

THE DOW CHEMICAL COMPANY

JOB SPECIFICATIONS

S901-425-508151 BOILER 1/BOILER 2 SUPER HEATER
TUBE AND WATER TUBE REPLACEMENT
BID ISSUE - ENGINEERING JOB NO. 930670
POWER 1

BLOCK-28
LOUISIANA DIVISION
PLAQUEMINE, LOUISIANA
OCTOBER 12, 1993

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CONFIDENTIAL

1. General Information

1.1 Contractor shall furnish supervision, labor, materials, tools, and equipment for construction of all general mechanical equipment to replace and fabricate Boiler 1 and Boiler 2 superheater and water tubes as described in this document located in Block 28 of the Dow Chemical Company, Louisiana Division, Plaquemine, Louisiana as shown and noted on the drawings and as specified herein.

1.1.1 All information provided by the contractor shall be based on these specifications, all referenced drawings, standards and specifications, Owner's Safety Manual and on the provisions in the standard contract form.

1.1.2 Any and all exceptions by the contractor to this document, and to these specifications and drawings shall be clearly stated.

1.1.3 Contractor shall submit to Dow in writing that he is in strict compliance with these specifications, and drawings, without exception, unless specifically noted under "exceptions".

1.1.4 Before the beginning of any work, there shall be a pre-job kick-off meeting. This meeting will be held by the Owner's Representative.

1.1.4.1 This meeting shall be attended by the General Contractor's Superintendent, Contractor's foremen assigned to this contract, Owner's Representative and all designated assistants, and any necessary Dow Design Discipline Representatives.

1.1.5 Hourly rates and equipment rental charges are to be supplied with the bids. These supplied rates are to be in effect throughout this contract.

1.1.6 A rate for chasing tubes (finding a good place to weld) is to be supplied with the bid. This rate can be by the foot or per tube. This rate is to be in effect throughout this contract.

1.2 Alternates

1.2.1 The contractor work shall be based on these specifications and drawings; however, contractor may submit alternates which may be mutually advantageous. Alternates must be submitted independent of the work plan and shall be in sufficient detail to allow evaluation by the owner.

1.3 Drawings & Specifications

1.3.1 In the event of discrepancies between the construction contract, job specifications, and the drawings, the governing document shall be in the sequence as follows:

1.3.1.1 Construction Contract

1.3.1.2 Purchase Order

1.3.1.3 Job Specifications

1.3.1.4 Drawings

1.3.1.5 Engineering Specifications

1.3.2 The drawings and specifications are the property of the owner and shall be returned at completion of work or upon request.

1.3.3 See section 92 of these specifications for the list of drawings which define the work.

1.3.4 The North Arrow shown on the drawings refers to "Plant North" and is not intended to indicate true or Magnetic North.

1.3.5 Drawings may have work circled, hatched, shaded or noted to indicate that work is a part of the scope of work.

1.3.6 Owner's Drawings have a "Drawing Issue Record" block to identify the various issues of that drawing. The record shows the specification, revision letter and dates of issue, for fabrication or construction. A drawing may be issued for reference if it does not show any work to be performed but assists in lending perspective to the contract package. An "X" will be entered in the "REF." Column of drawings issued for reference.

1.3.7 See section 91 of these specifications for the Engineering Specifications and Standards that apply to the work.

1.3.8 The standards and specifications referred to shall be the current edition in effect as of the date of this job specification.

1.3.9 The contractor shall comply with all specifications referred to in the technical sections (1-89) of this document whether or not included in Section 91. Contractor should contact Owner's Representative, in writing, if there is any question as to intent of specifications.

1.4 Contractor Furnished Materials

1.4.1 When material that is to be furnished by the contractor is referred to by trade name, manufacturer, or catalog number, the work shall be based upon use of the specified material. An alternate plan may be submitted based upon the use of an equal or better material that meets these specifications, for the owner's approval. A list of materials, for approval as "equal", shall be submitted with the plan of work including sufficient information to enable the owner to determine the quality of the work substitution.

1.5 Owner Furnished Material Documentation

1.5.1 Owner furnished material documentation will be made available to the contractor, upon request, through the Owner's Representative. Two days notice will be required.

1.5.2 The owner will supply all items indicated in section five(5) "Owner Furnished Materials".

1.6 Schedule

1.6.1 Contractor shall submit with his work plan, the following:

1.6.1.1 A simplified plan of construction to show the general sequence of work activities and time allowed for each. Start dates and completion dates should be shown on this plan.

1.6.1.2 The required number of calendar days, after award of contract, to start field work.

1.6.1.3 The required number of standard work days, after award of contract, to complete field work.

1.6.1.4 Any plan of work of extended or non-standard work week must be submitted separately and as an alternative.

1.6.2 Field work shall start on or about November 8, 1993 with completion projected for December 17, 1993. The contractor shall provide a completion date based on the established work week using November 8 as the start date. Contractor shall submit his best schedule. Contractor must provide sufficient man loading to accomplish the work by the finish date. Any deviations to the standard work week to meet this end date should be identified by the contractors.

1.6.3 Owner wishes to complete all work on Boiler 1 as soon as possible. Boiler 2 work can only be started after Boiler 1 is completed and back on line for one week (production demands could cause this time to be greater or less). Contractor shall include this one week delay in his construction schedule.

1.6.4 See Owner Furnished Material, section five(5) for the designation of areas in which equipment is located.

1.6.5 The contractor shall submit a plan of construction showing, in useful detail, and to time scale, how he intends to perform the work within the time specified in the contract. The plan shall indicate restraints imposed by owner's activity, contractor furnished components, and subcontractor activities and components. The construction plan shall be updated once each shift during the turn around, by the contractor to show work accomplished versus work still remaining. The plan shall be delivered to the Owner's Representative within five(5) days from date of contract award.

