NON-VEHICULAR	SLEEVING SCHEDULE
PIPE SIZE	SLEEVING PIPE SIZE
3/4"	2"
1"	2"
1-1/4"	3"
1-1/2"	3"
2"	4"
3"	6"
4"	8"
6"	12"
8"	16"

SLEEVING NOTES:

- 1. VEHICULAR CROSSINGS ARE SHOWN AND SIZED ON THE
- 2. NON-VEHICULAR SLEEVES ARE SHOWN BUT NOT SIZED. 3. SIZE ALL NON-VEHICULAR SLEEVES ACCORDING TO THE
- ABOVE CHART. 4. MAINLINE CROSSINGS MUST ALSO INCLUDE A 2" CONDUIT
- SLEEVE FOR CONTROL WIRE.
- 5. CONTRACTOR TO DUCT TAPE END OF SLEEVES TO KEEP SLEEVE CLEAN AND CLEAR.
- 6. CONTRACTOR TO STAKE END OF EACH SLEEVE ABOVE GROUND AND PAINT FLUORESCENT ORANGE. LABEL EACH
- STAKE WITH THE WORD 'SLEEVE' AND ITS SIZE. 7. CONTRACTOR TO PROVIDE A 3 FT MINIMUM DEPTH OF COVERAGE OVER ALL SLEEVES.

12"/6"/2" SLEEVES MEANS TO INSTALL ONE 12", ONE 6" AND ONE 2" SLEEVE.

DECODERS:

THE DECODERS SHALL BE COMPLETELY WATERPROOF. EACH DECODER SHALL HAVE A SINGLE RED AND A SINGLE BLUE WIRE, FOR CONNECTION TO THE COLOR-CODED TWO-WIRE PATH. EACH DECODER SHALL INCLUDE 2 WATERPROOF CONNECTORS, UL LISTED TO 600V DIRECT BURIAL, TO INSURE PROPER CONNECTION.

THE DECODERS SHALL BE AVAILABLE IN A SINGLE-STATION CONFIGURATION, AND A TWO-STATION CONFIGURATION. THE INDIVIDUAL STATION OUTPUTS SHALL ALSO BE COLOR-CODED TO INSURE PROPER CONNECTION.

EACH DECODER STATION OUTPUT SHALL BE CAPABLE OF ACTIVATING A MINIMUM OF 2 TYPICAL 24VAC IRRIGATION SOLENOIDS. INDIVIDUAL SOLENOID SPECIFICATIONS SHOULD BE REFERENCED FOR ANY DIFFICULTIES WITH DECODER OPERATIONS (SUCH AS SOLENOIDS CONTAINING EXTRA COMPONENTS FOR SURGE PROTECTION).

DECODERS SHALL BE INSTALLED WITHIN 100 FT/30 M OF THE SOLENOIDS THEY ARE INTENDED TO OPERATE. IN HIGH LIGHTNING AREAS, THE USE OF WEBBED WIRE PAIRS FOR DECODER-TO-SOLENOID CONNECTIONS IS HIGHLY RECOMMENDED.

ALL DECODER INSTALLATIONS SHALL BE MADE IN APPROPRIATELY SIZED VALVE BOXES. AT EACH DECODER SPLICE, APPROXIMATELY 5 FT/1.5 M OF WIRE SLACK SHALL BE PROVIDED, LOOPED INSIDE EACH VALVE BOX, TO PREVENT STRAIN ON THE CONNECTION OVER TIME.

THE SYSTEM SHALL ACCOMMODATE UP TO 48 DECODER STATIONS IN ANY COMBINATION OF SINGLE OR TWO-STATION DECODERS.

ALL DECODER STATIONS SHALL BE COMPATIBLE WITH LICENSE-FREE WIRELESS REMOTE CONTROL.

SURGE PROTECTION:

SURGE SUPPRESSION DEVICES DESIGNED FOR USE WITH THE DECODER SYSTEM SHALL BE INSTALLED AT A MINIMUM OF EVERY 1000 FT/300 M OR EVERY 12 DECODER MODULES, WHICHEVER IS FIRST. A SURGE SUPPRESSION MODULE MUST BE INSTALLED AT THE END OF EACH TWO-WIRE PATH.

THE SURGE SUPPRESSION DEVICE SHALL BE COMPLETELY WATERPROOF, AND SHALL INCLUDE TWO OF EACH COLOR-CODED WIRE LEADS, TO MATCH THE TWO-WIRE PATH.

