete Section 502.195 - Quality Assurance Method C Concrete or Hot Mix Asphalt, Section 401.2022 Pay Adjustment – Method B & D.”

106.7.1 Standard Deviation Method Revise 106.7.1, subsection H by removing the following from the first paragraph:

“Method B: $PF = [70 + (\text{Quality Level} * 0.33)] * 0.01$ ”

SECTION 107 TIME

107.3.1 General Amend this paragraph by adding “**Juneteenth**” between ‘Patriot’s Day’ and ‘the Friday after Thanksgiving’.

SECTION 110 INDEMNIFICATION, BONDING, AND INSURANCE

110.3.9 Administrative & General Provisions Amend this subsection by adding “**Automobile Liability**” under letter A) Additional Insured to the list of exceptions.

SECTION 206 STRUCTURAL EXCAVATION

206.01 Description – *Structural Earth Excavation, Below Grade* delete the entire sentence and replace with “**shall consist of the removal of excavation required for unknown or unanticipated subsurface condition. See 206.04 – Method of Measurement for pay limits.**”

206.04 Method of Measurement – Drainage and Minor Structures Paragraph 1, sentence 2, delete the remainder of the sentence beginning with “....provided the maximum allowable...”

And replace with: “**....in accordance with the following limits:**”

- **Vertical pay limits:**
 - **Below a plane parallel with and 12 inches below the bottom of the drainage or minor structure or**
 - **Below the excavation limits shown in the Bid Documents; whichever is greater.**
- **Horizontal pay limits – The maximum allowable horizontal dimensions shall not exceed those bounded by vertical surfaces 18 inches outside the base, or extreme limits of, the structure, and to the vertical neat lines of underdrain trenches, as shown in the Contract Documents.**

SECTION 401 HOT MIX ASPHALT PAVEMENT

401.19 Contractor Quality Control Amend this Section by adding the following to the end:
“**Failure to comply with the approved QCP will result in work suspension and pay reductions as outlined in Section 106.4.6. The Quality Control Plan Value shall be the total bid value for all items covered by the QCP as identified in Special Provision 403.**”

SECTION 502 STRUCTURAL CONCRETE

502.09 Forms and Falsework Amend this subsection by adding the subsection title “**502.10 Placing Concrete**” after section “D” Removal of Forms and False work” and after the paragraph beginning with “2. Forms and False work, including blocking...”. So that a new subsection starts and reads:

“**502.10 Placing Concrete**

A. **General Concrete shall not be placed until forms”**

502.1701 Quality Control, Method A and B Revise this Section so that the first paragraph and the first sentence of the second paragraph read:

“502.17 Quality Control The Contractor shall control the quality of the concrete through testing, inspection, and practices which shall be described in the QCP, sufficient to assure a product meeting the Contract requirements. The QCP shall meet the requirements of Section 106, Quality, and this specification. No work under this item shall proceed until the QCP is submitted to and approved by the Department. Failure to comply with the approved QCP will result in work suspension and pay reductions as outlined in Section 106.4.6. The Quality Control Plan Value shall be the total bid value for all cast-in-place items covered by the QCP, using the P value listed in Special Provision 502. If no P value is listed, a value of \$350, or bid value per cubic yard, whichever is less, shall be used.

502.1701 Quality Control, Method A and B The QCP shall address all elements that affect the quality of the structural concrete including, but not limited to, the following: “

502.18, Method of Measurement, Revise Subsection ‘F’ by removing the word ‘transverse’ so that it reads: “Saw cut grooving of concrete wearing surfaces, complete and accepted, will be measured for payment as one lump sum.”

502.19, Basis of Payment, Revise the third paragraph by removing the word ‘transverse’ so that it reads: “Saw cut grooving of concrete wearing surfaces will be paid for at the Contract Lump Sum Price, which shall be payment for furnishing all materials, labor, and equipment, including depth gauges and all incidentals, to satisfactorily complete the work.”

(Also see 535.24 and 535.25 for related changes)

SECTION 503 REINFORCING STEEL

Section 503.07 Splicing Revise this section by removing the table and following footnote and replacing them with:

Minimum Lap Splice Length (inches)									
Bar Type	Bar Size								
	#3	#4	#5	#6	#7	#8	#9	#10	#11
Plain or Galvanized	16	20	24	29	38	47	59	72	85
Epoxy or Dual Coated	17	24	36	43	56	71	88	107	128
Stainless	19	24	30	36	47	59	73	89	107
Low-carbon Chromium	24	32	39	47	63	78	97	119	142

“The minimum lap splice lengths in the table above are based on the parameters below. When any of these parameters are altered, appropriate minimum lap splice lengths will be as shown on the Plans.

- Normal weight concrete
- Minimum 28-day concrete compressive strength from 4,000 psi to 10,000 psi

- **Class B tension lap splice**
- **Minimum center-to-center spacing between bars of 6 inches**
- **Minimum clear cover of 2 inches**
- **Nominal reinforcing steel yield strengths**
 - **Low-carbon Chromium = 100 ksi**
 - **Stainless = 75 ksi**
 - **All others = 60 ksi**
- **Reinforcement with yield strengths greater than 75 ksi shall have beam transverse reinforcement and column ties provided over the required lap splice length in accordance with the current edition of the AASHTO LRFD Bridge Design Specifications**

When lap splices are placed horizontally in an element where the concrete depth below the splice will be 12 inches, or more, the indicated lap splice lengths shall be multiplied by a factor of 1.3.”

SECTION 506 SHOP APPLIED PROTECTIVE COATING – STEEL

506.13 Surface Preparation Amend this section by adding this paragraph to the end:

“Steel shall meet the requirements of SSPC SP8 Pickling prior to being immersed in the zinc tanks. Verification of the surface preparation shall be included in the QC documentation.”

SECTION 523 BEARINGS

523.051 Protective Coating Revise this subsection by removing the paragraph beginning with “Anchor rods shall be galvanized...” and replacing with:

“Anchor rods shall be galvanized. When anchor rods are designated to secure bare unpainted steel or painted steel, a dielectric coating (epoxy or bituminous type coatings are acceptable) shall be applied to the anchor rod and/or adjacent steel to prevent contact between galvanized surfaces and painted or unpainted steel.”

523.22 Fabrication Amend this subsection by adding the following: **“Elastomeric Bearings shall be fabricated in accordance with AASHTO M251.”**

SECTION 526 CONCRETE BARRIER

Amend this section by deleting it in its entirety and replacing it with:

“526.01 Description This work shall consist of the furnishing, constructing, erecting, setting, resetting, and removal of concrete barrier and associated elements in accordance with these specifications, the Standard Details, and the lines and grades shown on the Plans or established by the Resident.

The types of concrete barrier are designated as follows:

Portable Concrete Barrier Type I Double faced removable barrier in accordance with the Standard Details.

Permanent Concrete Barrier Type II Double faced barrier as shown on the Plans.

Permanent Concrete Barrier Type IIIa Single faced barrier 32 inches high in accordance with the Standard Details or as shown on the Plans.

Permanent Concrete Barrier Type IIIb Single faced barrier 42 inches high in accordance with the Standard Details or as shown on the Plans.

Permanent Concrete Transition Barrier Barrier of various heights joining steel bridge rail to steel guardrail in accordance with the Standard Details or as shown on the Plans.

Permanent Texas Classic Rail Barrier Traffic rail or sidewalk rail, in accordance with the Standard Details or as shown on the Plans.

526.02 Materials

a. **Concrete** Concrete for barriers, both permanent and portable, shall have a design strength of 5,000 psi.

For cast-in-place barrier: The concrete shall be Class LP, in accordance with Standard Specification Section 502, Structural Concrete.

