STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH, N.C.

PROPOSAL

INCLUDES ADDENDUM No. 1 DATED 3-4-2019

DATE AND TIME OF BID OPENING: **MARCH 19, 2019 AT 2:00 PM**

CONTRACT ID	C204310
WBS	47256.3.2

VOID FOR BIDDING

FEDERAL-AID NO.	STATE FUNDED
COUNTY	DARE
T.I.P. NO.	F-5703B
MILES	0.000
ROUTE NO.	
LOCATION	MANNS HARBOR IN DARE COUNTY.

TYPE OF WORK 2 SUPPORT TUGS W/A FRAME, 2 SUPPORT TUGS, AND 2 DECK BARGES.

NOTICE:

ALL BIDDERS SHALL COMPLY WITH ALL APPLICABLE LAWS REGULATING THE PRACTICE OF GENERAL CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA WHICH REQUIRES THE BIDDER TO BE LICENSED BY THE N.C. LICENSING BOARD FOR CONTRACTORS WHEN BIDDING ON ANY NON-FEDERAL AID PROJECT WHERE THE BID IS $30,000 OR MORE, EXCEPT FOR CERTAIN SPECIALTY WORK AS DETERMINED BY THE LICENSING BOARD. BIDDERS SHALL ALSO COMPLY WITH ALL OTHER APPLICABLE LAWS REGULATING THE PRACTICES OF ELECTRICAL, PLUMBING, HEATING AND AIR CONDITIONING AND REFRIGERATION CONTRACTING AS CONTAINED IN CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA. NOTWITHSTANDING THESE LIMITATIONS ON BIDDING, THE BIDDER WHO IS AWARDED ANY FEDERAL - AID FUNDED PROJECT SHALL COMPLY WITH CHAPTER 87 OF THE GENERAL STATUTES OF NORTH CAROLINA FOR LICENSING REQUIREMENTS WITHIN 60 CALENDAR DAYS OF BID OPENING.

BIDS WILL BE RECEIVED AS SHOWN BELOW:

THIS IS A FERRY PROPOSAL

5% BID BOND OR BID DEPOSIT REQUIRED

_____

PROPOSAL FOR THE CONSTRUCTION OF:

Project No. WBS 47256.3.2

in **Dare County**, North Carolina

Department of Transportation

Raleigh, North Carolina

The Bidder has carefully examined the specifications and plans of the proposed work to be known as Project No. **WBS 47256.3.2**, which are acknowledged to be part of the proposal, the special provisions, the proposal, the form of contract, and the forms of contract payment bond and contract performance bond; and thoroughly understands the stipulations, requirements and provisions. The undersigned bidder agrees to bound upon his execution of the bid and subsequent award to him by the Board of Transportation in accordance with this proposal to provide the necessary contract payment bond and contract performance bond within fourteen days after the written notice of award is received by him. The undersigned Bidder further agrees to provide all necessary machinery, tools, labor, and other means of construction; and to do all the work and to furnish all materials, except as otherwise noted, necessary to perform and complete the said contract by **12:00 Noon on June 29, 2020** and in accordance with the requirements of the Engineer, and at the unit or lump sum prices, as the case may be, for the various items given on the sheets contained herein.

The Bidder shall provide and furnish all the materials, machinery, implements, appliances and tools, and perform the work and required labor to construct and complete State Highway Project No. **WBS 47256.3.2** for the unit or lump sum prices, as the case may be, bid by the Bidder in his bid and according to the proposal, plans, and specifications prepared by said Department, which proposal, plans, and specifications show the details covering this project, and hereby become a part of this contract.

If the proposal is accepted and the award is made, the contract is valid only when signed either by the Contract Officer or such other person as may be designated by the Secretary to sign for the Department of Transportation. The conditions and provisions herein cannot be changed except over the signature of the said Contract Officer.

Accompanying this bid is a bid bond secured by a corporate surety, or certified check payable to the order of the Department of Transportation, for five percent of the total bid price, which deposit is to be forfeited as liquidated damages in case this bid is accepted and the Bidder shall fail to provide the required payment and performance bonds with the Department of Transportation, under the condition of this proposal, within 14 calendar days after the written notice of award is received by him, as provided in the Standard Specifications; otherwise said deposit will be returned to the Bidder.

DocuSigned by:
Contract Standards and Development
50495DB2666A456...
3/4/2019

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PROJECT SPECIAL PROVISIONS

GENERAL

EXECUTION OF SIGNATURE SHEETS

(6-17-82)

The Bidder's attention is directed to the various sheets in the proposal form which are to be signed, sealed or require information to be entered by the Bidder. A list of these sheets is shown below. The bid bond is inserted in the proposal form.

1. Listing of MBE and WBE subcontractors
2. Facility Location
3. Labor and Materials
4. Cost Breakdown
5. Item sheet
6. Execution of Bid Sheets: 1, 2, 3, 4, 5, or 6 (Bid)
7. Bid Bond (Proposal Insert)

PROPRIETARY ITEMS ON PLANS

The Contractor's attention is directed to the fact that there may be references to proprietary items listed in the contract plans. These references shall not supersede the provisions in the contract proposal. Other products of equal quality may be used provided they meet or exceed the requirements of the special provisions and are approved for use by the Ferry Division. In those instances where there is no provision in the contract proposal to cover the work, the plan information shall apply unless otherwise directed by the Ferry Division.

LICENSURE / CERTIFICATION:

The Bidder does not need a NC General Contractors license to bid this project. However, they will be required to furnish proof of licensure and/or certifications to build vessels of the size and type, as described in the Contract Drawings and Specifications, by the state in which they are performing the work and the United States Coast Guard.

MANDATORY PRE-BID CONFERENCE (Prequalifying To Bid):

(7-18-06) (Rev. 3-25-13) SPI 1-14

In order for all prospective bidders to have an extensive knowledge of the project, all prospective bidders shall attend a mandatory pre-bid conference at:

Thursday, January 31, 2019, 10:00am – 2:00pm

NCDOT State Shipyard
8550 Shipyard Rd.
Manns Harbor, North Carolina 27953
Administration Conference Room
Phone (252) 426-5104

The pre-bid conference will include a thorough discussion of the plans, contract pay items, special provisions, etc.

Only bidders who have attended and properly registered at the above scheduled pre-bid conference and who have met all other prequalification requirements will be considered prequalified to bid on this project. A bid received from a bidder who has not attended and properly registered at the above scheduled pre-bid conference will not be accepted and considered for award.

Attendance at the pre-bid conference will not meet the requirements of proper registration unless the individual attending has registered at the pre-bid conference in accordance with the following:

(A) The individual has signed his name on the official roster no later than thirty (30) minutes after the above noted time for the beginning of the conference.

(B) The individual has written in the name and address of the company he or she represents.

(C) Only one company has been shown as being represented by the individual attending.

(D) The individual attending is an officer or permanent employee of the company they are representing.

Attendance at any prior pre-bid conference will not meet the requirement of this provision.

ELECTRONIC SUBMITTAL OF COST BREAKDOWN SHEET

Bidders shall complete an electronic version of the Cost Breakdown Sheet found on page SS-5 of this proposal. The values in the electronic file shall match the values written in the chart on page SS-5 of the proposal as those numbers are considered the official bid.

If the values in the electronic version do not match the bid proposal version, the electronic values will be changed by the Department to match the bid proposal values.

The Microsoft Excel file is available on NCDOT website at the following address:

https://xfer.services.ncdot.gov/dsplan/2019%20Highway%20Letting/03-19-19/Plans%20and%20Proposals/DARE_47256.3.2_F5703B_C204310/

Once the electronic file is complete, the bidder shall save the Excel file to a standard USB flash drive. The flash drive shall be placed in a sealed envelope with the outer wrapping clearly marked as follows:

Mr. Joe D. Waldrep
NCDOT Ferry Division
Contract C204310
WBS **47256.3.2**
Cost Breakdown Sheet

The envelope containing the flash drive shall be place in the sealed parcel containing the completed bid Price Proposal.

After opening the bid proposals on the scheduled letting date, the sealed envelopes containing the flash drives will be sent to the Ferry Division for evaluation. The information contained on the flash drives will be considered confidential and will be treated as such.

SCHEDULE OF ESTIMATED COMPLETION PROGRESS:

(7-15-08) (Rev. 5-16-17) 108-2 SP1 G58

The Contractor's attention is directed to the Standard Special Provision entitled *Availability of Funds Termination of Contracts* included elsewhere in this proposal. The Department of Transportation's schedule of estimated completion progress for this project as required by that Standard Special Provision is as follows:

Fiscal Year		Progress (% of Dollar Value)
2019	(7/01/18 - 6/30/19)	**20**% of Total Amount Bid
2020	(7/01/19 - 6/30/20)	**80**% of Total Amount Bid

The Contractor shall also furnish his own progress schedule in accordance with Article 108-2 of the *2018 Standard Specifications*. Any acceleration of the progress as shown by the Contractor's progress schedule over the progress as shown above shall be subject to the approval of the Engineer.

DOMESTIC STEEL AND IRON PRODUCTS:

(April 19, 1994)

The requirements of this provision do NOT apply to certain ferry boat equipment and machinery items. These items include **marine diesel engines, electrical switchboards and switchgear, electric motors, pumps, ventilation fans, boilers, electrical controls and electronic equipment**. The use of these specific equipment and machinery items, which have been manufactured outside the United States, is permitted for ferry boat construction.

Except as provided in the above paragraph, all steel and iron products which are permanently incorporated into this project shall be produced in the United States. Minimal amounts of foreign steel and iron products may be used provided the combined project cost of the bid items involved does not exceed one-tenth of one percent (0.1 percent) of the total amount bid for the entire project or $2,500.00, whichever is greater. This minimal amount of foreign produced steel and iron products permitted for use by this Special Provision is not applicable to fasteners. Domestically produced fasteners are required for this project.

All steel and iron products furnished as "domestic products" shall be melted, cast, formed, shaped, drawn, extruded, forged, fabricated, produced, or otherwise processed and manufactured in the United States. Raw materials used in manufacturing "domestic" steel and iron products may be imported; however, all manufacturing processes to produce the products, including coatings, must occur in the United States.

Before each steel or iron product is incorporated into this project or included for partial payment on a monthly estimate, the Contractor shall furnish the Resident Engineer a notarized certification

certifying that the product conforms to the above requirements of this Special Provision. The Resident Engineer will forward a copy of each certification to the Materials and Tests Unit.

Each purchase order issued by the Contractor or a subcontractor for steel and iron products to be permanently incorporated into this project shall contain in bold print a statement advising the supplier that all manufacturing processes to produce the steel or iron shall have occurred in the United States. The Contractor and all affected subcontractors shall maintain a separate file for steel products permanently incorporated into this project so that verification of the Contractor's efforts to purchase "domestic" steel and iron products can readily be verified by an authorized representative of the Department or the Federal Highway Administration.

MINORITY BUSINESS ENTERPRISE AND WOMEN BUSINESS ENTERPRISE:

(10-16-07)(Rev. 1-15-19) 102-15(J) SP1 G66

Description

The purpose of this Special Provision is to carry out the North Carolina Department of Transportation's policy of ensuring nondiscrimination in the award and administration of contracts financed in whole or in part with State funds.

Definitions

Additional MBE/WBE Subcontractors - Any MBE/WBE submitted at the time of bid that will not be used to meet the Combined MBE /WBE Goal. No submittal of a Letter of Intent is required.

Combined MBE/WBE Goal: A portion of the total contract, expressed as a percentage that is to be performed by committed MBE/WBE subcontractors.

Committed MBE/WBE Subcontractor - Any MBE/WBE submitted at the time of bid that is being used to meet the Combined MBE /WBE goal by submission of a Letter of Intent. Or any MBE or WBE used as a replacement for a previously committed MBE or WBE firm.

Contract Goal Requirement - The approved participation at time of award, but not greater than the advertised Combined MBE/WBE contract goal.

Goal Confirmation Letter - Written documentation from the Department to the bidder confirming the Contractor's approved, committed participation along with a listing of the committed MBE and WBE firms.

Manufacturer - A firm that operates or maintains a factory or establishment that produces on the premises, the materials or supplies obtained by the Contractor.

MBE Participation (Anticipated) - A portion of the total contract, expressed as a percentage that is anticipated to be performed by committed MBE subcontractor(s).

Minority Business Enterprise (MBE) - A firm certified as a Disadvantaged Minority-Owned Business Enterprise through the North Carolina Unified Certification Program.

Regular Dealer - A firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials or supplies required for the performance of the contract are bought, kept in stock, and regularly sold to the public in the usual course of business. A regular dealer engages in, as its principal business and in its own name, the purchase and sale or lease of the products in question. A regular dealer in such bulk items as steel, cement, gravel, stone, and petroleum products need not keep such products in stock, if it owns and operates distribution equipment for the products. Brokers and packagers are not regarded as manufacturers or regular dealers within the meaning of this section.

Replacement / Substitution – A full or partial reduction in the amount of work subcontracted to a committed (or an approved substitute) MBE/WBE firm.

North Carolina Unified Certification Program (NCUCP) - A program that provides comprehensive services and information to applicants for MBE/WBE certification. The MBE/WBE program follows the same regulations as the federal Disadvantaged Business Enterprise (DBE) program in accordance with 49 CFR Part 26.

United States Department of Transportation (USDOT) - Federal agency responsible for issuing regulations (49 CFR Part 26) and official guidance for the DBE program.

WBE Participation (Anticipated) - A portion of the total contract, expressed as a percentage, that is anticipated to be performed by committed WBE subcontractor(s).

Women Business Enterprise (WBE) - A firm certified as a Disadvantaged Women-Owned Business Enterprise through the North Carolina Unified Certification Program.

Forms and Websites Referenced in this Provision

Payment Tracking System - On-line system in which the Contractor enters the payments made to MBE and WBE subcontractors who have performed work on the project. https://apps.dot.state.nc.us/Vendor/PaymentTracking/

DBE-IS *Subcontractor Payment Information* - Form for reporting the payments made to all MBE/WBE firms working on the project. This form is for paper bid projects only. https://connect.ncdot.gov/business/Turnpike/Documents/Form%20DBE-IS%20Subcontractor%20Payment%20Information.pdf

RF-1 *MBE/WBE Replacement Request Form* - Form for replacing a committed MBE or WBE. http://connect.ncdot.gov/projects/construction/Construction%20Forms/DBE%20MBE%20WBE%20Replacement%20Request%20Form.pdf

SAF *Subcontract Approval Form* - Form required for approval to sublet the contract. http://connect.ncdot.gov/projects/construction/Construction%20Forms/Subcontract%20Approval%20Form%20Rev.%202012.zip

JC-1 *Joint Check Notification Form* - Form and procedures for joint check notification. The form acts as a written joint check agreement among the parties providing full and prompt disclosure of the expected use of joint checks.

http://connect.ncdot.gov/projects/construction/Construction%20Forms/Joint%20Check%20Notification%20Form.pdf

Letter of Intent - Form signed by the Contractor and the MBE/WBE subcontractor, manufacturer or regular dealer that affirms that a portion of said contract is going to be performed by the signed MBE/WBE for the estimated amount (based on quantities and unit prices) listed at the time of bid.
http://connect.ncdot.gov/letting/LetCentral/Letter%20of%20Intent%20to%20Perform%20as%20a%20Subcontractor.pdf

Listing of MBE and WBE Subcontractors Form - Form for entering MBE/WBE subcontractors on a project that will meet the Combined MBE/WBE goal. This form is for paper bids only.
http://connect.ncdot.gov/municipalities/Bid%20Proposals%20for%20LGA%20Content/09%20MBE-WBE%20Subcontractors%20(State).docx

Subcontractor Quote Comparison Sheet - Spreadsheet for showing all subcontractor quotes in the work areas where MBEs and WBEs quoted on the project. This sheet is submitted with good faith effort packages.
http://connect.ncdot.gov/business/SmallBusiness/Documents/DBE%20Subcontractor%20Quote%20Comparison%20Example.xls

Combined MBE/WBE Goal

The Combined MBE/WBE Goal for this project is **0.0 %**

The Combined Goal was established utilizing the following anticipated participation for Minority Business Enterprises and Women Business Enterprises:

(A) Minority Business Enterprises **0.0 %**

(1) *If the anticipated MBE participation is more than zero*, the Contractor shall exercise all necessary and reasonable steps to ensure that MBEs participate in at least the percent of the contract as set forth above.

(2) *If the anticipated MBE participation is zero*, the Contractor shall make an effort to recruit and use MBEs during the performance of the contract. Any MBE participation obtained shall be reported to the Department.

(B) Women Business Enterprises **0.0 %**

(1) *If the anticipated WBE participation is more than zero*, the Contractor shall exercise all necessary and reasonable steps to ensure that WBEs participate in at least the percent of the contract as set forth above.

(2) *If the anticipated WBE participation is zero*, the Contractor shall make an effort to recruit and use WBEs during the performance of the contract. Any WBE participation obtained shall be reported to the Department.

The Bidder is required to submit only participation to meet the Combined MBE/WBE Goal. The Combined Goal may be met by submitting all MBE participation, all WBE participation, or a combination of MBE and WBE participation.

Directory of Transportation Firms (Directory)

Real-time information is available about firms doing business with the Department and firms that are certified through NCUCP in the Directory of Transportation Firms. Only firms identified in the Directory as MBE and WBE certified shall be used to meet the Combined MBE/WBE Goal. The Directory can be found at the following link.
https://www.ebs.nc.gov/VendorDirectory/default.html

The listing of an individual firm in the directory shall not be construed as an endorsement of the firm's capability to perform certain work.

Listing of MBE/WBE Subcontractors

At the time of bid, bidders shall submit all MBE and WBE participation that they anticipate to use during the life of the contract. Only those identified to meet the Combined MBE/WBE Goal will be considered committed, even though the listing shall include both committed MBE/WBE subcontractors and additional MBE/WBE subcontractors. Any additional MBE/WBE subcontractor participation above the goal will follow the banking guidelines found elsewhere in this provision. All other additional MBE/WBE subcontractor participation submitted at the time of bid will be used toward the Department's overall race-neutral goals. Only those firms with current MBE and WBE certification at the time of bid opening will be acceptable for listing in the bidder's submittal of MBE and WBE participation. The Contractor shall indicate the following required information:

(A) Electronic Bids

Bidders shall submit a listing of MBE and WBE participation in the appropriate section of Expedite, the bidding software of Bid Express®.

(1) Submit the names and addresses of MBE and WBE firms identified to participate in the contract. If the bidder uses the updated listing of MBE and WBE firms shown in Expedite, the bidder may use the dropdown menu to access the name and address of the firms.

(2) Submit the contract line numbers of work to be performed by each MBE and WBE firm. When no figures or firms are entered, the bidder will be considered to have no MBE or WBE participation.

(3) The bidder shall be responsible for ensuring that the MBE and WBE are certified at the time of bid by checking the Directory of Transportation Firms. If the firm is not certified at the time of the bid-letting, that MBE's or WBE's participation will not count towards achieving the Combined MBE/WBE goal.

(B) Paper Bids

(1) *If the Combined MBE/WBE Goal is more than zero,*

(a) Bidders, at the time the bid proposal is submitted, shall submit a listing of MBE/WBE participation, including the names and addresses on *Listing of MBE and WBE Subcontractors* contained elsewhere in the contract documents in order for the bid to be considered responsive. Bidders shall indicate the total dollar value of the MBE and WBE participation for the contract.

(b) If bidders have no MBE or WBE participation, they shall indicate this on the *Listing of MBE and WBE Subcontractors* by entering the word "None" or the number "0." This form shall be completed in its entirety. **Blank forms will not be deemed to represent zero participation.** Bids submitted that do not have MBE and WBE participation indicated on the appropriate form will not be read publicly during the opening of bids. The Department will not consider these bids for award and the proposal will be rejected.

(c) The bidder shall be responsible for ensuring that the MBE/WBE is certified at the time of bid by checking the Directory of Transportation Firms. If the firm is not certified at the time of the bid-letting, that MBE's or WBE's participation will not count towards achieving the Combined MBE/WBE Goal.

(2) *If the Combined MBE/WBE Goal is zero,* entries on the *Listing of MBE and WBE Subcontractors* are not required for the zero goal, however any MBE or WBE participation that is achieved during the project shall be reported in accordance with requirements contained elsewhere in the special provision.

MBE or WBE Prime Contractor

When a certified MBE or WBE firm bids on a contract that contains a Combined MBE/WBE goal, the firm is responsible for meeting the goal or making good faith efforts to meet the goal, just like any other bidder. In most cases, a MBE or WBE bidder on a contract will meet the Combined MBE/WBE Goal by virtue of the work it performs on the contract with its own forces. However, all the work that is performed by the MBE or WBE bidder and any other similarly certified subcontractors will count toward the goal. The MBE or WBE bidder shall list itself along with any MBE or WBE subcontractors, if any, in order to receive credit toward the goal.

MBE/WBE prime contractors shall also follow Sections A and B listed under *Listing of MBE/WBE Subcontractor* just as a non-MBE/WBE bidder would.

Written Documentation – Letter of Intent

The bidder shall submit written documentation for each MBE/WBE that will be used to meet the Combined MBE/WBE Goal of the contract, indicating the bidder's commitment to use the

MBE/WBE in the contract. This documentation shall be submitted on the Department's form titled *Letter of Intent*.

The documentation shall be received in the office of the State Contractor Utilization Engineer or at DBE@ncdot.gov no later than 10:00 a.m. of the sixth calendar day following opening of bids, unless the sixth day falls on an official state holiday. In that situation, it is due in the office of the State Contractor Utilization Engineer no later than 10:00 a.m. on the next official state business day.

If the bidder fails to submit the Letter of Intent from each committed MBE and WBE to be used toward the Combined MBE/WBE Goal, or if the form is incomplete (i.e. both signatures are not present), the MBE/WBE participation will not count toward meeting the Combined MBE/WBE Goal. If the lack of this participation drops the commitment below the Combined MBE/WBE Goal, the Contractor shall submit evidence of good faith efforts for the goal, completed in its entirety, to the State Contractor Utilization Engineer or DBE@ncdot.gov no later than 10:00 a.m. on the eighth calendar day following opening of bids, unless the eighth day falls on an official state holiday. In that situation, it is due in the office of the State Contractor Utilization Engineer no later than 10:00 a.m. on the next official state business day.

Banking MBE/WBE Credit

If the bid of the lowest responsive bidder exceeds $500,000 and if the committed MBE/WBE participation submitted exceeds the algebraic sum of the Combined MBE /WBE Goal by $1,000 or more, the excess will be placed on deposit by the Department for future use by the bidder. Separate accounts will be maintained for MBE and WBE participation and these may accumulate for a period not to exceed 24 months.

When the apparent lowest responsive bidder fails to submit sufficient participation by MBE and WBE firms to meet the advertised goal, as part of the good faith effort, the Department will consider allowing the bidder to withdraw funds to meet the Combined MBE/WBE Goal as long as there are adequate funds available from the bidder's MBE and WBE bank accounts.

Submission of Good Faith Effort

If the bidder fails to meet or exceed the Combined MBE/WBE Goal, the apparent lowest responsive bidder shall submit to the Department documentation of adequate good faith efforts made to reach that specific goal.

A hard copy and an electronic copy of this information shall be received in the office of the State Contractor Utilization Engineer or at DBE@ncdot.gov no later than 10:00 a.m. on the sixth calendar day following opening of bids unless the sixth day falls on an official state holiday. In that situation, it would be due in the office of the State Contractor Utilization Engineer no later than 10:00 a.m. on the next official state business day. If the contractor cannot send the information electronically, then one complete set and 5 copies of this information shall be received under the same time constraints above.

Note: Where the information submitted includes repetitious solicitation letters, it will be acceptable to submit a representative letter along with a distribution list of the firms that were

solicited. Documentation of MBE/WBE quotations shall be a part of the good faith effort submittal. This documentation may include written subcontractor quotations, telephone log notations of verbal quotations, or other types of quotation documentation.

Consideration of Good Faith Effort for Projects with a Combined MBE/WBE Goal More Than Zero

Adequate good faith efforts mean that the bidder took all necessary and reasonable steps to achieve the goal which, by their scope, intensity, and appropriateness, could reasonably be expected to obtain sufficient MBE/WBE participation. Adequate good faith efforts also mean that the bidder actively and aggressively sought MBE/WBE participation. Mere *pro forma* efforts are not considered good faith efforts.

The Department will consider the quality, quantity, and intensity of the different kinds of efforts a bidder has made. Listed below are examples of the types of actions a bidder will take in making a good faith effort to meet the goals and are not intended to be exclusive or exhaustive, nor is it intended to be a mandatory checklist.

(A) Soliciting through all reasonable and available means (e.g. attendance at pre-bid meetings, advertising, written notices, use of verifiable electronic means through the use of the NCDOT Directory of Transportation Firms) the interest of all certified MBEs/WBEs that are also prequalified subcontractors. The bidder must solicit this interest within at least 10 days prior to bid opening to allow the MBEs/WBEs to respond to the solicitation. Solicitation shall provide the opportunity to MBEs/WBEs within the Division and surrounding Divisions where the project is located. The bidder must determine with certainty if the MBEs/WBEs are interested by taking appropriate steps to follow up initial solicitations.

(B) Selecting portions of the work to be performed by MBEs/WBEs in order to increase the likelihood that the Combined MBE/WBE Goal will be achieved.

(1) Where appropriate, break out contract work items into economically feasible units to facilitate MBE/WBE participation, even when the prime contractor might otherwise prefer to perform these work items with its own forces.

(2) Negotiate with subcontractors to assume part of the responsibility to meet the advertised goal when the work to be sublet includes potential for MBE/WBE participation (2^{nd} and 3^{rd} tier subcontractors).

(C) Providing interested certified MBEs/WBEs that are also prequalified subcontractors with adequate information about the plans, specifications, and requirements of the contract in a timely manner to assist them in responding to a solicitation.

(D) (1) Negotiating in good faith with interested MBEs/WBEs. It is the bidder's responsibility to make a portion of the work available to MBE/WBE subcontractors and suppliers and to select those portions of the work or material needs consistent with the available MBE/WBE subcontractors and suppliers, so as to facilitate MBE/WBE participation. Evidence of such negotiation includes the names, addresses, and telephone numbers of MBEs/WBEs that were considered;

a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why additional agreements could not be reached for MBEs/WBEs to perform the work.

(2) A bidder using good business judgment would consider a number of factors in negotiating with subcontractors, including MBE/WBE subcontractors, and would take a firm's price and capabilities as well as the advertised goal into consideration. However, the fact that there may be some additional costs involved in finding and using MBEs/WBEs is not in itself sufficient reason for a bidder's failure to meet the contract goal, as long as such costs are reasonable. Also, the ability or desire of a prime contractor to perform the work of a contract with its own organization does not relieve the bidder of the responsibility to make good faith efforts. Bidding contractors are not, however, required to accept higher quotes from MBEs/WBEs if the price difference is excessive or unreasonable.

(E) Not rejecting MBEs/WBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities. The bidder's standing within its industry, membership in specific groups, organizations, or associates and political or social affiliations (for example, union vs. non-union employee status) are not legitimate causes for the rejection or non-solicitation of bids in the bidder's efforts to meet the project goal.

(F) Making efforts to assist interested MBEs/WBEs in obtaining bonding, lines of credit, or insurance as required by the recipient or bidder.

(G) Making efforts to assist interested MBEs/WBEs in obtaining necessary equipment, supplies, materials, or related assistance or services.

(H) Effectively using the services of available minority/women community organizations; minority/women contractors' groups; Federal, State, and local minority/women business assistance offices; and other organizations as allowed on a case-by-case basis to provide assistance in the recruitment and placement of MBEs/WBEs. Contact within 7 days from the bid opening the Business Opportunity and Work Force Development Unit at BOWD@ncdot.gov to give notification of the bidder's inability to get MBE or WBE quotes.

(I) Any other evidence that the bidder submits which shows that the bidder has made reasonable good faith efforts to meet the advertised goal.

In addition, the Department may take into account the following:

(1) Whether the bidder's documentation reflects a clear and realistic plan for achieving the Combined MBE/WBE Goal.

(2) The bidders' past performance in meeting the contract goal.

(3) The performance of other bidders in meeting the advertised goal. For example, when the apparent successful bidder fails to meet the goal, but others meet it, you may reasonably raise the question of whether, with additional reasonable efforts the

apparent successful bidder could have met the goal. If the apparent successful bidder fails to meet the advertised goal, but meets or exceeds the average MBE and WBE participation obtained by other bidders, the Department may view this, in conjunction with other factors, as evidence of the apparent successful bidder having made a good faith effort.

If the Department does not award the contract to the apparent lowest responsive bidder, the Department reserves the right to award the contract to the next lowest responsive bidder that can satisfy to the Department that the Combined MBE/WBE Goal can be met or that an adequate good faith effort has been made to meet the advertised goal.

Non-Good Faith Appeal

The State Contractual Services Engineer will notify the contractor verbally and in writing of non-good faith. A contractor may appeal a determination of non-good faith made by the Goal Compliance Committee. If a contractor wishes to appeal the determination made by the Committee, they shall provide written notification to the State Contractual Services Engineer or at DBE@ncdot.gov. The appeal shall be made within 2 business days of notification of the determination of non-good faith.

Counting MBE/WBE Participation Toward Meeting the Combined MBE/WBE Goal

(A) Participation

The total dollar value of the participation by a committed MBE/WBE will be counted toward the contract goal requirements. The total dollar value of participation by a committed MBE/WBE will be based upon the value of work actually performed by the MBE/WBE and the actual payments to MBE/WBE firms by the Contractor.

(B) Joint Checks

Prior notification of joint check use shall be required when counting MBE/WBE participation for services or purchases that involves the use of a joint check. Notification shall be through submission of Form JC-1 *(Joint Check Notification Form)* and the use of joint checks shall be in accordance with the Department's Joint Check Procedures.

(C) Subcontracts (Non-Trucking)

A MBE/WBE may enter into subcontracts. Work that a MBE subcontracts to another MBE firm may be counted toward the anticipated MBE participation. The same holds true for work that a WBE subcontracts to another WBE firm. Work that a MBE/WBE subcontracts to a non-MBE/WBE firm does <u>not</u> count toward the contract goal requirement. It should be noted that every effort shall be made by MBE and WBE contractors to subcontract to the same certification (i.e., MBEs to MBEs and WBEs to WBEs), in order to fulfill the MBE or WBE participation breakdown. This, however, may not always be possible due to the limitation of firms in the area. If the MBE or WBE firm shows a good faith effort has been made to reach out to similarly certified firms and there is no interest or availability,

and they can get assistance from other certified firms, the Engineer will not hold the prime responsible for meeting the individual MBE or WBE breakdown. If a MBE or WBE contractor or subcontractor subcontracts a significantly greater portion of the work of the contract than would be expected on the basis of standard industry practices, it shall be presumed that the MBE or WBE is not performing a commercially useful function.

(D) Joint Venture

When a MBE or WBE performs as a participant in a joint venture, the Contractor may count toward its contract goal requirement a portion of the total value of participation with the MBE or WBE in the joint venture, that portion of the total dollar value being a distinct clearly defined portion of work that the MBE or WBE performs with its forces.

(E) Suppliers

A contractor may count toward its MBE/ WBE requirement 60 percent of its expenditures for materials and supplies required to complete the contract and obtained from a MBE or WBE regular dealer and 100 percent of such expenditures from a MBE or WBE manufacturer.

(F) Manufacturers and Regular Dealers

A contractor may count toward its MBE/ WBE requirement the following expenditures to MBE/WBE firms that are not manufacturers or regular dealers:

(1) The fees or commissions charged by a MBE/WBE firm for providing a *bona fide* service, such as professional, technical, consultant, or managerial services, or for providing bonds or insurance specifically required for the performance of a DOT-assisted contract, provided the fees or commissions are determined to be reasonable and not excessive as compared with fees and commissions customarily allowed for similar services.

(2) With respect to materials or supplies purchased from a MBE/WBE, which is neither a manufacturer nor a regular dealer, count the entire amount of fees or commissions charged for assistance in the procurement of the materials and supplies, or fees or transportation charges for the delivery of materials or supplies required on a job site (but not the cost of the materials and supplies themselves), provided the fees are determined to be reasonable and not excessive as compared with fees customarily allowed for similar services.

Commercially Useful Function

(A) MBE/WBE Utilization

The Contractor may count toward its contract goal requirement only expenditures to MBEs and WBEs that perform a commercially useful function in the work of a contract. A MBE/WBE performs a commercially useful function when it is responsible for execution of the work of the contract and is carrying out its responsibilities by actually

performing, managing, and supervising the work involved. To perform a commercially useful function, the MBE/WBE shall also be responsible with respect to materials and supplies used on the contract, for negotiating price, determining quality and quantity, ordering the material and installing (where applicable) and paying for the material itself. To determine whether a MBE/WBE is performing a commercially useful function, the Department will evaluate the amount of work subcontracted, industry practices, whether the amount the firm is to be paid under the contract is commensurate with the work it is actually performing and the MBE/WBE credit claimed for its performance of the work, and any other relevant factors. If it is determined that a MBE or WBE is not performing a Commercially Useful Function, the contractor may present evidence to rebut this presumption to the Department.

(B) MBE/WBE Utilization in Trucking

The following factors will be used to determine if a MBE or WBE trucking firm is performing a commercially useful function:

(1) The MBE/WBE shall be responsible for the management and supervision of the entire trucking operation for which it is responsible on a particular contract, and there shall not be a contrived arrangement for the purpose of meeting the Combined MBE/WBE Goal.

(2) The MBE/WBE shall itself own and operate at least one fully licensed, insured, and operational truck used on the contract.

(3) The MBE/WBE receives credit for the total value of the transportation services it provides on the contract using trucks it owns, insures, and operates using drivers it employs.

(4) The MBE may subcontract the work to another MBE firm, including an owner-operator who is certified as a MBE. The same holds true that a WBE may subcontract the work to another WBE firm, including an owner-operator who is certified as a WBE. When this occurs, the MBE or WBE who subcontracts work receives credit for the total value of the transportation services the subcontracted MBE or WBE provides on the contract. It should be noted that every effort shall be made by MBE and WBE contractors to subcontract to the same certification (i.e., MBEs to MBEs and WBEs to WBEs), in order to fulfill the participation breakdown. This, however, may not always be possible due to the limitation of firms in the area. If the MBE or WBE firm shows a good faith effort has been made to reach out to similarly certified transportation service providers and there is no interest or availability, and they can get assistance from other certified providers, the Engineer will not hold the prime responsible for meeting the individual MBE or WBE participation breakdown.

(5) The MBE/WBE may also subcontract the work to a non-MBE/WBE firm, including from an owner-operator. The MBE/WBE who subcontracts the work to a non-MBE/WBE is entitled to credit for the total value of transportation services

provided by the non-MBE/WBE subcontractor not to exceed the value of transportation services provided by MBE/WBE-owned trucks on the contract. Additional participation by non-MBE/WBE subcontractors receives credit only for the fee or commission it receives as a result of the subcontract arrangement. The value of services performed under subcontract agreements between the MBE/WBE and the Contractor will not count towards the MBE/WBE contract requirement.

(6) A MBE/WBE may lease truck(s) from an established equipment leasing business open to the general public. The lease must indicate that the MBE/WBE has exclusive use of and control over the truck. This requirement does not preclude the leased truck from working for others during the term of the lease with the consent of the MBE/WBE, so long as the lease gives the MBE/WBE absolute priority for use of the leased truck. This type of lease may count toward the MBE/WBE's credit as long as the driver is under the MBE/WBE's payroll.

(7) Subcontracted/leased trucks shall display clearly on the dashboard the name of the MBE/WBE that they are subcontracted/leased to and their own company name if it is not identified on the truck itself. Magnetic door signs are not permitted.

MBE/WBE Replacement

When a Contractor has relied on a commitment to a MBE or WBE subcontractor (or an approved substitute MBE or WBE subcontractor) to meet all or part of a contract goal requirement, the contractor shall not terminate the MBE/WBE subcontractor for convenience. This includes, but is not limited to, instances in which the Contractor seeks to perform the work of the terminated subcontractor with another MBE/WBE subcontractor, a non-MBE/WBE subcontractor, or with the Contractor's own forces or those of an affiliate.

The Contractor must give notice in writing both by certified mail and email to the MBE/WBE subcontractor, with a copy to the Engineer of its intent to request to terminate and/or substitute, and the reason for the request. The Contractor must give the MBE/WBE subcontractor five (5) business days to respond to the Contractor's Notice of Intent to Request Termination and/or Substitution. If the MBE/WBE subcontractor objects to the intended termination/substitution, the MBE/WBE, within five (5) business days must advise the Contractor and the Department of the reasons why the action should not be approved. The five-day notice period shall begin on the next business day after written notice is provided to the MBE/WBE subcontractor.

A committed MBE/WBE subcontractor may only be terminated after receiving the Department's written approval based upon a finding of good cause for the proposed termination and/or substitution. For purposes of this section, good cause shall include the following circumstances:

(a) The listed MBE/WBE subcontractor fails or refuses to execute a written contract;
(b) The listed MBE/WBE subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided, however, that good cause does not exist if the failure or refusal of the MBE/WBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the prime contractor;

(c) The listed MBE/WBE subcontractor fails or refuses to meet the prime contractor's reasonable, nondiscriminatory bond requirements;
(d) The listed MBE/WBE subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;
(e) The listed MBE/WBE subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant to 2 CFR Parts 180, 215 and 1,200 or applicable state law;
(f) The listed MBE/WBE subcontractor is not a responsible contractor;
(g) The listed MBE/WBE voluntarily withdraws from the project and provides written notice of withdrawal;
(h) The listed MBE/WBE is ineligible to receive MBE/WBE credit for the type of work required;
(i) A MBE/WBE owner dies or becomes disabled with the result that the listed MBE/WBE contractor is unable to complete its work on the contract;
(j) Other documented good cause that compels the termination of the MBE/WBE subcontractor. Provided, that good cause does not exist if the prime contractor seeks to terminate a MBE/WBE it relied upon to obtain the contract so that the prime contractor can self-perform the work for which the MBE/WBE contractor was engaged or so that the prime contractor can substitute another MBE/WBE or non-MBE/WBE contractor after contract award.

The Contractor shall comply with the following for replacement of a committed MBE/WBE:

(A) Performance Related Replacement

When a committed MBE/WBE is terminated for good cause as stated above, an additional MBE/WBE that was submitted at the time of bid may be used to fulfill the MBE/WBE commitment to meet the Combined MBE/WBE Goal. A good faith effort will only be required for removing a committed MBE/WBE if there were no additional MBE/WBEs submitted at the time of bid to cover the same amount of work as the MBE/WBE that was terminated.

If a replacement MBE/WBE is not found that can perform at least the same amount of work as the terminated MBE/WBE, the Contractor shall submit a good faith effort documenting the steps taken. Such documentation shall include, but not be limited to, the following:

(1) Copies of written notification to MBE/WBEs that their interest is solicited in contracting the work defaulted by the previous MBE/WBE or in subcontracting other items of work in the contract.

(2) Efforts to negotiate with MBE/WBEs for specific subbids including, at a minimum:

(a) The names, addresses, and telephone numbers of MBE/WBEs who were contacted.
(b) A description of the information provided to MBE/WBEs regarding the plans and specifications for portions of the work to be performed.

