TECHNICAL SPECIFICATIONS

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION
FERRIES DIVISION

M.V. SUQUAMISH DRYDOCKING
CONTRACT NO. 00-9684

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TECHNICAL SPECIFICATIONS

For the following Technical Specifications, the Contractor is to provide all labor, material and equipment to accomplish each and every Bid Item unless otherwise specified.

The Contractor shall provide Material Safety Data Sheets (MSDS) of the Paint to be used on the Vessel to the WSF Project Engineer at the Contract Pre-Arrival Conference. No painting of the Vessel shall be started until the Material Safety Data Sheets are provided.

For the following Technical Specifications, the Contractor is to provide all labor, material and equipment to clean and gas free all spaces including any tanks, piping and reservoirs associated with the Work, as necessary, and obtain a Marine Chemist certificate for "SAFE FOR WORKERS", and "SAFE FOR HOT WORK". Maintain the certificate during the course of the Work. Provide fire watches as required.

Reference: Supplemental Specifications

WSF 001, MARINE COATING AND COLOR SCHEME SPECIFICATIONS

Area Preparation, Surface Preparation, Grit Blasting, Paint Coatings and Inspection for Vessel's hull, Curtain Plates, casing and super structure shall be in accordance with WSF 001, Marine Coating and Color Scheme Specifications, unless otherwise specified in the following Specifications. Revision 7/2020.

WSF 002, ELECTRICAL INSTALLATION SPECIFICATIONS

Details of all electrical installations shall be in accordance with WSF 002, Electrical Installation Specifications, unless otherwise specified in the following Specifications. Revision 01/2007.

WSF 003, GENERAL CONSTRUCTION REQUIREMENTS

Details of all structural and mechanical installations shall be in accordance with WSF 003, General Construction Requirements, unless otherwise specified in the following Specifications. Revision 04/2007.

WSF 004, REMOVAL CATEGORIES AND REQUIREMENTS

Details of all removal categories shall be in accordance with WSF 004, Removal Categories and Requirements, unless otherwise specified in the following Specifications. Revision 04/2007.

All Work accomplished under this Contract, unless specifically specified differently in a Work Item in this Technical Specification, shall be in accordance with the requirements of the **IFB Volume I, Part 2, Supplemental Specifications, WSF 001 - WSF 004** cited above, the IFB Contract Drawings and all other IFB documents, as amended.

1. DRYDOCK VESSEL

M.V. SUQUAMISH Vessel Particulars:

Length: 362' 3", Beam: 83' 2", Draft: 18', Displacement: 4,384 LT.

A. Drydock M.V. Suquamish ("Vessel") within one (1) calendar day of Vessel arrival for cleaning, painting, inspections, and the Work specified herein.

B. The Vessel shall be blocked to expose the block positions used at the previous docking. The **DWG 9001-667-001-09, M/V Tokitae 144 – Auto Ferry, Docking and, Underwater Survey Plan** is provided for reference.

1. Provide the Contractor's docking plan 4 working days prior to the drydocking.

NOTE:

There is no Frame 0 on the Olympic class Vessels.

C. Block spacing shall be at twelve foot (12') centers. Within twenty-four (24) hours of docking, provide three (3) copies of the block position drawing to the WSF Inspector indicating the block positions used.

2. TEMPORARY SERVICES

A. Install one (1) telephone on board in a location designated by the Vessel Staff Chief Engineer. The telephone is to have one (1) outside line with toll-free access to Seattle and vicinity and, if different, one (1) line for local numbers. The telephone shall have touchtone service if available from the Contractor's telephone system. Provide one (1) high-speed internet connection onboard in a location designated by the Vessel Staff Chief Engineer. The Contractor, as an alternative to a direct high-speed internet connection, may provide a wireless internet connection to the Vessel that will provide an unobstructed and constant wireless high-speed internet connection.

B. Provide and maintain 200 Amp electricity, certified potable water, sewage removal, safe lighted gangway and trash removal services while Vessel is in the Contractor's facility.

1. For estimating purposes, assume the sewage tank to be pumped once with a tank capacity of 8,000 Gallons.

C. Provide safety and security with continuous on site personnel for the entire Vessel throughout this performance period until such time as the WSF Representative has accepted re-delivery of the Vessel. Every reasonable precaution shall be taken to protect the Vessel from the hazards of fire, flooding, pilferage, malicious damage and other events, including cataclysmic phenomena of nature.

D. Provide and maintain comprehensive and effective fire prevention and fire detection, and fire fighting programs and systems sufficient to ensure the safety and integrity of the Vessel. Provide personnel trained in shipboard fire fighting techniques and also trained to cooperate with and assist local fire fighting organizations. Provide sufficient shore fire lines to ensure an adequate supply of fire fighting water, at sufficient pressure, and maintain an adequate number of tested fire-hoses aboard the Vessel to effectively fight fires at any location in the Vessel.

E. Provide and maintain portable fire extinguishers in sufficient quantity, and of the appropriate type, to combat local fires of any class. Provide sufficient fire watches, including roving watches as may be required, to ensure that fires that may be inadvertently started by welding sparks or heat, electrical malfunction, or spontaneous combustion are detected, reported and promptly extinguished.

F. Tow Vessel from WSF Eagle Harbor Facility to Contractor's Facility

G. Tow Vessel from Contractor's Facility to WSF Eagle Harbor Facility

H. Provide six (6) crane lifts to support WSF, including all necessary chasing and rigging support and forklift moves, to lift palletized material on and off of the Vessel. All lifts are to be pre-authorized by WSF Inspectors. The Contract Price will be adjusted upward or downward, based on the crane lift Unit Price.

1. For estimating purposes, assume the crane lifts to be no greater than 1000 lbs., 4' x 4' x 4' to the Nav/Bridge deck.

NOTE:

In addition to the Temporary Service Requirements, there are additional WSF Personnel Facility Requirements in the IFB Special Provisions.

I. Provide AMS-STD-595A Color chips with certificates of conformity, for seven colors, to WSF Inspectors to ensure the WSF specified paint colors match applied coatings. A known source for Federal Standard color chips including a Certificate of Conformity is listed below.