For precast barrier: The concrete shall meet the requirements of Standard Specification 712.061, Structural Precast Concrete Units, except that the stripping strength for precast barriers is 4,000 psi.

b. **Reinforcing Steel** Reinforcing steel shall meet the requirements of Section 503, Reinforcing Steel.

c. **Structural Steel** Plates and barrier connections shall meet the requirements specified in Standard Specification 504 - Structural Steel and shall be hot dip galvanized after fabrication in accordance with Standard Specification 506, Shop Applied Protective Coating – Steel

d. **Bolts** Bolts shall meet the requirements specified in Section 713.02, High Strength Bolts.

e. Connecting Pins for Portable Concrete Barrier Portable concrete barriers must be connected using a 1- inch diameter pin. The connecting pin must be smooth, not deformed, i.e., reinforcing bar may not be used, and shall meet the strength requirements of ASTM A449 steel. Materials with greater strength may be used with the approval of the Department.

f. Anchor Pins for Portable Concrete Barrier Anchoring to concrete or asphalt will be required when specified on the Plans. When required, portable concrete barriers must be anchored using a 1 ½ - inch diameter anchor pin. The anchor pin must be smooth, not deformed, i.e., reinforcing bar may not be used, and shall meet the strength requirements of ASTM A36 steel. Materials with greater strength may be used with the approval of the Department.

g. Device Crashworthiness MaineDOT is transitioning to MASH2016 criteria for Portable Concrete Barrier on the following schedule:

New Portable Concrete Barrier shall be crash tested and/or evaluated to MASH2016 criteria.

Current Portable Concrete Barrier in useful serviceable condition that is successfully tested to NCHRP Report 350 or MASH2009 criteria may be utilized through December 31, 2029.

Other current Portable Concrete Barrier that is deemed acceptable by the Department may be utilized on projects off the National Highway System through December 31, 2024.

526.03 Construction Requirements

Cast-in-place barriers shall be fabricated in accordance with Standard Specification Section 502, Structural Concrete. Precast barriers shall be fabricated in accordance with Standard Specification 534, Precast Structural Concrete.

Concrete finish for permanent barrier shall be rubbed as defined in Standard Specification Section 502, Structural Concrete, 502.13 D2 or an approved equal.

Portable concrete barrier shall be generally free from fins and porous areas and shall present a neat and uniform appearance.

Permanent barrier shall have a protective coating applied in accordance with Standard Specification Section 515, Protective Coating for Concrete Surfaces.

Reflective delineators for concrete median barrier shall meet the requirements of Special Provision 645, Highway Signing.

Preformed Joint Filler shall meet the requirements specified in Subsection 705.01, Preformed Expansion Joint Filler.

Permissible dimensional tolerances for all concrete barriers shall be as follows:

- a. Cross-sectional dimensions shall not vary from design dimensions by more than $\frac{1}{4}$ inch. The vertical centerline shall not be out of plumb by more than $\frac{1}{4}$ inch.**
- b. Longitudinal dimensions shall not vary from the design dimensions by more than $\frac{1}{4}$ inch per 10 feet of barrier section and shall not exceed $\frac{3}{4}$ inches per section.**
- c. Location of anchoring holes shall not vary by more than $\frac{1}{2}$ inch from the dimensions shown in the concrete barrier details on the Plans.**
- d. Surface straightness shall not vary more than $\frac{1}{4}$ inch under a 10-foot straightedge.**
- e. The barrier shall have no significant cracking. Significant cracking is defined as fractures or cracks passing through the section, or any continuous crack extending for a length of 12 inches or more, regardless of position in the section.**
526.04 Method of Measurement Permanent Concrete Barrier Type II, IIIa, IIIb, Texas Classic Rail, and Precast Median Barrier will be measured for payment by lump sum, complete in place.

Portable concrete barrier, both anchored and unanchored will be measured for payment by lump sum. Lump sum measurement will include verification of the installation and removal of all portable concrete at the completion of the Contractor's operations.

The Contractor shall replace sections of portable concrete barrier, including anchored barrier damaged by the traveling public when directed by the Resident. Replacement sections will be measured for payment in accordance with Standard Specification 109.7, Equitable Adjustments to Compensation and Time.

Transition barrier will be measured by each, complete in place.

526.05 Basis of Payment The accepted quantities of Concrete Barrier Type II, IIIa, IIIb, Texas Classic Rail, and Precast Median Barrier will be paid for at the Contract lump sum price for the type specified, complete in place.

The accepted quantities of Portable Concrete Barrier Type I, both anchored and unanchored will be paid for at the Contract lump sum price. Such payment shall be full compensation for furnishing all materials, assembling, moving, resetting, transporting, temporarily storing, removing barrier, furnishing new parts as necessary, and all incidentals necessary to complete the work.

Portable barrier shall become the property of the Contractor upon completion of the use of the barrier on the project and shall be removed from the project site by the Contractor.

Transition barrier will be paid for at the Contract price each, complete in place.

The accepted quantity of all types of concrete barrier, whether portable or permanent, will be paid for at the lump sum or per each price, as applicable, which payment shall be full compensation for all materials, including reinforcing steel, protective coating, reflective delineators, steel plates and hardware, equipment, labor and incidentals required, as necessary, to complete the work.

Payment will be made under:

	<u>Pay Item</u>	<u>Pay Unit</u>
526.301	Portable Concrete Barrier, Type I	Lump Sum
526.304	Portable Concrete Barrier, Anchored Type I	Lump Sum
526.312	Permanent Concrete Barrier Type II	Lump Sum
526.321	Permanent Concrete Barrier Type IIIa	Lump Sum
526.323	Texas Classic Rail	Lump Sum
526.331	Permanent Concrete Barrier Type IIIb	Lump Sum
526.34	Permanent Concrete Transition Barrier	Each
526.502	Precast Concrete Median Barrier	Lump Sum

SECTION 527 ENERGY ABSORBING UNIT

527.02 Materials Amend this section by deleting it in its entirety and replacing it with:

“MaineDOT is transitioning to MASH2016 criteria for Work Zone Traffic Control Devices on the following schedule:

Portable Crash Cushions will be crash tested and/or evaluated to MASH2016 criteria by January 1, 2030. Current Category 3 devices in useful serviceable condition that are successfully tested to NCHRP Report 350 or MASH2009 criteria may be utilized through December 31, 2029.

Work Zone Crash Cushions shall be selected from the Department’s Qualified Products List of Crash Cushions/Impact Attenuators or approved equal.”

SECTION 535 PRECAST, PRESTRESSED CONCRETE SUPESTRUCTURE

535.24, Installation of Slabs, Beams, and Girders Revise the 5th paragraph by replacing “6.0 and 9.0” to “5.0 and 8.0” so it reads: **“Ready mixed grout shall achieve a design compressive strength of 6,000 psi at 28 days, have an entrained air content of between 5.0 and 8.0 percent, be non-shrink, flowable, and contain a non-shrink additive listed on the Department QPL for expansive cements.”**

535.25, Installation of Precast/Prestressed Deck Panels Revise the 2nd paragraph by replacing “6.0 and 9.0” to “5.0 and 8.0” so it reads: **“Ready mixed grout shall achieve a design compressive strength of 6,000 psi at 28 days, have an entrained air content of between 5.0 and 8.0 percent, be non-shrink, flowable, and contain a non-shrink additive listed on the Department QPL for expansive cements.”**

SECTION 606 GUARDRAIL

Amend this section by replacing it with the following:

606.01 Description This work shall consist of furnishing and installing guardrail components in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans or as established. Guardrail is designated as:

31” W-Beam Guardrail - Mid-Way Splice

Galvanized steel w-beam, 8” wood or composite offset blocks, galvanized steel posts

Thrie Beam

Galvanized steel thrie beam, 8” wood or composite offset blocks, galvanized steel posts

Median guardrail shall consist of two beams of the above types, mounted on single posts.

Bridge mounted guardrail shall consist of furnishing all labor, materials, and equipment necessary to install guardrail as shown on the plans. This work shall also include drilling for and installation of offset blocks if specified, and incidental hardware necessary for satisfactory completion of the work.

Remove and Reset and Remove, Modify, and Reset guardrail shall consist of removing the existing designated guardrail and resetting in a new location as shown on the plans or directed by the Resident. Remove, Modify, and Reset guardrail and Modify guardrail include the following guardrail modifications: Removing plate washers at all posts, except at anchorage assemblies as noted on the Standard Details, adding offset blocks, and other modifications as listed in the Construction Notes or General Notes. Modifications shall conform to the guardrail Standard Details.

