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**PART 1. GENERAL**

1.01 RELATED SECTIONS

- A. Section 15200 Process Piping General
- B. Supplement 15200-02 HDPE Pipe and Fittings Data Sheet

1.02 SUBMITTALS

- A. Action Submittals:
  - 1. Shop Drawings:
    - a. Product Data:
      - 1) Valves.
      - 2) Pump Station.
      - 3) Pipe and Fittings.
      - 4) Sprinkler heads.
      - 5) Water Storage Tank.
- B. Information Submittals:
  - 1. Operations and Maintenance Data: As specified in Section 01430.

1.03 QUALIFICATIONS

- A. System Supplier: Regularly engaged in the supply and production of irrigation systems with a minimum of 5 years' previous experience with similar systems.

1.04 SCOPE

- A. Provide all materials, tools, and labor to complete an operable irrigation system as shown on the Drawings and as specified.

1.05 PERFORMANCE REQUIREMENTS

- A. Provide irrigation system to achieve minimum of 25 mm per day on biofilter media. Irrigation coverage must be uniform across the entire surface of the media and the 25 mm amount must be supplied over a 2 hour or less period, but in no case more than 25 mm per hour. If irrigation system requires zonal operation, 25 mm of irrigation must be supplied in 2 hours per less per zone. Contractor is responsible for demonstrating these conditions are met and making any adjustments as required to meet these conditions at no additional cost to the City.
- B. Provided irrigation system shall be unconditionally guaranteed by the Contractor as to material and workmanship for a period of 1 year following the date of final acceptance of the Work. Contractor shall make all adjustments without extra cost to the City,

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including complete restoration of all damaged piping, paving, or other improvements during the 1-year period from the date of completion.

- C. Operational difficulties in connection with the irrigation system within the specified guarantee period shall be immediately repaired at no additional cost to the City, including any and all other damage caused by such defects.

1.06 EXTRA MATERIALS

- A. Furnish, tag, and box for shipment and storage the following spare parts and special tools.

Quantity	Item
2 sets	Special wrenches for removal and installation of each type of sprinkler head provided.

**PART 2. PRODUCTS**

2.01 BIOFILTER IRRIGATION SYSTEM

- A. Product Handling: Conform with requirements as specified in Section 01600, Material and Equipment.

2.02 VALVES

- A. Ball Valves and Drain Valves:

1. Type V330 PVC Ball Valve 50 mm and Smaller:
  - a. Rated 1035 kPa at 22.8 degree C, with ASTM D1784, Type I, Grade 1 polyvinyl chloride body, ball, and stem, end entry, double union design, solvent-weld socket ends, elastomer seat, Viton or Teflon O-ring stem seals, to block flow in both directions.
  - b. Manufacturers and Products:
    - 1) Chemline; Type 21
    - 2) Hayward Z-Ball True Union Valve
    - 3) Watts; Series TPBV-D
    - 4) Nibco-Chemtrol; PVC Model C.

2.03 PUMP STATION

- A. Provide complete pump station with:
1. ODP, 2 HP, single phase, 230 V motor.
  2. 1 1/4-inch discharge, 1 1/2-inch suction.
  3. Quick disconnects
  4. Discharge hose

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5. Power relay
6. Base and 3R powder coated steel power enclosure. Enclosure UL<sub>C</sub>, NEMA 3R.
7. Berkley SSHM-2 4-stage pump, 30 USGPM at 178 ft of TDH (75 psi).
8. Weatherproof irrigation timer/controller installed on outside of enclosure.

B. Manufacturer and Products:

1. Pumptronics Pump Station
2. Or Approved Equal in accordance with B6.

2.04 ELECTRICAL

- A. Provide a NEMA 12 box, provide power relay.
- B. If zone system proposed, provide low voltage cable from 24 V timer on pump enclosure to the four solenoid valves (located near sprinklers).