1.7 Contractor Organization

1.7.1 Contractor shall specify in the work plan in detail the procedures with which contractor proposes to organize and manage the work. Work schedules shall include a statement informing Dow of the contractor starting work dates. The dates shall include the field mobilization.

1.7.2 The work schedule shall include a field organization chart and description of the organization the contractor proposes for the execution of the work. Resumes of experience of the Contractor's Representative and contractor's other key personnel nominated for this project shall be included.

1.7.3 Contractor shall define the expediting procedures to be used to ensure on time delivery of contractor furnished materials.

1.7.4 The contractor shall describe the field quality assurance program which contractor intends to use. As a minimum, contractor shall furnish the following:

1.7.4.1 A summary of the services, controls and procedures that contractor plans to use.

1.7.4.2 A project quality assurance organization chart indicating number and type of personnel to be assigned and lines of authority.

1.7.4.3 A list of the independent testing laboratories and/or third party inspection agencies that would be used and an outline of the procedures and methods to be used to coordinate their activities.

2. Special Conditions

2.1 Site

2.1.1 The project work area is as described in section one(1) of this document. The project work site is located in Block 28, of the Louisiana Division.

2.1.2 The work areas will be within an operating plant. Daily Safe Work Permits will be required. Permits can be obtained starting at 6 a.m. and should not be obtained any later than 6:30 a.m..

2.1.2.1 Separate Daily Work Permits that require a site tour jointly by Dow's Construction Representative and the Contractor Superintendent will be completed each morning before work begins to ensure the safe condition of the work areas.

2.1.3 A separate Hot Work Permit is required for each welding, cutting, or other open flame operation.

2.1.4 Work areas will be designated at the job site visit within which contractor will be required to obtain Hot Work Permits for cutting or welding.

2.1.5 Daily Safe Work Permits will be required, and in addition, Hot Work Permits will be required for each hazardous or welding operation within extra hazardous portions of the plant as described below. It is not anticipated that obtaining permits will cause any work delay. However, welding at the work site shall be held to a minimum.

2.1.6 Contractor's supervisory personnel will be allowed on the work site early, for the purpose of obtaining work permits.

2.1.7 The standard work week will be seven(7) days per week, 2-10 hour shifts per day, Monday thru Sunday. Work shall begin at 7:00 a.m. No contractor personnel will be allowed to work in excess of the established work day, or work week without approval by the Owner's Representative.

2.1.8 The established lunch period will be set by the contractor. The contractor shall inform the owner's representative the times of the lunch periods.

2.2 Safety requirements

2.2.1 The work shall be performed in a manner to ensure maximum safety for people, facilities and equipment. Contractor's and subcontractor's personnel shall be familiar with and shall rigidly comply with the rules and procedures in the Dow Chemical U.S.A., Safety and Loss Prevention Standards and Reference Manual, and the Safety and Loss Prevention Manual for Contractors. These two documents shall hereafter be referred to as the "Safety Standards Manual" or "Safety Reference".

2.2.2 The contractor shall provide a non-working safety observer to insure all safety and loss prevention guidelines are followed and coordinate safety meetings.

2.2.3 All contractor's personnel must complete a forty-five minute Dow Louisiana Division General Safety Orientation before beginning work. The indoctrination times are 7:00 a.m. and 1:00 p.m. only. This includes any subs or repair personnel for equipment.

2.2.4 All contractor's personnel must complete a twenty minute Safety Orientation for each area/block where work will be performed before beginning work. This is required regardless of amount of time the worker is in the block. The orientation must be scheduled 12 hours prior to person beginning work.

2.2.5 A pre-job safety meeting with the contractor will be conducted by Owner's Representative in Block 28. The time and place to be designated later. The contractor's Field Superintendent, the safety officer of the company, field supervisor for each shift, and a Safety Representative from each subcontractor shall attend. The intent is to have a representative who has attended the pre-job safety conference present at the job.

2.2.6 The contractor shall hold weekly safety meetings for contractor's and subcontractor's personnel. Minutes of the meetings shall be recorded by contractor and kept on file for duration of contract. The Owner's Representative may attend as required. Meetings should last approximately ten to fifteen minutes. During a turnaround, meetings shall be held for each shift. A copy of minutes shall be submitted to the Owner's Representative.

2.2.7 A five minute tailgate safety meeting shall be held at the beginning of each shift.

2.2.8 All accidents, injuries, and/or near miss incidents no matter how small must be reported to Owner's Representative as soon as they occur.

2.2.9 Effective July 1, 1993, smoking on Dow Chemical Company Louisiana Division properties will be prohibited. Properties include all land, building, vehicles, vessels, and aircraft owned or leased by Dow. It does not include Dow owned property under lease to another firm. This policy includes Dow Employees, contractors and their employees working at the Louisiana Division, plus visitors to the Louisiana Division.

2.2.10 The contractor will furnish safety stand-by observer personnel when required for confined space entry. This will be discussed at the job site visit.

2.3 Safety Equipment and Clothing

2.3.1 All contractor's and subcontractor's personnel shall be equipped with and shall use approved safety equipment and clothing as required by Safety Standards Manuals.

2.3.2 Safety requirements for this plant require that contractor's and subcontractor's personnel wear safety glasses, hard-hats, hearing protection (ear plugs or ear muffs) and carry in their possession at all times ready to use, monogoggles, a chlorine/acid-gas single cartridge mouthbit respirator approved by Dow.

2.3.3 Double hearing protection may be required in some areas of the operational unit.

2.3.3.1 Monogoggles shall be worn in designated areas.

2.3.3.2 All safety gear is to be furnished by the contractor.

2.3.4 Because of the possibility of chemical spills and/or releases of hazardous gases, the safety gear requirements will be strictly enforced.

2.3.5 Protective clothing and full face shields shall be worn during work on tie-ins to existing hazardous lines.

2.3.6 The wearing of finger rings is prohibited.

2.3.7 Wearing of fabric shoes or sandals will not be permitted anywhere on Dow's Property. Steel toe safety shoes are recommended.

