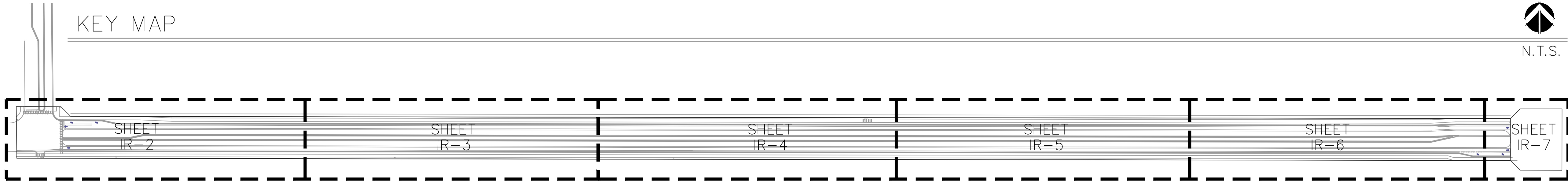


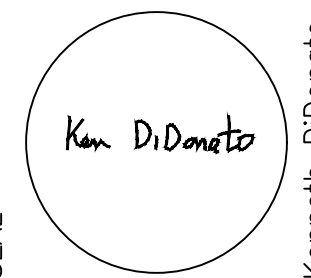
BECKER ROAD AT RIVERLAND IRRIGATION PLANS

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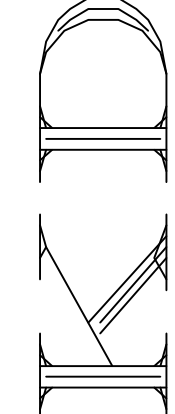
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PORT ST. LUCIE, FLORIDA
IRRIGATION COVER SHEET

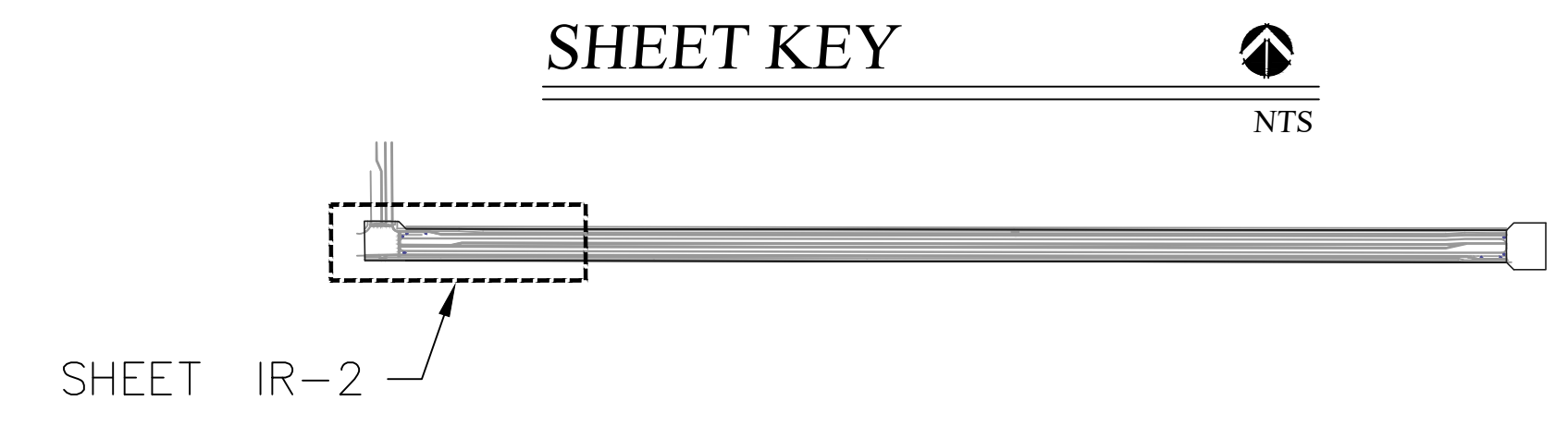
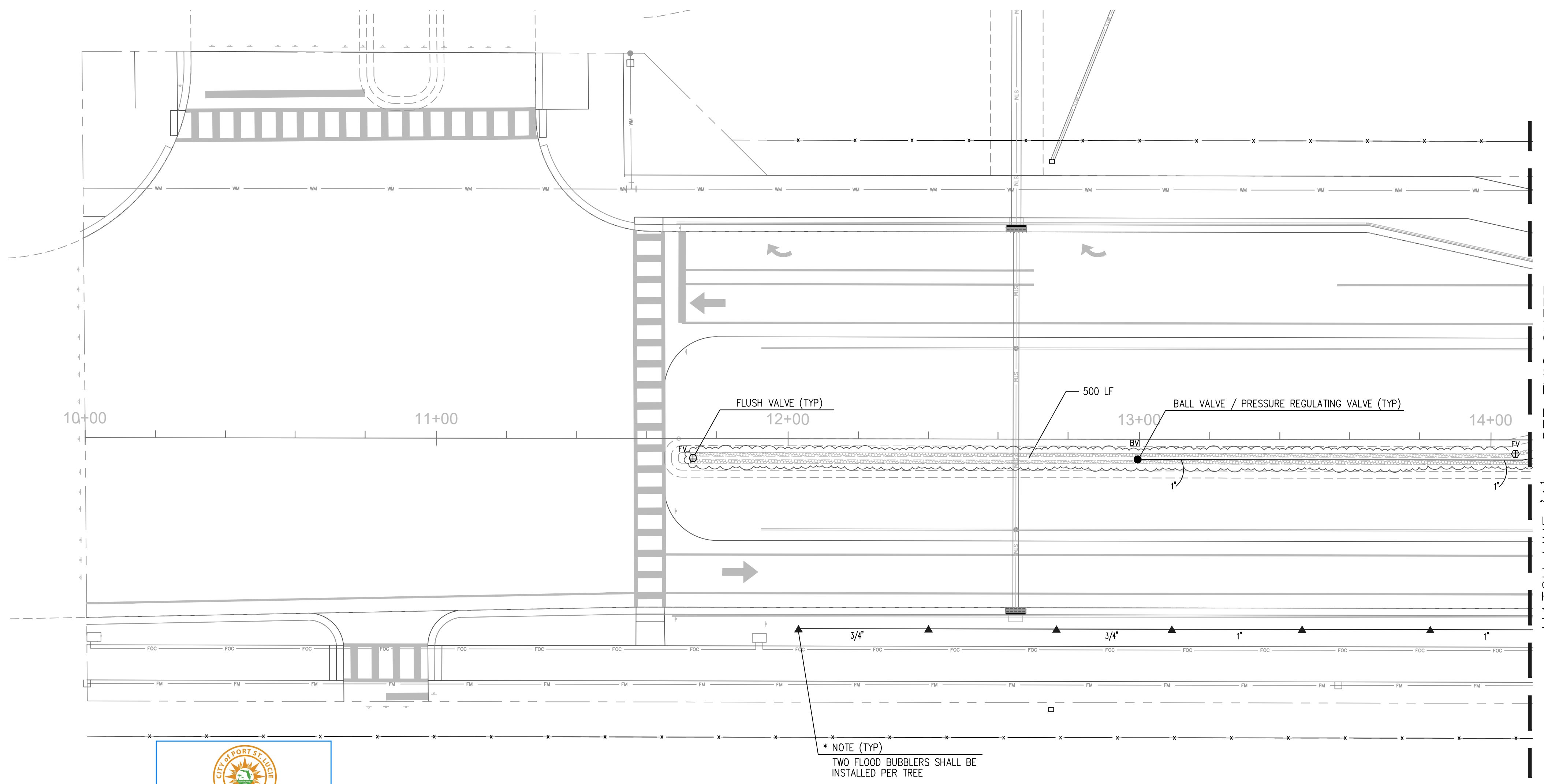
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 Kenneth DiDonato
 P.E. Lic. #20892

PROJECT NO. 2017-24
 DRAWN BY KMD
 DESIGNED BY KMD
 SCALE: N.T.S.
 DATE : DECEMBER 2022
 DWG. NO. IR-1
 SHT. NO. 1 of 10
 REVISIONS :
 05-11-23 CITY REVIEW COMMENTS

- NOTE #1: Per the Port St. Lucie Public Works Irrigation Standards for pump systems, a particle size analysis and water quality test shall be performed and submitted to Public Works for review and approval. This particle size analysis and water quality test will be used by Public Works to determine if a filtration system is needed as per the Irrigation Standards.
- NOTE #2: Irrigation mains shall be located outside ultimate pavement limits where feasible, and pavement crossings are necessary. Sleeves shall be installed per the Irrigation Standards.
- NOTE #3: Irrigation mains (non-reclaim) shall be installed with a 5' minimum horizontal separation and an 18" minimum vertical separation at crossings to all PSLUSD pipes. The minimum separation shall be measured from the outside of each pipe. Irrigation mains shall be installed under PSLUSD potable water mains.



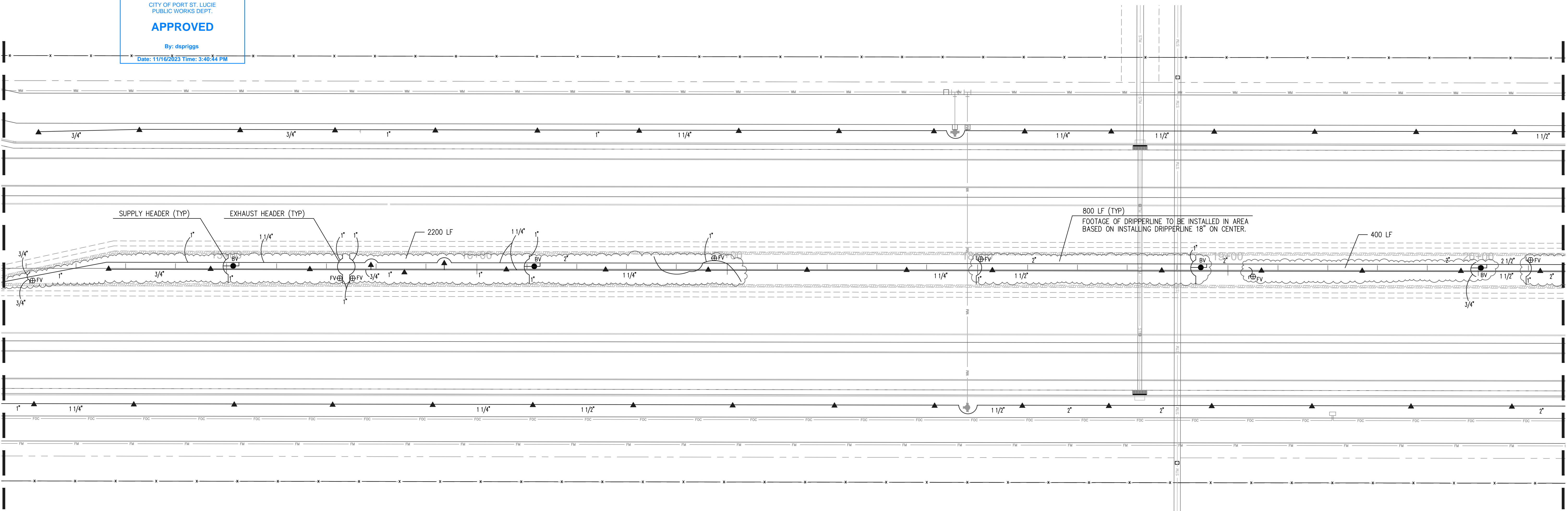
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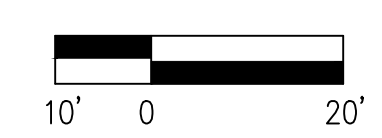
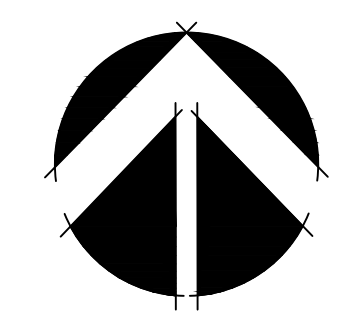
NOTE
REFER TO SHEET IR-9 FOR TYPICAL DRIP ZONE LAYOUT



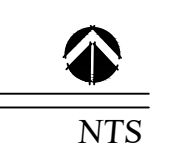
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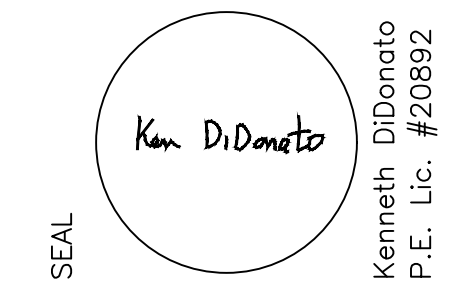


SHEET KEY



PROJECT TITLE : **BECKER ROAD AT RIVERLAND
PORT ST. LUCIE, FLORIDA**
IRRIGATION PLAN

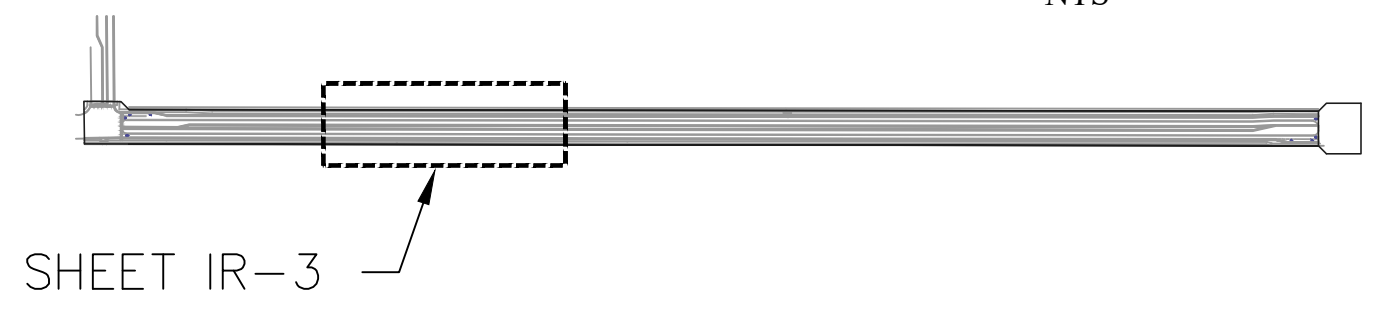
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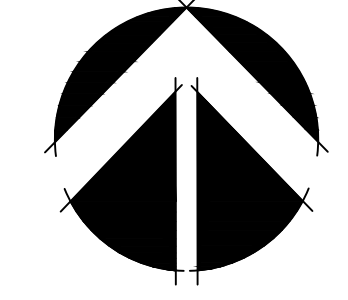
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SHT. NO. 2 of 10
REVISIONS :