(3) A list of reasons why MBE/WBE quotes were not accepted.

(4) Efforts made to assist the MBE/WBEs contacted, if needed, in obtaining bonding or insurance required by the Contractor.

(B) Decertification Replacement

(1) When a committed MBE/WBE is decertified by the Department after the SAF (*Subcontract Approval Form*) has been received by the Department, the Department will not require the Contractor to solicit replacement MBE/WBE participation equal to the remaining work to be performed by the decertified firm. The participation equal to the remaining work performed by the decertified firm will count toward the contract goal requirement.

(2) When a committed MBE/WBE is decertified prior to the Department receiving the SAF (*Subcontract Approval Form*) for the named MBE/WBE firm, the Contractor shall take all necessary and reasonable steps to replace the MBE/WBE subcontractor with another MBE/WBE subcontractor to perform at least the same amount of work to meet the Combined MBE/WBE goal requirement. If a MBE/WBE firm is not found to do the same amount of work, a good faith effort must be submitted to NCDOT (see A herein for required documentation).

All requests for replacement of a committed MBE/WBE firm shall be submitted to the Engineer for approval on Form RF-1 *(DBE Replacement Request).* If the Contractor fails to follow this procedure, the Contractor may be disqualified from further bidding for a period of up to 6 months.

Changes in the Work

When the Engineer makes changes that result in the reduction or elimination of work to be performed by a committed MBE/WBE, the Contractor will not be required to seek additional participation. When the Engineer makes changes that result in additional work to be performed by a MBE/WBE based upon the Contractor's commitment, the MBE/WBE shall participate in additional work to the same extent as the MBE/WBE participated in the original contract work.

When the Engineer makes changes that result in extra work, which has more than a minimal impact on the contract amount, the Contractor shall seek additional participation by MBEs/WBEs unless otherwise approved by the Engineer.

When the Engineer makes changes that result in an alteration of plans or details of construction, and a portion or all of the work had been expected to be performed by a committed MBE/WBE, the Contractor shall seek participation by MBEs/WBEs unless otherwise approved by the Engineer.

When the Contractor requests changes in the work that result in the reduction or elimination of work that the Contractor committed to be performed by a MBE/WBE, the Contractor shall seek additional participation by MBEs/WBEs equal to the reduced MBE/WBE participation caused by the changes.

Reports and Documentation

A SAF (*Subcontract Approval Form*) shall be submitted for all work which is to be performed by a MBE/WBE subcontractor. The Department reserves the right to require copies of actual subcontract agreements involving MBE/WBE subcontractors.

When using transportation services to meet the contract commitment, the Contractor shall submit a proposed trucking plan in addition to the SAF. The plan shall be submitted prior to beginning construction on the project. The plan shall include the names of all trucking firms proposed for use, their certification type(s), the number of trucks owned by the firm, as well as the individual truck identification numbers, and the line item(s) being performed.

Within 30 calendar days of entering into an agreement with a MBE/WBE for materials, supplies or services, not otherwise documented by the SAF as specified above, the Contractor shall furnish the Engineer a copy of the agreement. The documentation shall also indicate the percentage (60% or 100%) of expenditures claimed for MBE/WBE credit.

Reporting Minority and Women Business Enterprise Participation

The Contractor shall provide the Engineer with an accounting of payments made to all MBE/ WBE firms, including material suppliers and contractors at all levels (prime, subcontractor, or second tier subcontractor). This accounting shall be furnished to the Engineer for any given month by the end of the following month. Failure to submit this information accordingly may result in the following action:

(A) Withholding of money due in the next partial pay estimate; or

(B) Removal of an approved contractor from the prequalified bidders' list or the removal of other entities from the approved subcontractors list.

While each contractor (prime, subcontractor, 2nd tier subcontractor) is responsible for accurate accounting of payments to MBEs/WBEs, it shall be the prime contractor's responsibility to report all monthly and final payment information in the correct reporting manner.

Failure on the part of the Contractor to submit the required information in the time frame specified may result in the disqualification of that contractor and any affiliate companies from further bidding until the required information is submitted.

Failure on the part of any subcontractor to submit the required information in the time frame specified may result in the disqualification of that contractor and any affiliate companies from being approved for work on future DOT projects until the required information is submitted.

Contractors reporting transportation services provided by non-MBE/WBE lessees shall evaluate the value of services provided during the month of the reporting period only.

At any time, the Engineer can request written verification of subcontractor payments.

The Contractor shall report the accounting of payments through the Department's Payment Tracking System.

Failure to Meet Contract Requirements

Failure to meet contract requirements in accordance with Subarticle 102-15(J) of the *2018 Standard Specifications* may be cause to disqualify the Contractor.

STANDARD SPECIAL PROVISION
AVAILABILITY OF FUNDS – TERMINATION OF CONTRACTS

(5-20-08) Z-2

General Statute 143C-6-11. (h) Highway Appropriation is hereby incorporated verbatim in this contract as follows:

(h) Amounts Encumbered. – Transportation project appropriations may be encumbered in the amount of allotments made to the Department of Transportation by the Director for the estimated payments for transportation project contract work to be performed in the appropriation fiscal year. The allotments shall be multiyear allotments and shall be based on estimated revenues and shall be subject to the maximum contract authority contained in *General Statute 143C-6-11(c).* Payment for transportation project work performed pursuant to contract in any fiscal year other than the current fiscal year is subject to appropriations by the General Assembly. Transportation project contracts shall contain a schedule of estimated completion progress, and any acceleration of this progress shall be subject to the approval of the Department of Transportation provided funds are available. The State reserves the right to terminate or suspend any transportation project contract, and any transportation project contract shall be so terminated or suspended if funds will not be available for payment of the work to be performed during that fiscal year pursuant to the contract. In the event of termination of any contract, the contractor shall be given a written notice of termination at least 60 days before completion of scheduled work for which funds are available. In the event of termination, the contractor shall be paid for the work already performed in accordance with the contract specifications.

Payment will be made on any contract terminated pursuant to the special provision in accordance with Subarticle 108-13(E) of the *2018 Standard Specifications*.

STANDARD SPECIAL PROVISION

MINIMUM WAGES

(7-21-09) Z-5

FEDERAL: The Fair Labor Standards Act provides that with certain exceptions every employer shall pay wages at the rate of not less than SEVEN DOLLARS AND TWENTY FIVE CENTS ($7.25) per hour.

STATE: The North Carolina Minimum Wage Act provides that every employer shall pay to each of his employees, wages at a rate of not less than SEVEN DOLLARS AND TWENTY FIVE CENTS ($7.25) per hour.

The minimum wage paid to all skilled labor employed on this contract shall be SEVEN DOLLARS AND TWENTY FIVE CENTS ($7.25) per hour.

The minimum wage paid to all intermediate labor employed on this contract shall be SEVEN DOLLARS AND TWENTY FIVE CENTS ($7.25) per hour.

The minimum wage paid to all unskilled labor on this contract shall be SEVEN DOLLARS AND TWENTY FIVE CENTS ($7.25) per hour.

This determination of the intent of the application of this act to the contract on this project is the responsibility of the Contractor.

The Contractor shall have no claim against the Department of Transportation for any changes in the minimum wage laws, Federal or State. It is the responsibility of the Contractor to keep fully informed of all Federal and State Laws affecting his contract.

STANDARD SPECIAL PROVISION

TITLE VI AND NONDISCRIMINATION:

(6-28-77)(Rev 6/19/2018) Z-6

Revise the *2018 Standard Specifications* as follows:

Replace Article 103-4(B) with the following:

The North Carolina Department of Transportation is committed to carrying out the U.S. Department of Transportation's policy of ensuring nondiscrimination in the award and administration of contracts.

The provisions of this section related to United States Department of Transportation (US DOT) Order 1050.2A, Title 49 Code of Federal Regulations (CFR) part 21, 23 United States Code (U.S.C.) 140 and 23 CFR part 200 (or 49 CFR 303, 49 U.S.C. 5332 or 49 U.S.C. 47123) are applicable to all North Carolina Department of Transportation (NCDOT) contracts and to all related subcontracts, material supply, engineering, architectural and other service contracts, regardless of dollar amount. Any Federal provision that is specifically required not specifically set forth is hereby incorporated by reference.

(1) **Title VI Assurances (USDOT Order 1050.2A, Appendix A)**

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

(a) Compliance with Regulations

The contractor (hereinafter includes consultants) shall comply with the Acts and the Regulations relative to Nondiscrimination in Federally-assisted programs of the U.S. Department of Transportation, Federal Highway Administration (FHWA), as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

(b) Nondiscrimination

The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor shall not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

(c) Solicitations for Subcontractors, Including Procurements of Materials and Equipment

In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to Nondiscrimination on the grounds of race, color, or national origin.

(d) Information and Reports

The contractor shall provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the FHWA to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor shall so certify to the Recipient or the FHWA, as appropriate, and shall set forth what efforts it has made to obtain the information.

(e) Sanctions for Noncompliance:

In the event of a contractor's noncompliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it and/or the FHWA may determine to be appropriate, including, but not limited to:

(i) Withholding payments to the contractor under the contract until the contractor complies; and/or

(ii) Cancelling, terminating, or suspending a contract, in whole or in part.

(f) Incorporation of Provisions

The contractor shall include the provisions of paragraphs (a) through (f) in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor shall take action with respect to any subcontract or procurement as the Recipient or the FHWA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

(2) **Title VI Nondiscrimination Program (23 CFR 200.5(p))**

The North Carolina Department of Transportation (NCDOT) has assured the USDOT that, as a condition to receiving federal financial assistance, NCDOT will comply with Title VI of the Civil Rights Act of 1964 and all requirements imposed by Title 49 CFR part 21 and related nondiscrimination authorities to ensure that no person shall, on the ground of race, color, national origin, limited English proficiency, sex, age, or disability (including religion/creed or income-level, where applicable), be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any programs, activities, or services conducted or funded by NCDOT. Contractors and other organizations under contract or agreement with NCDOT must also comply with Title VI and related authorities, therefore:

(a) During the performance of this contract or agreement, contractors (e.g., subcontractors, consultants, vendors, prime contractors) are responsible for complying with NCDOT's Title VI Program. Contractors are not required to prepare or submit Title VI Programs. To comply with this section, the prime contractor shall:

1. Post NCDOT's Notice of Nondiscrimination and the Contractor's own Equal Employment Opportunity (EEO) Policy in conspicuous locations accessible to all employees, applicants and subcontractors on the jobsite.
2. Physically incorporate the required Title VI clauses into all subcontracts on federally-assisted and state-funded NCDOT projects, and ensure inclusion by subcontractors into all lower-tier subcontracts.
3. Required Solicitation Language. The Contractor shall include the following notification in all solicitations for bids and requests for work or material, regardless of funding source:

   "The North Carolina Department of Transportation, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 US.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award. In accordance with other related nondiscrimination authorities, bidders and contractors will also not be discriminated against on the grounds of sex, age, disability, low-income level, creed/religion, or limited English proficiency in consideration for an award."
4. Physically incorporate the FHWA-1273, in its entirety, into all subcontracts and subsequent lower tier subcontracts on Federal-aid highway construction contracts only.
5. Provide language assistance services (i.e., written translation and oral interpretation), free of charge, to LEP employees and applicants. Contact NCDOT OCR for further assistance, if needed.
6. For assistance with these Title VI requirements, contact the NCDOT Title VI Nondiscrimination Program at 1-800-522-0453.

(b) Subrecipients (e.g. cities, counties, LGAs, planning organizations) may be required to prepare and submit a Title VI Plan to NCDOT, including Title VI Assurances and/or agreements. Subrecipients must also ensure compliance by their contractors and subrecipients with Title VI. (23 CFR 200.9(b)(7))

(c) If reviewed or investigated by NCDOT, the contractor or subrecipient agrees to take affirmative action to correct any deficiencies found within a reasonable time period, not to exceed 90 calendar days, unless additional time is granted by NCDOT. (23 CFR 200.9(b)(15))

(d) The Contractor is responsible for notifying subcontractors of NCDOT's External Discrimination Complaints Process.

1. Applicability

   Title VI and related laws protect participants and beneficiaries (e.g., members of the public and contractors) from discrimination by NCDOT employees, subrecipients and contractors, regardless of funding source.

2. Eligibility

   Any person—or class of persons—who believes he/she has been subjected to discrimination based on race, color, national origin, Limited English Proficiency (LEP), sex, age, or disability (and religion in the context of employment, aviation, or transit) may file a written complaint. The law also prohibits intimidation or retaliation of any sort.

3. Time Limits and Filing Options

   Complaints may be filed by the affected individual(s) or a representative and must be filed no later than 180 calendar days after the following:

   (i) The date of the alleged act of discrimination; or

   (ii) The date when the person(s) became aware of the alleged discrimination; or

   (iii) Where there has been a continuing course of conduct, the date on which that conduct was discontinued or the latest instance of the conduct.

   Title VI and related discrimination complaints may be submitted to the following entities:

   - North Carolina Department of Transportation, Office of Civil Rights, Title VI Program, 1511 Mail Service Center, Raleigh, NC 27699-1511; toll free 1-800-522-0453
   - Federal Highway Administration, North Carolina Division Office, 310 New Bern Avenue, Suite 410, Raleigh, NC 27601, 919-747-7010
   - US Department of Transportation, Departmental Office of Civil Rights, External Civil Rights Programs Division, 1200 New Jersey Avenue, SE, Washington, DC 20590; 202-366-4070

4. Format for Complaints

   Complaints must be in writing and signed by the complainant(s) or a representative, and include the complainant's name, address, and telephone number. Complaints received by fax or e-mail will be acknowledged and processed. Allegations received by telephone will be reduced to writing and provided to the complainant for confirmation or revision before processing. Complaints will be accepted in other languages, including Braille.

5. Discrimination Complaint Form

   Contact NCDOT Civil Rights to receive a full copy of the Discrimination Complaint Form and procedures.

6. Complaint Basis

   Allegations must be based on issues involving race, color, national origin (LEP), sex, age, disability, or religion (in the context of employment, aviation or transit). "Basis" refers to the complainant's membership in a protected group category.

TABLE 103-1
COMPLAINT BASIS

Protected Categories	Definition	Examples	Applicable Nondiscrimination Authorities
Race and Ethnicity	An individual belonging to one of the accepted racial groups; or the perception, based usually on physical characteristics that a person is a member of a racial group	Black/African American, Hispanic/Latino, Asian, American Indian/Alaska Native, Native Hawaiian/Pacific Islander, White	Title VI of the Civil Rights Act of 1964; 49 CFR Part 21; 23 CFR 200; 49 U.S.C. 5332(b); 49 U.S.C. 47123. *(Executive Order 13166)*
Color	Color of skin, including shade of skin within a racial group	Black, White, brown, yellow, etc.	
National Origin *(Limited English Proficiency)*	Place of birth. Citizenship is not a factor. (*Discrimination based on language or a person's accent is also covered)*	Mexican, Cuban, Japanese, Vietnamese, Chinese	
Sex	Gender. The sex of an individual. *Note:* Sex under this program does not include sexual orientation.	Women and Men	1973 Federal-Aid Highway Act; 49 U.S.C. 5332(b); 49 U.S.C. 47123.
Age	Persons of any age	21-year-old person	Age Discrimination Act of 1975 49 U.S.C. 5332(b); 49 U.S.C. 47123.
Disability	Physical or mental impairment, permanent or temporary, or perceived.	Blind, alcoholic, para-amputee, epileptic, diabetic, arthritic	Section 504 of the Rehabilitation Act of 1973; Americans with Disabilities Act of 1990
Religion (in the context of employment) *(Religion/ Creed in all aspects of any aviation or transit-related construction)*	An individual belonging to a religious group; or the perception, based on distinguishable characteristics that a person is a member of a religious group. In practice, actions taken as a result of the moral and ethical beliefs as to what is right and wrong, which are sincerely held with the strength of traditional religious views. ***Note:*** Does not have to be associated with a recognized religious group or church; if an individual sincerely holds to the belief, it is a protected religious practice.	Muslim, Christian, Sikh, Hindu, etc.	Title VII of the Civil Rights Act of 1964; 23 CFR 230; FHWA-1273 Required Contract Provisions. *(49 U.S.C. 5332(b);* *49 U.S.C. 47123)*

(3) **Pertinent Nondiscrimination Authorities**

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest agrees to comply with the following non-discrimination statutes and authorities, including, but not limited to:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21.

- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 et seq.), (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 et seq.), as amended, (prohibits discrimination on the basis of disability) and 49 CFR Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 et seq.), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);

(g) The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);

(h) Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131-12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;

(i) The Federal Aviation Administration's Nondiscrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);

(j) Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures Nondiscrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;

(k) Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of Limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);

(l) Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq).

(m) Title VII of the Civil Rights Act of 1964 (42 U.S.C. § 2000e et seq., Pub. L. 88-352), (prohibits employment discrimination on the basis of race, color, religion, sex, or national origin).

(4) **Additional Title VI Assurances**

***The following Title VI Assurances (Appendices B, C and D) shall apply, as applicable*

(a) Clauses for Deeds Transferring United States Property (1050.2A, Appendix B)

The following clauses will be included in deeds effecting or recording the transfer of real property, structures, or improvements thereon, or granting interest therein from the United States pursuant to the provisions of Assurance 4.

NOW, THEREFORE, the U.S. Department of Transportation as authorized by law and upon the condition that the North Carolina Department of Transportation (NCDOT) will accept title to the lands and maintain the project constructed thereon in accordance with the North Carolina General Assembly, the Regulations for the Administration of the Federal-Aid Highway Program, and the policies and procedures prescribed by the Federal Highway Administration of the U.S. Department of Transportation in accordance and in compliance with all requirements imposed by Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-assisted programs of the U.S Department of Transportation pertaining to and effectuating the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252; 42 U.S.C. § 2000d to 2000d-4), does hereby remise, release, quitclaim and convey unto the NCDOT all the right, title and interest of the U.S. Department of Transportation in and to said lands described in Exhibit A attached hereto and made a part hereof.

(HABENDUM CLAUSE)

TO HAVE AND TO HOLD said lands and interests therein unto the North Carolina Department of Transportation (NCDOT) and its successors forever, subject, however, to the covenants, conditions, restrictions and reservations herein contained as follows, which will remain in effect for the period during which the real property or structures are used for a purpose for which Federal financial assistance is extended or for another purpose involving the provision of similar services or benefits and will be binding on the NCDOT, its successors and assigns.

The NCDOT, in consideration of the conveyance of said lands and interests in lands, does hereby covenant and agree as a covenant running with the land for itself, its successors and assigns, that (1) no person will on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination with regard to any facility located wholly or in part on, over, or under such lands hereby conveyed [,] [and]* (2) that the NCDOT will use the lands and interests in lands and interests in lands so conveyed, in compliance with all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, Effectuation of Title VI of the Civil Rights Act of 1964, and as said Regulations and Acts may be amended [, and (3) that in the event of breach of any of the above-mentioned nondiscrimination conditions, the Department will have a right to enter or re-enter said lands and facilities on said land, and that above described land and facilities will thereon revert to and vest in and become the absolute property of the U.S. Department of Transportation and its assigns as such interest existed prior to this instruction].*

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary in order to make clear the purpose of Title VI.)

(b) Clauses for Transfer of Real Property Acquired or Improved Under the Activity, Facility, or Program (1050.2A, Appendix C)

The following clauses will be included in deeds, licenses, leases, permits, or similar instruments entered into by the North Carolina Department of Transportation (NCDOT) pursuant to the provisions of Assurance 7(a):

1. The (grantee, lessee, permittee, etc. as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree [in the case of deeds and leases add "as a covenant running with the land"] that:

   (i.) In the event facilities are constructed, maintained, or otherwise operated on the property described in this (deed, license, lease, permit, etc.) for a purpose for which a U.S. Department of Transportation activity, facility, or program is extended or for another purpose involving the provision of similar services or benefits, the (grantee, licensee, lessee, permittee, etc.) will maintain and operate such facilities and services in compliance with all requirements imposed by the Acts and Regulations (as may be amended) such that no person on the grounds of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities.

2. With respect to licenses, leases, permits, etc., in the event of breach of any of the above Nondiscrimination covenants, the NCDOT will have the right to terminate the (lease, license, permit, etc.) and to enter, re-enter, and repossess said lands and facilities thereon, and hold the same as if the (lease, license, permit, etc.) had never been made or issued. *

3. With respect to a deed, in the event of breach of any of the above Nondiscrimination covenants, the NCDOT will have the right to enter or re-enter the lands and facilities thereon, and the above described lands and facilities will there upon revert to and vest in and become the absolute property of the NCDOT and its assigns. *

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

(c) Clauses for Construction/Use/Access to Real Property Acquired Under the Activity, Facility or Program (1050.2A, Appendix D)

The following clauses will be included in deeds, licenses, permits, or similar instruments/ agreements entered into by the North Carolina Department of Transportation (NCDOT) pursuant to the provisions of Assurance 7(b):

1. The (grantee, licensee, permittee, etc., as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree (in the case of deeds and leases add, "as a covenant running with the land") that (1) no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities, (2) that in the construction of any improvements on, over, or under such land, and the furnishing of services thereon, no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or otherwise be subjected to discrimination, (3) that the (grantee, licensee, lessee, permittee, etc.) will use the premises in compliance with all other requirements imposed by or pursuant to the Acts and Regulations, as amended, set forth in this Assurance.

2. With respect to (licenses, leases, permits, etc.), in the event of breach of any of the above Non¬ discrimination covenants, the NCDOT will have the right to terminate the (license, permit, etc., as appropriate) and to enter or re-enter and repossess said land and the facilities thereon, and hold the same as if said (license, permit, etc., as appropriate) had never been made or issued. *

3. With respect to deeds, in the event of breach of any of the above Nondiscrimination covenants, the NCDOT will there upon revert to and vest in and become the absolute property of the NCDOT and its assigns. *

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

STANDARD SPECIAL PROVISION

MINORITY AND FEMALE EMPLOYMENT REQUIREMENTS

Z-7

NOTICE OF REQUIREMENTS FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (*EXECUTIVE NUMBER 11246*)

1. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, see as shown on the attached sheet entitled "Employment Goals for Minority and Female participation".

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and nonfederally involved construction.

The Contractor's compliance with the Executive Order and the regulations in *41 CFR Part 60-4* shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in *41 CFR 60-4.3(a),* and its effort to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project or the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the executive Order and the regulations *in 41 CFR Part 60-4.* Compliance with the goals will be measured against the total work hours performed.

2. As used in this Notice and in the contract resulting from this solicitation, the "covered area" is the county or counties shown on the cover sheet of the proposal form and contract.

EMPLOYMENT GOALS FOR MINORITY AND FEMALE PARTICIPATION

Economic Areas

Area 023 29.7%
Bertie County
Camden County
Chowan County
Gates County
Hertford County
Pasquotank County
Perquimans County

Area 024 31.7%
Beaufort County
Carteret County
Craven County
Dare County
Edgecombe County
Green County
Halifax County
Hyde County
Jones County
Lenoir County
Martin County
Nash County
Northampton County
Pamlico County
Pitt County
Tyrrell County
Washington County
Wayne County
Wilson County

Area 025 23.5%
Columbus County
Duplin County
Onslow County
Pender County

Area 026 33.5%
Bladen County
Hoke County
Richmond County
Robeson County
Sampson County
Scotland County

Area 027 24.7%
Chatham County
Franklin County
Granville County
Harnett County
Johnston County
Lee County
Person County
Vance County
Warren County

Area 028 15.5%
Alleghany County
Ashe County
Caswell County
Davie County
Montgomery County
Moore County
Rockingham County
Surry County
Watauga County
Wilkes County

Area 029 15.7%
Alexander County
Anson County
Burke County
Cabarrus County
Caldwell County
Catawba County
Cleveland County
Iredell County
Lincoln County
Polk County
Rowan County
Rutherford County
Stanly County

Area 0480 8.5%
Buncombe County
Madison County

Area 030 6.3%
Avery County
Cherokee County
Clay County
Graham County
Haywood County
Henderson County
Jackson County
McDowell County
Macon County
Mitchell County
Swain County
Transylvania County
Yancey County

SMSA Areas

Area 5720 26.6%
Currituck County

Area 9200 20.7%
Brunswick County
New Hanover County

Area 2560 24.2%
Cumberland County

Area 6640 22.8%
Durham County
Orange County
Wake County

Area 1300 16.2%
Alamance County

Area 3120 16.4%
Davidson County
Forsyth County
Guilford County
Randolph County
Stokes County
Yadkin County

Area 1520 18.3%
Gaston County
Mecklenburg County
Union County

Goals for Female

Participation in Each Trade

(Statewide) 6.9%

CS-1

CONSTRUCTION SPECIFICATIONS
PROJECT WBS 47256.3.2

A.0 GENERAL REQUIREMENTS

A.1 DEFINITIONS
Wherever the words defined in this paragraph or pronouns used in their stead occur in these specifications, they shall have the meanings here given.

(a) The term "Owner" or “Department” means the North Carolina Department of Transportation, and shall include its authorized Representatives and Inspectors.

(b) The terms "Contractor" or “builder” means the person, firm or corporation named as such in the contract and includes the plural number and the feminine gender when such are named in the contract as the contractor.

(c) The term "Subcontractor" means an individual, partnership, firm, joint venture, or Corporation to whom the Contractor, with written consent of the Engineer, sublets any part of the contract.

(d) The word "Vendor" shall be taken to mean suppliers and/or manufacturers of materials and equipment purchased by the Contractor for use in the work covered by these specifications.

(e) Coast Guard Inspector means Officer in Charge of Marine Inspection having cognizance over the certification of the vessel, where applicable, and includes Inspection Officers under his command.

(f) The words "approval of the Owners" or "approved" shall mean an approval in writing signed by the owners, and shall also mean approval by the cognizant U. S. Coast Guard, section or office where applicable.

(g) The words "furnish", "provide" and "install" shall be taken to mean that the Contractor shall provide and install the specified material or equipment with necessary fittings, foundations, piping, electrical wiring and fixtures, etc., and make necessary hook-up and connections even though one of the words only is used, unless it is specifically stated otherwise.

(h) The term "work" of the Contractor or Builder or subcontractor includes labor or materials or both unless specifically stated otherwise herein.

(i) The words "renew" or "replace" shall be taken to mean that the existing material or item referred to shall be removed and disposed of as directed, and other material or items installed in place of the same as in subparagraph (h) above.

(j) The word "reinstall" shall mean that existing material shall be reused in either its original or a new location, and completely installed as in subparagraph (h) above.

(k) The term "Notice" as used herein shall include all written notices, demands, instructions, claims, approvals, and disapprovals, required to obtain compliance with Contract requirements. Any written notice by either party to the Contract shall be considered sufficiently given if delivered to the other party, agent, representative or officer in person. The person to whom the notice is delivered shall sign the duplicate copy and return the same to the other party immediately after receipt.

(l) The words "or equal" shall be taken to mean of equal quality, size capacity, general configuration and suitability for the use intended, as the item or items set out. Where reference is made to "trade names" or "catalogs", the reference is descriptive and restrictive unless stated otherwise by adding "or equal".

(m) The words "best Marine quality" or "first-class material" shall be taken to mean the top grade product of an approved marine manufacturer.

(n) The words "first class workmanship" shall be taken to mean the level of quality that would be done by a capable marine mechanic experienced in construction and outfitting of passenger vessels, using proper tools in good condition and in accordance with normally accepted good shipbuilding practice.

(o) All "tons" used herein are 2,240 pounds each

(p) The term "Act of God" as used herein is defined as an unusual and extraordinary manifestation of the forces of nature that could not under normal conditions have been anticipated or expected. It includes a tornado, a hurricane, lightning, and fires caused by lightning, but it does not include strikes, or other work stoppages, rain not accompanied by a hurricane, fire not caused by lightning or hot or cold temperatures.

(q) The "Chief Engineer" means Chief Engineer of Operations Division of Highways, North Carolina Dept. of Transportation.

(r) "Division of Highways" means the division of the Department of Transportation which, under the direction of the Secretary of Transportation, carries out state highway planning, construction, and maintenance functions assigned to the Department of Transportation.

(s) The "Engineer" means the Chief Engineer of Operations, Division of Highways, North Carolina Department of Transportation, acting directly or through his duly authorized representatives.

(t) The "Inspector" means the authorized representatives of the engineer assigned to make a detailed inspection of any or all portions of the work and materials.

(u) "Department" or "Department of Transportation" means a principal department of the Executive Branch which performs the function of planning, construction, and maintenance of an integrated statewide transportation system.

(v) "Board" or "Board of Transportation" means the Board created by the provisions of NCGS 143B-350 for formulating polices for the Department of Transportation and awarding all transportation construction contracts.

A.2 BIDDING REQUIREMENTS AND CONDITIONS

A.2-1 INVITATION TO BID

After the advertisement has been made, an invitation to bid will be mailed to known qualified Contractors informing them that bids will be received for the construction of specific project. Such invitation will indicate the project number, principal characteristics, and general description; a general summary of the boat dimensions, capacity, propulsion, and hull type and material; and the time and place for the public opening and reading of bids received. Information concerning the cost of and the availability of plans and proposal forms will also be indicated in the invitation to bid.

A.2-2 PREQUALIFYING TO BID

Prospective Bidders shall prequalify with the Department. The requirements for prequalification will be furnished each prospective Bidder by the Contractual Services Management office, Raleigh, NC (919-707-4803). All required statements and documents should be filed with the Contractual Services Management office by the prospective Bidder at least **two (2) weeks prior to the date of opening of bids.** A bid will not be opened unless all prequalification requirements have been met by the bidder and have been found to be acceptable by the Contractual Services Management office.

A.2-3 CONTENTS OF PROPOSAL FORMS

A proposal form will be furnished by the Department upon request. Each proposal form will be marked on the front cover by the Department with the name of the prequalified firm or individual to whom it is being furnished. It will set forth the date and time for the opening of bids. The form will include any requirements which vary from or are not contained in the plans. It will also include a bid sheet on which the Contractor shall place his lump sum bid for the project. All papers bound with the proposal form are necessary parts thereof and **shall not be detached, taken apart, or altered.**

The plans, specifications and other documents designated in the proposal form shall be considered a part of the proposal form whether attached or not. The prospective Bidder will be required to pay the Department of Transportation the sum stated in the invitation to bid for each copy of the proposal form and each set of plans requested.

A.2-4 EXAMINATION OF PLANS AND SPECIFICATIONS

The Bidder shall carefully examine the proposal form, plans and specifications, before submitting a bid. It is mutually agreed that submission of a bid shall be considered prima-facie evidence that the Bidder has made such examinations and is reasonably satisfied as to the conditions to be

encountered in performing the work, and as to the requirements of the proposal form and contract.

A.2-5 PREPARATION AND SUBMISSION OF BIDS

All bids shall be prepared and submitted in accordance with the following listed requirements:

1. **THE PROPOSAL FORM FURNISHED BY THE DEPARTMENT SHALL BE USED AND SHALL NOT BE TAKEN APART OR ALTERED.** The bid shall be submitted on the same proposal form which has been furnished to Bidder by the Department, as identified by the Bidder's name marked on the front cover by the Department.
2. All entries including signatures shall be written in ink.
3. The Bidder shall submit a unit or lump sum price for every item in the proposal form other than items which are authorized alternates to those items for which a bid price has been submitted.
4. The total amount bid shall be written in figures in the proper place in the proposal form.
5. Changes in any entry shall be made by marking through the entry in ink and making the correct entry adjacent thereto in ink. A representative of the bidder shall initial the change in ink.
6. The bid shall be properly executed. In order to constitute proper execution, the bid shall be executed in strict compliance with the following:

a. If a bid is by an individual, it shall show the name of the individual and shall be signed by the individual with the word "Individually" appearing under the signature. If the individual operates under a firm name, the bid shall be signed in the name of the individual doing business under the firm name.

b. If the bid is by a corporation, it shall be executed in the name of the corporation by the President or Vice President. It shall be attested by the Secretary or Assistant Secretary. The seal of the corporation shall be affixed. If the bid is executed on behalf of a corporation in any other manner than as above, a certified copy of the minutes of the Board of Directors of said corporation authorizing the manner and style of execution and the authority of the person executing shall be attached to the bid or shall be on file with the Department.

c. If the bid is made by a partnership, it shall be executed in the name of the partnership by one of the partners.

d. If the bid is a joint venture, it shall be executed by each of the joint ventures in the appropriate manner set out above. In addition, the execution by the joint ventures shall appear below their names.

7. The bid shall not contain any unauthorized additions, deletions, or conditional bids.
8. The Bidder shall not add any provision reserving the right to accept or reject an award, or to enter into a contract pursuant to an award.
9. The bid shall be accompanied by a bid bond on the form furnished by the Department or a bid deposit. The bid bond shall be completely and properly executed in accordance with the requirements of Section A.2-6. The bid deposit shall be a certified check or cashier’s check in accordance with Section A.2-6.
10. The bid shall be placed in a sealed envelope and shall have been delivered and received by the Department prior to the time specified in the invitation to bid.

A.2-6 BID BOND OR BID DEPOSIT

Each bid shall be accompanied by a corporate bid bond or a bid deposit of a certified or cashier's check in the amount of at least 5% of the total amount bid for the contract. No bid will be considered or accepted unless accompanied by one of the foregoing securities. The bid bond shall be executed by a Corporate Surety licensed to do business in North Carolina and the certified check or cashier's check shall be drawn on a bank or trust company insured by the Federal Deposit Insurance Corporation and made payable to the Department of Transportation in an amount of at least 5% of the total amount bid for the contract. The condition of the bid bond or bid deposit is: the Principal shall not withdraw its bid within sixty (60) days after the opening of the same, and if the Board of Transportation shall award a contract to the Principal, the Principal shall within fourteen (14) calendar days after the notice of award is received by him give payment and performance bonds with good and sufficient surety as required for the faithful performance of the contract and for the protection of all persons supplying labor and materials in the prosecution of the work; in the event of the failure of the Principal to give such payment and performance bonds as required, then the amount of the bid bond shall be immediately paid to the Department as liquidated damages or, in the case of a bid deposit, the deposit shall be forfeited to the Department.

When a bid is secured by a bid bond, the bond shall be on the form furnished by the Department. The bid bond shall be executed by both the Bidders and a Corporate Surety licensed under the laws of North Carolina to write such bonds.

The execution by the Bidder shall be in the same manner as required by Section A.2-5 for the proper execution of the bid. The execution by the Corporate Surety shall be the same as is provided for by Section A.2-5, Item 6b, for the execution of the bid. The seal of the Corporate Surety shall be affixed to the bid bond. The bid bond form furnished is for execution of the Corporate Surety by a General Agent or Attorney in Fact. A certified copy of the Power of Attorney shall be attached if the bid bond is executed by a General Agent or Attorney in Fact. The Power of Attorney shall contain a certification that the Power of Attorney is still in full force and effect as of the date of execution of the bid bond by the General Agent or Attorney in Fact. If the bid bond is executed by the Corporate Surety by the President or Vice President, and attested to by the Secretary or Assistant Secretary, then the bid bond form furnished shall be modified for such execution, instead of execution by the Attorney in Fact or the General Agent.

When a bid is secured by a bid deposit (certified check or cashier's check), the execution of a bid bond will not be required.

A.2-7 DELIVERY OF BIDS

All bids shall be placed in a sealed envelope having the name and address of the Bidder, and the statement **"Bid for the Construction of Project No. WBS 47256.3.2 in Dare County"** on the outside of the envelope.

If delivered prior to the Bid Date, or on the day the bids are to be received, Bids may be delivered in person or by USPS, Federal Express, etc. to the State Contract Officer, at:

North Carolina Department of Transportation
Contract Standards and Development Unit
Century Center Building B (Delivery)
1020 Birch Ridge Drive
Raleigh, NC 27610
Attention: State Contract Officer
(919) 707-6900

If delivered in person to the State Contract Officer, bids shall have been received prior to **2:00 pm** on the day of the bid opening. If delivered by mail, bids shall have been received prior to **2:00 pm** on the day of the bid opening. Bids received after the times specified above **WILL NOT** be accepted and will be returned to the Bidder unopened.

A.2-8 WITHDRAWAL OR REVISION OF BIDS

A Bidder may, without prejudice to himself, withdraw a bid after it has been delivered to the Department of Transportation, provided the request for such withdrawal is either in writing or by telegram to the Chief Engineer of Operations or the Engineer presiding over the public opening of bids before the date and time set for the opening of bids. The Bidder may then submit a revised bid provided it is received prior to the time set for opening of bids.

Only those persons authorized to sign bids under the provisions of Article A.2-5, Item 6 shall be recognized as being qualified to withdraw a bid.

A.2-9 RECEIPT AND OPENING OF BIDS AND NON-COLLUSION AFFIDAVIT

(a) RECEIPT AND OPENING OF BIDS

Bids will be opened and read publicly at the time and place indicated in the invitation to bid. Bidders, their authorized agents, and other interested parties are invited to be present.

A bid will be received and opened from any Bidder who:

1. Is prequalified in accordance with the provisions of Article A.2-2, and
2. Has delivered the bid to the place indicated in the Specifications prior to the time indicated in the invitation to bid, and
3. Has attended the Mandatory Pre-Bid Meeting as required elsewhere in this contract.

A bid received from a Bidder who has not complied with the above requirements will be returned to the Bidder unopened and under no circumstances will be considered for award.

(b) NON-COLLUSION AFFIDAVIT

In compliance with Section 112(c) of Title 23 USC and current regulations of the Department, each and every Bidder will be required to furnish the Department with an affidavit certifying that the Bidder has not entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with his bid on the project.

Affidavit will be included in the proposal form as part of the Signature sheets. Execution of Signature sheets will also constitute execution of Non-Collusion Affidavit. Signature sheets shall be notarized.

A.2-10 REJECTION OF BIDS

Any bid submitted which fails to comply with any of the requirements of Articles A.2-5, A.2-6 and A.2-7 shall be considered irregular and may be rejected, except that any bid which fails to comply with Section A.2-5, Item 3 shall be considered irregular and will be rejected.

In addition to the above, any bids submitted by any Bidder who has failed to comply with the following requirement will be rejected.

Any bid submitted by a Bidder who at the time of the submission is bankrupt, insolvent, or has committed an act of bankruptcy or financially unable to meet its outstanding obligations, shall be considered irregular and will be rejected.

Any Bidder who has been disqualified from bidding shall have been requalified prior to the time set for receiving bids. The right to reject any and all bids shall be reserved to the Board.

A.2-11 DISQUALIFICATION OF BIDDERS

Any one of the following causes may be justification for disqualifying a Contractor from further bidding until he has applied for and has been requalified in accordance with Article A.2-2:
1. Unsatisfactory progress in accordance with Section A.7.
2. Being declared in default in accordance with Section A.32.
3. Uncompleted contracts which, in the judgement of the Chief Engineer of Operations, might hinder or prevent the prompt completion of additional work if awarded.
4. Failure to comply with prequalification requirements.
5. The submission of more than one bid for the same work from an individual, partnership, joint venture, or corporation under the same or different names.
6. Evidence of collusion among Bidders. Each participant in such collusion will be disqualified.
7. Failure to furnish a non-collusion affidavit upon request.