2.05 SPRINKLERS

- A. Provide 4 nozzles as specified or shown on Drawings, Plastic; machined working surfaces, without burrs; with 1-inch NPT female pipe connection.
- B. Pop-Up Rotary: Gear drive, part circle type, heavy-duty unit; removable from aboveground; adjustable, as indicated; orifices or nozzles interchangeable.
- C. Manufacturer and Products: Rain Bird 80-05-SS-26.

2.06 STORAGE TANK

- A. Provide plastic storage tank as shown on drawings with minimum diameter of 2400 mm and minimum capacity of 7570 L (2000 IG).
- B. Tank shall include tie down slots, built in graduated litre indicators, an offset fill opening on top, drain fitting minimum 50 mm (2-inch) on bottom side and a vented lid.
- C. Manufacturer and Products:
  1. Norwesco #40051.
  2. Or Approved Equal in accordance with B6.
- D. Install and anchor tank level on concrete slab as shown in drawings.

**PART 3. EXECUTION**

3.01 INSTALLATION OF PIPES AND FITTINGS

- A. General: The layout of the irrigation system is schematic. Contractor shall make minor adjustments to the system as required to avoid physical elements, or to conform to other Site conditions. There shall be no conflicts between the irrigation system, mechanical process piping, and structural elements. The Contractor is responsible for maintaining

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coverage as indicated. Any such adjustment, and recording of any such changes, shall require prior approval from the City.

- B. HDPE Pipe:
  1. As per Section 15200, including Supplement 15200-02.
  2. Anchor pipe on the block walls as shown on drawings.

### 3.02 SYSTEM DRAINAGE

- A. Drain Valves: Locate at low points of pipelines so entire system is drained.
- B. Slope line(s) to ensure entire system effectively drained to drain valves.
- C. Provide compressed air connection at pump.

### 3.03 ELECTRICAL

- A. Conduit: Meet requirements of Section 16050, Basic Electrical Materials and Methods.

### 3.04 SPRINKLERS

- A. Adjusting and Tightening:
  1. Adjust sprinklers having adjustable pin nozzles so the pin is directed in to the stream for proper water distribution.
  2. Tighten nozzles on stationary pop-up sprinklers or stationary heads after installation.
  3. Adjust sprinklers having adjusting screw, adjusting stem, or adjusting friction collar on a lateral line or circuit, as necessary for proper coverage and discharge rate.

### 3.05 FLUSHING

- A. Flush supply lines and laterals as follows:
  1. Before installation of valves and fittings.
  2. Reflush after installation of valves and fittings.

### 3.06 TESTING AND INSPECTION

- A. Do not perform hydrostatic pressure test on solvent welded pipeline and pipe joints for at least 48 hours after installations of zone to be tested.
- B. Test system to 90 psi for 30 minutes continuous operation without leaks.
- C. Remove and replace defective piping, and perform testing until piping completely watertight at which time test may be considered successfully completed.
- D. Test complete system and ensure uniform distribution as shown on Drawings, Adjust as

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necessary to provide uniform coverage and correct any dry spots and to satisfy performance requirements.

3.07 SYSTEM BALANCING

- A. Adjust and balance the completed system at normal water pressure with fully open valves.

**END OF SECTION**

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**PART 1. GENERAL**

1.01 GENERAL REQUIREMENTS

- A. Provide equipment from the first named or acceptable alternative suppliers as outlined in Tender Form.

1.02 REFERENCES

- A. The following is a list of standards which may be referenced in this section:
1. Hydraulic Institute Standards (ANSI/HIS), Centrifugal/Vertical General Pump Standards.
  2. National Electrical Manufacturer's Association (NEMA): MG 1, Motors and Generators.

1.03 DEFINITIONS

- A. Terminology pertaining to pumping unit performance and construction shall conform to the ratings and nomenclature of the Hydraulic Institute Standards.

1.04 SUBMITTALS

- A. Shop Drawings:
1. Make, model, weight, and horsepower of each equipment assembly.
  2. Complete catalog information, descriptive literature, specifications, and identification of materials of construction.
  3. Performance data curves showing head, capacity, horsepower demand, and pump efficiency over the entire operating range of the pump, from shutoff to maximum capacity. Indicate separately the head, capacity, horsepower demand, overall efficiency, and minimum submergence required at the guarantee point.
  4. Detailed drawings showing the equipment dimensions, size, and locations of connections and weights of associated equipment.
  5. Power and control wiring diagrams, including terminals and numbers.
  6. Complete motor nameplate data, as defined by NEMA, motor manufacturer.
  7. Factory finish system data sheets.
- B. Quality Control Submittals:
1. Performance Test Reports.
  2. Special shipping, storage and protection, and handling instructions.

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3. Manufacturer's printed installation instructions.
4. Manufacturer's Certificate of Proper Installation.
5. Suggested spare parts list to maintain the equipment in service for a period of 1 year and 5 years. Include a list of special tools required for checking, testing, parts replacement, and maintenance with current price information.
6. List special tools, materials, and supplies furnished with equipment for use prior to and during startup and for future maintenance.
7. Operation and Maintenance Manual.

#### 1.05 EXTRA MATERIALS

##### A. Furnish:

1. One complete set of any special tools required for pump maintenance and tear down.

### **PART 2. PRODUCTS**

#### 2.01 GENERAL

- A. Pump shall be of a standard and industry proven design, designed and sized for the full range of operating duties and conditions specified, and the selected units shall meet the specified requirements of minimum service life.
- B. Coordinate pump requirements with drive manufacturer and be responsible for pump and drive requirements.

#### 2.02 PUMP DESIGN

- A. Duty point: 32 L/s (500 USgpm) at 77 meters (254 feet) TDH.
- B. The pump design shall consist of a single-stage, horizontal end suction centrifugal pump design with back pullout and a horizontal discharge.
- C. The pump shall incorporate an enclosed or semi-open impeller.
  - A. The pump casing shall be of the back pullout design and foot mounted to a fabricated steel baseplate.
  - B. Bearing shall conform to the standards of the Anti-Friction Bearing Manufacturers Association, Inc. (AFBMA). The bearing shall be designed to provide an L-10 bearing life of 50,000 hours.

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C. Coupling shall be the flexible spacer type to permit disassembly and inspection without disturbing the pump piping or driver. Coupling guards shall be provided.

D. The pump shall be provided with a single mechanical seal.

#### 2.03 ELECTRICAL MOTORS

A. See Section 16220, Low Voltage AC Induction Motors.

B. Refer to Data Sheet(s) at end of this Section. Where “AS” is indicated in the speed classification field of the data sheet.

#### 2.04 ACCESSORIES

A. Equipment Identification Plate: 1.6 mm stainless steel with 6 mm die-stamped equipment tag number securely mounted in a readily visible location. Individual plate for both the motor and pump.

B. Heavy duty skid mount assembly with base plate.

C. Fully balanced lifting bail assembly.

D. Control box shock mounted with water resistant housing, hourmeter, ammeter, tachometer and alternator failure light.

E. Suction vacuum and pressure discharge gauges.

F. All fittings and adapters required to connect from pump to 150 mm Camlock couplings (female) for both discharge and suction. Minimize hydraulic loss.