TYPICAL ZONE SUMMARY
 BRW - CONTROLLER
 1 - STATION
 72 - EST. WATER USE
 2" - VALVE SIZE
 DRIP - IRRIGATION TYPE

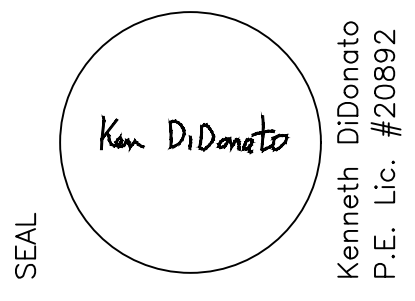
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NOTE
 REFER TO SHEET IR-9 FOR
 TYPICAL DRIP ZONE LAYOUT



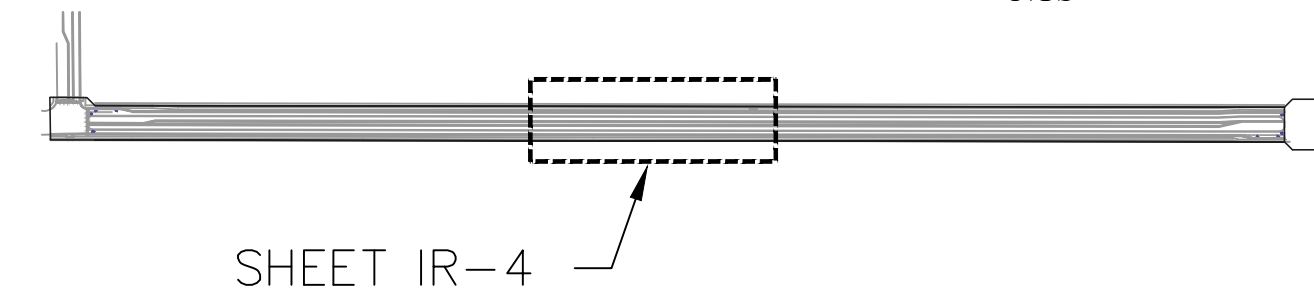
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SHEET KEY



SHEET IR-4

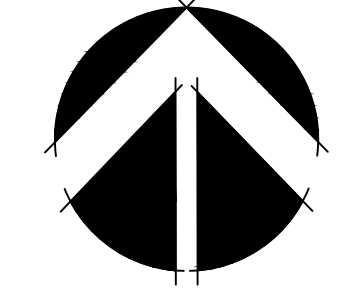
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TYPICAL DRIP ZONE LAYOUT

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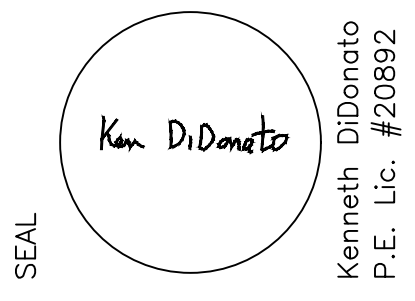
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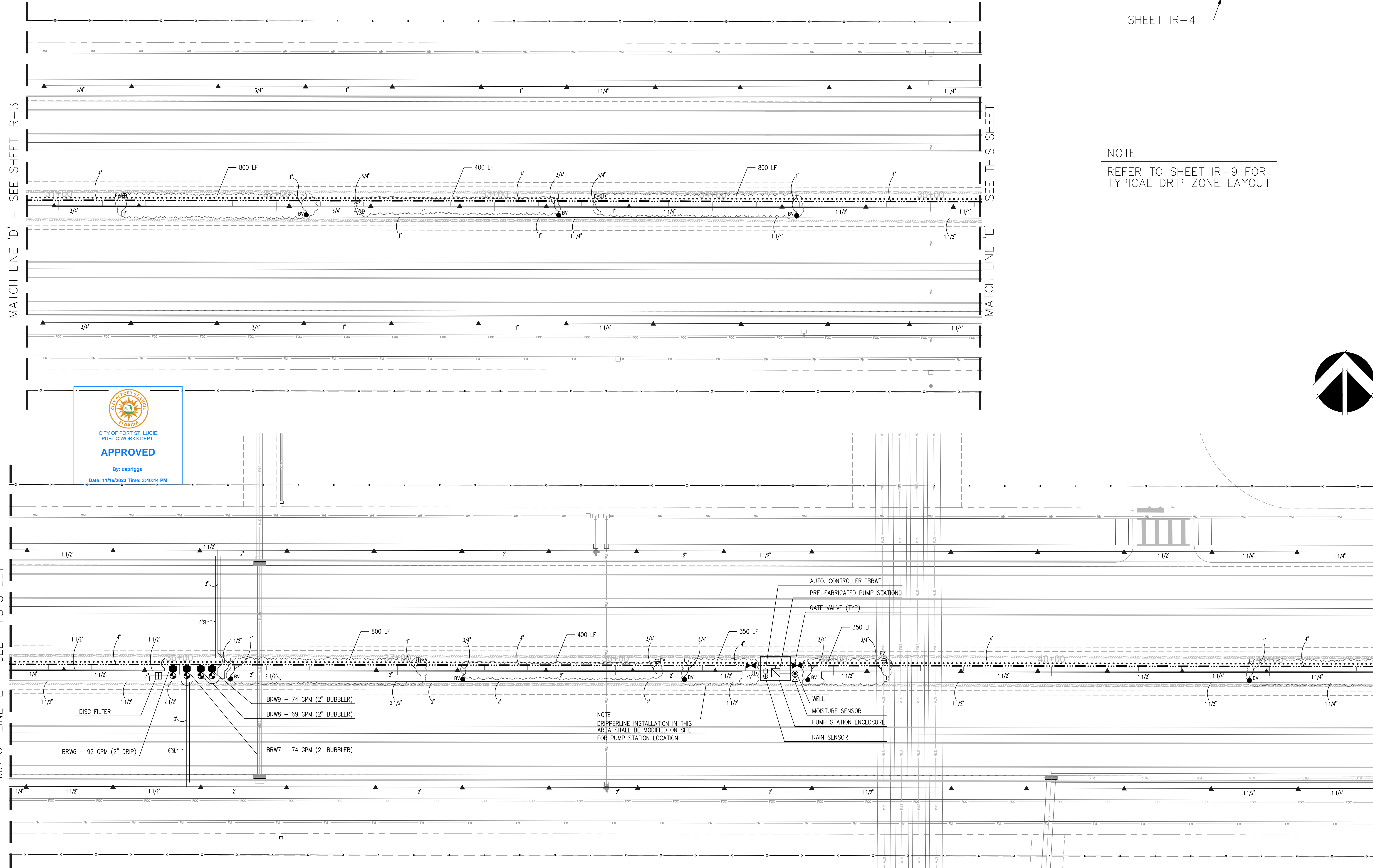
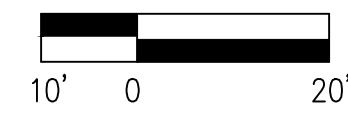


PROJECT TITLE : BECKER ROAD AT RIVERLAND
PORT ST. LUCIE, FLORIDA
IRRIGATION PLAN

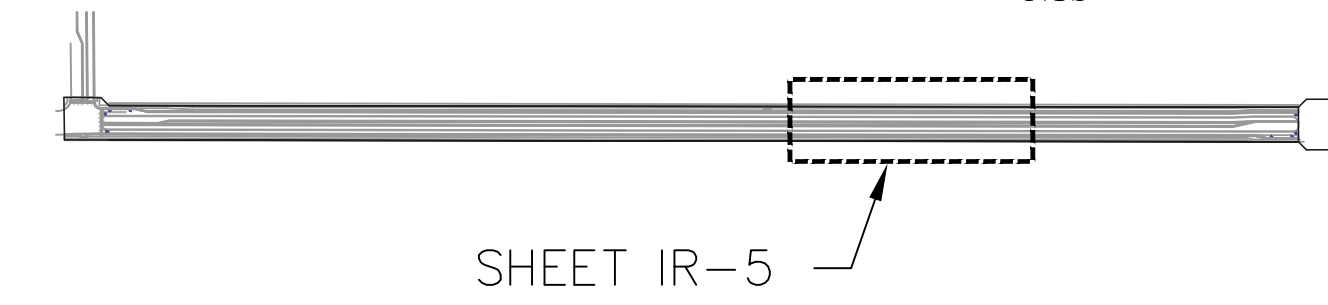
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REVISIONS :



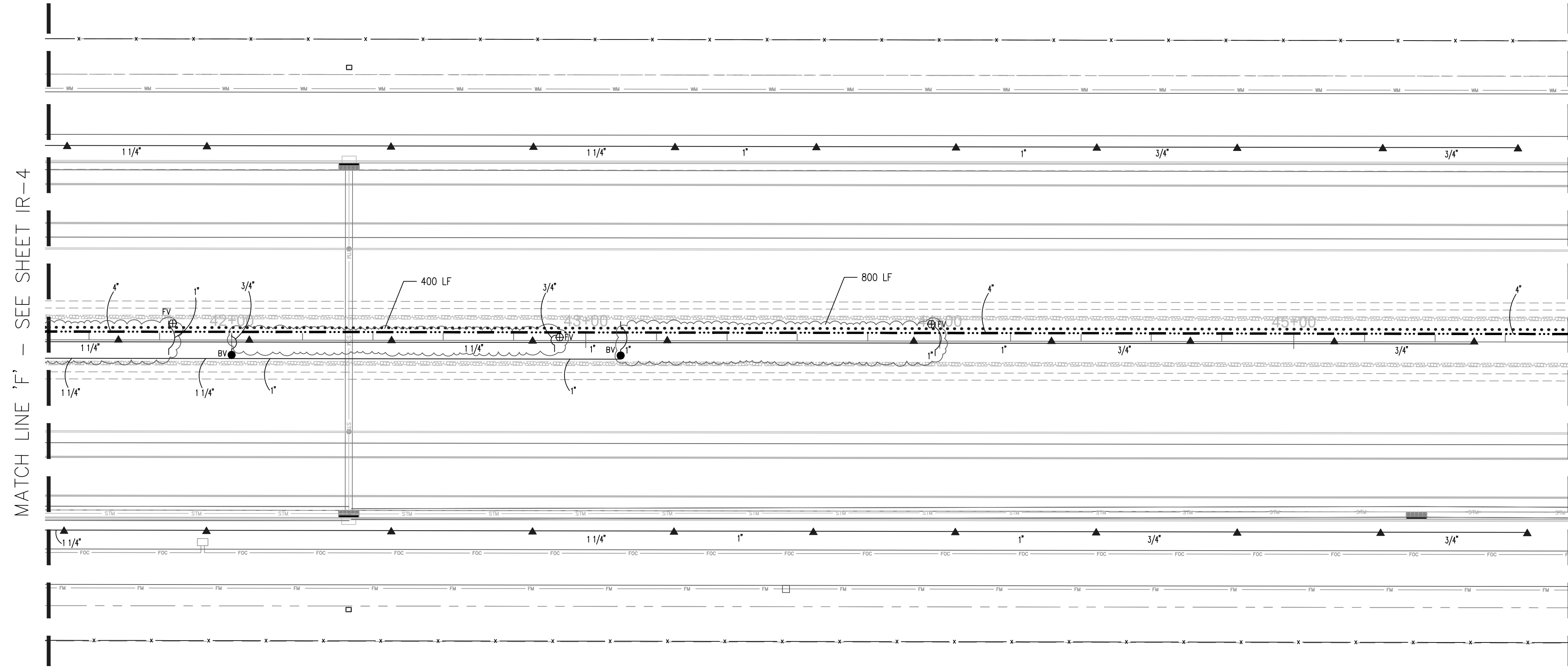
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NOTE
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TYPICAL DRIP ZONE LAYOUT

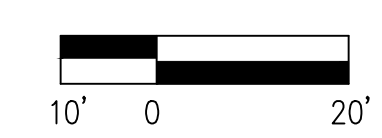
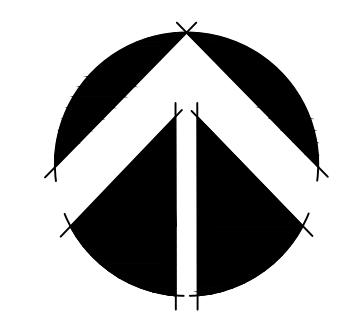
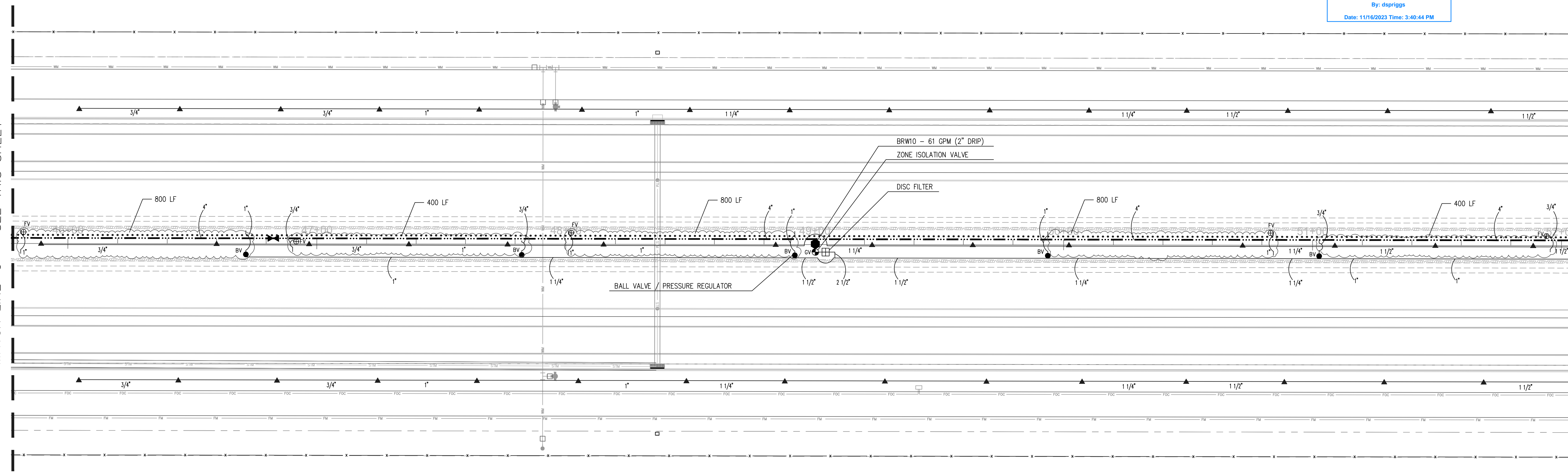
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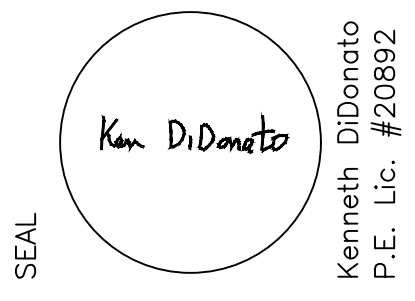
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MATCH LINE 'H' - SEE SHEET IR-6



