PERFORMANCE WORK STATEMENT (PWS)/STATEMENT OF WORK (SOW)

Test Frame Hydraulic Hardline Piping (base with option)

1.0 DESCRIPTION OF SERVICES/INTRODUCTION:

Naval Surface Warfare Center Carderock Division (NSWCCD) Department 60 is requesting a one-year contract (base with options) for provision and installation of non-welded steel piping in multiple laboratories to supply hydraulic fluid pressure between existing and planned existing MTS hydraulic power units (HPU) and MTS and NSWCCD-developed hydraulic testing systems located in Buildings 19 and 60 in West Bethesda, MD.

Installed hardline piping must provide sufficient sizing and connections to accommodate multiple existing and planned MTS test systems as detailed in Enclosure 1, "NSWCCD 60-19 Hardline Piping Plan RV3". This purchase of material testing support equipment is funded by PEO SSBN / PMS 397 (COLUMBIA) Engineering Services Tasking, which oversees multiple material testing and analysis tasks.

2.0 BACKGROUND:

NSWCCD currently utilizes MTS hydraulic testing systems in multiple testing laboratories within Department 60 to support both material and structural performance evaluation. Both laboratories have existing MTS HPUs to generate significant hydraulic pressures required to operate MTS and NSWCCD-developed testing systems. Pressurized hydraulic fluid flows through steel hardline piping, located within a floor trench and installed per MTS specifications, between separate MTS HPU and independent test frames. These material and structural test systems have been utilized by numerous technical projects in support virtually all surface and subsea programs to evaluate Naval material and structural performance and are valued in the millions of dollars; therefore, high-quality hydraulic piping is paramount to provide reliable system performance.

3.0 OBJECTIVE:

3.1 (BASE CONTRACT) Building 60 Piping Installation

- **3.1.1** The contractor shall complete installation of hydraulic piping in NSWCCD Bldg. 60, Rm. 172 per Enclosure 1.
- **3.1.2** The contractor shall provide sufficient piping, in accordance with MTS recommendations, for individual hydraulic pressure supply, pressure return, and drain lines. Piping must be sized sufficiently to provide hydraulic power for multiple hydraulic material testing systems operating simultaneously with operating pressures of 3,000 psi and maximum fluid flowrate of up to 180 gallons per minute.
  - **3.1.2.1** Piping shall be sized to maintain average hydraulic fluid pipe velocities less than 20 ft/s and/or pressure drop of 100 psi from the HPU to test fames and back to the HPU.
  - **3.1.2.2** Piping used shall have a burst rating at least three times the operating pressure of the system.
  - **3.1.2.3** The operating pressure of the supply line is 3,000 psi. The operating pressure of the return line will be at least 750 psi. The operating pressure of the drain line will be at least 100 psi.
- **3.1.3** Per manufacturer recommendation, seamless stainless steel or seamless low-carbon steel piping is acceptable.
  - **3.1.3.1** Pressure supply and return lines shall be sized NPS 2" SCH80. Drain lines shall be sized NPS 1.25" SCH40.

3.1.3.2 Stainless steel shall be ASTM A312 Type 316.

3.1.3.3 Low-carbon steel piping shall be cold drawn and normalized, E355+N (DIN 2391c ST 52.4 NBK) procured to EN 10305-4, or equivalent. Piping shall be fully phosphated for further corrosion resistance. Drain lines shall be E235+N (ST37.4 NBK) procured to EN 10305-4, or equivalent. Piping shall be fully phosphate for further corrosion resistance.

3.1.3.4 The contractor shall provide necessary piping flanges, elbows, tees, and all other fixturing necessary to connect existing MTS HPU and hydraulic test systems. Flares shall be 37 degrees and joined with 37 degree plated flared fittings conforming to SAE J514 standards. The contractor shall install sufficient ball valves on each line for each hydraulic test frame. Refer to Enclosure 1 for further details on laboratory floor plan, estimated piping lengths, and number of test frames.

3.1.4 The contractor shall provide all support bracketry necessary to install steel piping alongside existing hydraulic piping within the laboratory floor trench with concrete anchors.

3.1.5 The contractor shall complete pressure testing and pipe flushing prior to connection with existing MTS equipment to verify proper piping installation.

3.1.5.1 Supply and return lines shall be pressure tested to 1.5 times their working pressures for a minimum of 10 minutes.

3.1.5.2 After pressure testing, the system will be flushed. The pressure line will be looped into the return and drain lines; the hydraulic distribution system will be flushed for a minimum of 8 hours or until the ISO 4406 particle count of 16/13/9 required for high performance servo-hydraulic systems is achieved.

