

**APPENDIX A
Special Provision**

Description of Materials and/or Equipment for a Project, Related Work, and Schedule of Items

SCHEDULE OF ITEMS

Contractor _____

- The Bid must be Delivered to the precise location and by the precise time set forth in the Notice to Contractors or any applicable Bid Amendment.
- Required unit prices, lump sum prices and/or bid amounts must be provided and legible.
- Do not make handwritten changes to the bid documents.

Bidder is required to bid all Items.

EQUIPMENT	Quantity	Unit Price	Total Price = (Unit Price x Quantity)
New Caterpillar C32 EPA Tier III Main Propulsion Engines Standard Equipment specifications & requirements below	2	\$	\$
All Auxiliary Equipment & Particulars listed in Appendix A, Caterpillar Marine Propulsion Engines Model C32, US EPA Tier III Certified And Auxillary Equipment	2	\$	\$
New Caterpillar C4.4 EPA Tier III Marine Generator Sets Standard Equipment specifications & requirements below	2	\$	\$
All Auxiliary Equipment & Particulars listed in Appendix A, Caterpillar Marine Generator Sets C4.4 US EPA Tier III And Auxillary Equipment	2	\$	\$
TOTAL			\$

**Electronic bidding will NOT be
available
for this bid.**

**Bids will NOT be accepted
by email or fax.**

**SIGNED PAPER BIDS ARE REQUIRED
and may be
mailed, sent express or hand delivered.**

**For further information, see “BIDDING INSTRUCTIONS”
which are located near the front of the bid book.**

If a paper Bid is to be sent express, please take note that overnight services do not always arrive in time. Packages using express services should be sent to Maine Department of Transportation, 24 Child Street, Augusta, Maine.

CATERPILLAR MARINE PROPULSION ENGINES
MODEL C32, US EPA TIER III CERTIFIED
and AUXILLARY EQUIPMENT

Description The successful bidder will supply the following equipment and provide technical support for installation and warranty work.

Two (2) New Caterpillar model C32, US EPA Tier III certified marine propulsion engine, rated 750 BHP @ 1600-1800 RPM, with standard factory equipment, and Wide Operating Speed Range (WOSR) capability

This feature provides a constant power speed range from 1600-1800rpm. The engine's maximum speed can be adjusted using Cat ET to any point between this constant power speed range.

For many installations it can be beneficial or necessary to limit the maximum engine speed lower than the factory preset point of 1800rpm

Engines shall be Keel cooled and provided with the following standard and optional equipment.

AIR INLET SYSTEM

Separate Circuit After-Cooled (SCAC)
Turbochargers, jacket water cooled
Turbochargers inlet, 152 mm (6 in) OD straight connection

CONTROL SYSTEM

Programmable Low Idle (550 - 750 rpm)
WOSR (Wide Operating Speed Range)
Programmable High Idle Limit for WOSR Ratings
Electronic diagnostics and fault logging
Engine and transmission monitoring (speed, temperature, pressure)
Electronic fuel/air ratio control
Engine Protection Mode for extended ambient conditions
Torque Limiting functionality for WOSR ratings only
70-pin customer connector
Throttle Input signal options 0 - 5 Volts 4 - 20 mA PWM (Pulse Width Modulated)

COOLING SYSTEM

Separate Circuit After-Cooling (SCAC) for Keel cooled engines
SCAC pump, gear driven
Jacket water pump, gear driven
Expansion tanks not included

EXHAUST SYSTEM

Water-cooled exhaust manifold & turbocharger
4 Bolt 130 mm (5.12 in) diameter flanged outlet

FLYWHEELS & FLYWHEEL HOUSINGS

SAE standard rotation (CCW facing flywheel end)
Flywheel Housing: SAE No. 0
Flywheel: SAE No. 18 inch, 136 teeth

FUEL SYSTEM

Fuel supply size: JIC 37 Deg -10 (7/8-14)
Fuel transfer pump, gear driven
Manual fuel priming pump
Hybrid fuel line design

LUBE SYSTEM

Oil pump, gear driven
Deep sump oil pan

GENERAL

Common electrical bonding point
Engine does not ship with zinc components

CERTIFIED TO EPA TIER 3 MARINE COMMERCIAL PROPULSION(E3) CYCLE EMISSIONS STANDARDS

CERTIFIED TO IMO II MARINE COMMERCIAL PROPULSION (E3) CYCLE EMISSIONS STANDARDS

Optional Equipment Included:

- **Keel cooling SCAC** (Separate Circuit Aftercooled) with maximum allowable aftercooler inlet water temperature of 52 deg C
- **Ansi Flange Connections:** Provides installed isolation bellows for flanged jacket water and aftercooler connections.
- 1-1/2 inch class 150 ANSI connection inlet and outlet.
- 24-volt electrical system
- **Alternator:** 24-volt, 105-amp alternator- installed on main engine # 2 only
- **Starting System:** Compressed air starter motors installed with 24 volt start solenoid and manual override. Mounted on right side (RH) of engine. Air pressure regulator with 1-1/2 inch std. pipe thread connections is included. Serviceable 300 mesh screen filter with 1-1/2 inch std. pipe thread connections is included.
- **Engine room instrument panels:** MECPI, inboard mounted on each engine. Monochrome display of basic J1939 diagnostic and engine parameters such as engine speed, coolant temp,

oil pressure, etc., with visible and audible alarms, Start/Stop buttons, and Off/Local/Remote switch

- **Pilot House Instrument Panel:** Caterpillar CMD 8(Color Marine Display) One (1) electronic display per engine for monitoring vessel information. Features an 8" LCD touch screen with LED backlight technology. Supports 2 CAN, 2 Ethernet, 2 USB 2.0, and 1 RS485. Displays engine, transmission, and vessel information. 24 VDC. Shipped Loose for installation in the pilot house
- **Common Ground** wiring system and start/stop panels, for each pilot house station. Shipped loose and includes all interface harnesses. Final lengths to be determined
- **Lube oil drain lines:** Installed on each engine and transmission with isolation valves and manifold with center tap for customer supplied oil change system.
- **Duplex Fuel Filters:** Unit mounted / RH side on Port engine / LH side on Starboard engine
- **Spray Shielding:** To meet SOLAS regulations that require spray protection for liquid fuel and oil connections
- **Jacket Water Heater:** 240 Volt /1000 watts. Heating element installed at the engine jacket water coolant bonnets on the left hand and right hand side of the engine below the exhaust manifolds near the rear of the engine. Thermostat is installed at the right rear location of engine head. Shipped loose power cord assembly has length of 6.1 m (20 ft.) and is to be installed / wired by customer.
- **Dual Dry Exhaust Elbows:** 90-degree dry exhaust elbow for turbocharger outlet connection, 4-bolt flange, 203 mm (8 in) I.D. Includes Weldable mating flange, gasket, and hardware.
- **Heavy-duty front support** group which spans 914.4 mm (36 in), or 863.6 mm (34 in) from centerline of crankshaft.
- Separate circuit cooling for jacket water and aftercooler circuits
- **Torsional Vibration Analysis:** One (1). Provides a torsional report for a simple marine propulsion system powered by a Caterpillar engine. The report includes natural frequency calculations, mode shapes and forced vibration predictions for the engine, coupling, gear box and propeller shafting.

- **The following technical information is needed to perform the TVA:**
 - Coupling mass-elastic data. This includes coupling inertia and torsional stiffness. Provide complete coupling part number and
 - catalog reference sheets if available.
 - Marine gear mass-elastic data. Provide the gear manufacturers mass-elastic data sheet. If the data sheet is not available provide the manufacturer name, model number and gear ratio.
 - Propeller shaft. Provide dimensioned shaft drawings and shaft material. If shaft drawings are not available provide shaft diameter and length.
 - Propeller. Provide propeller drawing with listed inertia. If the draw or inertia value is not available provide propeller diameter and number of blades
- IMO II and EPA EIAPP Certificates: These certifications include serial number specific technical files certified by EPA
- Operation and maintenance, and parts manuals: Electronic versions, three (3) copies

- Commercial Paint Finish / Engine Color – CAT Yellow
- Standard engine preservation
- Shrink wrap protection
- Initial fill of Engine and Transmission Lube oil

Marine Transmission:

Twin Disc Model MGX-5225DC 4.03:1 vertical offset, and supplied with:

- Main oil pump with filter and cooler
- 24-volt Electric shift solenoid (quick shift technology)
- Pressure and temperature sensors Installed and compatible with Caterpillar ECM
- Torsional input coupling
- Output companion flange – final bolt pattern pending for shaft brake interface
- Parts & Service Manuals
- Factory endorsed commissioning, startup, and sea trials
- Factory certified Tech Rep for commissioning, startup, and sea trials
- Transmission oil cooler / shipped loose for shipyard mounting and connections to SCAC keel cooling circuit
- Transmission lube lines: Final lengths to be determined.

Engine Control System:

Twin Disc EC300. The electronic control system shall provide control of the main governors, and reverse/reduction gears.