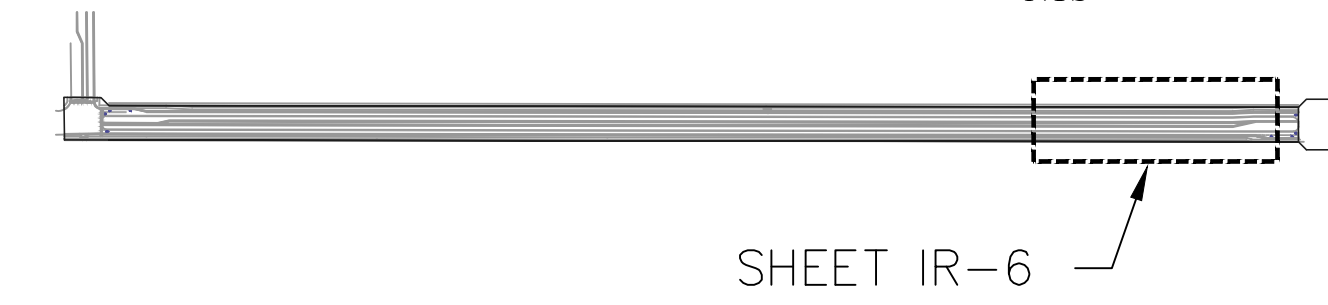
PROJECT TITLE : **BECKER ROAD AT RIVERLAND
PORT ST. LUCIE, FLORIDA**
IRRIGATION PLAN

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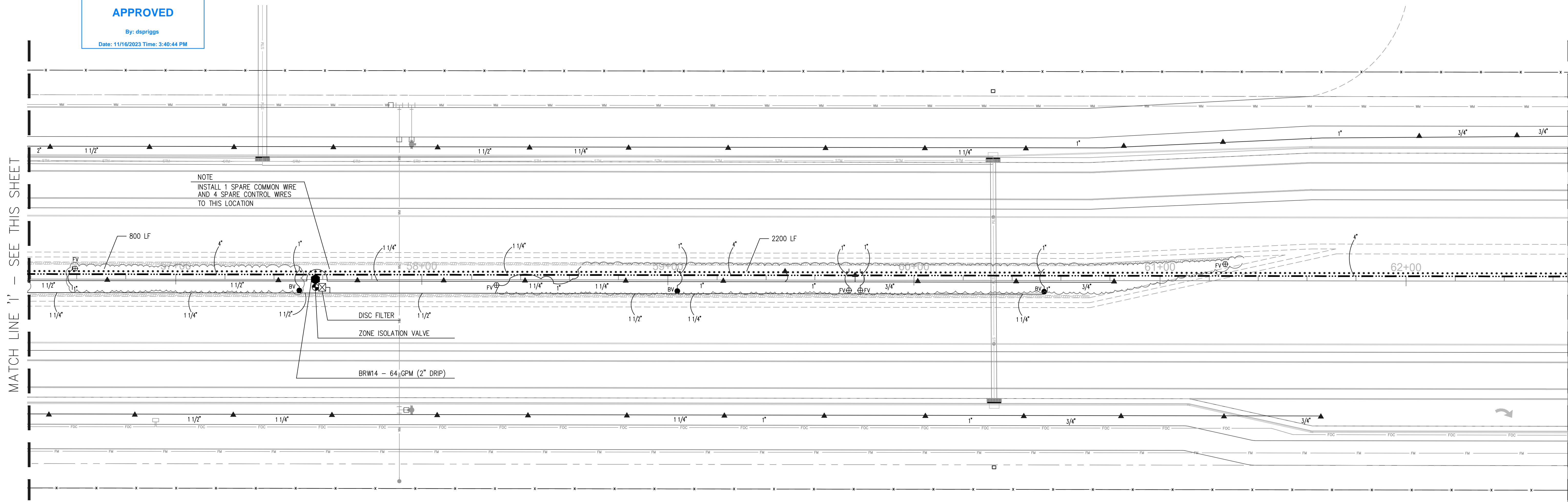
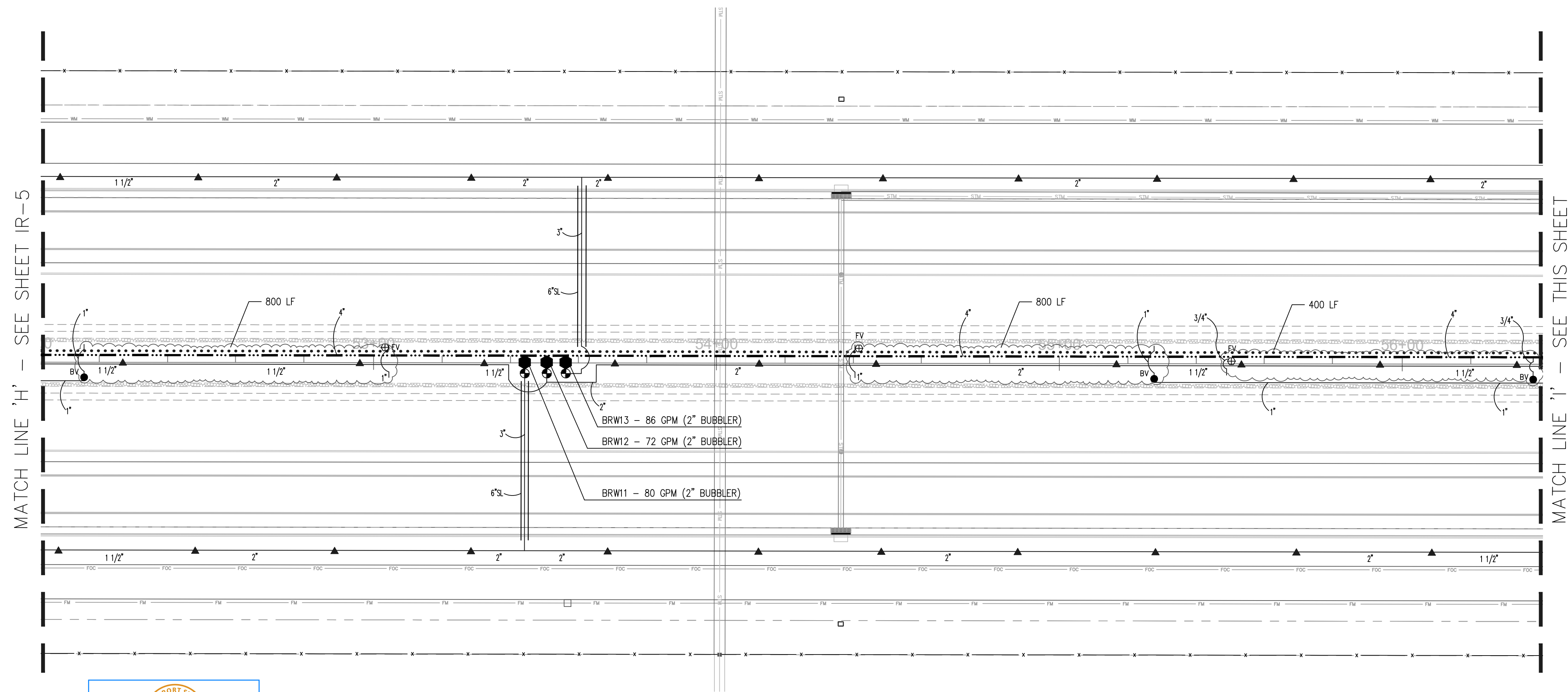
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DATE : DECEMBER 2022
DWG. NO. **IR-5**
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REVISIONS :

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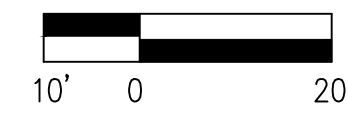
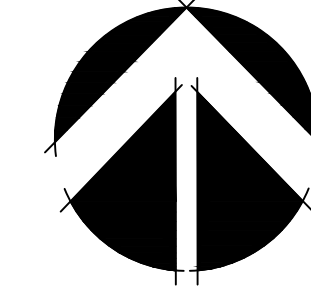


SHEET IR-6

NOTE
REFER TO SHEET IR-9 FOR
TYPICAL DRIP ZONE LAYOUT

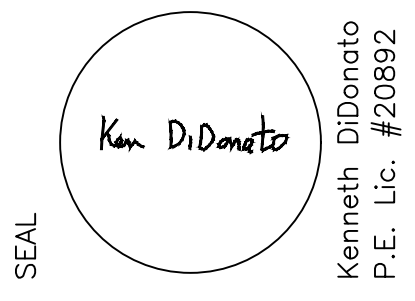


NOTE
INSTALL 1 SPARE COMMON WIRE
AND 4 SPARE CONTROL WIRES
TO THIS LOCATION



PROJECT TITLE : BECKER ROAD AT RIVERLAND
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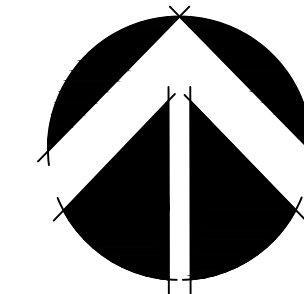
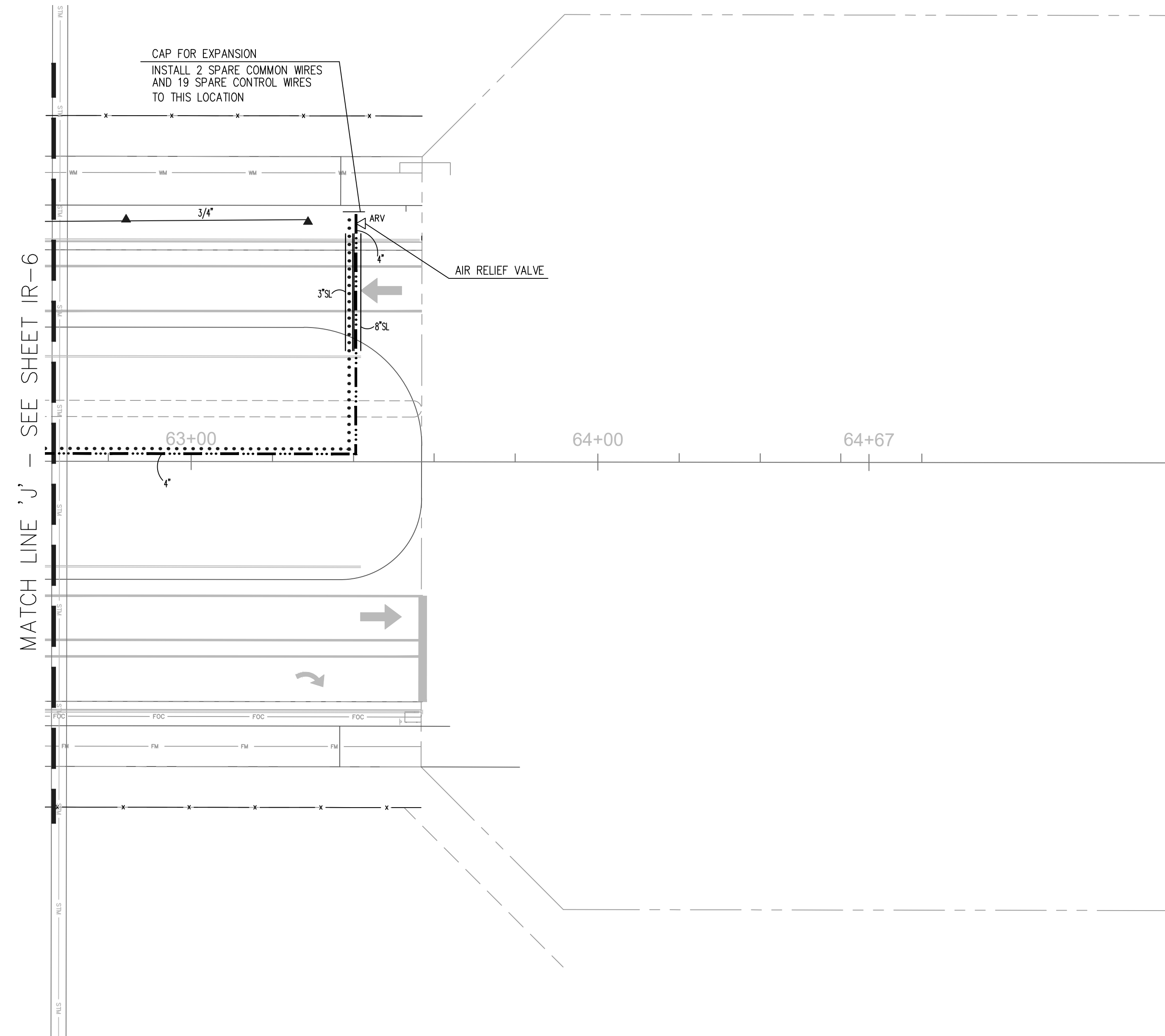


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DESIGNED BY KMD
SCALE: 1"=20'-0"
DATE : DECEMBER 2022
DWG. NO. IR-6
SHT. NO. 6 of 10
REVISIONS :

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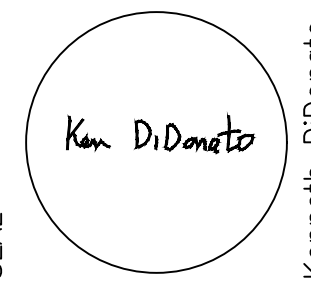


SHEET IR-7



PROJECT TITLE : BECKER ROAD AT RIVERLAND
 PORT ST. LUCIE, FLORIDA
 IRRIGATION PLAN

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SEAL

 Kenneth DiDonato
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 SCALE: 1"=20'-0"
 DATE : DECEMBER 2022
 DWG. NO. IR-7
 SHT. NO. 7 of 10
 REVISIONS :

CFILE: P23-073 5405A



GENERAL LEGEND

SYMBOL	MODEL NO.	DESCRIPTION	*EST. QUANTITY	CONTROL SYSTEM
▲	1404	RAIN BIRD FLOOD BUBBLER	712	
— CV	TLDL-CV-9-12	NETAFIM TECHLINE DRIPPERLINE	23,000 LF	
TLFV	TLFV	NETAFIM TECHLINE FLUSH VALVE	37	
TLSS	TLSS	NETAFIM TECHLINE SOIL STAPLES	AS REQUIRED	
TLACC	TLACC	NETAFIM TECHLINE ACCESSORIES	AS REQUIRED	
TLDF	TLDF	NETAFIM TECHLINE DISC FILTER	05	
TLPRV	TLPRV	NETAFIM TECHLINE PRESSURE REGULATING VALVE	34	
200 PEB	200 PEB	RAIN BIRD 2" SOLENOID VALVE	14	
ESP-40SITE-PED-SS	ESP-40SITE-PED-SS	RAIN BIRD SATELLITE CONTROLLER	01	
RANGAUGE	RANGAUGE	RAIN BIRD RAIN SENSOR	01	
S100	S100	BASELINE SOIL MOISTURE SENSOR	01	
		PAIGE THHN WIRE		
		#12 AWG COMMON	8,200 LF	
		#14 AWG CONTROL	71,000 LF	
		AQUAFUSE CONTROLFLO MAIN LINE GATE VALVE	05	
		NIBCO ZONE ISOLATION GATE VALVE	33	
		H.D.P.E. MAIN LINE	3,700 LF	
		SCH 40 PVC WIRE CONDUIT	3,700 LF	
		SCH 40 PVC LATERAL PIPE FITTINGS	AS REQUIRED	
		SDR 21 CLASS 200 PVC	AS REQUIRED	
LATERALS				
SLEEVES				
▲	ARY	AIR RELIEF VALVE	02	
●	NDS	NDS VALVE BOX	20	
●	BALL	BALL VALVE (TO LINE SIZE)	34	
●	SP	SPLICE BOX	AS REQUIRED	
—	MKT	METALLIC MARKING TAPE	4,100 LF	
—	GR	GROUNDING LOCATION	01	
—	W	WELL	01	
—	PS	PUMP STATION	01	
—	CS	CAPPED STUB-OUT	01	

NOTES: ABOVE QUANTITIES ARE FOR COMPARISON ONLY. CONTRACTOR SHALL VERIFY PRIOR TO SUBMITTING BID. THE SYMBOLS FOR THE BALL VALVES AND PRESSURE REGULATING VALVES ARE THE SAME.