A.3 AWARD AND EXECUTION OF CONTRACT

A.3-1 CONSIDERATION OF BIDS

After the bids are opened and read, the amount bid for each item and the total bid will be checked and made known to the public.

The right is reserved to reject any or all bids, to waive technicalities, to request the low bidder to submit an up-to-date financial and operating statement, to advertise for new bids, or to proceed to do the work otherwise, if in the judgment of the Board, the best interests of the State will be promoted thereby.

A.3-2 AWARD OF CONTRACT

The award of the contract, if it be awarded, will be made by the Board to the lowest responsible Bidder whose bid complies with all the requirements prescribed. The lowest responsible Bidder will be notified by letter mailed to the post office address shown on his bid that his bid has been accepted and that he has been awarded the contract. This letter shall constitute the notice of award. The notice of award, if the award be made, will be issued within sixty (60) calendar days after the opening of bids, except that with the consent of the successful Bidder the decision to award the contract to such Bidder may be delayed for as long a time as may be agreed upon by the Department of Transportation and such Bidder. In the absence of such agreement, the lowest responsible Bidder may withdraw his bid at the expiration of the sixty (60) calendar days without penalty if notice has not been issued.

A.3-3 CANCELLATION OF AWARD

The Board of Transportation reserves the right to rescind the award of any contract at any time before the receipt of the properly executed contract and contract bonds from the successful Bidder.

A.3-4 RETURN OF BID BOND OR BID DEPOSIT

All bid bonds will be retained by the Department until the contract is executed by the successful Bidder, after which all such bid bonds will be destroyed unless the individual bid bond form contains a note requesting that it be returned to the Bidder or the Surety.

Checks which have been furnished as a bid deposit by all Bidders other than the three (3) lowest responsible Bidders will be retained not more than ten (10) days after the date of opening if bids. After the expiration of such period, Department of Transportation warrants in the equivalent amount of checks which were furnished as a bid deposit will be issued to all Bidders other than the three (3) lowest responsible Bidders.

Checks which have been furnished as a bid deposit by the three (3) lowest responsible Bidders will be retained until after the contract bonds have been furnished by the successful Bidder, at which time Department of Transportation warrants in the equivalent amount of checks which were furnished as a bid deposit will be issued to the three (3) lowest responsible Bidders.

A.3-5 CONTRACT BONDS

The successful Bidder, within 14 calendar days after the notice of award is received by him, shall provide the Department with a contract payment bond and contract performance bond each in an amount equal to 100 percent of the amount of the contract. All bonds shall be in conformance with *GS44A-33*. The Corporate Surety furnishing the bonds shall be authorized to do business in the State.

A.3-6 EXECUTION OF CONTRACT

As soon as possible following receipt of the properly executed contract bonds, the Department will complete the execution of the contract, retain the original contract and return one certified copy of the contract to the Contractor.

A.3-7 FAILURE TO EXECUTE CONTRACT

The successful Bidder's failure to file acceptable bonds within fourteen (14) calendar days after the notice of award is received by him shall be just cause for the forfeiture of the bid bond or bid deposit and rescinding the award of the contract. Award may then be made to the next lowest responsible Bidder or the work may be re-advertised and accomplished under contract or otherwise, as the Board of Transportation may decide.

A.4 INTENT

(a) It is the intent of these specifications that the Contractor shall build, equip, launch, test and deliver to the Owner one (1) vessel, as described, complete and ready for service in every respect as concerns the work covered herein. The Contractor shall provide the necessary plant, launch/railway and lay days to construct the vessel, all tools, materials, machinery, equipment, fittings and labor, including upkeep of the vessel until final acceptance by the Owner.

(b) The Contractor shall make removals and replacements as necessary to affect the work covered by these specifications as a part of the contract if required.

(c) The Contractor shall coat all new work and restore and recoat all areas disturbed due to the work required by these specifications as a part of the Contract.

(d) Any work, equipment, machinery, or other part or parts of the vessel injured or damaged while the vessel is in the custody of the Contractor during the progress of the work covered by these specifications shall be repaired by the Contractor to the satisfaction of the Inspector, at no cost to the Owner.

(e) Any work or detail omitted from these specifications or plans, but necessary to complete the specified construction covered herein in accordance with good shipbuilding practice shall be furnished by the Contractor as a part of the Contract at no additional cost to the Owner, and nothing herein or on the plans shall be construed as meaning otherwise.

(f) Whereas the true intent and meaning is manifest, the Contractor shall not be relieved from fulfilling the full requirements of the contract plans, contract guidance plans and specifications, or of the responsibility for producing satisfactory results, or of properly performing any work by any of the following:

Absence of the details where the essential features, functions and arrangements are defined. Mistakes in description of hull or machinery details which, if not corrected, would interfere with the proper performance of the items involved.

The Contractor is responsible for proper performance of the Contract in accordance with the full manifested intent of these specifications despite any error, omission, discrepancy or lack of clarity in the plans or specifications which should reasonably have been apparent to an experienced Contractor upon a careful and critical review.

(g) The intent above given is of the essence of these specifications.

A.5 INSPECTION

(a) All work and materials entering into the construction of the vessel, it's machinery, fittings and equipment shall be subject at all times to the inspection and approval of the Inspector and where applicable the U.S. Coast Guard.

(b) It is the duty of the Inspector to insist that the Contractor perform all work and supply all materials as called for in these specifications. The Contractor shall perform all work in a satisfactory manner. In the event that any work or materials fail to comply with these specifications the Inspector will notify the Contractor in writing of the deficiency or unsatisfactory work as soon as it comes to his attention.

(c) Any work not satisfactory, whether from defective material, departure from specifications, or poor workmanship, or any work performed in the absence of the Inspector and later found to be unsatisfactory, shall be removed and replaced promptly to the satisfaction of the Inspector, at the Contractor's expense.

(d) The Owners, the Inspector, the U. S. Coast Guard, and any person employed by the same shall be allowed access to the work at any time during the regular working hours of the Contractor, or at such other times as will not entail additional expense to the Contractor, and the Contractor shall furnish all reasonable facilities and give ample time for such inspection.

A desk, desk chair, 4-drawer legal file cabinet with lock and keys, three (3) chairs, a 3' x 6' x 32" drawing board, compact copy machine, refrigerator at least 2 cubic feet, access to coffee maker, adequate lighting, access to sanitary facilities, and a dedicated parking space, shall be provided in a private office, and apart from facilities occupied by contractor's personnel. Office shall have lockable doors with keys and shall be for the Inspector's and Owner's sole use during the contract period. Office shall be provided with telephone service and internet connection with broadband service. Contractor shall provide internet service access as a part of this contract.

(e) The Inspector shall determine the amount, quality, acceptability, and witness all parts of the work. He shall interpret the specifications, Contract Documents and supplemental agreements, if any, and he shall decide all other questions in connection with the work. The Inspector shall have no authority to approve or order changes in the work which alter the terms or conditions of the Contract. The Inspector shall confirm in writing within five (5) days any oral order, direction, requirement, or determination. The decision of the Inspector shall be final and binding on both Contractor and Owner.

(f) Nothing herein shall be taken to relieve the Contractor of complete responsibility for unsatisfactory workmanship, faulty materials or other deficiencies of any kind whatsoever that are the result of his work, his sub-contractors work, or material purchased or provided and installed by him.

(g) The Inspector shall have general surveillance of the work. All orders and communications from the Contractor shall be transmitted through him. He shall have authority to stop the work whenever such stoppage may be necessary to ensure the proper execution of contract, said stoppage is to be a Contractor caused delay in computing liquidated damages, if any, for late delivery.

(h) As the Inspector is, in the first instance, the interpreter of the conditions of the contract and the judge of its performance, he shall use his powers under the contract to enforce its faithful performance.

(i) The Contractor shall notify the Inspector prior to all Contractor scheduled meetings or inspections relevant to this contract which involve any representative of the U.S. Coast Guard. The Inspector shall be given the opportunity, at his option, to be present on such occasions. At no time shall the Contractor allow access to any portion of this contract by personnel other than those employed by the Contractor without first receiving the Inspectors approval.

A.6 LAWS, PERMITS, AND REGULATIONS

(a) The Contractor shall obtain and pay for all licenses and permits and shall pay for all fees and charges for connection to outside service and use of property other than the site of the work for storage of materials and other purposes.

(b) The Contractor shall comply with all laws, ordinances, and regulations applicable to the work unless in conflict with contract requirements. If the Contractor ascertains at any time that any requirements of this Contract are at variance with applicable laws, ordinances, or regulations he shall promptly notify the Inspector and Owner and any necessary adjustment of the Contract shall be made as specified under Changes in the work.

(c) Any questions arising under this contract shall be determined under the laws of the State of North Carolina.

(d) The Contractor shall furnish the Inspector copies of affidavits upon request giving the original dates, renewal dates and expiration dates of all labor contracts, if any, related to any phase of the work to be performed in the shipyard under this contract.

A.7 PROSECUTION OF WORK (LIQUIDATED DAMAGES)

(a) Date of completion is the essence of any contract resulting from these specifications and plans. The Contractor will be required to complete all work no later than the date stated in the contract.

(b) Should progress of the work lag or fall behind schedule, the Contractor shall direct sufficient additional labor to work, including overtime if required, to maintain the contract delivery date, at no additional cost to the Owner.

(c) The Contractor will be required to pay liquidated damages for each and every day that delivery is delayed beyond the contract date for its completion. The timely completion of the performance of this contract has a substantial financial value to the Owners, which value is difficult or impossible to forecast or evaluate exactly. It is, therefore, stipulated and agreed that the value to the Owners for each calendar day of delay in delivery of the vessel by the Contractor to the Owners beyond the contract completion date of the work to be performed by the Contractor under this contract shall be a fixed sum and shall be set in advance. Upon the foregoing consideration and for the purpose of this contract, the sum of **One Thousand Dollars ($1,000.00) per calendar day** is hereby mutually agreed upon as the sum which the Contractor shall give to the Owners as liquidated damages for each calendar day delayed beyond the contract completion date that the work remains unfinished and said vessel remains undelivered.

(d) For the purpose of these specifications in determining the calendar days for which liquidated damages will be charged the Contractor shall be entitled to an extension of the contract time or to an apportionment and remittance of liquidated damages when a contract is not completed within the contract time to the extent that delays to the current controlling operations, or operations, were caused by acts of God as defined herein, or acts of the Boards or its agents. The Contractor, however, shall be entitled to an extension of contract time, or an apportionment and remittance of liquidated damages, only to the extent and in the proportion that such delays were caused by acts of God or acts of the Board, and it is understood that the Board does not hereby waive or release any claim against the Contractor for liquidated damages when the contract is not completed within the contract time for any reason whatsoever other than the said acts of God or acts of the Board. A request by the Contractor for an extension of time shall be made to the Inspector within five (5) days after such delay has occurred and he shall make a determination as to the cause of the delay and the amount of time that the contract should be extended by reason of such delay.

(e) It is understood and agreed that if a claim is filed for an extension of contract time, or an apportionment and remittance of liquidated damages, the burden of proof shall be upon the Contractor to establish the acts of God or the acts of the Board causing the alleged delay; and if the Contractor fails to sustain the burden of proof, he shall not be entitled to an extension of contract time, or to an apportionment and remittance of liquidated damages. The burden of proof herein referred to shall be the same that in other cases of like nature exists. Proof by the Contractor of delays due to an act of God or act of the Board to enforce or collect liquidated damages due to any other reason whatsoever.

(f) The Contractor is hereby notified that no consideration will be given to requests for remissions of liquidated damages for any reason whatsoever, except as covered by Paragraph A.7 herein. The Contract date for completion will be changed on a negotiated basis for any work authorized or deleted by supplemental agreements to the original contract.

A.7-1 WORK PROGRESS

(a) It is the intent of these specifications that the Contractor shall commence work on the date of availability as noted elsewhere herein. The Contractor shall not begin work prior to the date of availability without written approval of the Inspector. If such approval is given and the Contractor does begin work prior to the date of availability, the Department will assume no responsibility for any delays caused prior to the date of availability by any reason whatsoever, and such delays, if any, will not constitute a valid reason for extending the completion date.

(b) The Contractor shall not perform any work on the project until the Department has received the properly executed contract and contract bonds.

(c) It is further the intent of these specifications that the Contractor shall pursue the work diligently with workmen in sufficient numbers, abilities, and supervision and with equipment, material, and method of construction as may be required to complete the work described in the contract, or as may be amended by the completion date.

A.7-2 MASTER CONSTRUCTION SCHEDULE

(a) The Contractor shall prepare and submit for approval by the Inspector, a Master Construction Schedule of his proposed working progress on the project. The Contractor shall submit to NCDOT, the preliminary Master Construction Schedule showing the Contractor's plan and construction sequence proposed to accomplish the work with the Contract period. The preliminary and all subsequent Master Construction Schedule submittals shall be in PDF format and in MS Project native file format. NCDOT will review this document, comment, and return review comments within ten (10) working days to the Contractor. NCDOT will then meet with the Contractor to discuss the comments. The Contractor shall schedule the review meeting to be held within ten (10) working days after receipt of NCDOT comments. The Master Construction Schedule shall be updated by the Contractor within two (2) working days after the review meeting, and then resubmitted to NCDOT for final approval as the working document.

(b) The Master Construction Schedule shall sequence and schedule all work detailed in the Contract Documents, in accordance with the generally accepted practices for project management. The Master Construction Schedule shall be a time-phased/resource loaded Gantt Bar Chart. The Contractor shall decompose the activities indicated in the Contract Documents, down to a sufficient number of discrete tasks, to adequately control and monitor the work and to clearly report progress for the duration of the project. Progress shall be shown as a percentage by task, by boat and by overall project completion. Indicate, by table or directly on the Gantt Bar Chart, the start and stop dates, free float, and total float for each task. Indicate, by table or by link lines, all predecessor and successor dependencies for each task. Develop and clearly indicate the critical path through the project.

(c) The proposed Master Construction Schedule shall be submitted no later than the date of the project preconstruction conference (Section A.7-3) and before any work is begun on the project.

(d) When conditions beyond the Contractor's control have adversely affected his progress, the Contractor may submit a revised Master Construction Schedule to the Inspector for approval. Such revised Master Construction Schedule will not be approved unless accompanied by a detailed written statement giving the Contractor's reasons for the proposed revision.

(e) When, at any time during construction or repair of the project, the Contractor's progress deviates substantially from the latest approved Master Construction Schedule, the Inspector may request the Contractor to submit a revised Master Construction Schedule. Revised Master Construction Schedule requested by the Inspector shall be submitted within two (2) working days after the date of such request.

(f) The Master Construction Schedule shall additionally indicate the starting and completion dates of the following items:

A. The Contract award date.
B. Commencement and completion of engineering.
C. Regulatory body submittal dates for calculations and drawings.
D. Long lead time purchase order submittals. Anticipated date of delivery of all long lead time equipment and components and all major equipment.
E. Construction of the demi-hull erection jig.
F. USCG Dry Search of Hull (Fit-up and welding completed).
G. Prefabrication, fabrication, assembly and erection of all structural components.
H. Installation of major machinery components and packaged assemblies: Piping, mechanical, electrical, ventilation, coating, and outfitting systems installation.
I. Builder's trials.
J. Dock trials.
K. Sea trials.
L. Delivery of vessels to NCDOT.
M. Anticipated Owner's acceptance of the vessels.
N. Start, duration and completion of all significant task items.
O. Anticipated date of all items described in this Specification for NCDOT Representative's Review or Approval.

Review of the Master Construction Schedule by the NCDOT Representative does not relieve the Contractor of its responsibility to adjust labor force, equipment resources, or work schedule, as necessary, to anticipate and ensure completion of the work within the prescribed contract period.

A.7-3 PRECONSTRUCTION CONFERENCE

Immediately after receipt of notice of award, the Owner, Design Firm Dejong & Lebet, Inc. and the Contractor will establish a mutually agreeable date on which the preconstruction conference will be held. The Contractor's project superintendent and other individuals representing the Contractor who are knowledgeable of the Contractor's proposed progress schedule or who will be in charge of major items of the work shall attend the preconstruction conference. Contractor shall provide necessary personnel to take, transcribe, correct, reproduce and distribute minutes of the pre-construction meeting.

A.7-4 CONSTRUCTION CONFERENCES

(a) After work on the project has begun, initially construction conferences shall be held monthly and adjusted to suit construction. The construction conferences are to be scheduled at times which are mutually agreeable to both the Contractor's project superintendent and the Inspector. It shall be the superintendent's responsibility to attend the conference. Contractor may elect to have other members (See Section A.7-3) of his staff attend construction conferences. Contractor shall provide necessary personnel to take, transcribe, reproduce and distribute minutes of each meeting.

(b) The Contractor shall schedule and chair a monthly progress meeting, starting the first week, with the NCDOT Representative and the Contractor's key production persons. The Contractor shall provide an updated Master Construction Schedule and a progress report (expressed as a percentage of work complete) by Activity in a tabular form, and a list of completed milestones. The updated Master Construction Schedule shall reflect opened items, additional work, deleted work, and modifications, in addition to work progress and completions. In the last seventy five (75) calendar days of the scheduled performance period, the Contractor shall additionally prepare and submit an Open Task Report. The Contractor shall update and submit the Open Task Report at each subsequent progress meeting, and then daily starting the first day of the last thirty (30) calendar days of the scheduled performance period.

A.8 MATERIALS

(a) All materials intended for use, and all equipment used shall be new and as specified or as shown on plans except where Owner furnished (Paragraph A.17). Should the Contractor desire to substitute any material or equipment for that specified he must first obtain an order from the Owner in writing. (See also paragraphs A.5 and A.11 herein.)

(b) It is the responsibility of the Contractor to furnish sufficient data and information on materials he wishes to substitute to allow the Owner to make a decision.

(c) All equipment, where required, shall be of U. S. Coast Guard approved type and manufacture, and details or plans shall be submitted for U. S. Coast Guard approval by the Contractor where required and not previously approved. (See Section A.10 & A.11 "Plans and Specifications").

(d) Steel plate, shapes and other metal work shall be of the best quality domestic metal products for its particular purpose.

(e) Paints, electrical, piping, and all other materials shall conform to the standards of first class material for passenger vessels, as specified herein.

(f) All galvanizing shall be "hot dip" process.

(g) All plywood shall be waterproof marine type in all cases, with all edges sealed before installation, but after cutting to shape.

(h) Two (2) copies of each purchase order for all materials, articles, and equipment purchased by the Contractor shall be furnished to the Inspector prior to issue to the vendor. Purchase orders shall show unit and total price of materials, articles and equipment purchased and vendor's complete address.

(i) Materials requiring specified approval, which are ordered by the Contractor before approval, shall be entirely at the risk of the Contractor.

(j) Where material herein specified is not available on the present market, alternate materials of equal quality at no additional cost may be processed for approval of the Inspector by the Contractor.

(k) Any material or equipment provided by the Contractor which proves defective and unfit for service either before or after installation and whether previously approved or not shall be replaced by the Contractor with satisfactory items without additional cost to the Owner.

(l) Buy America compliance - This is a 100% North Carolina funded project. Source of supply and quality of materials shall comply with NCDOT requirements, as specified in *Standard Specifications for Roads and Structures 2018*. The Buy America requirements as required by NCGS 136-28.7 and 23 CFR 635.410 for federal aid highway projects shall apply to this project.

In accordance with 23 CFR 635.410, a nationwide waiver has been granted for certain ferryboat equipment and machinery items: **marine diesel engines, electrical switchboards and switch gear, electric motors, pumps, ventilation fans, boilers, electrical controls, and electronic equipment**. Items not specifically included in the waiver remain subject to the Buy America requirements. While waivers may be requested for other items, the basis of successful waiver applications is the non-availability of a functionally equivalent and serviceable product in which all steel and iron is of wholly US origin. Any waiver request must be submitted by NCDOT, therefore the Contractor must apply to NCDOT to make a waiver application on their behalf. Any delay associated with any waiver application is the sole responsibility of the Contractor, and is not grounds for additional time or receipt of additional payment.

The Contractor shall be responsible for ensuring that its subcontractors also comply with these requirements.

The Contractor shall monitor the Buy America compliance throughout the duration of the Contract.

The Contractor shall provide monthly updates of Buy America certification, inclusive of detailed, current status of contract percentages.

In addition to the national waiver listed above, a waiver for this project has been approved. The items approved are listed in the chart on the following pages.

NCDOT - FERRY Division

New Ferry Project Contract C204310 WBS 47256.3.2

2/18/2019

Material Description	Manufacturer	Vendor	Comments
Stainless Steel Plate 1/8" x 3/8" A-316	Unknown	Unknown	Hawser Reel
Gate Valves 1/2" thru 2" Screwed Bronze B-62	Unknown	Unknown	Ballast System
Swing Check Valves 1/2" thru 2" Screwed Bronze	Unknown	Unknown	Bilge and Ballast System
Ball Valves, 1/2" thru 1 1/2" Screwed Cast Steel	Unknown	Unknown	Hydraulic Systems
Globe Valves, 3/4" thru 2" Screwed Bronze B-62	Unknown	Unknown	Bilge System
Butterfly Valves 2" Lug Type Cast Steel	Unknown	Unknown	Engine Cooling System
Stainless Steel Tubing 1/4" thru 1" x 0.63 wall	Unknown	Aluminum and Stainless	Hydraulic Systems
2" Simplex Strainers - Cast Bronze	Tate	Donovan Marine	
2" Duplex Strainers - Cast Bronze	Tate	Donovan Marine	
Reduction Gear	Twin Disc	Twin Disc	
Shafting - Stainless Steel Aquamet 17	Armco	Armco	
Shaft Bearings - Pillow Type "Craft"	Unknown	Craft Bearings, Norfolk, VA	Rudders and Shafts
Nuts and Bolts, 1/4" thru 1" A-391 Steel	Unknown	McMaster Carr	Equipment Mounting Interior
Nuts and Bolts, 1/4" thru 3/4" A-316 SS	Unknown	McMaster Carr	Equipment Mounting Interior

Misc. Fasteners, 316 Stainless Steel	Unknown	McMaster Carr	Equipment Mounting Interior
Closed Chock Cast Steel 12" x 6"	Unknown	Donovan Marine	Deck Fittings
Kevel - 18" Cast Steel	Unknown	Donovan Marine	Deck Fittings
Anchor 150# Stocklass Cast Steel Galvanized	Unknown	Donovan Marine	Outfitting
Rectangular Tubing 6" x 8"	Unknown	Aluminum and Stainless	A-Frame
Hydraulic Components, Pumps, Controls, etc.	Unknown	Unknown	Steering and Hydraulic Systems
Stainless Steel Tubing Fittings 1/4" to 1" Compression	Unknown	McMaster Carr	Steering and Hydraulic Systems
8" Double Bitts - Cast Steel	Unknown	Donovan Marine	
Shaft Bearings - Rubber, Water Lubricated	Unknown	Donovan Marine	Shafting Bearings
20" Round Flush Multi-Bolt Manholes - Mild Steel	Centex Marine	Donovan Marine	Deck Access and Tank Access
3" Diameter Shaft Stuffing Glands Bronze	Unknown	Donovan Marine	
250 HP Tier III Diesel Engine 6 Cylinder TA	Caterpillar	Gregory Poole	
CuNi Keel Coolers	Fernstrum	Donovan Marine	
Winches - Deck 20 Ton Capacity	Unknown	Donovan Marine	
Propellers 36" Diameter 4-Blade Work Horse Style	Unknown	Donovan Marine	

NOTE TO CONTRACTOR - The items listed above have been waived out of the Buy America requirements

CS-19

A.8-1 MATERIAL SUBSTITUTION

This Specification and the Contract Guidance Drawings describe features, salient characteristics, and systems' performance in conjunction with equipment and outfit items as a means of describing the general quality of design and construction of the various items and articles. It shall be understood that this quality of design and construction is NCDOT's preference. Substitutions for such items must be of "equivalent" quality and performance, and must be approved by NCDOT in writing.

An "equivalent" substitution is one which exhibits the same size, weight, characteristics, performance, reliability, and maintainability of the system and of the vessel as the item or material described by this Specification and Contract Guidance Drawings. The Contractor shall be wholly responsible for demonstrating the equivalent status of any substitution.

Requests for substitutions shall be made in writing to NCDOT, setting forth the reason for the proposed substitution and providing documented evidence of the substitute's equivalence or superiority to the equipment, component or material integrated in the design. The request shall also provide the Contractor's assurance that the substitution, if approved, will not result in any increase in the Contract Price nor an extension of the delivery date of the vessel.

Requests for substitutions must include in writing:

(a) Regulatory Body approval (as applicable).

(b) Compliance with Buy America requirements (as applicable).

(c) Comprehensive comparison of construction features and materials between the design guidance item and the proposed item. Complete drawings and dimensional data shall be submitted for each item. The weight of each item will be provided.

(d) Comprehensive comparison of performance characteristics between the design item and the proposed item.

(e) Comprehensive list of impacts that the substitution will cause to arrangements, structure and interfacing of piping, ventilation, electrical and control systems.

(f) Valid manufacturers' price quote for the proposed item.

(g) Location of the nearest distributor stocking parts and providing field service for the proposed item.

(h) Verification that the item has similar or longer history of in use experience in commercial marine service.

(i) Statement from Contractor indicating that the proposed substitution will not be a cost increase and will not extend the delivery date of the vessel.

Incomplete substitution requests will not be considered.

Substitutions will be considered if based upon Contractor preference or familiarity with an item or equipment, provided it can be demonstrated that the item is equivalent (as defined above) to or better than the design item.

Substitutions will not be considered based upon cost savings alone. For each substitution proposed, a valid price quote shall be obtained by the Contractor from the manufacturer of the item integrated into the design and the proposed substitution. If the substitution is approved, any such cost savings will be subject of a change order providing a credit for the full difference to the Owner. Substitutions for more expensive items will only be considered if they result in no cost change to the Owner, unless there is substantial benefit for the Owner.

NCDOT will respond to complete written requests within ten (10) working days. NCDOT's decision will be final.

The Contractor shall be responsible for all engineering costs and construction costs associated with any substitution.

A.8-2 PURCHASE TECHNICAL SPECIFICATIONS, REQUISITIONS AND PURCHASE ORDERS

The Contractor shall submit all purchase technical specifications, requisitions, purchase orders, or similar descriptive data for review of compliance with the contract requirements by NCDOT prior to purchasing equipment. Each document shall contain a full technical description of the material to be ordered. If the Contractor wishes to purchase or supply equipment, fittings, or outfit other than that specified, the Contractor shall first inform NCDOT of the details of the intended purchase, and secure specific written approval in each such instance.

The Contractor shall, at a minimum, develop detailed purchase technical specifications for the following major equipment and systems:

(a) Propulsion engines and generators
(b) Reduction gears
(c) Z-Drive Azimuth Units
(d) EC panelboard
(e) Control systems
(f) Alarm and monitoring systems
(g) Fire suppression system
(h) Shafting
(i) Propulsion Exhaust System
(j) Pumps
(k) All purchases over $5,000.00

For all other equipment, purchase orders shall be submitted for review by NCDOT. This includes

all fans, pumps, electrical and electronic equipment, pipe, valves, pipe components, propulsion shafting components, bearings, couplings and components, paint and vinyl, windows and doors. Deliver electronic copies, in PDF format, of all vendor drawings or documents to NCDOT no later than the date the equipment is delivered to the Contractor's facilities.

Furnish a copy of all correspondence and technical data affecting design features of vendor items along with the submittal of the drawings showing these items.

A.9 WORKMANSHIP

(a) Workmanship throughout shall be first class and high grade in all respects for passenger vessels. Particular care shall be taken to insure fair lines, adequate and proper fastening, suitable butts and scarfs, smooth surfaces, neat and substantial work, and the maximum degree of water tightness. All welding shall be done by competent USCG/ABS certified welders. All plating shall be free of uneven and wavy lines or wrinkles after welding. (See paragraph A.27 herein also).

(b) The work shall be executed by competent workmen, in each trade, experienced in marine construction, and under adequate supervision to assure first class workmanship throughout.

(c) Ragged edges or sharp projections which are hazardous to operating personnel, contribute to additional maintenance, or detract from the finished appearance shall be eliminated.

(d) Dimensional tolerances, fit alignment, fairness and finish shall be in accordance with approved working plans. Where tolerances are not given on working drawings or specified elsewhere, a standard of plus or minus 1/16 of an inch will be assumed for non-machined fits. Machined fits shall be in accordance with S.A.E. Standards for tolerance and finish.

(e) Fittings at openings through decks and bulkheads for pipes, cables, etc., shall be properly designed to maintain watertight integrity, reduce transmission of heat and eliminate transfer of machinery vibration and noise to the hull structure. Doubler plates, inserts or other suitable strengthening shall be fitted at all bulkhead and hull penetrations.

(f) Piping and cables shall be run as indicated on plans and shall pierce the bulkheads as close under the decks and as near the top of the bulkheads as practicable.

A.9-1 ON SITE PROJECT SUPERVISION

(a) At all times that work is actually being performed, the Contractor shall have present on the project one competent individual who has been authorized to act in a supervisory capacity over all work on the project including work subcontracted. This individual who has been so authorized shall be experienced in the type of work being performed and is to be fully capable of managing, directing and coordinating the work; of reading and thoroughly understanding the contract; and of receiving and carrying out directions from the Inspector. He shall be an employee of the Contractor.

(b) The project Supervisor shall be authorized to accept and sign for notices and instructions, if and when found necessary, from the Inspector.

(c) The Project Supervisor shall be identified at the time of the Pre-construction Conference, Section A.7-3, and shall meet with the Inspector's approval. Should it become necessary to assign another individual in this position, the Contractor shall provide the Inspector written notification within five (5) working days of the proposed change. The individual assigned shall be approved by the Inspector and shall be capable of assuming the duties as outlined in Section A.9-1 (a) and (b) herein.

A.10 PLANS AND SPECIFICATIONS

(a) All work shall conform to these specifications, the plans, the Notice to Bidders and the Bid Proposals, which are made a part hereof by reference.

(b) The plans and these specifications are to be considered as mutually explanatory or supplementary, and any feature shown on one and not on the other shall have the same force and effect as though shown on both. Should any discrepancy appear or any misunderstanding arise as to the importance of anything contained in them it shall be called to the attention of the Marine Engineer or Inspector immediately, and no further work performed on the item in question until a decision is reached. Work performed based on such an error, omission, discrepancy or lack of clarity shall be at the Contractor's risk and expense. These plans and specifications shall be used by the Contractor as guides in the prosecution of the work required.

(c) The following plans will be furnished by the Owner to the Contractor: (List of plans is attached ahead of the Technical Specifications). These drawings were produced by computer aided drafting methods. CAD drawings were developed using AUTODESK, AutoCAD Release 2016.

(d) Contract Plans **HAVE NOT BEEN** submitted to the U.S. Coast Guard for approval. However, they have been stamped by a P.E. from Dejong & Lebet, Inc. and are thought to conform to all requirements.

(e) It is expressly understood that the Contractor shall verify all quantities and figures will be held responsible for the proper coordination of all dimensions and the work, and that the furnishing of the drawings herewith will not relieve the Contractor from responsibility for errors or omissions in dimensions and quantities. No addition to the cost will be entertained for errors, omissions or for discrepancies found between actual details and the plans and specifications after the proposal has been received.

(f) The Owner reserves the right to alter the drawings to correct or avoid impossible conditions created by prosecution of the work. The alterations necessary in the work, if any, are to be made by the Contractor without additional cost to the Owner.

A.11 DETAIL WORKING DRAWINGS

(a) Detail working drawings shall be prepared in accordance with contractor prepared working drawings list provided ahead of the Technical Specifications. Two (2) copies of each contractor prepared and/or revised drawing shall be submitted to the owner for review and comments. Owner

comments, if any, shall be incorporated in drawings and two (2) copies re-submitted to the Owner for final approval prior to submittal to U.S. Coast Guard Marine Safety Center, Washington, D.C. if required. Owner's drawing review action can be expected in one of the following manners:

(1) "APPROVED" - Drawing is acceptable and ready for U.S. Coast Guard review and/or or construction.
(2) "APPROVED SUBJECT TO COMMENTS" - Owner's comments shall be included on drawing at next normal issue, U.S. Coast Guard submittal or issue for construction.
(3) "RETURNED FOR REVISION" - Drawing is not in accordance with contract specification and/or applicable regulatory body (U.S. Coast Guard EEE45, etc.) rules and regulations. Drawing shall be revised resubmitted to owner for approval prior to issue and/or Coast Guard submittal.
(4) "REJECTED" - Drawing is not in compliance with Contract Specific and shall be redeveloped and resubmitted to owner for review.
(5) "EXAMINED" - Plans, calculations, sketches, etc., are found to be in accordance with contract specifications and do not require specific Owner approval. General data of this nature is supporting documentation.

(b) Contractor shall provide all engineering services necessary for the development and construction of the vessel, including technical calculations, and prepare and submit to the Engineer two (2) copies each for his approval all calculations, shop and working drawings as required. Working and shop drawings will be reviewed, and approved, or returned for correction, as promptly as the conditions will permit. No deviations from approved working drawings shall be made without the written approval of the Inspector.

(c) Plans/Drawings shall be prepared by the Contractor's Engineering Design personnel or by subcontract with an approved Engineering Design Agent. All plans shall be prepared using AUTODESK, AutoCAD Release 2016. All plans shall be revised providing details, assembly arrangements and material list to indicate "as built" condition. AutoCAD original drawings shall reflect all changes to "as built" conditions. AutoCAD drawings shall be REPLOTTED on plain bond paper in accordance with Section A.11 (d) herein.

(d) Original drawings shall be of uniform size 24”x 36” (arch size D) prepared on 20 lb. plain bond paper and to comply with sample format for title block etc. as provided to the contractor. All original drawings shall be capable of reproduction in clear and legible copies. Drawing number sequence shall be maintained in accordance with Owner furnished drawings. Original drawings prepared by the Owner and identified in the list ahead of Part II shall be provided to the contractor. Drawings shall be revised for resubmittal to the U.S. Coast Guard, if required and to reflect final "as built conditions". All drawings shall be stamped to indicate final U.S.C.G. approval date and letter file number. One (1) copy of all Contractor and Coast Guard correspondence relating to plan approval shall be submitted to the Owner and Inspector in PDF format. A copy of all USCG letters of approval and subject plans shall be provided to the Owner.

(e) In developing the working plans and detailed design, the Contractor shall adhere to all salient features and characteristics embodied in the specifications and plans, and the intent thereof. Modifications to the drawings which become necessary during development, or which may be

sired by the Contractor to suit his standard practice, shall be brought to the attention of the Inspector at the time of submittal of working drawings for approval. Failure to notify the Inspector of such modifications will not constitute approval even though the working drawing was approved.

(f) Within twenty (20) calendar days after execution of the Contract, the Contractor shall submit a Plan Schedule of working drawings for approval by the NCDOT Representative. The Plan Schedule shall list all drawings and documents required for submittal in this Specification and Contract Guidance Drawings and as required for all regulatory approval requirements. The schedule shall be submitted as a PDF file and as an Excel spreadsheet. The schedule shall include the following:

(1) A drawing number for each drawing listed.
(2) The drawing title.
(3) The scheduled date the drawing will be submitted by the Contractor for approval to NCDOT.
(4) The scheduled date the drawing will be submitted by the Contractor for approval by the regulatory agencies.
(5) Columns for recording the actual date of the initial submittal, the dates for approvals, and a column showing the current letter revision of each drawing.
(6) A list of drawings prepared by all subcontractors and vendors.

The Contractor shall revise and submit the Plan Schedule by the first of each month to show all changes, progress, and delays. Upon completion of the vessel and prior to delivery to NCDOT, the Contractor shall furnish a final copy of this schedule to the NCDOT Representative.

(g) The Inspector will cooperate with the Contractor in developing a plan approval procedure in order to expedite plan approval with minimum delay. Approval will be given subject to correction by the Contractor of any errors, omissions, and/or interferences contained thereon and compliance with the plans and specifications as previously noted. All revisions made to approved working plans shall be concisely described in a suitable revision column and copies forwarded to the Inspector for comments. Such revisions shall not negate the intent of the original approval without written consent of the Owner.

(h) Upon completion of the contract and at time of vessel delivery, all original drawings and CD's shall become the property of the North Carolina Department of Transportation and it is under stood that the Department of Transportation shall reproduce and issue above noted drawings in any manner for future use. One (1) set of the final approved copies and one (1) set of as-built originals shall be delivered with the vessel along with one (1) copy in PDF format on a thumb drive. Each set of drawings shall be individually packaged or boxed and shall be labeled as to contents. A list of drawings shall be included in each set.

(i) Shop sketches and templates shall be prepared by the Contractor as required for his shop use. One (1) copy of shop sketches shall be provided to the Owner on 20 lb. plain white bond paper along with one (1) copy in PDF format on a thumb drive. Each set of drawings shall be individually packaged or boxed and shall be labeled as to contents. A list of drawings shall be included in each set.

(j) The Contractor shall keep, on the work site, a copy of the drawings (latest revision) and specifications including all authorized supplemental agreements and shall at all times give the Owner and their authorized representatives access thereto. All drawings and specifications, except the signed contract, shall be returned to the Owner at the completion of work.

A.12 ALTERATIONS (CHANGES)

(a) The Owner reserves the right to make any deletions or additions to the work to be performed without invalidating the contract, or giving notices to the sureties. Any change in cost due to alterations or deletions shall be negotiated prior to accomplishment, or performed on a time and material basis as hereinafter provided in this section, at the Owner's option, and approval of any such changes shall be authorized by the Owner and accepted by the Contractor in writing on the Standard form provided prior to start of the work. Optional items, if any, may be approved by issue of a supplemental agreement by the Owner at the cost quoted therefor.

(b) In making any alteration on a time and material basis, the charge or credit for the change shall be determined by the labor rates submitted with the bid proposal and purchase orders for materials to be used. Material shall be at invoiced cost to the Contractor plus 15%. Deletion of equipment and/or material is to be negotiated on a cost of material and labor estimated basis.

(c) The Contractor shall, within five (5) working days, when required by the Owner, furnish to the Owner an itemized breakdown of the man-hours, quantities, and prices used in computing the value of any change that might be ordered. The above shall be published using Microsoft Excel Spreadsheet. All material shall be broken down (itemized) when pricing. The above shall only be approved in a Supplement Agreement signed by both parties.

(d) The completion date will be changed to cover additions to, or deletions from the contract, on a negotiated basis. (Paragraph A.7 (d) is to be used for guidance).

(e) The Contractor may not substitute other material for that specified, except as covered by Paragraph A.8 herein.

A.13 CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE

(a) The Contractor shall not commence work under this contract until he has obtained all the insurance required here under and such insurance has been approved by the Owner; nor shall the Contractor allow any subcontractor to commence work on his subcontract until all similar insurance has been so obtained and approved. Approval of the insurance by the Owner shall not relieve or decrease the liability of the Contractor hereunder.