1. http://standards.sae.org/amsstd595a/

3. SEA VALVE INSPECTION

A. Remove, open, clean and inspect all valves listed below in this Item for mechanical operation, condition of valve, condition of the valve seats and seals. All two inch (2") and below valves shall be replaced with in kind Contractor furnished new USCG approved sea valves. Sea valves that are replaced shall remain the property of WSF.

B. Open the below listed sea valves, clean and inspect as required for inspection on theVessel. Complete inspections and submit inspection reports no later than five (5) calendar days after drydocking.

SEA VALVE LIST					
	LOCATION	**SERVICE**	**TYPE**	**SIZE**	**QUANTITY**
1	No. 1 Engine Room	Bilge pump overboard	Flanged gate valve	5”	1
2	No. 2 Engine Room	Bilge pump overboard	Flanged gate valve	5"	1
3	No. 1 Engine Room	Sea chest suction	Flanged gate valve	4”	1
4	No. 2 Engine Room	Sea chest suction	Flanged gate valve	4”	1
6	No. 2 Engine Room	Sea chest suction	Flanged gate valve	10”	1
7	No. 1 Engine Room	Sea chest blow down	Flanged ball valve	½"	1
8	No. 2 Engine Room	Sea chest blow down	Flanged ball valve	½"	1
9	No. 1 Engine Room	Sea chest vent	Flanged gate valve	2”	1
10	No. 2 Engine Room	Sea chest vent	Flanged gate valve	2”	1
11	No. 1 Engine Room	Fire pump overboard	Flanged gate valve	4”	1
12	No. 2 Engine Room	Fire pump overboard	Flanged gate valve	4”	1
13	No. 2 Engine Room	Sprinkler pump overboard	Flanged gate valve	6”	1
14	No. 1 Engine Room	Bilge pump overboard	Check valve	5”	1
15	No. 2 Engine Room	Bilge pump overboard	Check valve	5”	1
16	No. 1 Engine Room	Fire pump overboard	Check valve	4”	1
17	No. 2 Engine Room	Fire pump overboard	Check valve	4”	1
18	No. 2 Engine Room	Sprinkler pump overboard	Check valve	6”	1

C. Sea valves shall be inspected by the WSF and USCG Inspectors and the Vessel Staff Chief Engineer for the following:

1. General material condition.
2. Valve disk to valve seat contact.
3. Proper mechanical operation.

D. Upon completion of valve overhaul, and prior to installation, hydrostatically test all overhauled and new valves to the satisfaction of the WSF and USCG Inspectors and the Vessel Staff Chief Engineer.

E. Remove all sea growth and/or all rust build-up in associated connecting piping between the sea chest and strainers. Sea chests, strainers and piping shall be inspected for cleanliness by the WSF Inspector and the Vessel Staff Chief Engineer prior to closing up. **WSF DWG 9001-6674-058-01, New 144 – Car Ferry, Firemain System Piping Diagram** is provided for reference.

F. Reinstall all valves using new Contractor furnished gaskets and 316 Stainless Steel Fasteners.

G. Inspect for water leakage prior to launching. Required repairs to stop leakage will be made at the Contractor's sole expense.

H. Prepare and Coat all new and disturbed areas in accordance with **WSF 001, Marine Coating and Color Scheme Specification**.

4. ANODE RENEWALS

A. Remove the existing anodes and bolts; renew with new bolts, studs and bolt-on aluminum anodes, meeting MIL-DTL-24779C. **WSF DWG 9001-703-002-02, M/V Tokitae, Anode Installations** and **WSF DWG 9001-667-001-09, M/V Tokitae 144 – Auto Ferry, Docking and, Underwater Survey Plan** are provided for guidance and documentation.

B. Install **54** each AHC-10, **66** each ASC-11, **50** each AHS-37, and **2** each WSF 22-B, bolt-on aluminum anodes, at the following locations:

1. Located on the hull there are 24 each AHC-10 anodes. Plan view 7-C & 8-C.
2. Located on the rudders there are 24 each AHC-10 anodes. Elevation 7-A
3. Located inside the rope guards there are 4 each AHC-10 anodes cut in half. Elevation 7-A
4. Located on the propeller hubs there are 2 each WSF 22-B aluminum anodes 9 1/2 DIA WITH 7 1/2" DISTANCE X .54" HOLE CENTERS SIZE.
5. Auxiliary Coolers No. 1 have 12 each ASC-11 and 12 each AHS-37 anodes. Plan 15-A.
6. Main Engine No. 1 has 8 each ASC-11 and 10 each AHS-37 anodes. Plan 18-A.
7. Ships Service Diesel Generator No. 2 has 16 each ASC-11 and 4 each AHS-37 anodes. Plan 18-C.
8. Auxiliary Coolers No. 2 have 12 each ASC-11 and 12 each AHS-37 anodes. Plan 22-A.

9. Main Engine No. 2 has 8 each ASC-11 and 10 each AHS-37 anodes. Plan 26-A.

10. Ships Service Diesel Generator No. 3 has 8 each ASC-11 and 2 each AHS-37 anodes. Plan 27-C.

11. The engine room No. 1 sea Chests has 2 each ASC-11 anodes.

12. The engine room No. 2 sea chest has 2 each AHC-10 anodes.

C. All AHS-37 anodes will need to have holes at each end of the straps drilled to 17/32" dia. using detail 15-D for reference.

D. Install the cooler anodes using Details 19-A, 20-C, 24-A, and 24-B for reference. Renew the anode isolation washers for each anode using **WSF DWG 9001-703-002-02** as guidance.

1. DO NOT overtighten the Keel cooler isolation fasteners (shown on detail 20-C), causing the shoulder washers to be damaged.
2. Provide 20 extra shoulder washers for torque testing.
3. Include the G10 stud isolator sleeves shown on **WSF Sketch 001** to isolate the stud between the shoulder washers.

E. Install copper ground strap connections on each keel cooler as shown on Detail 19-A.

F. Perform a continuity test of all keel cooler anodes to prove that they are dielectrically isolated from the hull and cooler guards, in the presence of WSF Inspectors and the Vessel Staff Chief Engineer.

G. Use new 316 Stainless steel nyloc nuts and washers on all of the anodes and ground straps fasteners. Secure hub anode fasteners with LOCTITE® 242™ THREADLOCKER.

H. A known shoulder washer supplier is ELECTRO-GUARD Marine Corrosion Solutions.

1. ELECTRO-GUARD
Marine Corrosion Solutions
P.O. Box 1719
Mount Shasta, CA 96067
Telephone(530)926-4000
FAX(530)926-4221
Support; techsupport@boatcorrosion.com

I. The Contractor Shall Document the placement of all anodes by creating a red line drawing of the anode drawing.

5. USCG U / W HULL AND INTERNAL INSPECTIONS

A. Contact the local United States Coast Guard Officer in Charge Marine Inspection (OCMI) to arrange and coordinate the Drydock and Internal Structural Examination (ISE) and other necessary inspections during the drydock performance period. Coordinate and schedule all inspections with WSF Inspectors and the Vessel Staff Chief Engineer.

B. The Contractor will be responsible for scheduling ongoing USCG inspections on Contract Work Items during the performance period as required to complete on schedule.

C. Complete initial inspections within 2 days of drydocking.

D. Provide the name of the Coast Guard Officer assigned and contact information at the Contract pre-arrival conference.

1. The contact information for the local Officer in Charge of Marine Inspection (OCMI) dispatch office:

USCG Sector Puget Sound
Building 4 Inspections
1519 Alaskan Way S.
Seattle, WA 98134
(206) 217-6208
secseadispatch@uscg.mil

E. Provide the services of a Marine Chemist to certify all voids and tanks throughout the Vessel "SAFE FOR WORKERS TO ENTER".

F. Maintain the Chemist certificate for the duration of the performance period.

G. Provide lighting and ventilation as necessary to facilitate the WSF and USCG Inspection and any other work to be performed in the Void spaces.

H. Upon completion of work in the Voids, close up the Voids using new Contractor furnished grommets, gaskets and fasteners.

6. RUDDER INSPECTION, NO. 1 AND NO. 2 ENDS

A. Drain and static pressure-test rudders for leaks in the presence of the WSF Inspector. Test pressure shall be 42" of water with Manometer, or 1.5 PSI on acceptable calibrated pressure gage that has 1.5 PSI at mid-scale range. Accepted test is no leaks for one (1) hour. Provide three (3) copies of the test results to the WSF Inspector.

B. Take and record clearances of the rudder stock, rudder trunk and rudder flap on the No. 1 and No. 2 End rudders. Cycle each rudder from hard over to hard over in the presence of the WSF Inspector recording the time and total travel.

1. Use a dial gauge arranged to measure the movement between the rudder stock and the rudder trunk to check neck bearing clearances using **Rolls-Royce Rudders, Installation Manual, FB Measurements Table** as reference.
2. Force the rudder in transverse direction by using a jack or hoist pulley.
3. Set point of zero.
4. Force the rudder in the opposite direction.
5. Log the travel by reading the dial gauge.
6. Repeat this operation in longitudinal direction.

NOTE:

It is important to install the dial gauge as close to the bearing as possible.

7. Make similar arrangements to measure the rudder flap bearing clearances.
8. Record all measurements in the table as shown in **Rolls Royce FB Measurements Table.**

NOTE:

Rudders have a single chamber, as well as a rudder flap, which has its own drain plug.

C. Complete all inspections and submit three (3) copies of a written report of findings to the WSF Inspector no later than two (2) calendar days after drydocking.

D. Coat the entire leading edge of the rudders with Arcor® S-20 epoxy system or approved equal for a total of 100 square feet on each rudder. Include an additional 50 square feet of Arcor® EE-91 or approved equal to fill in deep pits or gouges of abraded areas.

7. SHAFT AND STERN TUBE BEARING INSPECTIONS

A. Take stern tube bearing clearances. Take visual readings using dial indicators and the jack/bump process. Reading to be witnessed by the WSF Inspector.

B. Take propeller shaft bearing wear down readings within 48 hours of docking the Vessel. Reading to be witnessed by the WSF Inspector and the Vessel Staff Chief Engineer.

C. Complete all inspections and submit three (3) copies of a written report of findings to the WSF Inspector no later than two (2) calendar days after drydocking.

8. NO. 1 AND NO. 2 ENDS, INBOARD AND OUTBOARD SEAL ELEMENT REPLACEMENT

NOTE:

The seals shall not be disturbed until the Shaft Bearing Inspections Item is complete.

A. Renew the Simplex seal elements in the inboard and outboard seals on both the No. 1 and No. 2 Ends. The seal elements will require vulcanizing in place. The Original Equipment Manufacturer (OEM) Simplex Representatives are;

1. The representative is Simplex Americas LLC.
   Contact Information;

   Chuck Autrey
   Pacific Coast Sales & Service Manager
   Simplex Americas LLC
   20 Bartles Corner Road
   Flemington NJ 08822-5717
   (908) 237-9099
   Chuck@simplexamericas.com

B. Remove and reinstall all interferences as necessary to complete this Work.

C. Drain all oil from the stern tube systems, including the stern tube cavities. Dispose of oil (approximately 550 gallons) from each End in accordance with all local, State and Federal regulations. Clean the head tanks and the bilge sump tanks. Flush the piping from the head tanks to the bilge sump tanks by using ten (10) gallons of clean system oil poured down the piping from the head tanks to the bilge sump tanks. Clean flushing oil from the bilge sump tanks. Close up the head tanks and sump tanks with new Contractor furnished fasteners and gaskets.

D. Remove the existing seal elements as **Category "D"**.

E. Install new Contractor provided seal elements.

F. Dial in the liner/clamp ring. Total indicated run out not to exceed .005". Readings to be witnessed by the WSF Inspector. Submit three (3) copies of a written report of the readings to the WSF Inspector.