IRRIGATION NOTES & SPECIFICATIONS

AUTOMATIC IRRIGATION SYSTEM
 WATER DEMAND / ZONE
 WATER SOURCE
 PUMPING CAPACITY

REFER TO PLAN WELL 200 GPM @ 162 FT.HD.

GENERAL

IRRIGATION SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF PORT ST LUCIE PUBLIC WORKS IRRIGATION SPECIFICATIONS SECTION 328400, CONTRACT DRAWINGS, AND APPENDIX "F" OF THE FLORIDA BUILDING CODE.

IRRIGATION DESIGN BASED ON PARKER YANETTE "PLANTING PLANS" DATED NOVEMBER 15, 2022. CONTRACTOR SHALL REFER TO THESE PLANS TO COORDINATE SPRINKLER LOCATIONS AND PIPE ROUTING WITH NEW AND EXISTING PLANT LOCATIONS.

THIS IRRIGATION PLAN SHALL BE USED AS A GUIDE ONLY. CONTRACTOR SHALL INSTALL IRRIGATION TO MATCH ON SITE CONDITIONS AND TO OVERCOME THE INHERENT INACCURACIES THAT RESULT WHEN DESIGNING FROM BASE PLANS SCALED AT 1" = 20'. THE WATER SOURCE SHALL BE PRE-FABRICATED PUMP STATION DRAWING WATER FROM A WELL.

THIS IRRIGATION HAS BEEN DESIGNED AS A TYPICAL BLOCK VALVE TYPE USING NETAFIM DRIP EQUIPMENT, AND RAIN BIRD BUBBLERS, IN-LINE VALVES, AND MAXI CONTROL SYSTEM. WATER CONSERVATION EQUIPMENT SHALL BE INSTALLED.

IRRIGATION SHALL BE INSTALLED AND MAINTAINED TO MINIMIZE UNDESIRABLE OVERTHROW ONTO PAVEMENT AND SIDEWALKS.

CONTRACTOR IS ADVISED TO STUDY THE PLANS FOR ADDITIONAL INFORMATION AND TO VISIT THE SITE TO BECOME FAMILIAR WITH EXISTING CONDITIONS.

TO ENSURE PROPER OPERATION, PROGRAMMING, VALVE SIZES, ZONE CAPACITIES, DRIPPERLINE SPACING, PIPE AND WIRE SIZES, AND INSTALLATION NOTES AND DETAILS SHALL BE FOLLOWED AS SHOWN.

PIPING

PIPE ROUTING IS SCHEMATIC ONLY AND SHALL BE ADJUSTED FOR ON SITE CONDITIONS.

PIPE SHALL BE INSTALLED IN ACCORDANCE WITH LOCAL CODES AND PIPE MANUFACTURER'S INSTRUCTIONS.

PIPE ROUTED UNDER HARDSCAPED AREAS SHALL BE SLEEVED IN SDR 21, CLASS 200 PVC. EACH SLEEVE SHALL BE: (1) BURIED TO A MINIMUM DEPTH OF 36"; (2) TWO PIPE SIZES LARGER THAN CARRIER PIPE, AND (3) EXTENDED 3' BEYOND HARDSCAPED AREA ON EACH END. CONTRACTOR SHALL VERIFY THE SIZE, DEPTH, AND LOCATION OF ALL EXISTING SLEEVES.

MAIN LINE PIPING SHALL BE DR 11-9710 H.D.P.E. WITH FUSION WELDED FITTINGS. ALL LATERAL PIPING AND SUPPLY AND EXHAUST HEADERS SHALL BE SDR 21, CLASS 200 TYPE 1120 PVC SOLVENT WELD TYPE WITH SCH 40 PVC FITTINGS.

PIPE SIZED TO LIMIT FLOW VELOCITIES TO 5 FEET/SECOND AND TO LIMIT FRICTION LOSS IN THE PIPING NETWORK.

PIPE SHALL BE INSTALLED AT SUFFICIENT DEPTH BELOW GROUND TO PROTECT IT FROM HAZARD SUCH AS VEHICULAR TRAFFIC OR ROUTINE OCCURRENCES WHICH OCCUR IN THE NORMAL USE AND MAINTENANCE OF THE PROPERTY. DEPTHS OF COVER SHALL MEET OR EXCEED SCS CODE 430-OD. REFER TO THE APPLICABLE DETAIL FOR ADDITIONAL INFORMATION.

BACKFILL SHALL BE OF SUITABLE MATERIAL, FREE OF ROCKS, STONES, AND OTHER DEBRIS THAT WOULD DAMAGE IRRIGATION SYSTEM COMPONENTS. BACKFILL AROUND ALL PIPE SHALL BE 6" OF CLEAN SAND.

GATE VALVES SHALL BE INSTALLED FOR MAIN LINE AND ZONE ISOLATION. BALL VALVES SHALL BE INSTALLED FOR DRIP ZONE AREA ISOLATION. EACH VALVE SHALL BE TO LINE SIZE AND INSTALLED IN A VALVE BOX. POROUS MATERIAL SHALL BE INSTALLED PER BOX TO PROMOTE DRAINAGE.

AIR RELIEF VALVES SHALL BE INSTALLED TO PROTECT THE PIPING NETWORK FROM EXCESSIVE PRESSURES THAT DEVELOP WHEN COMPRESSING ENTRAPPED AIR. EACH UNIT SHALL BE INSTALLED IN A VALVE BOX.

METALLIC MARKING TAPE SHALL BE INSTALLED IN ALL MAIN LINE TRENCHES.

SPRINKLERS

RAIN BIRD 1404 FLOOD BUBBLERS SHALL BE INSTALLED TO IRRIGATE TREES. TWO BUBBLERS SHALL BE INSTALLED PER TREE.

BUBBLERS SHALL BE INSTALLED WITH THICKWALLED POLY PIPE.

CONTROL SYSTEM

THE CONTROL SYSTEM SHALL BE A RAIN BIRD MAXICOM TYPE. ONE 40 STATION SITE SATELLITE CONTROLLER SHALL ACTIVATE 14 IN-LINE VALVES. CONTROLLER SHALL COMMUNICATE WITH THE CITY'S CONTROL MONITORING COMPUTER VIA PHONE LINE, ETHERNET, CELL MODEM, OR FIBER OPTIC CABLE. SPARE STATIONS SHALL BE USED TO CONTROL FUTURE IRRIGATION.

THE CONTROLLER SHALL BE INSTALLED AS A PEDESTAL MOUNT. THE CONTROLLER SHALL REQUIRE AN INDEPENDENT ELECTRIC SOURCE. A RAIN CAN AND MOISTURE SENSOR SHALL BE INSTALLED TO CONSERVE WATER.

CONTROL LINES FROM AUTOMATIC CONTROLLER TO IN-LINE AUTOMATIC VALVES SHALL BE #14 AWG THHN TYPE WHICH SHALL BE: (1) INSTALLED IN ACCORDANCE WITH LOCAL CODES; (2) INSTALLED IN SCH 40 PVC WIRE CONDUIT; (3) BURIED TO A MINIMUM DEPTH OF 3"; (4) COLOR CODED TO FACILITATE TROUBLESHOOTING AND (5) SPLICED MOSTLY AT VALVE LOCATIONS. SPLICES NOT LOCATED AT VALVE LOCATIONS SHALL BE INSTALLED IN A SPLICE BOX. SPLICES SHALL BE MADE WATERPROOF USING APPROVED METHODS. SPARE WIRES SHALL BE ROUTED FROM THE CONTROLLER IN ALL DIRECTIONS TO THE FARTHEST VALVES CONTROLLED. REFER TO PLAN FOR THE NUMBER OF SPARE COMMON AND CONTROL WIRES REQUIRED.

AUTOMATIC VALVE LOCATIONS ARE SCHEMATIC ONLY AND SHALL BE ADJUSTED FOR ON SITE CONDITIONS. EACH VALVE SHALL BE INSTALLED IN A VALVE BOX. A MINIMUM OF ONE CUBIC FOOT OF GRAVEL SHALL BE PROVIDED PER BOX TO PROMOTE DRAINAGE. A GATE VALVE SHALL BE INSTALLED WITH EACH ZONE VALVE FOR ISOLATION.

THE RAIN GAUGE AND MOISTURE SENSOR SHALL BE INSTALLED IN ACCORDANCE WITH LOCAL CODES AND MANUFACTURER'S INSTRUCTIONS.

DRIP IRRIGATION

DRIP IRRIGATION SHALL BE INSTALLED TO IRRIGATE ALL AREAS LANDSCAPED WITH SHRUBS AND GROUNDCOVERS.

DRIP IRRIGATION SHALL CONSIST OF TECHLINE NETAFIM DRIPPERLINE AND ACCESSORIES. FLUSH VALVES SHALL BE INSTALLED AS RECOMMENDED BY NETAFIM FOR REGULAR MAINTENANCE.

DRIPPERLINE WITH EMITTERS SPACED 12" ON CENTER WITH AN APPLICATION RATE OF 0.8 GPH SHALL BE SPACED A MAXIMUM OF 18" BETWEEN ROWS. DRIPPERLINE SHALL ALSO BE INSTALLED TO MATCH PLANTING PATTERNS. REFER TO PLAN FOR APPROXIMATE LINEAR FOOTAGE REQUIRED PER PLANTED AREAS.

DRIP IRRIGATION SHALL BE PROPERLY FILTERED AND PRESSURE REGULATED TO ENSURE PROPER OPERATION. A NETAFIM IN-LINE FILTER SHALL BE INSTALLED PER SOLENOID VALVE, AND A NETAFIM PRESSURE REGULATOR SHALL BE INSTALLED PER LANDSCAPE AREA.

DRIP IRRIGATION SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS, THE DETAILS INCLUDED ON THE PLANS, AND UNDER THE SUPERVISION OF THE LANDSCAPE ARCHITECT.

PUMP STATION/WELL

LOCATION OF THE NEW PUMP STATION AND WELL SHALL BE VERIFIED ON SITE.

PUMP STATION SHALL BE A PRE-FABRICATED TYPE WITH A CAPACITY OF 200 GPM @ 162 FT.HD. BASIC COMPONENTS SHALL INCLUDE:

- (1) A SUBMERSIBLE PUMP WITH THE CAPACITY NOTED
- (2) A 1/2 HP MOTOR TO MATCH ON SITE ELECTRIC
- (3) VARIABLE FREQUENCY DRIVE WITH INDUSTRIAL AIR CONDITIONER FOR A NEMA 4 CONTROL PANEL.
- (4) MAGNETIC FLOW SENSOR
- (5) PRESSURE TANK
- (6) WELDED ALUMINUM SKID
- (7) FIBERGLASS ENCLOSURE
- (8) GATE AND CHECK VALVES
- (9) INHIBITOR SYSTEM
- (10) FLOW GUARD

STATION SHALL BE MANUFACTURED BY HOOVER PUMPING SYSTEMS. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL.

STATION SHALL BE MOUNTED ON A 6" THICK CONCRETE SLAB SIZED TO ACCOMMODATE EACH STATION AND ASSOCIATE EQUIPMENT. STATION SHALL BE INSTALLED IN A FENCED-IN ENCLOSURE. REFER TO CITY SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING THE ENCLOSURE.

SUCTION LINES SHALL BE INSTALLED IN ACCORDANCE WITH PUMP STATION MANUFACTURER'S INSTRUCTIONS, AND SHALL BE PROPERLY SCREENED TO PREVENT THE INTAKE OF HARMFUL MATERIAL INTO THE SYSTEM.

THE WATER SOURCE SHALL BE A WELL WHICH SHALL BE DEVELOPED FOR A MINIMUM FLOW OF 225 GPM. THE WELL SHALL BE ESTABLISHED AT THE DEPTH REQUIRED TO ACCESS WATER MINIMAL RUST STAINING PROPERTIES. A RUST INHIBITOR SYSTEM SHALL BE INSTALLED IF NEEDED TO PREVENT STAINING.

PROGRAMMING

SYSTEM SHALL BE PROGRAMMED TO ENSURE THE CAPACITIES OF THE PIPING NETWORK AND PUMP STATION ARE NOT EXCEEDED.

SYSTEM SHALL ALSO BE PROGRAMMED TO OPERATE UNDER THE WATER RESTRICTION GUIDELINES ESTABLISHED BY LOCAL AUTHORITIES.