WHEN THE SURGE SUPPRESSION DEVICE IS INSTALLED IN-LINE, ONE RED/BLUE PAIR SHALL BE CONNECTED TO THE WIRE PATH ON THE CONTROLLER SIDE OF THE DEVICE, AND ANOTHER RED/BLUE PAIR SHALL BE CONNECTED ON THE FIELD SIDE, CONTINUING THE DECODER WIRING PATH. WHEN THE SURGE SUPPRESSION DEVICE IS INSTALLED AT THE END OF THE TWO-WIRE PATH, THE TWO RED LEADS SHALL BE JOINED TOGETHER WITH THE RED WIRE ON THE PATH. THE TWO BLUE LEADS SHALL ALSO BE JOINED TOGETHER WITH THE BLUE WIRE ON THE TWO-WIRE PATH, SO THAT NO LEADS ARE LEFT UN-TERMINATED.

ALL SURGE SUPPRESSION DEVICE INSTALLATIONS SHALL BE MADE IN APPROPRIATELY SIZED VALVE BOXES. AT EACH DECODER SPLICE, APPROXIMATELY 5 FT/1.5 M OF WIRE SLACK SHALL BE PROVIDED, LOOPED INSIDE EACH VALVE BOX, TO PREVENT STRAIN ON THE CONNECTION OVER TIME.

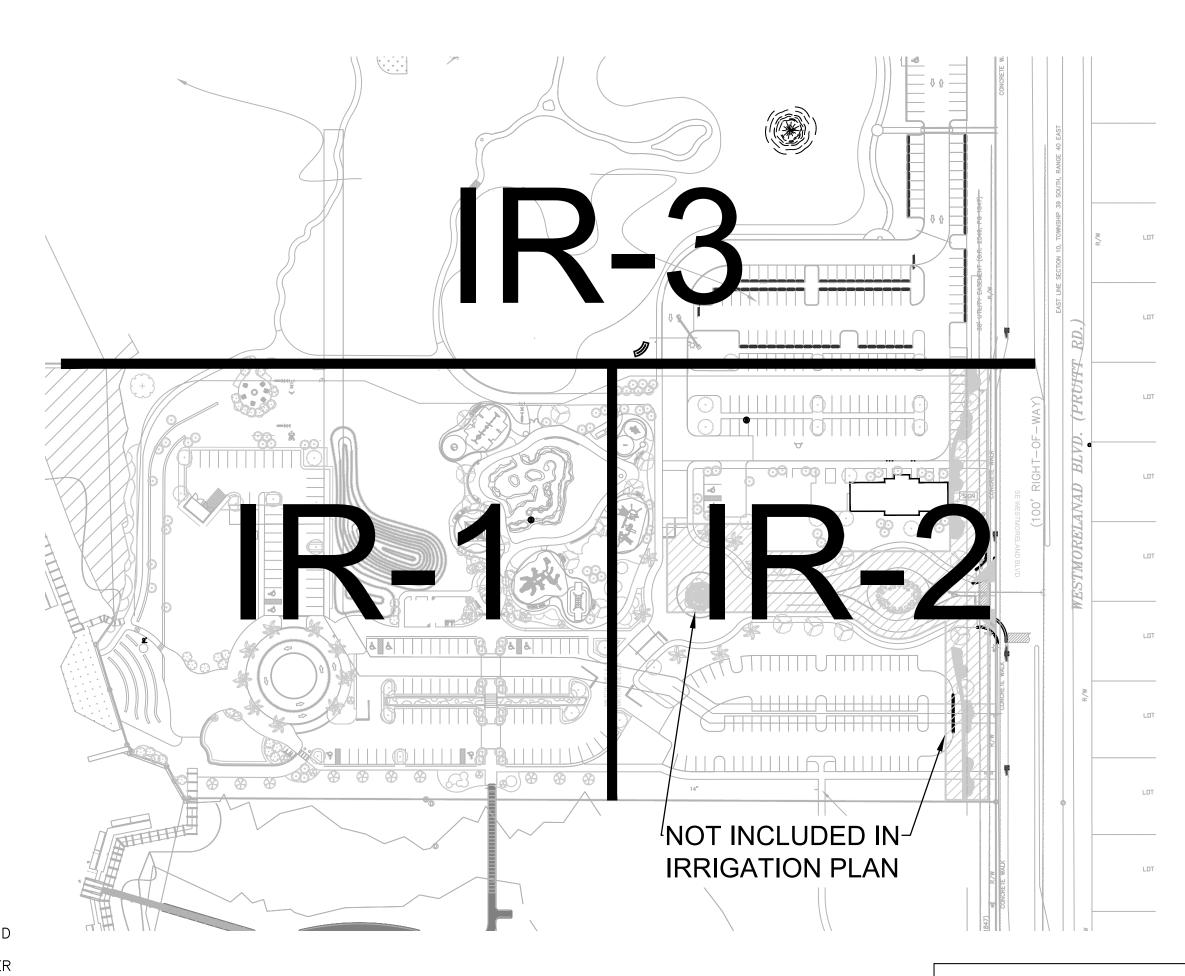
EARTH GROUND HARDWARE SHALL NOT BE LOCATED IN THE SAME VALVE BOX AS THE SURGE SUPPRESSION DEVICES.

