SECTION 23 2123
DEWATERING PUMPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Dewatering Pumps

1.02 DEFINITIONS

A. Furnish
   1. The term “furnish” is used to mean “purchase, supply, provide and deliver to the Project site, protect and provide interim storage and be ready for unloading, unpacking, assembly, installation, and similar operations in accordance with Manufacturer’s specifications.”

B. If Applicable:
   1. The term “if applicable” will be that work which may be required for completed construction at applicable locations, but is not necessarily shown or described in the Contract Documents.

C. As Necessary
   1. The term “as necessary” will be that work which is required for completed construction, but is not necessarily shown or described in the Contract Documents.

D. As Required
   1. The term “as required” will be that work which is required for completed construction and is shown on the drawings or described in the project Specification.

E. Product
   1. The term “product” will mean any item of equipment, material, fixture, apparatus, appliance or accessory installed under this Division.

F. Words in the singular will also mean and include the plural, wherever the context so indicates, and words in the plural will mean the singular, wherever the context so indicates.

1.03 SUBMITTALS

A. Product Data: Provide certified pump curves showing performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable. Include electrical characteristics and connection requirements.

B. Millwright's Certificate: Certify that base mounted pumps have been aligned.

C. Manufacturer's Installation Instructions: Indicate hanging and support requirements and recommendations.

D. Operation and Maintenance Data: Include installation instructions, assembly views, lubrication instructions, and replacement parts list.

E. Submittal of Shop Drawings:
   1. All hard copy submittals shall be compiled into an indexed three ring binder prior to submittal. Any loose leaf or stapled sheets will be rejected.
      a. Documents for Review:
         1) Small Size Sheets, Not Larger Than 8-1/2 x 11 inches (215 x 280 mm): Submit the number of copies that Contractor requires, plus three copies that will be retained by Architect.
         2) Larger Sheets, Not Larger Than 36 x 48 inches (910 x 1220 mm): Submit the number of opaque reproductions that Contractor requires, plus three copies that will be retained by Architect. A minimum of eight submittals shall be submitted.
   2. Electronic submittals shall be in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible or scanned files will be rejected.
      a. Submittals shall be for specific equipment to be provided on the project and not an entire catalog.

3. Major components of the system shall be submitted at one time under a protective cover with each section indexed with visible file tabs. All equipment shall be labeled per the equipment tags on the drawings, ie. Equipment names, etc.
4. Shop drawings shall indicate manufacturer name, model number, dimensions, voltage and current characteristics, construction and rough-in connections of all materials to be used. Each shop drawing shall be certified as being checked and approved by the Contractor before submittal.
5. The Engineer is not an error checker. Where the entity submitting pricing is submitting shop drawings that differ from the specifications, the entity submitting pricing must itemize in writing, each variance from the specifications. Failure to do so will be considered an error on the entity submitting pricing part and the specified materials shall be furnished. Shop drawings submitted in error or with errors as compared to Specifications and Drawings will be the responsibility of the entity submitting pricing to correct such error later.
6. Shop drawings must only be those materials as specified or approved in published addendum. Others will be returned without review.
7. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of the completed Work.
8. When revised for resubmission, identify all changes made since previous submission.
9. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
10. Identify Project and supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacture, assembly, and field performance of pumps, with minimum three years of documented experience.

B. Codes and Standards:
1. Materials and equipment shall be new and of best quality, of the type best suited for the purpose intended, and be made by nationally recognized and substantially established manufacturers. The type and weight of material used for each purpose shall be as herein specified, and material shall conform with the requirements of the latest standard specifications of the “ASTM” for that particular material.

C. Alternate Equipment
1. Where items of equipment and materials are specifically identified herein by a single manufacturer’s name, or as many as three manufacturer’s names, model or catalog numbers, and the words “or equal and approved” do not follow the manufacturer’s names, only such specific items may be used in the base bid, except as hereinafter provided.
2. Items of equipment of the entity submitting pricing’s choice may be offered as alternates to such specified items, either in the spaces provided for same in the proposal form or if no space is provided, on the bidder’s letterhead attached to each copy of the proposal form.
3. Alternate proposal must be accompanied by full descriptive and technical data for item proposed, together with statement or amount of cost addition or deduction from the base bid if alternate is accepted. Substitutions proposed by the entity submitting pricing will not be considered in the award of the contract.
4. The entity submitting pricing must judge that such alternate equipment is of equal quality and character to the specified equipment, and it is physically adaptable for installation within the allotted space with all required service clearances. Unless otherwise specified with this Division, the Engineer will not approve or disapprove any alternate equipment or materials before the bids are opened.
5. The cost of any changes to other trades as a result of use of the alternate material or equipment must be borne by the entity submitting such material or equipment.

D. Equipment of Substitution:
1. Where items of equipment and materials are specifically identified herein by a single manufacturer’s name, or as many as three manufacturer’s names, model or catalog

numbers, and the words “or equal and approved” follow the manufacturer’s name, such items may be substituted until such time that the “Schedule of Materials and Equipment” is submitted to the Architect or Engineer. The base bid and any alternate shall be based on materials only as specified or approved.

1.05 METHODS OF REQUEST FOR APPROVAL:

A. Prior to the award of the contract, interested parties may request approval of substitute materials. Such requests shall be made in writing and delivered to the South Dakota Science & Technology Authority (SDSTA) no later than ten (10) days prior to the receipt of bids. Any substitutions that the SDSTA finds satisfactory will then be published in an addendum as “acceptable substitutions.”

B. The listing of any manufacturer as “acceptable” does not imply automatic approval. It is the sole responsibility of the entity submitting pricing to ensure that any price quotations received and submittals made are for products which meet or exceed the specifications included herein.

C. The entity submitting pricing must judge that such items of substitution are of equal quality and character to the specified items and it is physically adaptable for installation within the allotted space with all required service clearances. This includes the following:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Will provide the same (or better) warranty for the substitution as for the specified product.
   3. Waives claims for additional costs or time extensions which may subsequently become apparent.
   4. Will reimburse Owner and Architect/Engineer for review or redesign services associated with re-approval by authorities.

1.06 TRANSPORTATION AND HANDLING

A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

B. Transport and handle products in accordance with manufacturer's instructions.

C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.07 STORAGE AND PROTECTION

A. Store and protect products in accordance with manufacturers' instructions.

B. Store with seals and labels intact and legible.

C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

D. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products. Coordinate storage requirements with owner.

E. Prevent contact with material that may cause corrosion, discoloration, or staining.

F. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

G. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.08 WARRANTY

A. Products shall be free from defects in material and workmanship under normal use and service for the time periods noted:

1. Assembly:
    a. 12 months from installation or 18 months from arrival on site, whichever is less.
    b. For installations that occur within 18 months of arrival on site, a factory trained representative shall inspect the installation for compliance with the manufacturer's installation requirements no less (2) times during the installation. Notifications of deficiencies in the installation shall be made to the Engineer within 48hrs.
2. Motor:
    a. 36 months from installation or 48 months from arrival on site, whichever is less.

PART 2 PRODUCTS

2.01 DEWATERING PUMPS - GENERAL

A. Provide pumps that operate at specified system fluid temperatures without vapor binding and cavitation and operate within 25 percent of midpoint of published maximum efficiency curve.

B. Construction:
1. Design for continuous operation in 104 degree F (40 degree C), 80% relative humidity environment.
2. Design for temperature rise in accordance with NEMA MG 1 limits for insulation class, service factor, and motor enclosure type.
3. External Paint: Corrosion resistant; mill and chemical duty paint.

C. Base Mounted Pumps: Aligned by qualified millwright. Note that pump, base, and motor will need to be brought down the shaft to the installation location separately and aligned once installed.

D. Products Requiring Electrical Connection: Listed and classified by UL or testing agency acceptable to Authority Having Jurisdiction as suitable for the purpose specified and indicated.

2.02 HORIZONTAL THREE STAGE PUMPS

A. Casing: Meets or exceeds ASME Section VIII and include required corrosion allowance required by ISO 13709 (API 610). Axially split with confined, non-asbestos gaskets. Includes ASTM A193 B7 studs and A194 2H nuts as required by ISO 13709 (API 610). Pumps shall distribute loads for high nozzle load capability. Provide with ANSI B16.5 class 600# R.F. suction and discharge flanges and shall be back faced as required by ISO 13709 (API 610). Provide socket welded and flanged drain connection.

B. Impeller: Enclosed, single suction design, and keyed to the shaft. Impellers shall be dynamically balanced to ISO 13709 (API 610) requirements.

C. Wear Rings: Provide with replaceable casing and impeller wear rings, secured by a press fit and set screws. Clearances between the wear surfaces integral impeller wear surfaces shall be per ISO 13709 (API 610).

D. Center Bushing: Provide with replaceable center bushing and sleeve. Sleeve shall be shrunk fit and keyed to the shaft. Provide API running clearances between the wear surfaces.

E. Seal Chambers (Case Covers): Seal chambers shall be integral with the case covers and are designed to accommodate single, dual pressurized or dual unpressurized, packing style seals in full compliance with ISO 21049 (API 682) seal chamber dimensions.

F. Shaft: The rotor shall be a classically stiff shaft design in accordance with ISO 13709 (API 610) 9 h edition that does not rely on bushing or wear ring fits for stability. The standard heavy-duty shaft shall easily transmits torque and limits deflection to less than 0.06 mm (0.002") at the seal chamber. It shall be fully machined over its length with large radii for lower stress.

G. Baseplate & Coupling Guard: The baseplate shall be fabricated from carbon steel, heavily reinforced to meet API 610 (ISO 13709) nozzle loads and deflection limits. Continuous welding shall be utilized top and bottom. The top plate shall slope from the driver to pump end for complete drainage. Grout holes shall provided with raised lips. A minimum 2” NPT drain connection shall be supplied. The underside of the baseplate incorporates angles to grip the grout. Baseplate dimensions and mounting surfaces conform to API 610 (ISO 13709). For baseplate sizes larger than the API 610 (ISO 13709) standard sizes, the same heavy-duty

design features shall be provided. Horizontal driver alignment screws and baseplate leveling screws shall be provided. Provided for 2x API nozzle loads. Provide with nonsparking aluminum coupling guard meeting OSHA requirements.

H. Couplings: Provide with nonlubricated flexible disc type spacer coupling to permit easy removal of pump components.

I. Seal Flush: Provide API 610 piping for primary seal flush, secondary seal flush, and cooling water.

J. Hydrostatic and Performance Testing: Testing shall be accomplished in accordance with API 610 latest edition (ISO 13709). Pump shall be hydrotested at a minimum of 1.5 times MAWP. Provide performance test submittal with performance and vibration data.

K. Welding & Non-Destructive Examination (NDE): Welding procedures for pressure boundary parts shall conform to ASME and to AWS welding requirements. Visual inspection of castings shall comply with MSS-SP55.

L. Electrical Characteristics:
   1. Motor: 3560 rpm
   2. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70.
   3. Provide motor with winding and bearing temperature RTD's (Resistance Temperature Detectors).

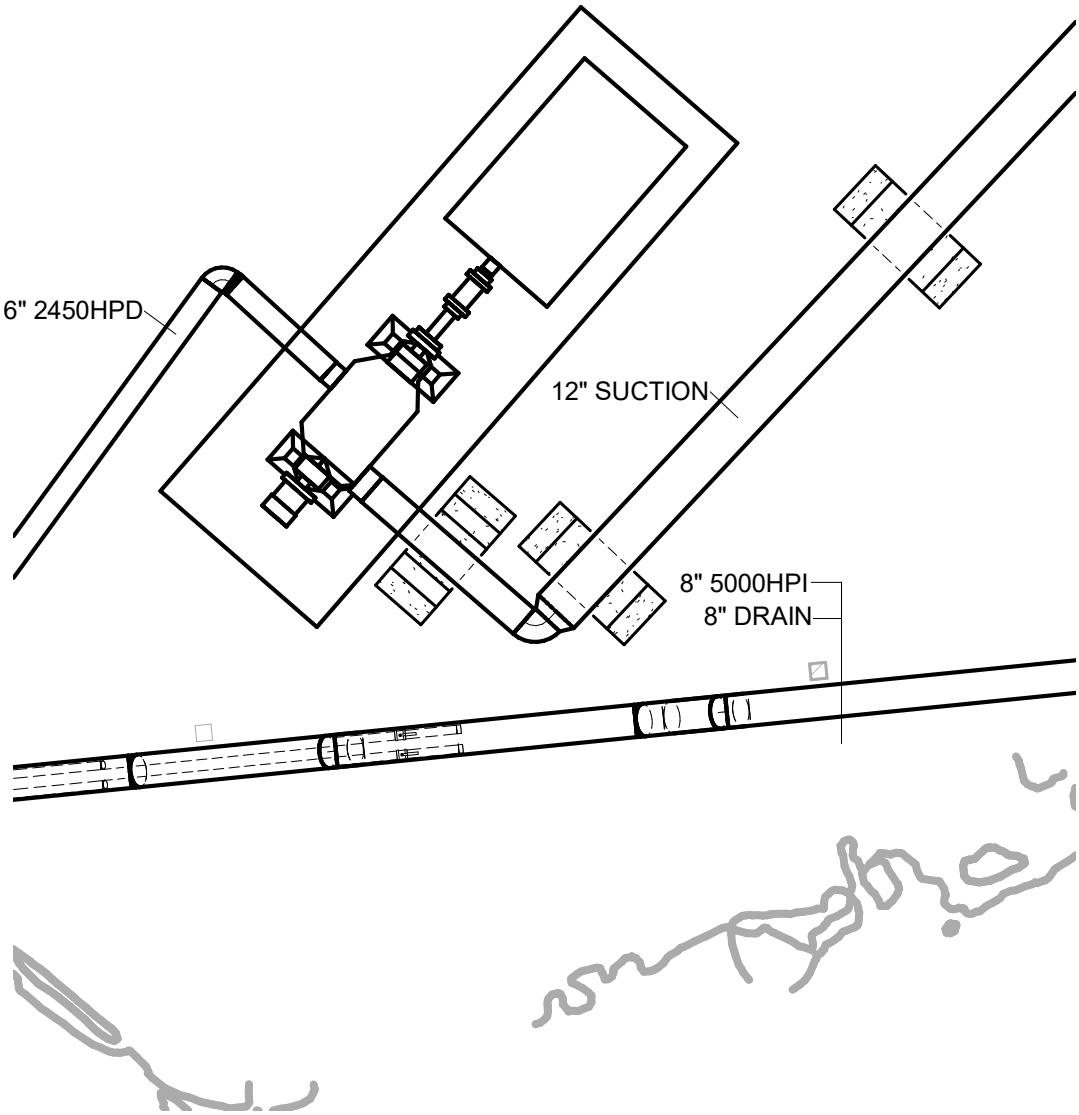
M. Motor:Motors for pumps shall meet NEMA MG 1, Parts 30 and 31. "Inverter Rated" and/or "Inverter Ready" motors are not acceptable.
   1. Type: Totally enclosed fan cooled.
   2. Accessories: Space heaters and thermal protection
   3. Provide shaft grounding kits for all motors.
   4. Double shielded bearings.

PART 3 EXECUTION

3.01 SCHEDULES

A. Basis of Design Pump:
   1. Material: API S-6 with hard surface overlay on all parts in contact with transfer media.
   2. Flow Capacity: 1450 GPM
   3. Head: 1500 ft H2O.
   4. NPSHA: 18.67
   5. NPSHR: 16
   6. Minimum Efficiency: 75%
   7. RPM: 3560
   8. Electrical: 4160V/3PH, 2-Pole
   9. Motor Size: 800 HP.
   10. Maximum Dimensions and Weight (per component):
      a. Width: 52"
      b. Length: 143"
      c. Height: 37.6"
      d. Weight: 13,500 lbs
      e. Pump will need to be disassembled from base so each piece can be transported down shaft separately. Maximum dimensions are the maximum sizes that can be transported through the shaft and drifts. Maximum weight is the maximum capacity of the shaft elevator.
   11. Refer to attached plan for pump orientation and piping connection locations.

END OF SECTION



1 3650L PUMP REMODEL PLAN
1/4" = 1'-0"

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3650L PUMP ROOM REMODEL PLAN

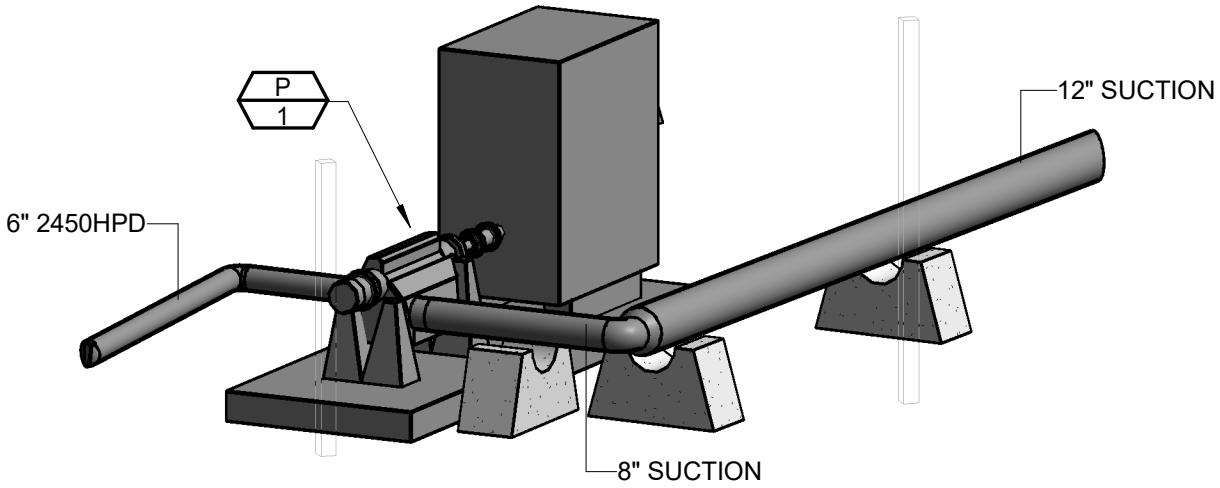
SDSTA 3650L PUMP ROOM REHAB

LEAD, SOUTH DAKOTA

DESIGNED:	MSH	DRAWN:	Author
APPROVED:	MSH		
PROJECT#:	BR21031		
DATE:	03/11/2022		

SHEET: 232123A

REVIT FILE NAME: BR21031 - SDSTA 3650L Pump Room Rehab - MEP22 - Central.rvt



1 232123B PUMP - 3D VIEW

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3650L PUMP ROOM REMODEL 3D PLAN

SDSTA 3650L PUMP ROOM REHAB

LEAD, SOUTH DAKOTA

DESIGNED:	MSH	DRAWN:	MSH
APPROVED:	MSH		
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