Company Name

Address

DATE

ROICC

PSC Box 8006

Cherry Point, NC 28533-0006

Proposal for Project Number/Title:

Amendments Acknowledged: ☐No Amendments Issued or ☐ Amendments

Subcontractors to be used:	
Subcontractor	Discipline

Bid amounts:			
Bid Item #	Amount	Bid Item #	Amount
Lump Sum			
		Total Bid	

Comments:

General Decision Number: NC080055 10/23/2009 NC55

Superseded General Decision Number: NC20070055

State: North Carolina

Construction Type: Building

County: Craven County in North Carolina.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes and apartments up to and including 4 stories)

Modification Number	Publication Date
0	02/08/2008
1	03/07/2008
2	06/06/2008
3	01/30/2009
4	02/13/2009
5	02/20/2009
6	07/24/2009
7	10/23/2009

BOIL0030-001 01/01/2009

	Rates	Fringes
Boilermaker	$ 27.63	13.96

Welder:
Pressure welder: $.75 per hour additional.

SUNC2000-002 03/21/2000

	Rates	Fringes
Carpenter (includes drywall hanging)	$ 9.82	
Cement mason/concrete finisher	$ 9.75	
Electrician	$ 10.18	
Laborer, general	$ 7.25	
Painter, brush	$ 10.00	
Pipefitter (includes HVAC piping)	$ 13.50	.93
Plumber (does not include HVAC piping)	$ 11.75	.66

Power equipment operators:
_Backhoe operator.....$ 10.54

Sheet metal worker
_(includes HVAC duct work)..$ 11.56 .97

Truck driver.....$ 7.88

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

In the listing above, the "SU" designation means that rates listed under the identifier do not reflect collectively bargained wage and fringe benefit rates. Other designations indicate unions whose rates have been determined to be prevailing.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.

Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

MECHANICAL CLEANING OF FIRESIDE
AND WATERSIDE TUBES ON #3 AND #4 BOILERS
CENTRAL HEAT PLANT, BUILDING 152

WORK REQUEST # 5209455

1. **GENERAL INTENTION.** It is the declared and acknowledged intention of this solicitation to obtain the supervision, expertise, labor, materials, equipment to accomplish: Mechanical Cleaning of fireside and waterside tubes on #3 & #4 Boilers, Building 152.

2. **LOCATION.** Central Heat Plant, Building 152 .

3. **DETAILED REQUIREMENTS.** The Contractor shall:

a. Install all necessary barricades and safety barriers to prevent unauthorized personnel from entering the work area..

b. Ensure that permit required confined space procedures are followed prior to entering the boilers.

c. Clean the water side and fire sides of (2) each boilers. (#3 & #4)

d. Fireside cleaning shall be accomplished by mechanical means which will include but not limited to hand brushing and pneumatic brushes. All tubes shall be inspected for evidence of leaks, sagging, building, acid corrosion (especially adjacent to the water drums and headers), pitting, scaling and fireside thinning. Remove all fireside scale, carbon deposits, projections and residue from on the refractory and floors and, if present from the burner throats.

e. Cleaning of the watersides using a high pressure water jet following manufacturer's equipment manual for guidance. Notify the contracting officer prior to commencing water jet operations, to ensure notification is given to IWTP (Industrial Waste Treatment Plant) of influx of wastewater. Wastewater shall be drained or pumped into to the designated drains which run directly to the IWTP.

f. Waterjet solution shall consist of one pound of sodium nitrate to 100 gallons of clean fresh water. During the cleaning the Waterjet shall be operated and maintained at a maximum of 10,000psi and 9,700 psi minimum. At a flow rate minimum of 20 gpm (gallons per minute). Drum and header surface cleaning requires a maximum of 7,500 psi and a minimum of 5,000 psi at 12 to 14 gpm. Downcomers, risers and support tubes shall be water jetted twice.

g. Immediately dry tubes, headers and downcomers upon completion of Waterjet cleaning to ensure there is no flash rust. Ensure soft deposits and obstructions have