EACH SURGE SUPPRESSION DEVICE SHALL HAVE A SINGLE BARE COPPER EARTH GROUND LEAD, FOR CONNECTION TO EARTH GROUNDING HARDWARE. THE LEAD SHALL BE ROUTED AT RIGHT ANGLES TO THE TWO WIRE PATH, A MINIMUM OF 8 FT/2.5 M AWAY FROM THE TWO-WIRE PATH, AND CONNECTED TO A COPPER-CLAD STEEL GROUND ROD OR COPPER PLATE OF 4"/100 MM WIDTH AND 36"/1 M LENGTH. NOMINAL RESISTANCE OF THIS EARTH GROUND CONNECTION SHALL BE APPROXIMATELY 10 OHMS OR LESS, AND GROUND-ENHANCEMENT MATERIALS MAY BE REQUIRED TO ACHIEVE THIS.

DECODER WIRING:

EACH TWO-WIRE PATH SHALL CONSIST OF APPROVED DECODER CABLE FOR THIS SPECIFIC SYSTEM. THE WIRE SHALL CONSIST OF TWO TWISTED SOLID-CORE COPPER WIRES, COLOR-CODED RED AND BLUE, WITHIN A POLYETHYLENE JACKET FOR SOLAR AND CUT PROTECTION. WIRE CONDUCTORS SHALL BE 14AWG /2MM2 FOR DISTANCES UP TO 5000 FT/1500 M, OR 12AWG/3.3MM2 FOR DISTANCES UP TO 7500 FT/2300 M.

ALL SPLICES MADE WITHIN THE TWO-WIRE PATH SHALL BE MADE WITH UL-LISTED WATERPROOF CONNECTIONS RATED TO 600V DIRECT BURIAL WITH A ROBUST STRAIN RELIEF. ALL SPLICES IN THE WIRE PATH SHALL BE MADE IN VALVE BOXES, WITH A MINIMUM OF 5 FT/1.5 M SLACK IN EACH VALVE BOX. ALL DECODERS AND SURGE SUPPRESSION DEVICES SHALL INCLUDE THE MINIMUM NUMBER OF SUCH CONNECTORS IN THE BOX FROM THE MANUFACTURER TO INSURE PROPER CONNECTION.



-GALLONS PER MINUTE-CATALOG FLOW WATERTRONICS 10 HP, CENTRIFUGAL, PREFABRICATED, ENCLOSED PUMP STATION MODEL #WMLV-5000-1-10-230-3-105-70 USING THE ADJACENT LAKE AS THE WATER SOURCE. PUMP SHALL INCLUDE A FLOW SENSOR (CONTRACTOR TO PROVIDE HUNTER DECODER FOR CONNECTION TO TWO WIRE PATH) AND NETAFIM AUTOMATIC FILTRATION SYSTEM. AVAILABLE POWER ON SITE IS ASSUMED TO BE A MINIMUM OF 230V/3PH, THIS SHOULD BE VERIFIED PRIOR TO PUMP INSTALLATION/ORDERING. RAIN BIRD PESB SERIES REMOTE CONTROL VALVE (SIZED PER PLAN) WITH A NIBCO T-113 GATE VALVE & HUNTER DUAL-1 DECODER IN A CARSON 1220 JUMBO VALVE BOX WITH BOLT DOWN LID CONTROLLER IS AN EXISTING HUNTER I—CORE TWO WIRE/DECODER CONTROLLER WITH 48 STATION CAPACITY, 30 STATIONS OCCUPIED. (CONTROLLER LOCATION NOT SHOWN) NIBCO P-619-RW MAINLINE ISOLATION VALVE (LINE SIZE) IN A CARSON 1419 VALVE BOX. CLASS 200 PVC LATERAL LINE W/ SCH 40 SOLVENT WELD PVC FITTINGS (SIZE PER PLAN, MINIMUM PIPE SIZE SHALL BE 3/4", NO 1/2" PIPES PERMITTED) CLASS 200 GASKETTED PVC MAINLINE WITH LEEMCO DUCTILE IRON FITTINGS AND MECHANICAL JOINT RESTRAINTS (SIZE PER PLAN). TRANSITION TO DR11-4710 IPS H.D.P.E. MAINLINE WITH AND FUSION WELDED FITTINGS UNDER HARDSCAPES GREATER THAN 20' WIDE (UNSLEEVED HDPE) DUE TO BELL ENDED PVC MAINLINE. CLASS 200 PVC SLEEVES W/SCH 40 SOLVENT-WELD PVC FITTINGS (SIZE PER PLAN) NOTE: EVERY MAINLINE SLEEVE/SLEEVE LOCATION SHALL BE ACCOMPANIED BY AN ADDITIONAL 2" SLEEVE FOR IRRIGATION CONTROL WIRES, SEE MAINLINE IN LEGEND FOR MAINLINE SLEEVING/HDPE OVER 20' LONG QUANTITIES GIVEN ARE FOR CONTRACTOR CONVENIENCE ONLY. THE ACCURACY IS NOT GUARANTEED. ALL QUANTITIES SHALL BE VERIFIED.