3.1.5.3 Pressure testing and flushing shall utilize Mobil1 DTE-25 or Mobil1 DTE-25 Ultra hydraulic oil only. The contractor shall provide all pressure testing equipment.

3.2 (OPTION) Building 19 Piping Installation

3.2.1 The contractor shall complete installation of hydraulic piping in NSWCCD Bldg. 19, Rm. B-Bay per Enclosure 1.

3.2.2 The contractor shall provide sufficient piping, in accordance with MTS recommendations, for individual hydraulic pressure supply, pressure return, and drain lines. Piping must be sized sufficiently to provide hydraulic power for multiple hydraulic material testing systems operating simultaneously with operating pressures of 3,000 psi and maximum fluid flowrate of up to 180 gallons per minute.

3.2.2.1 Piping shall be sized to maintain average hydraulic fluid pipe velocities less than 20 ft/s and/or pressure drop of 100 psi from the HPU to test frames and back to the HPU.

3.2.2.2 Piping used shall have a burst rating at least three times the operating pressure of the system.

3.2.2.3 The operating pressure of the supply line is 3,000 psi. The operating pressure of the return line will be at least 750 psi. The operating pressure of the drain line will be at least 100 psi.

3.2.3 Per manufacturer recommendation, seamless stainless steel or seamless low-carbon steel piping is acceptable.

3.2.3.1 Pressure supply and return lines shall be sized NPS 2” SCH80. Drain lines shall be sized NPS 1.25” SCH40.

3.2.3.2 Stainless steel shall be ASTM A312 Type 316.

3.2.3.3 Low-carbon steel piping shall be cold drawn and normalized, E355+N (DIN 2391c ST 52.4 NBK) procured to EN 10305-4, or equivalent. Piping shall be fully phosphated for further corrosion resistance. Drain lines shall be E235+N (ST37.4 NBK) procured to EN 10305-4, or equivalent. Piping shall be fully phosphate for further corrosion resistance.

3.2.3.4 The contractor shall provide necessary piping flanges, elbows, tees, and all other fixturing necessary to connect existing MTS HPU and hydraulic test systems. Flares shall be 37 degrees and joined with 37 degree plated flared fittings conforming to SAE J514 standards. The contractor shall install sufficient ball valves on each line for each hydraulic test frame. Refer to Enclosure 1 for further details on laboratory floor plan, estimated piping lengths, and number of test frames.

3.2.4 The contractor shall provide all support bracketry necessary to install steel piping alongside existing hydraulic piping within the laboratory floor trench with concrete anchors.

3.2.5 The contractor shall complete pressure testing and pipe flushing prior to connection with existing MTS equipment to verify proper piping installation.

3.2.5.1 Supply and return lines shall be pressure tested to 1.5 times their working pressures for a minimum of 10 minutes.

3.2.5.2 After pressure testing, the system will be flushed. The pressure line will be looped into the return and drain lines; the hydraulic distribution system will be flushed for a minimum of 8 hours or until the ISO 4406 particle count of 16/13/9 required for high performance servo-hydraulic systems is achieved.

3.2.5.3 Pressure testing and flushing shall utilize Mobil1 DTE-25 or Mobil1 DTE-25 Ultra hydraulic oil only. The contractor shall provide all pressure testing equipment.

3.3 (OPTION) Additional Material/Labor Costs

3.3.1 The contractor shall provide additional unplanned material and/or labor necessary to fully complete tasking with a maximum value of $25,000.00.

4.0 WARRANTY:

4.1 The contractor shall provide full warranty for all components for at least one year from the date of installation.

5.0 SPECIAL QUALIFICATIONS:

N/A

6.0 APPLICABLE DOCUMENTS

N/A

7.0 GOVERNMENT FURNISHED EQUIPMENT/PROPERTY/INFORMATION

N/A

8.0 DELIVERABLES

N/A

9.0 PLACE, PERIOD OF PERFORMANCE, AND DELIVERY DESTINATION:

8.1 The contractor shall complete all installations at the Naval Surface Warfare Center Carderock Division, located in West Bethesda, MD.

NSWC Carderock Division
9500 MacArthur Blvd.
West Bethesda, MD 20817-5700

The contractor shall arrange for travel and transportation for all personnel, equipment, and material required to complete all contract tasking.

8.2 The period of performance for the base contract is one year from time of contract award. The period of performance for the option, if exercised, is one year from time of option award.

8.3 Shipping and FOB Destination. If shipping of materials and equipment is required, the contractor shall ship to the FOB Destination: NSWC Carderock Division, 9500 MacArthur Blvd, Bldg 143 RECEIVING, West Bethesda, MD 20817

10.0SECURITY REQUIREMENTS:

UNCLASSIFIED.

GOVERNMENT TECHNICAL POINTS OF CONTACT: