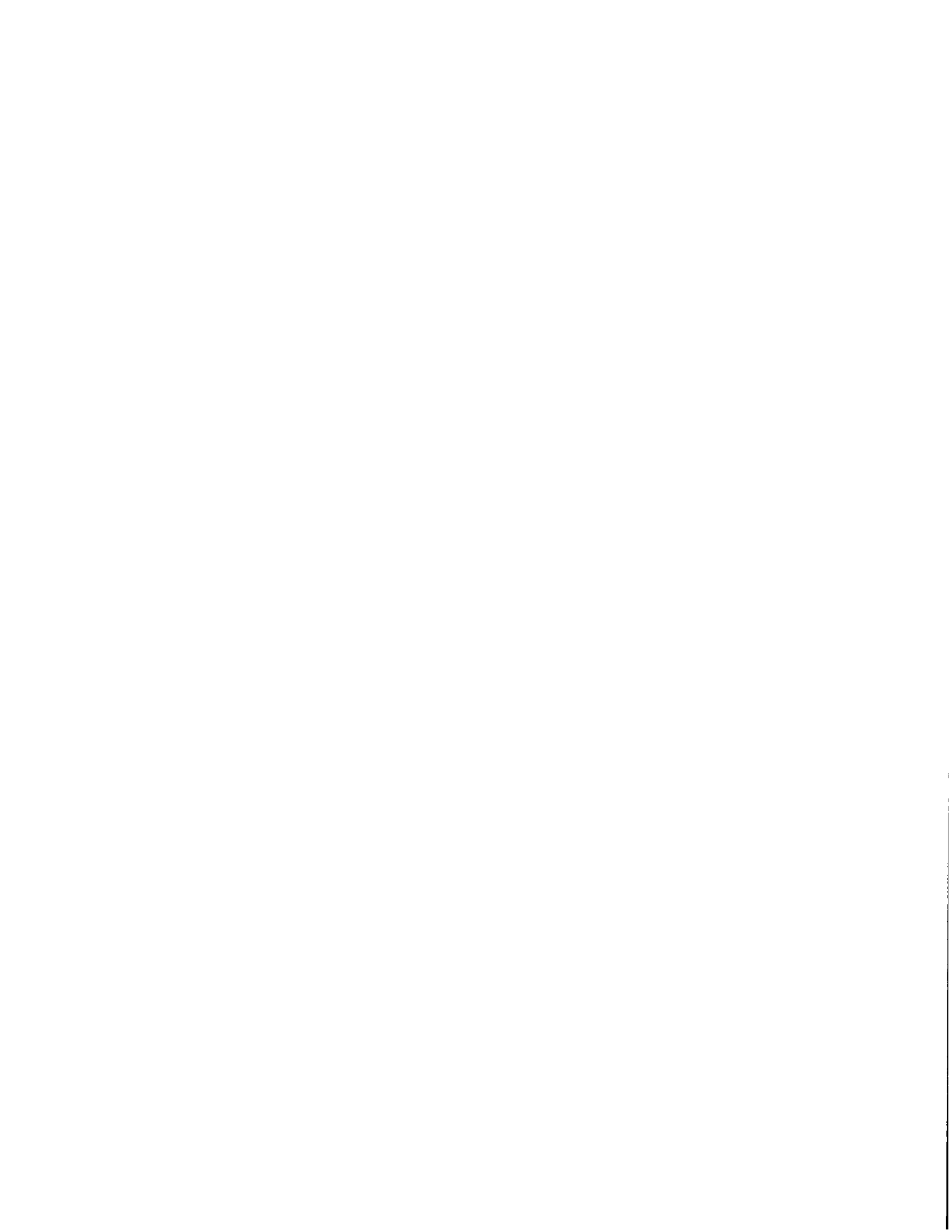


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SECTION 08110 – STEEL DOORS

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes steel doors. Also included is door installation. Coordinate with louver manufacturer for proper cut-outs (see Section 10225 – Door Louvers).

1.02 RELATED WORK

- A. Section 08710 – Door Hardware
- B. Division 9 for painting
- C. Section 10225 – Door Louvers

1.03 REFERENCES

- A. American Society for Testing and Materials
 - 1. ASTM B 117 - Standard Practice for Operating Salt Spray (Fog) Apparatus
 - 2. ASTM E 283 – Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
 - 3. ASTM A 568 & A 569 – Standard Specification for Steel, Sheet, Carbon, Hot-Rolled, Commercial Quality.
 - 4. ASTM A 653 – Standard Specification for Steel, Sheet, Zinc-Coated (Galvannealed) by the Hot-Dip Process
 - 5. ASTM A 924 – Standard Specification for General Requirements for Steel, Sheet, Metallic Coated by the Hot-Dip Process
 - 6. ASTM D 1735 - Standard Practice for Testing Water Resistance of Coating Using Water Fog Apparatus
- B. American National Standards Institute
 - 1. ANSI A224.1 – Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames
 - 2. ANSI A250.3 – Test Procedure and Acceptance Criteria for Factory Applied Finish Painted Steel Surfaces for Steel Doors and Frames
 - 3. ANSI A250.4 – Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcing
 - 4. ANSI A250.6 (SDI 107) – Hardware on Standard Steel Doors (Reinforcement-Application)
 - 5. ANSI A250.7 – Nomenclature for Steel Doors and Steel Door Frames
 - 6. ANSI A250.8 (SDI-100) – Recommended Specifications for Steel Doors & Frames
 - 7. ANSI A250.10 – Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames
 - 8. ANSI/DHI A115 – Specifications for Hardware Preparations in Standard Steel Doors and Frames
 - 9. ANSI/DHI A115.IG – Installation Guide for Doors and Frames

C. Steel Door Institute

1. SDI 106 – Recommended Standard Door Type Nomenclature
2. SDI 108 – Recommended Selection and Usage Guide for Standard Steel Doors
3. SDI 109 – Hardware for Standard Steel Doors & Frames
4. SDI 111 – Recommended Standard Details for Steel Doors and Frames
5. SDI 112 – Zinc-Coated (Galvanized/Galvannealed) Standard Steel Doors & Frames
6. SDI 122 – Installation and Troubleshooting Guide for Standard Steel Doors and Frames
7. SDI 124 – Maintenance of Standard Steel Doors and Frames

1.04 REGULATORY REQUIREMENTS

- A. Doors and frames shall conform to applicable codes for fire ratings.
- B. Install fire labeled doors and frame products in accordance with NFPA-80, current edition.

1.05 SUBMITTALS

- A. Submit shop drawings, product data, and O&M data under provisions of Division 1.
- B. Indicate door elevations, material thickness, internal reinforcement, closure method, and cutouts for louvers.
- C. Submit manufacturer's installation instructions and other information as necessary to show specification and code compliance.
- D. Submit samples of manufacturer's colors for Owner selection.

1.06 DELIVERY, STORAGE AND PROTECTION

- A. Doors shall be stored in an upright position under cover. Place the units on at least 4-inch wood sills on floors in a manner that will prevent rust and damage. Do not use non-vented plastic or canvas shelters which create humidity chambers and promote rusting. If the corrugated wrapper on the door becomes wet, or moisture appears, remove the wrapper immediately.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Doors and Frames shall be manufactured by Amweld, Steelcraft, Fleming, Curries, or approved equal. All products supplied under this Section shall be from a single manufacturer.

2.02 MATERIALS

- A. Frames, frame components, and doors shall be manufactured tension leveled steel conforming to ASTM A924, galvanized to ASTM A653, commercial steel (CS), coating designation A40 (Galvanneal). Galvannealed steel shall be treated to insure proper paint adhesion. All steel component parts used in galvannealed doors and/or frames shall meet the galvanized specification.

- B. All exterior doors, frames and frame components shall be cleaned, phosphatized and finished as standard with one coat of rust inhibiting prime paint in accordance with ANSI A250.10. Exterior doors and frames will be field painted.

2.03 DOORS

A. Exterior doors

1. 16-gage hot dipped galvanized steel, with closed tops.
2. Full-flush Seamless construction, continuous smooth welded or epoxy filled mechanically interlocked edge seams.
3. Sizes and style as shown on the drawings. Verify size and thickness with on-site measurements.
4. Rigid extruded polystyrene, polyisocyanurate, or polyurethane core, fire retardant, thermal value: R11.0 minimum, conforming to ASTM C578.

B. Construction of Doors:

1. Doors shall be reinforced, stiffened, sound deadened and insulated with impregnated specified core completely filling the inside of the doors and laminated to inside faces of both panels using contact adhesive applied to both panels and core.
2. Door shall have continuous vertical mechanical interlocking or welded joints at lock and hinge edges with visible edge seams (interior) or with edge seam filled and ground smooth (exterior). The internal portion of the seam shall be sealed with epoxy, or welded. An intermittent fastening along the seam is not permitted. Doors shall have beveled (1/8" in 2") hinge and lock edges. Top and bottom steel reinforcement channels shall be galvanized 14 gage and projection welded to both panels.
3. Hinge reinforcements shall be 7-gage for 1-3/4" doors. Lock reinforcements shall be 16 gage and closer reinforcements 14 gage - box minimum 6" high and 20" long. Hinge and lock reinforcements shall be projection welded to the edge of the door. Doors shall be factory blanked, reinforced, drilled and tapped for fully templated hardware and factory blanked and reinforced for hardware that is not fully templated. Galvanized doors shall have galvanized hardware reinforcements. Adequate reinforcements shall be provided for other hardware as required. Coordinate with specified hardware. Hinge locations must match existing frames, Contractor to verify.
4. Trim for doors with cutouts shall be 24-gage steel conforming to ASTM designation A 924 hot dipped galvanized steel with a zinc coating of 0.06 ounces per square foot (A60). The trim shall be installed into the door as a four sided welded assembly. The trim shall cap the cutout but shall not extend more than 1/16" from the door face. The corners of the assembly shall be mitered, reinforced and welded. The trim shall be the same on both sides of the door. Exposed fasteners shall not be permitted. Label and non-label doors shall use the same trim.
5. All exterior out swing doors shall have the tops closed to eliminate moisture penetration. Door tops shall not have holes or openings. Top caps are permitted. All exterior doors shall include a self-adjusting, concealed door sweep installed in the bottom channel. The bottom seal shall not utilize springs.

6. Door faces shall be fabricated without visible seams, free of scale, pitting, coil brakes, buckles or waves.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify door frame openings are installed plumb, true and level, and dimensionally correct before beginning the installation process. Make corrections and/or adjustments as necessary.
- B. Verify that proper door and frame reinforcement has been provided for the specified hardware and that cutouts and reinforcements are properly located.
- C. Select fasteners of adequate type, number and quality to perform the intended functions.
- D. Verify that louver cutouts are located and sized properly.

3.02 INSTALLATION

- A. Doors and frames shall be installed in accordance with ANSI/DHI A115.IG Installation Guide for Doors and Frames and manufacturer's installation instructions.
- B. Adjust operable parts for correct clearances and function.
- C. Exposed field welds shall be finished to present a smooth, uniform surface. Touch-up with rust inhibitive primer.
- D. Exposed surfaces that have been scratched or otherwise marred during shipment, installation or handling shall be touched-up with a rust inhibitive primer.
- E. Finish paint in accordance with Section 09900.

PART 4 SPECIAL PROVISIONS

4.01 MEASUREMENT AND PAYMENT

- A. Cost for work and materials in this Section shall be included as a portion of the lump sum bid price for the Project as stated on the Bid Form. No separate measurement for these quantities will occur.

END OF SECTION

SECTION 08120 – ROLL UP DOORS

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes provisions for a steel weatherized roll up door, track, hub and other accessories.

1.02 RELATED WORK

- A. Division 9 for painting

1.03 REGULATORY REQUIREMENTS

- A. Doors and frames shall conform to applicable building codes.

1.04 SUBMITTALS

- A. Submit shop drawings, product data, and O&M data under provisions of Division 1.
- B. Indicate door elevations, material thickness, and wind load.
- C. Submit manufacturer's installation instructions and other information as necessary to show specification and code compliance.
- D. Submit samples of manufacturer's colors for Owner selection.

1.05 DELIVERY, STORAGE AND PROTECTION

- A. Doors shall be delivered to the site in the manufacturer's original, unopened container and packaging with labels clearly identifying the product name and manufacturer.
- B. Store materials in a clean dry place in accordance with the manufacturer's instructions. Keep containers sealed until ready to use.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Door, tracking, guides, hood and other products supplied under this Section shall be from a single manufacturer.

2.02 CURTAIN

- A. Roll-formed sections, factory-seamed from 26-gauge, Grade 80 galvanized steel. Full-length felt tape at each drum.

2.03 BOTTOM ASSEMBLY

- A. Zinc-coated steel bottom angle mounted to corrosion-resistant aluminum extrusion with stainless steel bolts. TPE blade astragal also included.

2.04 DRUM

- A. Stamped, continuously welded at the hub. 12" diameter x 1-1/2" wide. 16-gauge, zinc-coated steel. Three drums with doors up to 8' wide, four drums with doors over 8' wide.

2.05 GUIDES

- A. 16-gauge, zinc-coated, 2-3/4" deep. Featuring polypropylene guide runners to assure smooth operation and prevent steel-on-steel contact. Guide windlock bar manufactured from 12-gauge, zinc-coated steel.

2.06 INTERIOR LOCK

- A. 12-gauge, zinc-coated steel slide bolt engages a lock strike attached to the side guide. Two locks per door fasten to the bottom assembly and are suitable for padlocking.

2.07 PULL CHAIN

- A. Door operation shall be use of a manual chain hoist. Chain to have a locking bracket located on a guide angle.

2.08 SPRING COUNTERBALANCE

- A. Counterbalance: Housed in a steel pipe, maximum deflection of 0.03" per foot of door width is achieved by having the appropriate diameter and wall thickness.
- B. Springs: Helical torsion with a 25% overload factor for ease of operation and are greased packed mounted on a cold rolled steel inner shaft.
- C. Spring Tension: Can be adjusted from outside of end bracket plate.
- D. Ball Bearing: Sealed in order to minimize wear of pipe shaft rotating around inner shaft.

2.09 HOOD

- A. Hoods: To completely enclose curtain and counterbalance, hoods shall be provided form #24 U.S. Gauge galvanized steel.
- B. Reinforcing: Hoods can be reinforced laterally to prevent sag.
- C. Intermediate Hood Supports: Provided where door width exceeds 16'.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify door frame openings are installed plumb, true and level, and dimensionally correct before beginning the installation process. Make corrections and/or adjustments as necessary.
- B. Verify that proper door and guide reinforcement has been provided for the specified hardware and that cutouts and reinforcements are properly located.
- C. Select fasteners of adequate type, number and quality to perform the intended functions.

3.02 INSTALLATION

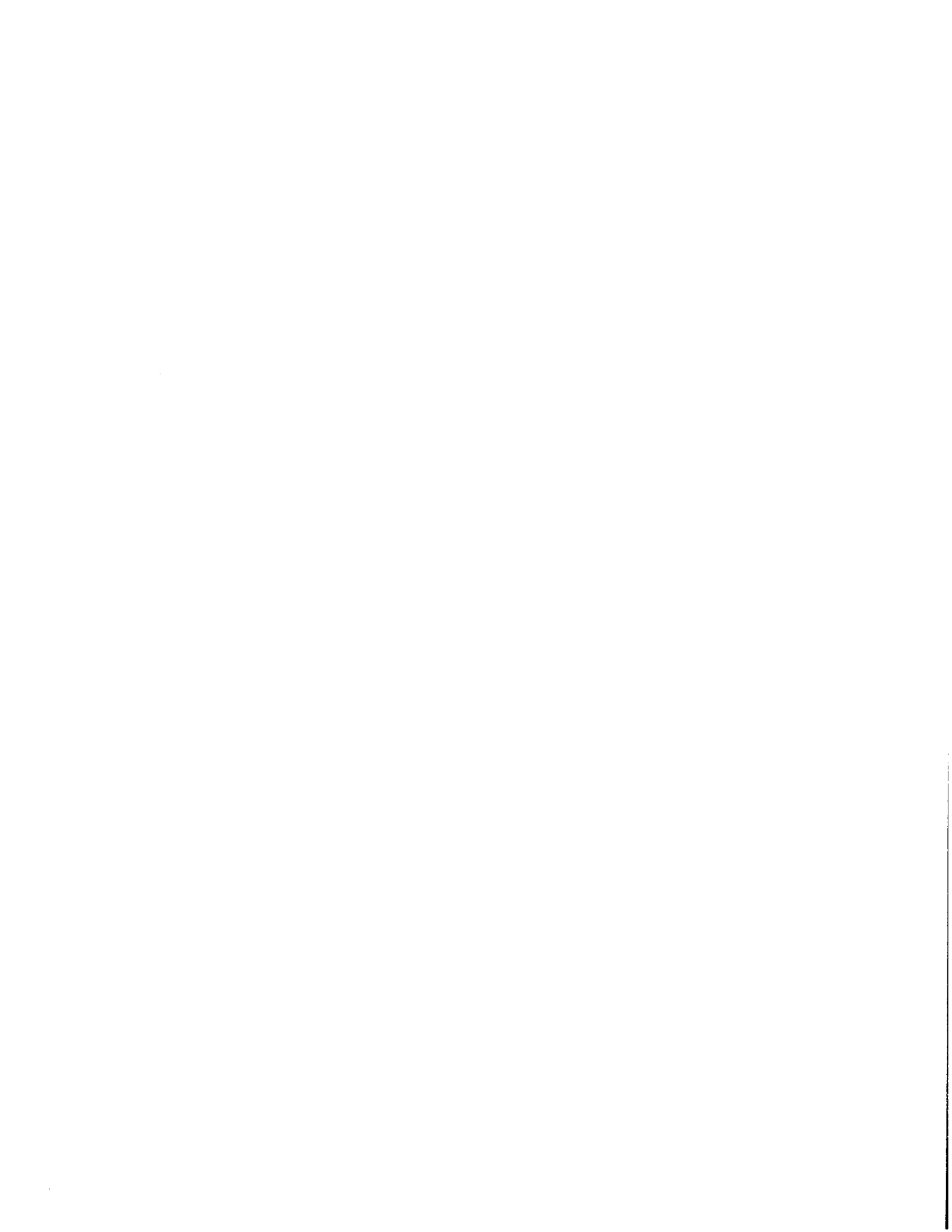
- A. Doors and frames shall be installed in accordance with ANSI/DHI A115.IG Installation Guide for the roll up door per manufacturer's installation instructions.
- B. Adjust operable parts for correct clearances and function.
- C. Exposed field welds shall be finished to present a smooth, uniform surface. Touch-up with rust inhibitive primer.
- D. Exposed surfaces that have been scratched or otherwise marred during shipment, installation or handling shall be touched-up with a rust inhibitive primer.
- E. Finish paint in accordance with Section 09900.

PART 4 SPECIAL PROVISIONS

4.01 MEASUREMENT AND PAYMENT

- A. Cost for work and materials in this Section shall be included as a portion of the lump sum bid price for the Project as stated on the Bid Form. No separate measurement for these quantities will occur.

END OF SECTION



SECTION 08305 – CAST-IN ACCESS DOORS

PART 1 GENERAL

1.01 SUMMARY

- A. The work in this Section consists of furnishing all labor and materials, and performing all work necessary for the proper installation of cast-in-place metal access doors as indicated on Plans. Coordinate with access door manufacturer.

1.02 REFERENCES

- A. Section 03300 – Cast-In-Place Concrete.

1.03 SUBMITTALS

- A. Submit product data in accordance with Section 01300.
- B. Submit shop drawings showing layout, profile and product components including attachment, accessories, finish and color. Submit shop drawings for approval prior to fabrication.

1.04 PROJECT CONDITIONS

- A. Verify all dimensions before ordering product. Contractor is responsible for product fitment and function.

1.05 DELIVERY, STORAGE AND HANDLING

- A. General: Comply with Division 1 Product Requirements Sections.
- B. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Sequence deliveries to avoid delays and minimize on site storage.
- D. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by the Manufacturer. Protect from sunlight, weather, excessive temperatures and construction operations.

1.06 WARRANTY

- A. Provide written warranty signed by Manufacturer, agreeing to repair or replace equipment which exhibits defects in materials or workmanship for a minimum period of 5 years.

PART 2 PRODUCTS

2.01 ACCESS HATCHES

- A. Valve Vault Hatch shall be FLED-AOSH 48x72 or approved equal. Clear opening shall be 48-inch x 72-inch. Overall (outside frame) dimensions shall be no more than 55-inch x 79-inch.
- B. Wetwell Hatch shall be FLET 36x84 or approved equal. Clear opening shall be 36-inch x 84-inch. Opening shall accommodate the Flygt NP3153.091 SH pumps. Overall (outside frame) dimensions shall be no more than 46-inch x 87-inch.
- C. Flowmeter Hatch shall be 332AL or approved equal. Clear opening shall be 34-inch x 33.5-inch. Opening shall accommodate the 8" flowmeter. Overall (outside frame) dimensions shall be no more than 37-inch x 37.75-inch.
- D. Access covers shall be designed for cast-in-place installation and be cast into the vault by the manufacturer. All surfaces that will come into contact with concrete shall be coated with bitumastic paint.
- E. Access covers shall be single leaf with integral safety grate. Safety grate shall not allow hatch to be closed unless the fall through protection has been put back in place. Safety grate shall be constructed of aluminum and painted safety orange. Safety grate shall have a load rating at least equal to the load rating of access cover. Safety grate must be able to rotate 180° on a side (i.e. open either to the right or left) by moving grate hinges.
- F. Frame shall be extruded aluminum channel and all surfaces that will come into contact with concrete shall be coated with bitumastic paint. Frame shall be rated for 300 pounds per square foot.
- G. Hatch shall be constructed of ¼" thick aluminum diamond tread plate. Hatch shall be equipped with pneumatic-spring lift assist and automatic hold-open arm. Hatch must be easily opened such that one person can reasonably open hatch with one hand.
- H. Hatch shall be equipped with a stainless steel slam lock with protected keyway. Lock shall be fastened with 316 stainless steel hardware.
- I. Hinge shall be 316 stainless steel construction with 316 stainless steel hinge pin. Hardware shall be 316 stainless steel.
- J. Hatch shall be equipped with a stainless steel flush drop handle.
- K. All hatches shall be lockable with the use of a padlock.
- L. Latch shall be stainless steel slam lock with fixed interior handle. Latch release shall be protected by a removable threaded plug.
- M. Each door shall be equipped with automatic hold-open arms with grip handle release. Each door shall be easily opened by one person with one hand operation. Door shall lock open in the 90 degree position.
- N. Manufacturer shall be Syracuse Castings (available through Flygt for pump access applications) or Bilco.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install per manufacturers recommendations and per contract drawings. Steel rebar shall not be allowed to be in contact with any portion of aluminum frame. Hatches shall open in direction indicated on drawings. No alteration of location or orientation will be allowed without written approval by the Engineer.

PART 4 SPECIAL PROVISIONS

4.01 MEASUREMENT AND PAYMENT

- A. Cost for work and materials in this Section shall be included as a portion of the lump sum bid amount for the project as stated on the Bid Form. No separate measurement for work in this Section will occur.

END OF SECTION



SECTION 08710 – DOOR HARDWARE

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes items known commercially as finish hardware or builders hardware, required for swing and other doors.
- B. Types of finish hardware may include: hinges, lock cylinders and keys, lock and latchsets, bolts, thresholds, protection plates, weatherstripping, sound stripping, astragals, and other miscellaneous door hardware as required.

1.02 REFERENCES

- A. ANSI A117.1 – American National Standards Institute Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People
- B. ANSI A115.1 – Specification for Standard Steel Door and Frame Preparation for Mortise Locks for 1 3/8" and 1 3/4" Doors
- C. ANSI A115.2 – Specification for Standard Steel Door and Frame Preparation for Bored or Cylindrical Locks for 1 3/8" and 1 3/4" Doors.
- D. ANSI/BHMA A156.2 – Bored and Preassembled Locks and Latches
- E. ANSI/BHMA A156.13 – Mortise Locks and Latches
- F. ANSI/BHMA A156.18 – Materials and Finishes
- G. National Fire Protection Association (NFPA) Standard No. 80. This requirement takes precedence over other requirements for such hardware.

1.03 SUBMITTALS

- A. Submit Hardware Schedule, 3 copies
 - 1. Detailed hardware schedule shall be prepared by an experienced hardware consultant. All items shall be suitable for the intended location and purpose.
 - 2. Hardware finish and styles shall match as closely as possible at all locations.
 - 3. Organize hardware schedule into "hardware sets" for each door, indicating complete designations of every item.
 - 4. Include manufacturer's technical data and hardware directions for each door.
 - 5. Do not order materials until Schedule has been reviewed and approved by the Engineer.
- B. Deliver templates to fabricators of other work which is to receive finish hardware.

1.04 QUALITY ASSURANCE

- A. Use products of similar type from one manufacturer throughout project. Coordinate with manufacturer for proper use and installation of each piece of hardware.

- B. Hardware supplier shall be a recognized builders hardware supplier, who has been furnishing hardware in Oregon for a period of not less than 3 years. Supplier shall employ an experienced AHC certified hardware consultant, available for consultation during the course of the work.
- C. Hardware supplier shall prepare detailed hardware schedule based on these specifications and their experience for the best use and function of hardware.

1.05 WARRANTY

- A. Blanket coverage on locksets for a minimum period of 5 years. Mechanical failure on door closers for 5 years. Failure on other parts of hardware for 2 years. These minimums may be superceded by specific requirements in the following sections.

PART 2 PRODUCTS

2.01 FINISH

- A. All hardware shall have a silver satin (dull, brushed) finish. Finishes from various manufacturers and different hardware shall be matched as closely as possible.

2.02 HINGES

- A. Five knuckle, button tip, full mortise template type with non-rising loose pins and ball bearings. Manufactured by Stanley; or approved equal.
- B. Doors up to 36-inches wide: 4.5-inch by 4.5-inch. Provide at least 3 hinges per leaf for doors up to 86-inches high.
- C. Exterior Doors: 4 ball bearing, stainless steel, 0.180 gage minimum hinges with non-removable pin construction.

2.03 LOCKS

- A. Heavy-Duty Cylindrical Locks and Latchsets. Reversible door handing. Solid cast Lever handles. Stanley/Best Access 9K Series.
 - 1. Lockset must be cylindrical type with minimum 2 ¾-inch backset, with 9/16-inch throw latchbolt.
 - 2. Lockset with 7-pin interchangeable and masterkeyed core.
 - 3. Keyed lever to be removeable only after core is removed, by authorized control key, to allow access to lever "keeper".
 - 4. Locks to have solid shank with no opening for access to keyed lever keeper.
 - 5. Locksets and latchsets must conform to ANSI A156.2, Series 4000, Grade 1. and be UL listed.
- B. Heavy-Duty Commercial Security Deadbolts. Stanley/Best Access Systems T Series.
 - 1. High strength, solid stainless steel deadbolts.
 - 2. 1-Inch throw, 5/8-inch x 7/8-inch bolt.
 - 3. Solid brass or bronze rotating cylinder rings.
 - 4. Solid bronze or brass cylinders.
 - 5. Interchangeable 7-pin tumbler, masterkeyed.
 - 6. Meets all ANSI 156.5 Grade 1 requirements, UL listed.

2.04 THRESHOLDS

- A. Thresholds shall have height and shape conforming to ANSI A117.1 with height not exceeding ½-inch. Aluminum with corrugated surface.

2.05 WEATHERSTRIPPING

- A. Silicone rubber seal. Provide at each edge of every exterior door. Pemko, Reese, or approved equal.

2.06 KEYING

- A. All door locks shall be keyed alike for a single building. Contractor shall provide contractor lock cores for use during construction. Replacement lock cores shall be provided in unopened packaging to the Owner upon completion.

2.07 HARDWARE SCHEDULE

- A. Exterior Doors
 - 1. Heavy-Duty Cylindrical Locks
 - 2. Heavy-Duty Security Deadbolts
 - 3. Threshold
 - 4. Weatherstripping

PART 3 EXECUTION

3.01 PREPARATION

- A. Ensure that door and frame reinforcements have been provided properly for the hardware to be used.
- B. Have sufficient quantities of fasteners required. Use fasteners supplied by the hardware manufacturer.
- C. Doors to be field painted shall be painted prior to installing hardware.

3.02 INSTALLATION

- A. Install door hardware in accordance with the manufacturer's instructions. Use fasteners provided by hardware manufacturer.
- B. Ensure that proper hardware is mounted for each specific door according to the approved hardware schedule. Note where left and right handed doors are shown.
- C. Adjust strikes, latches and closers for proper function. Readjust prior to final acceptance if necessary.
- D. Upon completion, deliver all keys to Owner.

- E. Standards: Install in accordance with requirements of DHI and BHMA. Mounting height measurements are from finish floor except top butt.
1. Butts: Top 11 3/4" center of butt to top of door; intermediate equal distance between top and bottom butts; bottom 13" to center of butt.
 2. Knob Locks: 40 5/16" to center of strike.
 3. Deadlocks: 48" to center of strike.
 4. ADA Standard: Conform to ANSI A117.1 for positioning requirements for disabled.

PART 4 SPECIAL PROVISIONS

4.01 MEASUREMENT AND PAYMENT

- A. All hardware and work required for installation shall be included as a portion of the lump sum bid amount for the project as stated in the Bid Form. No separate measurement and payment for work in this Section will occur.

END OF SECTION

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SECTION NO.

TITLE

SECTION 09900

PAINTS AND COATINGS



SECTION 09900 – PAINTS AND COATINGS

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Work in this section includes furnishing and field application of all paints and coating systems required for interior and exterior coating of drywall, wood, steel, iron, plastic, concrete, masonry, and other materials to be painted.
 - 1. Unless otherwise specified or shown, paint all surfaces and items which are exposed to view, including those visible out of doors, windows or on roofs.
 - 2. Exterior surfaces shall be coated with an anti-graffiti clear finish to a height of 10 feet.
- B. Section 09900 also includes necessary surface preparation, protection, curing and touch-up.

1.02 RELATED SECTIONS

- A. Section 02509 – Site Piping
- B. Section 08110 – Steel Doors and Frames: Shop primed items.
- C. Division 15 – Mechanical: Fabricated and/or shop primed items.
- D. Division 16 – Electrical: Fabricated and/or shop primed items.

1.03 SURFACES NOT TO BE PAINTED

- A. Prefinished items including finished metal surfaces, unless otherwise noted.
- B. Walls or ceilings of concealed or inaccessible areas.
- C. Fire or smoke rating labels on doors or frames.
- D. Equipment name plates.
- E. Piping identification labels.
- F. Moving parts of mechanical or electrical equipment.

1.04 SUBMITTALS

- A. Product Data
 - 1. Materials List: Complete list of proposed manufacturers and products.
 - 2. Manufacturer's Specifications: Manufacturer's technical information for each product, including paint analysis and application instructions.
 - 3. Material safety data sheets for each product.
- B. Samples: Preliminary Samples: samples of each color, texture and sheen on glossy card stock. Colors are subject to approval by City Engineer.
- C. Certificates: Provide certificate from each manufacturer stating material is premium quality and suitable for intended use on this Project.
- D. Closeout Submittals:
 - 1. Two copies of manufacturer's color and sheen formula, and 4" x 6" color chips, for each final color used in the Project.

2. Product Usage Records: Three copies of product usage records for each paint, coating and solvent product used in the project. Include product name, amount used, and period of time over which the product was used.
3. Manufacturer's Warranty:
 - a. Twenty-year limited warranty for exterior 100% acrylic coatings.
 - b. Five year warranty for labor and materials for elastomeric coatings.

1.05 QUALITY ASSURANCE

- A. Applicator Qualifications: Company specializing in performing the work of this section with minimum 5 years successful experience in work of similar scope.
- B. Regulatory Requirements: Products containing chromates, cadmium, lead, or mercury or are not permitted.
- C. Manufacturer's Instructions: Perform painting work in accordance with manufacturer's written instructions and recommendations.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the Project in original, new, unbroken packages and containers bearing manufacturer's name and label, with:
 1. Name of material, color and sheen.
 2. Manufacturer's name, product number and date of manufacture.
 3. Contents by volume of major pigments and vehicle constituents.
 4. Thinning and application instructions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturers: Benjamin Moore, Pittsburgh, Rodda, or approved other.
 1. Unless otherwise indicated, Benjamin Moore products are specified in Paint Schedule Articles 3.03 and 3.04 to establish standards and type of materials required. Equal products of manufacturers specified above are acceptable.

2.02 MATERIALS

- A. Material Quality
 1. Provide premium quality materials. Materials not bearing manufacturer's identification as a premium-grade product are not acceptable.
 2. Should manufacturer's specifications or product numbers change, provide its current equal or better product.
 3. Primer and undercoats are to be of same manufacturer as final coat.
 4. Materials left from previous jobs are not acceptable.
 5. Use only thinners approved by paint manufacturer, and use only within recommended limits.
 6. Etching Solutions: As recommended by paint manufacturer for the use intended.
 7. Solvents: Non-petroleum based, as recommended by paint manufacturer for the use intended.

- B. Finish Coat Coordination: Provide finish coats which are compatible with prime paints used.

2.03 COLORS

- A. General
 - 1. Use of proprietary names in color selections does not imply exclusion of equivalent products of other manufacturers.
 - 2. The proposal and acceptance of any paint manufacturer shall not restrict the owner to selection of standard colors of that manufacturer.
- B. Finish coat colors shall be factory mixed.

PART 3 EXECUTION

3.01 PREPARATION

- A. Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as specified for substrate condition.
- B. Remove hardware, accessories, and items in place that are not to be painted, or provide protection prior to surface preparation and painting. Reinstall removed items after painting.
- C. Clean surfaces before applying paint. Remove oil and grease prior to mechanical cleaning. Schedule cleaning so contaminants from cleaning process do not fall onto wet, newly painted surfaces.
- D. Moisture Content: Do not paint over surfaces where moisture content exceeds manufacturer's instructions.
- E. Ferrous Metals:
 - 1. Bare Surfaces: Clean of oil, dirt, loose mill scale, and other foreign substances with solvent or by mechanical cleaning.
 - 2. Shop Applied Primer: Touch up where damaged or bare using same type of primer as adjacent surfaces.
 - 3. Galvanized Surfaces: Clean free of oil and surface contaminants using solvent.
- F. Gypsum Board: Remove dust, and repair surface imperfections. Spot-prime defects after repair.
- G. Mix painting materials in accordance with manufacturer's instructions.
- H. Store materials in tightly covered containers. Maintain containers used in storage, mixing and application of paint in a clean condition, free of foreign materials and residue.
- I. Stir materials before application to produce mixture of uniform density, and stir as required during application. Do not stir surface film into material, strain material before using if necessary.

3.02 APPLICATION

- A. Apply paint in accordance with manufacturer's instructions. Use applicators and techniques best suited for substrate and type of material being applied.
 - 1. Apply additional coats when stains or blemishes show through final coat, until paint is a uniform finish, color and appearance.
 - 2. Ensure dry film thickness at corners and crevices is equivalent to that of flat surfaces.
 - 3. Sand lightly between each succeeding enamel or varnish coat.
 - 4. Finish exterior doors on tops, bottoms and side edges same as exterior faces.

- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated or otherwise prepared for paint as soon as practicable after preparation.
 - 1. Do not apply materials in areas where dust is being generated, or will be generated, before coatings are thoroughly dry.
 - 2. Allow time between successive coats to permit proper drying.
 - 3. Do not recoat until paint feels firm and does not deform or feel sticky under moderate thumb pressure.

- C. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate, to achieve a total dry film thickness (DFT) as recommended by coating manufacturer.

- D. Prime Coats: Apply to items not previously primed. Recoat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat.

- E. Finish Coats: Provide even texture. Leave no laps, irregularity in texture, skid marks, or other surface imperfections.
 - 1. Opaque Finishes: Provide opaque, uniform finish, color and coverage. Cloudiness, spotting, holidays, brush marks, runs, sags, ropiness or other surface imperfections are not acceptable.
 - 2. Transparent Finishes: Provide glass smooth surface film of even luster. Cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections are not acceptable.

- F. Completed Work: Match approved samples for color, texture and coverage. Remove, refinish or repaint work not accepted.

3.03 PAINT SCHEDULE – EXTERIOR COATINGS

- A. Wood trim - Painted
 - 1. One coat Exterior Wood Primer: Moorcraft Busan 100% acrylic primer exterior primer No. 166 applied at a dry film thickness of not less than 1.8 mils.
 - 2. Two Coats acrylic latex enamel, semi-gloss: Moorcraft Super Spec latex House & Trim No. 170 applied at a dry film thickness of not less than 1.1 mils per coat.

- B. Steel – Unprimed
 - 1. One coat exterior DTM primer: Acrylic Metal Primer M04 applied at a dry film thickness of not less than 2.0 mils.
 - 2. Two coats exterior DTM semi-gloss finish: IMC DTM Acrylic semi-gloss (M29) applied at a dry film thickness of not less than 2.0 mils per coat.

- C. Steel – Shop Primed
 - 1. Touch-up with original primer.
 - 2. Two coats exterior DTM semi-gloss finish: IMC DTM Acrylic Semi-gloss (M29) applied at a dry film thickness of not less than 2.0 mils per coat.
- D. Steel – Galvanized
 - 1. Touch-up with original primer.
 - 2. Two coats exterior DTM Semi-gloss finish: IMC Waterborne Epoxy Metal Primer (M08/M09) applied at a dry film thickness of not less than 2.0 mils per coat.
 - 3. Intermediate Coat: Once Coat High Solids Epoxy, Polyamide Epoxy Coating – High Build (M36/M39) applied at a dry film thickness of not less than 4.0 mils per coat.
 - 4. Topcoat: Once Coat Aliphatic Acrylic Urethane, Aliphatic Acrylic Urethane Gloss (M74/M75) applied at a dry film thickness of not less than 2.0 mils per coat.
- E. Steel – Galvanized sheet metal flasing
 - 1. Clean and etch surface.
 - 2. One coat exterior acrylic DTM primer: Acrylic Metal Primer M04 applied at a dry film thickness of not less than 2.0 mils per coat.
 - 3. Two coats exterior DTM semi-gloss finish: IMC DTM acrylic semi-gloss (M29) applied at a dry film thickness of not less than 2.0 mils per coat.
- F. Aluminum – Mill finish
 - 1. Clean and etch surface
 - 2. Two coats 100% acrylic DTM paint, semi-gloss: IMC DTM Acrylic Semi-gloss (M29) applied at a dry film thickness of not less than 2.0 mils per coat.

3.04 PAINT SCHEDULE – INTERIOR SURFACES

- A. Wood - Painted
 - 1. One coat latex Wood Primer sealer: Moorcraft Super spec latex enamel undercoater and primer sealer (252) applied at a dry film thickness of not less than 1.5 mils.
 - 2. Two Coats latex enamel, semi-gloss: Moorcraft Super Spec latex semi-gloss enamel No. 276 applied at a dry film thickness of not less than 1.2 mils per coat.
- B. Steel – Unprimed
 - 1. One coat acrylic DTM primer: Acrylic Metal Primer M04 applied at a dry film thickness of not less than 2.0 mils.
 - 2. Two coats acrylic DTM semi-gloss finish: IMC DTM Acrylic semi-gloss (M29) applied at a dry film thickness of not less than 2.0 mils per coat.
- C. Steel – Shop Primed
 - 1. Touch-up with original primer.
 - 2. Two coats acrylic DTM semi-gloss finish: IMC DTM Acrylic Semi-gloss (M29) applied at a dry film thickness of not less than 2.0 mils per coat.

D. Steel – Galvanized

1. One coat acrylic DTM primer: Acrylic Metal Primer (M04) applied at a dry film thickness of not less than 2.0 mils per coat.
2. Two coats exterior DTM semi-gloss finish: IMC DTM Acrylic Semi-gloss (M29) applied at a dry film thickness of not less than 2.0 mils per coat.

E. Gypsum Board

1. One coat polyvinyl-acetate primer sealer: Moorcraft super spec latex enamel undercoater and primer sealer No. 253 applied at a dry film thickness of not less than 1.2 mils per coat.
2. Two coats semi-gloss acrylic epoxy finish: IMC Acrylic Epoxy Coating (M34/M44-84) applied at a dry film thickness of not less than 1.5 mils per coat.

F. Aluminum – Mill finish

1. Clean and etch surface
2. Two coats 100% acrylic DTM paint, semi-gloss: IMC DTM Acrylic Semi-gloss (M29) applied at a dry film thickness of not less than 2.0 mils per coat.