2.3.8 Any person grinding, chipping, etc. will be required to wear a face shield and monogoggles or safety glasses with side shields.

2.3.9 Venturi type air movers will not be used to direct air for cooling toward a workplace. This type of air mover greatly increases the speed of the air, and any small objects that are pulled into the air stream could cause injury.

2.3.10 Equipment (including manlifts and forklifts), cables and tools shall be inspected and certified by Dow prior to use. All items shall comply with Dow's Safety Standards. Items inspected and not meeting requirements shall be replaced on request.

2.3.11 Each person on this job site is required to wear an approved hard hat and safety glasses (MUST MEET ANSI STANDARD Z87.1) as a minimum. In addition each person on the job site shall have a mouthbit respirator (AMERICAN OPTICAL 12-97 WITH R-722 CARTRIDGE) on their person at all times. The contractor shall furnish all safety equipment.

2.3.11.1 Monogoggles must be worn if safety glasses with side shields cannot be worn.

2.3.11.2 Clear safety glasses must be worn by the night shift and anytime contractors will be working within the boiler.

2.3.12 A fall protection system shall be used continually by personnel in work areas not protected by guardrails and mid-rails where there is a danger of personnel falling from a distance of six(6) feet or greater as measured from lowest point of body. Refer to Safety Reference B-10.

2.3.13 If the heat index within the work area of the boiler is such that the contractor deems it necessary to reduce the internal temperature, it will be the contractor's responsibility to provide an air conditioning system that is acceptable to the owner's representative.

2.4 Contractor's Facilities and Construction Utilities

2.4.1 The contractor shall provide and maintain temporary facilities as required for his personnel. The location, size and maintenance of the facilities shall be subject to the approval of the Owner's Representative, pending approval and inspection of the local Fire Marshall, and shall be in accordance with all other local and national regulations.

2.4.2 During the job site visit the contractor will be informed by owner about the location and area available for personnel facilities.

2.4.3 Cooling or heating units required during construction shall be approved by the Owner's Representative before use.

2.4.4 Contractor's personnel shall not use owner's facilities.

2.4.5 If contractor's personnel will be eating at the job site, the contractor shall furnish a suitable protected facility for his personnel. Location of the facility must be approved by the owner. Eating by contractor's personnel is permitted only in the contractor's designated facility.

2.4.6 The contractor shall provide adequate temporary, weatherproof storage facilities for materials and equipment upon which the weather has a detrimental effect.

2.4.7 Materials not affected by weather may be stored in the open at contractor's risk.

2.4.8 The contractor may utilize an area in the vicinity of the job site for the storage facilities. The location and size of the storage facilities shall be subject to approval by the Owner's Representative.

2.4.9 The contractor may provide a temporary fabrication shop in the vicinity of the job site. The location and size of the shop shall be subject to approval by the Owner's Representative.

2.4.10 The use of Owner's Telephones by contractor will not be permitted.

2.4.11 During the job site visit the contractor will be informed by owner of the availability of telephones.

2.4.12 Sanitary facilities (CONTRACTOR FURNISHED) shall be portable chemical type approved by the State Laws of Louisiana.

2.4.13 Plant water for testing, drinking water without ice, and water for general construction purposes will be made available to the contractor without cost. The contractor shall furnish his own hauling, distribution and dispensing facilities and remove them at job completion.

2.4.14 A 110v power supply for small tools and temporary buildings will be made available to the contractor without cost, but the contractor shall be responsible for the distribution facilities. D.C. welding machines shall not be used as a power source.

2.4.15 Any required compressed air will be furnished by the contractor.

2.4.16 The contractor shall make provisions for fuel to be delivered for his equipment. No onsite storage of fuel will be allowed.

2.5 Plant Roadways

2.5.1 The contractor shall keep all roadways clear of spillage from his traffic. Any accidental spillage shall be cleaned immediately, to the satisfaction of the Owner's Representative.

2.5.2 Roadways shall be adequately protected from damage which may be caused by excessive haulage loads.

2.5.3 Any damage to roadways caused by contractor shall be repaired at contractor's expense.

2.5.4 The contractor shall use mats for his equipment or other precautions that may be necessary to prevent damage to existing concrete pavement and underground piping.

2.5.5 Access to work areas for contractor's equipment shall be determined with Owner's Representative.

2.5.6 Fire lanes and access roads shall not be blocked by contractor's equipment after working hours. During working hours contractor must be able to clear fire lanes and access roads at any time.

2.5.7 The transportation of loads over eight(8) feet wide on in- plant roads will require an escort by Dow Plant Security.

2.5.8 For wide loads, travel on in-plant roads shall be at hours other than 7-8 a.m., 11 a.m. to 12:30 p.m., and 2-5 p.m., Monday through Friday.

2.5.9 Plant railroads may be used by contractor for delivery of materials and equipment on an owner approved schedule.

2.5.10 Contractor shall provide and maintain adequate barricades and warning lights.

2.5.11 Seat belts shall be worn in all vehicles inside the plant. There is a thirty(30) mph speed limit inside the Louisiana Division Plant Site. There is a five(5) mph speed limit inside each block within the division.

2.5.12 Subject to approval by Owner's Representative, the contractor may construct temporary bridges, culverts and roadways as required for access to the work site.

2.5.13 These temporary bridges, etc. shall be constructed and maintained so as to adequately sustain loads conveyed on them and not damage underground installations.

2.5.14 Only construction equipment and the personal car of the Contractor's Representative will be permitted to be parked on the job site.

2.5.15 Contractor's personnel may use a parking area inside the job site or adjacent to the job site as designated by Owner's Representative.

2.5.16 The number and category of vehicles in the parking area will be subject to approval by Owner's Representative.

2.5.17 Parking vehicles on roads or places other than the designated parking areas will not be allowed.

2.5.18 Transportation of personnel to and from the job site shall be the contractor's responsibility and be at his expense. All contractor vehicles must have company name displayed on the front driver and passenger door.

2.6 Contractor Equipment and Tools

2.6.1 Lockouts on power tools are not allowed in accordance with S-217 of the Safety and Loss Prevention Standard (1993- 1994).

2.6.2 Contractor shall use a ground fault circuit interrupter with continuity plugs on outside power extension cords or electrical tools per Dow's Safety Standards Manuals.

2.6.3 All scaffolding shall conform to the Safety Standards Manuals.

2.6.4 Tools utilizing explosive charges shall be used only with permission of the Owner's Representative.

2.6.5 Abrasive blasting will be allowed only in an area designated by the Owner's Representative.

2.6.6 Contractor has the complete responsibility for the safe operation of any hoisting or lifting equipment. Contractor shall verify weights of loads to be lifted for approval. Contractor shall submit to the Owner's Representative for approval an outline of safety planning for each lift with any of the following conditions:

- 1) Load exceeds 80% of rated load chart for crane.
- 2) Load exceeds 50% of rated load chart for crane, and possible failure would endanger existing

facilities.

- 3) Two or more booms are required to make lift.
- 4) Poles or derricks are to be utilized for a special lift.

2.6.7 All critical lifts (lifts over 80% of crane capacity), lifts over 10,000 pounds or lifts requiring two rigs shall be approved by Owner's Representative. Contractor shall complete required lifting permit form and submit to Owner's Representative for approval prior to making lift.

2.6.7.1 Rig charts shall be available.

2.6.7.2 Only approved, tested and tagged chokers are allowed (no webbing slings are allowed). Tag shall specify size and capacities at 15, 30 and 45 degrees and date tested.

2.6.7.3 Rig booms are to be lowered at night and over weekends (when not in use). They are not to be left up over process areas.

2.6.7.4 Rigs shall be inspected and approved prior to use at the job site. For inspection notify the owner's representative 24 hrs. in advance.

2.6.7.5 The weights of owner furnished material given in the specifications or on the drawings represents the owner's best available information. The contractor shall verify weights and provide adequate rigging and hoisting equipment to safely handle equipment. Weight evidence, such as shipping weights, scale weight tickets, calculated figures, or vendor weights shall be made available for this purpose. Any extra work or equipment necessary to verify owner furnished equipment weights will be handled as an extra to the contract with prior authorization of the Owner's Representative.

2.7 Security

2.7.1 Wandering of contractor's personnel through plant areas other than the immediate work area will not be permitted.

2.7.2 Photographs of the project or any part thereof shall not be taken without written permission of the Owner's Representative. The contractor shall assist the Owner's Representative in preventing unauthorized photographs being taken.

2.7.3 Contractor's employment badge and identification procedures may be used. However, security measures shall be enforced at all times to prevent unauthorized personnel from entering the construction site.

2.7.4 The display of any signs or advertisement shall have prior written approval of the Owner's Representative. However, contractor's buildings and vehicles shall display the contractor's name.

2.7.5 Contractor's personnel shall be logged in and out of operating areas daily by Contractor's Supervisor. Location of the log book will be designated by Owner's Representative.

2.7.6 A weekly man count of contractor's personnel shall be taken and recorded and supplied to the owner. Completed forms shall be submitted to the Owner's Representative at the beginning of each shift.

2.7.7 No piece of operating equipment may enter the block without prior written approval from the Owner's Representative. Equipment leaving will require a material passout. This passout has to be signed by the owner's representative.

2.7.8 Security guards are not provided at job site. Contractor shall take necessary precautions to ensure the security of personnel, equipment, or owner furnished materials under his control.

2.8 Housekeeping

2.8.1 Housekeeping and clean-up of the job site is a basic requirement and shall be done on a ongoing basis. Contractor shall give special ongoing attention to maintain clear walkways and roadways, removal of trash, removal of slipping and tripping hazards, and proper stacking of materials. The contractor will be responsible for the housekeeping in the area regardless of who causes the poor housekeeping.

2.8.2 Contractor shall collect scrap, debris, and waste material resulting from his operations on a ongoing basis and place in proper container as described below.

2.8.3 Contractors providing services within the Louisiana Division shall place in proper container the following bulk non-burnable, non-hazardous solids generated through their activities.

2.8.3.1 Definition: Non-burnable, non-hazardous solid waste material shall consist of:

- a) Scrap wood larger than 24" x 24" x 1"
- b) Steel reinforced hoses which have been water washed
- c) General construction type debris

Where small amounts of these materials will be generated, the contractor may use the yellow loadlugger bins for disposal. These bins are available in each block.

2.8.4 Contractors providing services within the Louisiana Division shall place in proper container the following non-contaminated, non-burnable solids generated through their activities.

2.8.4.1 Definition: Non-burnable, non hazardous solid waste material shall consist of:

- a) Broken concrete and associated steel in pieces no larger than 24"x24"x24".
- b) Non-contaminated dirt

2.8.5 Contractors providing services within the Louisiana Division shall place in proper container burnable materials generated through their activities.

2.8.5.1 Definition: Bulk burnable solids will consist of non-contaminated materials such as:

- a) General day-to-day garbage and trash
- b) Cardboard
- c) Plastic films
- d) Utility hoses
- e) Slicker suits
- f) Scrap wood smaller than 24" x 24" x 1"
- g) General burnable construction debris

Where small amounts of this type of material

will be generated, the gray burnable bins at the plant site may be utilized for their disposal.

2.8.6 The disposal of all contaminated materials generated through the activities of contractors within the Louisiana Division shall be the responsibility of the Dow Department Supervision where the contract services are being performed.

2.8.7 All materials hauled by contractors for disposal shall be weighed at gate 3 operations plant for incineration services. Environmental Operations' billing for disposal of wastes will be to the plant or department generating the material.

2.8.8 Waste materials generated by the activities of contractors within the Louisiana Division will not be taken off-site for disposal. The off-site disposal of any waste materials shall be approved by the Dow Louisiana Division Environmental Manager.

2.8.9 A dumpster for containing metal will be provided and handled by Dow.

2.9 Liaison and Coordination

2.9.1 During all phases of the work, the owner will supply a representative who will be authorized to act in a representative capacity on all matters relating to the work.

2.9.2 Other owner's personnel will convey all communications through the Owner's Representative.

2.9.3 The Owner's Representative will be responsible only for written instructions. Approval by Owner's Representative shall not relieve the contractor of any of his responsibilities.

2.9.4 Contractor shall appoint a representative through whom all communications with the Owner's Representative shall take place.

2.9.4.1 The Contractor's Representative shall be available full time on site.

2.9.5 This work will be done in an operating plant. Scheduling of the work is of utmost importance and shall be coordinated through the Owner's Representative. The contractor shall have fabrication completed and field checked for accuracy. All materials required shall be on hand prior to any shutdown to keep shutdown time to a minimum.

2.9.6 Contractor shall give a minimum of five(5) calendar days notice to the Owner's Representative prior to moving in of labor, equipment or material to any location within the jobsite.

2.9.7 Locations and elevations of work shall match and line up with the existing facilities. In case of variation or discrepancy, the Owner's Representative shall be contacted immediately for directions before proceeding with permanent work.

2.9.8 Other contractors will be working at the job site during work on this contract. It is imperative that the contractor cooperate closely with these other contractors in maintaining a safe and efficient work site for all parties working at the site.

2.9.9 In cases where a Vendor's Representative is to be at the site for assistance in assembly of equipment, notify the Owner's Representative sufficiently in advance to allow for the arrangements to be made and for travel time.

2.10 Planning and Cost Control

2.10.1 Within five(5) calendar days after award of contract, the contractor shall submit a detailed construction schedule for owner's approval. This schedule is in addition to the time schedule required by the contract, article 4, paragraph 4.01.

2.10.1.1 The construction schedule may be in the form of a bar chart or an arrow diagram.

2.10.1.2 The construction schedule shall show the order in which the contractor proposes to carry out the work and the dates for start and completion of each activity and the percentage of work scheduled for completion at any time.

2.10.1.3 The construction schedule shall show manpower details including number of man-days and peak labor requirements for completion of the work within the time specified in contractor's original plan of work.

2.10.1.4 The contractor shall update the construction schedule, to indicate actual progress, bi-weekly.

2.10.1.5 The contractor shall submit, along with the construction schedule, and organization chart itemizing all supervision down to foreman level and all other personnel that the contractor intends to employ at the job site.

2.10.1.6 Contractor shall also itemize all major machinery and equipment that the contractor proposes to utilize at the job site.

2.10.1.7 The contractor shall have planning personnel available on site.

2.10.2 On approval of contractor's construction schedule, the schedule will be considered binding for the progress of the work and shall be the basis for monthly billings.

2.10.3 The contractor shall submit a plan of construction showing, in useful detail, and to time scale, how he intends to perform the work within the time specified in his original plan of work. The plan shall indicate restraints imposed by owner furnished components, contractor furnished components, sub-contractor activities and components. The plan shall be delivered to the Owner's Representative within seven (7) days from date of contract. This plan is in addition to the time schedule required by the contract, article 4, paragraph 4.01. This plan shall be updated weekly to show work accomplished versus work still to be done.

2.10.4 The Owner's Representative may request work extra to, or omitted from the scope of this specification. Should the Owner's Representative decide that this work be done on a cost plus basis, the following will apply:

2.10.4.1 The contractor shall supply names of personnel assigned requested extra work to the Owner's Representative prior to beginning the work.

2.10.4.2 The contractor shall submit time sheets daily to the Owner's Representative for approval. Time sheets will indicate the work accomplished the previous day and will show the construction order number, number of personnel, their classification and hours worked.

2.10.4.3 The invoiced cost of material to the contractor shall not exceed the cost for which the owner is able to purchase identical material from the manufacturer or a licensed distributor. At the Owner Representative's request, the contractor shall submit, with his invoice for payment, copies of all invoices for material supplied by the contractor.

2.10.5 If the contractor incurs any additional costs, not covered by the contract or construction orders, he must submit his claim, accompanied by supporting documentation, to the Owner's Representative within the same day. Claims submitted after this period are null and void.

2.11 Quality Assurance

2.11.1 Dow will furnish inspectors for all portions of job. These inspectors shall have the final decision on questions concerning quality of construction and shall have right of rejection of any work contrary to these specifications or of an inferior quality.

2.11.2 Contractor shall be responsible for inspection of the quality of his own work and the work by his subcontractors.

2.11.3 Contractor shall be responsible for all shop inspection of contractor furnished material and equipment.

2.11.4 For contractor furnished materials, the contractor shall prepare and include in the material specifications complete inspection and testing procedures.

2.11.4.1 The Owner's Authorized Representative will make inspections of work in progress in sub-vendor shops and/or carry out final inspections prior to shipment.

2.11.5 The contractor shall submit welding procedures, certificates, and a welder identification (accounting) procedure for Owner's Representative review and approval prior to any welding being performed.

2.11.6 Furnish to the Owner's Representative within two weeks after receipt of material, two copies of mill test reports, vendor's certification papers, or certified laboratory reports on contractor-furnished pipe and fittings.

2.11.7 Traceable material test certificates shall be submitted for all fasteners including bolts, studs, etc., furnished on this contract. The owner (DOW) may test random samples at his (owner's) expense. If tested samples fail to meet the specified properties, compositions, etc., in accordance with the applicable ASTM, ASME, or SAE Codes and Standards, the contractor shall replace all fasteners furnished on this contract with materials that comply with the specification. The contractor shall provide proof of compliance through testing that all materials replaced or maintained are in accordance with the applicable code or standards.

2.12 Emergency and Evacuation Procedures

2.12.1 In the event a warning is given to "evacuate", the contractor shall immediately shut down his equipment and all personnel shall leave the area. In the event a warning is given to "cease operations", the contractor shall shut down his equipment and cease any operation that would be hazardous to explosive mixtures. Any lost time caused by the shutdown will be paid for by the owner as an extra to the contract. The contractor shall include in his bid a "flat down time rate" that does not include profit, overhead, or any consumables. Time lost shall be negotiated as soon as possible and shall be agreed upon the same day the stoppage occurs or considerations for extra payment will not be given. Final details for the activities as outlined shall be developed with the Owner's Representative immediately after award of contract.

2.12.2 It is not anticipated that contractor's work will be interrupted or unusually delayed by plant operations. In the event it becomes necessary for the contractor to cease work or evacuate the area, the lost time will be handled as an extra to the contract.

3. Scope of Work

3.1 General

3.1.1 The work consists of furnishing supervision, labor, materials, tools, and equipment to complete all work as described in section one(1) of this document, and as shown and noted on the drawings and as specified herein.

3.1.2 The contractor shall furnish all equipment and some materials (EXCEPT AS SPECIFIED AS BEING OWNER FURNISHED) and provide qualified supervision, labor, and tools to complete the work as specified on drawings, schedules and in this specification.

3.1.3 It is the contractor's responsibility to be fully knowledgeable of and to strictly comply with Dow's rules and regulations and all applicable national and local codes and regulations.

3.1.4 The contractor shall not cut all of the superheater tubes at the same time. The contractor shall submit his plan for the removal of these tubes for approval.

3.1.5 The contractor shall not cut all of the water tubes at the same time. The contractor shall submit his plan for the removal of these tubes for approval.

3.1.6 The contractor shall contact Dow if he suspects that any material he is about to come in contact with is ceramic fiber or asbestos. Dow will remove any such material.

3.1.7 If the contractor requires the removal of equipment, insulation, electrical, instrumentation or pipe he shall notify the owner representative 24 hours in advance.

3.1.8 If the contractor plans to do work on the superheater tubes and the water tubes at the same time, it will be necessary to take precautions to insure that the crew working on the lower level is protected from falling objects.

3.1.9 The contractor shall indicate his intent to comply with the medical surveillance documentation on the Bid Proposal. The successful bidder shall complete sheet 6 of 6 of the medical surveillance documentation (L10Q-0001-01) on every employee.

3.2 Major Categories of Work

3.2.1 The following is a summary of the major types of work required. The summary is for guidance only and does not constitute the complete scope of the specification and drawings.

3.2.1.1 On Boiler 1-

3.2.1.1.1 Replace 74 first row super heater tubes and 74 second row super heater tubes.

3.2.1.1.2 Replacement of the castible refractory at the roof where the tubes go into the penthouse. Castible refractory shall be Kast-O-Lite 25, (95#/cu.ft.) from A.P. Green (comes in 100# bags).

3.2.1.1.3 Replacement of 71 water tubes, as per drawing.

3.2.1.1.4 The superheater tubes are 2-1/2" O.D., with .260" wall thickness and made of SA213-T22 material. Use welding spec. L47-357.

3.2.1.1.5 The water tubes are 3-1/2" O.D., with .240" wall thickness and made of SA192 material. The castible refractory will have to be removed so the pipe can be welded. After the welding is completed and inspected the castible refractory will have to be replaced. Use welding spec. L8S-6501-CB.

3.2.1.1.6 Cut 23 thermocouples from the superheater tubes.

3.2.1.1.7 Tack weld 29 thermocouples to superheater tubes and route the leads to the outside of boiler for the owner to terminate.

3.2.1.2 On Boiler 2-

3.2.1.2.1 Replace 74 first row super heater tubes and 74 second row super heater tubes.

3.2.1.2.2 Replacement of the castible refractory at the roof where the tubes go into the penthouse. Castible refractory shall be Kast-O-Lite 25, (95#/cu.ft.) from A.P. Green (comes in 100# bags).

3.2.1.2.3 Replacement of 71 water tubes, as per drawing.

3.2.1.2.4 The superheater tubes are 2-1/2" O.D., with .260" wall thickness and made of SA213-T22 material. Use welding spec. L47-357.

3.2.1.2.5 The water tubes are 3-1/2" O.D., with .240" wall thickness and made of SA192 material. The castible refractory will have to be removed so the pipe can be welded. After the welding is completed and inspected the castible refractory will have to be replaced. Use welding spec. L8S-6501-CB.

3.2.1.2.6 Cut 23 thermocouples from the superheater tubes.

3.2.1.2.7 Tack weld 29 new thermocouples to superheater tubes and route the leads to the outside of boiler for the owner to terminate.

3.2.1.3 All tubes will be brought into the furnace through an existing opening on the side of boilers.

3.2.1.4 Remove and replace all ship lap tile below the superheater section. This is to avoid breaking while first and second pass superheater tubes are being replaced.

3.2.2 In addition to paragraph 3.1.2 the Contractor shall furnish , the castible refractory material and any insulation at the penetration of the superheater tubes into the penthouse, separator clips (1/2" or 5/8" bar stock) that are welded between the water tubes, brick and castible refractory material in back of the water tubes.

4. Work Done by Others

4.1 Asbestos Abatement (if any is required)

4.2 Any ceramic fiber work.

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5. Owner-Furnished Material

5.1 General

5.1.1 Owner-Furnished Material will be available to the contractor at the job site.

5.1.2 Owner-Furnished Material lost or damaged after receipt of same by the contractor shall be repaired or replaced by the contractor.