System shall include:

- A failure alarm system shall be provided for the control and hydraulic system functions.
- Tech Rep for commissioning, startup, and sea trials.
- Two (2) Main Engine control system stations. One (1) located in the pilothouse at the helm station, and one (1) control station located in the engineers operating station, located in the engine room.
- Two (2) Displays, one located in the pilot house station, and one (1) in the engineers operating station
- PSTP and DVTP requirements

Shop Prep:

- Installation of marine gears
- Installation of test probes for sea trial documentation
- Shrink Wrap protection for transport

Start-up / Sea Trial / Formal Commissioning:

- Shipyard installation guidance shall be provided by a dedicated Milton Cat project manager.
- Initial start-up and installation audit shall be provided prior to final sea trial date.
- Milton Cat will arrange for initial start-up, dockside trials, Full PAR testing, and formal commissioning

MSFS Rockland
WIN 23901.00
M/V Captain E. Frank Thompson
Marine Main Propulsion Engines and Generator Sets
July 29, 2021

Warranty:

One full year Caterpillar warranty from the in-service date of the engine for all Cat content.
Manufacturer's one year warranty shall apply for all non-Cat content.

Supplier will provide technical support for installation and start-up of both units. Manuals, both spare parts and operational, will be supplied with each engine. Technical support will be provided for heat rejection calculations and exhaust sizing to ensure engines will work adequately with existing keel coolers and exhaust silencers if requested.

CATERPILLAR MARINE GENERATOR SETS C4.4 US EPA TIER III
and AUXILLARY EQUIPMENT

Description The successful bidder will supply the following equipment and provide technical support for installation and warranty work.

Two (2) new Caterpillar model C4.4 MARINE GENERATOR EPA Tier 3 99ekW @ 1800rpm Prime Power Rating.

Units shall be equipped with the following standard and optional equipment.

Standard Equipment:

AIR INLET SYSTEM

Open Crankcase Ventilation (OCV) system
Turbocharger, jacket water cooled
Integrated coolant lines into manifold utilizing EGR circuit

CONTROL SYSTEM

Panels available in RH, LH, and rear configurations with a remote mount option.
Electronic diagnostics and fault logging
Electronic governor
Electronic Control Module (ECM)
SAE J1939 data link Ratings Only
Electronic fuel/air ratio control

COOLING SYSTEM

Compact design integral coolant passages
Thermostat and housing
Jacket Water Heater 120/240V option
Auxiliary seawater pump, gear driven
Engine mounted heat exchanger, removable tube Bundle (for sea water)
Engine oil cooler
Auxiliary sea water lines
Keel cooling

EXHAUST SYSTEM

Water-cooled exhaust manifold & turbocharger
102 mm (4 in) round flanged outlet
Dry Elbow/Bellows/Flange options

FLYWHEELS & FLYWHEEL HOUSINGS

Flywheel Housing, SAE No. 3
Flywheel, 126 teeth
SAE standard rotation

FUEL SYSTEM

Common Rail Fuel System
Simplex and Duplex Fuel options
Flexible fuel line option
Fuel transfer pump, gear driven

GENERATORS AND GENERATOR ATTACHMENTS

12 leads 3 phase Brushless
Separately excited from auxiliary winding to provide 300% short circuit current up to 10 seconds
2/3 Pitch
Broad voltage band
IP23 Water protection
Solid state voltage regulator with integral voltage adjustment
Class H insulation
Generator winding temperature rise meets marine society requirements.

LUBE SYSTEM

Crankcase breather
Simplex and Duplex options
Oil filter, RH service
Oil filler, in valve cover and timing case (option)
Oil level gauge, RH service
Oil pan drain, RH
Lubricating oil
Engine oil pump (gear driven)

MOUNTING SYSTEM

Formed C-channel rails
Anti vibration isolators between base and engine-generator

POWER TAKE-OFFS

Multi-V groove for alternator drive
PTO Shaft Kit (optional)

GENERAL

Paint, Caterpillar yellow

Lifting eyes

Protective lifting covers

Literature

Battery disconnect switch

Plastic wrap packaging

Keel-cooled gen sets do not include the keel cooler(s).

**CERTIFIED TO 2013 EPA TIER 3 COMMERCIAL AUXILIARY (D2 CYCLE)
EMISSIONS STANDARDS.**

Optional Equipment included:

- 24v 55A Charging Alternator
- 24v Air starting motor
- 208v AC Voltage
- Jacket Water Heater 120V
- Droop kit option
- Package mounted EMCP 4.2 controller, E-stop and Annunciator in an IP44 enclosure. LH Mount
- Dry Exhaust elbow & flange

Warranty:

- Standard Caterpillar one-year commercial warranty shall apply for all Caterpillar content.
- Manufacturer's warranty shall apply for all non-Cat equipment.
- All warranties shall begin on the actual in-service date of the new engine.

Supplier will provide technical support for installation and start-up of both units. Manuals, both spare parts and operational, will be supplied with each engine. Technical support will be provided for heat rejection calculations and exhaust sizing to ensure engines will work adequately with existing keel coolers and exhaust silencers if requested.