#### 2.05 FACTORY FINISHING

A. Manufacturer’s standard enamel finish.

#### 2.06 SOURCE QUALITY CONTROL

A. Functional Test: Perform manufacturer’s standard test on equipment. Include vibration test, as follows:

1. Dynamically balance rotating parts of each pump and its driving unit before final assembly.



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- B. Performance Test:
1. Conduct on each pump.
  2. Perform under simulated operating conditions.
  3. Test for a continuous 3-hour period without malfunction.
  4. Test Log: Record the following:
    - a. Total head.
    - b. Capacity.
    - c. Horsepower requirements.
    - d. Flow measured by factory instrumentation and storage volumes.
    - e. Average distance from suction well water surface to pump discharge centerline for duration of test.
    - f. Pump discharge pressure converted to meters of liquid pumped and corrected to pump discharge centerline.
    - g. Calculated velocity head at the discharge flange.
    - h. Field head.
    - i. Driving motor voltage and amperage measured for each phase.
  5. Adjust, realign, or modify units and retest in accordance with Hydraulic Institute Standards if necessary.
- C. Motor Test: See Section 16220, Low Voltage AC Induction Motors.
- D. Hydrostatic Tests: Pump casing(s) tested at 150 percent of shutoff head. Test pressure maintained for not less than 5 minutes.

### **PART 3. EXECUTION**

#### **3.01 FIELD FINISHING**

- A. Equipment as specified in Section 09900, Painting.

#### **3.02 FIELD QUALITY CONTROL**

- A. Functional Tests: Conduct on pump.
1. Alignment: Test complete assemblies for correct rotation, proper alignment and connection, and quiet operation.
- B. Performance Test: In accordance with Hydraulic Institute Standards.

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3.03 MANUFACTURER’S SERVICES

- A. Manufacturer’s Representative: Present at Site designated by City, for minimum person-days listed below, travel time excluded:
  - 1. 0.5 person-days for performance testing and completion of Manufacturer’s Certificate of Proper Installation.
  - 2. 0.5 person-days for Site training for each shift.
  - 3. Number of shifts: 2.
- B. See Section 01640, Manufacturers’ Services and Section 01810, Equipment Testing and Facility Startup.

3.04 SUPPLEMENTS

- A. The supplements listed below, following “End of Section,” are a part of this Specification.
  - 1. Data Sheets:
    - a. Irrigation Pump and Motor Data Sheet.

**END OF SECTION**

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<b>PUMP DATA SHEET HORIZONTAL END SUCTION CENTRIFUGAL PUMPS</b>		
Project: <u>Leaf &amp; Yard Waste and Biosolids Facility</u>		
Owner: <u>City of Winnipeg</u>		
Service: <u>Compost Windrow Irrigation</u>		
Pump Name: <u>Irrigation Pump</u>		
Equip. Tag Number(s): <u>P-101</u>		
Manufacturer and Model: (1) <u>Flowsolve 2K4x3US-82RV M3US</u> (2) <u>Approved Alternate</u> (3) _____		
No. Pumps Required: <u>1</u>		
Drive Type: <input checked="" type="checkbox"/> Constant <input type="checkbox"/> Adjustable		
<input type="checkbox"/> Direct-Coupled <input type="checkbox"/> Belt		
<b>LIQUID</b>	<b>OPERATING CONDITIONS</b>	<b>SERVICE CONDITIONS</b>
Name: _____	Capacity (l/s): _____	Temp (°C): Max ____ Min ____
Pumping Temperature (°C): Normal ____ Max ____ Min ____	Normal <u>32.5</u> Rated ____	Rel. Hum (%): Max ____ Min ____
Specific Gravity @ ____ (°C): _____	Discharge Pressure (kPa): <u>755</u>	Altitude (m): _____
Viscosity (CP) @ ____ (°C): _____	Suction Pressure (kPa): Max ____ Rated ____	<input type="checkbox"/> Indoor <input type="checkbox"/> Heated
pH: _____	Diff. Pressure (kPa): _____	<input type="checkbox"/> Outdoor <input type="checkbox"/> Unheated
Corrosion/Erosion/Abrasion Caused by: _____	Diff. Head (m): _____	Area Classification: _____
	NPSH Available (m): _____	Other: _____
Remarks: <u>Retention Pond Water</u>	Remarks: _____	Remarks: _____
<u>Surface Runoff</u>	_____	_____
_____	_____	_____
<b>PERFORMANCE REQUIREMENTS (manufacturer to supply missing data)</b>		
Proposal Curve No.: _____	Max. Head (kPa): _____	Factory Testing:
Speed (rpm): _____	Max. Power (kW): _____	<input type="checkbox"/> Required <input checked="" type="checkbox"/> Not Required
Efficiency (%): _____		
Rated Power (kW): _____		
Remarks: _____		
_____		