G. Take shaft bearing wear down readings upon completion of all Seal Work. Reading to be witnessed by the WSF Inspector and the Vessel Staff Chief Engineer. Submit three (3) copies of a written report of the readings to the WSF Inspector.

H. Refill the stern tubes with contractor furnished Environmentally Acceptable (EAL) oil. Use RSC BioSolutions ENVIROLOGIC HF 68 HP.

I. Fill the outer seal with Hyperlube or STP.

J. Inspect for leaks upon refilling of oil system and after rotating shaft. No leakage will be accepted. To be witnessed by WSF Inspector and the Vessel Staff Chief Engineer.

K. Complete all Seal Work no later than four (4) calendar days prior to the scheduled undocking of the Vessel.

L. Conduct a final inspection for leaks and installation; all final inspections will be witnessed and accepted by the WSF Inspector and the Vessel Staff Chief Engineer. Submit three (3) copies of the written reports of the inspection.

M. Prepare any damaged coating in accordance with the Underwater Hull Coating Items.

9. PROPELLER BLADE INSPECTIONS

A. Remove and reinstall all interferences as necessary to complete this Work.

B. Thoroughly clean Propeller Blades and Propeller Hubs for Nondestructive Dye Penetrant testing/inspection.

C. Conduct a Nondestructive Dye Penetrant test/inspection for cracks and/or other defects on Propeller Blades and Propeller Hubs in the presence of the WSF Inspector. Submit three (3) copies of a written report of findings to the WSF Inspector within twenty-four (24) hours of test completion.

D. Complete inspections and provide reports no later than five (5) calendar days after drydocking.

10. NO. 1 AND NO. 2 ENDS CPP HUB OIL INSPECTION

A. Open a drain plug on the No. 1 and No. 2 End Controllable Pitch Propeller (CPP) Hubs and drain the Oil for inspection.

B. Dispose of oil (approximately 300 gallons) from each End in accordance with all local, State and Federal regulations.

C. Submit oil samples for ISO 4406 testing. Submit results to WSF project team.

D. Close the drain plugs and refill the system using Chevron GST 68 oil.

E. Inspect for leaks upon refilling of oil system and after rotating shaft. No leakage will be accepted. To be witnessed by WSF Inspector and the Vessel Staff Chief Engineer.

F. Complete all hub work no later than four (4) calendar days prior to the scheduled undocking of the Vessel.

G. Conduct a final inspection for leaks and installation; all final inspections will be witnessed and accepted by the WSF Inspector and the Vessel Staff Chief Engineer. Submit three (3) copies of the written reports of the inspection.

H. Prepare any damaged coating in accordance with the Underwater Hull Coating Items.

11. ROPE GUARD AND LINE CUTTER INSTALLATION NO. 1 AND NO. 2 ENDS

A. Remove the existing rope guards and anodes from the No. 1 and No. 2 Ends and replace them with new Contractor furnished rope guards. Install four (4) knife style line cutters on each new rope guard. Staging is included in the Propeller inspection Item, and Outer Seal Inspection.

B. Prepare and paint the rope guards using the below the water line painting system specifications. Do not paint Anodes.

C. Anode Renewals

1. Under both rope guards install four (4) anodes (two AHS-10 6” x 12” aluminum anodes cut in half per end welded to the inside of the rope guards).meeting MIL-DTL-24779C material requirements. Renew all anode studs and replace with new, 316 stainless steel bolts to match the new anode configuration.

D. Install knife style line cutters at the 12:00, 3:00, 6:00 and 9:00 positions of the rope guard.

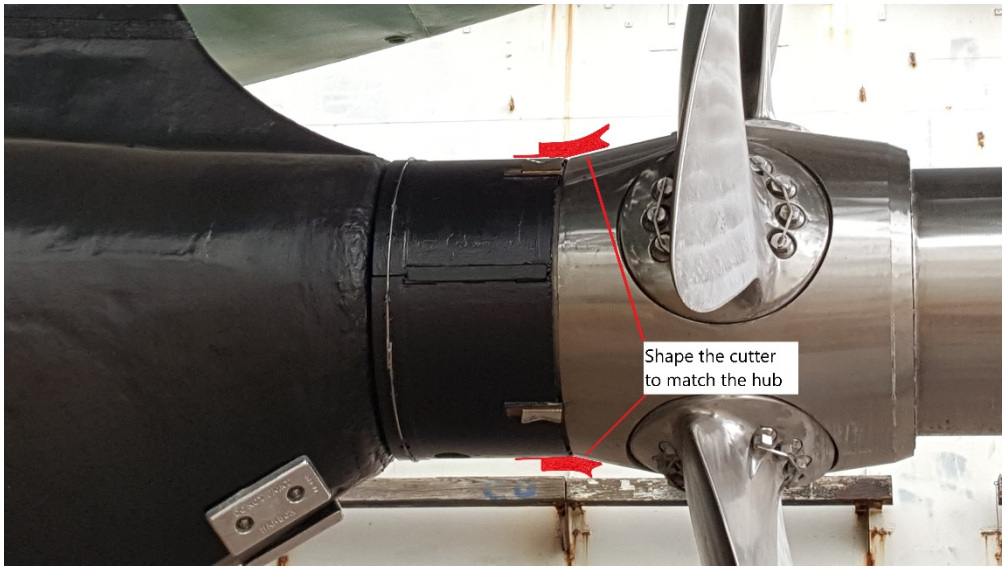
1. Fabricate the blades from 3/8” thick x approximately 2” wide x 6” long 316 Stainless steel.

Top View

Side View

2. Machine knife blade edges on the curved sides of the line cutters.

3. Install the line cutter overlapping the propeller hub by approximately 2". The line cutter's foundations will require a wedge shape to allow the cutters to lap over the hub due to the hub's shape. Maintain an approximate 1/8" gap between the cutters and the hubs.



4. Chimacum Line cutters

E. 100% Seal weld the line cutters to the rope guards.

F. Conduct a final installation inspection to be witnessed and accepted by the WSF Inspector and the Vessel Staff Chief Engineer. Submit three (3) copies of the written reports of the inspection.