ENCLOSURE (1)

been removed. Any obstructions that cannot be removed by waterjet cleaning shall be documented on a report with four legible copies to the supervisor.

h. Upon completion the boilers shall be hydrostatically tested to 165psi and hold for 15 minutes to insure integrity of man way seals prior to being placed back in service.

i. Cleaning of boilers shall be completed one at a time and returned to service before starting the next boiler.

j. Conduct daily cleanup and ensure that all water leaks and spillage on concrete deck surfaces shall be identified with proper safety signage and clean up immediately to prevent fall hazards.

k. Provide four (4) copies of final inspection report to contracting officer for distribution,

l. Due to operational requirements boiler cleaning shall begin no earlier than 15 April and completed not later that September 15th. Cleaning shall be conducted one boiler at a time and in the order as designated by the Boiler Plant Supervisor

4. SPECIAL REQUIREMENTS. The Contractor shall be required to:

a. Commence work under this contact immediately after award notification or any other communication authorizing the Contractor to proceed by the Contractor Officer.

b. Notify the Facilities Support Contract Office prior to the commencement of work.

c. Have all materials on-site prior to commencement.

d. Prosecute the work diligently.

e. Complete the work within ninety, (90) calendar days.

f. All outages requires Contractor's written request fifteen (15) days prior to commencement of such work and Contracting Officer's approval.

5. TERMS OF CONTRACT: The contractor is responsible for an on-site visit to inspect the work areas and to understand fully the scope of work. All work performed shall be during the hours of 0700-1600, Monday through Friday. Any work performed outside of these periods must be, pre-approved by the Contracting Officer.

6. JOB EXECUTION: The contractor shall coordinate thru the Contracting Officer to minimize the impact on the tenant's schedules. The demolition practice and installation shall conform to all industry standards and applications, i.e. all North Carolina Building Codes and Statues, NEC and other OSHA Safety standards as they apply to this

project. All equipment and debris generated from this project becomes the property of the contractor. The contractor must remove all equipment and debris from the job site and MCAS Cherry Point and taken to a state certified landfill, at no expense to the government

NAVSEA
STANDARD ITEM

FY-97

ITEM NO: 009-31
DATE: 12 JAN 1996
CATEGORY: II

1. SCOPE:

1.1 Title: Boiler Waterjet Cleaning

2. REFERENCES:

a. [redacted]

3. REQUIREMENTS:

3.1 Accomplish the [redacted] for waterjet cleaning of boiler watersides, using manufacturer's equipment manual [redacted].

3.1.1 Portable extension lights shall conform to MIL-F-16377/49, Symbol 306.2 or MIL-F-16377/52, Symbol 286.

3.1.1.1 Ground each light fixture at the voltage source.

3.1.2 The high pressure waterjet cleaning unit shall be operated at no more than 10,000 pounds per square inch (PSI).

3.1.3 Rope off and post warning signs in the areas where the unit is operating, where the high pressure hose is run, and where the waterjet cleaning is to be accomplished.

3.1.4 Unit shall be stopped immediately if high pressure leaks occur in pump, piping, high pressure hose, or hose couplings.

3.1.5 While personnel are waterjetting, lance operator shall be in direct visual contact with control gun operator stationed outside of boiler. Control gun operator shall also maintain direct person-to-person voice communication with pump operator, using telephone, radio, or other positive direct means. Communication relay through intermediaries is not acceptable.

3.1.6 The control gun operator shall be able to regulate the flow of water to permit the system to be pressurized during the actual tube cleaning and have the nozzle pressure reduced to zero while the operator removes the lance from one tube and inserts it into the next tube to be cleaned.

3.2 Cleaning equipment shall meet minimum requirements listed herein:

ENCLOSURE (2)

3.2.1 Supply hose from the pump to the control gun shall be 1/2-inch inside diameter (I.D.) with 30,000 PSI minimum burst pressure and shall not exceed 400 feet in length. A 15 foot length of supply hose shall be attached between the control gun and the flexible lance.