(b) COMPENSATION AND EMPLOYER'S LIABILITY INSURANCE
The Contractor shall take out and maintain during the life of this contract the statutory Workmen's Compensation and Employer's Liability Insurance for all his employees to be engaged in work under this contract and in case of any such work is sublet, the Contractor shall require the subcontractor similarly to provide Workmen's Compensation and Employer's Liability Insurance

for all of the latter's employees to be engaged in such work and shall save the Owner harmless.

(c) BODILY INJURY LIABILITY AND PROPERTY DAMAGE LIABILITY INSURANCE
The Contractor shall take out and maintain during the life of this contract such Bodily Injury Liability and Property Damage Liability Insurance as shall protect him from claims for damages for personal injury, including death, as well as from claims for property damage, which may arise from operations under this contract whether such operations be by himself or by anyone directly or indirectly employed by either of them, and shall save the Owner harmless.

(d) INSURANCE ON VESSEL
The Contractor shall, at his expense, from the time construction starts at his facility to the time of final acceptance at Hatteras, N.C. after completion of all work and testing, furnish all risk insurance as provided in American Institute Builder's Risk Form dated February 8, 1979, amended by striking out line 217 covering the value of the vessel in the full amount and shall save the Owner harmless from any damage whatsoever while the vessel is in custody of the Contractor. The insurance shall be in a responsible company or companies authorized to transact such business in the State in which the construction is being accomplished, and in the State of North Carolina. A statement agreeing to accept service of legal action in North Carolina must accompany the policy. The policy shall be made payable to the Owner. Where the Contractor carries a blank plant policy a rider must be obtained designating the Owner as first beneficiary under the policy in the amount stated.

For the purpose of this Contract the value of the vessel shall be placed as the Total Bid Amount.

A.14 ACCIDENT PREVENTION

Precaution shall be exercised at all times for the protection of persons, including employees, and property. The safety provisions of applicable laws shall be observed. Machinery equipment and all hazards shall be guarded or eliminated in accordance with the best marine construction safety practices.

A.15 SUBCONTRACTS

The Contractor shall not sublet, sell, transfer, assign, or otherwise dispose of the contract or any portion thereof; or of his right, title, or interest therein; without written consent of the Engineer. In case such consent is given, the sublet work shall be performed by the Subcontractor unless otherwise approved in writing by the Inspector. A firm which has been disqualified because of its failure to maintain satisfactory progress will not be approved as a subcontractor until the firm demonstrates the ability to perform the work in a satisfactory manner. Contractor shall submit a certified copy of the actual subcontract agreement executed between the Contractor and Subcontractor prior to written consent being issued by the Inspector. In case such consent is given, the Contractor will be permitted to sublet a portion thereof, but shall perform with his own organization, work amounting to not less the 75 percent of the total original contract amount.

Extra work performed in accordance with Section A.12 will not be considered in the computation

of work required to be performed by the Contractor.

An assignment by operations of law or assignment for the benefit of creditors, or the bankruptcy of the Contractor, shall not vest any right in this contract in the Trustee in bankruptcy, the Contractor's creditors, or the agent of the creditors.

A Subcontractor shall not sublet, sell, transfer, assign, or otherwise dispose of his contract with a Contractor or any portion thereof; or of his right, title, or interest therein; without written consent of the Inspector. When directed by the Inspector, the Contractor shall submit a certified copy of the actual subcontract agreement executed between the Subcontractor and the Second Tier Subcontractor. In the event of an assignment by operations of law or the bankruptcy of the Subcontractor, the Contractor shall have the right, power, and authority, in its discretion, without violating the contract or releasing the surety, to terminate the subcontract. An assignment by operations of law or assignment for the benefit of creditors or the bankruptcy of the Subcontractor shall not vest any right in this contract in the Trustee in bankruptcy, nor the Subcontractor's creditors or agents of the creditors.

Neither the Contractor, nor any Subcontractor, shall enter into any written or oral equipment lease or rental agreement, materials purchase agreement, and/or labor agreement which circumvents the provisions of this article.

If the Contractor or a Subcontractor enters into a lease or rental agreement for equipment based upon payment for a unit of work, such agreement will be considered subletting of the contract unless the lease or rental agreement is with a commercial equipment company, manufacturer, and/or commercial leasing agency and such firm has been approved by the Inspector. An equipment lease or rental agreement which is based upon unit price per unit of time will not be considered subletting of the contract.

The approval of any subcontract will not release the Contractor of his liability under the contract and bonds, nor will the Subcontractor or the second tier Subcontractor have any claim against the Department of Transportation by reason of the approval of the subcontract.

The Contractor shall as soon as practicable after the signing of the Contract, notify the Owner in writing of the names of the Subcontractors proposed for parts of the work and shall not employ any that the Inspector may within a reasonable time object to as incompetent or unfit.

The Contractor agrees that he is as fully responsible to the Owner for the acts and omissions of his Subcontractors and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

Failure of the Contractor to comply with any of the provisions of this article may be justification for disqualifying the Contractor from further bidding in accordance with the provisions of Section A.2-11.

A.16 PROTECTION AND CUSTODY OF VESSEL

(a) The Contractor shall take suitable means of protecting the vessel, the engines, and all other machinery, outfit, equipment, piping, wiring, etc. from the start of construction and until the vessel is accepted by the Owner, and he will be held responsible for any damage that may be sustained during this period. (See paragraph A.13 herein also).

(b) The vessel is agreed to be in the custody of the Contractor from the start of work at his plant until the completion of the vessels, including the tests and trials if required by the Technical Specifications herein, and until delivery to the Owner.

(c) The Contractor shall keep all litter and debris removed from the vessels, and shall conform to normal standard safety practices in the prosecution of the work and condition of the shipyard area.

A.17 MATERIAL FURNISHED BY OWNER AND TO BE RETAINED BY OWNER

The Contractor shall receive, handle, and install all Owner furnished material and equipment, if any, and shall provide the required foundation, piping, wiring, etc., to make a complete and satisfactory installation at no additional cost to the Owner as a part of this contract. **The Owner shall furnish a list of Owner Furnished Material at the Pre-Bid Conference.**

A.18 HAULING AND LAY-TIME

(a) The Contractor shall provide a suitable safe means for hauling the vessel and sufficient lay days to complete all work as required, or that may become necessary.

(b) The vessel shall enter the drydock or railway without list and without excessive trim. If any strain or possible damage to the vessel be suspected or observed, the docking operation shall be suspended and necessary corrective measures taken. Blocking and shores shall be arranged in accordance with standard practice, leaving room in way of water jet thrusters, and other obstructions. The vessel shall remain on the drydock or railway until the underwater work has been satisfactorily completed, then it shall be carefully undocked.

A.19 RAILWAY CERTIFICATION

Upon award of the contract, the Contractor shall submit to the Ferry Division Engineer, a certificate of condition and capacity of Railway, Crane, Travel Lift or Drydock intended for use during docking if required. Certificate shall indicate capacity, maximum width, and condition of facility which has been inspected within thirty (30) days of bidding by a Certified Marine Inspector or Registered Professional Engineer.

A.20 GUARANTEE

(a) The Contractor shall guarantee all materials furnished and all workmanship performed by him under these specifications for a period of twelve months following final acceptance date by the Owner. This guarantee shall be limited to replacement (including labor) of any parts giving out

under normal service because of defect in material or workmanship, and not because of carelessness or neglect on the part of the Owner, his officers or agents; provided further, that any work necessary under this warranty shall be performed without delay by the Contractor at a shipyard or such other place as may be approved by the Owner, and said Contractor shall not be liable for any expense or damages other than as herein called for above. The regular manufacturer's warranty shall be furnished with all equipment, machinery, fitting, etc., provided by the Contractor.

(b) Manufacturer's warranties shall be filed by the Contractor for all equipment provided and installed and said warranties shall be transferred and/or filed in the Owner's name for all equipment, machinery, fittings, etc.; regular warranty periods will apply for all component items not hereinafter listed.

(c) The Contractor shall make good all damage to the vessel or its equipment or contents thereof, which is the result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with the terms of the contract and shall restore all disturbed work resulting from the same.

(d) If the Contractor, after notice, fails to proceed promptly to comply with the terms of the guarantee, the Owner may have the defects corrected and the Contractor and his surety shall be liable for all expenses incurred.

(e) All special guarantees applicable to definite parts of the work that may be stipulated in the specifications or other papers forming a part of the contract shall be subject to the terms of this paragraph during the life of such special guarantees. **All guarantees shall begin on the date of final acceptance by the Department.**

A.22 CERTIFICATES, DOCUMENTS, ETC.

(a) Upon completion of vessel and prior to acceptance the Contractor shall turn over to the Owner "Consent of Surety," "Affidavit of Payment of Labor and Materials" which shall include a list of material and equipment that is unpaid, waivers from suppliers and a statement that the vessel is free and clear of all liens and any other documents called for in other paragraphs herein.

(b) Upon completion of the vessel and after it is delivered, the Owner shall turn over to the Contractor a (notarized) certified statement (that all work required by these specifications, including any extra work is complete and satisfactory on the date of delivery. This statement in no way affects or reflects on the guarantee covered herein.

A.23 DELIVERY

(a) The vessels shall be delivered by the Contractor to the Owner at the North Carolina State Shipyard, located at 8550 Shipyard Road, Manns Harbor, North Carolina 27953. The vessels may be delivered individually prior to the contract completion date as directed by the Owner.

(b) The Owner shall upon delivery turn over to the Contractor all documents required by these specifications, (paragraph A.22(b)).

(c) The Contractor shall upon delivery turn over to the Owner all documents required by these specifications (paragraph A.22(a)).

A.24 ACCEPTANCE

When the trials and all tests have been made, and all work completed to the satisfaction of the Owner, the vessel will be formally accepted by the Owner after delivery upon presentation of all necessary documents as described herein. See section A.39 for final acceptance requirements and permanent USCG COI at owner's facility in Manns Harbor, NC. All vessel items must be 100% complete prior to acceptance.

A.25 FAILURE TO RECOGNIZE

Failure of the Contractor to recognize the need for performance of work or furnishing of materials required to complete the vessel in accordance with the true intent of these specifications shall not be grounds for additional payments or charges under this contract or these specifications.

A.26 PATENT RIGHTS

The Contractor shall pay all royalties and assume defense and indemnity and save harmless the Owner and his officers, from any patent infringements.
There is no knowledge of any infringement.

A.27 WELDING

(a) Qualifications of Welders
All welding performed under this specification shall be done by welders holding a valid qualification certificate issued by the U. S. Coast Guard, or the American Bureau of Shipping, for the class of work to be accomplished. A list of welders and their certification shall be provided to the Owner. List shall be updated as required.

Qualified welding supervisors shall be employed to assure conformity with standards of workmanship required.

(b) Standards
In general, the design of joints and the amount and type of welding shall conform to the A.B.S. Rules for Building and Classing Steel Vessels under 90 Meters (295 Feet) in Length, 2017, Part 2, Chapter 4. A more detailed description of the workmanship required can be found in the IACS Guide No. 47, Shipbuilding and Repair Quality Standard and the Ninth Edition of the Welding Handbook, published by the American Welding Society. Electrodes used for welding shall be of type approved by the U. S. Coast Guard for the various types of materials to be welded. Plates shall be smooth and free from wrinkles, uneven joints, wavy surfaces, etc.

No welding is to be done on hull plating below or near the waterline while the vessel is afloat. Welds shall be uniform and properly sized. Unsatisfactory welding shall be removed, ground

smooth and re-welded in a satisfactory manner.

The striking of an arc on any principal hull plate surface is prohibited unless the plate surface on which the arc is struck is to be incorporated in a welded joint. Marks left by an accidental striking of an arc shall be ground out to a smooth contour, taking care that the plate thickness is not reduced more than ten (5) percent. Arc marks which exceed ten (10) percent of the plate thickness shall be reported at once to the Inspector, and corrective action taken as he directs. U.S. Coast Guard and/or ABS approved welding procedures shall be provided prior to starting construction.

Hull Protection - The Contractor shall maintain rigid control of welding and grounding for protection of the hull, its systems and appendages during the entire time the vessel is in the custody of the Contractor. Grounding connections shall be bolted as opposed to clamped.

A.28 CARE DURING CONSTRUCTION

All parts of the vessel, including, but not limited to, structure, deck coverings, fittings, equipage, outfit, furniture, insulation, paint work, machinery, auxiliaries, appliances and apparatus, shall be maintained in satisfactory condition during the entire period of construction and fitting out. All dirt, chips, and scrap material shall be cleaned out at frequent intervals during construction, and no water shall be allowed to remain in the vessel. The vessel must be thoroughly cleaned throughout at the time of delivery to the Owner. Special measures shall be taken to minimize damage incident to storage, installation and construction and to prevent corrosion or other deterioration, especially to all unpainted, polished, and moving parts. All defects, damage, and deterioration of the vessel, its parts, fittings, and outfit that occur before acceptance of the vessel shall be corrected and repaired by the Contractor at his expense. Equipment, prefabricated parts, furniture, and items such as life floats, lines, and canvas, which are stored in warehouses or on piers during the construction period of the vessel, shall be thoroughly examined for and rid of rats and vermin before being placed on board.

Fire Protection - During construction, flammable material shall not be stored onboard the vessel in such a manner to create a serious fire hazard. The Contractor shall exercise special care to prevent the possible outbreak of fire. The Contractor shall maintain a **Fire Watch** during all construction phases of the project. This person or persons shall be properly trained and equipped with adequate communications equipment to conduct a **Fire Watch**. The Contractor shall provide a charged fire hose and adequate number of portable fire extinguishers to adequately provide a safe working environment. At no time shall the Contractor conduct any welding where joiner work has been installed unless he notifies the Owner's Representative 24 hours in advance.

Where hot work is being carried out in the vicinity of combustible material, a fire watch whose sole purpose shall be to watch for fires and keep firefighting equipment on hand shall be constantly on duty.

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A.29-1 PAYMENTS AND ACCEPTANCE

(a) Payments shall be made as set out in the Contract.

(b) All material and work covered by partial payments made shall thereupon become the sole property of the Owner, but this provision shall not be construed as relieving the Contractor from the sole responsibility for all materials and work upon which payments have been made or the restoration of any damaged work or any responsibility of the Contractor as herein set forth or as a waiver of the right of the Owner to require the fulfillment of all of the terms of the Contract.

(c) The final payment will not become due until the Contractor shall deliver to the Owner through the Inspector, Consent of Surety for final payment and an Affidavit of Payments of Claims that all subcontractors and suppliers of either labor or materials have been paid all sums due them for work performed or materials furnished in connection with this Contract or that satisfactory arrangements have been made by the Contractor with such subcontractors and suppliers with respect to the payment of such sums as may be due them by the Contractor (See paragraph A.35 also).

(d) ACCEPTANCE OF FINAL PAYMENT CONSTITUTES RELEASE
No certificate for payment issued by the Inspector and no payment, final or otherwise, nor partial or entire use or occupancy of the work by the Owner, shall be an acceptance of any work or materials not in accordance with the contract, nor shall the same relieve the Contractor of responsibility for faulty materials on workmanship or operate to release the Contractor or his surety from any obligations under the contract or the Performance Bond. North Carolina *General Statute 136-29 (2)* applies.

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A.29-2 MILESTONE PAYMENT SCHEDULE

Note – Partial payments will be processed based upon progress estimates as prepared by the Engineer in accordance with the following payment schedule and Section 109-4 of the Standard Specifications.

Item	Item Description	Milestone Percent
1.	Engineering (USCG Approved Plans, Manuals, Certificates and As-Builts)	10%
2.	Structure (Steel Material and Labor to Complete	10%
3.	Superstructure (Aluminum Material and Labor to Complete)	10%
4.	Machinery (Engines, Gears, Shafting and Rudders Installed Complete)	10%
5.	Piping (Pumps and Piping Material Installed Complete)	10%
6.	Electrical (Panelboards, Wiring, Switches, Lights and Electronics)	10%
7.	Outfitting, Masts and Deck Equipment including A-Frame Installed	10%
8.	Blasting and Painting (Interior and Exterior)	10%
9.	Testing (Dock and Sea Trials)	10%
10.	Delivery of all six (6) vessels to NCDOT with USCG COI as Required	10%
	Contract Total	**100%**

A.30 CONTRACTOR'S TITLE TO MATERIALS

No materials or supplies for the work shall be purchased by the Contractor or by any subcontractor subject to any chattel mortgage or under a conditional sale or other agreement by which an interest is retained by the seller. The Contractor warrants that he has good title to all materials and supplies for which he accepts partial payment.

A.31 CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE CONTRACT

If the work should be stopped under an order of any court or other public authority for a period of three (3) months, through no act or fault of the Contractor or of anyone employed by him, or if the Inspector should fail to issue any certificate for payment within a reasonable time after it is due, or if the Owner should fail to pay to the Contractor within a reasonable time any sum certified by the Inspector, then the Contractor may, upon fourteen (14) calendar days of written notice to the Owner via the Inspector, stop work or terminate this contract and recover from the Owner payment for all work executed.

A.32 OWNER'S RIGHT TO TERMINATE CONTRACT

(a) If the work to be done shall be abandoned or if the Contractor should be adjudged a bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if this contract or any part thereof shall be sublet without previous approval of the Owners; or if this contract or any claim thereunder shall be assigned by the Contractor; if any materials or any tools, machinery or other equipment shall be attached or encumbered, which attachment or encumbrance remains undissolved for a period exceeding ten (10) days; or if at any time the Inspector shall be of the opinion, and shall so certify in writing to the Contractor, that the said work is being unnecessarily delayed by the Contractor, or is not executing said contract in good faith, or is not making such progress in the execution of the work as to indicate its completion within the required time, or if he should persistently or repeatedly refuse or should fail to supply enough properly skilled workmen or proper materials, or persistently disregard laws, ordinances, or the instructions of the Inspector, the Owners shall have the power and right to notify the Contractor to discontinue all work or any part thereof under this contract and thereupon the Contractor shall discontinue such work or such part thereof as the Owner shall designate and the Owners shall thereupon have the power, by contract or otherwise as they may determine, to enter the premises of the Contractor where said vessel is being constructed and complete the work herein described, or such part thereof as they deem necessary; and to use such tools and other equipment and such materials of every description as may be found upon or designated to be used upon said work, and to procure additional tools and other equipment and additional materials for the completion of the same; and to debit to the Contractor the expense of labor and of additional materials and of additional tools and other equipment so procured, which additional tools and other equipment shall be and remain the property of the Contractor upon the completion of the work; and to credit him with the value of the work so done, as estimated by the Inspector.

(b) The excess of any cost to the Owners caused by or arising from its having taken over the completion of said vessel including compensation for additional inspection, managerial and

administrative services shall be paid to said North Carolina Department of Transportation by the Contractor or by the surety on its performance bond, and in such accounting, the Owners shall not be held to obtain the lowest cost for the work of completing the contract, or any part thereof, but all sums actually paid therefore shall be charged to the Contractor.

(c) It is further agreed that in case the Contractor shall not fully complete the contract work at the time stipulated, the Owners, in lieu of the foregoing provision, may at its option pay the Contractor for the parts already done, according to the provisions of the contract, and these specifications, and may treat and consider the parts remaining undone as if the contract was cancelled or abandoned by said Contractor or as if they had never been included in or contemplated by this contract.

(d) No action, proceeding or notice contemplated by the contract on the part of the Owners or Inspector and nothing herein contained shall operate as a waiver or release of any rights of the North Carolina Department of Transportation under this agreement against either the Contractor or its Surety.

(e) For purposes of the above "Abandonment of Work" shall mean any consecutive period of ten (10) calendar days without performance of work on the vessel by the Contractor.

A.33 CLIMATIC CONDITIONS

When so ordered by the Inspector, the Contractor shall suspend any work that may be subject to damage by climatic conditions existing or predicted for the area within 24 hours.

A.34 TAXES

The Contractor shall without additional expense to the Owner pay all applicable federal, state and local and other taxes which are assessed against this work.

A.35 ASSIGNMENTS

The Contractor shall not assign any part of the contract nor shall the Contractor assign any claim due under the contract or monies due or to become due under the contract.

A.36 SPECIAL NOTES

(a) All bidders are cautioned to clarify any questions prior to submission of proposal.

(b) The submission of a bid will be considered an acceptance of all requirements of these specifications and all governing laws and ordinances without exception

(c) There may be requirements for manufacturers or their representative personnel to perform work on some items of the ship's equipment not covered by these specifications, while at the Contractor's plant. These persons shall be allowed access to the vessel during normal working hours to perform their work. The Contractor shall provide a reasonable amount of electric power for hand tools and light if required.

(d) Any questions concerning these specifications should be addressed to:

North Carolina Department of Transportation
Contract Standards and Development Unit
Century Center Building B
1020 Birch Ridge Drive
Telephone: (919) 707-6900
Fax: (919) 250-4127
Attn: State Contract Officer

(e) The Owners reserve the right to waive informalities or to reject any or all bids.

(f) All bidders shall be prequalified by the Department of Transportation at least two (2) weeks prior to bid opening.

(g) Proposals received after the date and time set for the opening regardless of the cause will be returned unopened.

(h) COAST GUARD inspection of this vessel is required during construction and at final delivery to Owner.

A.37 GUARDING

All moving parts of machinery, shafts, etc., shall be shielded to prevent injury to personnel. Shielding fitted on items requiring frequent attention shall have doors, covers or be readily portable.

A.38 QUALITY CONTROL

(a) A competent employee of the Contractor, satisfactory to the Owner, shall from the start of work until the completion of the vessel, maintain quality control over the job. He shall make such inspections and investigations as are necessary to insure that the quality of workmanship, materials and testing is in accordance with that specified.

(b) The quality control employee shall prepare and maintain records of his actions, provide copies to the Inspector and cooperate with the Inspector.

(c) The Inspector shall have access to the quality control employee and his records at all reasonable times during working hours.

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A.39 CONTRACT TIME

Contract time shall be the number of calendar days inclusive between the date of availability and the completion date, said dates as being set forth below, including authorized extensions to the completion date.

Date of Availability for this contract is: April 29, 2019.

Final contract completion date for this contract is: 12:00 Noon June 29, 2020.

The completion date shall include at least five (5) working days of Contractor's representative(s) at Manns Harbor, N.C. to provide operational instructions to Ferry Division personnel prior to final acceptance. Local USCG OCMI shall provide permanent COI before vessel can be accepted. The OWNER shall provide vessel crew and fuel for test and operation of vessel prior to acceptance by Owner.

CS-38

LIST OF WORKING DRAWINGS TO BE PREPARED AND SUBMITTED BY THE CONTRACTOR FOR USCG APPROVAL:

25’-6” Support Tugs

1. Lines Plan
2. General Arrangement and Profile
3. Longitudinal Structural Details
4. Main Deck Structural Details
5. Aluminum Pilothouse Structural Details
6. Aluminum Stack Structural Section
7. Shafting Details
8. Bilge System Details
9. Navigation Lights
10. Electronic Wiring Diagram
11. Safety Plan

LIST OF WORKING DRAWINGS TO BE PREPARED AND SUBMITTED BY THE CONTRACTOR FOR USCG APPROVAL:

45’-6” Support Tugs with A-Frame

1. General Arrangement
2. Outboard Profile
3. Linesplan
4. Bottom & Sideshell Structural Details
5. Transverse Frame Structural Details
6. Longitudinal Sections
7. Main Deck Structural Details
8. Pilothouse & Stack Structural Details
9. Hatches & Manholes Schedule
10. Mast Details
11. Shafting Plan
12. A-Frame Details
13. Machinery Arrangements
14. Main Deck Outfitting
15. Steering System Details
16. Cooling System Details
17. Engine Exhaust Details
18. Fuel Oil Piping Details
19. Bilge, Ballast & Fire Piping Details
20. Shaft Flushing Piping Details
21. Hydraulic System Details
22. Electrical One-Line Diagram
23. Navigation Lights Details
24. Electrical Wiring Diagram
25. Vents & Fills Details
26. Windows & Doors Schedule
27. Safety Plan
28. Push Knee & Fendering Details

29. Deck Capstan & Hawser Reel Details

LIST OF WORKING DRAWINGS TO BE PREPARED AND SUBMITTED BY THE CONTRACTOR FOR USCG APPROVAL:

40’-0” Deck Barges

1. General Arrangements and Profile
2. Structural Details

25’-6” Harbor Tug

Technical Specifications

Prepared for NCDOT Raleigh, North Carolina

Revision 2

February 22, 2019

Dejong & Lebet, Inc.

D L
Naval Architects
Marine Engineers
Consultants
Surveyors

William M. Hayden, PE
Digitally signed by William M. Hayden, PE
Date: 2019.03.02 14:53:25 -08'00'

WILLIAM HAYDEN
LICENSE
NO. 60106
STATE OF FLORIDA
PROFESSIONAL ENGINEER

GROUP 0 GENERAL PROVISIONS

Table of Contents

References

0.1 American Bureau of Shipping Rules for Building and Classing Steel Vessels under 90 m.

0.2 USCG Subchapter "M" Guidelines for Tugs

010 Vessel Performance/Capabilities

The vessel is twin screw tug boat intended for service on the lakes, bays, rivers and sounds of North Carolina from Wilmington to Knots Island. The vessel must be designed to operate at an even level keel with 4'-0" draft forward and aft. No fixed ballast will be used to trim vessel.

The hull of the vessel is to be of all welded steel construction using a transverse system of framing.

Propulsion will be provided by two (2) 250 hp marine diesel engines. Drive will be through reversing reduction gears with shafting and propellers.

Electric power requirements will be 12 VDC from two (2) banks of propulsion engine starting batteries with main transfer switch.

Design trial speed shall be approximately 8 knots and a full load service speed of 6 knots pushing or towing.

020 Mission Statement

The vessel shall be designed for pushing and towing ferries for the Ferry Division when they become stranded on shoals or become grounded outside of the channels. The vessel shall be capable of operating during daylight and nighttime operations to match Hatteras Operation schedule. The tug shall be capable of being operated by a two (2) man crew in the same sea state as the ferries.

The vessel will not be capable of handling 1,110# Danforth anchors for the 12" Suction/Discharge Dredge operated by the Ferry Division. A portable A-Frame shall be capable of being installed at the bow to handle the anchors with a 10,000-lb. hydraulic powered winch which can be purchased from Dredge Supply, Inc.

030 Regulatory Body/Classification Requirements

The vessel shall be designed and constructed to the requirements of Reference 0.1 and 0.2

040 Principal Characteristics

Dimensions:	
Length overall (molded)	25’-6”
Length on design load waterline	25’-6”
Breadth (molded)	16'-0"
Depth (molded) amidships at side	6'-6"
Draft (molded) at DWL	4'-0"
Capacities (approximate):	
Fuel oil (96%)	500 Gallons
Fresh water	N/A
Lube oil	N/A
Gear oil	N/A
Power (approximate):	
Propulsion power	2 × 250 = 500 BHP
Ship’s Electrical Power	12 Volt DC

050 Materials

All materials, machinery, equipment, and components shall be of good commercial marine quality, in full compliance with these Specifications, suitable for the service intended.

An "or equal" product is one which exhibits the same salient features of size, weight, characteristics, performance, reliability, and maintainability as the product identified in these Specifications. The total performance of the "or equal" product will be such that its use will not adversely affect the intended performance of other systems or the vessel and with no increase in required maintenance or replacement periodicity. Demonstration of an "or equal" status is the responsibility of the Contractor and must be approved by Owner.

Fastenings throughout shall be 316 stainless steel unless otherwise specified, and in accordance with all sizes required or shown on plans and listed elsewhere in these specifications.

All hardware shall be made of best quality marine grade brass, bronze or 316 stainless steel, unless otherwise specified. Bolts shall be fitted with lock washers, flat washers and nuts. Nuts shall be drawn up tight. Screws shall be of highest quality stainless steel, with clean cut threads. All threads shall be coated with sealant (non-seizing) prior to installation.

060 Construction Drawings

The vessel shall be constructed as depicted in below listed Construction Drawings and as described in these Specifications. Information contained in the Construction Drawings is subject to alteration, development, and refinement by the Contractor pursuant to implementing the details of these specifications, appropriate authoritative agency regulations, and design development.

1393B-100-1	Linesplan
1393B-101-1	General Arrangement and Profile
1393B-120-1	Longitudinal Structural Details
1393B-130-1	Main Deck Structural Details
1393B-152-1	Aluminum Pilothouse Structural Details
1393B-152-2	Aluminum Stack Structural Details
1393B-182-1	Shafting Details
1393B-263-1	Bilge System Details
1393B-422-1	Navigation Lights
1393B-423-1	Electronic Wiring Diagram
1393B-680-1	Safety Plan

Plans provided to the Contractor at time of bidding are to be used for guidance and construction. The Contractor shall verify quantities, provide additional working drawings, and sketches, if required, and obtain approval of same from the Owner. Piping drawings shall include bill of material schedule stating size, quantity, mfg. model number, etc. All drawings shall be as-built upon delivery of vessel to owner.

070 DEFINITIONS

Owner:	North Carolina Department of Transportation, Ferry Division
Owner's Representative:	Marine Design Engineer-NCDOT Ferry Division
Contractor:	Shipyard
Builder	Shipyard
ABS:	American Bureau of Shipping
USCG:	United States Coast Guard
USCG OCMI	Local USCG Inspector (Officer in Charge of Marine Inspection)
USCG MSC	Marine Safety Center, Washington, DC
Contract Drawings:	Drawings A-1 & A-2 listed in section 060 Construction Drawings
Equal To:	Similar in material specification, size, finish, quality and performance
Vessel:	See section 010 thru 060

080 CERTIFICATES

1. Main Engine Manufacturer's Certificate (ABS)
2. Reduction Gear Manufacturer's Certificate (ABS)
3. Main Engine Extended Warranty (five years or 7,000 hours)
4. Reduction Gear Extended Warranty (twelve months)

GROUP 1 STRUCTURAL

References

64-S1, Scantling and Inboard Profile

64-A1 Outboard Profile

64-A2 General Arrangement

64-A3 Hold Plan

100 Structure – General Requirements

All steel shall be new, ASTM-A36 certified, and of U.S. manufacture and origin. Aluminum shall be ASTM 6061 for marine service. The Contractor shall provide mill certification. See special provision for purchase of domestic steel products.

101 Material and Scantlings

The vessel shall be constructed on a Transverse system of framing.

Limber and vent holes, 1-1/2" radius minimum, shall be cut as necessary to ensure proper venting and drainage of tanks, compartments, pockets, and voids. Tanks shall have limber holes and vent holes of adequate size for full capacity flow to suction and vent lines.

All structural steel material, including forged components, are to be made of open hearth mild steel of uniform quality, the chemical and physical properties of which are to conform to the requirements of the ASTM-A36.

All scantlings shall meet or exceed the American Bureau of Shipping requirements. Where scantlings on the plans exceed ABS requirements, the increased scantlings shall be used.

Scantlings not specified by the plans, ABS rules are to be minimum requirement.

Temporary access openings may be provided through shell, bulkheads, decks, etc., for convenience of workers and are to be reclosed in place by welding. All such openings shall have large radius corners for this purpose, openings shall be positioned to utilize existing design butt welds and seams wherever possible.

Local reinforcements, for special loads and vulnerable areas subject to high wear, also compensation for penetration, doors, stairway openings, etc., shall be provided generally in accordance with ABS rules.

Doublers may be used at bitts and deck fittings except for towing bitts at bow and stern. These towing bitts shall be designed to withstand (2) times the expected bollard pull of the vessel in all directions. Side double bitts shall be designed for the expected bollard pull in the forward and aft directions only. Side pull for bitts shall be designed to ½ of the bollard pull. The deck winch foundation and under deck structure shall be designed for full strength of the winch. Winches shall be installed on insert plates of 1/2” minimum thickness. Except at the Main Deck, wherever there is a difference in adjacent plate thickness, the stiffener side shall be kept flush. Particular care shall be taken on all visible surfaces (i.e., outside shell, deckhouse, etc.) to maintain a good appearance by means of suitable chamfers.

No rough edges shall remain where steelwork is cut. Penetrations shall be pre-cut by machine or neatly burned. All rough edges shall be ground smooth.

All steel material shall be blasted to coating manufacturer's recommendations but at least to SSPC Sp 10 standard, and immediately thereafter coated with a suitable primer. The primer shall be of weldable type and fully compatible with ultimate coating system.

Design of steel structures shall allow clear heights as specified after allowing for passage of ducts, pipes, etc.

Unfairness of plating between frames, stiffeners, or deck beams shall not exceed 1/8" in 24”.

102 Welding

Electric arc welding shall be used for assembly of all construction elements in hull, superstructures, stern, stem, meeting or exceeding ABS requirements.

Weld joints shall be prepared and welded in compliance with ABS requirements. Mill scale, rust, moisture, dirt, slag, and other alien substances shall be removed before welding is executed. After the welding, remnants of slag are to be removed.

Special care is to be taken to welding sequence in narrow places or places having difficult access (i.e., rudder, fore peak, etc.).

All welding shall be done after carefully scheduled sequences. The welding sequence shall ensure a minimum of strains of finished hull. Particular care is to be taken in the welding sequence to relieve stresses which might cause inherent weakness in the structure or excessive buckling of plates.

Deck beams shall be welded with a minimum of 3" in 12" intermittent proper sized fillet weld with a balanced 3" and wrapped fillet weld at the ends. All other welds shall meet or exceed ABS requirements. All welding exposed to the weather shall be sealed continuous. A welding schedule shall be submitted for regulatory body and Owner's approval.

Good grounding connections shall be ensured for all welding, and care is to be taken with all welding to avoid undue stresses.

Electrodes shall be of the quality approved by ABS and USCG for intended materials.

Internal scallops may only be used for air escape, drainage and in way of cross welds. Crossings shall be made with notch, or the first weld to be ground flush before the crossing element is installed.

Single side welding may be performed only on down-hand runs, generally to ABS requirements.

Back gouging, where necessary, shall be carried out by air gouging.

Temporary welding shall be carefully removed by chipping and/or grinding and steelwork in way made good to the satisfaction of Owner or his approved surveyors.

Direct attachment of fittings to oil-tight structures shall be by welding only. Such welds shall be tested for tightness.

103 Lofting

Hull lines shall be carefully faired and offsets determined. Offsets shall be taken at each frame and three (1) copy of the offsets provided to the Owner prior to steel lay-off.

110 Shell and Supporting Structure

Frames and girders shall be bracketed on both sides of oil-tight and watertight bulkheads. Attention shall be paid to the alignment of girders under the engines and reduction gears, and at the struts and rudders.

111 Shell Plating

Attention shall be paid to finish of exposed steel on outside shell and superstructure; welding shall be ground smooth where unsightly. It is not the intention to grind smooth all hand-made welding on the side shell plating. Shell plating shall be minimum 5/16” on bottom. Bow and side plating shall be a minimum of 5/16”. Deck plating shall be 1/4” throughout.

Each overboard discharge through the shell plating shall be rigidly stiffened vertically and horizontally to the nearest structural members.

114 Towing Rainbow

N/A

115 Stanchions

Heavy stanchions and girders shall be fitted in machinery spaces as needed to minimize vibration. Care is to be taken in the design of accommodation areas to ensure continuity of pillars, girders, bulkheads and webs to minimize vibration.

116 Skeg

The skeg shall be tapered, hollow construction with widths (half breadths) as shown. The skeg shall be fitted with suitable transverse framing and made watertight. The bottom of the skeg shall be 1/2” plate.

Stainless steel half couplings shall be installed in bottom plating at each skeg void and shall be fitted with 1" brass flush plugs. Install liquid rust inhibitor in skeg void after testing and welding in adjacent areas has been completed.

117 Framing

Framing shall be in accordance with ABS for tug impact service except where the plans specify heavier framing. Minimum framing thickness is to be 1/4”. Frame spacing shall be 24” centers. Plate stiffeners shall be longitudinal with major transverse frames on 6’-0” maximum centers.

120 Hull Structural Bulkheads

Structural bulkheads shall be arranged as shown on the plans. Hull bulkhead plating shall be no less than 5/16" thick. Bulkhead stiffeners shall be arranged to line up with girders or other stiffeners.

All openings shall have rounded corners to the Owner's approval.

121 Center Vertical Keel

N/A

130 Main Deck

The Main Deck shall be fabricated as shown.

Insert plates with radiused corners shall be installed under bitts, cleats, pad eyes, and similar fittings. Main Deck insert plates shall be installed flush on the underside with surrounding plates.

Decks shall be reinforced in way of corners of large openings, breaks, etc., where required by regulatory bodies. Such reinforcement shall be by insert plates of increased thickness - doublers are not to be used – and by installation of heavy girders.

132 Lifting Padeyes

The are to be four (4) lifting pad eyes at the main deck for lifting the tug onto the deck of the NCDOT Crane Barge “SKYCO”. The pad eyes shall be arranged for a transverse spreader bar to attach to slings for both sides. The Spreader bar shall be fabricated using a heavy wall pipe with caped ends designed as lifting eyes.

Lifting slings will be manufactured using Amsteel Blue synthetic rope with non-metallic thimbles at each end. Two (2) additional slings will connect to the spread bar to a single lifting crane hook sized for a minimum of 40 tons. See tug plans for location of pad eyes and lifting sling details.

150 Wheelhouse Structure

The wheelhouse shall be constructed of aluminum angle stiffeners throughout. 3/8” plate inserts shall be located at all wheelhouse roof items.

151 Bulwarks

N/A

161 Deck Fittings

Cast steel cleats and chocks shall be provided on the main deck as shown. Corners and weld bead shall be ground smooth to prevent chafing of mooring lines.

Chafing protection, round bar or pipe, shall be provided on bulwark stiffeners where lines may lead from kevels or chocks.

Provide a 8” pipe H-bitt for towing aft rated for 200% of vessel bollard (5 tons). A forward towing bitt shall be provided and sized for 200% of vessel bollard in reverse (3 tons) using 8” pipe. Both bitts shall penetrate the main deck to provide adequate strength.

163 Sea Chests

Each sea chest shall be 5/16" minimum thickness with a stainless steel gate valve installed. The sea chest shall be vented outside the machinery space.

Strainers shall be 5/16" plate steel, hinged with 316 stainless steel pins and fasteners.

167 Watertight Doors, Hatches, and Manholes

Steel hatches and doors shall be shot blasted and coated with one coat of inorganic zinc to all surfaces prior to assembly.

Bolted manholes (20” minimum size) shall be provided for each built-in tank and void. Where the lower edge of the manhole is more than three feet above the tank bottom or working platform, bent round bar rungs shall be provided for safe access. The wheelhouse shall be bolted to a raised flange section to provide access for removing the propulsion engines.

These shall be installed in-way of the stacks for removal of the main engines or other machinery as required.

Flush deck watertight quick-acting hatches, 20" diameter, shall be installed in the main deck as shown on main deck plan for access to compartments and voids.

168 Tanks

The interiors of all tanks and voids shall be thoroughly cleaned and to the satisfaction of the Owner.

Fuel oil tanks shall be thoroughly cleaned of all debris, weld splatter, flux and other foreign matter and approved by the Owner prior to initial filling, and shall be kept closed thereafter until ready for use. All tanks shall be fitted with overflow/vents of twice the open area of the suction piping. Each tank shall have a 1 ½" sounding pipe and a 2" fill all located in a common spill pan at each tank. Tanks shall have a 1 ½" drain at the lowest point in the tank to drain into the machinery space. See Group 400 for details of vents, overflows, sounds and fill connections for each tank.