Bridge Connection shall consist of the installation and attachment of beam guardrail to the existing bridge. This work shall consist of constructing a concrete end post or modifying an existing end post as required, furnishing, and installing a terminal connector, necessary hardware, and incidentals required to complete the work as shown on the plans. Bridge Transition shall consist of a bridge connection and furnishing and installing guardrail components as shown in the Standard Details.

606.02 Materials Materials shall meet the requirements specified in the following Sections of Division 700 - Materials:

Timber Preservative	708.05
Metal Beam Rail	710.04
Guardrail Posts	710.07
Guardrail Hardware	710.08

Guardrail components shall meet the applicable standards of "A Guide to Standardized Highway Barrier Hardware" prepared and approved by the AASHTO-AGC-ARTBA Joint Cooperative Committee, Task Force 13 Report.

Posts for underdrain delineators shall be "U" channel steel, 8 ft long, 2 ½ lb/ft minimum and have 3/8-inch round holes, 1-inch center to center for a minimum distance of 2 ft from the top of the post.

Reflectorized Flexible Guardrail Markers shall be mounted on all guardrails. A marker shall be mounted onto guardrail posts at the flared guardrail terminal end point and tangent point, both at the leading and trailing ends of each run of guardrail. The marker's flexible posts shall be gray with either silver-white or yellow reflectors (to match the edge line striping) at the tangents, red at leading ends, and green at trailing ends. Whenever the guardrail terminal is not flared, markers will only be required at the terminal end point. These shall be red or green as appropriate. Markers shall be installed on the protected side of guardrail posts unless otherwise approved by the Resident. Reflectorized flexible guardrail markers shall be from the Department's Qualified Products List of Delineators. The marker shall be gray, flexible, durable, and of a non-discoloring material to which 3-inch by 9-inch reflectors shall be applied, and capable of recovering from repeated impacts and meeting MASH 16 requirements. Reflective material shall meet the requirements of Section 719.01 for ASTM D 4956 Type III reflective sheeting. The marker shall be secured to the guardrail post with two fasteners, as shown in the Standard Details.

Reflectorized beam guardrail ("butterfly"-type) delineators shall be mounted on all "w"-beam guardrail. The delineators shall be mounted within the guardrail beam at guardrail posts. Delineators shall be fabricated from high-impact, ultraviolet & weather resistant thermoplastic. Reflectorized beam guardrail delineators shall be placed at approximately 62.5 ft intervals or every tenth post on tangents and at approximately 31.25 ft intervals or every fifth post on curves. Exact locations of the delineators shall be as directed by the Resident. On divided highways, the left-hand delineators shall be yellow, and the right-hand delineators shall be silver/white. On two directional highways, the right-hand side shall be silver/white, and no reflectorized delineator used on the left. All reflectors shall have reflective sheeting applied to only one side of the delineator facing the direction of traffic as shown in the Standard Details. Reflectorized sheeting for guardrail delineators shall meet the requirements of Section 719.01.

Single wood post shall be of cedar, white oak, or tamarack, well-seasoned, straight, and sound and have been cut from live trees. The outer and inner bark shall be removed, and all knots trimmed flush with the surface of the post. Posts shall be uniform taper and free of kinks and bends.

Single steel post shall conform to the requirements of Section 710.07 b.

Single steel pipe post shall be galvanized, seamless steel pipe conforming to the requirements of ASTM A120, Schedule No. 40, Standard Weight.

Acceptable multiple mailbox assemblies shall be listed on the Department's Qualified Products List and shall be MASH 16 tested and approved.

Flared and Tangent w-beam guardrail terminals and guardrail offset blocks shall be from the Department's Qualified Products List. Flared terminals shall be installed with a 4 ft offset as shown in the Manufacturer's installation instructions.

Anchorage assemblies used to anchor trailing ends, radius guardrail, or other ends not exposed to traffic shall meet the applicable standards of "A Guide to Standardized Highway Barrier Hardware" prepared and approved by the AASHTO-AGC-ARTBA Joint Cooperative Committee, Task Force 13 Report, Drawing SEW02a.

Existing materials damaged or lost during adjusting, removing and resetting, or removing, modifying, and resetting, shall be replaced by the Contractor without additional compensation. Existing guardrail posts and guardrail beams found to be unfit for reuse shall be replaced when directed by the Resident.

606.03 Posts Posts for guardrail shall be set plumb in holes or they may be driven if suitable driving equipment is used to prevent battering and distorting the post. When posts are driven through pavement, the damaged area around the post shall be repaired with approved bituminous patching. Damage to lighting and signal conduit and conductors shall be repaired by the Contractor.

When set in holes, posts shall be on a stable foundation and the space around the posts, backfilled in layers with suitable material, thoroughly tamped.

The reflectorized flexible guardrail markers shall be set plumb with the reflective surface facing the oncoming traffic. Markers shall be installed on the protected side of guardrail posts. Markers, which become bent or otherwise damaged, shall be removed and replaced with new markers.

Single wood posts shall be set plumb in holes and backfilled in layers with suitable material, thoroughly tamped. The Resident will designate the elevation and shape of the top. The posts, that are not pressure treated, shall be painted two coats of good quality oil base exterior house paint.

Single steel posts shall be set plumb in holes as specified for single wood posts or they may be driven if suitable driving equipment is used to prevent battering and distorting the post.

Additional bolt holes required in existing posts shall be drilled or punched, but the size of the holes shall not exceed the dimensions given in the Standard Details. Metal around the holes shall be thoroughly cleaned and painted with two coats of approved aluminum rust resistant paint. Holes shall not be burned.

606.04 Rails Brackets and fittings shall be placed and fastened as shown on the plans. Rail beams shall be erected and aligned to provide a smooth, continuous barrier. Beams shall be lapped with the exposed end away from approaching traffic.

End assemblies shall be installed as shown on the plans and shall be securely attached to the rail section and end post.

All bolts shall be of sufficient length to extend beyond the nuts but not more than ½ inch. Nuts shall be drawn tight.

Additional bolt holes required in existing beams shall be drilled or punched, but the size of the holes shall not exceed the dimensions given in the Standard Details. Metal around the holes shall be thoroughly cleaned and painted with two coats of approved aluminum rust resistant paint. Holes shall not be burned.

606.045 Offset Blocks The same offset block material is to be provided for the entire project unless otherwise specified.

606.05 Shoulder Widening At designated locations the existing shoulder of the roadway shall be widened as shown on the plans. All grading, paving, seeding, and other necessary work shall be in accordance with the Specifications for the type work being done.

606.06 Mail Box Post Single wood post shall be installed at the designated location for the support of the mailbox. The multiple mailbox assemblies shall be installed at the designated location in accordance with the Standard Details and as recommended by the Manufacturer. Attachment of the mailbox to the post will be the responsibility of the home or business owner.

606.07 Abraded Surfaces All galvanized surfaces of new guardrail and posts, which have been abraded so that the base metal is exposed, and the threaded portions of all fittings and fasteners and cut ends of bolts shall be cleaned and painted with two coats of approved rust resistant paint.

606.08 Method of Measurement Guardrail will be measured by the linear foot from center to center of end posts along the gradient of the rail except where end connections are made to masonry or steel structures, in which case measurement will be as shown on the plans. When connected to radius rail, measurement will be to the end of the last tangent beam.

Guardrail terminal, reflectorized flexible guardrail marker, terminal end, anchorage assembly, bridge transition, bridge connection, multiple mailbox post, and single post will be measured by each unit of the kind specified and installed.

Widened shoulder will be measured as a unit of grading within the limits shown on the plans.

Excavation in solid rock for placement of posts will be paid under force account unless otherwise indicated in the Bid Documents.

606.09 Basis of Payment The accepted quantities of guardrail will be paid for at the contract unit price per linear foot for the type specified, complete in place. Reflectorized beam guardrail (“butterfly”-type) delineators will not be paid for directly but will be considered incidental to guardrail items. Reflectorized flexible guardrail marker, terminal end, anchorage assembly, bridge transition, bridge connection, multiple mailbox post, and single post will be paid for at the contract unit price each for the kind specified complete in place.

Guardrail terminals will be paid for at the contract price each, complete in place which price shall be full payment for furnishing and installing all components including the terminal section, posts, offset blocks, "w" beam, cable foundation posts, plates and for all incidentals necessary to complete the installation within the limits as shown on the Standard Details or the Manufacturer's installation instructions. Pay limits for a flared terminal will be 37.5 feet. Pay limits for a tangent terminal will be 50 feet. Each guardrail terminal will be clearly marked with the Manufacturer's name and model number to facilitate any future needed repair. Such payment shall also be full compensation for furnishing all material, excavating, backfilling holes, assembling, and all incidentals necessary to complete the work, except that for excavation for posts or anchorages in solid ledge rock, payment will be made under 109.7.5 – Force Account. Type III Retroreflective Adhesive Sheeting shall be applied to the approach buffer end sections and sized to substantially cover the end section. On all roadways, the ends shall be marked with alternating black and retroreflective yellow stripes. The stripes shall be 3 in wide and sloped down at an angle of 45 degrees toward the side on which traffic is to pass the end section. Guardrail terminals shall also include a set of installation drawings supplied to the Resident.

Anchorage to bridge end posts will be part of the bridge work. Connections thereto will be considered included in the unit bid price for guardrail.

Guardrail to be placed on a radius of curvature of 150 ft or less will be paid for under the designated radius pay item for the type guardrail being placed.

Widened shoulder will be paid for at the contract unit price each complete in place and will be full compensation for furnishing and placing, grading and compaction of aggregate subbase and any required fill material.

Adjust guardrail will be paid for at the contract unit price per linear foot and will be full compensation for adjusting to grade. Payment shall also include adjusting guardrail terminals where required.

Modify guardrail will be paid for at the contract unit price per linear foot and will be full compensation for furnishing and installing offset blocks, additional posts, and other specified modifications; removing, modifying, installing, and adjusting to grade existing posts and beams; removing plate washers and backup plates, and all incidentals necessary to complete the work. Payment shall also include removing and resetting guardrail terminals where required.

Remove and Reset guardrail will be paid for at the contract unit price per linear foot and will be full compensation for removing, transporting, storing, reassembling all parts, necessary cutting, furnishing new parts when necessary, reinstalling at the new location, and all other incidentals necessary to complete the work. Payment shall also include removing and resetting guardrail terminals when required.

Remove, Modify, and Reset guardrail will be paid for at the contract unit price per foot and will be full compensation for the requirements listed in Modify guardrail and Remove and Reset guardrail.

Bridge Connections will be paid for at the contract unit price each. Payment shall include, attaching the connection to the endpost including furnishing and placing concrete and reinforcing steel

necessary to construct new endposts if required, furnishing and installing the terminal connector, and all miscellaneous hardware, labor, equipment, and incidentals necessary to complete the work.

Bridge Transitions will be paid for at the contract unit price each. Payment shall include furnishing and installing the thrie beam or "w"-beam terminal connector, doubled beam section, and transition section, where called for, posts, hardware, precast concrete transition curb, and any other necessary materials and labor, including the bridge connection as stated in the previous paragraph.

No payment will be made for guardrail removed, but not reset and all costs for such removal shall be considered incidental to the various contract pay items.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
606.1301 31" W-Beam Guardrail - Mid-Way Splice – Single Faced	Linear Foot
606.1302 31" W-Beam Guardrail - Mid-Way Splice – Double Faced	Linear Foot
606.1303 31" W-Beam Guardrail - Mid-Way Splice, 15' Radius and Less	Linear Foot
606.1304 31" W-Beam Guardrail - Mid-Way Splice, Over 15' Radius	Linear Foot
606.1305 31" W-Beam Guardrail - Mid-Way Splice Flared Terminal	Each
606.1306 31" W-Beam Guardrail - Mid-Way Splice Tangent Terminal	Each
606.1307 Bridge Transition (Asymmetrical) – Type IA	Each
606.1721 Bridge Transition - Type I	Each
606.1722 Bridge Transition - Type II	Each
606.1731 Bridge Connection - Type I	Each
606.1732 Bridge Connection - Type II	Each
606.178 Guardrail Beam	Linear Foot
606.25 Terminal Connector	Each
606.257 Terminal Connector - Thrie Beam	Each
606.259 Anchorage Assembly	Each
606.265 Terminal End-Single Rail - Galvanized Steel	Each
606.266 Terminal End-Single Rail - Corrosion Resistant Steel	Each
606.275 Terminal End-Double Rail - Galvanized Steel	Each
606.276 Terminal End-Double Rail - Corrosion Resistant Steel	Each
606.353 Reflectorized Flexible Guardrail Marker	Each
606.354 Remove and Reset Reflectorized Flexible Guardrail Marker	Each
606.356 Underdrain Delineator Post	Each
606.358 Guardrail, Modify	Linear Foot
606.362 Guardrail, Adjust	Linear Foot
606.365 Guardrail, Remove, Modify, and Reset	Linear Foot
606.366 Guardrail, Remove and Reset	Linear Foot
606.367 Replace Unusable Existing Guardrail Posts	Each
606.47 Single Wood Post	Each
606.48 Single Galvanized Steel Post	Each

606.50	Single Steel Pipe Post	Each
606.51	Multiple Mailbox Support	Each
606.568	Guardrail, Modify - Double Rail	Linear Foot
606.63	Thrie Beam Rail Beam	Linear Foot
606.64	Guardrail Thrie Beam - Double Rail	Linear Foot
606.65	Guardrail Thrie Beam - Single Rail	Linear Foot
606.66	Terminal End Thrie Beam	Each
606.70	Transition Section - Thrie Beam	Each
606.71	Guardrail Thrie Beam - 15 ft radius and less	Linear Foot
606.72	Guardrail Thrie Beam - over 15 ft radius	Linear Foot
606.73	Guardrail Thrie Beam - Single Rail Bridge Mounted	Linear Foot
606.74	Guardrail - Single Rail Bridge Mounted	Linear Foot
606.753	Widen Shoulder for Low Volume Guardrail End	Each
606.754	Widen Shoulder for Flared Guardrail Terminal	Each
606.78	Low Volume Guardrail End	Each
606.80	Buried-in-Slope Guardrail End	Each

SECTION 608 SIDEWALKS

Section 608.022 Detectable Warning Materials Standard Revise this section by removing the last sentence of this section beginning with “Concrete...” and replacing it with “**Concrete shall meet the requirements of Section 608.021, Sidewalk Materials, of this specification or may be a prepackaged concrete mix from the Department’s Qualified Products List (QPL).**”

SECTION 609 CURB

609.02 Materials Revise the paragraph beginning “The Contractor shall submit a concrete mix...” so that it reads:

“The Contractor shall submit a concrete mix design for the Portland Cement Concrete to the Resident, with a minimum designed compressive strength of 3000 psi concrete fill.”

609.03 Vertical Stone Curb, Terminal Section and Transition Sections and Portland Cement Concrete Curb, Terminal Sections and Transition Sections Revise this section by underlining the section number and title so that it reads in the spec book as:

“609.03 Vertical Stone Curb, Terminal Section and Transition Sections and Portland Cement Concrete Curb, Terminal Sections and Transition Sections”

Revise the last paragraph beginning with “The Contractor may elect...” so that it reads:

“The Contractor may elect to substitute concrete to backfill Stone Curbing or Stone Edging at their option. If the concrete backfill option is elected, the Concrete Fill shall meet the requirements of 609.02. The Contractor shall submit a concrete design for the Portland Cement Concrete, with a minimum designated compressive strength of 3000 PSI meeting the requirements of Class S or Class Fill Concrete. The Contractor may elect to choose a Prepackaged Concrete Mix from the Department’s Qualified Products list (QPL). Concrete backfill shall be completed in conformance with a Department supplied concrete backfill detail.”