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Equipment Tag Number(s): P-101_____								
<b>PUMP CONSTRUCTION DETAILS (manufacturer to supply missing data)</b>								
<b>Nozzles</b>					<b>Miscellaneous Connections</b>			
	<b>Size</b>	<b>Rating</b>	<b>Facing</b>	<b>Location</b>		<b>Size</b>	<b>Location</b>	
Suction			Horizontal		Drain			
Discharge			Horizontal		Vent			
					Pres. Gauge			
					Warm Up			
Discharge Orientation: _____			Impeller Diameter (in.):			Bearings (Type/No.):		
			Rated _____ Max _____ Min _____			Radial _____ Thrust _____		
			Packing:			Lubrication Type:		
			Manufacturer _____			<input type="checkbox"/> Grease <input type="checkbox"/> Oil		
			Type _____			Coupling:		
			Size/No. Rings _____			Manufacturer _____		
Hydro Test Pressure (kPa): _____			Mechanical Seal:			Type _____ Model _____		
Field Testing: <input type="checkbox"/> Not required			API Class Code _____			Driver Half-Coupling Mounted by:		
<input type="checkbox"/> Required, functional and performance			Manufacturer _____			<input type="checkbox"/> Pump Mfr. <input type="checkbox"/> Driver Mfr.		
			Model _____			<input type="checkbox"/> Purchaser		
			Manufacturer Code _____			Gland Type/Material: _____		
						Gland Plate Taps Required:		
						<input type="checkbox"/> Quench <input type="checkbox"/> Flush <input type="checkbox"/> Drain <input type="checkbox"/> Vent		
Remarks: _____								
_____								
_____								
<b>MATERIALS (manufacturer to supply missing data)</b>								
Case: _____			Impeller: _____			Shaft: _____		
Case Wear Rings: _____			Impeller Wear Rings: _____			Shaft Sleeve: _____		
Remarks: _____						Baseplate:		
						Material _____		
<b>ADDITIONAL REQUIREMENTS</b>								
Horizontal, Bolted Pump Casing								
_____								
_____								

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<b>INDUCTION MOTOR DATA SHEET</b>	
Project: <u>Leaf &amp; Yard Waste and Biosolids Facility</u>	
Owner: <u>City of Winnipeg</u>	
Equipment Name: <u>Irrigation Pump Motor</u>	
Equipment Tag Number(s): <u>P-101</u>	
Type: <u>Squirrel-cage induction meeting requirements of NEMA MG 1</u>	
Manufacturer: <u>For multiple units of the same type of equipment, furnish motors and accessories of a single manufacturer</u>	
Motor Kilowatts: _____	Guaranteed Minimum Efficiency at Full Load: ____ percent
Voltage: _____	Guaranteed Minimum Power Factor at Full Load: ____ percent
Phase: _____	Service Factor (@ rated max. amb. temp.): <input type="checkbox"/> 1.0 <input type="checkbox"/> 1.15
Frequency: _____	Enclosure Type: _____
Synchronous Speed: _____ rpm	Mounting Type: <input checked="" type="checkbox"/> Horizontal <input type="checkbox"/> Vertical
<input type="checkbox"/> Multispeed, Two-Speed:	<input type="checkbox"/> Vertical Shaft: <input type="checkbox"/> Solid <input type="checkbox"/> Hollow
____ / ____ rpm	<input type="checkbox"/> Vertical Thrust Capacity (kg): Up ____ Down ____
<input type="checkbox"/> Constant kW	<input type="checkbox"/> Adjustable Speed Drive: See Section 16260, Low Voltage
<input type="checkbox"/> Variable Torque	Adjustable Frequency Drive Systems.
<input type="checkbox"/> Constant Torque	Operating Speed Range: ____ to ____% of Rated Speed
Winding: <input type="checkbox"/> One <input type="checkbox"/> Two	<input type="checkbox"/> Thermal Protection: _____
	<input type="checkbox"/> Space Heater: ____ volts, single phase
	<input type="checkbox"/> Oversize main terminal (conduit) box for motors
	<input type="checkbox"/> Terminal for connection of equipment grounding wire in each terminal box
Additional Motor Requirements: <input checked="" type="checkbox"/> See Section 16220, Low-Voltage AC Induction Motors	
Special Features:	
_____	
_____	