3.04 COLOR SCHEDULE

- A. Consult City Engineer for color designations.

PART 4 SPECIAL PROVISIONS

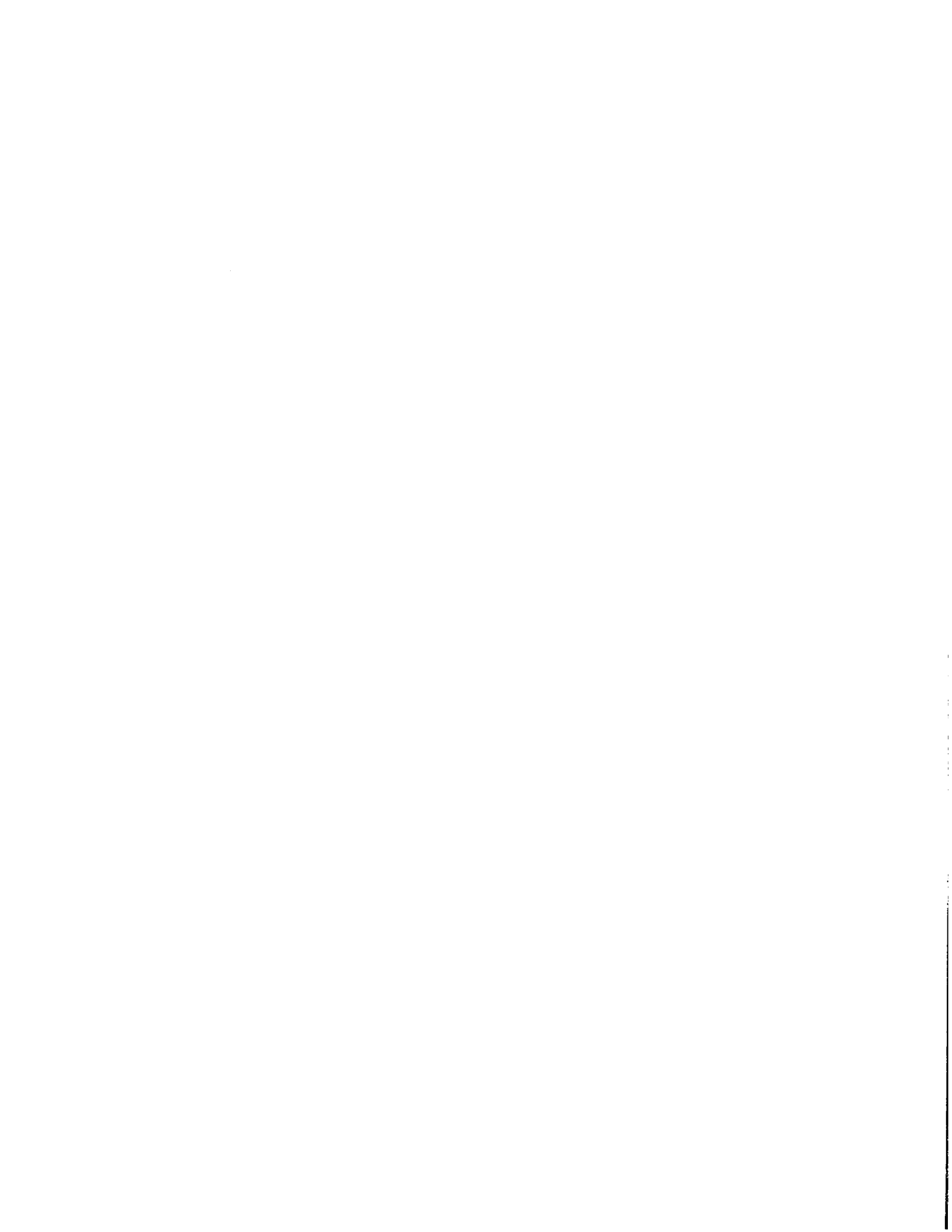
4.01 MEASUREMENT AND PAYMENT

- A. Payment for work in this Section shall be included as a portion of the lump sum bid amount for the project as stated in the Bid Form. No separate payment will be made for work in this Section.

END OF SECTION

DIVISION 10
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| <u>SECTION NO.</u> | <u>TITLE</u> |
|-----------------------------|----------------------------------|
| <u>SECTION 10225</u> | <u>DOOR LOUVERS</u> |
| <u>SECTION 10500</u> | <u>FIRE EXTINGUISHERS</u> |



SECTION 10225 – DOOR LOUVERS

PART 1 GENERAL

1.01 SUMMARY

- A. The work in this Section consists of furnishing all labor and materials, and performing all work necessary for the proper installation of door-mounted louvers with captivated frame in doors as indicated on Plans. Coordinate with door manufacturer, see Section 08110.

1.02 REFERENCES

- A. National Fire Protection Association (NFPA); NFPA 820 Standard for Fire Protection in Wastewater Treatment and Collection Facilities.

1.03 SUBMITTALS

- A. Submit product data in accordance with Section 01300.
- B. Submit shop drawings showing layout, profile and product components including attachment, accessories, finish and color. Submit shop drawings for approval prior to fabrication.

1.04 PROJECT CONDITIONS

- A. Verify actual opening dimensions required and frame dimensions before ordering product. Contractor is responsible for product fitment. Show recorded measurements on shop drawings. Coordinate with door manufacturer. See Plans for louver size.

1.05 QUALITY ASSURANCE

- A. Manufacturer of louver assembly shall have a minimum of 10 years experience in the fabrication and installation of aluminum louvers. Verification of experience and list of completed projects of a similar nature shall be made available to the Engineer upon request.

1.06 DELIVERY, STORAGE AND HANDLING

- A. General: Comply with Division 1 Product Requirements Sections.
- B. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Sequence deliveries to avoid delays and minimize on site storage.
- D. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by the Manufacturer. Protect from sunlight, weather, excessive temperatures and construction operations.

1.07 WARRANTY

- A. Provide written warranty signed by Manufacturer, agreeing to repair or replace equipment which exhibits defects in materials or workmanship for a minimum period of one year.

PART 2 PRODUCTS

2.01 APPROVED MANUFACTURERS

- A. Approved manufacturers are Greenheck Fan Corporation, Anemostat; or approved equal.

2.02 MANUFACTURED LOUVERS

- A. Stationary storm proof louver with fully captivated aluminum frame, extruded aluminum louvers, and birdscreen. Louver shall fit in cut-out opening in door, with captivated frame providing means of attachment and finished appearance. Louvers shall be of storm proof design to resist rain infiltration.
1. Frame shall be 6063 T5 extruded aluminum with 1 ½-inch x 0.063-inch nominal dimensions.
 2. Blades shall be storm proof, 6063 T5 extruded aluminum, 0.063-inch nominal thickness.
 3. Birdscreen shall be ½ or ¾-inch x 0.051-inch flattened, expanded aluminum in a removable frame. Screen shall be mounted on the inside (back) of louver.
 4. Finish shall be clear anodized to 0.7 mils minimum surface depth; or baked enamel.
 5. Louvers shall have a minimum free area of 36%.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Louver Installation
1. Match profiles, sizes and spacings indicated on approved shop drawings.
 2. Cut opening in door, debur edges, provide reinforcement inside the door if necessary to maintain shape, strength and adequately support louver assembly.
 3. Anchor work securely to supporting structure, but allow for differential and thermal movement.
 4. Prime and paint all door surfaces that will be in contact with the louver assembly frame before final installation.
 5. Follow manufacturer's installation recommendations.
- A. After installation remove temporary coverings and repair or replace damaged items to satisfaction of Owner or Engineer. Clean installed products in accordance with manufacturer's instructions prior to Engineer's acceptance.

3.02 PROTECTION

- A. Care must be exercised in placing aluminum in contact with dissimilar materials. Aluminum shall not be installed in contact with dissimilar metals, concrete, pressure treated/pretreated lumber, masonry, or corrosive non-metallic materials. Dissimilar materials shall be painted or otherwise protected before contact with aluminum or when drainage passes over aluminum.

PART 4 SPECIAL PROVISIONS

4.01 MEASUREMENT AND PAYMENT

- A. Cost for work and materials in this Section shall be included as a portion of the lump sum bid amount for the project as stated on the Bid Form. No separate measurement for work in this Section will occur.

END OF SECTION



SECTION 10500 – FIRE EXTINGUISHERS

PART 1 GENERAL

1.01 MANUFACTURER

- A. Larsen's Manufacturing Company
- B. J.L. Industries
- C. Modern Metals Company
- D. Or approved equal

PART 2 PRODUCTS

2.01 MATERIAL

- A. CD20 15 lb ABC dry chemical extinguisher with bracket for hanging.

PART 3 EXECUTION

3.01 LOCATION

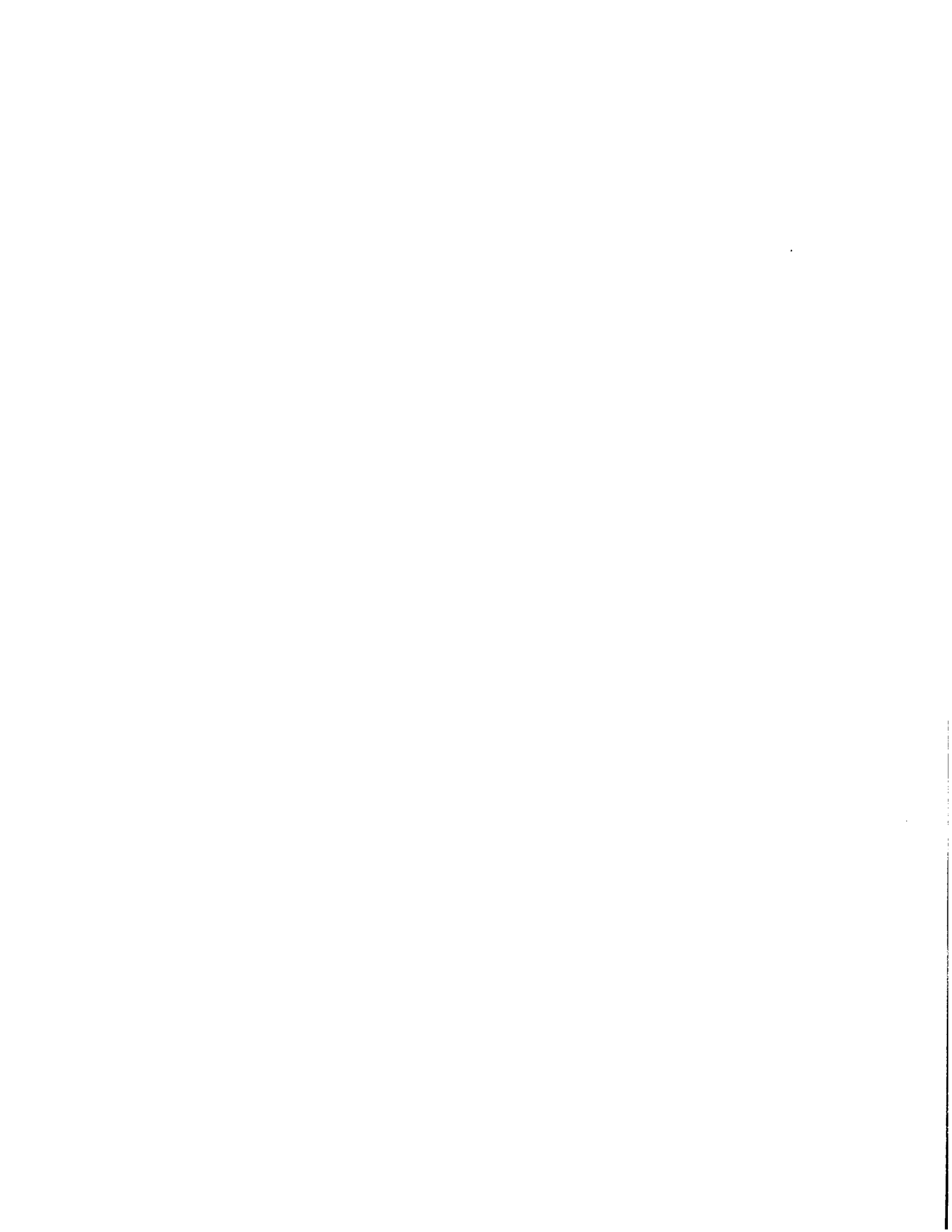
- A. Mount on wall where directed by Engineer and Fire Marshal, 2 required, one each per room.

PART 4 SPECIAL PROVISIONS

4.01 MEASUREMENT AND PAYMENT

- A. Cost for work and materials in this Section shall be included as a portion of the lump sum bid amount for the project as stated on the Bid Form. No separate measurement for work in this Section will occur.

END OF SECTION



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SECTION NO.

TITLE

SECTION 11310

SUBMERSIBLE CENTRIFUGAL PUMPS



SECTION 11310 – SUBMERSIBLE CENTRIFUGAL PUMPS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Specifications for the ITT Flygt submersible centrifugal pumps and motors for wastewater pumping.

1.02 SUMMARY

- A. Three (3) pumps required for redundancy. Each pump will run independently to meet duty point. Maximum design flow will be achieved with two (2) pumps running. Pumps will alternate starts and run cycles to achieve approximately equal run time averages.
- B. Pump shall be supplied with electric motor, close coupled volute, and cast iron discharge elbow, guide bar brackets, power cable and accessories.
- C. The pump, mechanical seals and motor units provided under this specification shall be from the same manufacturer.