SECTION 610

STONE FILL, RIPRAP, STONE BLANKET, AND STONE DITCH PROTECTION

610.02 Materials Amend this subsection by adding the following to the end of the material list:
“Stone Ditch Protection 703.29”

SECTION 618

SEEDING

618.08 Mulching Revise this Section so that the third sentence reads: “Mulch for Seeding Method Number 1 shall only be cellulous fiber mulch Section 619.04 (b) or straw mulch Section 619.04 (a).”

SECTION 619

MULCH

619.03 General Amend this Section by adding the following sentence to the end: **“Straw mulch shall be used in all wetland areas.”**

SECTION 626

FOUNDATIONS, CONDUIT, AND JUNCTION BOXES FOR HIGHWAY SIGNING, LIGHTING, AND SIGNALS

Section 626.021 Miscellaneous Materials Revise this section by removing the fourth paragraph beginning with “ All Concrete for concrete encasement...” and replace it with **“All concrete for concrete encasement of conduit shall be Class S or Class Fill concrete in accordance with the applicable requirements of Section 502 – Structural Concrete, or a Prepackaged Concrete Mix from the Department’s Qualified Products List (QPL).”**

Section 626.031 Conduit Revise the fifth paragraph beginning with “After the trench has been...” by removing the last sentence beginning with “Where concrete encasement...” and replacing it with **“Where concrete encasement is required around the conduit, the concrete shall meet Class S, Class Fill in accordance with the applicable requirements of Section 502 – Structural Concrete, or a Prepackaged Concrete Mix from the Department’s Qualified Products List (QPL).”**

626.034 Concrete Foundations Revise this Section by changing ‘626.037’ to ‘**626.036**’ in the Second Paragraph which begins with “Foundations shall consist of cast-in-place...”.

Revise the 10th paragraph beginning with “Before placing concrete, the required elbows...” by removing “...in accordance with **Standard Specification 633.**”

626.036 Precast Foundations Revise the last sentence of paragraph one so that it reads: **“Construction of precast foundations shall conform to the Standard Details and all requirements of 712.061.”**

SECTION 627 PAVEMENT MARKINGS

627.06 Application Revise this subsection by replacing the paragraph beginning with “ On other final pavement markings...” with the following:

“On other final pavement markings and on curb, where the paint is applied by hand painting or spraying, application shall be one uniform covering coat at least 16 mils thick. Before the paint has dried, the glass beads shall be applied by a pressure system that will force the glass beads onto the undried paint as uniformly as possible.

Painted lines and markings shall be applied in accordance with the manufacturer’s published recommendations. These recommendations will be supplied to the Resident prior to installation.”

SECTION 643 TRAFFIC SIGNALS

643.021 Materials Amend this subsection by adding the following at the end:

“MaineDOT is transitioning to MASH2016 criteria for Work Zone Traffic Control Devices on the following schedule:

Temporary Traffic Control Signals will be crash tested and/or evaluated to MASH2016 criteria by January 1, 2030. Current Category 4 devices in useful serviceable condition that are successfully tested to NCHRP Report 350 or MASH2009 criteria may be utilized through December 31, 2029.”

643.09 Service Connection Revise this subsection by removing the paragraph that begins with “Traffic signal services shall have...”.

And by removing the paragraphs beginning with “ A service ground rod shall be installed...” and “A total of 4, 10’ service...” and replace them with **“A total of 4, 10’ service ground rods shall be installed and properly connected together on the outside of the cabinet foundation. One ground rod shall be located at each corner and shall be either flush or slightly below finished grade. The connection between the ground rod and the ground wire shall be an**

exothermic connection such as a Cadweld. The ground wire from the interconnected ground rods shall be routed through a conduit in the foundation and into the base of the cabinet”.

SECTION 645 HIGHWAY SIGNING

Section 645.023 Sign Support Structures. Under letter “c.”, revise the fifth paragraph beginning with “In addition to the required details...” by removing the words **”and foundation”** from the 5th sentence.

Section 645.08 Method of Measurement. Revise the second paragraph beginning with “Bridge-type, cantilever and...” by removing the words **”including the foundation”** .

Section 645.09 Basis of Payment. Revise the third paragraph beginning with “The accepted bridge-type, cantilever and...” by removing the word **”foundation”** from the second sentence. Add the following sentence to the end of the paragraph **“Conduits, Junction Boxes, and Foundations will be paid for under Section 626.”**

SECTION 652 MAINTENANCE OF TRAFFIC

Amend this Section by adding the following new subsection:

“652.2.6 Device Crashworthiness MaineDOT is transitioning to MASH2016 criteria for Work Zone Traffic Control Devices on the following schedule:

Category 1 (Cones, Drums, Tubular Markers, Flexible Delineators, and similar devices that have little chance if causing windshield penetration, tire damage, or other significant effect on the control or trajectory of a vehicle) – All Category 1 devices will be manufacturer self-certified as MASH2016 by January 1, 2025. Current Category 1 devices in useful serviceable condition that are not self-certified as MASH2016 compliant may be utilized through December 31, 2024.

Category 2 (Barricades, Portable Sign Supports, Category 1 devices with attachments, and similar devices that are not expected to produce significant vehicular velocity change but may be otherwise hazardous) – All Category 2 devices will be crash tested and/or evaluated to MASH2016 criteria by January 1, 2025. Current Category 2 devices in useful serviceable condition that are successfully tested to NCHRP Report 350 or MASH2009 criteria may be utilized through December 31, 2024.

Category 3 (Portable Concrete Barrier, Portable Crash Cushions, Truck Mounted Attenuators, Category 2 devices weighing more than 100 pounds, and similar devices that are expected to produce significant vehicular velocity change or other harmful reactions) – All Category 3 devices will be crash tested and/or evaluated to MASH2016 criteria by January 1, 2030. Current Category 3 devices in useful serviceable condition that are successfully tested to

NCHRP Report 350 or MASH2009 criteria may be utilized through December 31, 2029. (See Standard Specification 526 for additional Portable Concrete Barrier information).

Category 4 (Trailer Mounted Devices: Arrow Boards, Temporary Traffic Control Signals, Area Lighting, Portable Changeable Message Sign, and other similar devices.) – All Category 4 devices will be crash tested and/or evaluated to MASH2016 criteria by January 1, 2030. Current Category 4 devices in useful serviceable condition that are successfully tested to NCHRP Report 350 or MASH2009 criteria may be utilized through December 31, 2029.”

652.4 Flaggers Revise the first paragraph of this section so that it reads:

“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.”

SECTION 681 PRECAST AGGREGATE-FILLED, CONCRETE BLOCK GRAVITY WALL

681.08 Basis of Payment Amend this section by adding the Item Number “**681.10**” in front of the item “Precast Aggregate-Filled Concrete Block Gravity Wall” at the end of the section.

SECTION 703 AGGREGATES

Add the following to Section 703 - Aggregates

703.01 Fine Aggregate for Concrete Fine aggregate for concrete shall consist of natural sand or, when approved by the Resident, other inert materials with similar characteristics or combinations thereof, having strong, durable particles. Fine aggregate from different sources of supply shall not be mixed or stored in the same pile nor used alternately in the same class of construction or mix without permission of the Resident.

All fine aggregate shall be free from injurious amounts of organic impurities. Should the fine aggregate, when subjected to the colorimetric test for organic impurities, AASHTO T 21, produce a color darker than the reference standard color solution (laboratory designation Plate III), the fine aggregate shall be rejected.

Fine aggregate shall have a sand equivalent value of not less than 75 when tested in accordance with AASHTO T 176.

Fine aggregate sources shall meet the Alkali Silica Reactivity (ASR) requirements of Section 703.0201.

The fineness modulus shall not be less than 2.26 or more than 3.14. If this value is exceeded, the fine aggregate will be rejected unless suitable adjustments are made in proportions of coarse and fine

aggregate. The fineness modulus of fine aggregate shall be determined by adding the cumulative percentages of material by weight retained on the following sieves: Nos. 4, 8, 16, 30, 50, 100 and dividing by 100.

Fine aggregate, from an individual source when tested for absorption as specified in AASHTO T 84, shall show an absorption of not more than 2.3 percent.

