

SECTION 11155

FIBERGLASS REARING TANKS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. The work includes furnishing all labor, materials and equipment for the installation of fiberglass fish rearing tanks as shown on the drawings and as specified herein.

1.2 SUBMITTALS

- A. Provide the following submittals in accordance with SECTION 01340.
1. Shop Drawings. Shop drawings and design calculations shall be submitted showing details of construction and layouts for review and acceptance before materials are fabricated.
 2. Product Data. Submit manufacturer's printed literature for care and maintenance for review and acceptance.
 3. Samples. Submit 12" x 12" samples showing or indicating material type, thickness, and finish of available colors for review and acceptance.
 - a. Provide samples of the laminate system using the selected color at a minimum size of 12" x 12" for approval prior to tank fabrication.

PART 2 PRODUCTS

2.1 REQUIREMENTS

- A. Manufacturers' Qualifications
1. Only manufacturers with 5 years or more of proven experience and satisfactory performance in the manufacture of fiberglass reinforced plastic fish rearing tanks.
 2. All manufacturers will be required to submit a complete set of design calculations, material specifications and shop drawings.

NORTHEAST OREGON
HATCHERY PROJECT

B. Description of Fiberglass Tank

1. Provide fiber-reinforced plastic tanks complete and ready for piping hookup and installation. The tanks are to be used for the production of fish in water temperatures ranging from 0 to 30 degrees Celsius. The tanks are to be used for interior application as shown on the drawings and may be subjected to the maximum ambient temperature range and fluctuations for the geographical location.
2. Tanks shall conform to all dimensions and have the features indicated on the Drawings. Contractor shall verify tank dimensions and resolve any spacing changes required prior to installation. Units to be provided with slightly angles sides (to remove from mold), flat bottom, exterior reinforcement sufficient to maintain less than 1/4" total deflection at midpoint when filled with water. Supporting legs/skirts shall be structurally designed and shall support the filled tank with no deflection. Tank stability shall be such that they can be moved empty with a forklift in the center or can be carried by each end without causing deformation or damage to the unit.
3. Tanks shall be supplied in a dark green.
4. Tank standpipe openings and screen slots shall be fabricated for use as shown on the project plans.
5. All tank screens shall be provided by the tank manufacturer. Screens shall be interchangeable in any tank.
6. All tank standpipes shall be provided by the tank manufacturer. Standpipes shall seat in receptacles where shown in the Drawings to provide watertight seal at base.
7. Exposed tank flange and interior surface shall receive high gloss gel coat finish with UV inhibitor.

C. Extended Warranty

1. The tanks shall be warranted in writing for a period of three (3) years from the date of substantial completion and acceptance. This date shall be confirmed in writing by the Engineer. The warranty shall include defective work, breakage, deformation, cracking, delamination, leakage and loss of finishes or fading of color.

PART 3 EXECUTION

3.1 TANK INSTALLATION AND DELIVERY

- A. The fiberglass tank manufacturer shall review and certify in writing that all installation requirements as shown on the plans are in accordance with design character and limitations of the unit.
- B. The tanks are to be covered and protected to prevent damage in shipment and handling. All finished surfaces are to be protected. Tanks shall not be stored in the open at manufacturer's site or at job site. Any damage to the units incurred in transit and unloading will be the responsibility of the manufacturer. Permits, import requirements, and precautionary measures required for highway transport are the entire responsibility of the manufacturer.
- C. The manufacturer shall be responsible for delivering and supervising the unloading of the units at the hatchery. Visually imperfect units will be rejected. The manufacturer and Contractor shall fully cooperate in the inspection, unloading and installation of the units at the hatchery.
- D. The manufacturer shall fully cooperate and will assist the Contractor with respect to the tank inspection, shipping and loading/unloading schedule. The shipping schedule shall conform to the project completion schedule.
- E. The manufacturer must provide a qualified site representative with the first shipment of units to the project site to insure proper unloading, handling and final installation. The Contractor will provide equipment to handle and install the tanks in strict accordance with the manufacturer's instructions.
- F. All minor defects must be refinished by the manufacturer prior to completion of the Project and acceptance by the Owner. The refinished surface shall show no discernible variations in appearance from the surrounding areas. The Contractor and manufacturer shall cooperate in this requirement; the intent is to provide high quality, identical rearing units. The Contractor must take all necessary precautions to protect the tanks during completion of this project.
- G. Prior to shipment, the tanks shall be cleaned to remove any residual parting agent, film or other deleterious material. The units shall be carefully cleaned (per the manufacturer's instructions) prior to completion of the project.
- H. The first tank manufactured shall be inspected by the Owner and the Engineer for conformance to drawings and specifications prior to manufacturing remaining

NORTHEAST OREGON
HATCHERY PROJECT

order. All subsequent tanks shall be inspected by the Engineer prior to shipment to site.

END OF SECTION

SECTION 11230

PACKED COLUMNS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. The work includes furnishing design labor, materials, and equipment required to fabricate and install packed columns as shown on the Drawings and as specified herein.

1.2 SUBMITTALS

- A. Submit the following in accordance with SECTION 01340:
 1. Manufacturer's certification that products meet specification requirements.
 2. Manufacturer's recommended methods of installation, operation and maintenance.
 3. Shop drawings which include plans, elevations, sections and details for all components. Shop drawings shall show material specifications, fasteners and weld symbols.
 4. Catalog data for assembly components.

PART 2 PRODUCTS

2.1 PACKED COLUMNS

- A. All packed or aeration columns shall be provided by a single manufacturer. The manufacturer shall be a recognized manufacturer of packed columns specifically for aquaculture and have at least 5 years experience specific to the design and manufacture of packed columns. A list of 4 installation references similar to these specifications shall be supplied along with other submittal materials.
- B. Packed columns shall be of the size and configuration shown on the Drawings. Packed columns shall be EMA Engineered Products (541) 929-3255 - Engineered Products Division Model DP Series with modification required to meet these specifications or as shown on the Drawings, or approved equivalent manufactured by WMT - Water Management Technologies (225) 755-0026.

NORTHEAST OREGON
HATCHERY PROJECT

- C. Packed column aerators must be able to operate with efficient water distribution and resist phase inversion at loading variances between 50 and 120 gpm per square foot.
- D. The column shall be constructed entirely of aluminum. Column shell shall be 3000 series aluminum, rolled aluminum plate, of at least 14 gauge. Distribution plates, support collar, and tabs, handles shall be 5052 and 6061 aluminum.
- E. Distributor plate assemblies shall have chimneyed vents with a total height as required to prevent water flow into the chimneys. The quantity and size of chimney vents as well as plate perforations shall be designed by manufacturer to meet flow requirements noted in 2.1.C above.
- F. Column media shall be 1.5-inch polyethylene pall ring type. Media shall be contained in a minimum of 3 netted sacks allowing removal of media as a unified step.

PART 3 EXECUTION

3.1 FABRICATION AND INSTALLATION

- A. The Contractor shall verify all measurements and take all necessary field measurements required for correct fabrication of the packed column aerator/distribution tank assemblies.
- B. The packed column aerators shall be filled with media at the manufacturer's shop and shipped to the site as a unit. Install packed column/distribution tank at locations shown on the Drawings. Install in accordance with manufacturer's instructions.

END OF SECTION

SECTION 11452

KITCHEN EQUIPMENT

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. The work includes furnishing all labor, materials, equipment and appliances required to complete the installation of the Kitchen Equipment as indicated on the drawings and as specified herein.

1.2 SUBMITTALS

- A. Submit manufacturer's literature for the Kitchen Equipment with dimensions and installation details for acceptance prior to installation in accordance with SECTION 01340.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Under Counter Refrigerator: Shall be Model No. TAX4BNS Spacemaker Refrigerator with right-hand door, as manufactured by General Electric, or approved equal.
- B. Range: Shall be 30" drop-in electric range, Model No. JDS26BW, white on white, as manufactured by General Electric, or approved equal.
- C. Microwave: Shall be GE Profile Over-The-Range Microwave Oven with two-speed exhaust fan, Model No. JVM1660WB, white on white, as manufactured by General Electric, or approved equal.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install and connect the Kitchen Equipment for full operation in accordance with the manufacturer's printed instructions. Furnish guarantees, certificates and manuals to the Engineer.
- B. Mechanical and Electrical Rough-In: Covered under DIVISIONS 15 and 16, respectively.

END OF SECTION

SECTION 11881

INCUBATORS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. The work includes furnishing all labor, materials and equipment for the installation of vertical flow incubation cabinets as shown on the Drawings and as specified herein.

B. Related Requirements Specified Elsewhere:

SECTION 05990 - Miscellaneous Metals

SECTION 15050 - Basic Mechanical Material and Methods

DIVISION 16 - Electrical

1.2 GENERAL REQUIREMENTS

A. Manufacturer's Qualifications. Only manufacturers with 3 years of proven experience and satisfactory performance in the manufacture of specified or comparable items will be acceptable for the items for this project. All equipment shall fully meet the intent of the specification. Engineer shall review for acceptance any equipment not listed to determine whether it will fulfill the intent of the contract documents. Engineer reserves the right to reject any equipment which, in the Engineer's opinion, does not fulfill the intent of the contract documents.

1.3 SUBMITTALS

A. Submit the following in accordance with SECTION 01340:

1. Submit complete manufacturer's background data with shop drawing data including performance records and manufacturing history as required in 1.2.A above.

2. Submit detailed shop drawings with full layout dimension data.

3. Submit full material list of components to be furnished and materials to be used. Submit 12" x 12" sample sections of all fiberglass units to illustrate finish, color and structural character of the tank.

NORTHEAST OREGON
HATCHERY PROJECT

4. Submit complete descriptive data.

PART 2 PRODUCTS

2.1 VERTICAL FLOW INCUBATION CABINETS

- A. General. The basic unit shall consist of an aluminum tray stand complete with eight (8) fiberglass trays. Tray units shall be provided as shown on the Drawings.
- B. Tray Stand. Incubation cabinet stand structural components shall be 6063 T-6 aluminum supports with tray slides of polyester resin reinforced with glass roving. Stands shall be provided with floor mounting clips. Tray stand shall be approximately 24-1/4 inches wide by 24-3/4 inches deep by 31-3/4 inches high.
- C. Incubation Trays. Shall consist of 4 components; a water distribution ring, egg and fry compartment, a cover screen, and tray media.
 1. Water distribution ring shall be constructed of polyester resin reinforced with glass roving, size 21-1/4 inch by 24-3/4 inch by 3-3/8 inch. Water outflow openings shall be designed to eliminate dribble, backflow and dripping into tray below. Inflow water receiving compartment shall be designed to minimize possible overflow and splashing from trays above. Water flow capacity shall be 10 maximum gpm and 3 minimum gpm. A 1-inch diameter clean-out hole shall be located on the front of the tray and shall be equipped with a stainless steel activator rod and rubber stopper. Molded surface shall be smooth, without cracks or crevices, to permit rapid, easy cleaning.
 2. Egg and fry compartment and cover screen shall be polyester resin reinforced with glass roving. Metal parts shall be stainless steel. Net size of egg compartment shall be 16-inch by 13-3/4 inch by 2-inch. The fiberglass screens are to be provided by the manufacturer for each tray. The screen material shall consist of a 12 x 12 per square inch (standard salmon) PVC-coated mesh mounted by the incubator manufacturer in the top and bottom of each egg tray compartment. The egg container tray and cover when removed from the rack shall float when placed in water. Hold down clamps shall permit easy removal of the cover separately or egg container cover and tray as a unit.
 3. Tray media shall consist of a rigid PVC net pipe material, 30 mm in diameter. A sufficient number of pipes shall be placed in each tray to loosely fill the tray (gaps between pipes no greater than 1/8 inch). Tray media shall be as manufactured by Daishin Kogyo or approved equal.

NORTHEAST OREGON
HATCHERY PROJECT

- D. Manufacturers. FAL/Heath Tray by Marisource, Fife WA, a division of Flex-a-Lite Consolidated. The named incubator unit is the only known item which functions satisfactorily. Other manufacturers of a fish incubator unit must submit complete design and layout and proof of production capability of such design before a consideration of acceptance will be given.
- E. Accessories
 - 1. General: Provide the complete array of piping, valves and incidentals as required to equip the incubation cabinets as shown on the Drawings. There shall not be any brass, bronze or zinc parts or coatings in the incubation system, use aluminum, stainless steel or plastic piping system as shown.
 - 2. Valves: See SECTION 15050 and SECTION 15100.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install all vertical flow incubation cabinets detailed in this specification at the locations shown on the Drawings. Coordination of work with other trades is required for proper installation.
- B. Do not install vertical flow incubation cabinets until all ceiling, wall and floor construction is completed, unless special permission to address extenuating circumstances is obtained from the Engineer.

END OF SECTION

SECTION 11884

FISH CROWDERS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. Work consists of furnishing all labor, materials and equipment for the fabrication, installation, and testing of three fish crowders:

1. One crowding channel crowder (FC-3).
2. One bridge crowder for holding ponds 1 through 3 (FC-1).
3. One bridge crowder for holding ponds 4 through 6 (FC-2).

B. Work includes, but is not limited to:

1. Crowder rail
2. Structural steel frame
3. Drive motor and drive reducers
4. Bearings
5. U-joint and drive shaft
6. Winch
7. Shaft collar
8. Bolts, Nuts & Washers, Headed Concrete Anchors
9. Ladders & Steps (Rungs)
10. Aluminum Fabrications
11. Miscellaneous fabricated steel
12. Electric power, controls, and instrumentation

C. Related Sections

- | | |
|------------------|--------------------------|
| 1. Section 05100 | Structural Metal Framing |
| 2. Section 05990 | Miscellaneous Metals |
| 3. Section 09900 | Painting |
| 4. Division 16 | Electrical |

1.2 SUBMITTALS

A. Submit in accordance with 01340.

B. Product data for products used in structural, mechanical, and electrical systems.

NORTHEAST OREGON
HATCHERY PROJECT

- C. Shop drawings detailing fabrication and installation of structural, mechanical, and electrical systems. Include list of materials, plans, elevations, sections, and details for metal fabrication, mechanical assemblies, electrical wiring, and control schematics.
- D. Operation and maintenance manuals.
- E. Quality Assurance/Control Submittals
 - 1. Design data. Structural and mechanical design calculations including the operating loads for hoist selection.
 - 2. Shop test reports.
 - 3. Manufacturer's instructions.
 - 4. Manufacturer's field reports.

1.3 QUALITY ASSURANCE

- A. Fabrication qualifications. Firms specializing in, and successfully producing equipment similar to that indicated for this project, with sufficient production capability to produce the required units without delay in the work. Firm shall be responsible for furnishing complete shop tested units.
- B. Conform to applicable codes, standards, specifications, and requirements specified herein.
- C. Quality welding processes and welding operations in accordance with AWS DI.1 "Structural Welding Code – Aluminum." Certify that each welder has satisfactorily passed the AWS qualification tests for welding processes involved and if pertinent has undergone re-certification.
- D. Shop assembly inspection and testing: Specific requirements in relation to the extend of shop assembly inspection and testing to be performed are set for in Parts 2 and 3.

1.4 REFERENCE STANDARDS

- A. American Society for Testing Materials (ASTM)
- B. American Welding Society (AWS)
- C. Materials Handling Institute (MHI)
- D. National Electrical Manufacturers Association (NEMA)
- E. American Institute for Steel Construction (AISC)
- F. Aluminum Association (AA)
- G. National Association of Architectural Metal Manufacturers (NAAMM)

NORTHEAST OREGON
HATCHERY PROJECT

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Prepare and strictly follow procedures to ensure that the preparation of the equipment and related equipment are performed expeditiously, in logical sequence, using the proper tools and in appropriately equipped workshops.
- B. Protect and maintain the equipment clean and free from damage, throughout various stages of manufacture. No component or assembly, at any stage, shall be laid aside or stored in any place where damage may result
- C. Throughout progressive stages of material receipt, storage, preparation, fabrication, and assembly, use an effective method of maintaining the identification of material types and grades in the work, cross referenced to heat numbers and mill test reports.

2.2 FISH CROWDERS (FC-1, FC-2, AND FC-3)

- A. It is the intent of the Drawings and Specifications to illustrate the general arrangement and type of fish crowder unit desired and not necessarily restrict the manufacturer from using standard components which have been developed for similar type of equipment. List of manufacturers by name herein is to indicate general type and quality desired; however equipment changes may require dimensional and mounting changes. Those changes required from the Contractor's substitution of materials or equipment shall be the responsibility of the Contractor. All changes shall be approved by the Engineer.
- B. Construct and install two fish crowders (FC-1 and FC-2) in the adult holding ponds as shown on Drawings. Construct and install one fish crowder (FC-3) in the crowding channel as shown on the drawings. Crowder FC-3 will have the same components as illustrated for FC-1 and FC-2 with the crowder designed to span only one 8 foot channel. Individual components required for fabrication are shown on the Drawings and specified herein.
- C. Structural steel and metal fabrication. Structural steel shall conform to Section 05100. Metal fabrication shall conform to Section 05990.
- D. Gear motors. A 1 hp electric motor with double reduction dual output shafts: Primary reduction 4:1, Secondary reduction 30:1, dual output shafts 14-16 rpm, output torque 2900-3100 in-lbs, variable frequency control. Hub City, Double Reduction Series 320 Model 324 or approved equal.
- E. Drive shafts. Drive shafts shall be constructed from 416 stainless steel to lengths and dimensions shown on the drawings.

NORTHEAST OREGON
HATCHERY PROJECT

- F. Shaft couplings. Shaft couplings will be non-lubricated, flexible, jaw-type couplings as shown on the Drawings. Coupling inserts shall be constructed of oil impregnated bronze. Coupling bodies will be constructed of steel and provided with key way and set screw. Couplings will be Boston Gear Series FC or approved equal with a minimum torque capacity of 3200 in-lbs.
- G. Pillow blocks: Pillow blocks shall be designed for shaft size and mounting configuration indicated on the Drawings. Pillow blocks will be medium duty provided with extended race, locking screw set, and double row Timken-tapered roller bearings. Flange-mounted pillow blocks will be Boston Gear MRF series, MRC Bearing Services ZPB ZMaRC or equal.
- H. Wheel assemblies: The wheel assemblies shall be as shown on the Drawings. Wheels will be constructed of gray iron, double flanged with treads to fit ASCE 25 rail. Wheel bearings will be standard quill roller bearings with large overload ratings. Axles will be hardened and precision ground steel, hollow bored for grease. Geared wheel assemblies will be provided with reduction ration indicated on the Drawings. Wheel gear will be constructed of gray cast iron with standard pitch cut teeth. Pinion gear will be constructed of steel. Stub shaft bearings will be journal-type housings with machined grease groove, all bearings will be provided with grease fittings.
- I. Painting: Aluminum crowder panels will be unpainted. Steel crowder frame shall be painted in accordance with Section 09900 for structural steel.
- J. Aluminum panel lift winches. AC Electric winch, 115V AC 50/60 hz single phase, wire rope with a 1500 pound capacity. Superwinch AC1500 or approved equal.
- K. Shaft Collar. Stafford Manufacturing Corp or equivalent.

PART 3 EXECUTION

3.1 CONSTRUCTION

- A. General Requirements
 - 1. The fish crowders shall be fabricated and shop tested prior to shipping to field. The Engineer shall be notified two weeks in writing prior to the shop test and provided the opportunity to witness the shop test. All mechanical, electrical, and structural systems shall be inspected and tested prior to shipping to the field.
 - 2. Damage which occurs to the fish crowders during testing, shipping, or field installation shall be repaired by the Contractor at the Contractor's expense.

NORTHEAST OREGON
HATCHERY PROJECT

3.2 INSTALLATION

- A. The crowder rail shall be installed in accordance with the Drawings providing a straight and even bearing surface. The rail shall be aligned to provide smooth travel of the fish crowders. All bearing plates embedded in the wall shall be installed flush with the concrete. All sharp edges shall be round at the shop. Any sharp edges identified in the field shall be ground smooth and the protective coating properly repaired.
- B. Power cable. The crowders shall be provided with a retractable power reel mounted to the side of the crowder. The power cable shall be connected to the main power system as per the Drawings. The crowders shall be fully grounded.
- C. The fish crowders shall be installed and tested on the holding ponds and crowding channel. The crowders will be first tested in the dry with no water in the holding ponds. Each crowder shall be operated across the full length of the holding pond or crowding channel a minimum of 10 times. The Engineer will inspect the test procedures to ensure the proper fit between the crowding channel frame and the wall, smooth operation of the drive system, operation of the crowding panel lift system, and overall crowder function. Repairs identified an
- D. Final acceptance of the fish crowders will be made when the crowders are installed, tested, and fully operational in the holding ponds and crowding channel.

END OF SECTION