5.1.3 Owner-Furnished Material in excess of job requirements shall be returned to the Owner's Representative.

5.1.4 All required loading, unloading, handling and hauling shall be done by the contractor.

5.2 Mechanical Equipment

5.2.1 All superheater tubes and waterwall tubes will be furnished by the owner and will be on the jobsite by the start date.

5.2.2 All thermocouples will be supplied by the owner.

5.3 Delivery Schedule

5.3.1 Owner-furnished Materials and equipment will be available to contractor upon arrival at job site November 8, 1993.

5.4 Receipt and Storage

5.4.1 Contractor shall receive materials and equipment from owner by arrangement with the Owner's Representative.

5.4.2 The contractor shall inspect and sign for all materials and equipment on receipt and shall immediately notify the owner of any shortage, damage or discrepancy thereof.

5.4.3 Thereafter, the completeness and condition of equipment and materials shall be the responsibility of the contractor. Any equipment and materials damaged or lost, after receipt by the contractor, shall be repaired or replaced by the contractor.

5.4.4 The materials and equipment already stored are to be received by the contractor and transferred from the Owner's Store to the Contractor's Store by the contractor within one(1) week of moving in date.

5.4.5 After arrival at the job site, the contractor shall be responsible for the receipt, recording, unloading, handling, storage and inspection and transport to job site of the remaining materials and equipment.

5.4.6 Materials and equipment delivered after the moving in date will be received and recorded by the owner and then transported to the Contractor's Store or job site.

5.4.7 The contractor may utilize an area in the vicinity of the job site for the storage facilities.

51. Fabrication

51.1 Design, fabrication, testing and materials shall be as per Section 1 of ASME Code.

51.2 Where holes are required of bolts in structural members, they shall be drilled or punched. Burning of holes for bolting will not be permitted.

51.3 Interior of furnace section, when completed, shall be free of foreign matter including slag, weld dropping, grit, and water.

51.4 All clips, brackets, other non-pressure containing attachments welded to the pressure containing parts shall be the same chemical composition as the pressure part to which they are welded.

51.5 Surface finish of all corners, fillets, welds, etc., are the responsibility of the contractor and shall be 1/8 inch minimum radius.

51.6 Contractor shall complete the Vessel Status Change Report (VSCR), Sections 5, 6 and 8. Contractor shall reference the LAD Vessel Program Changes In Vessel Status, Repair of Boilers instructions enclosed in this contract. Upon completion of the form, the contractor's representative shall return it to the Owner's Vessel Inspector.

52. Welding

52.1 Contractor shall notify the owner's welding services five (5) working days in advance of any welding.

52.2 All welding shall be in accordance with this specification and ASME Code.

52.3 Welding procedures and techniques shall be the responsibility of the contractor and shall be submitted to welding services for approval five (5) working days in advance of any welding.

52.4 Welders shall be certified in accordance with the ASME Code, Section IX, Welding Qualifications, and must meet the requirements for renewal of qualifications. Qualification of welders shall also conform to Dow Specification L8S-6500-01. Contractors shall submit welder's certifications to welding services for approval prior to any welding.

52.5 All butt welds, including those in nozzle necks shall have 100% penetration and fusion regardless of wall thickness or welding efficiency specified. No "icicles" will be permitted. The thickness of the reinforcement shall be as per ASME Code.

52.6 Single-welded butt joints and single-welded butt joints with backup strips are not permitted without the written consent of the owner's engineering representative and Welding Services.

52.7 Consumable backing inserts are not permitted without the written consent of the owner's engineering representative and Welding Services.

52.8 Film of the radiographed welds and a weld map of all the welds radiographed shall be submitted to the owner's welding services for interpretation.

52.9 Any welding failing to meet the approval of the owner's welding inspector shall be repaired at the contractor's expense. The weld repair will then be radiographed at the contractor's expense and the film shall be submitted to the owner's welding inspector for approval.

52.9.1 Paragraph 3.2.6 of specification L8S-6500-01 calls for a progressive examination when a weld fails to meet approval. In accordance with ASME B31.3-1993, the definition of progressive examination is as follows:

Progressive Examination- When required spot or random examination reveals a defect:

- (a) two additional items of the same kind (if welded or bonded joints, by the same welder, bonder, or operator) shall be given the same type of examination; and
- (b) if the items examined as required by (a) above are acceptable, the defective item shall be repaired or replaced and reexamined as specified in para. 52.10.1.1, and all items represented by this additional examination shall be accepted; but
- (c) if any of the items examined as required by (a) above reveals a defect, two further items of the same kind shall be examined for each defective item found by the examination; and
- (d) if all the items examined as required by (c) above are acceptable, the defective item(s) shall be repaired or replaced and reexamined as specified in para. 52.10.1.1, and all items represented by this additional examination shall be accepted; but
- (e) if any of the items examined as required by (c) above reveals a defect, all items represented by the progressive examination shall be either:
 - (1) repaired or replaced and reexamined as required ; or
 - (2) fully examined and repaired or replaced as necessary, and reexamined as necessary to meet the requirements of the code.

52.9.1.1 Defective Components and Workmanship- An examined item with one or more defects (imperfections of a type or magnitude exceeding the acceptance criteria of the Code) shall be repaired or replaced; and the new work shall be reexamined by the same methods, to the same extent, and by the same acceptance criteria as required for the original work.

52.10 Electrodes shall be purchased only in hermetically sealed packages. Upon opening this type of container the electrodes shall be stored in a holding oven. Ovens that hold low hydrogen electrodes shall have an internal temperature of at least 350 degrees Fahrenheit. Electrodes that have been exposed to the atmosphere more than four(4) hours shall be returned to the heated oven for a minimum of eight(8) hours before they may be used.