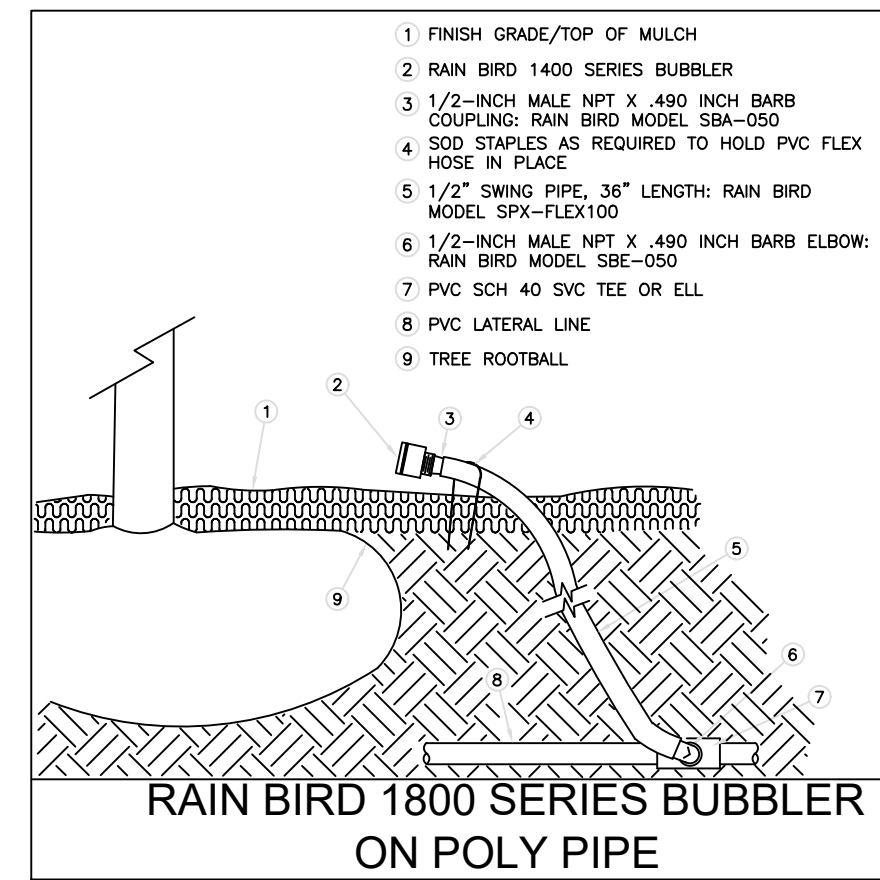
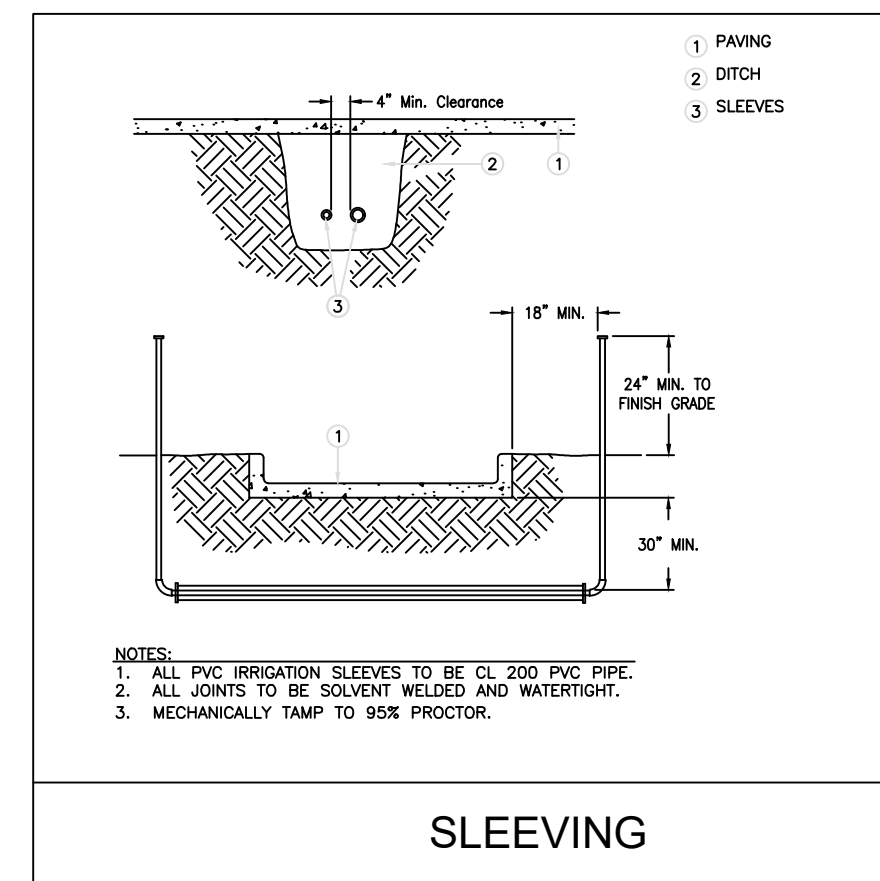
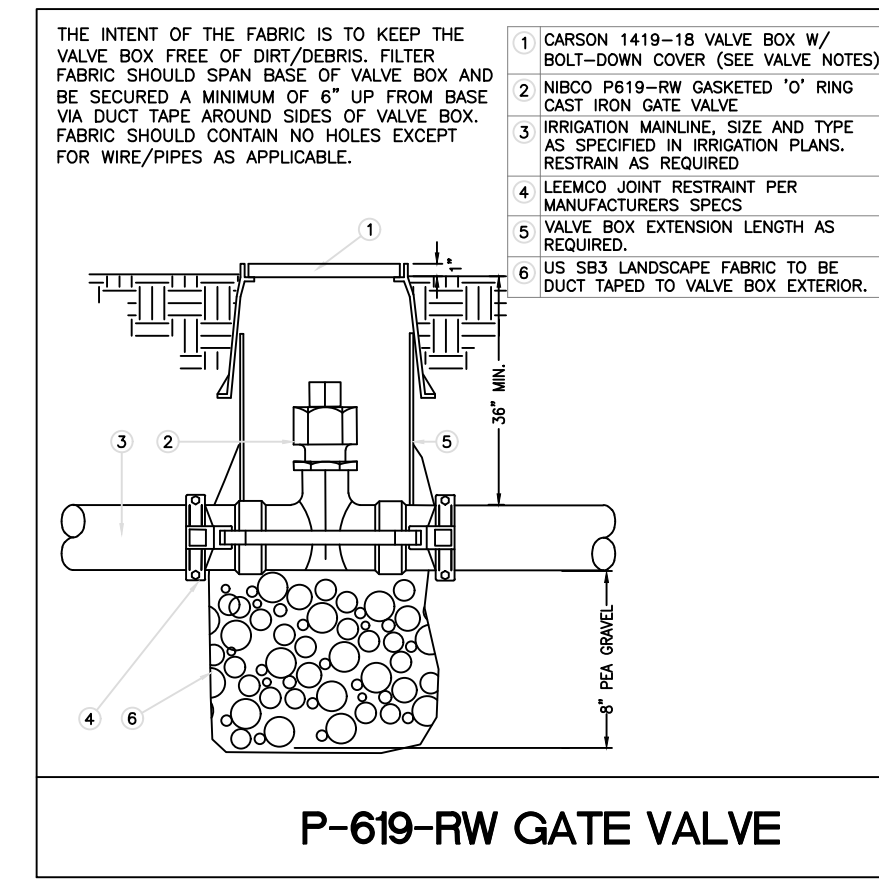
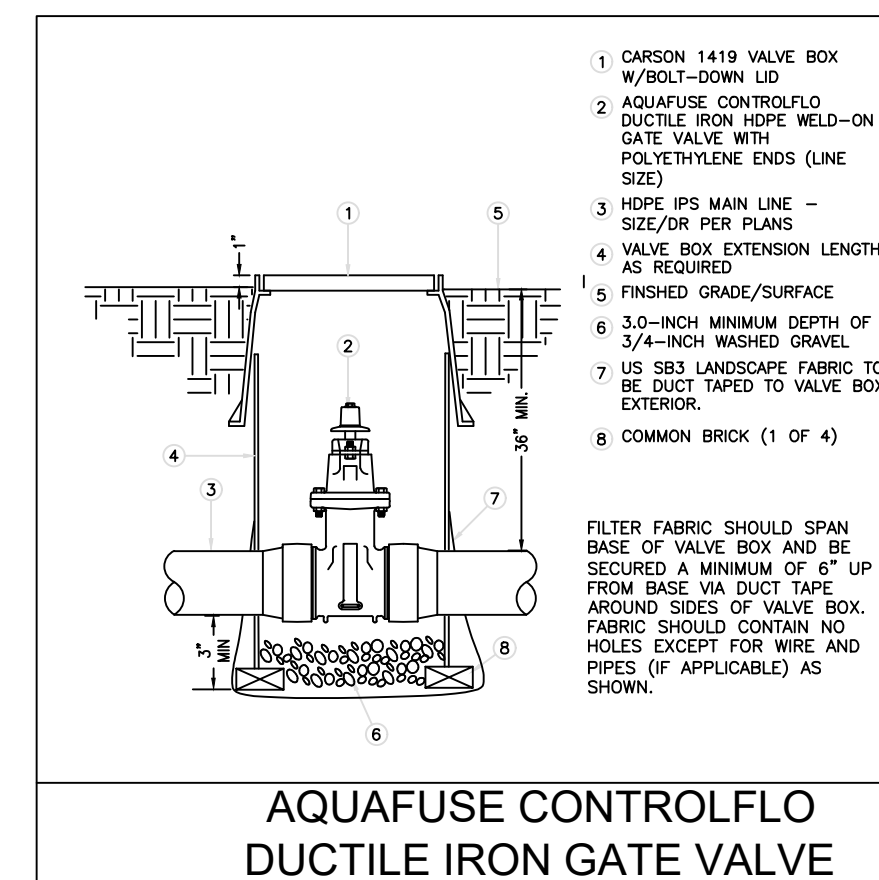
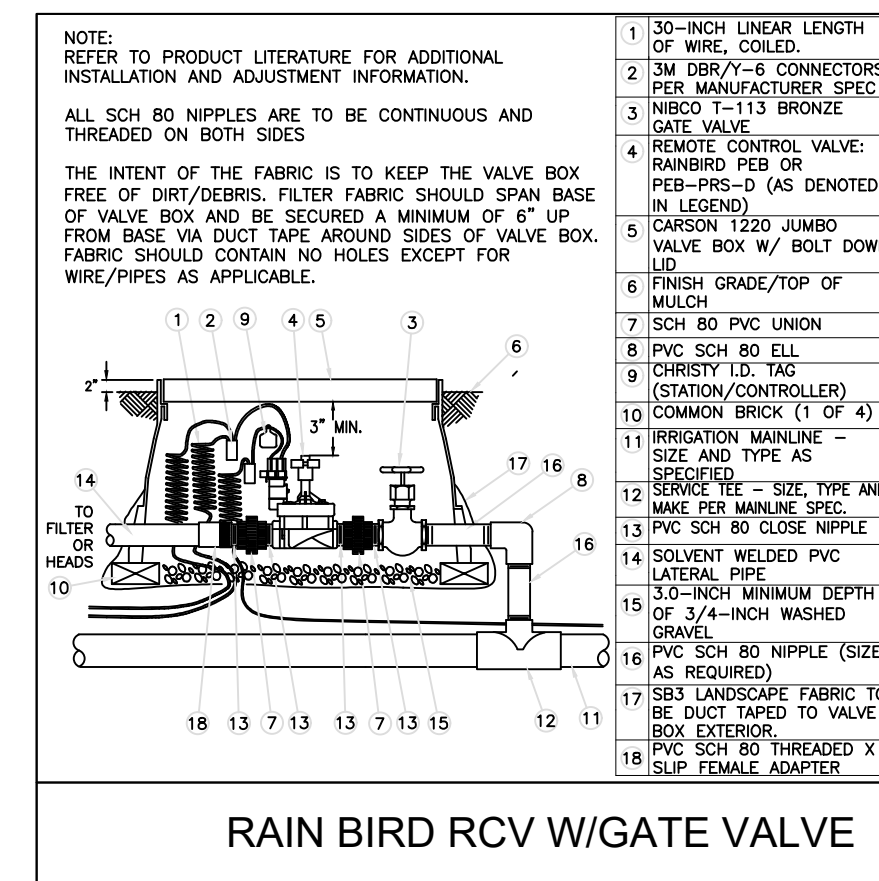
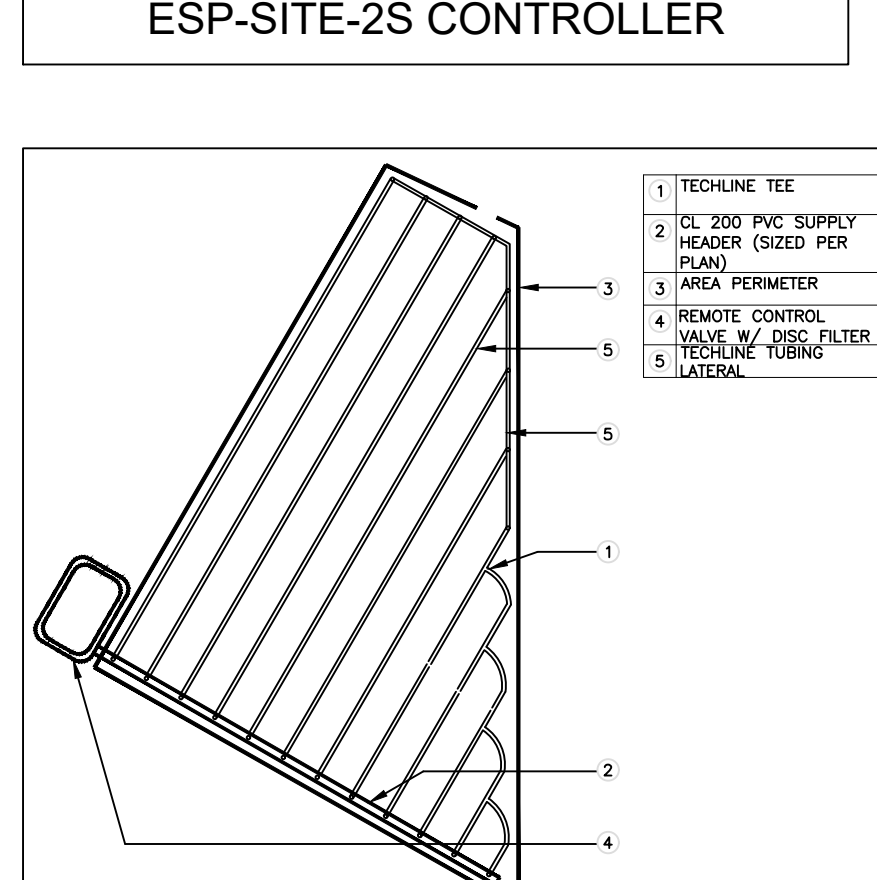
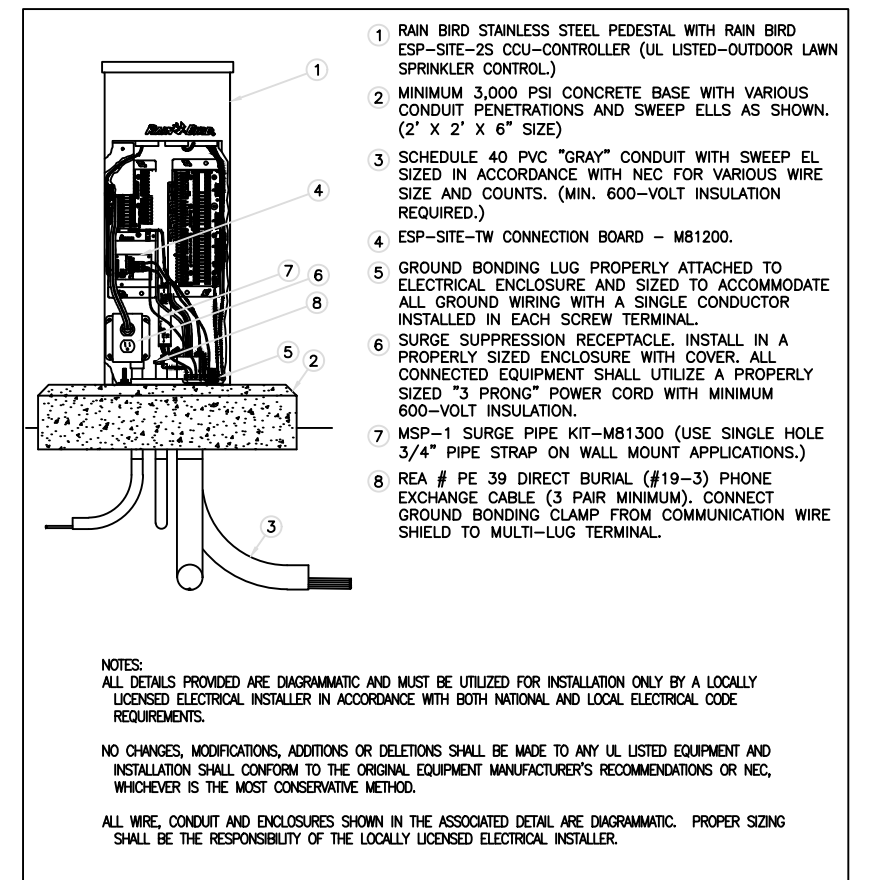