IRRIGATION LEGEND

DESCRIPTION

QTY

SYM

STATION NUMBER

*DET (ON THE LEGEND) — THE LETTER IN THIS COLUMN DENOTES THE CORRESPONDING DETAIL SHOWN ON THE DETAIL SHEET.

		<u>irrigation head legend</u>			
SYMBOL	SYMBOL	DESCRIPTION	DETAIL	DESIGN PSI	DESIGN GPM PER SYMBOL
56	Ð	EACH SYMBOL DENOTES TWO (2) HUNTER PRO SPRAY 04-CV W/ PCB FLOOD BUBBLERS	Q	30	0.50
6	T	HUNTER PRO SPRAY 06-PRS30-CV W/ HUNTER MPCORNER NOZZLE ADJ ARC 0-90	R	30	VAR
34	1	HUNTER PRO SPRAY 12-PRS30-CV W/ HUNTER MPCORNER NOZZLE ADJ ARC 0-90	S	30	VAR
150	\vdash	HUNTER PRO SPRAY 06-PRS30-CV W/ HUNTER MP1000 NOZZLE MAROON ADJ ARC 90-210	R	30	VAR
5		HUNTER PRO SPRAY 06-PRS30-CV W/ HUNTER MP1000 NOZZLE LIGHT BLUE ADJ ARC 210-270	R	30	VAR
2	\bigcirc	HUNTER PRO SPRAY 06-PRS30-CV W/ HUNTER MP1000 NOZZLE OLIVE ADJ ARC 360	R	30	0.65
133	M	HUNTER PRO SPRAY 12-PRS30-CV W/ HUNTER MP1000 NOZZLE MAROON ADJ ARC 90-210	S	30	VAR
1	1	HUNTER PRO SPRAY 12-PRS30-CV W/ HUNTER MP1000 NOZZLE LIGHT BLUE ADJ ARC 210-270	S	30	VAR
33	<u>M</u>	HUNTER PRO SPRAY 12-PRS30-CV W/ HUNTER MP1000 NOZZLE MAROON ADJ ARC 90-210 ON SCH 40 RISER	Т	30	VAR
1	<u>(1)</u>	HUNTER PRO SPRAY 12-PRS30-CV W/ HUNTER MP1000 NOZZLE LIGHT BLUE ADJ ARC 210-270 ON SCH 40 RISER	Т	30	VAR
1	<u> </u>	HUNTER PRO SPRAY 12-PRS30-CV W/ HUNTER MP1000 NOZZLE OLIVE ADJ ARC 360 ON SCH 40 RISER	Т	30	0.65
61	Œ\	HUNTER PRO SPRAY 06-PRS30-CV W/ HUNTER MP2000 NOZZLE BLACK ADJ ARC 90-210	R	30	VAR
1	G	HUNTER PRO SPRAY 06-PRS30-CV W/ HUNTER MP2000 NOZZLE GREEN ADJ ARC 210-270	R	30	VAR
54	ĸ	HUNTER PRO SPRAY 12-PRS30-CV W/ HUNTER MP2000 NOZZLE BLACK ADJ ARC 90-210	S	30	VAR
11	Ŕ	HUNTER PRO SPRAY 12-PRS30-CV W/ HUNTER MP2000 NOZZLE BLACK ADJ ARC 90-210 ON SCH 40 RISER	Т	30	VAR
47	B	HUNTER PRO SPRAY 06-PRS30-CV W/ HUNTER MP3000 NOZZLE BLUE ADJ ARC 90-210	R	30	VAR
2		HUNTER PRO SPRAY 06-PRS30-CV W/ HUNTER MP3000 NOZZLE YELLOW ADJ ARC 210-270	R	30	VAR
6	A	HUNTER PRO SPRAY 06-PRS30-CV W/ HUNTER MP3000 NOZZLE GRAY ARC 360	R	30	3.15
25	(B)	HUNTER PRO SPRAY 06-PRS30-CV W/ HUNTER MP3500 NOZZLE LT. BROWN ADJ ARC 90-210	R	30	VAR
3	B	HUNTER PRO SPRAY 12-PRS30-CV W/ HUNTER MP3000 NOZZLE BLUE ADJ ARC 90-210	S	30	VAR
3	<u>B</u>	HUNTER PRO SPRAY 12-PRS30-CV W/ HUNTER MP3000 NOZZLE BLUE ADJ ARC 90-210 ON SCH 40 RISER	Т	30	VAR
21		HUNTER PRO SPRAY 06-PRS30-CV W/ HUNTER MPCORNER NOZZLE RST	R	30	VAR
23		HUNTER PRO SPRAY 06-PRS30-CV W/ HUNTER MPCORNER NOZZLE LST	R	30	VAR
172	\bigcirc	HUNTER PRO SPRAY 06-PRS30-CV W/ HUNTER MPCORNER NOZZLE SST	R	30	VAR
38		HUNTER PRO SPRAY 12-PRS30-CV W/ HUNTER MPCORNER NOZZLE RST	S	30	VAR
37		HUNTER PRO SPRAY 12-PRS30-CV W/ HUNTER MPCORNER NOZZLE LST	S	30	VAR
71	\bigcirc	HUNTER PRO SPRAY 12-PRS30-CV W/ HUNTER MPSTRIP NOZZLE SST	S	30	VAR
27	\triangle	HUNTER PRO SPRAY 12-PRS30-CV W/ HUNTER MPCORNER NOZZLE LST ON SCH 40 RISER	Т	30	VAR
24		HUNTER PRO SPRAY 12-PRS30-CV W/ HUNTER MPCORNER NOZZLE RST ON SCH 40 RISER	Т	30	VAR
97	<u> </u>	HUNTER PRO SPRAY 12-PRS30-CV W/ HUNTER MPSTRIP NOZZLE SST ON SCH 40 RISER	T	30	VAR
15	2.Ø	HUNTER I-20-06-SS-2.0 STANDARD NOZZLE (QTR CIRCLE)	٧	55	2.10
		HUNTER I-20-06-SS-4.0 STANDARD NOZZLE (HALF CIRCLE)	٧	55	4.50
18	8.0	HUNTER I-20-06-SS-8.0 STANDARD NOZZLE (FULL CIRCLE)	٧	55	9.00