NOTE:

The Simplex Rope Cutters for Rope Guard Installation Drawing is provided for Reference.

12. GAUGE VESSEL STEEL

NOTE:

Initial hull readings are to be completed no later than three (3) calendar days after drydocking. The Contractor shall provide the WSF Inspector one (1) preliminary copy of the hull gauging report twenty-four (24) hours after the readings are compiled. This will provide information as to any additional steel repairs that may be needed prior the Vessel departing.

A. Perform a Vessel Plating Gauge Survey and written report of the Vessel's steel plating thickness. The locations of all NDT shots shall be laid out by the Contractor and approved by the WSF Inspector. Shot quantities and general locations shall be in accordance with the table below. The survey shall be performed in the presence of the WSF Inspector and the attending USCG Inspector.

B. The readings shall be taken from the exterior of the hull, deck and superstructure where possible, when the Vessel is in drydock. Provide man lifts capable of reaching all portions of the hull, from the keel to the guard. Remove and restore paint in areas affected by this Work.

Shot Area	Shot Qty
Keel Plating.	40
The three (3) Girth Belts (includes Vehicle Deck in way of Belt).	180 total
Port and Starboard wind and water line Strakes, full length of the Vessel.	160
Vehicle Deck and Superstructure.	50
Suspect Areas to be used throughout the Vessel as required.	150
Sea Chests, two (2).	20 total
Total	600

C. Operators of NDT equipment shall be thoroughly familiar with the equipment being used and shall be properly qualified, trained and certified to AWS requirements. Operators should also have experience to perform the necessary calibrations and tests, and to interpret and evaluate the test readings in accordance with AWS and with this Work Item of the Specification. When requested by the WSF Inspector, the Contractor shall provide evidence of such training and certification.

D. Ultrasonic gauging shall be conducted utilizing pulse-echo ultrasonic equipment. Ultrasonic equipment shall be calibrated to ensure an accuracy of ± 0.005 inches and have current calibration certification. Equipment qualification shall be in accordance with MIL-STD-271F.

E. At the conclusion of this survey, the Contractor shall produce a Vessel Plating Gauge Survey Report. The report shall be developed using a tabular format and include sketches indicating, for all readings, frame number, location of (Strake identification), original plate thickness, actual gauge reading, average thickness, and percent wastage for all plating surveyed. The Contractor shall provide five (5) paper copies and an exact digital copy to the WSF Inspector prior to Vessel redelivery to WSF.

1. Provide the report using the ABS TM2-BC format or approved equal.

13. DRYDOCKING REFERENCE VIDEO

A. While the Vessel is on the drydock provide a reference video on digital, 720p60 minimum, format on CD ROM, or other comparable data storage media, of all external areas of the underwater hull including rudders, stern frames, skegs, propellers, tail shaft/seal areas, hull protective systems, keel coolers, sea chests, hull reference markings and all other attached appurtenances. A narrative that unambiguously identifies the location of all objects and markings videotaped as part of the video.

1. Camera phones will not be acceptable for the UWILD video.

B. The video is to be made after all underwater work is complete, just prior to undocking of the Vessel. The lighting shall be sufficient to ensure clear definition of all objects videotaped. Background noise shall be minimized while making the narrative. Provide three (3) copies of the video.

1. Commentary should be made of all external areas of the underwater hull, including rudder, propellers, tailshafts, keel coolers, sea chests, hull protective system, and all other attached appurtenances.

2. Video should clearly show the hull UWILD reference markings.

C. Provide a copy to the WSF Project Engineer for review and approval prior to the Vessel being launched.

D. Upon approval of. the video provide two additional copies to the WSF Inspector. The videos shall be clearly labeled with the Vessel name, date and location at which the video was taken.

NOTE:

This video is for submission to a Regulatory Body and requires clarity and concise audibility to satisfy the requirements.

PAINTING OF VESSEL AND HULL PRESERVATION
(WSF-001)

Area Preparation, Surface Preparation, Grit Blasting, Paint Coatings, and Inspection for Vessel's hull, curtain plates, casing and super structure shall be in accordance with Washington State Ferries Marine Coating Specification 07/2020 unless otherwise specified in the following Technical Specifications

NOTE:

Prior to commencing surface preparation, the Contractor shall present to the WSF Inspector and the Vessel Staff Chief Engineer, all areas for inspection of the protective measures taken to prevent harm or damage to the Vessel's equipment, other surfaces and systems.

14. 100% TOPSIDE WASHDOWN

A. Perform a Low Pressure Water Cleaning (LP WC) at 3,000 – 5,000 PSI to achieve a condition of SSPC-SP 1, using Chlor*Wash to remove salts and clean the entire topside areas including the Wheel/Sun Deck houses, Solariums (including the interiors), Crew's Quarters, Midship house and Stack areas, all Sun Deck areas, and the Pickle Forks and Passenger Deck promenade areas (including the Passenger Deck promenade interiors). Include all hand railings and pointers. The wand shall be held no more that twelve inches (12") from the surface being washed. Capture and dispose of the water in accordance with all applicable local, State and Federal rules, laws, and regulations.

15. FRESH WATER WASH OF HULL

A. Within twenty-four (24) hours upon drydocking the Vessel, perform a Low-Pressure Fresh Water Cleaning (LP WC) at 3,000 - 3,500 PSI in accordance with SSPC-SP 12/NACE 5. The wand shall be held no more than twelve inches (12") from surfaces being washed. The entire hull from the guard to the keel, including all horizontal and vertical surfaces of the guard, flat keel, rudders, sea chests and strainer plates, propellers and all other exterior components of the Vessel that are part of the Vessel below the guard shall be washed. The wash shall leave no visible growth or residue after the hull dries from washing.

B. Remove sea chest strainer plates prior to pressure wash. Prior to closing sea chests, they shall be inspected by the WSF Inspector and the Vessel Staff Chief Engineer. Reinstall strainer plates upon completion of all related Work.