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**PART 1. GENERAL**

1.01 SYSTEM DESCRIPTION

- A. Performance Requirements: Able to sustain 28.4 L/s (450 GPM) flow rate based on an input pressure of 517 kPa (75 psi).
- B. The Water Hose Reel System will be used to add water to composting windrows. Normally, water will be added to windrows while they are being turned with the Straddle Turner. The Straddle Turner is equipped with a water bar assembly. The Water Hose Reel System will be used to supply water from fixed supply locations around the perimeter of the working area, to the Straddle Turner as the latter moves along the length of each windrow.
- C. The Water Hose Reel System will also be used to supply water to material stockpiles via perforated soaker hoses that are laid overtop the piles. In this case the Water Hose Reel System will be used to supply water from fixed supply locations at the composting facility to the stockpile locations. Water will be distributed from the Water Hose Reel System to perforated soaker hoses laid on the top surface of the stockpiles.

1.02 SUBMITTALS

- A. Informational Submittals:
  - 1. Shop Drawings
    - a. Manufacturer catalog and cut sheets.
    - b. Schematic drawing of system showing overall dimensions, and location of key components.
  - 2. Operation and Maintenance Instructions as specified in Section 01430, Operation and Maintenance Data. Include:
    - a. Operating and maintenance manual.
    - b. Listing of replacement part numbers.
    - c. Written description of specific practices required to prepare system for winter storage. The system is expected to be idle during the period from November through March.

1.03 EXTRA MATERIALS

- A. Furnish, tag, and box for shipment and storage the following special tools:

Item	Quantity
Special tools required to maintain or dismantle	One complete set

- B. Delivery: In accordance with General Conditions.

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## **PART 2. PRODUCTS**

### 2.01 SERVICE CONDITIONS

- A. Material Conveyed: Un-impacted storm water from outdoor retention pond.
- B. Capacity: 28.4 L/s (450 GPM)
- C. Use: Continuous
- D. Running Hours/Day: 6
- E. Location: Outside.

### 2.02 PERFORMANCE AND DESIGN REQUIREMENTS

- A. Equipment shall be new.
- B. Feeder Hose: 15-m long by 100-mm diameter flexible hose with 100 mm (4-inch) cam-lock fittings (one male and one female fitting).
- C. Traveller Hose: 250-m by 100 mm diameter polyethylene hose equipped with 100 mm (4-inch) male cam-lock fitting.
- D. Drum Drive System: Gasoline-driven positive traction chain drive with No. 80 chain with variable speed transmission.
- E. Drum Brake: disc brake system.
- F. Autostop feature during hose rewind.
- G. Input Pressure: 517 kPa (75 psi)
- H. Discharge Pressure: < 517 kPa (< 75 psi)
- I. Frame: Heavy-wall steel tubing upper and lower frame with single-axle and heavy-duty crank down stabilizers.
- J. All drive components shall be “wash down” specification capable of withstanding a direct high-pressure spray without failure.