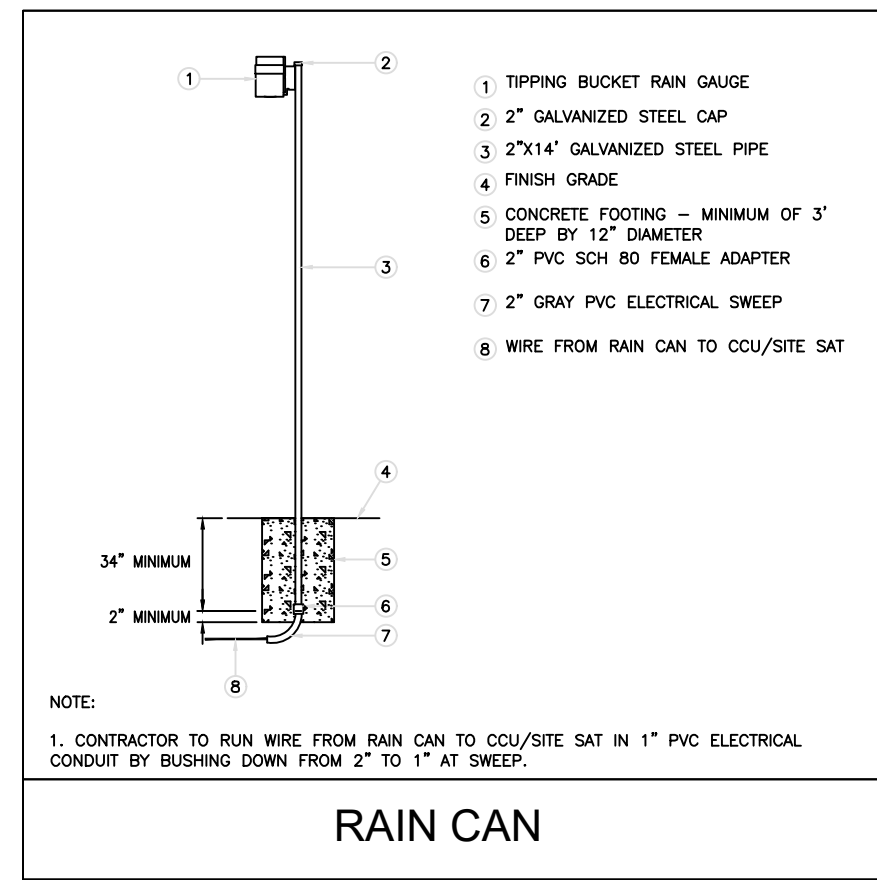
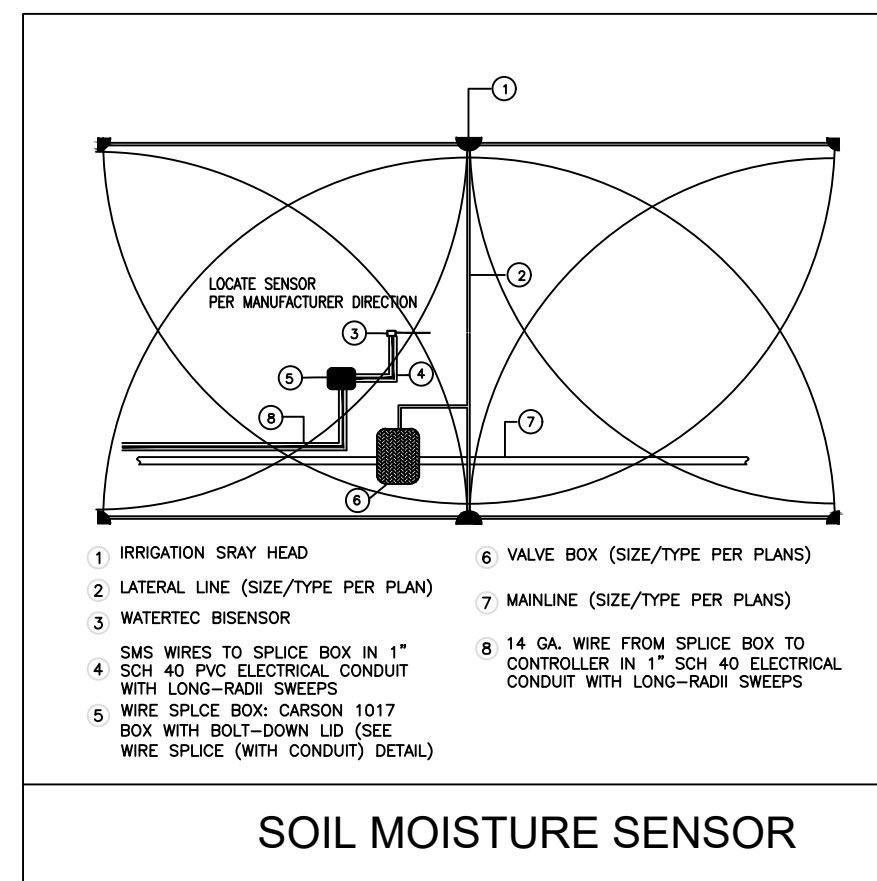
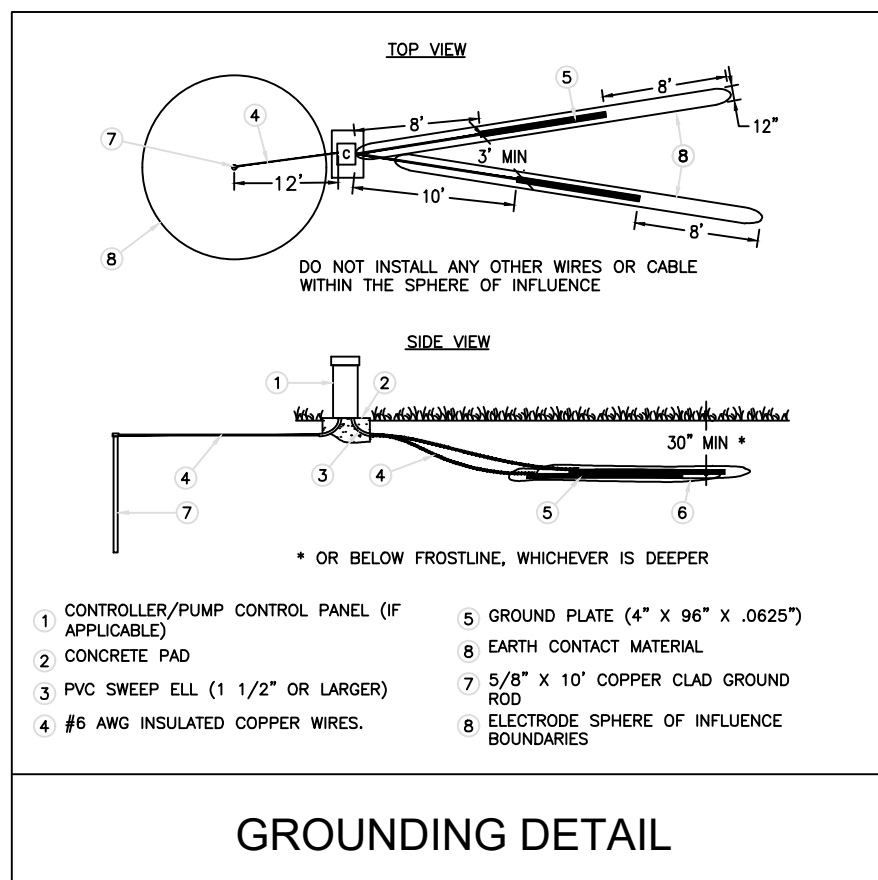
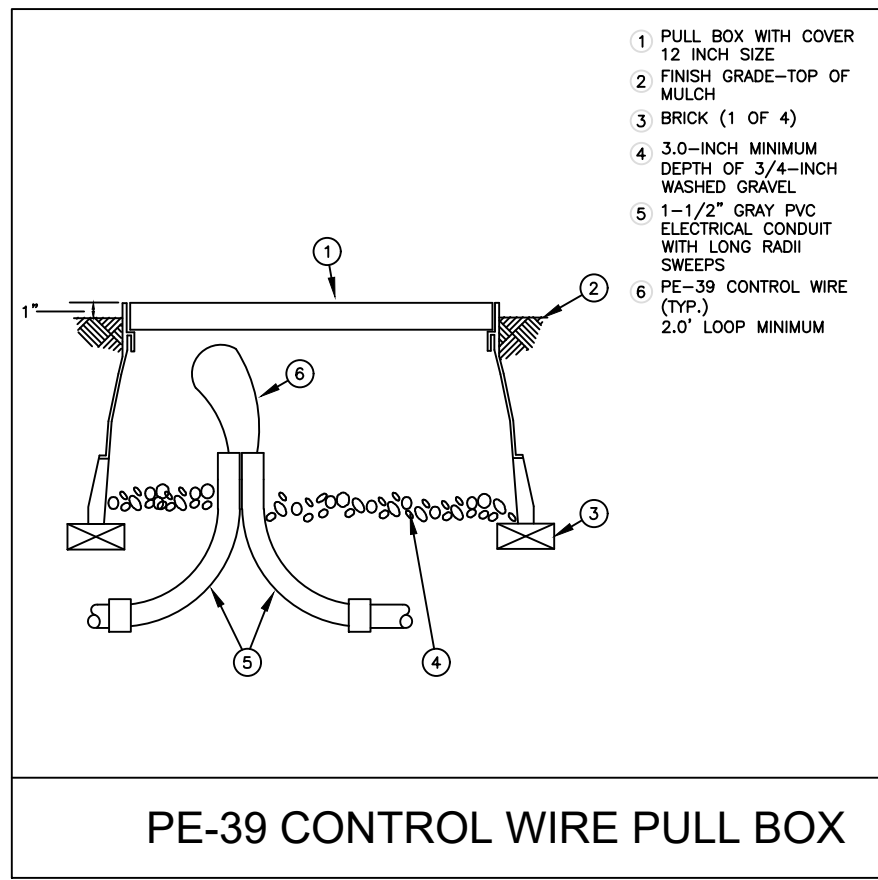
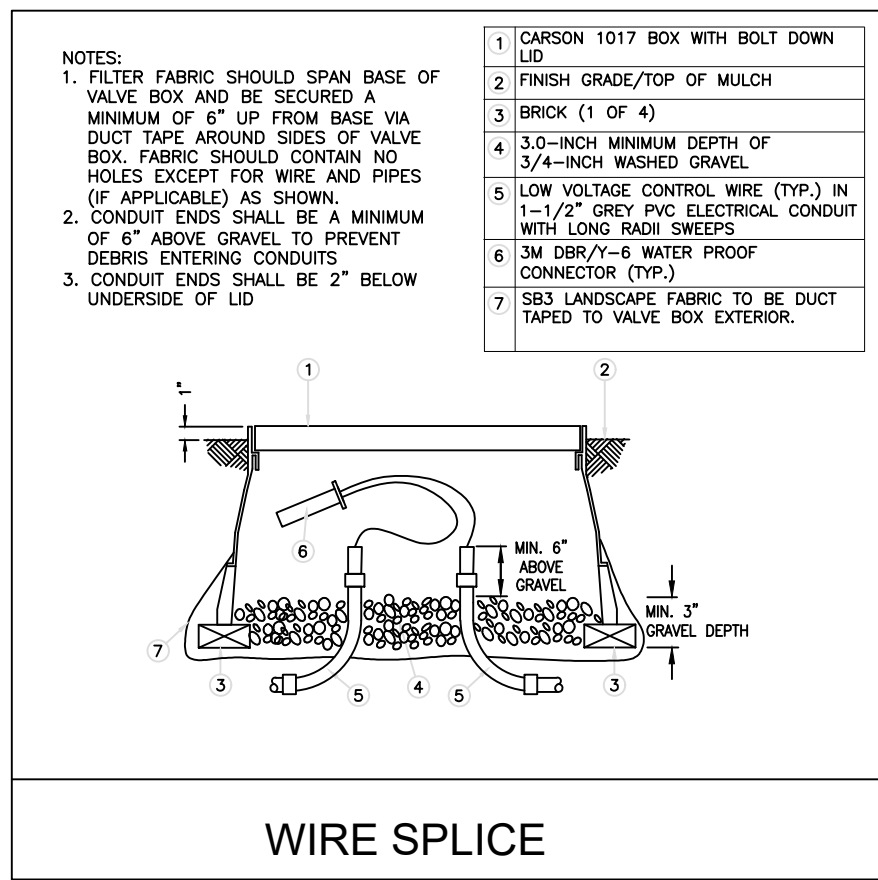
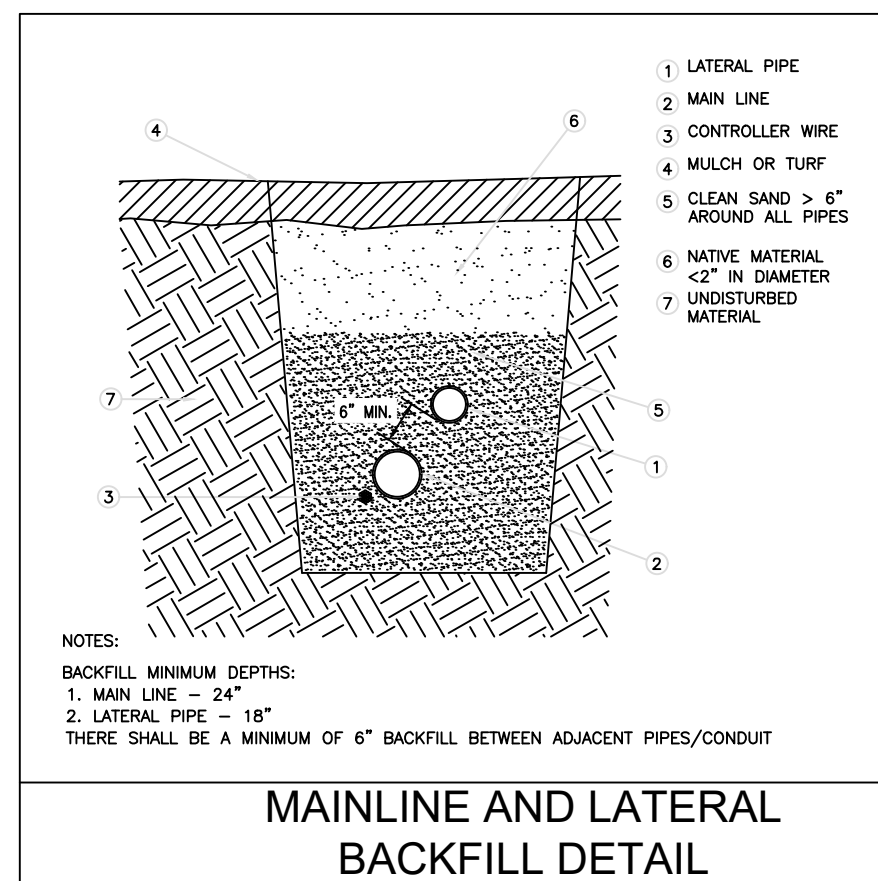
TIMING AND PRECIPITATION