16. PREPARATION OF VESSEL HULL FOR GRIT BLAST

NOTE:

Care shall be taken to avoid damage to the "Capac" anodes and reference cells. The anodes are located between Frames 31 and 32 Port and Starboard, both Ends, nine feet (9') above the keel. The reference cell is centered on the Starboard side between Frames 10 and 11.

A. Install protective covering on propellers, propeller bearings, rudder bearings, exposed shafting, CAPAC anodes and reference cell, ADIS transducers, and all through-hull penetrations and entrance ways to protect and prevent surface preparation material from causing damage or entering Vessel. Blank the main sea suction openings from the inside while the valves are removed for Maintenance, so the valve mounting flange may be painted on the inside diameter.

B. Conduct an inspection with the WSF Inspector and the Vessel Staff Chief Engineer prior to beginning surface preparation.

17. GRIT BLAST HULL

A. Document all hull markings and existing waterline dimensions; submit a written report of findings to the WSF Inspector.

B. Grit blast areas of abrasion, corrosion or steel repairs on the hull from the top flat surface of the rub rail down to the keel, including flat keel, sea chest, strainer plates and rudders to SSPC-SP6, Commercial Blast Cleaning.

C. The anti-fouling coating, for at least two inches (2") bordering the blasted area, shall be removed to existing ANTI-CORROSIVE COATINGS and feathered to a smooth surface.

NOTE:

For bidding purposes, assume that 5,000 Square Feet of the hull, 3,000 square feet below and 2,000 square feet above the water line will require grit blasting to SSPC-SP6, Commercial Blast Cleaning. Upon completion of hull grit blasting, the Contract Price will be adjusted upward or downward to account for the actual scope of grit blasting authorized by the WSF Inspector, based on the SSPC-SP6 Unit Price.

18. ANODE AREA CAPASTIC REPAIR

NOTE: For bidding purposes, assume that 25 Square Feet of failed capastic will require repair. The capastic shall be applied to a minimum thickness of 1/8 inch in the area of the shield out from the faired in area around the anode. The capastic shall be troweled so as to achieve a smooth overall surface.

A. Remove areas of damaged capastic as laid out by the WSF Inspector. Prepare the area to SSPC-SP10, grit blast to near white.

B. Renew capastic using Contractor furnished 'Capastic' epoxy troweling compound made by ELECTROCATALYTIC, INC.

C. Build up a minimum of 22 mils DFT of epoxy Anti-Corrosion coating over the capastic areas and the secondary dielectric shield areas.

19. SURFACE PREPARATION AND COATING OF VESSEL GUARD

NOTE:

For bidding purposes, assume that 600 Square Feet of the Guard will require grit blasting to SSPC-SP 6, Commercial Blast Cleaning. Upon completion of the blasting hull, the Contract Price will be adjusted upward or downward to account for the actual scope of grit blasting authorized by the WSF Inspector.

A. Prepare areas of abrasion and corrosion on the horizontal and vertical surfaces (top, bottom, and side) of the guard, as authorized by the WSF Inspector, to an SSPC-SP 6, Commercial Blast Cleaning.

B. The coating, for at least two inches (2") bordering the blasted area, shall be feathered to a smooth surface.

C. Apply coatings according to **WSF 001** to all prepared surface areas repaired in this Work Item.

20. PAINTING OF VESSEL HULL, ANTI - CORROSION COATING

A. Apply anti-corrosion coatings according to **WSF 001** to the Vessel hull in conjunction with areas prepared in the Grit Blast Hull Item.

21. PAINTING OF VESSEL HULL, BELOW WATERLINE ANTI - FOULING

A. Apply anti-fouling paint according to **WSF 001** to all surfaces painted in conjunction with the Grit Blast Hull and Anti-Corrosion Coating Items.

22. DRAFT AND HULL MARKINGS

A. Repaint all existing draft marks and underwater hull markings, according to **WSF 001**.

23. PAINTING OF VESSEL HULL, ABOVE THE WATERLINE

A. Apply coatings to the Vessel hull above the waterline according to **WSF 001**, using the FED Standard Green Color No. 14090, to all surfaces prepared above the waterline.

NOTE:

For bidding purposes, assume that 2,000 square feet of hull above the waterline will require painting of WSF Green. The Contract Price will be adjusted upward or downward, prorated based on the Unit Price, using the square footage determined in Grit Blasting Hull Item.

24. EXTERIOR CURTAIN PLATE / PASSENGER DECK SPOT COATINGS

A. Grit blast all areas of corrosion and abrasion on the Port and Starboard Curtain Plating and Passenger Deck. From the outboard top horizontal surface of the rub-rail to the top of the Passenger Deck level and from the Curtain Plate extremes at No. 1 and No. 2 Ends, including the anchor stowage area and anchor, hawse pipe, fixtures, vents and louvers. The Port and Starboard Passenger Cabin exteriors, the safety handrails below the windows, overhang above the windows, drainpipes and hangers, all attachments and appurtenances, along with the navigation light recesses.

B. Perform a Low-Pressure Water Cleaning (LP WC) at 3,000 - 3,500 PSI in accordance with SSPC-SP 1. The wand shall be held no more than twelve inches (12”) from the surface being washed.

C. Prepare to an SSPC-SP 6, Commercial Blast Cleaning, as authorized by the WSF Inspector. The Contractor shall survey this entire zone with the WSF Inspector to determine the exact areas to be blasted prior to beginning Work.

NOTE:

For bidding purposes, assume that 500 square feet will require grit blasting to an SSPC-SP 6, Commercial Blast Cleaning. Upon completion of the preparation and painting, the Contract Price will be adjusted upward or downward to account for the actual area authorized by the WSF Inspector.

D. The coating, for at least two inches (2") bordering the blasted area, shall be feathered to a smooth surface prior to coatings.

E. Apply coatings to prepared areas according to **WSF 001** to obtain a minimum of 3 mils (DFT), using FED Standard White Color No. 17875 and FED Standard Green Color No. 14090 for the area. Then apply one (1) full top coat according to **WSF 001**. All coatings shall be applied by spray application unless otherwise noted.

F. The Contractor shall wash the external surfaces of all passenger deck windows to remove any streaking paint, paint chips, and any other residue left by the water wash and painting.