NOTES:

- 1. PUMP MANUFACTURER TO INSTALL SUCTION LINE(S). ALL SUCTION LINES REQUIRE RIP RAP TO BE PLACED BELOW WATER LEVEL. ENSURE SUCTION LINE(S) IS/ARE AT LEAST 2' OFF OF LAKE/CANAL
- 2. PUMP MANUFACTURER TO ENSURE CANAL SCREEN IS PLACED AT END OF SUCTION LINE.
- 3. STATIC SUCTION LIFT FOR THE PUMP STATION CAN NOT EXCEED 10'. IF THIS MAXIMUM IS EXCEEDED, DO NOT PROCEED WITHOUT WRITTEN PERMISSION FROM THE OWNER/OWNER'S REPRESENTATIVE.
- 3. CONTRACTOR TO CHECK THE WATER QUALITY TO ENSURE IT IS SUITABLE FOR LANDSCAPE PLANTINGS. USE THE SERVICES OF A REPUTABLE, LICENSED LABORATORY ONLY. WATER QUALITY TESTING MUST INCLUDE pH, CONDUCTIVITY, SODIUM, POTASSIUM, CALCIUM, MAGNESIUM, CARBONATE, BICARBONATE, CHLORIDE, PHOSPHOROUS, NITRATE NO3, SULFATE SO4, BORON, IRON, TOTAL DISSOLVED SOLIDS, SODIUM ABSORPTION RATIO, AND HARDNESS. IF THE WATER IS DETERMINED SUITABLE CONTINUE IRRIGATION INSTALLATION. IF THE WATER QUALITY IS UNSUITABLE, DO NOT PROCEED WITHOUT WRITTEN DIRECTION FROM THE OWNER/OWNER'S REPRESENTATIVE.
- 4. IF A HIGH IRON CONTENT (OR OTHER STAIN PRODUCING COMPOUND) IS DETECTED, ADVISE THE OWNER/OWNER'S REPRESENTATIVE. DO NOT PROCEED WITHOUT WRITTEN PERMISSION. IF A CHEMICAL INJECTION SYSTEM IS REQUIRED BY THE OWNER, IT MUST BE DIRECTED BY THE OWNER AND INSTALLED BY THE PUMP SYSTEM MANUFACTURER.
- 5. PRIOR TO INSTALLING ANY IRRIGATION SYSTEM COMPONENTS. THE CONTRACTOR SHALL OBTAIN A WATER SAMPLE FROM THE PROPOSED WATER SUPPLY. CONDUCT A PARTICLE SIZE AND COUNT ANALYSIS ON THE SAMPLE USING THE SERVICES OF A REPUTABLE LAB CERTIFIED IN SUCH ANALYSES. SUBMIT THE TEST RESULTS TO THE OWNER/OWNER'S REPRESENTATIVE FOR REVIEW AND APPROVAL. DO NOT PROCEED FURTHER WITH SYSTEM INSTALLATION UNTIL GIVEN WRITTEN APPROVAL TO DO SO. IF CONTRACTOR DOES NOT COMPLY WITH THIS REQUIREMENT, ANY COSTS TO MAKE THE IRRIGATION SYSTEM OPERATE AS REQUIRED (WHICH WOULD NOT HAVE BEEN INCURRED HAD THESE REQUIREMENTS BEEN COMPLIED WITH), WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

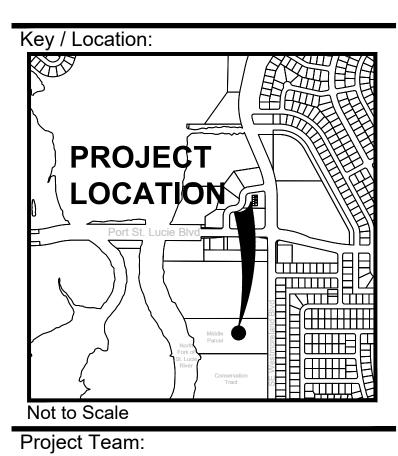
REMODEL NOTES (FOR EXISTING IRRIGATION)

- 1. CONTRACTOR TO CUT AND CAP ONLY THOSE PORTIONS OF THE EXISTING IRRIGATION NO LONGER NEEDED DUE TO NEW IRRIGATION.
- 2. CONTRACTOR TO ADD, ADJUST, MOVE, CHANGE, ETC. SPRINKLER HEADS AND NOZZLES AS REQUIRED TO ENSURE 100% HEAD TO HEAD COVERAGE WITH A D.U. OF .7 OR GREATER IN AREAS WHERE PROPOSED AND EXISTING IRRIGATION MEET.
- 3. CONTRACTOR TO FIELD LOCATE EXISTING IRRIGATION, AS REQUIRED. CUT, CAP, AND MARK PRIOR TO SITE DEMOLITION TO PREVENT DAMAGE TO EXISTING IRRIGATION. ONCE NEW HARDSCAPES ARE COMPLETED, INSTALL NEW IRRIGATION AND CONNECT MAINLINES FROM NEW IRRIGATION TO THE EXISTING IRRIGATION LINES, AS INDICATED. THE SIZE OF THE PROPOSED MAINLINE MUST BE EQUAL TO OR LARGER IN SIZE THAN THE EXISTING MAINLINE IT IS TO BE CONNECTED TO. IF THIS IS NOT WHAT IS FOUND, DO NOT PROCEED WITHOUT RECEIVING WRITTEN AUTHORIZATION TO PROCEED. IF THE CONTRACTOR PROCEEDS WITHOUT PRIOR WRITTEN AUTHORIZATION, IT IS AT THE CONTRACTORS RISK. ANY AND ALL COSTS INCURRED, THAT ARE REQUIRED TO PROVIDE A FULLY FUNCTIONAL IRRIGATION SYSTEM, WILL BE AT THE CONTRACTORS EXPENSE.
- 4. CONTRACTOR TO COORDINATE THE SCHEDULE OF EXISTING CONTROLLER WITH SCHEDULE OF PROPOSED CONTROLLER IF APPLICABLE.
- 5. IRRIGATION CONTRACTOR SHALL ENSURE ALL EXISTING LANDSCAPES CONTINUE TO RECEIVE IRRIGATION, AS NEEDED, DURING CONSTRUCTION.

INDEX OF DRAWINGS:

Overall Layout & Irrigation Legends CV-IR Irrigation Plan Details & Specifications IR-4 TO IR-7





Westmoreland Irrigation Plan

Port St. Lucie, Florida Owner/Developer: City of Port St. Lucie

By Description 0/29/21 JJ Resubmitta



SCALE: 1" = NTS

Designer

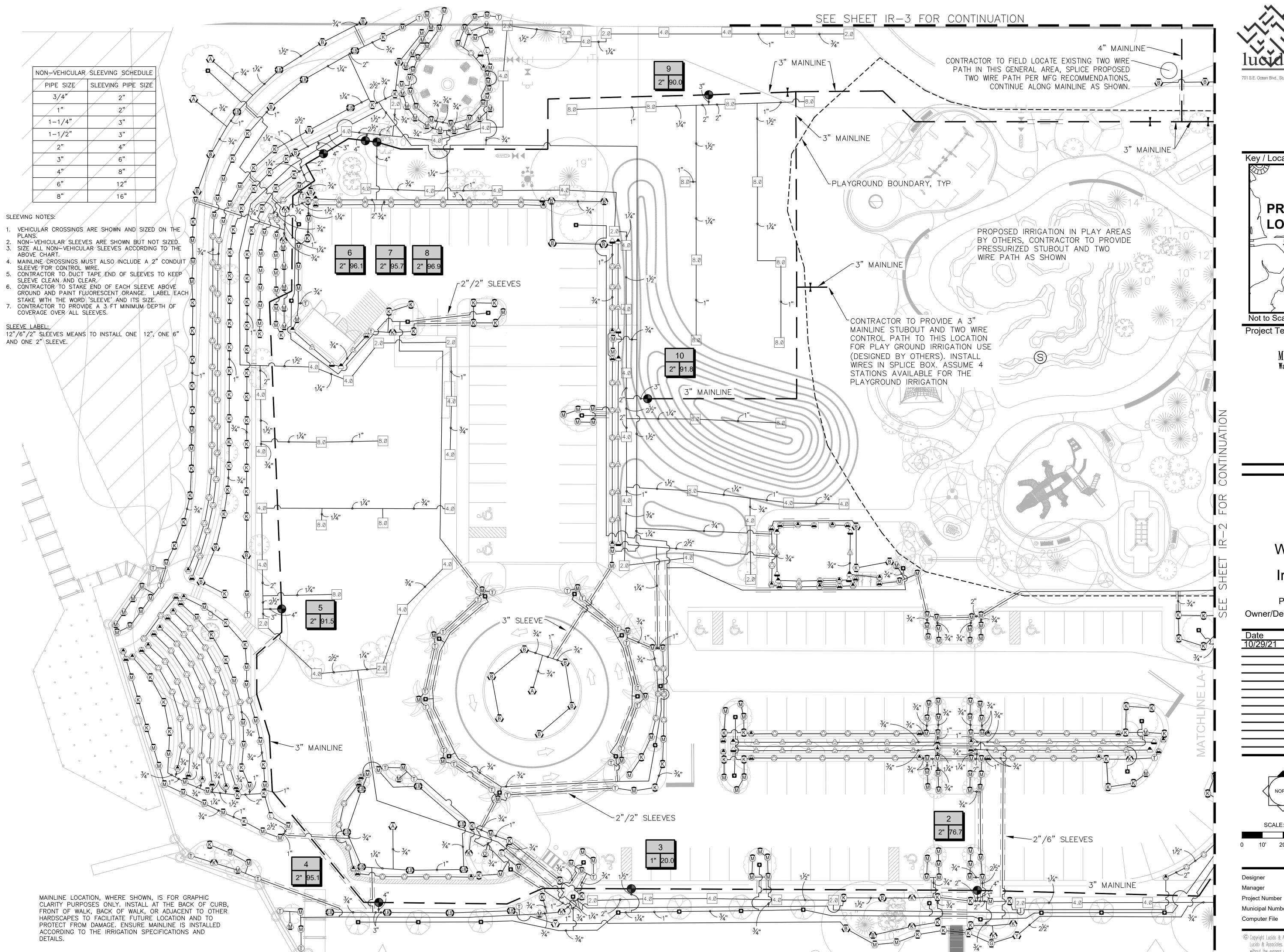
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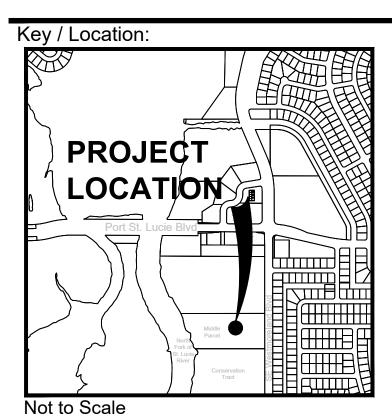
REG. # 1018 Thomas P. Lucido

Project Number Municipal Number P17-004-A2

20-110 Westmoreland_IR.dwg







Masuen Consulting LLC Water Management Consultants
301 S. Washington, Suite F
Newport, WA 99156

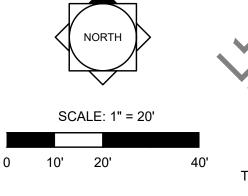
Project Team:

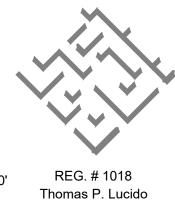
Telephone (866) 928-1533 Fax (800) 928-1534 PROUDLY DESIGNED AND PRODUCED IN THE USA