TIMING OF EACH STATION SHALL BE SET IN THE FIELD TO MATCH LOCAL REQUIREMENTS. REFER TO ZONE SUMMARY CHART FOR RECOMMENDED RUN TIMES.

ZONE SUMMARY CHART

VALVE NUMBER	PLANT TYPE	SPRINKLER TYPE	VALVE SIZE	WATER DEMAND**	RUN TIME	WEEKLY USAGE
BRW1	SHRUBS	DRIP	2"	72 GPM	60 MIN/WK	4,320 GAL/WK
BRW2	TREES	BUBBLER	2"	96 GPM	20 MIN/WK	1,920 GAL/WK
BRW3	TREES	BUBBLER	2"	78 GPM	20 MIN/WK	1,560 GAL/WK
BRW4	TREES	BUBBLER	2"	84 GPM	20 MIN/WK	1,680 GAL/WK
BRW5	SHRUBS	DRIP	2"	61 GPM	60 MIN/WK	3,660 GAL/WK
BRW6	SHRUBS	DRIP	2"	91 GPM	60 MIN/WK	5,460 GAL/WK
BRW7	TREES	BUBBLER	2"	74 GPM	20 MIN/WK	1,480 GAL/WK
BRW8	TREES	BUBBLER	2"	61 GPM	20 MIN/WK	1,220 GAL/WK
BRW9	TREES	BUBBLER	2"	74 GPM	20 MIN/WK	1,480 GAL/WK
BRW10	SHRUBS	DRIP	2"	61 GPM	60 MIN/WK	3,660 GAL/WK
BRW11	TREES	BUBBLER	2"	80 GPM	20 MIN/WK	1,600 GAL/WK
BRW12	TREES	BUBBLER	2"	72 GPM	20 MIN/WK	1,440 GAL/WK
BRW13	TREES	BUBBLER	2"	86 GPM	20 MIN/WK	1,720 GAL/WK
BRW14	SHRUBS	DRIP	2"	64 GPM	60 MIN/WK	3,840 GAL/WK
BRW15-40	SPARE					

**APPROXIMATE RUN TIMES TO APPLY 1.0 IN/WK ON SHRUBS AND 40 GAL/WK ON TREES.



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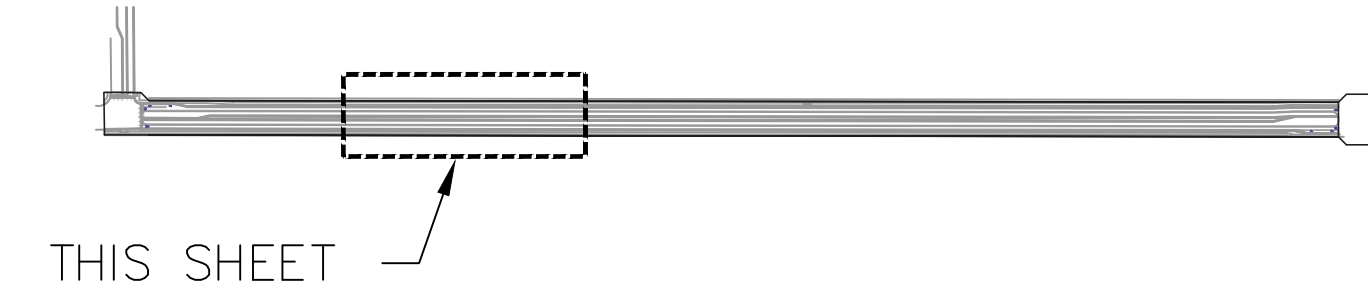
PROJECT TITLE: **BECKER ROAD AT RIVERLAND PORT ST. LUCIE, FLORIDA**
 IRRIGATION LEGEND, NOTES, AND DETAILS

PROJECT NO. 2017-24
 DRAWN BY KMD
 DESIGN BY KMD
 SCALE: N.T.S.
 DATE: DECEMBER 2022
 DWG. NO. IR-8
 SHT. NO. 8 of 10
 REVISIONS:

SEAL:

FILE: P23-073 5405A

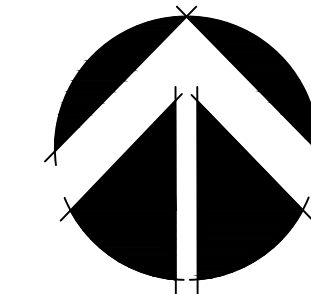
SHEET KEY



MATCH LINE 'B' - SEE SHEET IR-2

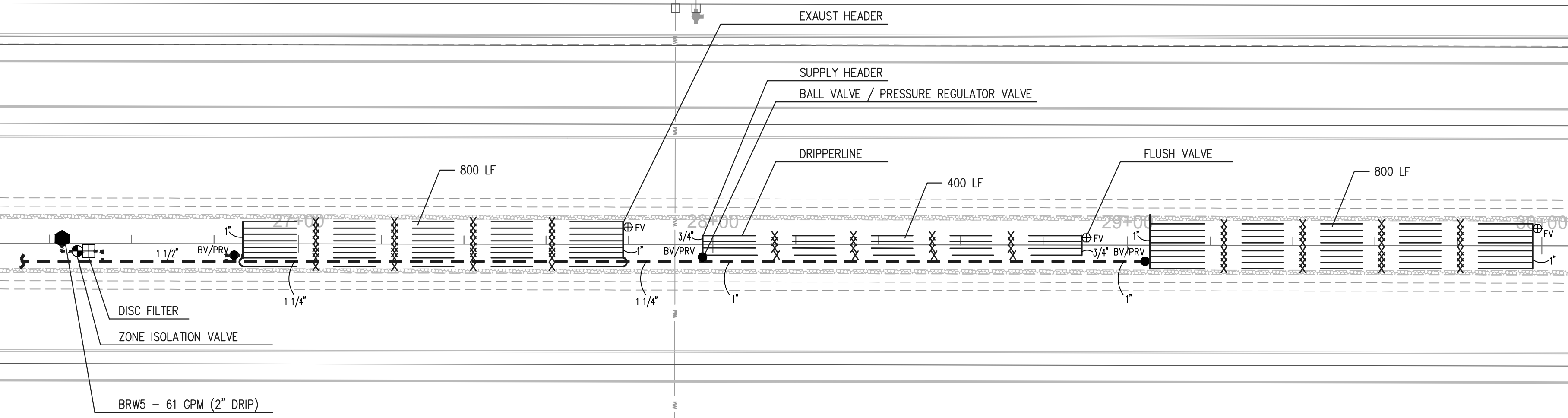
MATCH LINE 'C' - SEE THIS SHEET

21+00 22+00 23+00 24+00



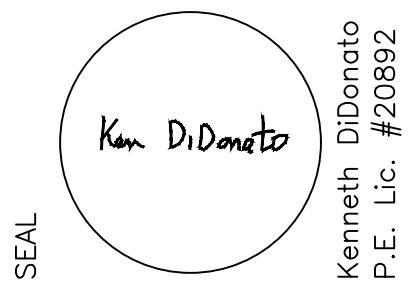
MATCH LINE 'C' - SEE THIS SHEET

MATCH LINE 'D' - SEE SHEET IR-4



PROJECT TITLE : BECKER ROAD AT RIVERLAND
PORT ST. LUCIE, FLORIDA
IRRIGATION PLAN
TYPICAL DRIP PIPE LAYOUT

Kenneth DiDonato, P.E.
CONSULTING ENGINEER
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2210 HOLLWOOD BLVD., HOLLYWOOD, FLORIDA 33020
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PROJECT NO. 2017-24
DRAWN BY KMD
DESIGNED BY KMD
SCALE: 1"=20'-0"
DATE : DECEMBER 2022
DWG. NO. IR-9
SHT. NO. 9 of 10
REVISIONS :

BECKER ROAD PROJECT GL HOMES

SPECIFICATIONS

SINGLE SUBMERSIBLE PUMP SYSTEM VARIABLE FREQUENCY DRIVE (VFD) PRESSURE DEMAND FIBERGLASS ENCLOSED

PURPOSE:

To provide a complete prefabricated skid mounted variable frequency drive pressure demand submersible pump system from a sole source company, herein after referred to as the "manufacturer", whose primary business is the manufacture of prefabricated pump systems. The manufacturer will manufacture, install and warrant the system to meet all specified operating requirements described below and in the system detail. The system shall be a Model HSF-15 PDV-230/3-C,M,R3,W,Z, as manufactured by Hoover Pumping Systems of Pompano Beach, Florida USA 954-971-7350 specified below and shown on the plan details. This specification describes the general components and minimal operating requirements and shall not be construed as a manufacturing guide or complete list of required system components and shall not be construed as a manufacturing guide or complete list of required system components and appurtenances.

The contractor shall submit seven (7) complete copies of the shop drawings to the designer for approval, prior to system order placement. The submittal shall contain cut sheets for all system components. To be considered an equal, 12 days prior to bid opening the contractor must submit the following: manufacturer brochure showing prefabricated pump systems manufacturing is the primary business of the manufacturer or division proposed to manufacture the system, written specifications, dimensioned layout detail, electrical schematic, product sheets for all main components, Underwriters Laboratory electrical control panel and "Packaged Pumping System" manufacturer's file numbers, list of 6 projects with similar operating systems with current name and phone number of person responsible for system operation, manufacturer's insurance certificate for general liability showing minimum coverage of \$1 million, and written certification from the manufacturer stating the proposed system meets all requirements described in this specification, the detail and the bid documents.

If the data submitted is determined to be an equal by the designer the bidder will be notified prior to the bid date.

FIBERGLASS ENCLOSURE:

The pump station shall be protected by a fiberglass enclosure, ultraviolet resistant open mold resin with exterior finish that is uniform in color and texture, reinforced with fiberglass and stiffeners for rigidity. The enclosure shall open clear of the equipment for ease of service with the aid of gas filled struts, a stainless steel hinge and latching lockable handle. The enclosure shall be of dimensions adequate to contain the pump system mounted on the skid as shown on the system detail.

MOUNTING ASSEMBLY:

The pump station shall be mounted on a prefabricated aluminum structural skid. Aluminum pedestals shall be provided to mount the control panel assemblies. The entire station shall be delivered and/or installed on a reinforced concrete slab size as noted on the system detail.

PUMP AND MOTOR:

The pump shall be a submersible type coupled to a submersible motor rated at 15 HP, voltage and phase to match 60 Hz. The pump system shall be designed for operation at 3450 RPM.

Submersible Pump 6" and larger: The pump bowls will be of close grained, cast iron ASTM A48 Class 30 with water passages lined to reduce friction losses and shall be free of holes and other detrimental defects. The pump discharge adapter shall be of close grain ductile iron; cast iron shall not be acceptable. The impellers shall be of bronze, enclosed type and dynamically balanced. Impellers shall be securely fastened to the shaft with steel tapered split bushings.

The pump shaft shall be of stainless steel A276 Grade 416 turned, ground and polished. It shall be supported by bronze bearings above and below each impeller. The size of the shaft shall be no less than that determined by ANSI/AWWA Specifications E101, Section A4.3 paragraph 4.3.3. The motor coupling shall be constructed of A276 type 416 stainless steel either keyed or splined as required to fit the motor shaft.

The power cable shall be sized such that the voltage drop will not exceed three percent at the motor rated full load current and voltage. Cables shall be designed specifically for submersible pump service and shall consist of either individually insulated conductors or individual conductors insulated and the whole covered with an outer jacket.

IRRIGATION PUMP CONTROL PANEL:

The control panel assembly shall be Underwriters Laboratories listed in accordance with section 508A for "enclosed industrial control panels." All control devices and electronic auto-sensory circuitry shall be housed in a self-contained weather-resistant stainless steel control cabinet. The control cabinet shall contain the following protection and control equipment:

Operation

This station operates as a Variable Frequency Drive (VFD) pressure demand start, reduced-flow retirement system. The station automatically maintains a constant discharge pressure from a pressure transducer input regardless of varying flow demands within the station operating range. The system is equipped with a "Hand-Off-Auto" (H-O-A) selector switch, and a "Reset-Normal-Override" selector switch. The self-diagnostic control panel assembly includes an "Alarm" indicator light, and an operator interface for display of status and diagnostic messages, event lists, and operation history. The operator interface also allows for viewing of system setup parameters.

Hoover-Flow Software features include flow control of pump starts, sequencing and retirement; automatic pump alternation; Loss of Prime/No-flow protection, Low Pressure protection, High Pressure protection; diagnostic information, flow and pressure history, service counters, elapsed run time meters, date and time stamping; Phase Loss protection, Phase Unbalance protection, Voltage monitoring and protection, operating mode meters, Service required alerts; Remote Communication Link interface; Hoover Drive control; emergency bypass operation, cooling system control, self-cleaning intake screen control; Booster bypass control; fail-safe data protection.

Drive Fault

In case of a drive fault, including under or over voltage, over current, heatsink thermal, and ground fault, the affected pump will shut off, the "Alarm" light will illuminate, and the operator interface will display "Drive Fault". The pump will remain off until the system is "Reset".

Hand – Off – Auto Switch

The pump is equipped with an H-O-A selector switch that operates as follows:

Position	Function
Hand	Manual pump start. This position overrides all protective features and start controls.
Off	Pump will not run.
Auto	Pump will start automatically. In this position, all start controls and protective features are active.

Reset – Normal – Override Switch

The station is equipped with an Override selector switch that operates as follows:

Position	Function
Reset	Resets all system failures.
Normal	Low Pressure protection is active.
Override	Low Pressure protection is disabled.

Operator Interface

A NEMA 4X HMI (Human Machine Interface) shall be provided with status display and control of operating mode, I/O status, system pressure, system flow, pressure and flow setpoints, elapsed run times, fault timer values and presets, display brightness, clock time, alarm and event logs with date and time stamps, and diagnostic information including counters and alarm indicators.

Protection Equipment

- Front operated main power disconnect
- Motor fuses for motor and drive short circuit and ground fault protection
- Full voltage class 10 IEC motor starters for emergency bypass operation
- Metal oxide varistors (MOV) for transient voltage suppression per phase
- Fused control circuitry with blown fuse lighted indicator for each circuit

Specification

Electric service to be, in order of preference:

- 480V 3-Phase (A, B, C, Ground)
- 230V Closed-Delta 3-Phase (A, B, C, Neutral, Ground)
- 208V Wye-3-Phase (A, B, C, Neutral, Ground)
- 230V 1-Phase (A, B, Neutral, Ground)
- 208V 1-Phase (A, B, Neutral, Ground)
- 230V Open-Delta 3-Phase (A, B, C, Neutral, Ground)

Selection of 230V Open-Delta 3-Phase may require an increase in electrical equipment size to meet desired performance criteria.