G. Upon completion of all Work in the area, prove proper operation of all deck drains in the affected area.

25. NO. 1 AND NO. 2 VOID ACCESS PLATFORMS

A. Install access catwalks in the No. 1 and No. 2 End voids using **WSF DWG 9003-660-079-05, M/V Chimacum, Floorplates and Gratings, Modifications in Way of, Shaft Alley/Voids #1 & #2** for reference.

B. Ensure all machinery is well protected, prior to the start of any work in the space. Remove and reinstall all interferences as necessary to complete this Work. Prior to removals, inspect cover up and protection to the satisfaction of the WSF Inspector and Vessel Staff Chief Engineer.

C. Remove and reinstall all interferences and provide the necessary access to the voids as necessary to complete this Work.

D. Install new ladder ways, grates, platforms, and walkways in the No. 1 and No. 2 End voids using **WSF DWG 9003-660-079-05** for reference. The No.2 End Shaft Alley Void Access hole shall be enlarged to the same size as the No.1 Shaft Alley Void Access hole. Final inside dimension shall be 15" Wide x 36" Tall.

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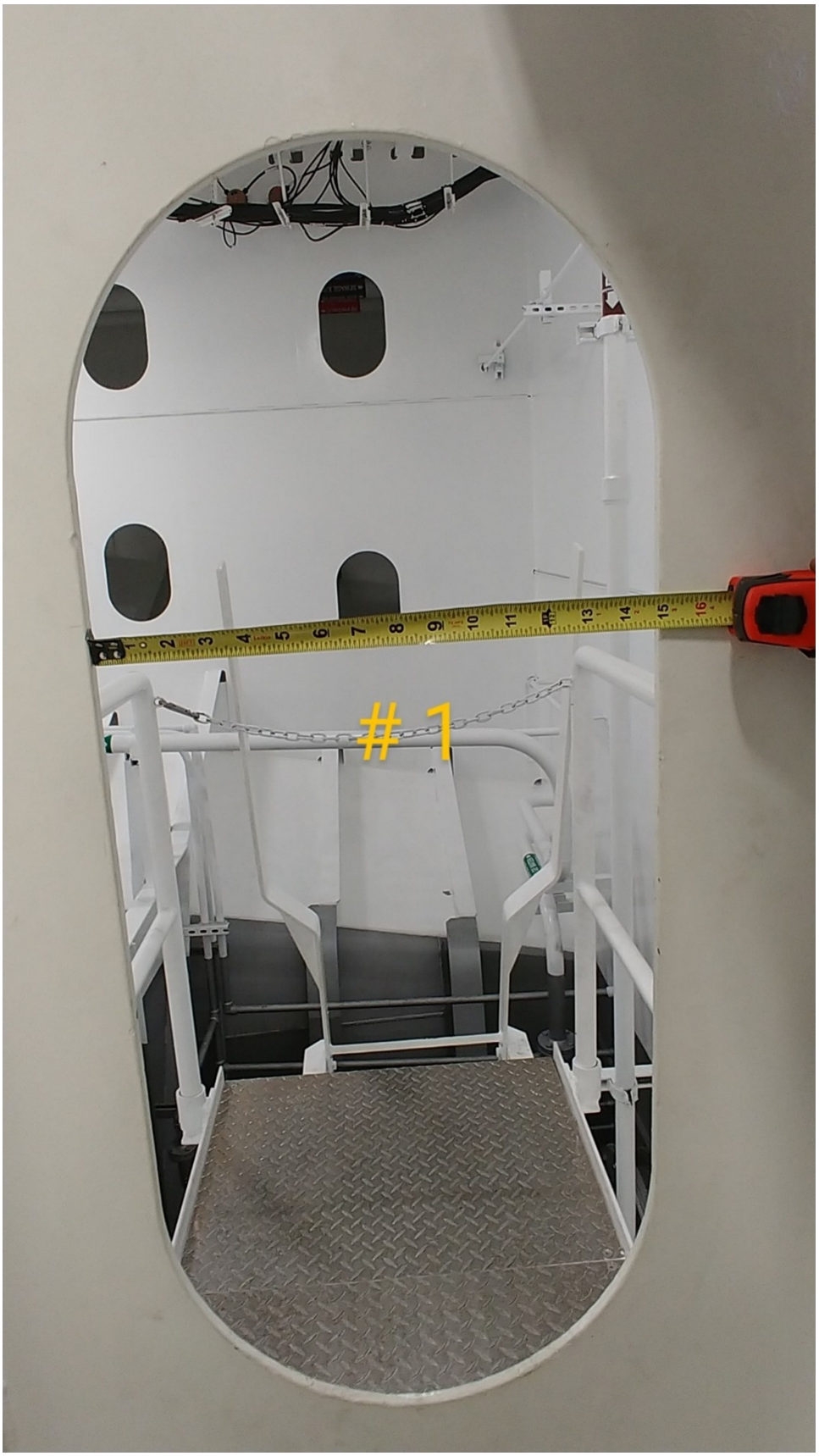

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E. Grind completely smooth the edges of all new openings as to leave no ridges, valleys, notches or any other discontinuity that may act as a stress riser.

F. Provide an additional 200 lbs. of void steel repair in this Item to be adjusted up or down based on the void steel Unit Price.

G. All new steel shapes shall meet ASTM Standard A-36 requirements. All new steel shall be wheel-abraded or grit blasted to SSPC SP-10 and immediately primed with weld through primer that is compatible with the Vessel's coating system.