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves
$\frac{3}{8}$ inch	100
No. 4	95-100
No. 8	80-100
No. 16	50-85
No. 30	25-60
No. 50	10-30
No. 100	2-10
No. 200	0-5.0

703.02 Coarse Aggregate for Concrete Coarse aggregate for concrete shall consist of crushed stone or gravel having hard, strong, durable pieces, free from adherent coatings and of which the composite blend retained on the $\frac{3}{8}$ inch sieve shall contain no more than 15 percent, by weight of flat and elongated particles when performed in accordance with test method ASTM D 4791, Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate, using a dimensional ratio of 1:5.

The coarse aggregate from an individual source shall have an absorption no greater than 2.0 percent by weight determined in accordance with AASHTO T 85 modified for weight of sample.

The composite blend shall have a Micro-Deval value of 18.0 percent or less as determined by AASHTO T 327 or not exceed 40 percent loss as determined by AASHTO T 96.

Coarse aggregate sources shall meet the Alkali Silica Reactivity (ASR) requirements of Section 703.0201.

Coarse aggregate shall conform to the requirements of the following table for the size or sizes designated and shall be well graded between the limits specified.

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves			
Grading	A	AA	S	LATEX
Aggregate Size	1 inch	$\frac{3}{4}$ inch	$1\frac{1}{2}$ inch	$\frac{1}{2}$ inch
2 inch			100	
$1\frac{1}{2}$ inch	100		95-100	
1 inch	95-100	100	-	
$\frac{3}{4}$ inch	-	90-100	35-70	100
$\frac{1}{2}$ inch	25-60	-	-	90-100
$\frac{3}{8}$ inch	-	20-55	10-30	40-70
No. 4	0-10	0-10	0-5	0-15
No. 8	0-5	0-5	-	0-5
No. 16	-	-	-	-
No. 50	-	-	-	-
No. 200	0 - 1.5	0 - 1.5	0 - 1.5	0 - 1.5

703.0201 Alkali Silica Reactive Aggregates All coarse and fine aggregates proposed for use in concrete shall be tested for Alkali Silica Reactivity (ASR) potential under AASHTO T 303 (ASTM C 1260), Accelerated Detection of Potentially Deleterious Expansion of Mortar Bars Due to Alkali-Silica Reaction, prior to being accepted for use. Acceptance will be based on testing performed by an accredited independent lab submitted to the Department. Aggregate submittals will be required on a 5-year cycle, unless the source or character of the aggregate in question has changed within 5 years from the last test date.

As per AASHTO T 303 (ASTM C 1260): Use of a particular coarse or fine aggregate will be allowed with no restrictions when the mortar bars made with this aggregate expand less than or equal to 0.10 percent at 30 days from casting. Use of a particular coarse or fine aggregate will be classified as potentially reactive when the mortar bars made with this aggregate expand greater than 0.10 percent at 30 days from casting. Use of this aggregate will only be allowed with the use of cement-pozzolan blends and/or chemical admixtures that result in mortar bar expansion of less than 0.10 percent at 30 days from casting as tested under ASTM C 1567.

Acceptable pozzolans and chemical admixtures that may be used when an aggregate is classified as potentially reactive include, but are not limited to the following:

- Class F Coal Fly Ash meeting the requirements of AASHTO M 295
- Ground Granulated Blast Furnace Slag (Grade 100 or 120) meeting the requirements of AASHTO M 302
- Densified Silica Fume meeting the requirements of AASHTO M 307
- Lithium-based admixtures
- Metakaolin

Pozzolans or chemical admixtures required to offset the effects of potentially reactive aggregates will be incorporated into the concrete at no additional cost to the Department.

703.05 Aggregate for Sand Leveling Aggregate for sand leveling shall be sand of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. The aggregate shall meet the grading requirements of the following table.

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves
¾ inch	85-100
No. 200	0-5.0

703.06 Aggregate for Base and Subbase The following shall apply to Sections (a.) and (c.) below. The material shall have a Micro-Deval value of 25.0 or less as determined by AASHTO T 327. If the Micro-Deval value exceeds 25.0, the Washington State Degradation DOT Test Method T113, Method of Test for Determination of Degradation Value (January 2009 version) shall be performed, except that the test shall be performed on the portion of the sample that passes the ½ in sieve and is retained on the No. 10 sieve. If the material has a Washington Degradation value of less than 15, the material shall be rejected. The material used in Section (b.) below shall have a Micro-Deval value of 25.0 or less as determined by AASHTO T 327. If the Micro-Deval value exceeds 25.0 the material may be used if it does not exceed 25 percent loss on AASHTO T 96, Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

Recycled Asphalt Pavement (RAP) shall not be used for or blended with aggregate base or subbase.

- a. Aggregate for base, Type A and B shall be crushed ledge or crushed gravel of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. The gradation of the part that passes a 3 inch sieve shall meet the grading requirements of the following table:

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves	
	Type A	Type B
½ inch	45-70	35-75
¼ inch	30-55	25-60
No. 40	0-20	0-25
No. 200	0-6.0	0-6.0

At least 50 percent by weight of the material retained on the No. 4 sieve shall have at least one fractured face as tested by AASHTO T 335.

Type A aggregate for base shall only contain particles of rock that will pass the 2 inch square mesh sieve.

Type B aggregate for base shall only contain particles of rock that will pass the 4 inch square mesh sieve.

- b. Aggregate for base, Type C shall be crushed ledge or crushed gravel of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. The material shall meet the grading requirements of the following table:

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves
	Type C
4 inches	100
3 inches	90-100
2 inches	75-100
1 inch	50-80
½ inch	30-60
No. 4	15-40
No. 200	0-6.0

At least 50 percent by weight of the material coarser than the No. 4 sieve shall have at least one fractured face as tested by AASHTO T 335.

- c. Aggregate for subbase shall be sand or gravel of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. The gradation of the part that passes a 3 inch sieve shall meet the grading requirements of the following table:

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves	
	Type D	Type E
½ in	35-80	
¼ inch	25-65	25-100
No. 40	0-30	0-50
No. 200	0-7.0	0-7.0

Type D aggregate for subbase gravel may contain up to 50 percent by weight Recycled Concrete Aggregate (RCA). When RCA is used, the portion of the resulting blend of gravel and RCA retained on a ½" square mesh sieve shall contain a total of no more than 5 percent by weight of other recycled materials such as brick, concrete masonry block, or asphalt pavement as determined by visual inspection.

RCA shall be substantially free of wood, metal, plaster, and gypsum board as defined in Note 9 in Section 7.4 of AASHTO M 319. RCA shall also be free of all substances that fall under the category of solid waste or hazardous materials.

Aggregate for subbase shall not contain particles of rock which will not pass the 6 inch square mesh sieve.

703.08 Recycled Asphalt Pavement Recycled asphalt pavement shall consist of salvaged asphalt materials from milled pavements or production waste that has been processed before use to meet the requirements of the job mix formula. It shall be free of winter sand, granular fill, construction debris, or other materials not generally considered asphalt pavement.

703.081 RAP for Asphalt Pavement Recycled Asphalt Pavement (RAP) may be introduced into hot-mix asphalt pavement at percentages approved by the Department according to the MaineDOT Policies and Procedures for HMA Sampling and Testing.

If approved by the Department, the Contractor shall provide documentation stating the source, test results for average residual asphalt content, and stockpile gradations showing RAP materials have been sized to meet the maximum aggregate size requirements of each mix designation. The Department will obtain samples for verification and approval prior to its use.

The maximum allowable percent of RAP shall be determined by the asphalt content, the percent passing the 0.075 mm sieve, the ratio between the percent passing the 0.075 mm sieve and the asphalt content, and Coarse Micro-Deval loss values as tested by the Department.