52.11 Striking an arc on base metal, other than in the weld groove, is prohibited.

52.12 All weld areas, both inside and outside diameters, (2" back from and including the weld groove), must be cleaned before tacking or welding. All rust, mill scale, paint, dirt, grease, oil, etc. must be removed. On galvanized material, it will be necessary to remove the Zinc in the area of the joint prior to the welding operation.

52.13 Welding shall not be done when the quality of the weld or rods would be adversely effected by the prevailing weather conditions. The owner's welding inspector will determine when weather conditions require termination of work.

52.14 Each welder shall bucket his welding rod stubs as they are generated and disposed of at designated dumping areas.

52.15 Stringent inspection during construction by contractor shall be carried out to insure that welding meets the owner specifications. The owner's welding inspectors shall also be inspecting welding throughout the job.

80. Inspection and Testing

80.1 The materials and equipment used, methods of application and quality of work done shall at all times be subject to the inspection and approval of the Owner's Representative.

80.2 The contractor shall test and/or inspect the work completed at several stages of completion of work. Results of these tests and/or inspections shall be documented in writing and shall be submitted to the Owner's Representative for approval and subsequent inclusion in the Owner's Records System.

80.3 Test/inspection reports are to be submitted to the Owner's Representative within one (1) week of completion of the test and/or inspection.

80.4 Inspection and approval by the Owner's Representative shall not relieve the contractor from compliance with these specifications.

80.5 The contractor shall make available scaffolding and/or suitable access equipment and assist the Owner's Representative in making any test or inspection when, in the opinion of the representative, such devices and/or assistance is necessary.

80.6 Inspection

80.6.1 Supplemental to the inspection by the contractor, a representative of the owner will inspect the tube welds and other work and witness any tests, having at all times the same prerogatives given an inspector under the ASME Code standard, including that of rejection.

80.6.2 Inspection and approval by the Owner's Representatives shall not relieve the contractor from compliance with this specification.

80.6.3 The contractor shall maintain permanent records of welder qualifications, welding procedures, radiographs and all pertinent data pertaining to the superheater and water tubes for a minimum of five (5) years.

80.6.4 Prior to Owner's final inspection of each unit, the contractor shall have prepared in finished form and notarized 3 sets of records, except final test data, as set forth in this paragraph.

80.6.4.1 Data report for Boilers per ASME Code

80.6.4.1.1 In addition to the required data, the Owner's Purchase Order Number, Item Number, and Vessel Identification Number (VIN) shall appear on the data report for Owner's Identification. (BOILER 1 VIN = 303321 and BOILER 2 VIN = 303322)

80.6.4.2 Material mill test reports for all parts

80.6.4.3 Traceable material test certificates for all fasteners (bolts, studs, nuts, etc.)

80.6.4.4 Nameplate rubbing or facsimile of finished nameplate

80.6.4.5 AWS Classification and contractor of electrode or filler metal

80.6.4.6 Post weld heat treat charts

80.6.4.7 Written certification of impact tests, as required.

80.6.4.8 Complete set of final design calculations

80.6.4.9 Complete set of final as-built fabrication drawings

80.6.4.9.1 These drawings may be folded to 8-1/2" x 11", three-hole punched and inserted in the booklet or placed in a pouch at the back of the booklet.

80.6.5 These forms shall be submitted to the Owner's Representative at the time of final test so that he may certify correctness by affixing his signature to each booklet.

80.6.6 These forms, together with final test data, shall be assembled into 3 complete sets for each item. Each set shall be in booklet form, no larger than 9-1/2 inches by 12 inches, with each and every sheet bearing the Owner's Order Number, Owner's Item Number, Vessel Identification Number and Contractor's Boiler Serial Number. In no case shall a record book pertain to more than one tank number. The contractor shall mail to the purchaser the three sets of records for each tank.

80.7 Hydrostatic Testing

80.7.1 The Hydrostatic Testing shall be performed as per Section 1, ASME Code.

91. Specifications and Forms

91.1 Engineering Specifications

Specification No.	Date	Description
L2S-1525-01	30-Apr-1993	Scaffold Procedure
L2S-1525-02	30-Apr-1993	Sectional Scaffold
L2S-1525-03	30-Apr-1993	Tube & Coupler Scaffolding
L8S-6500-01	12-Mar-1992	Welding Specification for Pipe
L8S-6501-CB	12-Mar-1992	Welding Carbon Steel (.187" To .564") Using The Combined Gas Tungsten Arc And Shielded Metal Arc Processes
L8S-6504-AI	12-Mar-1992	Welding Heavy Wall (3/16" To 2 3/4") 1 1/4% Cr- 1/2% Mo Low Alloy Steel Using The Combined Gas Tungsten Arc And Shielded Metal Arc Processes
L47-357	8-JUL-1992	Welding Alloy Steel (.1875" To 2.00") Using The Combined Gas Tungsten Arc And Shielded Metal Arc Processes
L10Q-0001-01	21-Jul-1993	Compliance With OSHA Required Medical Surveillance

91.2 Forms

Latest Louisiana Division Safety and Loss Prevention Manual

Vessel Status Change Report (VSCR)

Changes in Vessel Status - Repair of Boilers (From LAD Vessel Program)

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92. Vendor Drawing List

92.1 Drawing Number Cover Sheet

Drawing Number	Date/Rev.	Description
2314-B5-4	5-10-57	General Arrangement of Riley Steam Generating Unit, Riley Stoker
2314-B6A-2	5-27-57	Plan Sections of Riley Steam Generating Unit, Riley Stoker
2314-B5A-1	10-22-56	Front View & Front Section Riley Steam Generating Unit, (Sheets 1 and 2) Riley Stoker

92.2 Dow Drawings

Drawing Number	Date/Rev.	Description
B5-042-P50-001	8-18-72	Superheater Tubes Boiler Nos. 1 & 2
B4-BOILER-1-2	10-93	Boiler 1 and 2 Superheater Water Wall Tubes
A5-930670-01	10-13-93	Water Tube Section