169 Special Purpose Closures

171 Mast

A navigation light mast shall be provided and located as shown on Reference outboard profile. The navigation light masts shall be of aluminum construction, hinged for access to navigation lights.

Electrical cables on the navigation light masts shall be provided with watertight receptacles at each light fixture and adjacent to the mast base.

Flagstaffs shall be fitted with sheaves and brass cleats for halyards. Provide brass pulleys for each arm and gaff, three (3) complete with flag halyard of 1/4" nylon line with brass snap hooks secured to each end of halyard. Halyards shall be endless loop type, suitable for service intended. The mast shall be fitted with mounts for all electronic antenna as required for vessel electronics.

180 Foundations and Struts

Contractor shall fabricate and install all necessary foundations and supporting structure. Foundations shall ensure rigidity, freedom from vibration in normal operation.

182 Propulsion Plant Foundations

Foundations for the propulsion machinery shall be fitted as an integral part of the vessel's primary structure. Abrupt discontinuities shall be avoided by gradual tapers at the extremities of foundation structure.

The propulsion machinery foundations shall be of a height to suit the engine and reduction gear alignment chocks. The reduction gear foundations shall be a continuation of the main engine foundations. Brackets shall be installed at every frame, except where such brackets interfere with the engine bolting arrangements. Welding of engine and reduction gear foundations shall be

continuous. Minimum thickness of vertical portion of foundation is to be 3/8". Rider plate shall be a minimum of 5/8" x 6" with 5/16" plate brackets as shown on plans. The propulsion engine and gear foundations shall extend the entire length of the machinery space with brackets on the far side of the bulkheads.

183 Generator Engine Foundations

N/A

184 Navigation/Communications/Electronics

185 Auxiliary Equipment Foundations

Foundations for davits, kevels, chocks and the like shall be designed to withstand anticipated loads. The stern towing bitt and bow towing bitt shall be designed for twice the anticipated bollard pull of 10,000 pounds on the aft bitt and 7,500 pounds on the forward bitt.

GROUP 200 PROPULSION & PIPING

References

A-1 Outboard Profile

A-2 General Arrangement

Addendums

200 Propulsion Plant, General

The propulsion system is for a single-ended design, with two fixed-pitch stainless steel propellers at the stern. The propulsion machinery installation will consist of two non-reversing, 4-stroke, turbo-

charged (Tier III) diesel engines, each connected through reversing reduction gear to a propeller with disc type shaft brakes controlled by engine controls.

233 Main Engines

The main propulsion engines shall be 280 HP continuous duty cycle @ 2300 RPM, arranged for keel cooling. Manufacturer factory certification documentation shall be provided for each engine.

Engines shall burn No. 2 diesel fuel. Engines shall be 24 VDC starting with engine mounted alternators for charging the starting batteries. Batteries shall be with 800 amp starting capacity arranged for two 12 Volt batteries in a single fiberglass battery box for each engine.

Contractor shall provide all required fasteners, wiring, fuel oil flex hoses, exhaust system flex connections, all piping, insulation, bedding materials, guards, gaskets, fittings, etc. for a complete and operational installation.

Each engine shall be provided and installed with two (2) lighted tachometers (digital) with dimmers, at pilothouse control station and at each engine. Lube oil pressure, water temperature gauges shall be included at each station.

Each engine shall be filled with a mixture of freshwater and manufacturer approved water treatment product. Amount of water treatment added shall be to manufacturer's recommendation for type and size of engines. Contractor shall provide one manufacturer water treatment test kit.

Contractor shall provide the services of a manufacturer authorized technician to accomplish initial start up of main engines. Test reports of initial startup shall be provided to the Owner. Engine warranty shall begin at initial startup and shall be for a period of 24 months or 5000 hours.

Contractor shall provide the services of a factory authorized technician to accomplish a PAR test on both main engines. Main engines shall have local and remote starting. Emergency shutdown shall be located in the wheelhouse console and at each engine.

The propulsion system shall meet USCG requirements including all regulatory documentation, failure modes analyses, and testing and verification procedures (PSTP). Each procedure shall be approved by USCG MSC in Washington, DC. These procedures shall be verified on sea trials.

Each engine shall have a DVTP/PSTP procedures to verify the following test:

- Overspeed Trip
- Low Oil Pressure Shutdown
- High Water Temperature Alarm
- Low Water Level (Jacket Water Only)
- Low 12 voltage to Engine ECM for Engine

236 Propellers

236.1 Propeller Details

Provide two fixed-pitch propellers fabricated, machined, and balanced. Design propellers to accommodate rope guards and lifting/pulling bolts. Propellers shall be thoroughly stress relieved

prior to machining and finishing. Propellers shall be dynamically balanced and the trailing edges of blades shall be properly ground to prevent "singing". Propellers shall be secured to the tail shafts with stainless steel propeller nuts and a stainless steel ¼" x 1" weld strap.

Manufacturer certified drawings and certificates shall be provided for each propeller including spares.

The Contractor or Builder shall provide a set of spare propellers bored and blue fitted to the shafts to the Owner at the time of delivery.

236.2 Propeller Specifications

Propellers shall be as follows;

Material	Nibral Bronze
Number of blades	4
Style	Workhorse
Diameter	36.00"
Pitch	(Fixed) to be determined by Marine Engineer
DAR	70 minimum

240 Reduction Gears

Reduction gears shall be forward/reversing with internal hydraulic. Gear radio shall be 3:1 at 250 hp at 1800 rpm shall turn a 36" diameter 4-blade work horse style propeller to absorb the full horsepower of the engines at 0 knots (against a bulkhead). Manufacturer factory certification documentation shall be provided for each gear.

The reduction gear warranty shall begin at initial startup by engine technician and shall be for a period of 12 months.

243 Propulsion Shafting

243.1 Propulsion Shafting Details

Propulsion shafting arrangement shall be as shown on references 2.1 and 2.2. Shafts material shall be Aquamet 17 sized to suit horsepower and reduction per ABS guidelines. Keyways shall be curved at ends with radius corners but not spooned. Couplings shall be machined to receive a disc type shaft break on the after side of the companion flange. Liners shall be raised brass per Ferry Division standard (Lines to be shrunk-on). Couplings and propellers shall be blue fitted at the machine shop and witnessed by the owner's representative or a designated person.

The shaft arrangement shall be so designed that the propellers shall be at least 3" above the vessel baseline and provide 15% tip clearance for the propellers at the hull. The use of chock fast or other compound to align the bearings is prohibited. Shaft tubes shall be line bored with the water lubricated bearings pressed in. Provisions shall be provided for jacking bolts or studs to help

remove the shaft tube bearings. The outside of the bearings shall be machined in three steps to help in the installation and removal of the bearings.

The stern tube shall be heavy wall mechanical tubing per ABS rules from the propeller support bearing to the aft machinery space transverse bulkhead. There shall be a forward stern tube bearing and a stuffing box at the aft machinery space bulkhead. Both shaft bearing lengths shall be approximately four (4) times the shaft diameter. The stern tube seal and bearings shall have a flushing water system as noted in section 262. There shall be a stuffing box flushing pump located at the aft machinery bulkhead to serve both shaft stuffing boxes. A second pump shall be installed as backup. Water flow shall be monitored by a flow meter with low water flow alarm in wheelhouse. Pumps and low volume alarm shall operate on 12 VDC power.

After vessel is afloat, but in no case less than 24 hours, align shaft system with the reduction gears so that tolerance is no greater than 0.005" on any of the four (4) directions. A record of the flange alignment shall be presented to the owner's representative at the time of verification.

The Contractor or Builder shall furnish two (2) spare shafts complete with bearings, propeller nut, gear end coupling, key-stock and nut at the time of delivery. All four (4) shafts shall have material certification and machine certificates signed by the inspecting USCG OCMI.

243.2 Bulkhead Shaft Seals

N/A

244 Rudders

There shall be two (2) rudders at each propeller per contract guidance drawings. The rudder stocks shall be stainless steel with steel blades welded to the stock. Blade reinforcement shall be per ABS rules. The rudder stocks shall be one piece through the main deck at the tiller arm. The rudder stock shall be sized such that a lower pintel bearing is not required. The lower and upper bearings shall be nylon with a nylon carrier bearing at the main deck. All four (4) rudder tillers shall be connected to the jockey bars located above the main deck. A fiberglass walk platform shall be installed above the tillers and jockey bars about 12" above the main deck. Grating shall be held in place with stainless steel screw clips. Rudders shall be kept 6" above the vessel baseline as shown on Outboard Profile.

Rudder stock material shall have material certification certificate and machine certificates signed by the inspecting USCG OCMI. The Contractor or Builder shall furnish one spare rudder complete with lower and upper bearings, for every two vessels built.

252 Propulsion Control System

252.1 Main Engine and Reduction Gear Controls

Provide and install electronic engine control system for each main engine in the wheelhouse. The control system shall include disc type shaft brakes at each gear output coupling. The control system voltage shall be 12 VDC with power provided at the 12 VDC panel board. The Contractor shall provide a USCG approved DVTP and PSTP procedure for the engine control system. These procedures shall be verified on sea trials.

253 Steering System

253.1 Steering System Design

The steering system hydraulics shall be powered from both propulsion engines using a 12 VDC selector valve for switching from port to starboard hydraulic pumps. Each pump shall have its own hydraulic reservoir. The system shall be designed to meet 46 CFR 143.545 parts (a) and/or (b). The rudders shall move 35 degrees from center in both directions with mechanical stops and limit switches to limit travel to 35 degrees per ABS rules. The system shall be so designed to move the rudders from hard over to hard over in no less than 15 seconds. Hydraulic power shall be from two hydraulic pumps mounted on the reduction gears.

253.2 Steering System Controls

The controls shall be designed with a full follow-up control lever and a non-follow-up control lever. Both control levers shall be located on the console in the wheelhouse. The rudder angle indicators shall be located on the overhead above the control console between the VHF radios. The rudder angle indicators shall be back lighted with a dimmer switch located at the indicators. The Contractor or Builder shall provide on set of steering controls (FFU and NFU) at delivery.

253.3 Steering System Control Panel

The control panel shall have a switch to control the steering pumps (port or starboard) with warning lights and audible alarm for the following:

1. Low steering pressure
2. Low oil level
3. Loss of 24 VDC Control power

253.4 Steering Hydraulic Cylinders

The rudders shall be controlled by two hydraulic cylinders located on the main deck aft. Cylinders shall be designed for marine service (salt water environment). They shall be furnished with Certificates from the manufacturer to meet USCG and ABS rules. Cylinder pins shall be stainless steel and provided with stainless steel grease fittings. Grease fittings shall be so installed to prevent mechanical damage. The Contractor or Builder shall provide two (2) spare hydraulic steering cylinders to the owner at delivery**,** for every two vessels built.

353.5 Hydraulic piping, hoses, valves and fittings

The entire piping system shall use stainless steel tubing with bent turns and compression fittings at ends. All hoses shall be manufactured using factory end fittings and must meet USCG requirements for hydraulic steering systems. All fittings shall be stainless steel. Arrangement and layout of the system shall be shown on vendor drawings such that owner approval will guarantee neat system layout. Any changes in the field shall require prior owner approval

255 Propulsion Engine Cooling

255.1 Keel Coolers

Provide keel cooling for all four diesel engines using Fernstrum Keel coolers sized for 0 knots at full horsepower. Keel coolers shall be installed as near the engines as possible to minimize lengths of piping between each engine and its respective cooler. Shutoff valves shall be located at the cooler in such a manner that valves can be easily attended if necessary. Guards shall be installed at coolers as suggested by the manufacturer. Expansion tanks with low level alarms shall be installed for each engine located in the wheelhouse. Tanks shall have a sight glass installed for checking water level. The system shall be filled with a mixture of water and antifreeze to meet the engine manufacturer requirements.

The Contractor or Builder shall provide one (1) spare keel cooler with gaskets and anodes for each propulsion engine to the owner at delivery, for every two vessels built.

259 Engine Exhaust Piping

259.1 Exhaust System Design

Provide proper sized exhaust line from each engine to the exhaust stack as shown on plans. The lines shall include silencers, stainless flex joints and flanges for easy removal of piping. Flex joints shall be installed in each section of pipe between elbows to allow for proper expansion. Expansion calculations shall be provided to verify proper flex length.

259.2 Exhaust System Piping Details

Insulation on exhaust lines shall be blanket type rated for 1500 degrees F. Insulation shall cover all piping, flex joints, silencers and turbo on each engine. Piping exposed to the weather above the main deck shall be stainless steel Propulsion engine exhaust shall terminate above the wheelhouse aft at each corner. The exterior portion of the piping shall be stainless steel with a removable expanded metal heat guard from the main deck to the house top. The pipe shall terminate 36” above the roof of the wheelhouse.

261 Fuel Oil Piping

261.1 Fuel System Design

The fuel oil system shall provide piping from each fuel tank to a manifold with branch lines to each engine. All valves shall be carbon steel per USCG requirements. Return lines shall be routed to the top of the fuel tanks. Provide USCG approved fuel filter/water separators for each engine sized to suit. A shut off valve with reach rod shall be provided at each tank suction line for emergency shutoff of fuel in case of fire at the main deck behind the wheelhouse. A fuel deck fill and vent shall be provided for each fuel tank at the main deck with a 21 Gallon drip pan. Drip pan shall have drain plug with ball valve and plug for valve. Hoses at each engine shall be USCG approved type not more than 30” long with 37 Degree JIC swivel at one end. Provide shutoff valve at suction hose and check valve at return hose.

261.2 Fuel System Tanks

The fuel tank shall have a sound tube for each tank along with sounding chart in inches/gallons. Chart shall show how many gallons are remaining in the tank. Tank capacity shall be 250 gallons each with a 3” air gap at the top not included in the 250 Gallon capacity.

262 Shaft Flushing Piping

Provide a shaft flushing system to include pumps, strainers and piping complete to furnish at least 10 gallons per minute at 15 psi to both shafts. These values shall be verified on sea trials. The system shall include two (2) engine belt driven water pumps with a sea strainer for each, valves, pressure gage and associated piping. The drive belts shall have a tension idler arrangement to maintain belt tightness.

The piping shall be 1” ASTM 316 stainless steel with screwed fittings. Each pump shall have its own 6” seachest complete with sea valve and strainer sized for the pump. Both pumps shall be cross connected with check valves in case one fails. Pumps shall be located, that they are always below the vessel water line by a minimum of 6”. Each seachest shall have a petcock to vent air from the seachest.

There shall be a pressure gage located in the wheelhouse console to indicate flow pressure for each pump.

The Contractor or Builder shall provide two (2) spare pumps at the time of delivery.

263 Bilge Piping

263.1 Bilge Piping System Design

The vessel shall have a 12 Volt bilge pump on off switch in the wheelhouse console. The machinery space shall have two 12 Volt 1000 gph electric bilge pumps with discharge piping through the side shell port and starboard. The discharge pipe shall have a positive closing valve at the shell with a check valve inboard of the closing valve.

GROUP 3 ELECTRICAL SECTION

References

3.1 A-1, Outboard Profile

3.2 A-2, General Arrangement and Hold Plan

Addendums

300 Electrical System – General

The Contractor shall provide a complete electrical system, including wiring and equipment, as described in these Specifications.

All equipment, materials and workmanship shall fully comply with the following electrical standards:

- 46CFR Subchapter J, Electrical Engineering
- ABS Rules for Vessels Under 90 Meters
- 72 COLREGS

301 Electrical Equipment Arrangement

In general, equipment shall be located per References 3.1 and 3.2.

Each connection box in a damp or wet location shall be watertight, with terminal or stuffing tubes for cable entrance and external mounting feet. Each watertight connection box shall be mounted by the external mounting feet.

All electrical components installed in locations exposed to the weather shall be 316 stainless steel or bronze, as approved by the Owner.

302 Electrical Motors & Associated Equipment

302.1 General

The vessel shall have a 24 Volt DC electrical system using the propulsion engine starting batteries as a main source of power. The four (4) 12 Volt 8D batteries shall be grouped together is sets of two with charging by the engine alternators. The batteries will be connected to a transfer switch with a 12 Volt DC panelboard to supply vessel power.

302.2 Motors

All electric motors and fans shall be 12 Volt DC powered.

304 Cabling – General

Cables shall be selected and sized per ABS and USCG rules and shall meet the recommendations of IEEE STD 45. 24 Volt cables shall be rated for 600 VAC. The minimum size of conductors for power and lighting cables shall be #14 AWG.

All electrical power, lighting and low voltage control cables in interior areas and protected exterior areas shall be low smoke cable. Plenum-rated cabling may be used for specialty data and communications cabling.

All electrical communications and data cable in interior areas and protected exterior areas shall comply with UL 1581.

305 Equipment Label Plates

Labeling requirements for specific equipment/components are included in the follow-on Specification sections.

Cable tags:

- All electrical cables shall be tagged with embossed aluminum tags on each side of a penetration, into and out of junction/connection boxes and/or equipment. The unique circuit designation, keyed to the various electrical plans, shall be embossed on the tag.
- All control wiring within control panels and consoles shall be identified with floaters

313 Batteries, Battery Charger and Shore Power

313.1 Batteries

Batteries shall be 12 Volt 1000 Amp capacity for propulsion engine starting.

Battery connections shall be pressure type lugs. Battery cables shall be end sealed to prevent electrolyte entrance by creepage or spray. Each battery bank shall be contained in a battery box located adjacent to the served unit and securely mounted in a foundation to the Owner's satisfaction.

313.2 Battery Charger

Battery chargers shall not be installed directly over the batteries. The vessel shall be equipped with a 45 Amp dual battery charger (120VAC/24VDC/12VDC) connected to the shore power for keeping batteries charged while vessel is moored. The charger shall be capable of charging both sets of 12 Volt batteries. A separate 120VAC/12VDC charger shall be connected to the 12 Volt electronics equipment battery. Both battery chargers shall be located in the wheelhouse.

313.3 Shore Power

The shore power receptacle shall be stored in a water tight box on the front of the wheelhouse. The box shall be labeled (120 VOLT-30 AMP SHORE POWER). A green light shall be installed in the front of the box indicating power available. A shore power cable of 30'-0" in length shall be provided and stored in the deck locker inboard of the port exhaust stack.

314 Vessel Alarm System

314.1 Alarm System Design

There shall be an alarm system to monitor the following points located in the wheelhouse:

1. 12 Volt DC power available
2. Starboard Propulsion Engine Low Oil Pressure
3. Starboard Propulsion Engine High Water Temp
4. Starboard Propulsion Engine Low Water Level
5. Starboard Propulsion Engine Loss of 12 Volt Power
6. Port Propulsion Engine Low Oil Pressure
7. Port Propulsion Engine High Water Temp
8. Port Propulsion Engine Low Water Level
9. Port Propulsion Engine Loss of 12 Volt Power
10. High Bilge Level in Machinery Space
11. High Bilge Level in Forward Void
12. High Bilge Level in Aft Void
13. Loss of 12 Volt Power to Steering
14. Loss of 12 Volt Power to Engine Controls
15. Low Water Pressure to Starboard Shaft Seal
16. Low Water Pressure to Port Shaft Seal
17. Low Fuel Tank Level-Port
18. Low Fuel Tank Level-Starboard

19. Spare
20. Spare
21. Spare
22. Spare
23. Spare
24. Spare

326 Panelboards

Panelboards shall be dead front, circuit breaker type. The lighting and power panelboards shall be provided with 12 spare breakers of assorted sizes including 5 Amp, 10 Amp, 20 Amp and 30 Amp.

The 24 Volt DC panelboard shall be located in the wheelhouse per Owner.

A 12 Volt DC electronics panelboard shall be provided in the wheelhouse console with power from the 12 Volt electronics battery. This battery will take power from the 12 V DC rectifier power from the 12 Volt DC panelboard.

All electrical panelboards and instrument panels shall be located in the wheelhouse control console.

327 DC Systems

24 and 12 VDC systems shall be provided as necessary to provide power for starting, DC power and pilothouse electronics. Systems shall include batteries, cabling, disconnects, panels, breakers, inverters, chargers, transfer switches, power supplies, and monitoring devices. System shall be similar to the 45’-6” Support Tug.

All electrical items such as chargers, transfer switches, power supplies and monitoring devices shall be located in the wheelhouse.

328 Wireways

328.1 General

All wireways and cable installations shall be in accordance with IEEE STD 45 recommendations.

Cable wireways shall be segregated into two individual systems: power/lighting and low voltage (including data and communications). Electrical systems shall maintain a minimum of 6" separation in wireways and MCT's and shall cross at right angles to each other. Wireway hangers shall be color coded: red for power/lighting, and blue for low voltage, data, and communications.

All cable hanger material shall be steel with a corrosion resistant finish. Painting is acceptable as a corrosion resistant finish for interior hanger material. Bolts, nuts, and washers for use with painted hanger material shall be stainless steel.

Exterior hanger material and studs shall be stainless steel with stainless steel, brass or bronze nuts, bolts, and washers.

Each weld area at hangers and/or studs shall be wire brushed and coated immediately after welding and before the installation or any cables.

All electrical cable shall be banded to the wireway downcomers with stainless steel banding.

328.2 Wireway Penetrations

Openings in decks or platforms for the purpose of cable penetrations which do not require stuffing tubes or kickpipe protection shall have a collar continuously welded around the edge of the opening. This requirement particularly applies to cable openings in switchboard platforms and other deck structures where watertight integrity is not otherwise required.

Cable penetrations through bulkheads and decks, both watertight and non-watertight, shall comply with ABS rules. Multi-cable, transit type penetrations may be substituted for stuffing tubes for all penetrations. Built-in watertight boxes may be used in lieu of kickpipes. Transits shall be of a box type construction with individual fire-retardant penetrations. The use of poured sealers or putty type packing shall not be used. Cabling shall not be routed in tanks below the main deck.

Multi-cable, transit type penetrations shall maintain segregation of power/lighting circuits and low voltage/data/communication circuits. The two different types of circuits shall not share the same multi-cable penetration.

329 Receptacles, Junction Boxes, & Misc. Distribution Devices

329.1 Shore Power Receptacles

One shore power receptacle shall be provided the wheelhouse. The shore power shall be 120 Volt A/C to the battery chargers in the machinery space. This charger shall provide power to the propulsion engine starting batteries.

329.2 Junction/Connection Boxes

Each junction/connection box in a damp or wet location shall be watertight, terminal or stuffing tubes for cable entrance and have external mounting feet. Each watertight connection box shall be mounted on external stainless-steel mounting feet.

Watertight junction boxes shall be with gaskets, etc., as needed.

All junction boxes shall be identified with phenolic tags, black with white lettering, which correspond with the unique circuit designation keyed to the various electrical plans.

330 Lighting

331.1 Lighting Systems

Interior lighting and exterior lighting shall be LED fixtures Owner-approved. The Contractor shall prepare and submit a list of all lighting fixtures and control devices for approval by the Owner prior to purchasing any items. Emergency lights shall have a RED “E” adjacent to the light fixture. Emergency lights shall be controlled from the DC panel in the wheelhouse console.

Contractor shall provide and install all necessary ancillary materials and equipment, including but not limited to foundations, junction boxes, switches, cabling, hangers, etc., for a complete and operational system.

331 Navigation Lighting

Provide and install navigation lights to comply with latest COLREG requirements. Masthead, stern, and sidelight fixtures shall be dual-lens. Navigation light fixtures shall be phenolic and complete with lamps; all fixtures shall use LED bulbs. Provide yard arms for day markers per COLREG as required and signal flags, three (3) halyards on each side.

331.1Navigation Light Panel

The Navigation Light Panel shall light circuits supervised and have an audible alarm.

331.2 Navigation Lights

The navigation lights shall be installed on the main mast per reference 3.1 (A-1 Outboard Profile). Side lights shall be installed with blinds on the wheelhouse roof port and starboard forward of the main mast. All navigation lights shall use LED bulbs.
Navigation lights shall be sized for vessels under 65 feet (20 meters). Lights shall be installed per current inland navigation rules 72 COLREGS.

Install the following lights on the main mast:

- Anchor Light 360 degrees all-around (white)
- Bow Light 270 degrees (white)
- Range Light 270 degrees (white)
- Stern Light 135 degrees (white)
- Aft Upper Towing Light 135 degrees (yellow)
- Aft Lower Towing Light 135 degrees (yellow)
- Port Side Light 112.5 degrees (red)
- Starboard Side Light 112.5 degrees (starboard)
- Horn Signal Light 360 degrees all-around (white)
- Freeze Warning Light to be 360 degree Blue located on back side of mast above flag staff.

GROUP 4 NAVIGATION, COMMUNICATIONS and ELECTRONICS

References:

4.1 Outboard Profile

4.2 General Arrangement

400 Navigation and Communications

Electronic systems shall be in accordance with the applicable regulations of the FCC Rules. Installation and testing of equipment shall be supervised by the equipment manufacturer's representative. All antennae shall be installed to avoid interference with each other and provide maximum clear reception.

The Contractor shall be responsible for accomplishing FCC inspection and obtaining certification. The systems shall be considered complete only when the FCC inspection and certification has been accomplished.

421 Navigation Equipment

421.1 Compass

Install a 4” magnetic compass for steel-hulled vessels. Compass shall have adjustable illumination and necessary compensation for adjusting the compass.

421.2 Bell

Pilothouse shall be fitted with an 8” brass bell. Bell shall have the ship's name, official number, year built engraved, and including mounting bracket. The bell will be location on the forward side of the wheelhouse on centerline as approved by the Owner.

421.3 Inclinometer

Install an inclinometer with dual glass tube scales: 15-0-15 in the wheelhouse. Location shall be near approved by the Owner.

421.4 Electric Horn

Pilothouse shall be fitted with one 12 Volt electric trumpet type horn as shown on Reference 4.1.

There shall be a momentary contact switch in the wheelhouse console to control the 12 Volt power relay for the horn.

422 Search Light

422.1 Search Light

Provide and install one 24 volt, 8", 500,000 candle power seal beam searchlight, with manual operation from pilothouse station. The Contractor or Builder to furnish one (1) spare seal beam bulb. Light construction to chrome plated brass light and base.

423 Electronic Navigation Equipment

Required electronic equipment shall consist of the following:

- One (1) VHF radios with antenna mounted on top of pilothouse as directed by owner.
- One (1) Digital depth sounder “Furuno” Model FE-700 600W w/ 6.5” Color Display).
- One (1) GPS “Furuno” Model GP-33 4.3” GPS Navigator with antenna.
- One (1) Radar “Furuno” Model 1835 4kW 10.4” Color Display.

The above equipment shall be located on or above the forward console in the pilothouse.

429 Environmental Monitoring Systems

429.1 Required monitoring systems:

- One (1) Ship’s Clock, 4 ½” electric
- One (1) Ship’s Barometer, 4 ½” to match Ship’s Clock
- One (1) Digital depth sounder with transducer in separate sea chest (located by owner).

429.2 Wind Instruments

Pilothouse shall be fitted with one wind speed/direction readout. The readout shall be located near the wheelhouse console. The wind speed indicator shall be located on the main mast starboard side yard arm.

433 Interior Communications

No internal communications required.

436 Alarm System

436.1 Fire Detection System

The fire detection/monitoring system will provide the following functions (automatic and Pilothouse manual control):

- Heat detection (engine room)
- Smoke detection (engine room)
- Main ventilation system shutdown (engine room)
- Detection of system activation (engine room)

The fire detection system shall be certified by vendor technician.

Electrical power for Fire Detection system to be 24V DC from Engine Start Batteries

437 Tank Level Indication

437.1 Fuel Tank Gaging

The two (2) fuel tanks shall be fitted with high/low level alarms (see 314 Vessel Alarm System). Each tank shall be fitted with a sound tube accessible on the main deck. Each sounding tube shall be tagged with a stainless-steel plate with the tank name scribed in ¼" letters.

GROUP 5 MARKINGS, VENTILATION AND FIRE SUPPRESSION

References

5.1 A-1, Profiles and Deck Arrangements
5.2 A-2, Engine Room and Tank Room Arrangement
5.3

500 Auxiliary Systems - General

Mechanical and Piping Standards:

- CFR 46Subchapter M, Marine Engineering.
- ABS Rules for Vessels Under 90 Meters

501 Label Plates and Markings

501.1 Label Plates

All piping systems shall be labeled with color to match system along with flow arrows.

All electrical power wiring shall be marked with aluminum tags stamped with circuit number.

All panelboard circuits shall be numbered according to the DC one-line diagram.

501.2 Markings and Signage

The vessel name shall be on the port and starboard bulwark plates just aft of the bow using ¼" x 8" raised letters. The vessel name shall also be installed at the stern bulwark on centerline using ¼" x 8" letters. The vessel hailing port (Morehead City) shall be installed below the vessel name using ¼" x 6" letters. All letters shall be seal bead welded to the bulwark plate using 1/8" continuous bead.

The vessel shall have signage about to indicate safety equipment, fire-fighting equipment, storage lockers, fire stations, hatches, manholes, sounding tubes, emergency shut devices, shore power,

emergency ventilation shutdowns, official number, warnings plaques, no smoking, towing rope storage, engine room access, vessel name boards, NCDOT plaque, DOT plaque, etc.

512 Ventilation System

512.1 Machinery Space Ventilation

The machinery space shall use natural ventilation using intake louvers and exhaust air louvers. Louvers shall be approximately 18” x 24” with stainless steel removable louvers and bug screens as shown on contract plans A-1 and A-2.

515 Fire Suppression System and Portable Fire Extinguishers

515.1 Fire Suppression System

Install an aerosol canister type fire suppression system designed for machinery spaces under 2000 cu. Ft. capacity. System shall be designed to operate on 24 Volt DC power with control switch in the wheelhouse console. The system shall have a minimum of two (2) canisters in the machinery space.

515.2 Portable Fire Extinguishers

Install one (1) 10 Pound Dry Chemical hand held portable fire extinguishers at the wheelhouse and one in engine room.

GROUP 6 OUTFITTING

References

6.1 A-1, Outboard Profile
6.2 A-2, Tank Plan
6.3 A-3, General Arrangement, Main Deck and Above
6.4 A-5, Machinery Arrangement

600 General

Outfitting shall be provided and installed by the Contractor as described herein. All materials supplied under this item shall be constructed, applied or stowed in accordance with the authorized regulatory bodies listed under Section 050 of these Specifications.

602 Label Plates and Hull Markings

602.1 Hull Markings

The name of the vessel shall be approximately 10" high, cut from 1/4" plate, and welded to the forward bulwarks as shown on Outboard Profile. The vessel's name and hailing port, welded to the aft bulwarks port and starboard, shall be approximately 10" and 6" high respectively and cut from 1/4" plate. All welding shall be continuous.

Name boards shall be provided by the owner and installed by the builder on the pilothouse handrails, port and starboard.

The vessel's official number shall be center punched and painted black on the forward engine room bulkhead. Letters and numbers shall be 3" high.

The Builder's nameplate shall be approximately 24" long and shall be engraved on polished bronze plate and with enamel filled letters. The nameplate shall be mounted on 3/4" thick varnished hardwood (mahogany) pad, and shall be located in the Galley as directed by Owner. Builder's nameplate shall include the following:

VESSEL NAME

Official Number 00000000
Date of build (e.g. 18 May, 2009)
North Carolina Department of Transportation
Ferry Division
Roy Cooper - Governor
Designed by “NSME” Engineering Group
Builder's name
Hull 0000

602.2 Labeling

Life rings, life preservers, inflatable life raft, rescue boat, oars, fire axes, fire hoses, fire extinguishers shall have the vessel name or station number attached using vinyl lettering at the direction of the Owner.

All valves and operating gear shall be labeled to indicate the service used. Labels shall be brass material, machine engraved, with 1/8" letters to suit condition and easy legibility. Labels shall be secured to handwheels using stainless steel wire tie.

All wiring cables shall be labeled with embossed metal tags secured to cable at sufficient intervals to allow ready identification of cable and circuit if it should become necessary to trace circuits after shipboard installation is complete).

Label plates marking the centerline and four (4) foot mark above baseline shall be fitted on the after side of the engine room forward bulkhead.

Paint lines to indicate vehicle runways and safety zones on decks, colors and markings as specified by the Owner and Reference 6.1.

Provide fire station labels as required by 46CFR78.47- 20 (minimum 2" letters).

Provide "E" on all emergency and exit lights as required by 46CFR 78.47-33.

Center punch and paint the frame number on forward and aft side of each watertight bulkhead, 3" high, in black.

Provide and install 3/16" stainless steel, deeply engraved labels adjacent to each sounding plug, remote valve operator, fuel fill and vents, fresh water fill and vent, lube oil fill, bilge discharge line, quick acting hatches, watertight doors and joiner doors. Labels shall identify service and/or space served and be continuously welded in place.

All signs, notices, and labels required to be placed on vessel shall be fabricated of vinyl using Avery Graphics, Series A3, 3 to 4 mil material, or equal, unless otherwise specified herein. All signs, notices, and labels, required to be painted shall be produced by a qualified sign painter or shipyard sign shop approved by the Owner.

602.3 Labeling and Identification of Hand Wheels and Piping

All valve hand wheels and actuator handles shall be coated with glossy enamel using the following color codes.

SYSTEM	COLOR	FED.STD.NUMBER
Fuel oil	Yellow	13538
Bilge	Black (dk.gray)	16081
Hydraulic	Purple	17141
Sea water	Green	14062

All piping in the engine room shall be color coded, using the same scheme as above, by painting an arrow pointing in the direction of flow at sufficient intervals to allow ready identification. All fuel oil and hydraulic oil piping shall be marked in the same manner throughout the vessel. Provide and mount in frame in EOS, one 8 ½" × 11" color code key plan.

603 Draft Marks

Draft marks shall be cut from 1/4" plate and installed fore and aft, port and starboard as shown on Reference 6.1. Numerals shall be expanded so that the vertical projected height of each numeral is 6" and shall be painted in a contrasting color.

604 Locks, Keys and Tags

Spaces to be fitted with lockable doors are the Pilothouse, aft control house, ship's office and the crew storeroom. Lockable doors shall be capable of being unlocked from inside the space without a key.

Door hardware shall be provided for all doors including the following:

- Lock sets provided for crew spaces are standard marine hardware. Lock sets shall be keyed alike.
- Latch sets provided for crew spaces are standard marine hardware.
- Hardware shall be heavy duty marine-type brass, bronze or stainless steel.

605 Rodent and Vermin Proofing

N/A

611 Docking Plugs

No Docking Plugs required.

612 Rails and Stanchions

N/A

612.1 Safety Barriers

Not applicable

614 Fixed Ballast

Not applicable

621 Joiner Bulkheads, Linings, and Ceilings

The joiner wall system is to be vinyl covered aluminum sheathing over metal studs. Ceiling is to be vinyl covered aluminum in 24”suspended grid with clips to keep the tiles in place. Flooring to be hammer raised dot vinyl light gray in color. Vinyl matching cove moldings. Consoles to be painted black and built of light gauge metal to house the controls. Insulation shall be 2 lb. Density rock wool throughout. The overhead of the machinery space shall have A-60 insulation installed.

622 Floor Plates and Gratings

Contractor shall develop necessary drawings for the installation of aluminum deck plates in the Engine Room.

Deck plates shall be installed to provide complete coverage of Engine Room except directly below machinery and manifolds. Deck plates shall be installed to provide walkways and convenient access to and around machinery.

Grating shall be 1/4" aluminum diamond plate supported by 3" × 2" × 1/4" angles (beams and stanchions). Steel floor plates shall be installed only where required by USCG regulations. Grating shall be portable type bolted down with 3/8" diameter socket flat head countersunk stainless steel machine screws. Angle frames shall be drilled and tapped. Flush hinged plates shall be provided for quick access to valves and bilge suction foot valves located below grating line. Hinges shall be stainless steel.

623 Ladders and Stairways

All ladders and stairways shall be constructed in accordance with 46CFR 72.05-20.

Install vertical ladders for access to all voids on bulkheads at each manhole.

- Vertical ladders shall be provided for access to the bottom of voids, tanks, house tops, and elsewhere, as required. Vertical ladders shall be portable, secured with stainless steel fasteners, and constructed with 3" × 3/8"flat bar stringers and 5/8" square bar rungs spaced 12" apart. The minimum ladder width shall be 16" between stringers. Where independent ladder rungs are required, they shall be fabricated with a 3" drop center to prevent a foot from slipping off an open side. Rungs shall be aligned vertically.
- Ladders and independent rungs shall provide a foothold of 7" minimum depth. Ladders shall not be recessed under the deck more than is reasonably necessary to keep the ladder clear of the access opening.
- Vertical ladders shall be installed at all escapes and elsewhere as required for access to compartments.

624 Doors

Tops of doors shall be at least 6'-8" above the finished deck. Interior doors shall be operable from both sides and shall be furnished complete with latches, locks, key hooks, holdbacks, bumpers, and closers as required for each particular door. Reinforcing plates shall be provided in way of door closers.

Exterior surfaces of all doors shall be coated with same coating system as on adjoining structure.

Weather doors shall have watersheds over them where not otherwise protected.

Weather doors shall be filled with fibrous glass thermal insulation. Fire-rated doors shall be filled with USCG-approved structural insulation necessary to comply with the structural fire protection requirements. Doors to weather from the Passenger Lounge shall be fitted with panic bars.

All doors shall be fitted with hooks with bumpers to secure them in the open position, except watertight doors. Joiner and weather tight doors shall be installed with 1/4" diameter, hex head, stainless steel, machine screws with nuts and lock washers spaced on 3" centers.

625 Windows and Window Wipers

One window at the Pilothouse front and one window at the aft Pilothouse shall be fitted with pantograph wipers, Wynn model 1801 or equal.

Pilothouse and aft control station windows shall be of size and at locations as shown on plans and shall be clamp-in style with powder coated aluminum frames.

Other windows shall be of size and at locations as shown on plans and shall be 1/4" thick (minimum) dark tint laminated safety plate glass as shown on plans. Watershed bars of 1 1/2" × 1/4" flat bar shall be installed above all windows which are not protected by overhangs.

631 Coating Systems

Final color selections shall be determined by the Owner at a later date. The Contractor shall provide and install custom color trim similar to other vessels in the NC DOT fleet.

631.1 Surface Preparation

Surface preparations and coating as specified herein shall be accomplished in strict accordance with and as recommended by the Steel Structure Paint Council, Jotun Marine Coatings Company, and the Owner. The Owner reserves the right to select the standards used.

Where structure, machinery, or equipment will cover other structure in a manner that prevents access for maintenance, both structures shall be cleaned prior to installation of the covering structure and both coated with one (1) coat of inorganic zinc followed by the applicable paint schedule as applied to the surrounding area as specified elsewhere herein.

All grease, dirt, and other contaminating properties shall be removed from surfaces before painting: All loose, blistered, cracked paint, all rust and mil scale shall be removed from surfaces to be painted by appropriate methods as specified elsewhere herein, and spot primed with appropriate primers prior to subsequent coatings.

Zinc primers shall be fully cured and all oxidation removed prior to subsequent coatings.

All coats of paint applied must be compatible with primers and other paints.

Sufficient time for proper drying or tacking shall be allowed between coats.

All painting shall be accomplished to protect all surfaces liable to water, immersion, seepage or condensation.

The vessel shall be shifted on blocks so that complete painting of the bottom area may be accomplished. Areas in way of block spots shall be shotblasted and coating system brought up as specified herein.

631.2 Type Coating

All paints used, unless otherwise specified, shall be of the best quality for marine application and applied in strict accordance with Jotun recommendations as directed by Jotun or the Owner.

Provide the Owner with one (1) copy of painting report prior to each application of paint.

The Owner reserves the right to approve the manufacturer of the coating system used and all paint for work not described or called for in this Section but which is required and shall be accomplished using a paint schedule designed for the purpose intended and within the applicable standards.

631.3 Weather Conditions – Minimum Standards

No paint shall be applied when weather conditions are below the minimum recommended standards as prescribed by Jotun product data sheets. Contractor shall provide a factory authorized applications technician to accept or reject surface preparation and environmental conditions prior to paint applications. In the event of uncertain or unfavorable weather conditions, the Contractor shall advise and discuss conditions and paint applications with the Owner prior to applying paint.

Conditions of the hull such as condensation will prohibit paint application. The Owner shall stop or delay all painting operation until more favorable weather conditions exist.

631.4 Paint Application

Paint may be sprayed, brushed, or rolled on as the Contractor select except as described below. Paint may not be thinned, except as approved by the Owner. Any coat applied without measurement or inspection of previous coats by Owner will not be recognized as applied.

The Contractor shall repair, as specified elsewhere herein, any areas damaged due to the use of destructive testing techniques, if used.

Protect all hull anodes, transducers, propellers and bearing surfaces from paint coatings.

The final coat of finish paint above the water line shall not be applied until all other work has been completed and the vessel is otherwise ready for delivery. The final coat shall be applied by spraying only.

Should the vessel remain undelivered, excluding delivery time, three (3) months after launching, it shall be dry-docked, surface prepared and one (1) additional coat of anti-fouling paint applied.

The 4'-0" waterline shall be defined by intermittent weld bead on 2'-0" centers.

631.5 Shotblasting

All steel surfaces on the exterior of the hull, the entire interior of the hull, including all void spaces, the Engine Room, steering gear compartment, entire superstructure, Main Deck, overhang, bulwarks, etc. shall be shotblasted to near white metal, SSPC-SP-l0.

Immediately after shotblasting all shotblast material shall be completely removed from surfaces by sweeping and blowing with dry compressed air or other suitable means and one coat of inorganic zinc applied to prevent rusting. All shotblast material shall be completely removed from surfaces prior to any coating being applied.

Following general directions shall be accomplished for the preparation of surfaces to receive the self curing inorganic zinc coatings:

- Round off all rough welds and sharp steel edges, remove weld spatter.
- Dry-abrasive blast all pits and depressions, remove all mill scale, rust, rust scale, grease, paint or foreign matter. Surface profile from abrasive blasting should be similar to that obtained with fresh steel grit (G-40 size), steel shot (S-230 size), graded flint or silica sand (30-60 mesh), under nozzle pressure of 100 psi. Apply inorganic zinc coating as soon as possible to prevent blasted surfaces from rusting.
- Keep surfaces moisture-free until coated. Keep oil, grease or other organic matter off surface before coating.
- Blast to remove any contamination. Do not solvent-wipe.
- During blasting operations, seal off all deck machinery, ventilation fans and any other equipment which could be subject to damage from sandblasting operations. The Engine Room and all openings thereto are to be sealed off prior to blasting if any machinery is installed, and kept sealed for the duration of blasting operations.

631.6 Disturbed Surface Repairs

Any painted surface that is disturbed during construction or outfitting shall be restored to suit the adjacent area as follows:

- Remove any damaged coating system by sanding to a sound anchor profile.
- Sand surrounding paint to present an even contour with edges feathered and at least two of the three underlying coats separately visible and distinct from each other. Each layer or coat shall be a minimum of 2" wide.
- Where the disturbed area has penetrated through to the substrate any scarred or damaged metal shall be repaired and a proper anchor profile renewed.
- Restore damaged epoxy coatings systems to a finished surface profile equal to adjacent and surrounding areas. Each coat to be as specified elsewhere herein.

- Apply top coats as required elsewhere herein.

Finished paint shall blend with adjacent areas and present a smooth even profile free of runs, contamination, or other unsightly coating defects.

631.7 Clean-Up

After all construction and outfitting has been completed and just prior to vessels departure/delivery, Contractor shall remove all paint from all windows, slides, and free up moving sashes.

Contractor shall remove paint from all glass and bright work. All bright work shall be polished after all other work has been completed and vessel is otherwise ready for delivery.

Remove all paint and paint over-spray from machinery components, machinery label plates, signs, threads of wing nuts and bolts used for securing vent and storm covers etc., hinge pins, shafting, door knobs, latching mechanisms, actuator rods, valve stems, etc.

Vessel shall be thoroughly cleaned throughout including but not limited to the removal of all dust, grit, grease, solvents, and lint from all spaces, machinery, components, structure, void vents, drains, bilges, paneling, furnishings, deck coverings.

Wash down with fresh water and dry all decks, superstructure and bilges prior to final delivery of vessel.

631.8 Paint Schedule

Coat No.	Product	Mils DFT
1	PPG Pre-construction primer	1
2	PPG Universal Prime coat	7 +/- 1

Steel surfaces shall be finished as described below. Special care shall be taken to apply full thickness of coatings behind flanges. Failure to apply full coating thickness at any locations shall be remedied prior to application of successive coats. Hawser reel to be painted with epoxy primer and finish coats (LT Gray color).

Exterior hull to waterline

No.	Product	Mils DFT
1	PPG Universal gray	5 +/- 1
2	Hydroclean antifouling, Light red	4 +/- 1
3	PPG antifouling, Dark red	4 +/- 1

Exterior hull above waterline and bulwarks

No.	Product	Mils DFT
1	PPG lt gray	7 +/- 1

2	J-Kryl black	5 +/- 1

Exterior decks

No.	Product	Mils DFT
1	PPG lt gray	7 +/- 1
2	PPG gray	5 +/- 1

Add heavy nonskid to final coat on all exterior decks.

Superstructure and house exterior

No.	Product	Mils DFT
1	PPG lt gray	7 +/- 1
2	PPG white	5 +/- 1

Interior exposed bulkheads and overheads

No.	Product	Mils DFT
1	PPG lt gray	7 +/- 1
2	J-Kryl white	5 +/- 1

Interior decks (except where vinyl tile is installed)

No.	Product	Mils DFT
1	PPG lt gray	7 +/- 1
2	PPG gray	5 +/- 1

Bilges

No.	Product	Mils DFT
1	Jotamastic lt gray	7 +/- 1
2	J-Kryl white	5 +/- 1

Fuel, dirty oil and lube oil tanks

No.	Product	Mils DFT
1	Oil	N/A

Aluminum deck plates and stainless steel railings shall not be coated.

633 Cathodic Protection

Provide one 5 Pound Aluminum anode for every 50 square foot of bottom surface of the hull using flat bar raised racks per NC State Shipyard standard. Provide 5 pound tear drop type Aluminum anodes on or near shaft struts and rudders.

634 Deck Coverings

Deck covering shall epoxy gray paint.

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635 Hull Insulation

The Contractor shall furnish and install thermal insulation in accordance with Reference 6.3 and 46 CFR Subchapter H. Installation of all types of insulation shall be per manufacturer's recommendations.

Exterior weather boundaries and boundaries separating air conditioned spaces from non-air conditioned spaces to be insulated with a minimum 3" rock wool USCG-approved insulating material.

Acoustic faced insulation shall be installed at the Engine Room overhead, Engine Room companionway. Insulation shall be sheathed with factory-finished perforated, 18 gage aluminum metal sheathing.

Where structural fire protection insulation is not required, thermal insulation shall be provided on all weather boundaries in ventilated passenger and crew spaces, with the exception of the Engine Room

636 Hull Dampening and Vibration Control

The following measures will be taken by the Contractor to control vibration:

- Fans and compressors shall be mounted on Korfund or equal marine isolation mounts, and connected to ducting through flexible joints.
- Piping connections to equipment mounted on vibration isolators shall be through flexible connections.

640 Furniture and Furnishings

N/A

644 Sanitary Spaces and Furnishings

N/A

655 Crew Galley

Not applicable

657 Staterooms

658 Toilet Spaces

661

662 Pilothouse Outfit

662.1 Console

The Pilothouse Control Station shall be fitted with consoles generally as shown on general arrangement.

Consoles shall be totally enclosed manufactured of steel with suitable stiffeners to support equipment installation. Hinged doors or removable panels shall be installed to provide access.

Door sills shall be portable or removable. Stowage, equipment mounting surfaces, shelves, louvers, etc., shall be provided.

Equipment and instruments listed elsewhere herein shall be installed in consoles to provide complete operational control centers.

662.2 Furniture

The Pilothouse shall be furnished with the following commercial grade furniture and items:

- One marine clock, non-striking with 4" dial electric operation, color black
- One marine barometer, 4" dial, color black.
- One pilot chair with color to be determined by owner.
- Book shelf with three shelves.
- One life preserver (adult) storage rack suitable for two preservers as located by Owner.

662.3 Window Shades

N/A

662.4 Window Defrosters

N/A

662.5 Window Washers

N/A

663 Engineers Operating Station (EOS)

Not applicable

665 Machinery Spaces Outfit

N/A

671 Lockers

672 Store Rooms

680 Life Safety/Emergency Equipment

Life rafts, life preservers and other equipment shall be marked with paint by stenciling in accordance with the U.S. Coast Guard regulations in effect at time of contract. Life preserver stowage shall be marked as required.

The type, quantity, location and installation of life saving appliances are subject to final approval of cognizant Officer in Charge, Marine Inspection.

681 Life Rafts/Buoyant Apparatus

682 Personal Life Saving Equipment

Provide, install, and stow as required the following equipment:

- Two (2) adult life preservers suitable for service intended.
- Two (2) adult work vest
- Two (2) Jim Buoy model JB-SO-30 life rings w/ M/N 1123-30 life ring brackets
- Two (2) Jim Buoy model 1820 man overboard lights
- Two (2) Jim Buoy model 1821 man overboard light brackets

Contractor shall stow life rings and man overboard lights as shown on Reference 6.4. Final stowage locations shall be approved by the Owner.

Contractor shall provide and install on each Main Deck life ring, 100 feet of 5/16", braided, orange, polyethylene rope. Contractor shall provide and install on two of the four life rings stowed on the Main Deck, 6 feet of 5/16", braided, orange, polyethylene rope with one end spliced to the life ring and other end spliced to a man overboard light.

Contractor shall provide and install all necessary ancillary materials and equipment, including but not limited to all stainless-steel fasteners, lashing twine, rope, etc., for a complete and operational system.ds

683 Emergency Equipment

Emergency equipment shall be provided and installed generally as shown on plans.

683.1 Rescue Equipment

- N/A

683.2 Defibrillator

N/A

683.3 Fire Axes

N/A

683.4 Fire Extinguishers Hand Portable

As a minimum, the Contractor shall provide and install hand portable fire extinguishers, USCG-approved type in following locations:

▪ Engine Room	1	10# Dry Chemical
▪ Main Deck	1	10# Dry Chemical

GROUP 8 TESTING, INSPECTION, & DELIVERY

800 Tests and Inspections

841 Tests

Tests of structure, piping, machinery, and electrical systems shall be accomplished n accordance with applicable classification societies and regulatory agency test requirements.

This vessel shall be inspected in accordance with title 46 Code of Federal Regulations, Subchapter "H", and applicable classification society rules incorporated by reference therein. All tests shall be witnessed and approved by the Owner.

Three copies of all test records signed and dated by the Contractor, Owner, and USCG. (as required) shall be delivered to the Owner prior to the vessel leaving the Contractor's location. These records shall be bound in 3" D-style ring binders and properly labeled. Binders shall be black in color with clear cover to hold a label of 8-1/2" × 11" with the vessel's name, Contractor's name, and hull number. Three copies of the documents shall also be provided on CD.

Tests and trials shall be conducted by the Contractor at the Contractor's expense. Any deficiency recorded during the trials shall be corrected and given another trial similar to the original.

841.1 Welding

Welding shall be subject to inspection at any point in the process from fit-up to finish. Non-destructive inspection of all welds shall be performed at any point in the welding process at the discretion of the Owner.

Final welds shall be subjected to radiographic inspection in accordance with ABS Rules for Non-Destructive Inspection of Hull Welds, latest edition. Additional radiographs shall be taken for each failed radiograph, if any, in random locations designated by the Owner on a one-for-one basis.

All welds shall be subjected to visual inspection by the Owner to assure that they are free from surface discontinuities which might prove detrimental to the weld, such as undercut, porosity, cracks, melt through, burn through, etc.

841.2 Structural Tests

Voids and compartments below the Main Deck shall be proven watertight by testing at 1.5 PSI. While compartments and voids are under pressure, all boundaries shall be soaped to identify any leaks. Leaks shall be repaired by completely removing non-tight welds by grinding or other

suitable means and re-welded to the satisfaction of the Owner. No repair welding shall be accomplished while the compartment is being tested.

Watertight boundaries above Main Deck shall be proven by hose testing using a stream of water of at least 50 PSI directed at the boundary being tested to prove the boundary tight.

Any additional test to prove the integrity of the vessels structure which may be required by the USCG shall be performed as a part of this contract.

841.3 Piping System Tests

All tests of piping systems required by the USCG shall be performed as a part of contract.

All piping systems shall be tested using the medium normally carried in the system to a pressure of 1 1/2 times the system MAWP (Mean Actual Working Pressure), but in no case less than 50 PSI.

Hydraulic system piping shall be flushed.stainless-steel tubing.

Fuel system piping shall be flushed using diesel oil.

Test pressures shall be held for a minimum of thirty minutes to allow inspection of the entire piping system. After inspection of the system under pressure, the test pressure shall be monitored by a calibrated gauge, with a mid point range within 10% of the test pressure, for a minimum of one hour without any drop in pressure. The test gauge shall be at the opposite end of the piping system from the source of the test medium.

841.4 Electrical System Tests

Electrical systems shall be tested as prescribed in IEEE Standard #45 Section 46, ABS Rules for Building and Classing Steel Vessels Sections 35.161.2 and 35.161.3; and 46CFR 110.30.

The generators and switchboard shall be tested for the full anticipated load during an emergency condition. This shall include pumps, steering, lighting, rescue davit and any other expected loads as required. The list of items to be loaded on the switchboard shall be pre-approved by the Owner before test can begin.

The emergency generators and switchboard shall be tested for the full anticipated load during an emergency condition. This shall include pumps, steering, lighting, rescue davit and any other expected loads as required the list of items to be loaded on the switchboard shall be pre-approved by the Owner before test proceeds.

841.5 Machinery Tests

Each piece of machinery shall be operated for a period sufficient to indicate satisfactory performance and operational acceptability, but not less than two hours. Each piece of machinery shall have its own test page or pages as required to record data with place for date, time and witnesses to test. Anticipated test results shall be pre-approved by the Owner.

841.6 Electronic Equipment Tests

All other machinery and equipment shall be tested to prove its satisfactory operation and performance to the satisfaction of the Owner.

841.7 Alarm System Tests

A pretest of all alarm points shall be conducted to verify alarm point settings and dependability of system. The test shall be conducted by the manufacturer so any adjustments can be made by the manufacturer and noted in the warranty paper work.

Any adjustments shall be documented and become part of the vessel trial records.

842 Dock and Sea Trials

Dock trials shall include but not be limited to Sections 801.5 through 801.8.

A pre-approved agenda shall be used to conduct all dock trials. This document shall be signed by Contractor and by the Owner at the conclusion of each test.

Sea trials shall be conducted to check operation of steering gear and all equipment. The Owner shall be present to witness the trials. A minimum of two weeks notice shall be given by the Contractor to all parties involved as to the date(s) and time of the sea trials.

842.1 Main Engines

Each propulsion engine and generator shall receive a sea trial audit in accordance with manufacturer requirements. Main and auxiliary engines shall be tested using manufacture provided testing equipment as required to provide an accurate PAR test, providing a baseline for future testing of equipment by the Owner.

842.3 Endurance Test

This trial shall consist of a run of at least four hours, two hours each in opposite directions, during which the following tests shall be conducted:

1. Full speed run for thirty minutes to record vessel speed. This test is to be conducted in both directions.
2. Speed runs at 6 knots, 8 knots and, 8 knots in both directions for a minimum of fifteen minutes each.
3. Full ahead for ten minutes to stop and stop to full speed. This test is to be conducted in both directions.
4. The vessel shall be steered hard over ahead and astern.
5. The vessel shall be steered hard over to record the turning radius with radar and GPS at four points of the compass.
6. All machinery equipment shall be tested during sea trials with the performance recorded in the test records to be turned over to the Owner.

842.4 Vibration Analysis

Not applicable

843 Stability/Inclining Test

After dock trials are completed a stability test an inclining shall be conducted by the Contractor. Contractor shall supply weights, crane or other means of shifting weights, labor as required, and cribbing for weights.

856 Instruction Manuals, Drawings, Delivery and Certificates

856.1 Manuals

Three sets each of the manufacturer's operating and maintenance manuals shall be furnished for all machinery and equipment furnished by the Contractor. Manuals shall contain operating, maintenance instructions, and a list of parts. These manuals, along with the test records, shall be delivered to the Owner prior to the vessel leaving the Contractor's facility. The Owner shall approve all departure documents which shall include all deliverable items at the time of departure.

856.2 Drawings

The Contractor shall provide as-built drawings on CD to the Owner prior to sea trials. The drawings shall include contract plans and all other plans noted herein required to construct the vessel including vendor detail drawings, schematics, and bill of materials including all vendor plans.

856.3 Delivery Ceremonies

N/A

856.4 List of Certificates to Be Provided

1. Builder's Certificate (furnished by shipyard)
2. Documentation Certificate (furnished by shipyard)
3. Admeasurement Certificates, Regulatory and International (furnished by shipyard)
4. Stability data and other stability documents for towing criteria (furnished by shipyard)
5. Radio License (furnished by Owner)
6. Compass Deviation Card (furnished by shipyard)
7. Certificate for machinery space flooding system (furnished by vendor)
8. Certificate of Financial Responsibility (furnished by Owner)
9. Certificate of Inspection “UTV” (furnished by Owner)

856.5 Progress Payment Schedule

The payment of event #2 is contingent on USCG approval of drawings prepared by Contractor.

EVENT /MILSTONES	PERCENTAGE
1. Signing of contract Mobilization	10%
2. Completion of engineering and drawings and purchase of major equipment	10%
3. Keel laying (10 tons of steel fabricated and erected)	10%
4. Completion of 50% of hull and house steel	10%
5. Fabrication, erection and welding of 100% of hull steel	10%
6. Fabrication, erection and welding of 100% all superstructure	10%
7. Installation of propulsion machinery	25%
9. Completion of all outfitting and painting	10%
10. Satisfactory completion of sea trials and delivery to Manns Harbor, NC	15%
Total	100%

557.0 Spares
All spares shall be delivered with vessel to owner at Manns Harbor, NC

1. Main Engine (1)
2. Keel Coolers (2) Jacket Water and (2) Aftercooler
3. Reduction Gear (1)
4. Propulsion Shaft (2) for 45’-6” tug
5. Propulsion Shaft (2) for 25’-6” tug
6. Propeller Shaft Flushing Pump (2) ME driven
7. Propeller (2) one RH and one LH
8. Rudder (4)
9. Steering Pump (2) ME mounted
10. Steering Directional Control/Selector Valve (2)
11. Steering Hydraulic Cylinder (2)
12. Hydraulic Control valves (a complete set for all hydraulic deck equipment)
13. Deck Equipment Hydraulic Pump (ME Driven) (1)
14. Deck Equipment Hydraulic Pump Electric Clutch (1)
15. A-Frame Hydraulic Cylinder (2)

45’-6” Harbor Tug

Technical Specifications

Prepared for NCDOT Raleigh, North Carolina

Revision 1

February 27, 2019

Dejong & Lebet, Inc.

D L
Naval Architects
Marine Engineers
Consultants
Surveyors

William M. Hayden, PE
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WILLIAM HAYDEN
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STATE OF FLORIDA
PROFESSIONAL ENGINEER

GROUP 0 GENERAL PROVISIONS

Table of Contents

References

0.1 American Bureau of Shipping Rules for Building and Classing Steel Vessels under 90 m.

0.2 USCG Subchapter "M" Guidelines for Tugs

010 Vessel Performance/Capabilities

The vessel is twin screw tug boat intended for service on the lakes, bays, rivers and sounds of North Carolina from Wilmington to Knots Island. The vessel must be designed to operate at an even level keel with 4'-0" draft forward and aft. No fixed ballast will be used to trim vessel.

The hull of the vessel is to be of all welded steel construction using a transverse system of framing.

Propulsion will be provided by two (2) 250 hp marine diesel engines. Drive will be through reversing reduction gears with shafting and propellers.

Electric power requirements will be 24 VDC from two (2) banks of propulsion engine starting batteries with main transfer switch.

Design trial speed shall be approximately 8 knots and a full load service speed of 6 knots pushing or towing.

Vessel is to be fitting with 5 Ton Capacity Capstan (for 1-1/4"-2" ropes, speed to be 15ft minute/min.) on the aft deck driven by hydraulic motor powered off PTO on the front of the main engines, each PTO capable of supporting the hydraulic system. Controls shall be located near the equipment. The A-Frame cylinders and optional bow hydraulic winch as well as the 20-ton cable winches shall also be powered from the hydraulic system.

020 Mission Statement

The vessel shall be designed for pushing and towing ferries for the Ferry Division when they become stranded on shoals or become grounded outside of the channels. The vessel shall be capable of operating during daylight and nighttime operations to match Hatteras Operation schedule. The tug shall be capable of being operated by a two (2) man crew in the same sea state as the ferries.

As an option, the vessel shall be capable of handling 1,110 lb Danforth anchors for the 12" Suction/Discharge Dredge operated by the Ferry Division. A portable A-Frame shall be capable of being installed at the bow to handle the anchors with a 10,000-lb. hydraulic powered winch which can be purchased from Dredge Supply Inc.

030 Regulatory Body/Classification Requirements

The vessel shall be designed and constructed to the requirements of Reference 0.1 and 0.2

040 Principal Characteristics

Dimensions:	
Length overall (molded)	45'-6"
Length on design load waterline	45'-6"
Breadth (molded)	20'-0"
Depth (molded) amidships at side	6'-6"
Draft (molded) at DWL	4'-0"
Capacities (approximate):	
Fuel oil (96%)	700 Gallons
Fresh water	N/A
Lube oil	N/A
Gear oil	N/A
Power (approximate):	
Propulsion power	2 × 250 = 500 BHP
Ship's Electrical Power	24/12 VDC

050 Materials

All materials, machinery, equipment, and components shall be of good commercial marine quality, in full compliance with these Specifications, suitable for the service intended.

An "or equal" product is one which exhibits the same salient features of size, weight, characteristics, performance, reliability, and maintainability as the product identified in these Specifications. The total performance of the "or equal" product will be such that its use will not adversely affect the intended performance of other systems or the vessel and with no increase in required maintenance or replacement periodicity. Demonstration of an "or equal" status is the responsibility of the Contractor and must be approved by Owner.

Fastenings throughout shall be 316 stainless steel unless otherwise specified, and in accordance with all sizes required or shown on plans and listed elsewhere in these specifications.

All hardware shall be made of best quality marine grade brass, bronze or 316 stainless steel, unless otherwise specified. Bolts shall be fitted with lock washers, flat washers and nuts. Nuts shall be

drawn up tight. Screws shall be of highest quality stainless steel, with clean cut threads. All threads shall be coated with sealant (non-seizing) prior to installation.

060 Construction Drawings

The vessel shall be constructed as depicted in below listed Construction Drawings and as described in these Specifications. Information contained in the Construction Drawings is subject to alteration, development, and refinement by the Contractor pursuant to implementing the details of these specifications, appropriate authoritative agency regulations, and design development.

1393-100	General Arrangements
1393-100-3	Outboard Profile
1393-101	Linesplan
1393-110	Bottom & Sideshell Structural Details
1393-117	Transverse Frame Structural Details
1393-120	Longitudinal Sections
1393-130	Main Deck Structural Details
1393-152	Pilothouse & Stack Structural Details
1393-167	Hatches & Manholes Schedule
1393-171	Mast Details
1393-182	Shafting Plan
1393-185	A-Frame Details
1393-200	Machinery Arrangements
1393-201	Main Deck Outfitting
1393-253	Steering System Details
1393-255	Cooling System Details
1393-259	Engine Exhaust Details
1393-261	Fuel Oil Piping Details
1393-263	Bilge, Ballast & Fire Piping Details
1393-264	Shaft Flushing Piping Details
1393-265	Hydraulic System Details
1393-320	Electrical One-Line Diagram
1393-422	Navigation Lights Details
1393-423	Electrical Wiring Diagram
1393-506	Vents & Fills Details
1393-625	Windows & Doors Schedule
1393-680	Safety Plan
1393-684	Push Knee & Fendering Details
1393-685	Deck Capstan & Hawser Reel Details

Plans provided to the Contractor at time of bidding are to be used for guidance and construction. The Contractor shall verify quantities, provide additional working drawings, and sketches, if required, and obtain approval of same from the Owner. Piping drawings shall include bill of material schedule stating size, quantity, mfg. model number, etc. All drawings shall be as-built upon delivery of vessel to owner.

070 DEFINITIONS

Owner:	North Carolina Department of Transportation, Ferry Division
Owner's Representative:	Marine Design Engineer-NCDOT Ferry Division
Contractor:	Shipyard
Builder	Shipyard
ABS:	American Bureau of Shipping
USCG:	United States Coast Guard
USCG OCMI	Local USCG Inspector (Officer in Charge of Marine Inspection)
USCG MSC	Marine Safety Center, Washington, DC
Contract Drawings:	Drawings A-1 & A-2 listed in section 060 Construction Drawings
Equal To:	Similar in material specification, size, finish, quality and performance
Vessel:	See section 010 thru 060

080 CERTIFICATES to be provided by builder

1. Tonnage Certificate
2. Builder's Certificate
3. Steel and Aluminum Mill Certs
4. Main Engine Manufactures' Certificate (ABS)
5. Reduction Gear Manufacturers' Certificate (ABS)
6. Propellers Certificate (ABS)
7. Propeller Shafts Certificate (ABS)
8. Stability Documentation Including Tank Capacity table
9. FCC Bridge to Bridge Radio Certificate (Owner Furnished)
10. FCC Radio Certificate (Owner Furnished)
11. Certificate of Financial Responsibility
12. Builders' Risk Insurance Certificate
13. Station Bill (Owner Furnished)

14.. Life Raft Certificate

15.. Main Engine Extended Warranty (five years or 10,000 hours.)

16. Main Gears Extended Warranty (5 years or 10,000 hours)

17. Delivery and Acceptance Certificate

18. Letter of Payment Certification (Stating all vendors have been paid)

19. Certificate of Official Number

20. Vessel Response Plan (Owner Furnished)

21. Torsional Analysis

22. Portable Fire Extinguisher Report

23. Machinery Space Extinguishing Agent approval (Plan and Certificate)

24. Compass Deviation Certificate

25. Navigation Light Compliance Certificate (if required)

26. Final Payment/Estimate (NCDOT)

GROUP 1 STRUCTURAL

References

64-S1, Scantling and Inboard Profile

64-A1 Outboard Profile

64-A2 General Arrangement

64-A3 Hold Plan

100 Structure – General Requirements

All steel shall be new, ASTM-A36 certified, and of U.S. manufacture and origin. Aluminum shall be ASTM 6061 for marine service. The Contractor shall provide mill certification. See special provision for purchase of domestic steel products.

101 Material and Scantlings

The vessel shall be constructed on a Transverse system of framing.

Limber and vent holes, 1-1/2" radius minimum, shall be cut as necessary to ensure proper venting and drainage of tanks, compartments, pockets, and voids. Tanks shall have limber holes and vent holes of adequate size for full capacity flow to suction and vent lines.

All structural steel material, including forged components, are to be made of open-hearth mild steel of uniform quality, the chemical and physical properties of which are to conform to the requirements of the ASTM-A36.

All scantlings shall meet or exceed the American Bureau of Shipping requirements. Where scantlings on the plans exceed ABS requirements, the increased scantlings shall be used.

Scantlings not specified by the plans, ABS rules are to be minimum requirement.

Temporary access openings may be provided through shell, bulkheads, decks, etc., for convenience of workers and are to be reclosed in place by welding. All such openings shall have large radius corners for this purpose, openings shall be positioned to utilize existing design butt welds and seams wherever possible.

Local reinforcements, for special loads and vulnerable areas subject to high wear, also compensation for penetration, doors, stairway openings, etc., shall be provided generally in accordance with ABS rules.

Doublers may be used at bitts and deck fittings except for towing bitts at bow and stern. These towing bitts shall be designed to withstand (2) times the expected bollard pull of the vessel in all directions. Side double bitts shall be designed for the expected bollard pull in the forward and aft directions only. Side pull for bitts shall be designed to ½ of the bollard pull. The deck winch foundation and under deck structure shall be designed for full strength of the winch. Winches shall be installed on insert plates of 1/2” minimum thickness. Except at the Main Deck, wherever there is a difference in adjacent plate thickness, the stiffener side shall be kept flush. Particular care shall be taken on all visible surfaces (i.e., outside shell, deckhouse, etc.) to maintain a good appearance by means of suitable chamfers.

No rough edges shall remain where steelwork is cut. Penetrations shall be pre-cut by machine or neatly burned. All rough edges shall be ground smooth.

All steel material shall be blasted to coating manufacturer's recommendations but at least to SSPC Sp 10 standard, and immediately thereafter coated with a suitable primer. The primer shall be of weldable type and fully compatible with ultimate coating system.

Design of steel structures shall allow clear heights as specified after allowing for passage of ducts, pipes, etc.

Unfairness of plating between frames, stiffeners, or deck beams shall not exceed 1/8" in 24”.

102 Welding

Electric arc welding shall be used for assembly of all construction elements in hull, superstructures, stern, stem, meeting or exceeding ABS requirements.

Weld joints shall be prepared and welded in compliance with ABS requirements. Mill scale, rust, moisture, dirt, slag, and other alien substances shall be removed before welding is executed. After the welding, remnants of slag are to be removed.

Special care is to be taken to welding sequence in narrow places or places having difficult access (i.e., rudder, fore peak, etc.).

All welding shall be done after carefully scheduled sequences. The welding sequence shall ensure a minimum of strains of finished hull. Particular care is to be taken in the welding sequence to relieve stresses which might cause inherent weakness in the structure or excessive buckling of plates.

Deck beams shall be welded with a minimum of 3" in 12" intermittent proper sized fillet weld with a balanced 3" and wrapped fillet weld at the ends. All other welds shall meet or exceed ABS requirements. All welding exposed to the weather shall be sealed continuous. A welding schedule shall be submitted for regulatory body and Owner's approval.

Good grounding connections shall be ensured for all welding, and care is to be taken with all welding to avoid undue stresses.

Electrodes shall be of the quality approved by ABS and USCG for intended materials.

Internal scallops may only be used for air escape, drainage and in way of cross welds. Crossings shall be made with notch, or the first weld to be ground flush before the crossing element is installed.

Single side welding may be performed only on down-hand runs, generally to ABS requirements.

Back gouging, where necessary, shall be carried out by air gouging.

Temporary welding shall be carefully removed by chipping and/or grinding and steelwork in way made good to the satisfaction of Owner or his approved surveyors.

Direct attachment of fittings to oil-tight structures shall be by welding only. Such welds shall be tested for tightness.

103 Lofting

Hull lines shall be carefully faired and offsets determined. Offsets shall be taken at each frame and three (1) copy of the offsets provided to the Owner prior to steel lay-off.

110 Shell and Supporting Structure

Frames and girders shall be bracketed on both sides of oil-tight and watertight bulkheads or slotted through watertight bulkheads and collared. Special attention shall be paid to the alignment of girders under the engines and reduction gears, and at the struts and rudders.

111 Shell Plating

Attention shall be paid to finish of exposed steel on outside shell and superstructure; welding shall be ground smooth where unsightly. It is not the intention to grind smooth all hand-made welding on the side shell plating. Shell plating shall be minimum 5/16” on bottom. Bow and side plating shall be a minimum of 5/16”. Deck plating shall be 1/4” throughout.

Each overboard discharge through the shell plating shall be rigidly stiffened vertically and horizontally to the nearest structural members.

114 Towing Rainbow

N/A

115 Stanchions

Heavy stanchions and girders shall be fitted in machinery spaces as needed to minimize vibration. Care is to be taken in the design of accommodation areas to ensure continuity of pillars, girders, bulkheads and webs to minimize vibration.

116 Skeg

N/A

117 Framing

Framing shall be in accordance with ABS for tug impact service except where the plans specify heavier framing. Minimum framing thickness is to be 1/4”. Frame spacing shall be 24” centers. Plate stiffeners shall be longitudinal with major transverse frames on 6’-0” maximum centers.

120 Hull Structural Bulkheads

Structural bulkheads shall be arranged as shown on the plans. Hull bulkhead plating shall be no less than 5/16" thick. Bulkhead stiffeners shall be arranged to line up with girders or other stiffeners.

All openings shall have rounded corners to the Owner's approval.

121 Center Vertical Keel

N/A

130 Main Deck

The Main Deck shall be fabricated as shown.

Insert plates with radiused corners shall be installed under bitts, cleats, pad eyes, and similar fittings. Main Deck insert plates shall be installed flush on the underside with surrounding plates.

Decks shall be reinforced in way of corners of large openings, breaks, etc., where required by regulatory bodies. Such reinforcement shall be by insert plates of increased thickness - doublers are not to be used – and by installation of heavy girders.

150 Wheelhouse Structure

The wheelhouse shall be of aluminum construction with 3/16” minimum thickness plate. Plating shall be 5000 series alloy and all extrusions 6061-T6 alloy. 3/8” plate inserts shall be located at all wheelhouse roof items.

151 Bulwarks

N/A

161 Deck Fittings

Cast steel cleats and chocks shall be provided on the main deck as shown. Corners and weld bead shall be ground smooth to prevent chafing of mooring lines.

Chafing protection, round bar or pipe, shall be provided on bulwark stiffeners where lines may lead from kevels or chocks.

Provide a 8” pipe H-bitt for towing aft rated for 200% of vessel bollard (5 tons). A forward towing bitt shall be provided and sized for 200% of vessel bollard in reverse (3 tons) using 8” pipe. Both bitts shall penetrate the main deck to provide adequate strength.

163 Sea Chests

Each sea chest shall be 5/16" minimum thickness with a stainless-steel gate valve installed. The sea chest shall be vented outside the machinery space.

Strainers shall be 5/16" plate steel, hinged with 316 stainless steel pins and fasteners.

167 Watertight Doors, Hatches, and Manholes

Steel hatches and doors shall be shot blasted and coated with one coat of inorganic zinc to all surfaces prior to assembly.

Bolted manholes (20” minimum size) shall be provided for each built-in tank and void. Where the lower edge of the manhole is more than three feet above the tank bottom or working platform, bent round bar rungs shall be provided for safe access. The wheelhouse shall be bolted to a raised flange section to provide access for removing the propulsion engines.

These shall be installed in-way of the stacks for removal of the main engines or other machinery as required.

Flush deck watertight quick-acting hatches, 20" diameter, shall be installed in the main deck as shown on main deck plan for access to compartments and voids.

168 Tanks

The interiors of all tanks and voids shall be thoroughly cleaned and to the satisfaction of the Owner.

Fuel oil tanks shall be thoroughly cleaned of all debris, weld splatter, flux and other foreign matter and approved by the Owner prior to initial filling and shall be kept closed thereafter until ready for use. All tanks shall be fitted with overflow/vents of twice the open area of the suction piping. Each tank shall have a 1 ½” sounding pipe and a 2” fill all located in a common spill pan at each tank.

Tanks shall have a 1 ½" drain at the lowest point in the tank to drain into the machinery space. See Group 400 for details of vents, overflows, sounds and fill connections for each tank.

169 Special Purpose Closures

171 Mast

A navigation light mast shall be provided and located as shown on Reference outboard profile. The navigation light masts shall be of aluminum construction, hinged for access to navigation lights.

Electrical cables on the navigation light masts shall be provided with watertight receptacles at each light fixture and adjacent to the mast base.

Flagstaffs shall be fitted with sheaves and brass cleats for halyards. Provide brass pulleys for each arm and gaff, three (3) complete with flag halyard of 1/4" nylon line with brass snap hooks secured to each end of halyard. Halyards shall be endless loop type, suitable for service intended. The mast shall be fitted with mounts for all electronic antenna as required for vessel electronics.

180 Foundations and Struts

Contractor shall fabricate and install all necessary foundations and supporting structure. Foundations shall ensure rigidity, freedom from vibration in normal operation.

182 Propulsion Plant Foundations

Foundations for the propulsion machinery shall be fitted as an integral part of the vessel's primary structure. Abrupt discontinuities shall be avoided by gradual tapers at the extremities of foundation structure.

The propulsion machinery foundations shall be of a height to suit the engine and reduction gear alignment chocks. The reduction gear foundations shall be a continuation of the main engine foundations. Brackets shall be installed at every frame, except where such brackets interfere with the engine bolting arrangements. Welding of engine and reduction gear foundations shall be continuous. Minimum thickness of vertical portion of foundation is to be 3/8". Rider plate shall be a minimum of 5/8" x 6" with 5/16" plate brackets as shown on plans. The propulsion engine and gear foundations shall extend the entire length of the machinery space with brackets on the far side of the bulkheads.

183 Generator Engine Foundations

N/A

184 Navigation/Communications/Electronics Foundations

Welded steel foundations shall be provided as required for all navigation, communications, and electronics equipment and consoles.

185 Auxiliary Equipment Foundations

Foundations for davits, kevels, chocks and the like shall be designed to withstand anticipated loads. The stern towing bitt and bow towing bitt shall be designed for twice the anticipated bollard pull of 10,000 pounds on the aft bitt and 7,500 pounds on the forward bitt.

GROUP 200 PROPULSION & PIPING

References

A-1 Outboard Profile

A-2 General Arrangement

Addendums

200 Propulsion Plant, General

The propulsion system is for a single-ended design, with two fixed-pitch stainless steel propellers at the stern. The propulsion machinery installation will consist of two non-reversing, 4-stroke, turbo-

charged (Tier III) diesel engines, each connected through reversing reduction gear to a propeller with disc type shaft brakes controlled by engine controls.

233 Main Engines

The main propulsion engines shall be 250 HP continuous duty cycle @ 1800 RPM, arranged for keel cooling. Manufacturer factory certification documentation shall be provided for each engine.

Engines shall burn No. 2 diesel fuel. Engines shall be 12 VDC starting with engine mounted alternators for charging the starting batteries. Batteries shall be with 800 amp starting capacity arranged for two 12-volt batteries in a single fiberglass battery box for each engine.

Contractor shall provide all required fasteners, wiring, fuel oil flex hoses, exhaust system flex connections, all piping, insulation, bedding materials, guards, gaskets, fittings, etc. for a complete and operational installation.