PENETRATION STANDARD REQUIREMENTS:

All control panel penetrations shall be performed by a licensed electrician to minimum NEMA 4X requirements, and compliant with International Electrotechnical Commissions (IEC) IP56 rating under its IP code, to protect against dust ingress and against any harmful effects from water projected in powerful jets from any direction and protection against corrosion.

VARIABLE FREQUENCY DRIVES (VFD):

Variable Frequency Drive with the following characteristics shall be provided for the pump motor: 32-bit microprocessor controlled Pulse Width Modulated output, IGBT transistors, line reactors, built-in adjustable PID control, and acceleration ramp up and down, single pump VFD systems 25 hp or less NEMA 4 VFD with forced-air cooling. All other VFD system cooling is by industrial air conditioner. Variable torque control, 32 character alphanumeric English full text parameter display, single function keys, block parameter access, dual analog outputs, automatic and manual reset, opto-isolated outputs, log of last 30 events retained in memory.

MASTER/SHUTOFF VALVE:

- The valve shall be 230 psi working pressure with the following features:
 - Continuous duty industrial solenoid
 - Large capacity disk filter on pilot control tubing
 - 220 psi polyethylene control tubing with prest-o-lock fittings
 - Cast iron body and bonnet with polymer coating
 - 316 Stainless steel nuts, bolts, washers, shaft and spring
 - Stainless steel seat

For Irrigation controller use, the solenoid shall be energized to open, the valve wires will be stubbed into a NEMA 4X junction box on the back of the pump system for connection to the controller by the irrigation contractor. For Hoover Flowguard® the solenoid shall be energized to close.

PRESSURE TRANSMITTER:

A 4-20mA-pressure transmitter shall provide a feedback signal to drive PID loops and for system pressure control. The transmitter shall be CE & UL recognized and built with an all stainless steel housing and pressure port, rated to NEMA 4, and able to withstand shock and vibration levels to MIL-STD-810E. The transmitter sensor element will provide a signal over 0-150 PSIG range while rated for 600-PSI overpressure minimum. Conformity error will be less than or equal to 0.50% and the transmitter shall be capable of operation from -40 to +120C.

MAGNETIC FLOW METER:

A full-bore magnetic flow sensor shall be provided to control pump retirement and allow display of flow rate and total flow. The flow sensor shall have the following characteristics: no moving parts, unobstructed bore (no pressure loss), NEMA 5/IP 67 protection, international standard traceable calibration, stainless steel 1.4301 flow tube, 316 stainless steel electrodes, overall system accuracy for flows ≥ 1.5 fps of better than +/- 0.5% of actual rate, and for flows < 1.5 fps of better than +/- 0.32%v[fps] % of actual rate.

FLOWGUARD/MAXI-COM MAGNETIC FLOW METER/SHUT-OFF VALVE CONVERTER ASSEMBLY

Flowguard/Maxi-Com Magnetic Flow Meter/Shut-Off Valve converter Assembly

INJECTION SYSTEM:

An adjustable rate positive displacement pump shall be located inside the pump enclosure on or adjacent to the chemical tank connected to the pump system control panel and discharge pipe. The pump will have a pumping capacity of 6 to 30 gallons per day at up to 80 psi. The pump motor will be thermally protected and will stop pumping if the system backpressure exceeds the pump capacity. The tank will be made of polypropylene and have a capacity of 35 gallons with a refill hatch located on a concrete pad.

DISCHARGE PIPE MANIFOLD:

The pipe discharge manifold shall be constructed of galvanized steel pipe with galvanized roll groove fittings. A wafer type butterfly valve or bronze ballvalve will be provided at pump station discharge.

PUMP DISCHARGE:

The minimum pump discharge size shall be 2" diameter or larger as required for a maximum of 15 feet per second velocity flow. The pipe shall be schedule 40 galvanized steel with galvanized roll groove or threaded fittings. Each discharge shall have a bronze poppet check valve for lines smaller than 3" and cast iron roll groove swing check valve for larger sizes located as shown on the system detail.

Well Source: Each pump will be placed in a separate well. The pump/motor assembly shall be placed directly in the well unless a flow inducer is required for adequate water velocity across the motor. The discharge pipe and submersible cable shall exit the well head through a well seal with a junction box as shown in the system detail.

FLOWGUARD COMMUNICATION LINK:

Hoover supplied communication
- High speed modem, antenna and broadband Data communication plans

THE HOOVER FLOWGUARD

An easy to use Internet based irrigation system management tool providing real time monitoring and control that include:

-- PROACTIVE TROUBLESHOOTING TOOLS

Solve minor irrigation problems before they escalate into major landscape issues.

-- LANDSCAPE MANAGEMENT TOOL
Supplement random "wet check" expense with specifically identified irrigation repairs. Evaluate data that can be effectively used for troubleshooting performance issues. Field manually bypass button to override a closed Flowguard shutoff valve in two (2) hour increments each time pressed by field service personnel.
Rain sensor

-- AUTOMATED COMPLIANCE TOOLS

Daily municipal water use restrictions.
Water Management District water usage reporting
Budget water usage to assure compliance with Consumptive Water Use Permit

-- AUTOMATIC E-MAIL ALARMS & WARNINGS

Receive automatic e-mail alarms & warnings when irrigation system problems occur. Automatic adjustable alarm shut-downs with time delay between restarts.

-- REPORTS

Daily water usage
Specific events, a comprehensive list of alarms, warnings and pump operations

-- COMMUNICATION via customer provided T1, DSL, WiFi or 900 MHz radio communication line with STATIC IP ADDRESS complete with connection to the RS232 port on the Flowguard controller OR Hoover Optional High Speed Modem and Cellular Broadband service.

-- REMOTE CONTROL access to pump control and protection features, including: sequencing and retirement controls and setup parameters.

-- DIAGNOSTIC DATA: Real time and historical graphing of flow, pressure, source water level, water salinity, booster water source pressure, rain sensor, system status and maintenance alerts.

-- WATER USE MONITORING: Set and automatically monitor Daily, Monthly, and Annual water use volumes per Water Management District Use Permit. User - set alarms and warnings, with automatic and/or manual restarts.

-- WATER USE REPORTS: Print Reports for Daily, Monthly, and Annual flow volume history. View and print reports for graphing, logs, usage, audit trails, and maintenance status.

-- SECURITY ACCESS CONTROL: Multi-user capability with User ID and password protection.

-- USER TRAINING provides new user classes, support and phone assistance to set up initial parameters such as Water Windows, budgets and other user - set functions.

FLOWGUARD3 RAIN GAUGE:

The rain gauge with the following features:
- Remotely adjustable Shutoff and Restart levels, and remotely settable drying rate.
- Measurement of rainfall, with one-hundredth of an inch resolution.
- Recording of daily rainfall amounts.
- Display of today's total rainfall.
- Display of estimated time to restart when system shuts-down due to rain.

WARRANTIES:

Prior to shipping, the manufacturer shall flow test the system and submit a certified report to the designer stating the system is within 1% + or - of the specified flow rate and pressure, and meets the operational requirements.

The manufacturer of the pumping station shall warrant all components for a period of one (1) year from date of manufacture.

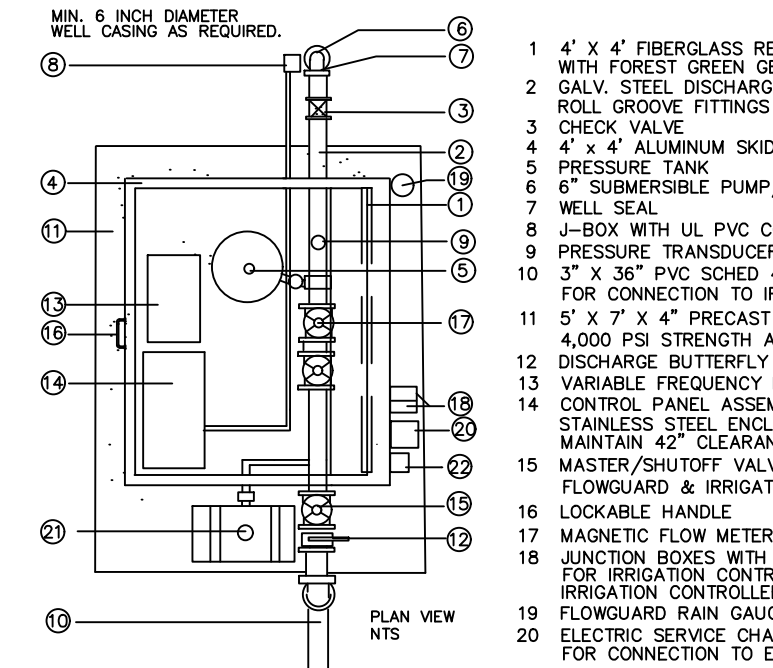
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NOTE: DISCHARGE PIPES & HEADER TO IRRIGATION MAIN SHALL BE SCHED 40 GALVANIZED STEEL PIPE WITH GALV. ROLL GROOVE FITTINGS. PUMP DROP PIPE SHALL BE HOPE HEAT FUSED OR SCHED 40 GALV. STEEL. SET PUMP 40' ON 3" PIPE. INSTALL MOTOR CABLE SPLICE BETWEEN MOTOR AND CONTROL PANEL IN NEMA 4X JUNCTION BOX ADJACENT TO WELL IN ACCORDANCE WITH ELECTRICAL CODES.

WELL DRILLER SHALL NOTIFY THE PUMP SYSTEM MANUFACTURER IN WRITING WITHIN 24 HOURS OF DEVELOPING THE WELL IF THE WELL PUMPING LEVEL IS GREATER THAN 40' BELOW FINISHED GRADE AFTER 8 HOURS OF CONTINUOUS PUMPING AT 125% OF THE DESIGN FLOW BELOW.

PROVIDE MINIMUM OF 4" CLEARANCE ON ALL SIDES OF PUMP SYSTEM

HOOVER FLOWGUARD WELL SYSTEM REMOTE CONTROL, COMMUNICATION AND FEATURES:
COMMUNICATION VIA CELLULAR MODEM CONNECTION PROVIDED BY HOOVER
USER DEFINED INTERNET BASED CONTROL PARAMETERS USING STANDARD WEB BROWSER WITH EVENT LOGGING AND EMAIL ALERTS FOR WARNINGS AND ALARMS AS FOLLOWS:
X HMI CONTROL INTERFACE AND DISPLAY ON CONTROL PANEL
X 30 MINUTE SHUTOFF WITH 15 MINUTE DELAY AND ADJUSTABLE TIME DELAY AND NUMBER
X MINIMUM TOTAL DAILY WATER USAGE
X DAILY MONTHLY TOTAL DAILY WATER USAGE BUDGETS
X SYSTEM EVENTS WITH TIME AND DATE SHOWN
X GRAPHING OF SEAL TIME AND HISTORICAL FLOW, INCOMING AND DISCHARGE PRESSURE
X RAIN GAUGE PRECIPITATION REPORTING, ADJUSTABLE SHUTDOWN
X HISTORIC WATER USAGE BY DAY AND MONTH
X VFD FAULT/SHUTTER OVERLOAD FAULT SHUTDOWN
X POWER OFF/ON ALERT
X PUMP NERVE DEVICE
X PUMP LOSS OF PRIME
X HIGH FLOW



- 4" x 4" FIBERGLASS REINFORCED ENCLOSURE WITH FOREST GREEN GELCOAT FINISH
- GALV. STEEL DISCHARGE HEADER PIPE WITH GALV. ROLL GROOVE FITTINGS
- CHECK VALVE
- 4" x 4" ALUMINUM SKID BOLTED TO CONCRETE PAD
- PRESSURE TRANSDUCER
- 6" SUBMERSIBLE PUMP/MOTOR IN WELL 15 HP
- WELL SEAL
- H-BOX WITH UL PVC CONDUIT TO CONTROL PANEL
- PRESSURE TRANSDUCER
- 5" x 3/8" PVC SCHED 40 GROOVED END PIPE FOR CONNECTION TO IRRIGATION MAIN
- 6" x 7" x 4" PRECAST REINFORCED CONCRETE PAD 4000 PSI STRENGTH AT 28 DAYS
- DISCHARGE BUTTERFLY VALVE
- VARIABLE FREQUENCY DRIVE
- CONTROL PANEL ASSEMBLY UL LISTED 304 STAINLESS STEEL ENCLOSURE MAINTAIN 4" CLEARANCE
- MASTER/SHUTOFF VALVE CONNECTED TO HOOVER FLOWGUARD & IRRIGATION CONTROLLER
- LOOKABLE HANDLE
- MAGNETIC FLOW METER
- JUNCTION BOXES WITH 110VAC POWER AND MY CIRCUIT FOR IRRIGATION CONTRACTORS FURNISHED AND INSTALLED
- IRRIGATION CONTROLLER
- FLOWGUARD RAIN GAUGE ON 8" POLE
- ELECTRIC SERVICE CHASEWAY TO CONTROL PANEL FOR CONNECTION TO ELECTRIC SERVICE BY ELECTRICIAN
- 35 GALLON INJECTOR TANK AND PUMP STRAPPED & ANCHOR BOLTED TO PAD
- 2ND MAG METER AS FLOW SENSOR OUTPUT IN JUNCTION BOX OUTSIDE ENCLOSURE FOR MAXI-CONTROLLER CONNECTION BY IRRIGATION CONTRACTOR

NOTE: CITY OF PORT ST. LUCIE REQUIRES A 6 FT HT CHAIN LINK FENCE AROUND PUMP SYSTEM

ELECTRIC SERVICE TO BE IN ORDER OF PREFERENCE:
480V 3-PHASE, 230V CLOSED-DELTA 3-PHASE,
208 WYE 3-PHASE, 230 OPEN-DELTA 3-PHASE,
230 1-PHASE, 208V 1-PHASE
PUMP PERFORMANCE
200 GPM @ 220 TQH, 70 PSI

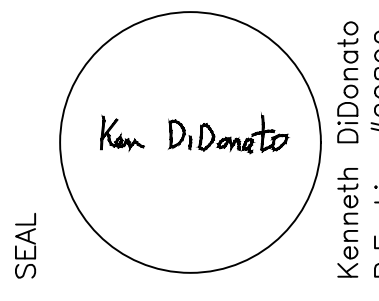
HOOVER PUMPING MODEL: HSF-15PDV-230/3-C,M,R3,W,Z
Pompano Beach, Florida, Tel: 954-971-7350

BECKER ROAD PROJECT
SUBMERSIBLE PUMP SYSTEM DETAIL
FIBERGLASS ENCLOSED WELL SUCTION
VARIABLE FREQUENCY DRIVE (VFD) PRESSURE DEMAND
HOOVER FLOWGUARD



PROJECT TITLE : BECKER ROAD AT RIVERLAND
PORT ST. LUCIE, FLORIDA
IRRIGATION PUMP STATION

Kenneth DiDonato, P.E.
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2210 HOLLWOOD BLVD., HOLLYWOOD, FLORIDA 33020
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PROJECT NO. 2017-24
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