1.03 RELATED SECTIONS

- A. Division 16 for drives, control unit and other electrical requirements

1.04 QUALITY ASSURANCE

- A. The pumps shall be heavy duty, electric submersible, centrifugal non-clog units designed for handling raw unscreened sewage and wastewater and shall be fully guaranteed for this use.
- B. The pumps shall be capable of operating in an ambient liquid temperature of 104 degrees F as specified by the National Electrical Manufacturers Association (NEMA) and Factory Mutual (FM).
- C. The pump and motor shall be suitable for continuous operation at full nameplate load while the motor is completely submerged, partially submerged or totally non-submerged.
- D. Motor horsepower shall be sufficient to be non-overloading over entire pump curve.
- E. The pump, mechanical seals and motor units provided under this specification shall be from the same manufacturer in order to achieve standardization of operation, maintenance, spare parts, manufacturer's service and warranty.

1.05 WARRANTY

- A. Warranty shall meet the standard warranty requirement as outlined in the contract documents.
- B. Warranty period shall commence on date of valid start-up.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver equipment to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer or as otherwise shipped and protected by the manufacturer.

- B. Store equipment in a clean dry area indoors in accordance with manufacturer's instructions. Keep containers sealed until ready to use.
- C. Protect equipment during handling and installation to prevent damage or contamination.

1.07 SUBMITTALS

- A. Technical (post-bid) submittal data shall consist of:
 - 1. Certified pump performance curves
 - 2. Anticipated frequency in Hz for flow conditions indicated in Section 2.01.A
 - 3. Pump outline drawing
 - 4. Electrical motor data
 - 5. Control drawing and data
 - 6. Typical installation guides
 - 7. Technical manuals
 - 8. Parts list
 - 9. Printed warranty
 - 10. Manufacturer's equipment storage recommendations
 - 11. Manufacturer's standard recommended start-up report form

1.08 SPARE PARTS

- A. For each pump, an appropriate set of spare parts shall be provided, based on the manufacturer's recommendations, to allow expeditions servicing of the pump and returning it to full service. At a minimum, a complete set of mechanical seals, gaskets, wear rings, and spare impeller shall be provided.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. System shall be capable of producing a minimum of 640 gpm at 138.0 feet total dynamic head with two pumps running.
- B. Pumps shall be capable of running at 45 Hz, or less, for sustained periods of time without overheating.

2.02 MANUFACTURER AND MODEL

- A. Permanent dry mount submersible pump by ITT Flygt, Model NP3153.091 SH with 176 mm impeller. Motor shall be explosion proof, 23 hp, 460 volt, 60 Hz, 3 phase as supplied by ITT Flygt. No substitutions will be allowed.

2.03 CONSTRUCTION

A. PUMP DESIGN

1. The pumps shall be automatically and firmly connected to the discharge connection, guided by no less than two (2) guide bars extending from the top of the station to the discharge connection. There shall be no need for personnel to enter the wetwell. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal watertight contact. Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be acceptable. No portion of the pump shall bear directly on the sump floor.

B. Pump

1. Major pump components shall be of gray cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blowholes or other irregularities. All exposed nuts or bolts shall be AISI Type 304 stainless steel construction. All metal surfaces coming into contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.
2. Sealing shall incorporate metal to metal contact between machined and fitted with Nitrile or Viton rubber O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit.

C. Cable Entry Seal

1. The cable entry shall consist of a single cylindrical, elastomer grommet, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter and compressed by the body containing a strain relief function, separate from the function of sealing the cable when necessary using the same entry seal. The cable entry junction chamber and motor shall be separated by a stator lead sealing gland or terminal board, which shall isolate the interior from foreign material gaining access through the pump top.

D. Motor

1. The pump motor shall be induction type with a squirrel cage rotor, shell type design housed in an air filled, watertight chamber, and NEMA B type. The stator windings and stator leads shall be insulated with moisture resistant Class F insulations rated 155°C (311°F). The stator shall be dipped and baked three times in Class F varnish and shall be heat-shrink fitted into the stator housing. The use of bolts, pins or other fastening devices requiring penetration of the stator housing is not acceptable. The motor shall be designed for continuous duty handling pumped media of 40°C (104°F) and capable of up to 10 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of cast aluminum. Thermal switches set to open at 125°C (260°F) shall be embedded in the stator lead coils to monitor the temperature of each phase winding. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the control panel. The junction chamber containing the terminal board shall be hermetically sealed from the motor by an elastomer compression seal. Connection between the cable conductors and stator leads shall be made with threaded compression type binding posts permanently affixed to a terminal board. The motor and pump shall be designed and assembled by the same manufacturer.

2. The motor shall have voltage tolerance of plus or minus 10%. The motor shall be designed for operation up to 40°C (104°F) ambient and with a temperature rise not to exceed (80°C). A performance chart shall be provided showing curves for torque, current, power factor, input/output kW and efficiency. This chart shall also include data on starting and no-load characteristics.
3. The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the junction box without the need of any splices. The outer jacket of the cable shall be oil resistant chloroprene rubber. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65-feet.

E. Bearings

1. The pump shaft shall rotate on two bearings. Motor bearings shall be permanently grease lubricated. The upper bearing shall be a single deep groove ball bearing. The lower bearing shall be a two row angular contact bearing to compensate for axial thrust and radial forces.
2. The minimum L10 bearing life shall be 50,000 hours at any usable portion of the pump curve.

F. Mechanical Seal

1. Each pump shall be provided with a tandem mechanical shaft seal system consisting of two totally independent seal assemblies. The seals shall operate in a lubricant reservoir that hydrodynamically lubricates the lapped seal faces at a constant rate. The lower, primary seal unit, located between the pump and the lubricant chamber and the motor housing, shall contain one stationary tungsten-carbide seal ring and one positively driven rotating tungsten-carbide ring. The upper, secondary seal unit, located between the lubricant chamber and the motor housing, shall contain one stationary tungsten-carbide seal ring. Each seal interface shall be held in contact by its own spring system. The seals shall require neither maintenance nor adjustment nor depend on direction of rotation for sealing. The position of both mechanical seals shall depend on the shaft.
2. Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and to provide lubricant expansion capacity. The drain and inspection plug, with positive anti-leak seal shall be easily accessible from the outside. The seal system shall not rely upon the pumped media for lubrication. The motor shall be able to operate dry without damage while pumping under load.

a. Seal lubricant shall be FDA Approved, non-toxic

G. Pump Shaft

1. Pump and motor shaft shall be the same unit. The pump shaft is an extension of the motor shaft. Couplings shall not be acceptable. The shaft shall be AISI Type 420 stainless steel.
2. If a shaft material of lower quality than 420 - stainless steel is used; a shaft sleeve of 420 - stainless steel is used to protect the shaft material. However, shaft sleeves only protect the shaft around the lower mechanical seal. No protection is provided in the oil housing and above. Therefore, the use of stainless steel sleeves will not be considered equal to stainless steel shafts.

H. Impeller

1. The impeller(s) shall be gray cast iron, Class 35B, dynamically balanced, double shrouded non-clogging design having a long through let without acute turns. The impeller(s) shall be capable of handling solids, fibrous materials, heavy sludge and other matter found in wastewater. A full vane impeller shall be used for maximum hydraulic efficiency; thus, reducing operating costs. The pump manufacturer upon request shall provide Mass moment of inertia calculations. Impellers(s) shall be keyed to the shaft, retained with an Allen head bolt and shall be capable of passing a minimum 3-inch diameter solid. All impellers shall be coated with an acrylic dispersion zinc phosphate primer.

I. Wear Rings

1. A wear ring system shall be used to provide efficient sealing between the volute and suction inlet of the impeller. Each pump shall be equipped with a brass, or nitrite rubber coated steel ring insert that is drive fitted to the volute inlet.

J. Volute

1. Pump volute(s) shall be single-piece gray cast iron, Class 35B, non-concentric design with smooth passages large enough to pass any solids that may enter the impeller. Minimum inlet and discharge size shall be as specified.

K. Protection

1. All stators shall incorporate thermal switches in series to monitor the temperature of each phase winding. At 125°C (260°F) the thermal switches shall open, stop motor and activate an alarm.
2. A leakage sensor shall be included to detect water in the stator chamber. The Float Leakage Sensor (FLS) is a small float switch used to detect the presence of water in the stator chamber. When activated, the FLS will stop the motor and send an alarm both local and remote.
3. The thermal switches and FLS shall be connected to a Mini CAS (Control and Status) monitoring unit. The Mini CAS shall be designed to be mounted in any control panel.

L. Pump Guide Rails

1. Furnish two (2) guide rails to permit rising and lowering the pump for each pump. Guide rails shall be 3-inch stainless steel pipe of adequate length to extend from the lower guide holders on the pump discharge connections to the upper guide holders mounted on the access frame. Guide rails, lifting chains, cables, and eyes, and all other mounting hardware in the wet well shall be stainless steel and as manufacture's standard for sewage service.
2. Intermediate guide bar brackets shall be supplied. Bracket, U-bolt and hardware shall be stainless steel. Install on intermediate guide bar bracket at the center of each guide bar length (one per pump).

L. Controls – See Division 16

M. Testing prior to installation

1. Impeller, motor rating and electrical connections shall be checked for compliance with manufacturer's recommendations and this specification.
2. Prior to submergence, each pump shall be run dry to establish correct rotation
3. Each pump shall be run submerged in water.
4. Motor and cable insulation shall be tested for moisture content and defects.

N. Lifting Provisions

1. Each pump shall be fitted with minimum 3/16" 316 stainless steel lifting chain of appropriate length, including shackles and appropriate flygt grip eyes for lifting pumps in multiple bites. Grip-eye lifting system shall consist of stainless steel cable connected to lifting chain attached to the lifting bail of the pump. Grip-eye shall be forged steel and designed for the intended lifting application.

O. FINISH

1. Pump and motor surfaces not constructed of stainless steel shall be factory primed and painted.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions at locations shown on the drawings and as directed.
- B. Construct pump base in accordance with drawings and Flygt recommendations. Level and grout as required. Use properly sized stainless steel anchor bolts. Ensure that pump is completely level and plumb.
- C. The pump and motor shall be factory assembled and tested prior to shipment to the project site. The manufacturer shall certify, and shall submit to the Engineer in writing, that all factory testing has been completed prior to shipment.
- D. Prior to starting up the station, all construction debris shall be removed from the system. A representative of the lift station manufacturer shall start, test, and adjust the equipment for complete and satisfactory operation and shall instruct a representative of the owner in the operation and maintenance of the station.
- E. All supplementary water required to start, test, and adjust the station shall be supplied by the contractor as directed by the lift station manufacturer's representative. It will be the responsibility of the contractor to make all necessary arrangements for the source of water.
- F. The lift start piping, conduit hatches, panels, etc. shall be touched up with the touch-up paint, coating, sealants, etc. matching those applied by manufacturers of field applied in accordance with these specifications and the entire interior, and exterior as applicable, cleaned of all dust, dirt, and other foreign material.

3.02 STARTUP & TESTING

- A. ITT Flygt shall furnish the services of a qualified factory trained field service engineer for one 8-hour working day at the site to inspect the installation and instruct the owner's personnel on the operation and maintenance of the pumping units. After the pumps have been completely installed and wired, the contractor shall have the manufacturer do the following:
 1. Megger stator and power cables
 2. Check seal lubrication
 3. Check for proper rotation
 4. Check power supply voltage

5. Measure motor operating load and no load current
 6. Check level control operation and sequence
- B. All units shall be field tested to determine the head, flow and electrical characteristics to ensure that equipment meets the specifications. After installation, the pump shall be dry tested to ensure smooth operation of all components. Acceptance tests shall be run to ensure that each pump meets the following requirements:
1. The pumping units operate as specified without excessive noise, cavitation, vibration, or without overheating.
 2. All automatic and manual controls are functional and capable of operating the pumps as specified.
 3. All drive equipment operates without overload.
 4. Pumps which do not provide the required flow at the stated head, or provide the required turndown flow rates, will be removed and replaced, or modified as required and accepted by the Owner.

3.03 Lift Station Tests

1. The lift station pumps and motor shall be given an operation test at the factory to check for excessive vibration, or leaks. Additional mechanical and field control testing will be required. Forms for the pump capacity are attached. These shall be filled out by the design engineer. Additional testing includes: checking for the air compressor and airflow adjustments, condensate purging, valve positioning and pigging operations. Pigging operations shall consist of a test run by the City staff prior to acceptance of the station. The condensate-purging valve shall be manually tested after hours of operation.
2. **Pressure Gauge Operation Instructions:** Pressure gauges should not be removed. Optimum mechanical reliability entails immediate troubleshooting and attention to problems, so gauges on pumps need to remain in place and ready. If gauges were in storage, they would not truly be ready, reducing effective reliability.

Gauges in sewage service are normally glycerin or silicone filled between the gauge face and the diaphragm seal. They should be fitted with isolation valves, and should have drip legs for purging sewage solids from the seal down. Normally the isolation cock should be kept closed, and the drip leg open. This allows the gauges to remain isolated and left open to atmospheric pressure. Otherwise they will “bounce” and wear out.

If a drip leg is not fitted below the gauge, a tap water flushing connection must be used. To read a flushed gauge, simply close the flushing connection and open the isolation cock. However, the gauge should then be flushed immediately to prevent solids from plugging the assembly. Flush the gauge root from its diaphragm past the isolation valve, then close the isolation valve while flushing. Finally, disconnect the flushing hose and leave the flushing connection open. Failure to flush, isolate, and relieve the pressure on the gauge can cause false readings and will eventually ruin the gauge.
3. **Pump Capacity Checks:** Operators should keep track of pump capacity as the impellers keep wearing down over the years. Eventually pumping rates will decline to a point where the impellers should be replaced.

Where there is no installed flowmeter, one can estimate flow rate from the manufacturer's pump curve. Pressure gauge readings are used to measure TDH (total dynamic head), which then marks the true flow rate on the pump curve. Flow measurement is perhaps the main purpose of gauging centrifugal sewage pump. However, the use of pressure gauges as a surrogate flowmeter is not accurate unless the procedure takes pump water into account. As pump impellers wear down over time, the shutoff head normally declines at the same rates as the operating head. When this happens, the shutoff head and the whole pump curve shift downward together.

This shift is exactly parallel to the original curve. A new curve needs only to be sketched under the original by using the current shut-off head as a starting point. The accuracy of this new curve will be as good as the original unless there is some unusual imbalance in the wear pattern.

4. **How to Measure Shut-Off Head:** The first step is to measure shut-off head ("dead-head" pressure) at the pump shut-off point. This is accomplished by closing the discharge isolation valve with the pump fully primed and running. Note the pressure adjusted to the elevation of the eye of the impeller. Due to wear, the shut-off head of used pumps will invariably be lower than the original factory curve shut-off head.
5. **How to Measure TDH:** When measuring TDH (total dynamic head), all measurements and gauge readings must be translated to the elevation of the pump impeller. This requires measuring the gauge height or offset from the eye of the pump impeller. Next the gauge readings and offset measurements need to be converted to consistent units to calculate TDH (total dynamic head). For example, convert inches and psi to feet. Finally, TDH can be used to estimate the flow rate with reference to the pump curve as described above.

Note that gauge offsets from the elevation of the impeller eye are often small. While this adjustment might be neglected in some high-head pumping applications, not so with centrifugal sewage pumps. Sewage pump curves often indicate variations of 75 – 100 gpm for every foot of headloss, so gauge offsets must be taken into account. A pump will discharge at its maximum rate on pump START, when the level in the wetwell is deepest; pumping rate will decline as the wetwell empties. This points to the importance of exact timing when reading gauges. Both suction and discharge pressures will change significantly from pump start to stop, and both readings must be made simultaneously.

The mid-point or average depth of the pump's operating pool is normally taken as the design point. Pumps should be evaluated exactly at mid-depth. This is most easily accomplished by taking readings at the start and stop elevations and averaging, as indicated on the attached Flow rate Check form.

Gauges are normally mounted higher than the elevation of the pump impeller. This offset causes the gauge to indicate a lower pressure than exists at the pump. The amount of gauge offset must be taken into account by adding it to the reading on the gauge.

Discharge pressure alone is not sufficient for estimating TDH of centrifugal sewage pumps. The suction side must also be measured. If the pump impeller is above the level of the liquid, the suction reading will represent a vacuum that must be added to the discharge pressure to calculate TDH.

If the pump is below the liquid level, pressure on the suction side will diminish TDH developed at the pump. A positive suction-side pressure reading must be subtracted from discharge pressure to calculate TDH.

6. Submersible and self-priming pumps present special situations:
 - a. The suction side of a self-priming pump is under vacuum. The pump must develop the amount of negative pressure shown on the suction gauge. Hence Total Dynamic Head (TDH) on a self-priming pump will be the suction head plus the discharge head. Also the suction and discharge side gauges offsets of self-priming pumps will cancel each other if both gauges are mounted at the same elevation.
 - b. With submersible pumps, the liquid depth over a pump must be physically measured while pumping. The liquid depth over the impellor reduces the head developed by the pump. To calculate TDH, this submergence must be subtracted from the discharge pressure.
7. Power Draw and Wetwell Drawdown Methods of Flow Measurement: Power draw and wetwell draw-down can also be used to check pump capacity. However, such methods are mainly a last resort where pumps lack properly installed gauges, or the gauges were removed, or the gauges were installed without proper diaphragm seals and flushing connections so that sewage exposure has ruined them.

Measuring power draw in the field helps check electrical demand and efficiency of the installation. However, to verify adequate pump capacity, power draw has poor accuracy. Power draw measurements are not reliable for arriving at an estimate of pumping rate.

Draw-down test of sewage pumps are often attempted in live wetwells with various degrees of success. Sometimes there is a flowmeter that needs to be recalibrated. Draw-down tests are an accepted method of wet-calibrating a flowmeter, but accurate draw-down testing is tedious and time-consuming.

Draw-down tests on a live wetwell are subject to a great variety of errors. The errors are best overcome by precise dimensional measurements and many timed repetitions. The extreme amount of time for adequate and accurate repetitions qualifies draw-down testing as a method of last resort.

8. Initial Pump Capacity Checks: Regardless of factory testing prior to installation, at the time of start-up pump installers and operators should measure pump shut-off head and mid-depth TDH. The data should then be re-measured once a year to track wear and schedule replacement. A comparison with this information can also help to diagnose emergency pump troubles before opening a pump or pigging a force main.

The attached flowcheck form can be used where applicable. For any specific pump installation, a similar form can be developed.

FLOW RATE CHECK

INSTALLATION DATA

#1

#2

- | | | |
|--|-------|-------|
| 1. IMPELLER EYE ELEVATION | _____ | _____ |
| 2. SUCTION GAUGE OFFSET FROM IMPELLER EYE, ft. | _____ | _____ |
| 3. DISCHARGE GAUGE OFFSET, ft | _____ | _____ |

PRESSURE DATA

- | | | |
|-----------------------|-------|-------|
| 1. SHUT-OFF HEAD, ft. | _____ | _____ |
|-----------------------|-------|-------|

(Note: Field-measured shut-off heads are normally below factory curve due to wear. Estimate true flow rate by using a parallel curve sketched through the measured shut-off head.)

2. SUCTION HEAD

(Note: for submersibles, use depth from water surface to pump centerline for suction head readings.)

- | | | |
|--|-------|-------|
| Gauge Reading @ Pump Start | _____ | _____ |
| Reading Adjusted to Impellor Eye, ft. | _____ | _____ |
| Gauge Reading @ Pump Stop | _____ | _____ |
| Reading Adjusted to Impeller Eye, ft. | _____ | _____ |
| 3. DISCHARGE HEAD | | |
| Gauge Reading @ Pump Start | _____ | _____ |
| Reading Adjusted to Impellor Eye, ft. | _____ | _____ |
| Gauge Reading @ Pump Stop | _____ | _____ |
| Reading Adjusted to Impeller Eye, ft. | _____ | _____ |
| 4. TOTAL DYNAMIC HEAD, ft. | | |
| THD @ Pump Start | _____ | _____ |
| TDH @ Pump Stop | _____ | _____ |
| 5. FLOW RATE DATA @ Pump RPM of _____rpm | | |
| Flow rate @ Pump Start, gpm | _____ | _____ |
| Flow rate @ Pump Stop, gpm | _____ | _____ |
| Average Flow, gpm | _____ | _____ |

STATION _____

DATE _____ SIGNATURE _____

Conversion factors:

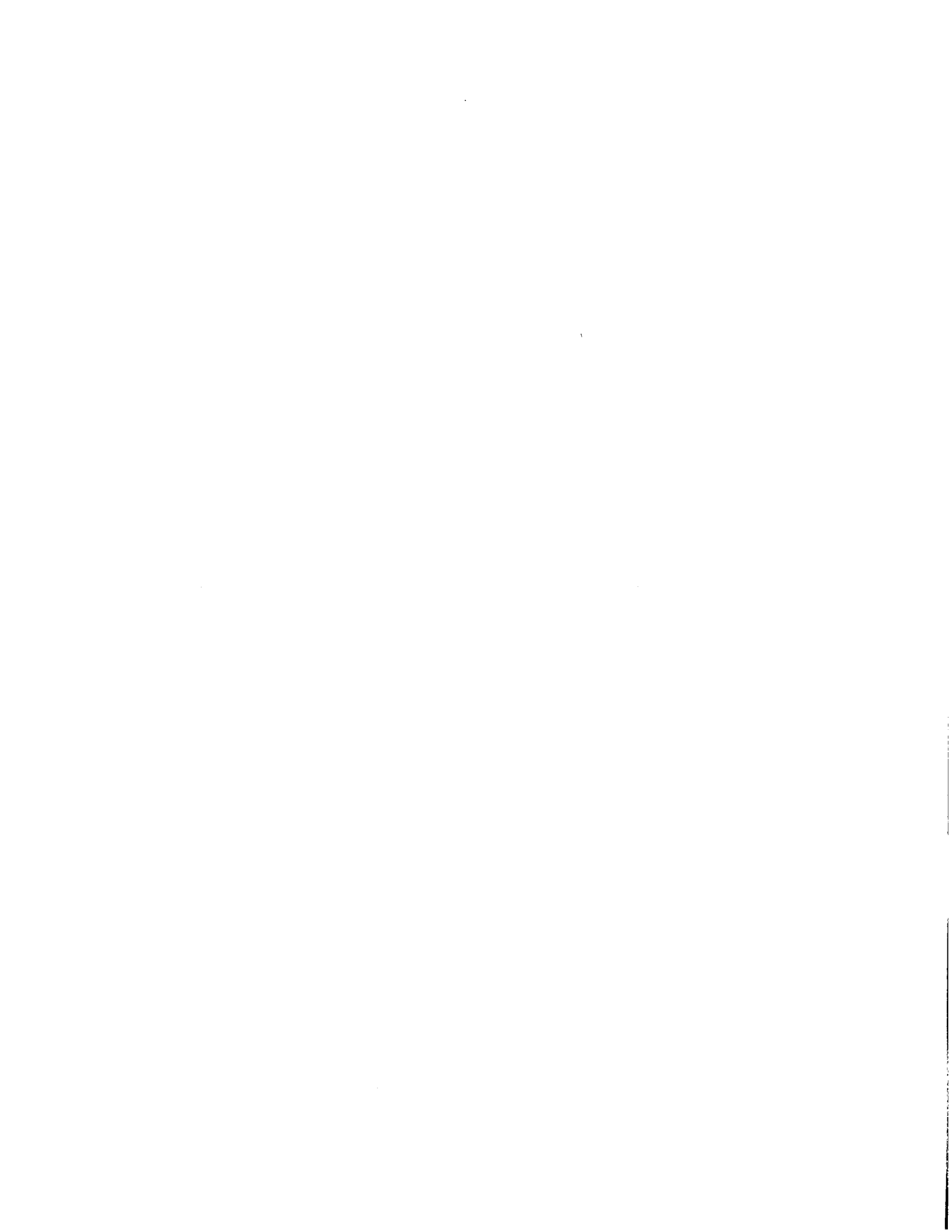
- 1" Hg = 1.13 ft water column
- 1 psi = 2.31 ft water column

PART 4 SPECIAL PROVISIONS

4.01 MEASUREMENT AND PAYMENT

- A. Cost for the submersible pumps as specified herein, shall be included within the lump sum price for the Project and as stated in the Bid Form. No separate measurement for work or materials in this Section will occur.

END OF SECTION



DIVISION 13
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SECTION NO.

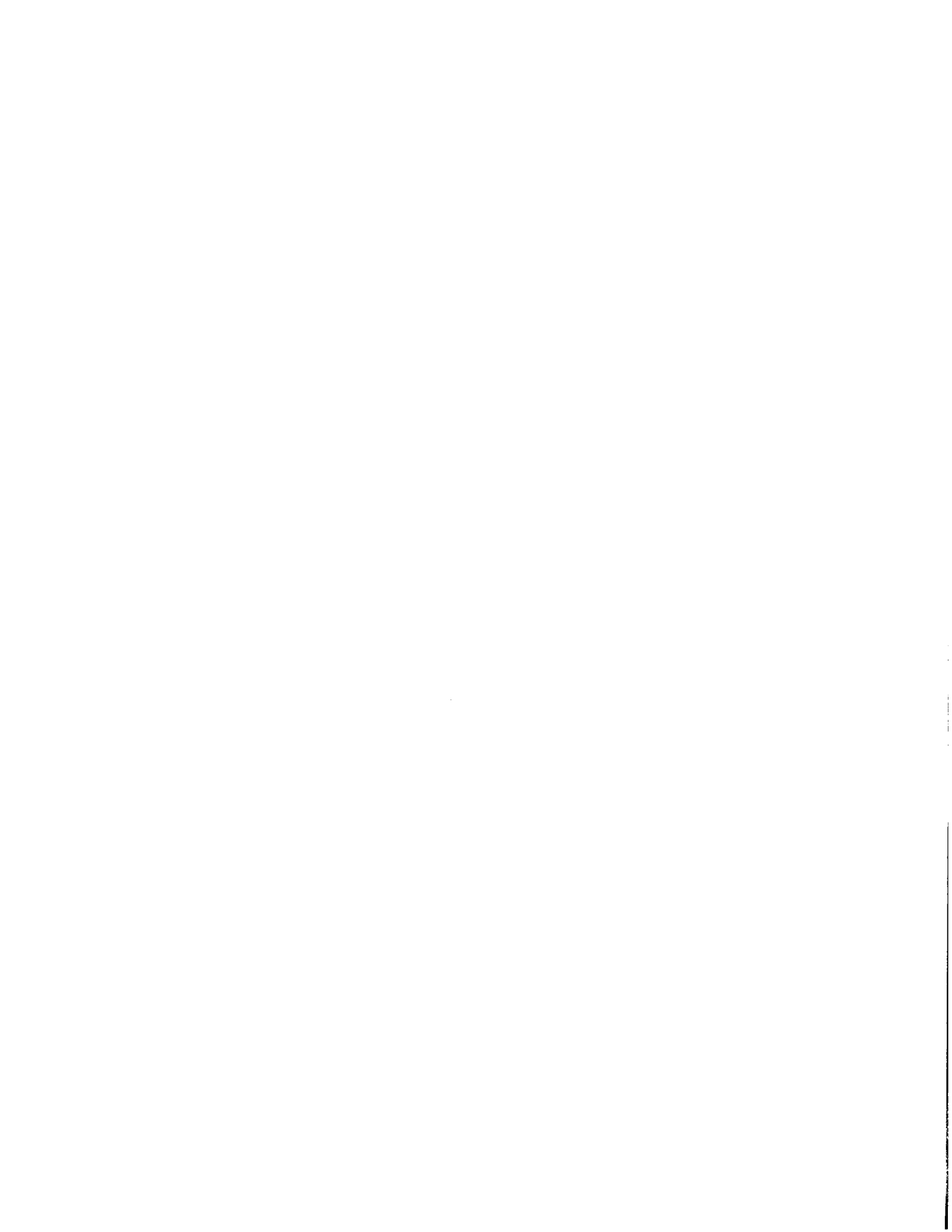
TITLE

SECTION 13420

FLOW METER

SECTION 13425

**DIAPHRAGM SEAL & PRESSURE
TRANSMITTER**



SECTION 13420 – FLOW METER

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Specifications for the flow meter that will measure wastewater flows discharged from the pump station.
- B. Provide a paperless recorder mounted in side the pump control panel.

1.02 SUMMARY

- A. The meter shall be magnetic type (magmeter) complete with flanged metering tube, remote wall-mount data display/keypad/transmitter, and sufficient interconnecting signal cable.
- B. Meters shall be equipped to forward analog signals to the pump controller from the meter remote display/signal converter. The flow proportional signal will be used to display rate/total (both at the remote display and the SCADA computer) and control the speed of variable frequency drive pumps to provide a specific flow as set by the Operating Strategy.
- C. Flow range will range from 0 to 2,640 gpm.

1.03 RELATED SECTIONS

- A. Division 3 for precast concrete flowmeter vault.
- B. Division 16 for signal and power wiring.

1.04 QUALITY ASSURANCE

- A. Manufacturer shall specialize in flow measurement and shall have been providing flow meters for a minimum of 10 years. Entire unit, including meter body, flow transmitter, and remote display/flow computer shall be shipped as a single package from the manufacturer.
- B. Meter shall be factory wet-flow calibrated with at least 3 points. Test shall be conducted on complete flow tube with its signal converter. Test facility shall be certified to an accuracy of $\pm 0.2\%$ of true flow and traceable to the National Institute of Standards and Technology.

1.05 WARRANTY

- A. Warranty shall meet the standard warranty requirement as outlined in the contract documents.
- B. All components making up the meter shall be warranted for 24 months from date of shipment and defects due to faulty materials or workmanship will be repaired or replaced free of charge during the two year warranty period.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver equipment to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer or as otherwise shipped and protected by the manufacturer.
- B. Store equipment in a clean dry area indoors in accordance with manufacturer's instructions. Keep containers sealed until ready to use.
- C. Protect equipment during handling and installation to prevent damage or contamination.

1.07 Submittals

- A. Submit technical data, drawings, and details sufficient to show complete specification compliance. If any deviations exist, clearly identify and explain.

PART 2 PRODUCTS

2.01 MANUFACTURERS & MODELS.

- A. The meter shall be Endress and Hauser Proline Promag 50W. Meter body shall have 8-inch flanges.

2.02 CONSTRUCTION

A. Body

- 1. The meter tube shall be fabricated stainless steel pipe with 150 pound AWWA Class "D" flanges for mating to 8-inch pipe. Meter tubes shall have a constant nominal inside diameter offering no obstruction to the flow.
- 2. Interior of body shall be fully lined with NSF approved polyurethane.
- 3. Electrodes shall be 316 stainless steel, or C22 tantalum.
- 4. Meter body exterior shall be a factory applied corrosion resistant coating, polyurethane or Al/Zn coating.

B. Signal Converter

- 1. The signal converter shall be independent from the meter body and shall be supplied with up to 300 feet of interconnecting cable. Contractor to verify installation location and order specific cable length to avoid unnecessary looping of extra cable.
- 2. The signal converter shall be microprocessor based with backlit LCD for continuous display of rate of flow and total volume of flow. Rate shall be displayed in gallons per minute (gpm) and totalized volume in gallons.
- 3. Unit shall be housed in a NEMA 4X case. Unit shall be wall-mounted as shown in the drawings or as directed by Engineer.

4. Instrument shall be factory programmed and shall include a self diagnostic test mode, password protected configuration parameters, and a front panel keypad used change display and parameters. The converter shall be compatible with Microsoft Windows and other software programs with built in terminal communication capabilities through a interface port.
5. The converter shall provide an isolated 4-20 mA output.
6. Unit shall store all data in a non-volatile memory with 10-year retention.

2.03 PERFORMANCE

- A. When installed in accordance with manufacturer's instructions, meter shall have the following minimum accuracy:
 1. Display, serial communications and frequency output accuracy to be $\pm 0.5\%$ of reading or ± 0.003 ft/sec, whichever is greater.
 2. Analog output frequency to be ± 0.005 mA

2.04 RECORDER

1. Recorder shall be paperless style suitable for mounting in indoor control panel.
2. Manufacturer to provide sufficient length of cable for connecting meters to recorder.
3. Internal memory recording length shall be suitable for a maximum of 700,000 values.
4. Manufacturer: The recorder shall be an Endress & Hauser Paperless Recorder Ecograph T RSG30 or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions at location shown on the drawings and as directed.
- B. Maintain upstream and downstream straight pipe runs as indicated in the Plans and as directed by the manufacturer.
- C. Install grounding cable. Ground as directed by manufacturer.
- D. Wall mount remote display as shown in the drawings and as directed.
- E. Provide shielded signal cable as recommended by manufacturer for the outputs. All signal cable from the flowmeter vault to control cabinet shall be installed in conduit. Provide flexible conduit near converter.
- F. Provide power to remote display (120 VAC) as shown in the drawings and as specified. Provide flexible conduit near converter.

- G. The manufacturer or authorized factory representative shall provide a minimum of one (1) day training and startup service to ensure installation and operation as required.
- H. Verify that flow reading is accurate using approved device and method.
- I. Recorder to be incorporated into pump control panel.

PART 4 SPECIAL PROVISIONS

4.01 MEASUREMENT AND PAYMENT

- A. Cost for the flow meter and recorder, as specified herein, shall be included within the lump sum price for the project and as stated in the Bid Form. No separate measurement for this item will occur.

END OF SECTION

SECTION 13425 – DIAPHRAGM SEAL & PRESSURE TRANSMITTER

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Specifications for the diaphragm seal, isolation valve and pressure transmitter/gauge assemblies for discharge pressure monitoring.

1.02 SUMMARY

- A. The diaphragm seal shall be a wafer type isolation ring with a flexible inner cylinder separating the process flow from the inner fill fluid. Isolation ring shall have an integral isolation valve to isolate the pressure gauge from the diaphragm seal.
- B. The transmitter shall provide a 4-20 mA output signal.
- C. The diaphragm seal, isolation valve, and internal pressure transmitting fluid shall be provided as a fully factory assembled unit, filled and ready for installation.

1.03 QUALITY ASSURANCE

- A. Manufacturer shall specialize in pressure and temperature instrumentation and shall have been providing diaphragm seals and pressure gauges for a minimum of 10 years. Entire unit, including diaphragm seal, isolation valve and pressure gauge shall be shipped as a single package from the manufacturer.
- B. Pressure gauge shall have an ASME B 40.1 Grade 1A, 1% accuracy full scale.

1.05 WARRANTY

- A. Warranty shall meet the standard warranty requirement as outlined in the contract documents.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver equipment to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer or as otherwise shipped and protected by the manufacturer.
- B. Store equipment in a clean dry area indoors in accordance with manufacturer's instructions. Keep containers sealed until ready to use.
- C. Protect equipment during handling and installation to prevent damage or contamination.

1.07 SUBMITTALS

- A. Submit technical data, drawings, and details sufficient to show complete specification compliance. If any deviations exist, clearly identify and explain.

PART 2 PRODUCTS

2.01 MANUFACTURERS & MODELS.

- A. The diaphragm seal shall be Ashcroft Iso-Ring Type 80 wafer type with integral needle valve; or approved equal.
- B. Pressure transmitter shall be Ashcroft GC52, lower mount; or approved equal.

2.02 CONSTRUCTION

A. Wafer Type Diaphragm Seal

- 1. The assembly flange shall be 316 stainless steel and housing shall be carbon steel. Inner flexible wall shall be Viton. Instrument connection shall be ¼-inch NPT. Filling fluid shall be glycerin.
- 2. Isolation ring diaphragm seal shall be equipped with an integral threaded needle valve to permit the removal of the pressure gauge without stopping the process flow or draining the fill fluid. Needle valve shall be capable of acting as a snubber by adjusting valve to “nearly closed” position. Needle valve shall be an integral part of the diaphragm housing, “stacked” valves mounted in between housing and gauge will not be allowed. Needle shall be of bronze construction.

B. Pressure Transmitter

- 1. The pressure gauge shall be NEMA 4X with aluminum die cast housing.
- 2. Transmitter shall be equipped with a back lit LCD screen.
- 3. Internal push-button configurability for quick range changes.
- 4. Output signal shall be 4-20 mA.

- C. Isolation Ring diaphragm seal, isolation valve, and pressure transmitter shall be provided as a single unit, factory filled with glycerin and ready for installation.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer’s instructions at location shown on the drawings and as directed.
- B. Provide all materials necessary for complete and functional installation

PART 4 SPECIAL PROVISIONS

4.01 MEASUREMENT AND PAYMENT

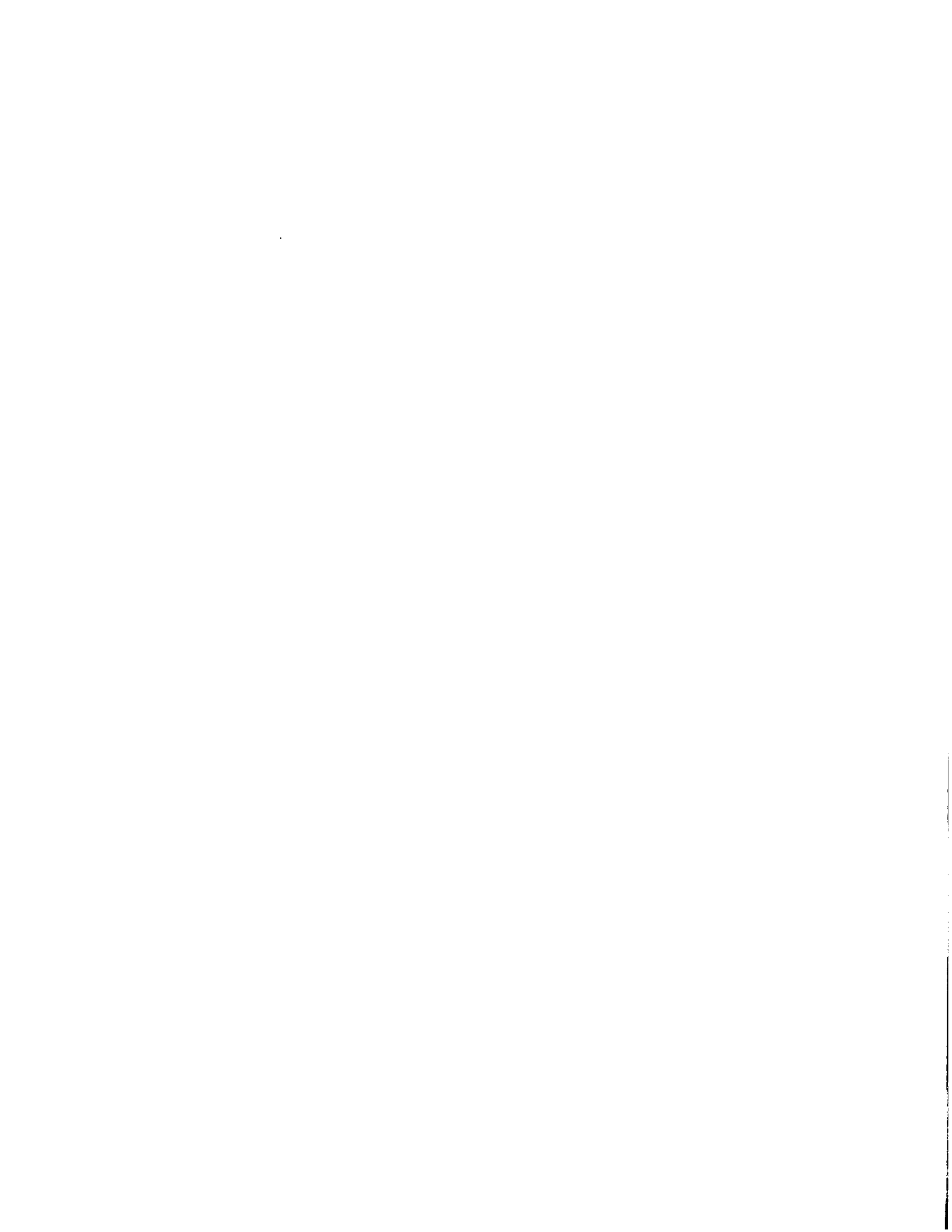
- A. Cost for isolation ring diaphragm seal, isolation needle valve and pressure transmitter assembly as specified herein, shall be included within the lump sum price for the project and as stated in the Bid Form. No separate measurement for this item will occur.

END OF SECTION



DIVISION 14
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| <u>SECTION NO.</u> | <u>TITLE</u> |
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| <u>SECTION 14615</u> | <u>DAVIT BASE</u> |
| <u>SECTION 14620</u> | <u>DAVIT HOIST</u> |



SECTION 14615 – DAVIT BASE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Specifications for the davit base and cap provided for davit crane mounting at the wet well access. One davit mount per pump access point shall be provided.

1.02 SUMMARY

- A. The davit mount shall be stainless steel, flush mount with four integral anchor bolts for cast-in-place installation. Shall be installed in new concrete wetwell cover as depicted in the Plans.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Deliver equipment to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer or as otherwise shipped and protected by the manufacturer.
- B. Store equipment in a clean dry area indoors in accordance with manufacturer's instructions. Keep containers sealed until ready to use.
- C. Protect equipment during handling and installation to prevent damage or contamination.

1.04 SUBMITTALS

- A. Submit technical data, stamped drawings, design certification by registered Professional Engineer, and details sufficient to show complete specification compliance. If any deviations exist, clearly identify and explain.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. The davit base shall be Thern Model 524SSF; or approved equal.
- B. The sleeve cap shall be Thern Model TK4P; or approved equal.

2.02 CONSTRUCTION

- A. Mount shall be of welded 304 stainless steel construction. All welding shall be performed by an AWS certified welder, or equivalent. Plate shall be a minimum ½-inch thick, sleeve shall be minimum SCH 40 pipe.
- B. Mount shall include integral headed anchors for cast-in-place installation. Anchors shall provide a minimum of 4-inches embedment.
- C. Mount shall be designed for flush mounting in fresh concrete.
- D. Mount shall be equipped with a PVC sleeve liner.
- E. Mount shall be rated for a mast moment proof load of 90,000 in-lbs.

- F. Sleeve cap shall be made of plastic.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions and in accordance with the Plans and Specifications. Locate as shown on plans and as directed. Mount shall be installed flush with the concrete surface.

PART 4 SPECIAL PROVISIONS

4.01 MEASUREMENT AND PAYMENT

- A. Cost for davit base and sleeve cap as specified herein, shall be included within the lump sum price for the project and as stated in the Bid Form. No separate measurement for this item will occur.

END OF SECTION

SECTION 14620 – DAVIT HOIST

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Specifications for the davit hoist provided for Pump Station # 5. One davit hoist, complete with upper and lower masts and winch, shall be provided.

1.02 SUMMARY

- A. Hoist system shall be compatible with specified davit mounts. Hoists shall be equipped with quick release pins to allow for easy collapsibility and transport. Davit hoist shall be supplied as a complete, functional and assembled unit.
- B. Follow davit hoist manufacturer's recommendations for appropriate use and maximum loads.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Deliver equipment to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer or as otherwise shipped and protected by the manufacturer.
- B. Store equipment in a clean dry area indoors in accordance with manufacturer's instructions. Keep containers sealed until ready to use.
- C. Protect equipment during handling and installation to prevent damage or contamination.

1.04 SUBMITTALS

- A. Submit technical data, stamped drawings, design certification by registered Professional Engineer, and details sufficient to show complete specification compliance. If any deviations exist, clearly identify and explain.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. The portable davit crane shall be thern series 5124; or approved equal.
- B. The winch shall be model M2 worm gear hand operated with powder coating; or approved equal.
- C. The wire rope shall be stainless steel ¼" x 28'; or approved equal.

2.02 CONSTRUCTION

- A. Davit and Mast shall have a corrosion resistant powder coated finish.

2.03 PERFORMANCE

- A. Davit and Mast shall be rated for a minimum 2000-pound working load. Davit and Mast shall be assembled with quick release pins to allow for easy collapsibility and transport.
- B. Boom shall be adjustable being capable of telescoping to 4 different lengths. Boom shall be adjustable in height while under load with ratchet style screw-jack.
- C. Crane shall be capable of rotating 360 on a pin and sleeve bearing in the base. Handle on the base shall ease rotation.

2.04 ACCESORIES

- A. Provide a wire rope keeper on the base to hold the free end of the wire rope. Model number B1766.

PART 3 EXECUTION

3.01 ASSEMBLY AND INSTALLATION

- A. Assemble in accordance with manufacturer's instructions and in accordance with the Plans and Specifications. Provide complete davit unit to owner.

PART 4 SPECIAL PROVISIONS

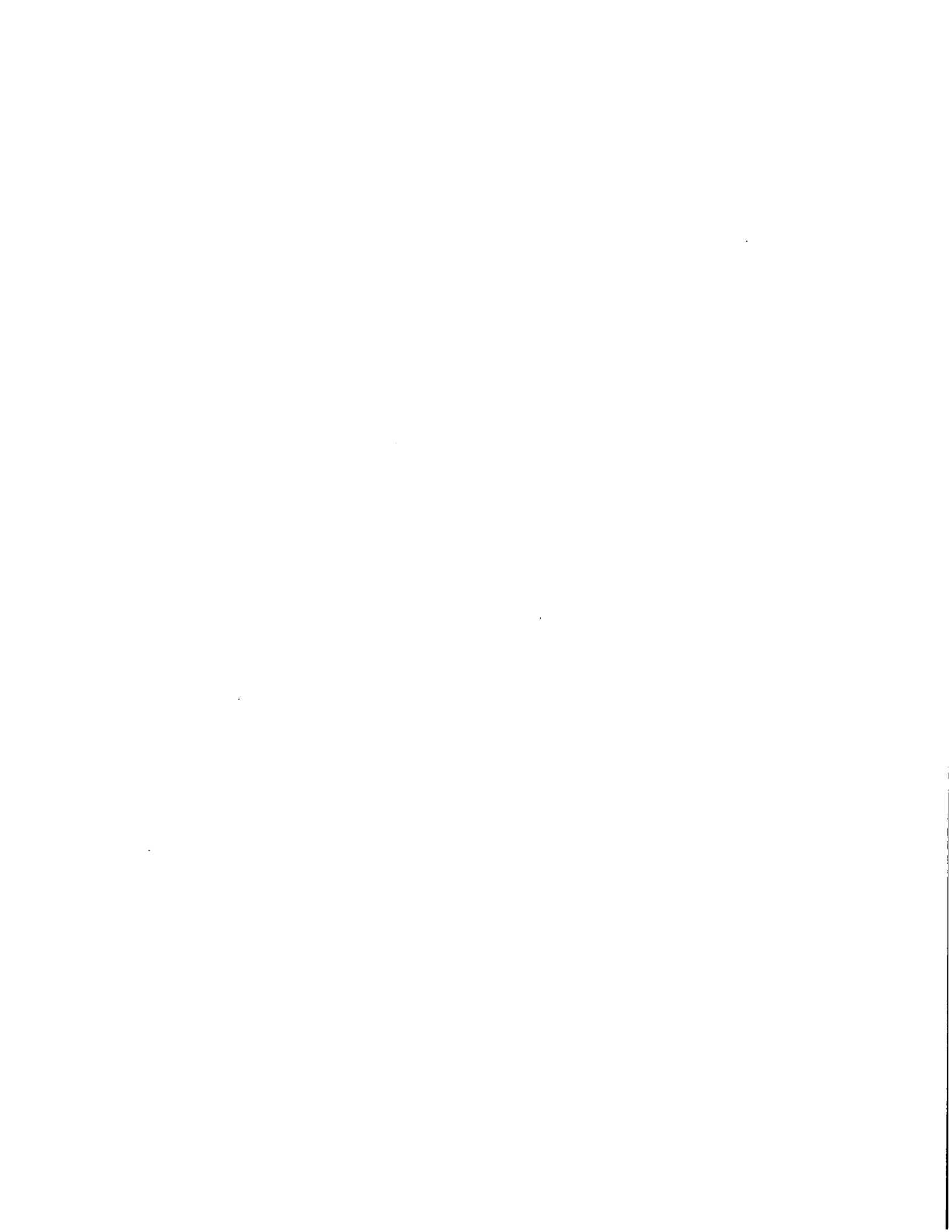
4.01 MEASUREMENT AND PAYMENT

- A. Cost for davit, mast and winch as specified herein, shall be included within the lump sum price for the project and as stated in the Bid Form. No separate measurement for this item will occur.

END OF SECTION

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| <u>SECTION NO.</u> | <u>TITLE</u> |
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| <u>SECTION 15050</u> | <u>BASIC MECHANICAL MATERIALS & METHODS</u> |
| <u>SECTION 15060</u> | <u>PIPE HANGERS, SUPPORTS AND CLAMPS</u> |
| <u>SECTION 15075</u> | <u>MECHANICAL IDENTIFICATION</u> |
| <u>SECTION 15105</u> | <u>PIPE PENETRATION SEALS</u> |
| <u>SECTION 15110</u> | <u>VALVES</u> |
| <u>SECTION 15111</u> | <u>DUCK BILL CHECK VALVE</u> |
| <u>SECTION 15140</u> | <u>DOMESTIC WATER PIPING</u> |
| <u>SECTION 15410</u> | <u>PLUMBING FIXTURES & COMPONENTS</u> |
| <u>SECTION 15500</u> | <u>VENTILATION</u> |
| <u>SECTION 15850</u> | <u>ADJUSTABLE WALL LOUVER</u> |



SECTION 15050 – BASIC MECHANICAL MATERIALS AND METHODS

PART 1 GENERAL

1.01 GENERAL INFORMATION

- A. Contractors shall become informed of all conditions under which this work is to be done. No monetary allowance shall subsequently be made because of any errors due to not becoming informed.
- B. Data given in the specifications and on the drawings are as exact as could reasonably be identified. Their extreme accuracy is not guaranteed. Drawings and Specifications are for the assistance and guidance of the Contractor; exact distances, levels and grades will be governed by the site conditions and existing construction.
- C. Mechanical materials shall be installed in a neat and workmanlike manner. Building and process piping, ductwork, and other conduits shall be properly secured and supported. Equipment shall be installed as specified and in conformance with the equipment manufacturer's recommendations and instructions. Vibrating equipment shall be installed with suitable vibration isolators to protect equipment and supporting structures from long-term damage. Lack of detail in drawings and specifications shall not relieve the Contractor of his responsibility to properly install, secure and support equipment and appurtenances.

1.02 STANDARDS AND CODES

- A. Applicable Federal, State, County and Local Codes and Standards are the minimum requirements for materials and labor practices not otherwise stated. Nothing in the Plans or Specifications shall be construed or are intended to permit materials or installation not conforming to the above referenced authorities. The "Oregon State Plumbing Code" shall govern building services piping and plumbing.

1.03 FEES

- A. Contractor shall obtain all permits and fees required by governing agencies having jurisdiction over this work. Work shall not begin until proper building permits are obtained and posted.
- B. Permit fees shall be a pass-through expense for the Contractor. Invoices for paid permit fees shall be submitted to the City of Coos Bay for reimbursement.
- C. Contractor shall secure and pay for all inspections and tests required by Governmental or Utility Codes or ordinances prior to, during, and at the completion of this work. Contractor shall coordinate required inspections at the proper times without causing delays in work or progress.

1.04 SUBMITTALS

- A. Shop Drawings. Contractor shall submit five copies to Engineer to be reviewed prior to construction or installation of work. Including, but not limited to:
 - 1. Process or special unit piping.
 - 2. All mounting brackets, standoffs, and supports used for piping, valves, and all mechanical fixtures.
 - 3. Special valves and equipment.
 - 4. Soil and drain plumbing fixtures floor or wall mounting.

5. Other submittals as required in specific Division 15 Sections.
6. See also requirements of Division 1.

1.05 QUALITY ASSURANCE

- A. Division 15 materials and equipment shall be installed by qualified workers with experience specific to the items being used and methods of installation being required in the work.
- B. Contractor shall obtain manufacturer's instructions for equipment and carefully review before performing work. Contractor shall also be familiar with referenced standards pertaining to installation methods and materials. Project drawings, specifications, approved shop drawings, and manufacturer's instructions shall be kept on site and adhered to.

1.06 WARRANTY

- A. The Contractor shall assume full responsibility for and warrant for one year (after final acceptance) the satisfactory performance of all mechanical systems.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 TESTING

- A. Contractor shall make tests of any portion of the installation as required by Engineer to determine if it is in accordance with these specifications.
- B. Should any piece of apparatus or any materials or work fail in any test immediately remove and replace. Portion of work replaced shall again be tested by Contractor with no additional cost to owner.
- C. Enclosed piping to be tested before concealing.
- D. All tests shall be made in the presence of the Engineer.
- E. Testing of building plumbing.
 1. Test all downspouts, rain leaders or their branch within the building by water as described for the above soil, waste and vent system.
 2. Provide all equipment, material and labor necessary for inspection and tests, and repair all work found defective. After repairs are made, repeat tests until entire systems are found satisfactory. All tests shall be performed in the presence of the Engineer. Ample advance notice of tests shall be given.
 3. All domestic water pressure piping; Hydrostatic test 150 psi for a minimum of 6 hours without drop in pressure. Exclude hot water heater from test.
- F. Testing of site and process pressure piping. Perform pressure test as specified in Division 2.

3.02 CLEANING

- A. Equipment, fixtures, piping and all other materials furnished under this Division shall be cleaned, free from all rust, scale and dirt before covering or painting, or systems put into operation.
- B. After completion of the work, all debris shall be removed, leaving entire work complete and undamaged.

3.03 PAINTING

- A. Pipes, and all fittings including hanger rods, etc., not of stainless steel, shall be primed and painted per Division 9.
- B. Shop pre-assembled equipment shall conform to painting specifications - Division 9, and shall be "touched up" or repainted if damaged during construction.

PART 4 SPECIAL PROVISIONS

4.01 MEASUREMENT AND PAYMENT

- A. No separate measurement and payment will occur for items specified in this Section. All required items and work shall be included as a portion of the applicable lump sum contract price pump station as stated in the Bid Form.

END OF SECTION