FOR ALL BID ITEMS

Technical support for installation and warranty The Contractor shall provide technical support during installation and for all warranty work. The Contractor shall be an authorized Caterpillar dealer. The Contractor shall ensure that all equipment installation will be done in accordance with U.S. Coast Guard regulations applicable to this work and is performed so as to ensure optimum performance of each individual piece of equipment. The Contractor shall conduct a pre-inspection prior to initial start-up and confirm suitability of installation. Upon initial start-up, the Contractor shall adjust engine speeds, confirm operational parameters are met, and adjust as necessary to bring within parameters. During first post installation sea-trial, the Contractor will be in attendance for a minimum of four hours during full-power test trials.

After bid opening and as a condition for Award of a Contract, the Department may require an apparent successful Bidder to demonstrate to the Departments satisfaction that the Bidder is responsible and qualified to supply the materials and perform the technical support.

Contractor must:

- Be an authorized Caterpillar dealer
- Be able to perform highly complex electrical, electronic, mechanical, and computer tasks
- Have a reliable vehicle (Service Truck) assigned to provide transportation to and from employee's place of residence and/or workplace during normal work hours. Vehicle must carry all tools, supplies, and equipment needed for job duties
- Have all tools and necessary equipment needed to perform required duties
- Be able to read, interpret, and construct a project from plans and specifications
- Have knowledge of all codes, OSHA requirements and Department safety policies as they relate to ferry vessels
- Knowledge of US Coast Guard regulations as they pertain to subchapter H and K ferry vessels
- Have, and use properly, all Personal Protective Equipment needed to perform job duties and comply with established safety guidelines and procedures
- Be able to work effectively with minimum supervision
- Be equipped with a pager and cell phone with the ability to be contacted at all times.

Delivery

The Contractor shall deliver the materials to the Installation Site, Rockland Marine Corporation Shipyard, located at 79 Mechanic Street, Rockland, Maine, on or before March 31st, 2022. The Contractor shall notify MaineDOT, Patrick Eutsler, Port Engineer, cell phone 207-446-1124 a minimum of one week prior to delivery for delivery coordination. Alternative contact is Jim Savoy, Assistant Ferry Port Engineer 207-441-8262. The Contractor shall deliver the materials only during the following times: Monday through Friday, 7:00 AM through 3:30 PM except for holidays and government closure days. The Rockland Marine Shipyard will offload the materials at the delivery site.

Equipment or Vehicle Disposal

Each engine being replaced must be scrapped or rendered permanently disabled prior to the Buyer submitting the payment request to MaineDOT in accordance with Appendix C.

Contract Administrator The Contract Administrator for this contract will be:

Name: Patrick Eutsler
Title: Ferry Service Port Engineer
Address: **Maine Department of Transportation/Maine State Ferry Service
517A Main Street, P.O. Box 645, Rockland, ME 04841-0645
Phone: (207) 596-5429**

The Contract Administrator shall be the Department's representative during the period of this Contract. The Contract Administrator has authority to curtail work if necessary to ensure proper execution of the Contract, to take actions needed to assure that the Contractor's Work and Materials conform with the Contract, to decide questions regarding quality and acceptability of Work and Materials, to reject Unacceptable or Unauthorized Work or Materials and to refuse to approve Progress and Final Payments until acceptable. The Contract Administrator shall certify to the Department when payments under the Contract are due and the amounts to be paid. He/she shall make decisions on all claims of the Contractor. Unless authorized by the Contract Administrator, other Departmental employees are not authorized to alter or waive the provisions of the Contract or to issue instructions contrary to the Contract. All progress reports, correspondence and related submissions from the Contractor shall be submitted to the Department's Project Manager who is designated as the Contract Administrator on behalf of the Department for this Contract, except where specified otherwise in this Contract.

Conformity with Standards

Unless otherwise provided in the contract, all materials shall conform to the following standards, as applicable, and industry standards prevailing at the time of bid:

46 CFR/Subchapter H and F
EPA Tier III
American Bureau of Shipping

Material Quality Materials and manufactured products shall be new unless otherwise specified, free from defect, and in conformity with the contract. If there is no applicable standard set forth in this Contract for a particular item, then the item shall be in accordance with industry standards prevailing at the time of bid. The Department has the authority to inspect all Materials and every detail of the Work.

When material is fabricated or treated with another material or where any combination of materials is assembled to form a finished product, any or all of which are covered by specifications, the Department may reject the finished product if any of the components do not comply with the

specifications. The Department may reject materials not conforming to the Specifications at any time.

The Contractor hereby assigns to the Department the right to enforce all manufacturer's warranties or guarantees on all materials, equipment or products purchased for the work that exceed the nature or duration of the warranty obligations assumed by the Contractor under this Contract. The Contractor agrees that the warranty obligations provided by this Contract shall be reported as an outstanding obligation in the event of bankruptcy, dissolution, or the sale, merger, or cessation of operations of the Contractor.