3.2.2 Provide a high pressure return line from the control gun dump connection to the waterjet supply tank, on units that discharge pressure to the bilges between cycles.

3.2.3 Tube cleaning nozzle shall be nonrotating. Orifices in the nozzles shall be angled back 30 degrees. Nozzles shall have a minimum of 18 orifices evenly spaced around the circumference. Each orifice shall be 0.024 inch in diameter, plus or minus 0.001 inch.

3.2.4 Fan pattern nozzle attached to a rigid lance for cleaning drum and header surfaces.

3.2.5 Lance and nozzle burst pressure ratings shall be 25,500 PSI minimum. Lance shall be 0.229 inch or larger I.D. and shall have a smooth Teflon core, and shall not exceed 25 feet in length.

3.2.6 Waterjet cleaning solution shall consist of one pound of sodium nitrite to 100 gallons of clean, fresh water.

3.3 Maintain operating pressures and flow rates for boiler cleaning as follows:

3.3.1 Boiler tube cleaning - 10,000 PSI maximum, 9,700 PSI minimum pump discharge pressure at 20 gallons per minute.

3.3.2 Drum and header surface cleaning - 7,500 PSI maximum, 5,000 PSI minimum pump discharge pressure, at 12 to 14 gallons per minute.

CHECK POINT (Verification and Demonstration)

3.4 Verify waterjet cleaning equipment capability prior to commencement of work.

3.4.1 Place the lance and nozzle which will be utilized in waterjet cleaning securely into a container. Ensure lance cannot break loose. Demonstrate to the SUPERVISOR that unit output is 20 gallons per minute.

3.5 Accomplish cleaning operations as follows:

3.5.1 Lance and nozzle shall traverse the entire length of every tube cleaned.

3.5.1.1 Downcomer, riser, and support tubes shall be traversed twice.

3.5.2 The lance and nozzle shall traverse the tubes at a maximum rate of one foot per second.

3.5.3 A fan nozzle shall be used to clean entire interior drum surfaces.

3.6 Pump waterjet wastewater effluent from boiler to a holding container or a waterjet wastewater recycling unit. Do not drain wastewater to bilges.

3.6.1 Waterjet wastewater recycling filter process shall be capable of filtering the wastewater effluent to meet the following criteria:

Suspended Solids	< 10 mg/L
Sodium Nitrite	1100 - 1300 mg/L
Ph	6.5 - 8.5
Nitrate	< 10 mg/L
Oil and Grease	< 5 mg/L

3.6.1.1 Recycled wastewater discharge samples shall be taken every 1,000 gallons to ensure levels do not exceed the above criteria.

3.6.1.2 Submit four legible copies of a report listing the results of the requirements of 3.6.1.1 to SUPERVISOR.

3.6.2 Remove and dispose of spent chemicals and solutions in accordance with federal, state, and local regulations.

3.7 Dry tubes, headers, drums, and downcomers using clean, dry air immediately upon completion of waterjet cleaning. Remove pockets of water and dry surfaces using clean rags.

CHECK POINT (Cleanliness)

3.8 Inspect surfaces to ensure the following requirements are met:

3.8.1 Surfaces shall be dry.

3.8.2 There shall be no evidence of flash rusting.

3.8.3 There shall be a streaking effect seen when looking into the tubes. The streaking effect shall begin within one to two inches from the tube end and continue through the visible length of the tube.

3.8.4 Soft deposits and obstructions shall be removed.

3.8.4.1 Submit four legible copies of a report listing location of obstructions that cannot be removed by waterjet cleaning to the SUPERVISOR.

3.8.5 Residual sodium nitrite deposits remaining after the surfaces are dried is acceptable.

4. NOTES:

4.1 None.

ITEM NO: 009-31
FY-97

ENCLOSURE (2-3)

CHAPTER 3
THEORY OF OPERATION

3-1 INTRODUCTION.