The maximum percentage of RAP allowable shall be the lowest percentage as determined according to Table 4 below:

Classification	Maximum RAP Percentage Allowed	Asphalt content standard deviation	Percent passing 0.075 mm sieve standard deviation	Percent passing 0.075 mm sieve / asphalt content ratio	Residual aggregate M-D loss value
Class III	10%	≤ 1.0	N/A	≤ 4.0	≤ 18
Class II	20%	≤ 0.5	≤ 1.0	≤ 2.8	
Class I	30%	≤ 0.3	≤ 0.5	≤ 1.8	

Table 4: Maximum Percent RAP According to Test Results

The Department will monitor RAP asphalt content and gradation during production by testing samples from the stockpile at approximately 15,000 T intervals (in terms of mix production). The

allowable variance limits (from the numerical average values used for mix designs) for this testing are determined based upon the maximum allowable RAP percentage and are shown below in Table 5.

Table 5: RAP Verification Limits

Classification	Asphalt content (compared to aim)	Percent passing 0.075 mm sieve (compared to aim)
Class III	± 1.5	± 2.0
Class II	± 1.0	± 1.5
Class I	± 0.5	± 0.7

For specification purposes, RAP will be categorized as follows:

Class III – A maximum of 10.0 percent of Class III RAP may be used in any base, intermediate base, surface, or shim mixture. A maximum of 20.0 percent of Class III RAP may be used in hand-placed mixes for item 403.209.

Class II – A maximum of 20.0 percent Class II RAP in any base, binder, surface, or shim course.

Class I – A maximum of 20.0 percent Class I RAP may be used in any base, intermediate base, surface, or shim mixture without requiring a change to the specified asphalt binder. A maximum of 30.0 percent Class I RAP may be used in in any base or intermediate base mixture provided that a PG 58-28 or PG 58-34 asphalt binder is used. A maximum of 30.0 percent Class I RAP may be used in any surface or shim mixture provided that PG 58-34 asphalt binder is used. Mixtures exceeding 20.0 percent Class I RAP must be evaluated and approved by the Department.

The Contractor may use up to two different RAP sources in any one mix design. The total RAP percentage of the mix shall not exceed the maximum allowed for the highest classification RAP source used (i.e. if a Class I & Class III used, total RAP must not exceed 30.0%). The blended RAP material must meet all the requirements of the classification for which the RAP is entered (i.e. 10% Class III with 20% Class I, blend must meet Class I criteria). The Department may take belt cuts of the blended RAP to verify the material meets these requirements. If the Contractor elects to use more than one RAP source in a design, the Contractor shall provide an acceptable point of sampling blended RAP material from the feed belt.

In the event that RAP source or properties change, the Contractor shall notify the Department of the change and submit new documentation stating the new source or properties a minimum of 72 hours prior to the change to allow for obtaining new samples and approval.

SECTION 710 FENCE AND GUARDRAIL

710.06 Fence Posts and Braces Revise the first Paragraph so that it reads:

“Wood posts shall be of cedar, white oak, or tamarack or other AWP approved species, of the diameter or section and length shown on the plans.”

Remove the fourth paragraph which starts “ That portion of wood posts...”.

Revise the paragraph beginning with “Braces shall be of spruce, eastern hemlock ... so that it now reads:

“Braces shall be of spruce, eastern hemlock, Norway pine, pitch pine, or tamarack timbers or other AWP approved species, or spruce, cedar, tamarack or other AWP approved species round posts of sufficient length to make a diagonal brace between adjacent posts. All wood posts and braces shall be pressure-treated in accordance with AASHTO M 133 and AWP U1, UC4A Commodity Specification B: Posts. “

710.07 Guardrail Posts Revise this section so that the first sentence of section a. reads:

“a. Wood posts shall be of Norway pine, southern yellow pine, pitch pine, Douglas fir, red pine, white pine, or eastern hemlock or other AWP approved species.”

Revise the next paragraph so that it reads:

Wood posts and offset brackets shall be preservative treated in accordance with the requirements of AASHTO M 133 and AWP U1, UC4A Commodity Specification B: Posts.

710.08 Guardrail Hardware Revise this subsection by replacing “AASHTO M 298” with “ASTM B965”

SECTION 712 MISCELLANEOUS HIGHWAY MATERIAL

712.061 Structural Precast Units Amend this section by adding the following sentence to the end of the first paragraph of the Construction subsection:

“Facilities certified by NPCA or PCI shall provide to the Fabrication Engineer a copy of their annual audit to include deficiency reports and corrective actions.”

Revise this section by changing the letter “b” of ASTM C1611 of the Concrete Testing subsection so that it reads:

“b. Air content shall be 5.0% to 8.0%.”

SECTION 713 STRUCTURAL STEEL AND RELATED MATERIAL

Section 713.02 High Strength Bolts

Revise the second sentence of this subsection so that it reads **“Nuts shall meet the requirement of ASTM A563”**. Revise the third sentence of this subsection so that it reads **“Circular and beveled washers shall conform to the requirement of ASTM F436”**.

SECTION 718 TRAFFIC SIGNALS MATERIAL

718.03 Signal Mounting Amend the paragraph beginning with “All trunions, brackets and...” by adding **“For polycarbonate signal heads with more than 3 sections or requiring mounting extensions greater than 12 inches in length, reinforcing plates shall be used to reinforce the housings at the point of attachment.”** to the end of the paragraph.

718.08 Controller Cabinet Revise this subsection by replacing the paragraph beginning with “The cabinet shall be supplied with LED light panels...” on or about page 7-66 with **“The cabinet shall be supplied with white LED light panels which shall automatically illuminate via a door open switch whenever one of the four main cabinet doors are opened for the ground mount cabinet or two main doors for the side of pole cabinet. The ground mounted cabinet shall contain four LED light panels per side totaling eight panels for the cabinet; one panel each at the top and bottom portion of the front side and back side on the Control side and Power/Auxiliary side of the cabinet. Each light panel shall produce a minimum of 250 lumens for a total minimum lumen output of 2000 lumens with all eight panels illuminated. The minimum output per side would be 1000 lumens. The LED panels shall be protected by a clear shatterproof shield. The side of pole mounted cabinet shall contain four light panels; one at the top of the rack assembly and one at the bottom rack assembly on each side of the cabinet. A second door open status switch per door shall activate a controller input to log a report event that one of the doors was opened. All door open status switches shall be connected to the same controller input. For the ground mount cabinet, there shall be two switches on each of the four main doors. For the side-of-pole mount cabinet, there shall be two switches on each of the two main doors.”**

Revise this subsection by replacing the paragraph beginning with “The cabinet shall be supplied with a generator panel ...” on or about page 7-68 with:

“The cabinet shall be supplied with a generator panel. The generator panel shall

consist of a manual transfer switch and a twist-lock connector for generator hookup. The transfer switch knob and twist-lock connector shall be located inside a stainless steel enclosure with a separate lockable door accessed with a Corbin #2 key. The unit shall be mounted on the left, exterior of the control side wall of the ground mount cabinet a minimum of 36" above the surrounding grade and on the lower left side of the pole mounted cabinet. The generator transfer switch shall be a Reliance C30A1N Signa Series or approved equal. "

Revise this subsection by removing the following from the paragraph beginning with "The ground mounted cabinet shall be supplied and installed with an electric service meter socket trim and electrical service disconnect switch ..." on or about page 7-69: **"(removed: thus preventing that space from being used either by equipment supplied as part of the project, or future equipment that would be installed in the rack system. Joe indicated that he would add this language to the detail so it is covered.)"**

Revise this subsection by replacing the following in the paragraph beginning with "The Contractor shall reconfigure the default user name..." on or around page 7-70; "MaineDOT IT" with **"MaineDOT Traffic Division"**.

In the paragraph beginning with "Tests shall be conducted by the contractor..." on or around page 7-73, amend this subsection by removing **"in the state of Maine and"** after "The facility shall be".

Amend this Section by adding the following subsection:

718.13 Field Monitoring Unit (FMU) This item of work shall conform to this specification. This item shall consist of furnishing and installing a Field Monitoring Unit (FMU) and software, as well as all needed accessories required for a full and complete installation, including but not limited to power adapters, Ethernet cables, and interface cables, as described herein.

Where applicable, communications from MaineDOT's cloud-based Central Management System (CMS) to the on-street traffic signal controllers shall be made through fiber optic interconnect cable connected back to existing internet connections and/or the Field Monitoring Unit (FMU). The Contractor shall furnish and install all materials necessary for a complete and operational fiber optic interconnection to all project intersections as shown on the plans. All connections to the CMS cloud-based system shall be via a secure VPN network.

The FMU shall be the only remote connection device used by isolated intersections to connect to the cloud-based system. All connections shall be encrypted VPN tunnels. The Contractor shall coordinate all configuration settings with MaineDOT IT and the Engineer.

The FMU central web based interface shall be a separate element from the CMS.

MATERIALS: The materials for this work shall conform to the following requirements:

1. The work under this item specifies the requirements for the FMU. The FMU shall operate independent of the brand/type of intersection controller deployed in the ATC traffic cabinet.
2. The FMU shall conform to the following requirements:

- 2.1 The FMU shall function correctly between -34 degrees C and +74 degrees C.
- 2.2 The FMU shall be provided with appropriately rated connectors that allows the FMU to be exchanged by unplugging connectors, without tools.
- 2.3 The FMU shall monitor and log all ATC Controller and ATC cabinet faults and or alarms.
- 2.4 The FMU shall be wired directly to the ATC cabinet.
- 2.5 The FMU shall have an internal cellular modem running at 4G LTE.
 - 2.5.1 The Cellular modem shall be designed to be replaced / upgraded to 5G service when available.
- 2.6 The FMU shall incorporate an integrated GPS and cell modem.
- 2.7 The configuration of the FMU shall be accomplished by accessing the internal web server with a browser. It shall be possible to configure the FMU without any special software.
- 2.8 The FMU shall be powered via a standard 120V input power.
- 2.9 The FMU shall allow for the routing of the controller configuration packets to and from the controller (either by Ethernet or serial communications) for any type of controller utilized by the MaineDOT. In this way it shall be possible to configure the controller and utilize the controller specific software to interrogate the controller, and the FMU shall provide the communications pipe which allows this to be accomplished.
- 2.10 The FMU shall, within the size limitations above, include a battery and battery charging/monitoring circuit, to allow the FMU to function correctly even when all power to the intersection has failed. The battery shall continue to power the FMU for a minimum of 5 hours after all power has failed to the intersection.
- 2.11 The FMU shall incorporate an integrated GPS which will allow the FMU to geo-locate itself on the FMU management software map, without configuration.
- 2.12 The FMU shall operate without requiring a static IP address. The only configuration required at the FMU is to enter the URL of where the FMU management software is hosted.
- 2.13 In the event that the cell service is interrupted or is not available, the FMU shall store any events that occur in internal memory and forward these events automatically to the FMU management software when the cell service is restored. In this way, a complete record of events at the device can be maintained even if cell service is interrupted for a period. The system will store 5000 events.
- 2.14 The FMU shall utilize HTTP and HTTPS protocols, and XML data structures, for communication with the FMU management software. In this way the data will be open

for future expansion and competition. The use of secret proprietary protocols is not permitted.

- 2.15 The FMU shall include Ethernet communications via an Ethernet Port with RJ45 connector.
- 2.16 The FMU shall include weather proof antennas.

3. Map Display FMU Management Software

- 3.1 The FMU shall include a scrollable, zoomable map display, with the intersections and other monitored devices shown as representative icons on the map. The map shall include the ability to see the intersections using Google Streetview.
- 3.2 The alarm status of the intersection shall be clearly indicated on the icon on the map, so that the user can see at a glance which intersections are in alarm.
- 3.3 The map display shall also include a list of intersections, with the number and priority of alarms indicated on the list. Intersections in high priority alarm shall be moved to the top of the list, followed by medium priority, low priority and then finally by intersections not in alarm.
- 3.4 The icons shall change to be able to clearly indicate if an intersection is offline.
- 3.5 Clicking on the icon on the map shall expose a box with the current parameters of the intersection shown.
- 3.6 The default map display position and zoom shall be configurable by user, so that the user's view will default to show the intersections that the user is responsible for managing.
- 3.7 The map view shall have the ability to show Google traffic overlays on the map.

4. Intersection Detail Display FMU Management Software

- 4.1 It shall be possible to drill down, either from the map icon or from the list, to a device level detail for the intersection, which as a minimum shall display the following parameters:
 - 4.1.1 The alarm status, with priority indicated, and a text description of the alarm (if an alarm is present for this device).
 - 4.1.2 The time since the last communication with the device
 - 4.1.3 The following parameters (real time now values, minimum for the day values, maximum for the day values, and average for the day values)
 - 4.1.3.1 The AC mains voltage (value)
 - 4.1.3.2 The battery back-up voltage (value)

- 4.1.3.3 The cabinet temperature (value)
- 4.1.3.4 The cabinet humidity (value)
- 4.1.3.5 The presence of AC power (OK or Fail)
- 4.1.3.6 The flashing status of the intersection (OK or Flashing)
- 4.1.3.7 Stop Time status (OK or Stop Time Active)
- 4.1.3.8 The cabinet door status (Open or Closed)
- 4.1.3.9 The intersection fan status (Fan On or Fan off)
- 4.1.4 It shall be possible to view graphs of each of the value parameters in graphical form, over the recent two-week period. This includes real time graphs of:
 - 4.1.4.1 The AC mains voltage
 - 4.1.4.2 The battery back-up voltage
 - 4.1.4.3 The cabinet temperature
 - 4.1.4.4 The cabinet humidity

5. Diagnostics and Log Display FMU Management Software

- 5.1 From the device level detail within the FMU management software, it shall be possible to drill down to get the raw data; the error logs; and the communications logs to allow a technician to fault-find problems.
- 5.2 It shall be possible to filter the logs by Device; by Device Type and/or by Group as well as between dates.
- 5.3 It shall be possible to print these selected logs to a local printer or a PDF file.
- 5.4 It shall be possible to export these logs to Excel on the local computer for further analysis.

6. Alarms FMU Management Software

- 6.1 The FMU management software shall have a comprehensive alarm generation capability
- 6.2 It shall be possible to configure alarms to be generated on any parameter becoming out of tolerance, including analog values, digital values and enumerated values.
- 6.3 Alarms shall be configurable to be of Low, High or Critical Priority.
- 6.4 The alarm priority shall be displayed throughout the FMU management software, on all displays, using color codes such as red-critical; yellow – high; and amber-low to indicate the priority of the alarm.

6.5 The current active alarms shall be accessible for view via an expandable window, to see which alarms are active and when the alarm occurred. The highest priority alarms shall rise to the top of the list.

7. Alerts FMU Management Software

7.1 The FMU management software shall have comprehensive alerting capability, to enable the response personnel to be notified when an abnormal situation has occurred.

7.2 It shall be possible to configure alerts to one or more personnel for each alarm. This will cause, as selected, an SMS and/or an email to be sent to the person when an alarm occurs.

7.3 The alert shall be configurable to optionally send via email and/or via SMS a message when an alarm clears.

7.4 The intention is that the FMU management software provides the alerts to the user in near real time. The SMS and email shall be issued within 30 seconds of the occurrence of event which results in an alert being issued.

8. Hosting and Connectivity and Service FMU / FMU Management Software

8.1 The contractor shall supply the FMU with the FMU manufacturers 10 year options for Connectivity and Service, as part of the purchase price. The Connectivity and Service agreement shall include at a minimum:

8.1.1 Cellular Connectivity

8.1.2 No cellular overage charges

8.1.3 Extended warranty on the hardware for the period of the Connectivity and Service Agreement

8.1.4 Over-the-air software updates

8.1.5 Over-the-air security updates

8.1.6 Future Connected Vehicles Service

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

720.12 Wood Sign Posts Revise the first sentence so that it reads:

Wood sign posts shall be rectangular, straight and sound timber, cut from live growing native spruce, red pine, hemlock, cedar trees or other AWPAs approved species, free from loose knots or other structurally weakening defects of importance, such as shake or holes or heart rot.

Revise the third paragraph that starts with “When pressure treated...” so that it reads:

All sign posts shall be pressure-treated in accordance with AASHTO M 133 and AWPAs Standard U1, UC4A, Commodity Specification A: Sawn Products.