



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

March 14, 2019

Addendum No. 2

RE: Contract # C204310

WBS # 47256.3.2

STATE FUNDED

Dare County (Tugs and Barges)

Construct 2 Support Tugs with A/Frame, 2 Support Tugs and 2 Deck Barges

March 19, 2019 Letting

To Whom It May Concern:

Reference is made to the plans and proposal form furnished to you on this project. The Department has since incorporated changes and has made every effort to highlight, in grey, the changes for your attention; however each bidder is advised to thoroughly review the plans and proposals and base their bid on its contents.

For your convenience, the following pages have been revised and revisions are highlighted in grey:

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| CS-29 |
| TS-1 - 4 |
| TS-12 - 14 |
| TS-48 - 50 |
| TS-53 |
| TS 61 - 63 |

Please void the above listed existing pages in your proposal and staple the revised pages thereto. In addition, on the cover page, please hand write the following statement “INCLUDES ADDENDUM No. 2 DATED 3-14-2019” below the text that states “INCLUDES ADDENDUM No. 1 DATED 3-4-2019”.

Please note that TS-1 and TS-48 will be sealed at a later date and those sealed sheets as well as the other revised sheets will be incorporated into the contract.

PLEASE ENSURE THAT YOU STAPLE THE NEW PAGES TO THE VOIDED PAGES. DO NOT SEPARATE THE BID PROPOSAL TO INSERT THE PAGES.

Sincerely,

DocuSigned by:

F81B6038A47A442...
Ronald. E. Davenport, Jr., PE
State Contract Officer

RED/jjl
Attachments

| | | |
|-----|-------------------------|-------------------------|
| cc: | Mr. Lamar Sylvester, PE | Mr. Ray Arnold, PE |
| | Ms. Jerry Jennings PE | Mr. Jamie Lancaster, PE |
| | Mr. Ron Hancock, PE | Mr. Mike Gwyn |
| | Mr. Jon Weathersbee, PE | Ms. Lori Strickland |
| | Mr. Ken Kennedy, PE | Ms. Jaci Kincaid |
| | Mr. Sterling Baker, PE | Ms. Penny Higgins |
| | Project File (2) | Mr. Mitchell Dixon |

CS-29

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. **Please note that if Contractor elects to deliver the vessels via another barge, NCDOT does not have the capabilities to offload the vessels. The Contractor shall provide necessary equipment to offload the vessels.**

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

25'-6" Harbor Tug

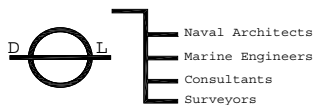
Technical Specifications

Prepared for NCDOT Raleigh, North Carolina

Revision 3

March 13, 2019

Dejong & Lebet, Inc.



GROUP 0 GENERAL PROVISIONS

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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) 280 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.

TS-3

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 × 280 = 560 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.

TS-4

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 8,000 hours)
4. Reduction Gear Extended Warranty (twelve months)

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261.2 Fuel System Tanks 6

262 Shaft Flushing Piping..... 7

237 Bilge Piping 7

237.1 Bilge Piping System Design 7

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 Nibral Bronze 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 60 months or 8000 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 "singling". Propellers shall be secured to the tail shafts with stainless steel propeller nuts and a stainless steel 1/4" 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 ratio shall be 2.88:1 at 280 hp at 2300 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

45'-6" Harbor Tug

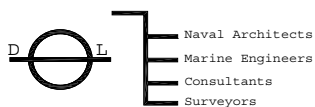
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References

- 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) 280 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.

TS-50

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 × 280 = 560 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

- 14.. Life Raft Certificate
- 15.. Main Engine Extended Warranty (five years or 8,000 hours.)
16. Main Gears Extended Warranty (12 Months)
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 200 PROPULSION & PIPING

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A-1 Outboard Profile

A-2 General Arrangement

Addendums

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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 60 months or 8000 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:

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- High Water Temperature Alarm
- Low Water Level (Jacket Water Only)
- Low 12 voltage to Engine ECM for Engine

236 Propellers

236.1 Propeller Details

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prior to machining and finishing. Propellers shall be dynamically balanced and the trailing edges of blades shall be properly ground to prevent "singeing". Propellers shall be secured to the tail shafts with stainless steel propeller nuts and a stainless steel 1/4" 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 ratio shall be 2.88:1 at 280 hp at 2300 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. 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.