3-1.1 PURPOSE. This chapter contains basic engineering principles which relate to waterjet cleaning. Proper tube and surface cleaning can only be accomplished if the proper conditions exist. It is necessary to understand which operating conditions will produce the most effective cleaning.

3-1.2 SCOPE. This chapter contains engineering principles related to general waterjet operations. Topics discussed in this chapter include deposit removal, pressure drops, flow rate and boiler mechanical cleaning methods.

3-2 DEPOSIT REMOVAL.

3-2.1 INTRODUCTION. Cleaning effectiveness is defined as the amount of deposits removed from a tube. It is expressed as a percentage of the deposits removed. It is necessary to operate at the proper parameters to ensure the highest cleaning effectiveness is attained.

3-2.2 PRESSURE AND FLOW RATE. The two parameters that control cleaning effectiveness are pressure and flow rate. Pump pressure is measured in pounds per square inch (psi) and flow rate in gallons per minute (gpm). Pressure has a greater effect on cleaning than flow rate. Table 3-1 depicts the effect pressure and flow rate changes have on boiler tube cleaning effectiveness. A minimum of 90 percent cleaning effectiveness is needed for proper boiler tube cleaning.

3-2.3 MEASURING CLEANING EFFECTIVENESS. If it is necessary to measure cleaning effectiveness

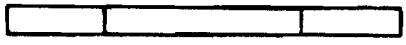

Figure 3-1. Tube Sample.

take a sample tube to be cleaned, and split it in three sections as shown in Figure 3-1. The length of sections A and C should be equal and add up to the length of section B. Sections A and C are vigorously wire brushed to remove all the deposits. The deposits are collected and weighed. It is assumed that the amount of deposits removed from sections A and C are present on section B before cleaning. Section B is then waterjet cleaned and wire

Table 3-1. Typical Boiler Cleaning Effectiveness.

Pump Pressure (psi)	Flow Rate (gpm)	Cleaning Effectiveness (%)
10,000	20	98
10,000	10	55
5,000	20	35

ENCLOSURE (24)

brushed. The remaining deposits are collected and weighed. The amount of deposits removed from the tube can be calculated by subtracting the deposits remaining after waterjet cleaning from the deposits originally on the tube. Cleaning effectiveness, expressed as a percent, is 100 times the amount of deposits removed divided by the deposits originally on the tube. Effectiveness expressed as a percent can be determined using the following formula:

$$\text{Effect (\%)} = \frac{100(\text{wt. before} - \text{wt. after})}{\text{wt. before}}$$

wt. before = weight of deposits before cleaning

wt. after = weight of deposits after cleaning

3-3 PRESSURE DROP.

3-3.1 INTRODUCTION. Pressure drop through the system is the result of friction between the water molecules and the internal surface of the hose, pipe or lance that it is flowing through. The smoother the surface, the lower the pressure drop that results. The higher the flow rate the greater the pressure drop that results. Excessive pressure drop will result in low discharge pressure at the nozzle, which will reduce cleaning effectiveness.

3-3.2 CALCULATING PRESSURE DROP. When the waterjet unit is producing 20 gpm, the following pressure drops occur:

a. Supply hose - 3 psi per foot

b. Cleaning lance - 100 psi per foot

c. Lance adapter - 1000 psi.

d. Downcomer adapter - 50 psi.

To calculate the pressure at the nozzle it is necessary to add up all the pressure drops through the system and subtract them from the pump discharge pressure. For effective cleaning of boiler tubes, pressure at the nozzle must be at least 5500 psi. Therefore, there must be less than 4500 psi pressure drop through the system if the pump is operating at 10,000 psi.

3-3.3 TYPICAL PRESSURE DROPS. Pressure drops through various types of hoses for different flow rates can be seen in Table 3-2.

3-4. FLOW RATE.

3-4.1 INTRODUCTION. The waterjet pump is a positive displacement pump. For a given speed the pump flow rate is constant. The flow rate does not depend on the pressure in the system. As discussed in section 3-2, flow rate has an effect on deposit removal. This section covers calculating actual flow rate and pump efficiency.