H. Test all new welds to the satisfaction of the USCG and the WSF Inspector.

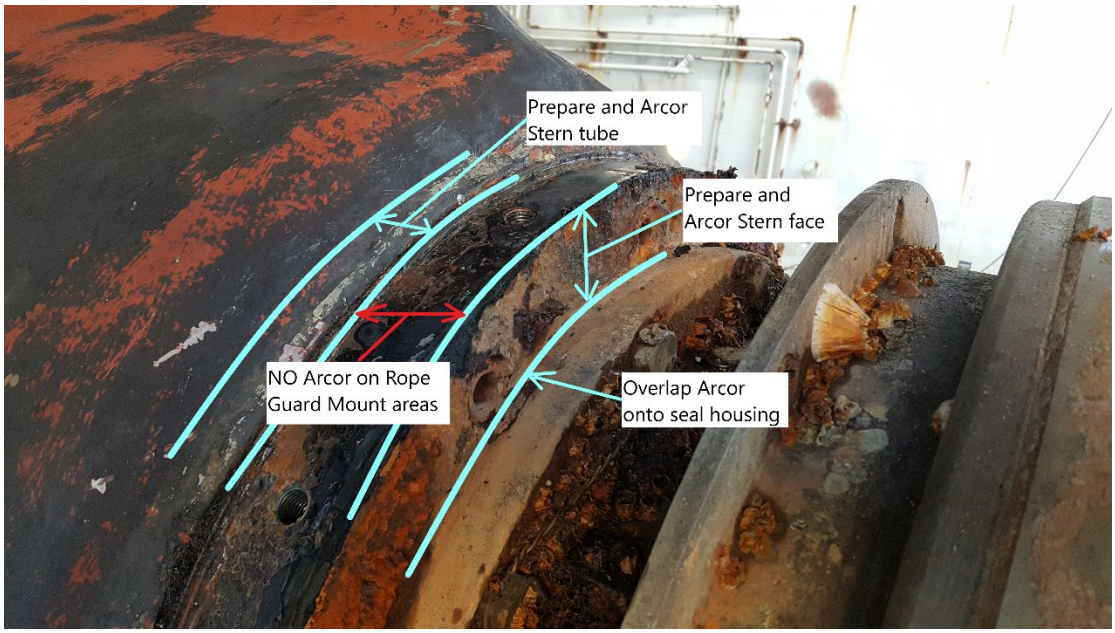
I. All disturbed internal areas and new plating shall be prepared to an SSPC-SP11 Power Tool Cleaning to bare steel, and coated with two (2) coats of contrasting colors of Sherwin Williams Dura-Plate MT to obtain minimum 6 mils (DFT) each coat. The first coat shall be off White and the second coat shall be Haze Gray. Hand stripe all edges. Ventilate the space until the paint is cured with no solvent odor. All coatings shall be done in accordance with **WSF 001, Marine Coatings and Color Scheme Specifications.**.

J. Mark up **WSF DWG 9003-660-079-05 s**howing any deviations from the drawing. Provide documentation to the WSF project team.

K. Prior to the removal of protective machinery covering, clean the affected spaces of any dust and debris to the satisfaction of the Vessel Staff Chief Engineer and the WSF Inspector. Wipe down all major equipment after removal of protective covering.

26. NO. 1 AND NO. 2 END STERN TUBE REPAIRS

A. Prepare deteriorated areas around the entire circumference on the No. 1 and No. 2 stern tube Ends to an SSPC-SP5 and coat with Arcor® S-20 epoxy system or approved equal epoxy system.



1. Typical Stern tube Deterioration.

2. Typical stern tube Arcor application.

B. Once the rope guards and seal housings are removed, prepare the entire circumference of the stern tube areas to an SSPC-SP5 White Metal Blast and the preparation instructions of the epoxy manufacturer. Coordinate this Work with the rope guard and seal renewal Items.

1. Protect critical stern tube and seal areas from damage during the preparation process. Inspect critical areas with the WSF Inspectors prior to the preparation process begins.

C. Apply Arcor® S-20 epoxy or approved equal epoxy system to prepared stern tube areas. Include Arcor® EE-91 or approved equal to fill in deep pits or gouges of abraded areas. Overlap the epoxy onto the stern tube seal housings.

1. Protect critical stern tube and seal areas from damage during the coating process. Inspect critical areas with the WSF Inspectors prior to beginning the coating process.

D. Apply additional coatings using **WSF 001** for the appropriate areas.

27. STEERING GEAR ROOM ACCESS OPENINGS NO. 1 & NO. 2 ENDS

A. Enlarge the Steering Gear Room Access Opening on the No. 1 and No. 2 Ends. The final finished size shall be 18" x 48". **WSF DWG 7104-002-901-U13EO, New 144 Auto Ferry, Unit 13 Assy** provided as guidance. All new steel shall be ABS Grade A. Steel shapes shall meet ASTM A-36 requirements. All new steel shall be wheel abraded or grit blasted SSPC-10 and immediately primed with weld through primer that is compatible with the Vessel's coating system.

B. Enlarge access opening to 18" x 48", current access opening is approx. 15" by 45" Install a 3" x 3/8" Flat Bar Rider around the entire periphery of the access opening. Final Finished opening shall be 18" by 48" as measured from inside edge to inside edge. Maintain radius of enlarged opening. Double continuous weld the Rider radius.

C. Install a 3" x 3/8" Flat bar header 4" above the upper radius of the access opening. Header shall be tied into vertical stiffeners on either side of the opening. All welds shall be double continuous.

Existing Access Opening

D. All new and disturbed areas shall be Prepared and Coated in accordance with **WSF 001**.

28. CHANGE FIREMAIN OVERBOARD VALVES TO GLOBE VALVES

A. Change the 4" Firemain overboard gate valves out to 4" Globe valves. The new Globe valves & Piping shall meet the Criteria set forth in **WSF DWG 9001-6674-058-01 New 144 – Car Ferry, Firemain System Piping Diagram**.

B. Contractor shall remove the existing 4” gate valves and make any and all piping modifications necessary to install Contractor Furnished 4” Globe Valve. Final Valve orientation shall be approved by Vessel Staff Chief Engineer and WSF Inspector.

Existing Gate Valve

C. Renew All gaskets, and hardware. New hardware shall be 316 SS. Grade 8.

D. All new piping shall be hot dip galvanized.

E. Provide Red Line Drawings with new valve information and piping modifications.

NOTE:

Prepare and Coat all new and disturbed areas in accordance with WSF 001, Marine Coatings and Color Scheme Specifications.

(END)