Each engine shall be provided and installed with two (2) lighted tachometers (digital) with dimmers, at pilothouse control station and at each engine. Lube oil pressure, water temperature gauges shall be included at each station.

Each engine shall be filled with a mixture of freshwater and manufacturer approved water treatment product. Amount of water treatment added shall be to manufacturer's recommendation for type and size of engines. Contractor shall provide one manufacturer water treatment test kit.

Contractor shall provide the services of a manufacturer authorized technician to accomplish initial start up of main engines. Test reports of initial startup shall be provided to the Owner. Engine warranty shall begin at initial startup and shall be for a period of 24 months or 5000 hours.

Contractor shall provide the services of a factory authorized technician to accomplish a PAR test on both main engines. Main engines shall have local and remote starting. Emergency shutdown shall be located in the wheelhouse console and at each engine.

The propulsion system shall meet USCG requirements including all regulatory documentation, failure modes analyses, and testing and verification procedures (PSTP). Each procedure shall be approved by USCG MSC in Washington, DC. These procedures shall be verified on sea trials.

Each engine shall have a DVTP/PSTP procedures to verify the following test:

- Overspeed Trip
- Low Oil Pressure Shutdown
- High Water Temperature Alarm
- Low Water Level (Jacket Water Only)
- Low 12 voltage to Engine ECM for Engine

236 Propellers

236.1 Propeller Details

Provide two fixed-pitch propellers fabricated, machined, and balanced. Design propellers to accommodate rope guards and lifting/pulling bolts. Propellers shall be thoroughly stress relieved

prior to machining and finishing. Propellers shall be dynamically balanced and the trailing edges of blades shall be properly ground to prevent "singing". Propellers shall be secured to the tail shafts with stainless steel propeller nuts and a stainless steel ¼" x 1" weld strap.

Manufacturer certified drawings and certificates shall be provided for each propeller including spares.

The Contractor or Builder shall provide a set of spare propellers bored and blue fitted to the shafts to the Owner at the time of delivery.

236.2 Propeller Specifications

Propellers shall be as follows;

Material	Bronze
Number of blades	4
Style	Workhorse
Diameter	36.00"
Pitch	(Fixed) to be determined by Marine Engineer
DAR	70 minimum

240 Reduction Gears

Reduction gears shall be forward/reversing with internal hydraulic. Gear ratio shall be 3:1.50 at 250 hp at 1800 rpm shall turn a 36" diameter 4-blade work horse style propeller to absorb the full horsepower of the engines at 0 knots (against a bulkhead). Manufacturer factory certification documentation shall be provided for each gear.

The reduction gear warranty shall begin at initial startup by engine technician and shall be for a period of 24 months or 5000 hours.

243 Propulsion Shafting

243.1 Propulsion Shafting Details

Propulsion shafting arrangement shall be as shown on references 2.1 and 2.2. Shafts material shall be Aquamet 17 sized to suit horsepower and reduction per ABS guidelines. Keyways shall be curved at ends with radius corners but not spooned. Liners shall be raised brass per Ferry Division standard. Couplings and propellers shall be blue fitted at the machine shop and witnessed by the owner's representative or a designated person.

The shaft arrangement shall be so designed that the propellers shall be at least 3" above the vessel baseline and provide 15% tip clearance for the propellers at the hull. The use of chock fast or other compound to align the bearings is prohibited. Shaft tubes shall be line bored with the water lubricated bearings pressed in. Provisions shall be provided for jacking bolts or studs to help remove the shaft tube bearings. The outside of the bearings shall be machined in three steps to help in the installation and removal of the bearings.

The stern tube shall be heavy wall mechanical tubing per ABS rules from the propeller support bearing to the aft machinery space transverse bulkhead. There shall be a forward stern tube bearing and a stuffing box at the aft machinery space bulkhead. Both shaft bearing lengths shall be approximately four (4) times the shaft diameter. The stern tube seal and bearings shall have a flushing water system as noted in section 262. There shall be a stuffing box flushing pump located at the aft machinery bulkhead to serve both shaft stuffing boxes. A second pump shall be installed as backup. Water flow shall be monitored by a flow meter with low water flow alarm in wheelhouse. Pumps and alarm shall operate on 12 VDC power.

After vessel is afloat, but in no case less than 24 hours, align shaft system with the reduction gears so that tolerance is no greater than 0.005" on any of the four (4) directions. A record of the flange alignment shall be presented to the owner's representative at the time of verification.

The Contractor or Builder shall furnish two (2) spare shafts complete with bearings, propeller nut, gear end coupling, key-stock and nut at the time of delivery. All four (4) shafts shall have material certification and machine certificates signed by the inspecting USCG OCMI.

243.2 Bulkhead Shaft Seals

Contractor shall provide and install (ManeGuard PSE by "Deep Sea Seals Ltd." from Wartsila Lips Inc., in Chesapeake, VA 757-558-3625) shaft seals, arranged for sea water cooling.

The Contractor shall provide a drip collection sump below each shaft seal. Provide a 12 VDC discharge pump at each sump connected to the generator starting battery bank. Pumps shall have a float switch activated and shall discharge overboard below the rubber fender port and starboard. Install a bilge alarm in each space not a tank connected to the ship's alarm panel.

Contractor shall provide and install all necessary ancillary materials and equipment, including but not limited to all foundations, fasteners, fittings, packing, lubricants, hoses, etc. for a complete and operational system.

See section 529 for piping details.

244 Rudders

There shall be two (2) rudders at each propeller per contract guidance drawings. The rudder stocks shall be stainless steel with steel blades welded to the stock. Blade reinforcement shall be per ABS rules. The rudder stocks shall be one piece through the main deck at the tiller arm. The rudder stock shall be sized such that a lower pintel bearing is not required. The lower and upper bearings shall be nylon with a nylon carrier bearing at the main deck. All four (4) rudder tillers shall be connected to the jockey bars located above the main deck. A fiberglass walk platform shall be installed above the tillers and jockey bars about 12" above the main deck. Grating shall be held in place with stainless steel screw clips. Rudders shall be kept 6" above the vessel baseline as shown on Outboard Profile.

Rudder stock material shall have material certification certificate and machine certificates signed by the inspecting USCG OCMI. The Contractor or Builder shall furnish one spare rudder complete with lower and upper bearings, for every two vessels built.

252 Propulsion Control System

252.1 Main Engine and Reduction Gear Controls

Provide and install electronic engine control system for each main engine in the wheelhouse. The control system shall include disc type shaft brakes at each gear output coupling. The control system voltage shall be 12 VDC with power provided at the 12 VDC panel board. The Contractor shall provide a USCG approved DVTP and PSTP procedure for the engine control system. These procedures shall be verified on sea trials.

253 Steering System

253.1 Steering System Design

The steering system hydraulics shall be powered from both propulsion engines using a 12 VDC selector valve for switching from port to starboard hydraulic pumps. Each pump shall have its own hydraulic reservoir. The system shall be designed to meet 46 CFR 143.545 parts (a) and/or (b). The rudders shall move 35 degrees from center in both directions with mechanical stops and limit switches to limit travel to 35 degrees per ABS rules. The system shall be so designed to move the rudders from hard over to hard over in no less than 15 seconds. Hydraulic power shall be from two hydraulic pumps mounted on the reduction gears.

253.2 Steering System Controls

The controls shall be designed with a full follow-up control lever and a non-follow-up control lever. Both control levers shall be located on the console in the wheelhouse. The rudder angle indicators shall be located on the overhead above the control console between the VHF radios. The rudder angle indicators shall be back lighted with a dimmer switch located at the indicators. The Contractor or Builder shall provide on set of steering controls (FFU and NFU) at delivery.

253.3 Steering System Control Panel

The control panel shall have a switch to control the steering pumps (port or starboard) with warning lights and audible alarm for the following:

1. Low steering pressure
2. Low oil level
3. Loss of 24 VDC Control power

253.4 Steering Hydraulic Cylinders

The rudders shall be controlled by two hydraulic cylinders located on the main deck aft. Cylinders shall be designed for marine service (salt water environment). They shall be furnished with Certificates from the manufacturer to meet USCG and ABS rules. Cylinder pins shall be stainless steel and provided with stainless

steel grease fittings. Grease fittings shall be so installed to prevent mechanical damage. The Contractor or Builder shall provide two (2) spare hydraulic steering cylinders to the owner at delivery, for every two vessels built.

253.5 Hydraulic piping, hoses, valves and fittings

The entire piping system shall use stainless steel tubing with bent turns and compression fittings at ends. All hoses shall be manufactured using factory end fittings and must meet USCG requirements for hydraulic steering systems. All fittings shall be stainless steel. Arrangement and layout of the system shall be shown on vendor drawings such that owner approval will guarantee neat system layout. Any changes in the field shall require prior owner approval

255 Propulsion Engine Cooling

255.1 Keel Coolers

Provide keel cooling for all four diesel engines using Fernstrum Keel coolers sized for 0 knots at full horsepower. Keel coolers shall be installed as near the engines as possible to minimize lengths of piping between each engine and its respective cooler. Shutoff valves shall be located at the cooler in such a manner that valves can be easily attended if necessary. Guards shall be installed at coolers as suggested by the manufacturer. Expansion tanks with low level alarms shall be installed for each engine located in the wheelhouse. Tanks shall have a sight glass installed for checking water level. The system shall be filled with a mixture of water and antifreeze to meet the engine manufacturer requirements.

The Contractor or Builder shall provide one (1) spare keel cooler with gaskets and anodes for each propulsion engine to the owner at delivery, for every two vessels built.

259 Engine Exhaust Piping

259.1 Exhaust System Design

Provide proper sized exhaust line from each engine to the exhaust stack as shown on plans. The lines shall include silencers, stainless flex joints and flanges for easy removal of piping. Flex joints shall be installed in each section of pipe between elbows to allow for proper expansion. Expansion calculations shall be provided to verify proper flex length.

259.2 Exhaust System Piping Details

Insulation on exhaust lines shall be blanket type rated for 1500 degrees F. Insulation shall cover all piping, flex joints, silencers and turbo on each engine. Piping exposed to the weather above the main deck shall be stainless steel Propulsion engine exhaust shall terminate above the wheelhouse aft at each corner. The exterior portion of the piping shall be stainless steel with a removable expanded metal heat guard from the main deck to the house top. The pipe shall terminate 36” above the roof of the wheelhouse.

261 Fuel Oil Piping

261.1 Fuel System Design

The fuel oil system shall provide piping from each fuel tank to a manifold with branch lines to each engine. All valves shall be carbon steel per USCG requirements. Return lines shall be routed to the top of the fuel tanks. Provide USCG approved fuel filter/water separators for each engine sized to suit. A shut off valve with reach rod shall be provided at each tank suction line for emergency shutoff of fuel in case of fire at the main deck behind the wheelhouse. A fuel deck fill and vent shall be provided for each fuel tank at the main deck with a 21 gallon drip pan. Drip pan shall have drain plug with ball valve and plug for valve. Hoses at each engine shall be USCG approved type not more than 30” long with 37 degree JIC swivel at one end. Provide shutoff valve at suction hose and check valve at return hose.

261.2 Fuel System Tanks

The fuel tank shall have a sound tube for each tank along with sounding chart in inches/gallons. Chart shall show how many gallons are remaining in the tank. Tank capacity shall be 250 gallons each with a 3” air gap at the top not included in the 350 gallon capacity.

262 Shaft Flushing Piping

Provide a shaft flushing system to include pumps, strainers and piping complete to furnish at least 10 gallons per minute at 15 psi to both shafts. These values shall be verified on sea trials. The system shall include two (2) engine belt driven water pumps with a sea strainer for each, valves, pressure gage and associated piping. The drive belts shall have a tension idler arrangement to maintain belt tightness.

The piping shall be 1” ASTM 316 stainless steel with screwed fittings. Each pump shall have its own 6” seachest complete with sea valve and strainer sized for the pump. Both pumps shall be cross connected with check valves in case one fails. Pumps shall so located, that they are always below the vessel water line by a minimum of 6”. Each seachest shall have a petcock to vent air from the seachest.

There shall be a pressure gage located in the wheelhouse console to indicate flow pressure for each pump.

The Contractor or Builder shall provide two (2) spare pumps at the time of delivery.

263 Fire Piping

263.1 Fire Pump

The fire pump shall be belt driven from the front of the port propulsion engine with adjustable idler to keep proper tension on drive belts. A matched pair of 5V design belts shall be used for driving the fire pump with 5V groove pulleys. Installation shall be such that belts can be kept to a minimum length yet provide for adequate room to access pump. The fire pump shall have a 2” suction and a 1 ½” discharge with a rpm of 3600.

263.2 Fire Piping System Design

The fire system shall be designed to supply 100 gpm at 60 psi pressure to the nozzle at the end of the 1 ½" fire hose. There shall be an electric 24 volt clutch with switch located at the fire pump control panel in the wheelhouse console. The control console shall also have a 100 psi pressure gage (flange face).

263.3 Fire Piping Layout

The system shall have a 8" pipe seachest with stainless steel closing valve to provide water to the fire pump. The open area of the seachest strainer plate shall be 3 times the area of the 2" suction pipe. There shall be a 2" flanged duplex basket strainer before the pump suction with an isolation valve for maintenance of the strainer. The discharge pipe shall have check valve. The piping shall terminate on the main deck aft of the forward of the wheelhouse with a 50-foot length of 1 ½" hose, angle hose valve, dual purpose nozzle, hose rack and spanner wrench.

264 Bilge Piping

264.1 Bilge Piping System Design

The bilge system shall have a 2" NPT engine driven self-priming bilge pump with manifold, capable of pumping out all compartments below the Main Deck. Pump shall have capacity sufficient to meet requirements USCG "M" rules.

Bilge suctions shall be located as close as possible to the lowest point of the space served. Overboard discharge shall be located in the side shell approximately 24" below the main deck between tires as not to obstruct water flow. Location to be approved by Owner during plan review.

265 Hydraulic System

The hydraulic system shall have the capacity to provide fluid power to the largest deck winch. Each main engine will have a front mounted 24VDC electric clutch driven PTO coupled to a variable displacement hydraulic pump, each capable of providing full fluid system power. The system working pressure shall be 3000 psi maximum. All piping shall be type 316L stainless steel tubing with compression fittings, long radius bends in lieu of 90-degree fittings shall be used where possible. All exposed hydraulic oil lines shall be insulated for safety of crew. All hose fittings shall be stainless steel. All controls valves exposed shall be marinized to prohibit rust. The hydraulic system shall provide power to 1 each A-Frame ram & winch, 1 each 5 ton vertical capstan and 2 each 20 ton deck winches. The controls for the hydraulic equipment shall be local.

GROUP 3 ELECTRICAL SECTION

References

3.1 A-1, Outboard Profile

3.2 A-2, General Arrangement and Hold Plan

Addendums

300 Electrical System – General

The Contractor shall provide a complete electrical system, including wiring and equipment, as described in these Specifications.

All equipment, materials and workmanship shall fully comply with the following electrical standards:

- 46CFR Subchapter J, Electrical Engineering
- ABS Rules for Vessels Under 90 Meters
- 72 COLREGS

301 Electrical Equipment Arrangement

In general, equipment shall be located per References 3.1 and 3.2.

Each connection box in a damp or wet location shall be watertight, with terminal or stuffing tubes for cable entrance and external mounting feet. Each watertight connection box shall be mounted by the external mounting feet.

All electrical components installed in locations exposed to the weather shall be 316 stainless steel or bronze, as approved by the Owner.

302 Electrical Motors & Associated Equipment

302.1 General

The vessel shall have 24/12 Volt DC electrical systems using the propulsion engine starting batteries as a main source of power. The four (4) 12 volt 8D batteries shall be grouped together is sets of two with charging by the engine alternators. The batteries will be connected to a transfer switch as shown on plans.

302.2 Motors

All electric motors and fans shall be 24 or 12 VDC powered.

304 Cabling – General

Cables shall be selected and sized per ABS and USCG rules and shall meet the recommendations of IEEE STD 45. 208/120/12 Volt cables shall be rated for 600 VAC. The minimum size of conductors for power and lighting cables shall be #14 AWG.

All electrical power, lighting and low voltage control cables in interior areas and protected exterior areas shall be low smoke cable. Plenum-rated cabling may be used for specialty data and communications cabling.

All electrical communications and data cable in interior areas and protected exterior areas shall comply with UL 1581.

305 Equipment Label Plates

Labeling requirements for specific equipment/components are included in the follow-on Specification sections.

Cable tags:

- All electrical cables shall be tagged with embossed aluminum tags on each side of a penetration, into and out of junction/connection boxes and/or equipment. The unique circuit designation, keyed to the various electrical plans, shall be embossed on the tag.
- All control wiring within control panels and consoles shall be identified with floaters

313 Batteries, Battery Charger and Shore Power

313.1 Batteries

Batteries shall be 12 Volt 1000 Amp capacity for propulsion engine starting.

Battery connections shall be pressure type lugs. Battery cables shall be end sealed to prevent electrolyte entrance by creepage or spray. Each battery bank shall be contained in a battery box located adjacent to the served unit and securely mounted in a foundation to the Owner's satisfaction.

313.2 Battery Charger

Battery chargers shall not be installed directly over the batteries. The vessel shall be equipped with a (120VAC/24VDC/12VDC) battery charger connected to the shore power for keeping batteries charged while vessel is moored. The charger shall be capable of charging both sets of 12 volt batteries. A separate 120VAC/12VDC charger shall be connected to the 12 Volt electronics equipment battery. Both battery chargers shall be located in the wheelhouse.

313.3 Shore Power

The shore power receptacle shall be stored in a water tight box on the front of the wheelhouse. The box shall be labeled (120 VOLT-30 AMP SHORE POWER). A green light shall be installed in the front of the box indicating power available.

314 Vessel Alarm System

314.1 Alarm System Design

There shall be an alarm system to monitor the following points located in the wheelhouse:

1. 24 Volt DC power available
2. 12 Volt DC power available
3. Starboard Propulsion Engine Low Oil Pressure
4. Starboard Propulsion Engine High Water Temp
5. Starboard Propulsion Engine Low Water Level
6. Starboard Propulsion Engine Loss of 12 Volt Power
7. Port Propulsion Engine Low Oil Pressure
8. Port Propulsion Engine High Water Temp
9. Port Propulsion Engine Low Water Level
10. Port Propulsion Engine Loss of 12 Volt Power
11. High Bilge Level in Machinery Space
12. High Bilge Level in Forward Void
13. High Bilge Level in Aft Void
14. Loss of 12 Volt Power to Steering
15. Loss of 12 Volt Power to Engine Controls
16. Low Water Pressure to Starboard Shaft Seal
17. Low Water Pressure to Port Shaft Seal
18. Low Fuel Tank Level-Port
19. Low Fuel Tank Level-Starboard

20. Spare
21. Spare
22. Spare
23. Spare
24. Spare
25. Spare

326 Panelboards

Panelboards shall be dead front, circuit breaker type. The lighting and power panelboards shall be provided with 12 spare breakers of assorted sizes including 5 amp, 10 amp, 20 amp and 30 amp.

The 24 Volt DC panelboard shall be located in the wheelhouse per Owner.

A separate 12 Volt DC electronics panelboard shall be provided in the wheelhouse console with power from the 12 Volt electronics battery. This battery will take power from the 12v/12v DC rectifier power from the 12 Volt DC panelboard.

All electrical panelboards and instrument panels shall be located in the wheelhouse control console.

327 DC Systems

24 VDC and 12 VDC systems shall be provided as necessary to provide power for starting, DC power and pilothouse electronics. Systems shall include batteries, cabling, disconnects, panels, breakers, inverters, chargers, transfer switches, power supplies, and monitoring devices.

All electrical items such as chargers, transfer switches, power supplies and monitoring devices shall be located in the wheelhouse.

328 Wireways

328.1 General

All wireways and cable installations shall be in accordance with IEEE STD 45 recommendations.

Cable wireways shall be segregated into two individual systems: power/lighting and low voltage (including data and communications). Electrical systems shall maintain a minimum of 6" separation in wireways and MCT's and shall cross at right angles to each other. Wireway hangers shall be color coded: red for power/lighting, and blue for low voltage, data, and communications.

All cable hanger material shall be steel with a corrosion resistant finish. Painting is acceptable as a corrosion resistant finish for interior hanger material. Bolts, nuts, and washers for use with painted hanger material shall be stainless steel.

Exterior hanger material and studs shall be stainless steel with stainless steel, brass or bronze nuts, bolts, and washers.

Each weld area at hangers and/or studs shall be wire brushed and coated immediately after welding and before the installation or any cables.

All electrical cable shall be banded to the wireway downcomers with stainless steel banding.

328.2 Wireway Penetrations

Openings in decks or platforms for the purpose of cable penetrations which do not require stuffing tubes or kickpipe protection shall have a collar continuously welded around the edge of the opening. This requirement particularly applies to cable openings in switchboard platforms and other deck structures where watertight integrity is not otherwise required.

Cable penetrations through bulkheads and decks, both watertight and non-watertight, shall comply with ABS rules. Multi-cable, transit type penetrations may be substituted for stuffing tubes for all penetrations. Built-in watertight boxes may be used in lieu of kickpipes. Transits shall be of a box type construction with individual fire-retardant penetrations. The use of poured sealers or putty type packing shall not be used. Cabling shall not be routed in tanks below the main deck.

Multi-cable, transit type penetrations shall maintain segregation of power/lighting circuits and low voltage/data/communication circuits. The two different types of circuits shall not share the same multi-cable penetration.

329 Receptacles, Junction Boxes, & Misc. Distribution Devices

329.1 Shore Power Receptacles

One shore power receptacle shall be provided the wheelhouse. The shore power shall be 120 Volt A/C to the battery chargers.

329.2 Junction/Connection Boxes

Each junction/connection box in a damp or wet location shall be watertight, terminal or stuffing tubes for cable entrance and have external mounting feet. Each watertight connection box shall be mounted on external stainless steel mounting feet.

Watertight junction boxes shall be with gaskets, etc., as needed.

All junction boxes shall be identified with phenolic tags, black with white lettering, which correspond with the unique circuit designation keyed to the various electrical plans.

330 Lighting

331.1 Lighting Systems

Interior lighting and exterior lighting shall be LED fixtures Owner-approved. The Contractor shall prepare and submit a list of all lighting fixtures and control devices for approval by the Owner prior to purchasing any items.

Contractor shall provide and install all necessary ancillary materials and equipment, including but not limited to foundations, junction boxes, switches, cabling, hangers, etc., for a complete and operational system.

331 Navigation Lighting

Provide and install navigation lights to comply with latest COLREG requirements. Masthead, stern, and sidelight fixtures shall be dual-lens. Navigation light fixtures shall be cast bronze and complete with lamps; all fixtures shall utilize the same lamp. Provide yard arms for day markers per COLREG as required and signal flags, three (3) halyards on each side. All bulbs shall be LED.

331.1Navigation Light Panel

The Navigation Light Panel shall USCG approved. Each light circuit shall be supervised and have an audible alarm. The audible alarm shall have silence button.

331.2 Navigation Lights

The navigation lights shall be installed on the main mast per reference 3.1 (A-1 Outboard Profile). Side lights shall be installed with blinds on the wheelhouse roof port and starboard forward of the main mast.
Navigation lights shall be sized for vessels under 65 feet (20 meters). Lights shall be installed per current inland navigation rules 72 COLREGS.

Install the following lights on the main mast:

- Anchor Light 360 degrees all-around (white)
- Bow Light 270 degrees (white)
- Range Light 270 degrees (white)
- Stern Light 135 degrees (white)
- Aft Upper Towing Light 135 degrees (yellow)
- Aft Lower Towing Light 135 degrees (yellow)
- Port Side Light 112.5 degrees (red)
- Starboard Side Light 112.5 degrees (starboard)
- Horn Signal Light 360 degrees all-around (white)
- Freeze Warning Light, 360 degree all around blue on aft side of mast

GROUP 4 NAVIGATION, COMMUNICATIONS and ELECTRONICS

References:

4.1 Outboard Profile

4.2 General Arrangement

400 Navigation and Communications

Electronic systems shall be in accordance with the applicable regulations of the FCC Rules. Installation and testing of equipment shall be supervised by the equipment manufacturer's representative. All antennae shall be installed to avoid interference with each other and provide maximum clear reception.

The Contractor shall be responsible for accomplishing FCC inspection and obtaining certification. The systems shall be considered complete only when the FCC inspection and certification has been accomplished.

421 Navigation Equipment

421.1 Compass

Install a 4” magnetic compass for steel-hulled vessels. Compass shall have adjustable illumination and necessary compensation for adjusting the compass.

421.2 Bell

Pilothouse shall be fitted with an 8” brass bell. Bell shall have the ship's name, official number, year built engraved, and including mounting bracket. The bell will be location on the forward side of the wheelhouse on centerline as approved by the Owner.

421.3 Inclinometer

Install an inclinometer with dual glass tube scales: 15-0-15 in the wheelhouse. Location shall be near approved by the Owner.

421.4 Electric Horn

Pilothouse shall be fitted with one 12 volt electric trumpet type horn as shown on Reference 4.1.

There shall be a momentary contact switch in the wheelhouse console to control the 12 volt power relay for the horn.

422 Search Light

422.1 Search Light

Provide and install one 12 volt, 8", 500,000 candle power seal beam searchlight, with manual operation from pilothouse station. The Contractor or Builder to furnish one (1) spare seal beam bulb. Light construction to chrome plated brass light and base.

423 Electronic Navigation Equipment

Required electronic equipment shall consist of the following:

- Two (2) VHF radios with antenna mounted on top of pilothouse as directed by owner.
- One (1) Digital depth sounder “Furuno” Model FE-700 600W w/ 6.5” Color Display).
- One (1) GPS “Furuno” Model GP-33 4.3” GPS Navigator with antenna.
- One (1) Radar “Furuno” Model 1835 4kW 10.4” Color Display.

The above equipment shall be located on or above the forward console in the pilothouse.

429 Environmental Monitoring Systems

429.1 Required monitoring systems:

- One (1) Ship’s Clock, 4 ½” electric
- One (1) Ship’s Barometer, 4 ½” to match Ship’s Clock
- One (1) Digital depth sounder with transducer in separate sea chest (located by owner).

429.2 Wind Instruments

Pilothouse shall be fitted with one wind speed/direction readout. The readout shall be located near the wheelhouse console. The wind speed indicator shall be located on the main mast starboard side yard arm.

433 Interior Communications

No Internal Communications required.

436 Alarm System

436.1 Fire Detection System

The fire detection/monitoring system will provide the following functions (automatic and Pilothouse manual control):

- Heat detection (engine room)
- Smoke detection (engine room)
- Main ventilation system shutdown (engine room)
- Detection of system activation (engine room)

The fire detection system shall be certified by a third-party vendor who will also provide documentation for USCG. Electric power to be 24V DC from Engine Start Batteries.

437 Tank Level Indication

437.1 Fuel Tank Gaging

The two (2) fuel tanks shall be fitted with high/low level alarms (see 314 Vessel Alarm System). Each tank shall be fitted with a sound tube accessible on the main deck. Each sounding tube shall be tagged with a stainless steel plate with the tank name scribed in ¼" letters.

GROUP 5 MARKINGS, VENTILATION AND FIRE SUPPRESSION

References

5.1 A-1, Profiles and Deck Arrangements
5.2 A-2, Engine Room and Tank Room Arrangement
5.3

500 Auxiliary Systems - General

Mechanical and Piping Standards:

- CFR 46Subchapter M, Marine Engineering.
- ABS Rules for Vessels Under 90 Meters

501 Label Plates and Markings

501.1 Label Plates

All piping systems shall be labeled with color to match system along with flow arrows.

All electrical power wiring shall be marked with aluminum tags stamped with circuit number.

All panelboard circuits shall be numbered according to the DC one-line diagram.

501.2 Markings and Signage

The vessel name shall be on the port and starboard bulwark plates just aft of the bow using ¼" x 8" raised letters. The vessel name shall also be installed at the stern bulwark on centerline using ¼" x 8" letters. The vessel hailing port (Morehead City) shall be installed below the vessel name using ¼" x 6" letters. All letters shall be seal bead welded to the bulwark plate using 1/8" continuous bead.

The vessel shall have signage about to indicate safety equipment, fire-fighting equipment, storage lockers, fire stations, hatches, manholes, sounding tubes, emergency shut devices, shore power,

emergency ventilation shutdowns, official number, warnings plaques, no smoking, towing rope storage, engine room access, vessel name boards, NCDOT plaque, DOT plaque, etc.

512 Ventilation System

512.1 Machinery Space Ventilation

The machinery space shall use port and starboard engine room 24VDC vent fans using intake louvers and exhaust air louvers.
Louvers shall be approximately 18” x 24” with stainless steel removable louvers and bug screens as shown on contract plans A-1 and A-2.

515 Fire Suppression System and Portable Fire Extinguishers

515.1 Fire Suppression System

Install an aerosol canister type fire suppression system designed for machinery spaces under 2000 cu. Ft. capacity. System shall be designed to operate on 12 volt DC power with control switch in the wheelhouse console. The system shall have a minimum of two (2) canisters in the machinery space.

515.2 Portable Fire Extinguishers

Install one (1) 10 pound hand held portable fire extinguishers at the wheelhouse and one in engine room.

GROUP 6 OUTFITTING

References

6.1 A-1, Outboard Profile
6.2 A-2, Tank Plan
6.3 A-3, General Arrangement, Main Deck and Above
6.4 A-5, Machinery Arrangement

600 General

Outfitting shall be provided and installed by the Contractor as described herein. All materials supplied under this item shall be constructed, applied or stowed in accordance with the authorized regulatory bodies listed under Section 050 of these Specifications.

602 Label Plates and Hull Markings

602.1 Hull Markings

The name of the vessel shall be approximately 10" high, cut from 1/4" plate, and welded to the forward bulwarks as shown on Outboard Profile. The vessel's name and hailing port, welded to the aft bulwarks port and starboard, shall be approximately 10" and 6" high respectively and cut from 1/4" plate. All welding shall be continuous.

Name boards shall be provided by the owner and installed by the builder on the pilothouse handrails, port and starboard.

The vessel's official number shall be center punched and painted black on the forward engine room bulkhead. Letters and numbers shall be 3" high.

The Builder's nameplate shall be approximately 24" long and shall be engraved on polished bronze plate and with enamel filled letters. The nameplate shall be mounted on 3/4" thick varnished hardwood (mahogany) pad and shall be located in the Galley as directed by Owner. Builder's nameplate shall include the following:

VESSEL NAME

Official Number 00000000
Date of build (e.g. 18 May, 2009)
North Carolina Department of Transportation
Ferry Division
Roy Cooper - Governor
Designed by DeJong & Lebet, Inc.
Builder's name
Hull 0000

602.2 Labeling

Life rings, life preservers, inflatable life raft, rescue boat, oars, fire axes, fire hoses, fire extinguishers shall have the vessel name or station number attached using vinyl lettering at the direction of the Owner.

All valves and operating gear shall be labeled to indicate the service used. Labels shall be brass material, machine engraved, with 1/8" letters to suit condition and easy legibility. Labels shall be secured to handwheels using stainless steel wire tie.

All wiring cables shall be labeled with embossed metal tags secured to cable at sufficient intervals to allow ready identification of cable and circuit if it should become necessary to trace circuits after shipboard installation is complete).

Label plates marking the centerline and six foot mark above baseline shall be fitted on the after side of the engine room forward bulkhead.

Paint lines to indicate vehicle runways and safety zones on decks, colors and markings as specified by the Owner and Reference 6.1.

Provide fire station labels as required by 46CFR78.47- 20 (minimum 2" letters).

Provide "E" on all emergency and exit lights as required by 46CFR 78.47-33.

Center punch and paint the frame number on forward and aft side of each watertight bulkhead, 3" high, in black.

Provide and install 3/16" stainless steel, deeply engraved labels adjacent to each sounding plug, remote valve operator, fuel fill and vents, fresh water fill and vent, lube oil fill, bilge discharge line, quick acting hatches, watertight doors and joiner doors. Labels shall identify service and/or space served and be continuously welded in place.

All signs, notices, and labels required to be placed on vessel shall be fabricated of vinyl using Avery Graphics, Series A3, 3 to 4 mil material, or equal, unless otherwise specified herein. All signs, notices, and labels, required to be painted shall be produced by a qualified sign painter or shipyard sign shop approved by the Owner.

602.3 Labeling And Identification of Hand Wheels and Piping

All valve hand wheels and actuator handles shall be coated with glossy enamel using the following color codes.

SYSTEM	COLOR FED.STD.NUMBER	
Fire main	Red	11105
Fresh water	Blue (light)	15200
Fuel oil	Yellow	13538
Compressed air	Orange	12246
Bilge	Black (dk.gray)	16081
Hydraulic	Purple	17141
Sea water	Green	14062
Sewage	Gray (light)	16376

All piping in the engine room shall be color coded, using the same scheme as above, by painting an arrow pointing in the direction of flow at sufficient intervals to allow ready identification. All fuel oil, hydraulic oil, and fire main piping shall be marked in the same manner throughout the vessel. Provide and mount in frame in EOS, one 8 ½" × 11" color code key plan.

603 Draft Marks

Draft marks shall be cut from 1/4" plate and installed fore and aft, port and starboard as shown on Reference 6.1. Numerals shall be expanded so that the vertical projected height of each numeral is 6" and shall be painted in a contrasting color.

604 Locks, Keys and Tags

Spaces to be fitted with lockable doors are the Pilothouse, aft control house, ship's office and the crew storeroom. Lockable doors shall be capable of being unlocked from inside the space without a key.

Door hardware shall be provided for all doors including the following:

- Lock sets provided for crew spaces are standard marine hardware. Lock sets shall be keyed alike.
- Latch sets provided for crew spaces are standard marine hardware.
- Hardware shall be heavy duty marine-type brass, bronze or stainless steel.

605 Rodent and Vermin Proofing

Not applicable

611 Docking Plugs

No docking plugs required

612 Rails and Stanchions

Rails and guards shall be provided and installed as shown on Reference 6.1. All rails shall be 1 1/4" Schedule 40 steel pipe, smooth and free of abrasions, sharp corners, and defects which could injure persons sliding a hand on or along the same.

Hand rails shall be provided around the perimeter of all decks fabricated of steel schedule 40 pipe, be three coarse and minimum 40" high.

Hand rails around the house top shall be three (3) -course, 40" high.

Storm rails of l-1/4" Schedule 40 steel pipe shall be fitted around the perimeter of the casing at the Main Deck, the Pilothouse and Deckhouse, and outboard of the curtain plate adjacent to the rescue boat access opening. Storm rails shall be set 4" out from bulkhead.

612.1 Safety Barriers

Not applicable

614 Fixed Ballast

Not applicable

621 Joiner Bulkheads, Linings, and Ceilings

The joiner wall system is to be vinyl covered aluminum sheathing over metal studs. Ceiling is to be vinyl covered aluminum in 24” suspended grid with clips to keep the tiles in place. Flooring to be hammer raised dot vinyl light gray in color. Vinyl matching cove moldings. Consoles to be painted black and built of light gauge metal to house the controls. Insulation shall be 2 lb. Density rock wool throughout. The overhead of the machinery space shall have A-60 insulation installed.

622 Floor Plates and Gratings

Contractor shall develop necessary drawings for the installation of aluminum deck plates in the Engine Room.

Grating shall be 1/4" aluminum diamond plate supported by 3" × 2" × 1/4" angles (beams and stanchions). Steel floor plates shall be installed only where required by USCG regulations. Grating shall be portable type bolted down with 3/8" diameter socket flat head countersunk stainless steel machine screws. Angle frames shall be drilled and tapped. Flush hinged plates shall be provided for quick access to valves and bilge suction foot valves located below grating line. Hinges shall be stainless steel.

Two course galvanized pipe handrails shall be provided around the perimeter of floor plates where a drop off of more than 12" exists.

623 Ladders and Stairways

All ladders and stairways shall be constructed in accordance with 46CFR 72.05-20.

Install vertical ladders for access to all voids on bulkheads at each manhole.

- Vertical ladders shall be provided for access to the bottom of voids, tanks, house tops, and elsewhere, as required. Vertical ladders shall be portable, secured with stainless steel fasteners, and constructed with 3" × 3/8"flat bar stringers and 5/8" square bar rungs spaced 12" apart. The minimum ladder width shall be 16" between stringers. Where independent ladder rungs are required, they shall be fabricated with a 3" drop center to prevent a foot from slipping off an open side. Rungs shall be aligned vertically.
- Ladders and independent rungs shall provide a foothold of 7" minimum depth. Ladders shall not be recessed under the deck more than is reasonably necessary to keep the ladder clear of the access opening.
- Vertical ladders shall be installed at all escapes and elsewhere as required for access to compartments.

Inclined ladders shall be portable and secured with stainless steel fasteners. Inclined steel ladders shall have MC 10" × 8.4 # channel side stringers, with MC 10" × 6.5 # channel treads with 8" × 24" and 8" × 36" × 9/32" aluminum safety treads, Super-Grip, Type 182 as manufactured by Wooster Products, Inc., Wooster, Ohio. Safety treads shall be attached by stainless steel, flat head countersunk machine screws. Aluminum shall be insulated from steel by 1/8" thick, rubber gasket material. Special care shall be taken that tread heights vary no more than 1/4" – **any variation greater than this will be cause for rejection.**

624 Doors

Tops of doors shall be at least 6'-8" above the finished deck. Interior doors shall be operable from both sides and shall be furnished complete with latches, locks, key hooks, holdbacks, bumpers, and closers as required for each particular door. Reinforcing plates shall be provided in way of door closers.

Exterior surfaces of all doors shall be coated with same coating system as on adjoining structure.

Weather doors shall have watersheds over them where not otherwise protected.

Weather doors shall be filled with fibrous glass thermal insulation.

All doors shall be fitted with hooks with bumpers to secure them in the open position, except watertight doors. Joiner and weather tight doors shall be installed with 1/4" diameter, hex head, stainless steel, machine screws with nuts and lock washers spaced on 3" centers.

625 Windows and Window Wipers

One window at the Pilothouse front and one window at the aft Pilothouse shall be fitted with pantograph wipers, Wynn model 1801 or equal.

Pilothouse and aft control station windows shall be of size and at locations as shown on plans and shall be clamp-in style with powder coated aluminum frames.

Other windows shall be of size and at locations as shown on plans and shall be 1/4" thick (minimum) dark tint laminated safety plate glass as shown on plans. Watershed bars of 1 1/2" × 1/4" flat bar shall be installed above all windows which are not protected by overhangs.

631 Coating Systems

Final color selections shall be determined by the Owner at a later date. The Contractor shall provide and install custom color trim similar to other vessels in the NC DOT fleet.

631.1 Surface Preparation

Surface preparations and coating as specified herein shall be accomplished in strict accordance with and as recommended by the Steel Structure Paint Council, Jotun Marine Coatings Company, and the Owner. The Owner reserves the right to select the standards used.

Where structure, machinery, or equipment will cover other structure in a manner that prevents access for maintenance, both structures shall be cleaned prior to installation of the covering structure and both coated with one (1) coat of inorganic zinc followed by the applicable paint schedule as applied to the surrounding area as specified elsewhere herein.

All grease, dirt, and other contaminating properties shall be removed from surfaces before painting: All loose, blistered, cracked paint, all rust and mil scale shall be removed from surfaces to be painted by appropriate methods as specified elsewhere herein, and spot primed with appropriate primers prior to subsequent coatings.

Zinc primers shall be fully cured and all oxidation removed prior to subsequent coatings.

All coats of paint applied must be compatible with primers and other paints.

Sufficient time for proper drying or tacking shall be allowed between coats.

All painting shall be accomplished to protect all surfaces liable to water, immersion, seepage or condensation.

The vessel shall be shifted on blocks so that complete painting of the bottom area may be accomplished. Areas in way of block spots shall be shotblasted and coating system brought up as specified herein.

631.2 Type Coating

All paints used, unless otherwise specified, shall be of the best quality for marine application and applied in strict accordance with Jotun recommendations as directed by Jotun or the Owner.

Provide the Owner with one (1) copy of painting report prior to each application of paint.

The Owner reserves the right to approve the manufacturer of the coating system used and all paint for work not described or called for in this section but which is required and shall be accomplished using a paint schedule designed for the purpose intended and within the applicable standards.

631.3 Weather Conditions – Minimum Standards

No paint shall be applied when weather conditions are below the minimum recommended standards as prescribed by Jotun product data sheets. Contractor shall provide a factory authorized applications technician to accept or reject surface preparation and environmental conditions prior to paint applications. In the event of uncertain or unfavorable weather conditions, the Contractor shall advise and discuss conditions and paint applications with the Owner prior to applying paint.

Conditions of the hull such as condensation will prohibit paint application. The Owner shall stop or delay all painting operation until more favorable weather conditions exist.

631.4 Paint Application

Paint may be sprayed, brushed, or rolled on as the Contractor select except as described below. Paint may not be thinned, except as approved by the Owner. Any coat applied without measurement or inspection of previous coats by Owner will not be recognized as applied.

The Contractor shall repair, as specified elsewhere herein, any areas damaged due to the use of destructive testing techniques, if used.

Protect all hull anodes, transducers, propellers and bearing surfaces from paint coatings.

The final coat of finish paint above the water line shall not be applied until all other work has been completed and the vessel is otherwise ready for delivery. The final coat shall be applied by spraying only.

Should the vessel remain undelivered, excluding delivery time, three (3) months after launching, it shall be dry-docked, surface prepared and one (1) additional coat of anti-fouling paint applied.

The 6'-6" waterline shall be defined by intermittent weld bead on 4'-0" centers.

631.5 Shotblasting

All steel surfaces on the exterior of the hull, the entire interior of the hull, including all void spaces, the Engine Room, steering gear compartment, entire superstructure, Main Deck, overhang, bulwarks, etc. shall be shotblasted to near white metal, SSPC-SP-l0.

Immediately after shotblasting all shotblast material shall be completely removed from surfaces by sweeping and blowing with dry compressed air or other suitable means and one coat of inorganic zinc applied to prevent rusting. All shotblast material shall be completely removed from surfaces prior to any coating being applied.

Following general directions shall be accomplished for the preparation of surfaces to receive the self curing inorganic zinc coatings:

- Round off all rough welds and sharp steel edges, remove weld spatter.
- Dry-abrasive blast all pits and depressions, remove all mill scale, rust, rust scale, grease, paint or foreign matter. Surface profile from abrasive blasting should be similar to that obtained with fresh steel grit (G-40 size), steel shot (S-230 size), graded flint or silica sand (30-60 mesh), under nozzle pressure of 100 psi. If abrasives are reused they shall be cleaned of contamination. Do not reuse sand or flint abrasives.

- Apply inorganic zinc coating as soon as possible to prevent blasted surfaces from rusting.
- Keep surfaces moisture-free until coated. Keep oil, grease or other organic matter off surface before coating.
- Spot blast to remove any contamination. Do not solvent-wipe.
- During blasting operations, seal off all deck machinery, ventilation fans and any other equipment which could be subject to damage from sandblasting operations. The Engine Room and all openings thereto are to be sealed off prior to blasting if any machinery is installed, and kept sealed for the duration of blasting operations.

631.6 Disturbed Surface Repairs

Any painted surface that is disturbed during construction or outfitting shall be restored to suit the adjacent area as follows:

- Remove any damaged coating system by sanding to a sound anchor profile.
- Sand surrounding paint to present an even contour with edges feathered and at least two of the three underlying coats separately visible and distinct from each other. Each layer or coat shall be a minimum of 2" wide.
- Where the disturbed area has penetrated through to the substrate any scarred or damaged metal shall be repaired and a proper anchor profile renewed.
- Restore damaged epoxy coatings systems to a finished surface profile equal to adjacent and surrounding areas. Each coat to be as specified elsewhere herein.
- Apply top coats as required elsewhere herein.

Finished paint shall blend with adjacent areas and present a smooth even profile free of runs, contamination, or other unsightly coating defects.

631.7 Clean-Up

After all construction and outfitting has been completed and just prior to vessels departure/delivery, Contractor shall remove all paint from all windows, slides, and free up moving sashes.

Contractor shall remove paint from all glass and bright work. All bright work shall be polished after all other work has been completed and vessel is otherwise ready for delivery.

Remove all paint and paint over-spray from machinery components, machinery label plates, signs, threads of wing nuts and bolts used for securing vent and storm covers etc., hinge pins, shafting, door knobs, latching mechanisms, actuator rods, valve stems, etc.

Vessel shall be thoroughly cleaned throughout including but not limited to the removal of all dust, grit, grease, solvents, and lint from all spaces, machinery, components, structure, void vents, drains, bilges, paneling, furnishings, deck coverings.

Wash down with fresh water and dry all decks, superstructure and bilges prior to final delivery of vessel.

631.8 Paint Schedule

Coat No.	Product	Mils DFT

1	PPG	1
	Pre-construction primer	
2	PPG Universal	7 +/- 1
	Prime coat	

Steel surfaces shall be finished as described below. Special care shall be taken to apply full thickness of coatings behind flanges. Failure to apply full coating thickness at any locations shall be remedied prior to application of successive coats. Hawser reel to be painted with Epoxy Primer and Finish coats (LT Gray)

Exterior hull to waterline

No.	Product	Mils DFT
1	PPG Universal gray	5 +/- 1
2	Hydroclean antifouling,	4 +/- 1
	Light red	
3	PPG antifouling,	4 +/- 1
	Dark red	

Exterior hull above waterline and bulwarks

No.	Product	Mils DFT
1	PPG lt gray	7 +/- 1
2	J-Kryl black	5 +/- 1

Exterior decks

No.	Product	Mils DFT
1	PPG lt gray	7 +/- 1
2	PPG gray	5 +/- 1

Add heavy nonskid to final coat on all exterior decks.

Superstructure and house exterior

No.	Product	Mils DFT
1	PPG lt gray	7 +/- 1
2	PPG white	5 +/- 1

Interior exposed bulkheads and overheads

No.	Product	Mils DFT
1	PPG lt gray	7 +/- 1
2	J-Kryl white	5 +/- 1

Interior decks (except where vinyl tile is installed)

No.	Product	Mils DFT
1	PPG lt gray	7 +/- 1
2	PPG gray	5 +/- 1

Bilges

No.	Product	Mils DFT
1	Jotamastic lt gray	7 +/- 1
2	J-Kryl white	5 +/- 1

Potable water tanks

No.	Product	Mils DFT
1	Epoxy Tank Lining 550, Buff	7 +/- 1
2	Epoxy Tank Lining 550, White	7 +/- 1

Fuel, dirty oil and lube oil tanks

No.	Product	Mils DFT
1	Oil	N/A

Aluminum deck plates and stainless steel railings shall not be coated.

633 Cathodic Protection

Provide one 22 pound zinc anode for every 200 square foot of bottom surface of the hull using flat bar raised racks per NC State Shipyard standard. Provide 5 pound tear drop type zinc anodes on or near shaft struts and rudders. Anodes shall be shown on docking plan. Provide two 5 pound anodes in each ballast tank as directed by owner.

634 Deck Coverings

Deck covering shall not be installed under built-in furniture or under equipment with enclosed foundations.

All deck coverings shall be applied in accordance with manufacturer's recommendations.

Deck covering in Pilothouse shall be 12" × 12" vinyl tile, Armstrong Imperial Excelon or equal. Tile color shall be "Sand Drift White, # 51858". The Contractor shall install a 4" high vinyl cove base wherever tile ends at a vertical boundary.

The entire EOS deck shall be covered with gray diamond pattern insulating switchboard matting meeting the requirements of ASTM D-178 and MilSpec M-15562F.

635 Hull Insulation

The Contractor shall furnish and install thermal insulation in accordance with Reference 6.3 and 46 CFR Subchapter H. Installation of all types of insulation shall be per manufacturer's recommendations.

Exterior weather boundaries and boundaries separating air conditioned spaces from non-air conditioned spaces to be insulated with a minimum 3” rock wool USCG-approved insulating material.

Acoustic faced insulation shall be installed at the Engine Room overhead. Insulation shall be sheathed with factory-finished perforated, 18 gage aluminum metal sheathing.

636 Hull Dampening and Vibration Control

The following measures will be taken by the Contractor to control vibration:

- Generator sets shall be mounted on marine isolators. Manufacturer and types shall be per engine manufacturer's recommendation.
- Fans and compressors shall be mounted on Korfund or equal marine isolation mounts, and connected to ducting through flexible joints.
- Piping connections to equipment mounted on vibration isolators shall be through flexible connections.

640 Furniture and Furnishings

Furniture and furnishings shall be provided as shown and shall be of good marine quality, installed so as to present a complete and pleasing package satisfactory to the Owner.

644 Sanitary Spaces and Furnishings

655 Crew Galley

Not applicable

656 Crew Day Room

Not applicable

657 Staterooms

Not applicable

658 Toilet Spaces

Not applicable

662 Pilothouse Outfit

662.1 Consoles

The Pilothouse and Aft Control Station shall be fitted with consoles generally as shown on general arrangement.

Consoles shall be totally enclosed manufactured of steel with suitable stiffeners to support equipment installation. Hinged doors or removable panels shall be installed to provide access. Door sills shall be portable or removable. Stowage, equipment mounting surfaces, shelves, louvers, etc., shall be provided.

Equipment and instruments listed elsewhere herein shall be installed in consoles to provide complete operational control centers.

662.2 Furniture

The Pilothouse shall be furnished with the following commercial grade furniture and items:

- One marine clock, non-striking with 4" dial electric operation, color black
- One marine barometer, 4" dial, color black.
- One pilot chair with color to be determined by owner.
- Chart table of enameled steel construction with a single 5" deep chart drawer and cabinets below. Chart table shall be furnished with a Plexiglas surface and red light for night use. Provide two duplex electrical outlets at the chart table.
- Book shelf with three shelves.
- One life preserver (adult) storage rack suitable for two preservers as located by Owner.

662.3 Window Shades

Contractor shall provide and install window shades on windows located in Pilothouse longitudinal and aft bulkheads.

Shades shall be Solar Screen Kool Vue window shades made of Du Pont's Mylar polyester film. Shade pattern shall be smoke/smoke 4.5 gage material consisting of two layers of smoke Mylar on one of silver in the middle.

Provide and install all mounting hardware including metal clips at bottom of windows to restrain movement while shade is covering window.

662.4 Window Defrosters

662.5 Window Washers

663 Engineers Operating Station (EOS)

Not applicable

665 Machinery Spaces Outfit

See machinery arrangement

671 Lockers

672 Store Rooms

680 Life Safety/Emergency Equipment

Life rafts, life preservers and other equipment shall be marked with paint by stenciling in accordance with the U.S. Coast Guard regulations in effect at time of contract. Life preserver stowage shall be marked as required.

The type, quantity, location and installation of life saving appliances are subject to final approval of cognizant Officer in Charge, Marine Inspection.

681 Life Rafts/Buoyant Apparatus

682 Personal Life Saving Equipment

Provide, install, and stow as required the following equipment:

- Two (2) adult life preservers suitable for service intended.
- Two (2) adult work vest
- Four (4) Jim Buoy model JB-SO-30 life rings w/ M/N 1123-30 life ring brackets
- Two (2) Jim Buoy model 1820 man overboard lights
- Two (2) Jim Buoy model 1821 man overboard light brackets

Contractor shall stow life rings and man overboard lights as shown on Reference 6.4. Final stowage locations shall be approved by the Owner.

Contractor shall provide and install on each Main Deck life ring, 100 feet of 5/16", braided, orange, polyethylene rope. Contractor shall provide and install on two of the four life rings stowed on the Main Deck, 6 feet of 5/16", braided, orange, polyethylene rope with one end spliced to the life ring and other end spliced to a man overboard light.

Contractor shall provide and install all necessary ancillary materials and equipment, including but not limited to all stainless steel fasteners, lashing twine, rope, etc., for a complete and operational system.

683 Emergency Equipment

Emergency equipment shall be provided and installed generally as shown on plans.

683.1 Rescue Equipment

Contractor shall provide and stow on board vessel as directed by the Owner the following rescue equipment as supplied by Lifesaving System Corp. 220 Elsberry Road, Apollo Beach, FL 33572:

- One Medevac II litter, M/N 404-F w/flotation kit #101 installed and with litter hoisting sling M/N 193 (factory installed)

683.2 Defibrillator

Not applicable

683.3 Fire Axes

Contractor shall provide and install two (2) fire axes with stainless steel mounting brackets in locations as shown on plans.

683.4 Fire Extinguishers Hand Portable

As a minimum, the Contractor shall provide and install hand portable fire extinguishers, USCG-approved type in following locations:

▪ Engine Room	1	10# Dry Chemical
▪ Main Deck superstructure	1	10# Dry Chemical

GROUP 8 TESTING, INSPECTION, & DELIVERY

800 Tests and Inspections

841 Tests

Tests of structure, piping, machinery, and electrical systems shall be accomplished n accordance with applicable classification societies and regulatory agency test requirements.

This vessel shall be inspected in accordance with title 46 Code of Federal Regulations, Subchapter "H", and applicable classification society rules incorporated by reference therein. All tests shall be witnessed and approved by the Owner.

Three copies of all test records signed and dated by the Contractor, Owner, and USCG. (as required) shall be delivered to the Owner prior to the vessel leaving the Contractor's location. These records shall be bound in 3" D-style ring binders and properly labeled. Binders shall be black in color with clear cover to hold a label of 8-1/2" × 11" with the vessel's name, Contractor's name, and hull number. Three copies of the documents shall also be provided on CD.

Tests and trials shall be conducted by the Contractor at the Contractor's expense. Any deficiency recorded during the trials shall be corrected and given another trial similar to the original.

841.1 Welding

Welding shall be subject to inspection at any point in the process from fit-up to finish. Non-destructive inspection of all welds shall be performed at any point in the welding process at the discretion of the Owner.

Final welds shall be subjected to radiographic inspection in accordance with ABS Rules for Non-Destructive Inspection of Hull Welds, latest edition. Additional radiographs shall be taken for each failed radiograph, if any, in random locations designated by the Owner on a one-for-one basis.

All welds shall be subjected to visual inspection by the Owner to assure that they are free from surface discontinuities which might prove detrimental to the weld, such as undercut, porosity, cracks, melt through, burn through, etc.

841.2 Structural Tests

Voids and compartments below the Main Deck shall be proven watertight by testing at 1.5 PSI. While compartments and voids are under pressure, all boundaries shall be soaped to identify any leaks. Leaks shall be repaired by completely removing non-tight welds by grinding or other

suitable means and re-welded to the satisfaction of the Owner. No repair welding shall be accomplished while the compartment is being tested.

Watertight boundaries above Main Deck shall be proven by hose testing using a stream of water of at least 50 PSI directed at the boundary being tested to prove the boundary tight.

Any additional test to prove the integrity of the vessels structure which may be required by the USCG shall be performed as a part of this contract.

841.3 Piping System Tests

All tests of piping systems required by the USCG shall be performed as a part of contract.

All piping systems shall be tested using the medium normally carried in the system to a pressure of 1 1/2 times the system MAWP (Mean Actual Working Pressure), but in no case less than 50 PSI.

Hydraulic system piping shall be pickled and flushed.

Fuel system piping shall be flushed using diesel oil.

Test pressures shall be held for a minimum of thirty minutes to allow inspection of the entire piping system. After inspection of the system under pressure, the test pressure shall be monitored by a calibrated gauge, with a mid point range within 10% of the test pressure, for a minimum of one hour without any drop in pressure. The test gauge shall be at the opposite end of the piping system from the source of the test medium.

841.4 Electrical System Tests

Electrical systems shall be tested as prescribed in IEEE Standard #45 Section 46, ABS Rules for Building and Classing Steel Vessels Sections 35.161.2 and 35.161.3; and 46CFR 110.30.

The generators and switchboard shall be tested for the full anticipated load during an emergency condition. This shall include pumps, steering, lighting, rescue davit and any other expected loads as required. The list of items to be loaded on the switchboard shall be pre-approved by the Owner before test can begin.

841.5 Machinery Tests

Each piece of machinery shall be operated for a period sufficient to indicate satisfactory performance and operational acceptability, but not less than two hours. Each piece of machinery shall have its own test page or pages as required to record data with place for date, time and witnesses to test. Anticipated test results shall be pre-approved by the Owner.

841.6 Electronic Equipment Tests

All other machinery and equipment shall be tested to prove its satisfactory operation and performance to the satisfaction of the Owner.

841.7 Alarm System Tests

A pretest of all alarm points shall be conducted to verify alarm point settings and dependability of system. The test shall be conducted by the manufacturer so any adjustments can be made by the manufacturer and noted in the warranty paper work.

Any adjustments shall be documented and become part of the vessel trial records.

842 Dock and Sea Trials

A pre-approved agenda shall be used to conduct all dock trials. This document shall be signed by Contractor and by the Owner at the conclusion of each test.

Sea trials shall be conducted to check operation of steering gear and all equipment. The Owner shall be present to witness the trials. A minimum of two weeks notice shall be given by the Contractor to all parties involved as to the date(s) and time of the sea trials.

1. Main Engines and Gears
2. 12 VDC Panelboard
3. All Pumps
4. Steering System
5. Engine Controls
6. Compressed Air System
7. Bilge System
8. Fire Main System
9. Ballast System
10. Fuel Oil System
11. Electronics and Radios
12. Lighting (Interior and Exterior)
13. Windshield Wiper
14. Navigation Lights and Panel
15. Winches (Deck cable)
16. A-Frame (Winch and Hydraulic Cylinders
17. Air Horn
18. Compass calibration
19. Alarm systems (engines and fire)
20. Communications System (exterior)
21. Hawser Reel and Controls

22. Deck Capstan and Controls
23. Speed trials
24. Maneuvering trials
25. Full Power in two directions for two (2) hours
26. Bollard Pull Test (20 foot of water depth required)

842.1 Main Engines

Each propulsion engine and generator shall receive a sea trial audit in accordance with manufacturer requirements. Main and auxiliary engines shall be tested using manufacture provided testing equipment as required to provide an accurate PAR test, providing a baseline for future testing of equipment by the Owner.

842.3 Endurance Test

This trial shall consist of a run of at least four hours, two hours each in opposite directions, during which the following tests shall be conducted:

1. Full speed run for thirty minutes to record vessel speed. This test is to be conducted in both directions.
2. Speed runs at 10 knots, 8 knots and, 6 knots in both directions for a minimum of fifteen minutes each.
3. Full ahead for ten minutes to stop and stop to full speed. This test is to be conducted in both directions.
4. The vessel shall be steered hard over ahead and astern.
5. The vessel shall be steered hard over to record the turning radius with radar and GPS at four points of the compass.
6. All machinery equipment shall be tested during sea trials with the performance recorded in the test records to be turned over to the Owner.

842.4 Vibration Analysis

Not applicable

843 Stability/Inclining Test

After dock trials are completed a stability test an inclining shall be conducted by the Contractor. Contractor shall supply weights, crane or other means of shifting weights, labor as required, and cribbing for weights.

856 Instruction Manuals, Drawings, Delivery and Certificates

856.1 Manuals

Three sets each of the manufacturer's operating and maintenance manuals shall be furnished for all machinery and equipment furnished by the Contractor. Manuals shall contain operating, maintenance instructions, and a list of parts. These manuals, along with the test records, shall be delivered to the Owner prior to the vessel leaving the Contractor's facility. The Owner shall approve all departure documents which shall include all deliverable items at the time of departure.

856.2 Drawings

The Contractor shall provide as-built drawings on CD to the Owner prior to sea trials. The drawings shall include contract plans and all other plans noted herein required to construct the vessel including vendor detail drawings, schematics, and bill of materials including all vendor plans.

856.3 Delivery Ceremonies

N/A

856.4 List of Certificates to Be Provided

1. Builder's Certificate (furnished by shipyard)

2. Documentation Certificate (furnished by shipyard)
3. Admeasurement Certificates, Regulatory and International (furnished by shipyard)
4. Stability data and other stability documents for towing criteria (furnished by shipyard)
5. Radio License (furnished by Owner)
6. Compass Deviation Card (furnished by shipyard)
7. Certificate for machinery space flooding system (furnished by vendor)
8. Certificate of Financial Responsibility (furnished by Owner)
9. Final COI at Manns Harbor with NCDOT crew and acceptance

856.5 Progress Payment Schedule

The payment of event #2 is contingent on USCG approval of drawings prepared by Contractor.

EVENT /MILSTONES	PERCENTAGE
1. Signing of contract Mobilization	10%
2. Completion of engineering and drawings and purchase of major equipment	10%
3. Keel laying (10 tons of steel fabricated and erected)	10%
4. Completion of 50% of hull and house steel	10%
5. Fabrication, erection and welding of 100% of hull steel	10%
6. Fabrication, erection and welding of 100% all superstructure	10%
7. Installation of propulsion machinery	10%
8. Completion of all outfitting and painting	10%
9. Completion of all dock trials and sea trials	10%
10. Satisfactory completion of sea trials at Manns Harbor and Delivery	10%
Total	100%

557.0 Spares
All spares shall be delivered with vessel to owner at Manns Harbor, NC

1. Main Engine Complete with starter, and manuals
2. Main Engine Keel Cooler (Two complete sets for both main engines)
3. Reduction Gear (1) Including engine controls for one engine
4. Propulsion Shafts (2)
5. Propeller Shaft Aft and Forward Bearings (2)
6. Propellers (1RH & 1LH)
7. Hydraulic Steering Pump (1)
8. Hydraulic Steering Control Shuttle Valves (2) and control valves (NFU and FFU)
9 Hydraulic Steering Feedback Box
10. Rudder with nut and key stock (Upper and lower sections w/ bearings)
11. Rudder Hydraulic Cylinder (2)
12. A-Frame Hydraulic Winch
13. A-Frame Hydraulic Pump

14. A-Frame Hydraulic Control Valve (including hoses)
15. Deck Cable Winch Hydraulic Motor
16. Deck Cable Winch Hydraulic Control Valve (including hoses)
17. Hawser Winch Hydraulic Motor
18. Hawser Winch Hyd. Motor Control Valve (including hoses)

40’-0” Barge

Technical Specifications

Prepared for NCDOT Raleigh, North Carolina

February 28, 2019

Dejong & Lebet, Inc.

D L
Naval Architects
Marine Engineers
Consultants
Surveyors

William M. Hayden, PE
Digitally signed by William M. Hayden, PE
Date: 2019.03.02 14:51:01 -08'00'

WILLIAM HAYDEN
LICENSE
NO. 60106
STATE OF FLORIDA
PROFESSIONAL ENGINEER

TS-101

The two barges shall be constructed in accordance with the plans. The barge shall be 1/4" plate with 3" x 2" x 1/4" stiffeners. Major frames to be 1/4" x 9" x 3" flange plates. Bulkheads to be 1/4" with angle stiffeners. Brackets at all ends of stiffeners throughout Painting to be the same as tugs except no interior painting is required.

LISTING OF MBE/WBE SUBCONTRACTORS			Sheet _____ of _____	
Firm Name and Address	Item No.	Item Description	* Agreed upon Unit Price	** Dollar Volume of Item
Name Address				
Name Address				
Name Address				
Name Address				
Name Address				
Name Address				
Name Address				

***** The Dollar Volume shown in this column shall be the Actual Price Agreed Upon by the Prime Contractor and the MBE/WBE subcontractor, and these prices will be used to determine the percentage of the MBE/WBE participation in the contract.

** Dollar Volume of MBE/WBE Subcontractor Percentage of Total Contract Bid Price:
If firm is a Material Supplier Only, show Dollar Volume as 60% of Agreed Upon Amount from Letter of Intent.
If firm is a Manufacturer, show Dollar Volume as 100% of Agreed Upon Amount from Letter of Intent.

LISTING OF MBE/WBE SUBCONTRACTORS			Sheet _____ of _____	
Firm Name and Address	Item No.	Item Description	* Agreed upon Unit Price	** Dollar Volume of Item
Name Address				
Name Address				
Name Address				
Name Address				
Name Address				
Name Address				

***** The Dollar Volume shown in this column shall be the Actual Price Agreed Upon by the Prime Contractor and the MBE/WBE subcontractor, and these prices will be used to determine the percentage of the MBE/WBE participation in the contract.

**** Dollar Volume of MBE/DBE Subcontractor**
$_____

Percentage of Total Contract Bid Price
_____%

** Dollar Volume of MBE/WBE Subcontractor Percentage of Total Contract Bid Price:
If firm is a Material Supplier Only, show Dollar Volume as 60% of Agreed Upon Amount from Letter of Intent.
If firm is a Manufacturer, show Dollar Volume as 100% of Agreed Upon Amount from Letter of Intent.

FACILITY LOCATIONS:

All bidders shall specify, in the space provide below, the physical locations of the construction facilities, which will be used for the construction of this project.

This information will be used by the Board of Transportation when award is made to the Lowest Responsible Bidder. Any substitution of construction sites after award of contract must be approved by the Department. The Contractor shall submit any request for facility substitution through the Marine Engineer of the Ferry Division and must provide a valid basis or reason for proposed substitution acceptable to the Department.

_____

Physical Address

_____

City and State

_____

Physical Address

_____

City and State

_____

Physical Address

_____

City and State

_____

Physical Address

_____

City and State

LABOR AND MATERIALS SHEET

NEW CONSTRUCTION TWO 45'-6" SUPPORT TUGS WITH A-FRAME, TWO 25'-6" SUPPORT TUGS AND TWO 40'-0" DECK BARGES

INSTRUCTIONS: Contractor shall complete each item below by inserting the appropriate value for each. Please use pen for completion.

LABOR AND MATERIALS	PER HOUR COST
a. Price of Chipper	$_____
b. Price of Shipfitter	$_____
c. Price of Machinist	$_____
d. Price of Carpenter	$_____
e. Price of Electrician	$_____
f. Price of Rigger	$_____
g. Price of Pattern Maker	$_____
h. Price of Pipe Fitter	$_____
i. Price of Welder	$_____
j. Price of Sheet Metal Worker	$_____
k. Price of Painter	$_____
l. Price of Welder Helper	$_____
m. Price of Pipe Fitter Helper	$_____
n. Price of Electrician Helper	$_____
o. Price of General Labor (helper)	$_____
p. Price of Crane Operator	$_____
q. Price of Crane Service (overhead shop crane)	$_____
r. Price of Crane Service (crawler crane)	$_____
s. Price of Metal Prep (sand blasting or shot blast)	$_____
t. Price of Welding (per linear foot /pass)	$_____
u. Price of Galvanizing (hot dip process)	$_____

The price charged as itemized opposite each of the above listed artificers will, except as noted, include the cost of materials and tools such as gas, electricity, heat, compressed air, torches, air hammers, forges, welding equipment, welding iron, and all other materials normally employed by artificers in performing operations under their trades, but will exclude the cost of any other materials actually used by the artificers in these processes. When welding is performed, the required number of passes over one (1) foot of seam shall constitute one (1) linear welded foot. Materials used in work, if purchased from the Contractor, shall be priced at his invoiced cost, plus 15 %.

SS-5

Cost Breakdown Sheet

INSTRUCTIONS: Bidders shall complete each item below by inserting the appropriate value for each. Lump Sum shall be equal to the total of individual item cost. ***Use Pen Only***

Item Number	Item Description	Material	Labor	Total Cost (materials + Labor)
1	Bonding, Engineering & As-built Plans			
2	Hull (Material, Fabricate and Erect)			
3	Superstructure and Exhaust Stack (Material, Fabricate and Erect			
4	Bulwarks, Winches, A-Frame & Outfit (Material, Fabricate and Erect)			
5	Stairways, Ladders & Handrails (Material, Fabricate and Erect)			
6	Doors, Windows & Manholes (Purchase and Install)			
7	Main Engines and Gears (Purchase and Install)			
8	Piping Systems (Purchase and Install)			
9	Electrical (Generators, Switchboard, Panelboards and Wiring)			
10	Joiner (Passenger Lounge, Snake Bars and Wheelhouse)			
11	Shafting, Stern Tubes and Propellers (Purchase and Install)			
12	Rudders and Steering System (Purchase and Install)			
13	Electronics, Searchlight, Window Wipers (Purchase and Install)			
14	Fire, Safety and IBA Inflatables (Purchase and Install)			
15	Painting & Hull Markings (Purchase and Install Paint)			
16	Dock Trials, Sea Trials and Testing of Systems			
17	Spares Machinery (Purchase and ship to NCDOT Manns Harbor)			
18	Delivery, Final Trials and USCG Inspection (To NCDOT in Manns Harbor, NC)			
	Lump Sum Total Cost of all the above items			

Please transfer the Lump Sum total cost on the above line to the itemized proposal sheet on the next page

1. The values shall be rounded off by the bidder to contain no more than two decimal places.
2. Changes in any entry shall be made by marking through the entry in ink and making the correct entry adjacent thereto in ink. A representative of the bidder shall initial the change in ink.
3. The values used above shall match those used in the electronic Cost Breakdown version
4. The values listed above should be for all vessels identified in the proposal.

County : Dare

Line #	Item Number	Sec #	Description	Quantity	Unit Cost	Amount
			ROADWAY ITEMS			
0001	0005000000-N	SP	GENERIC FERRY ITEM TWO 25'-6" SUPPORT TUGS	Lump Sum	L.S.	
0002	0005000000-N	SP	GENERIC FERRY ITEM TWO 40'-0" DECK BARGES	Lump Sum	L.S.	
0003	0005000000-N	SP	GENERIC FERRY ITEM TWO 45'-6" SUPPORT TUGS WITH AFRAME	Lump Sum	L.S.	

1244/Feb26/Q3.0/D15000000/E3

Total Amount Of Bid For Entire Project : $_____

NOTE: In the case where there is a discrepancy between the Total Amount of Bid entered on the line above and the Lump Sum Total Cost entered on page SS-5, the Total Amount of Bid entered above shall govern.

EXECUTION OF BID

NON-COLLUSION, DEBARMENT AND GIFT BAN CERTIFICATION

CORPORATION

The prequalified bidder being duly sworn, solemnly swears (or affirms) that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the prequalified bidder has not been convicted of violating *N.C.G.S. §133-24* within the last three years, and that the prequalified bidder intends to do the work with his own bona fide employees or subcontractors and will not bid for the benefit of another contractor.

By submitting this non-collusion, debarment and gift ban certification, the Contractor is attesting his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. §133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF PREQUALIFIED BIDDER

_____
Full name of Corporation

_____
Address as Prequalified

Attest _____ By _____

Secretary/Assistant Secretary
(Select appropriate title)

President/Vice President/Assistant Vice President
(Select appropriate title)

_____
Print or type Signer's name

_____
Print or type Signer's name

CORPORATE SEAL

NON-COLLUSION , DEBARMENT CERTIFICATION AND GIFT BAN CERTIFICATION

PARTNERSHIP

The prequalified bidder, being duly sworn, solemnly swears (or affirms) that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the prequalified bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the prequalified bidder intends to do the work with its own bona fide employees or subcontractors and will not bid for the benefit of another contractor.

By submitting this non-collusion, debarment and gift ban certification, the Contractor is attesting his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF PREQUALIFIED BIDDER

_____

Full Name of
Partnership

_____

Address as
Prequalified

_____	_____
Signature of Witness	Signature of Partner
_____	_____
Print or Type Signer's Name	Print or Type Signer's Name

NON-COLLUSION , DEBARMENT CERTIFICATION AND GIFT BAN CERTIFICATION

LIMITED LIABILITY COMPANY

The prequalified bidder, being duly sworn, solemnly swears (or affirms) that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the prequalified bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the prequalified bidder intends to do the work with its own bona fide employees or subcontractors and will not bid for the benefit of another contractor.

By submitting this non-collusion, debarment and gift ban certification, the Contractor is attesting his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF PREQUALIFIED BIDDER

_____
Full Name of Firm

_____
Address as Prequalified

_____	_____
Signature of Witness	Signature of Member/Manager/Authorized Agent *(Select appropriate Title)*
_____	_____
Print or Type Signer's Name	Print or Type Signer's Name

NON-COLLUSION, DEBARMENT AND GIFT BAN CERTIFICATION

JOINT VENTURE (2) or (3)

The prequalified bidder, being duly sworn, solemnly swears (or affirms) that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the prequalified bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the prequalified bidder intends to do the work with its own bona fide employees or subcontractors and will not bid for the benefit of another contractor.

By submitting this non-collusion, debarment and gift ban certification, the Contractor is attesting his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF PREQUALIFIED BIDDER

Instructions: **2 Joint Venturers** Fill in lines (1), (2) and (3) and execute. **3 Joint Venturers** Fill in lines (1), (2), (3) and (4) and execute. On Line (1), fill in the name of the Joint Venture Company. On Line (2), fill in the name of one of the joint venturers and execute below in the appropriate manner. On Line (3), print or type the name of the other joint venturer and execute below in the appropriate manner. On Line (4), fill in the name of the third joint venturer, if applicable and execute below in the appropriate manner.

(1) _____
Name of Joint Venture

(2) _____
Name of Contractor

_____
Address as Prequalified

BY

_____ _____
Signature of Witness or Attest Signature of Contractor

_____ _____
Print or Type Signer's Name Print or Type Signer's Name

If Corporation, affix Corporate Seal AND

(3) _____
Name of Contractor

_____
Address as Prequalified

BY

_____ _____
Signature of Witness or Attest Signature of Contractor

_____ _____
Print or Type Signer's Name Print or Type Signer's Name

If Corporation, affix Corporate Seal AND

(4) _____
Name of Contractor

_____
Address as Prequalified

BY

_____ _____
Signature of Witness or Attest Signature of Contractor

_____ _____
Print or Type Signer's Name Print or Type Signer's Name

If Corporation, affix Corporate Seal

NON-COLLUSION , DEBARMENT CERTIFICATION AND GIFT BAN CERTIFICATION

INDIVIDUAL DOING BUSINESS UNDER A FIRM NAME

The prequalified bidder, being duly sworn, solemnly swears (or affirms) that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the prequalified bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the prequalified bidder intends to do the work with its own bona fide employees or subcontractors and will not bid for the benefit of another contractor.

By submitting this non-collusion, debarment and gift ban certification, the Contractor is attesting his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF PREQUALIFIED BIDDER

Name of Prequalified Bidder _____

Individual Name

Trading and Doing Business As _____

Full name of Firm

_____

Address as Prequalified

_____ _____

Signature of Witness Signature of Prequalified Bidder, Individual

_____ _____

Print or Type Signer's Name Print or Type Signer's Name

NON-COLLUSION , DEBARMENT CERTIFICATION AND GIFT BAN CERTIFICATION

INDIVIDUAL DOING BUSINESS IN HIS OWN NAME

The prequalified bidder, being duly sworn, solemnly swears (or affirms) that neither he, nor any official, agent or employee has entered into any agreement, participated in any collusion, or otherwise taken any action which is in restraint of free competitive bidding in connection with any bid or contract, that the prequalified bidder has not been convicted of violating *N.C.G.S. § 133-24* within the last three years, and that the prequalified bidder intends to do the work with its own bona fide employees or subcontractors and will not bid for the benefit of another contractor.

By submitting this non-collusion, debarment and gift ban certification, the Contractor is attesting his status under penalty of perjury under the laws of the United States in accordance with the Debarment Certification attached, provided that the Debarment Certification also includes any required statements concerning exceptions that are applicable.

N.C.G.S. § 133-32 and Executive Order 24 prohibit the offer to, or acceptance by, any State Employee of any gift from anyone with a contract with the State, or from any person seeking to do business with the State. By execution of any response in this procurement, you attest, for your entire organization and its employees or agents, that you are not aware that any such gift has been offered, accepted, or promised by any employees of your organization.

SIGNATURE OF PREQUALIFIED BIDDER

Name of Prequalified Bidder _____

Print or Type Name

_____

Address as Prequalified

_____

Signature of Prequalified Bidder, Individually

_____

Print or type Signer's Name

_____

Signature of Witness

_____

Print or type Signer’s name

SIGNATURE SHEET - BID ACCEPTANCE BY DEPARTMENT

Contract No. **C204310**

County: **Dare**

ACCEPTED BY THE
DEPARTMENT OF TRANSPORTATION

_____
Contract Officer

_____
Date

Execution of Contract and Bonds
Approved as to Form:

_____
Attorney General

DEBARMENT CERTIFICATION OF PREQUALIFIED BIDDER

Conditions for certification:

1. The prequalified bidder shall provide immediate written notice to the Department if at any time the bidder learns that his certification was erroneous when he submitted his debarment certification or explanation that is file with the Department, or has become erroneous because of changed circumstances.

2. The terms *covered transaction*, *debarred*, *suspended*, *ineligible*, *lower tier covered transaction*, *participant*, *person*, *primary covered transaction*, *principal*, *proposal*, and *voluntarily excluded*, as used in this provision, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. A copy of the Federal Rules requiring this certification and detailing the definitions and coverages may be obtained from the Contract Officer of the Department.

3. The prequalified bidder agrees by submitting this form, that he will not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in NCDOT contracts, unless authorized by the Department.

4. For Federal Aid projects, the prequalified bidder further agrees that by submitting this form he will include the Federal-Aid Provision titled *Required Contract Provisions Federal-Aid Construction Contract (Form FHWA PR 1273*) provided by the Department, without subsequent modification, in all lower tier covered transactions.

5. The prequalified bidder may rely upon a certification of a participant in a lower tier covered transaction that he is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless he knows that the certification is erroneous. The bidder may decide the method and frequency by which he will determine the eligibility of his subcontractors.

6. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this provision. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

7. Except as authorized in paragraph 6 herein, the Department may terminate any contract if the bidder knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available by the Federal Government.

DEBARMENT CERTIFICATION

The prequalified bidder certifies to the best of his knowledge and belief, that he and his principals:

a. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

b. Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records; making false statements; or receiving stolen property;

c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph b. of this certification; and

d. Have not within a three-year period preceding this proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

e. Will submit a revised Debarment Certification immediately if his status changes and will show in his bid proposal an explanation for the change in status.

If the prequalified bidder cannot certify that he is not debarred, he shall provide an explanation with this submittal. An explanation will not necessarily result in denial of participation in a contract.

Failure to submit a non-collusion affidavit and debarment certification will result in the prequalified bidder's bid being considered non-responsive.

☐ Check here if an explanation is attached to this certification.