3-4.2 ACTUAL FLOW RATE. Actual flow rate is the amount of water that actually flows from the pump. To ensure the pump is producing the proper flow for the cleaning application being performed, it may be necessary to calculate actual flow rate. Flow rate can easily be measured by connecting the supply hose, lance and nozzle to the pump. Place the flexible lance and nozzle inside a 55 gallon drum and pull the control gun trigger for two minutes. The lance should be placed inside a tube or pipe to prevent the lance from whipping around in the drum. To calculate the flow rate, measure the amount of water which was collected in the drum, in gallons, and divide it by the time the trigger was pulled, in minutes. Ideal flow for the pump for a given engine speed is depicted in Table 3-3.

ENCLOSURE (2-5)

Table 3-2. Typical Pressure Drops.

HOSE ID (IN.)	BORE MATERIAL	FLOW (GPM)	PRESSURE DROP/FT. (PSI)
3/16	Teflon	20	262
3/16	Rubber	20	393
3/16	Teflon	10	76
3/16	Rubber	10	114
1/4	Teflon	20	100
1/4	Rubber	20	151
1/4	Teflon	10	29
1/4	Rubber	10	44
3/8	Teflon	20	18
3/8	Rubber	20	27
3/8	Teflon	10	4
3/8	Rubber	10	6
1/2	Teflon	20	2
1/2	Rubber	20	3
1/2	Teflon	10	0.6
1/2	Rubber	10	0.9

3-4.3 PUMP EFFICIENCY. Pump efficiency is defined as the ratio of the actual flow rate to the theoretical flow rate. Theoretical flow rate is the maximum amount of water that could possibly be discharged from the pump if each cylinder were able to be completely filled with water during the suction stroke. The theoretical flow rate for the waterjet pump for an engine speed of 2100 RPM is 21.98 gpm. The waterjet pump should be operating at an efficiency of 90 percent or greater. If the efficiency is lower than this refer to Chapter 7, Troubleshooting.

3-5 BOILER MECHANICAL CLEANING METHODS.

3-5.1 INTRODUCTION. Mechanical tube cleaning is used to remove soft deposits from boiler tube watersides. Soft deposits are deposits which can be removed by wire brushing or mild steel scraping. There are three types of mechanical tube cleaning:

a. High pressure waterjet

Table 3-3. Ideal Flow Rate.

ENGINE SPEED (RPM)	FLOW RATE (GPM)
1600	16.5
1700	17.0
1800	17.75
1900	18.0
1950	20.0

ENCLOSURE (26)

b. Ethylene-diamine-tetraacetate (EDTA)

c. Power-driven wire brush.

This section will discuss the benefits and limitations of each type of cleaning. This is necessary to determine which cleaning should be performed depending on the boiler conditions.

NOTE

Mechanical cleaning will not remove hard deposits or oily deposits. If hard deposits are found through tube sample analysis, the boiler must be acid cleaned in accordance with NSTM 221. Once the boiler is chemically cleaned, the hard deposits will become soft and you are then required to mechanically clean. If oily deposits are present the boiler must be boiled out and degreased in accordance with NSTM 221. Mechanical cleaning is not required after boiling out, unless inspection of the boiler reveals the presence of heavy soft deposits.

3-5.2 HIGH PRESSURE WATERJET. Waterjet cleaning removes over 90 percent of the soft deposits from boiler tubes. It is the most effective and preferred type of mechanical cleaning. Boiler cleaning can be performed much quicker using waterjet than rotating brush cleaning.

3-5.3 EDTA CLEANING. EDTA cleaning will, at times, save manhours. It is easier to accomplish at sea. However, excessively dirty boilers will not necessarily be completely cleaned by this method. The chemical may become exhausted before all the deposits are removed.

3-5.4 POWER-DRIVEN WIRE BRUSH. Power-driven wire brush only removes approximately 50 percent of the soft deposits from boiler tubes. It is time consuming and should only be used when one of the other types of cleaning methods can not be performed.

ENCLOSURE (27)