### 2.03 MANUFACTURERS AND PRODUCTS

- A. Cadman Power Equipment: 3750S

## **PART 3. EXECUTION**

### 3.01 FIELD FINISHING

- A. Following installation, touch up scratches, scrapes, or chips in interior and exterior surfaces of devices and equipment with finishes matching as nearly as possible the type, color, consistency, and type of surface of the original shop/factory finish.

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3.02 FIELD QUALITY CONTROL

A. Performance Test:

1. Perform under actual or approved simulated operating conditions.
2. Test unit for a period of 2 hours at 100% capacity without disruption.

3.03 MANUFACTURER'S SERVICES

A. Manufacturer's Representative:

1. The equipment manufacturer shall provide a Field Representative properly trained in the inspection and operation of the mechanism to approve the installation and operation and conduct the field test.
2. Manufacturer's Representative shall be present during 1 person-day for each of two shifts.

B. See Section 01640, Manufacturers' Field Services and Section 01810, Equipment Testing and Facility Startup.

**END OF SECTION**



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**PART 1. GENERAL**

1.01 SCOPE

- A. Supply and installation of all irrigation water supply system suction and discharge hose and all connecting fittings.

1.02 SUBMITTALS

- A. Action Submittals:
  - 1. Shop Drawings:
    - a. Product Data:
      - 1) Catalog cut sheets, specifications, drawings, and descriptive literature on equipment and accessories.
- B. Informational Submittals:
  - 1. Manufacturer's instructions for materials requiring special shipping, storage, or handling requirements.
  - 2. Manufacturer's printed assembly and installation instructions.
  - 3. Operating and Maintenance Data as specified in Section 01430, Operation and Maintenance Data.

**PART 2. PRODUCTS**

2.01 GENERAL

- A. Irrigation supply system shall work with irrigation pump and windrow watering system.
- B. Discharge and suction hose and fittings shall be rated for a minimum pressure of 1,030 kPa (150 psi).
- C. Size fittings and couplers for the actual inner and outer diameter of tubing as recommended by manufacturer.

2.02 SUCTION AND DISCHARGE HOSE

- A. Discharge Layflat Hose:
  - 1. Diameter: 150 mm.

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2. Length of each hose section shall match fitting spacing shown on the drawings.
  3. Acceptable manufacturers:
    - a. Oroflex
    - b. Or approved alternative in accordance with B6.
- B. Suction Hose:
1. Diameter: 150 mm.
  2. Length of hose section shall match fitting spacing shown on the drawings.
  3. Vertical foot valve and strainer on suction end.
  4. Acceptable manufacturers:
    - a. Oroflex
    - b. Or approved alternative in accordance with B6.
- C. Couplings:
1. Quick connect camlock that will function to connect to the lateral tee connections and to another hose segment.
  2. Working Pressure Rating, Minimum: Equivalent to hose.
- D. Lateral Tee Connections:
1. 150x150x100 tee.
  2. Connect to 150 mm mainline layflat hose and 100 mm reduction lateral complete with 100 mm ball valve and end cap.
  3. Working Pressure Rating, Minimum: Equivalent to hose.
- E. Ball Valve for General Water and Air Service:
1. Two-piece end entry type, brass or bronze body and end piece, hard chrome-plated bronze or brass ball, RTFE seats and packing, blowout-proof stem, zinc-coated steel hand lever operator with vinyl grip, rated 4140 kPa WOG, 1035 kPa SWP.

### **PART 3. EXECUTION**

#### **3.01 GENERAL**

- A. Assemble equipment and install at locations shown on Drawings.

#### **3.02 ASSEMBLY**

- A. In accordance with manufacturer's written instructions.
- B. Assemble each hose section and associated fittings complete for operation.

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3.03 TESTS AND INSPECTION

- A. In accordance with Section 01810, Equipment Testing and Facility Startup.
- B. The water supply system shall be considered operational when components have been assembled and operate as specified herein, and after it completes two 6-hour water application cycles without leaks.

**END OF SECTION**