Westmoreland Riverwalk Irrigation Plan

Port St. Lucie, Florida Owner/Developer: City of Port St. Lucie

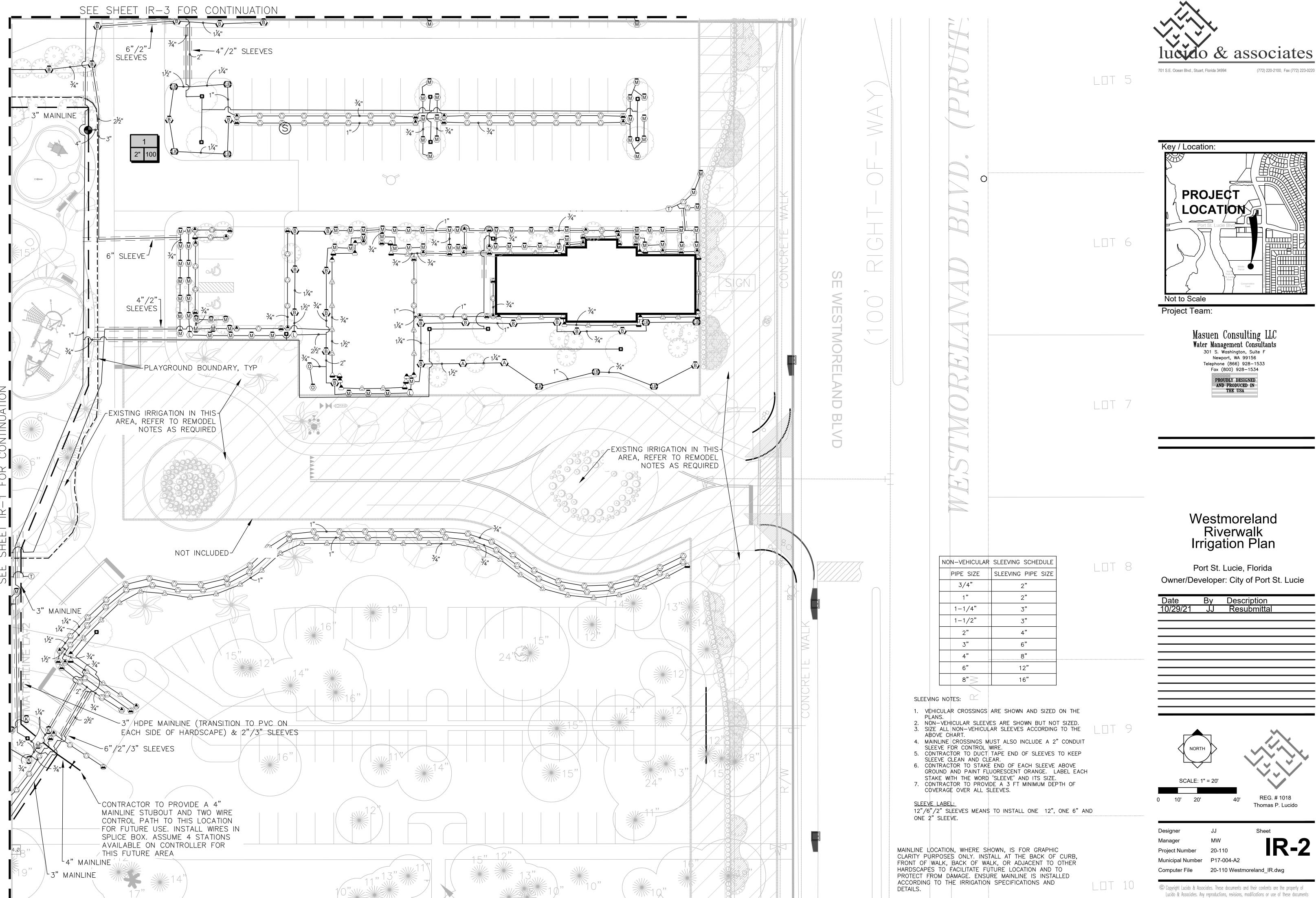
Date	Ву	Description	
10/29/21	JJ	Resubmittal	
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20-110 Project Number Municipal Number P17-004-A2

20-110 Westmoreland_IR.dwg



1.1 DESCRIPTION

PART 1 - GENERAL

A. The contractor shall provide solid wall high density polyethylene pipelines which conform to AWWA, and ASTM standards and other reference documents listed under Section 1.02 with flanged and thermal butt fusion joints complete in place.

1.2 REFERENCES

- A. To the extent referenced in this specification section, the standards and documents listed below are included, and made a part of this specification.
- B. In the event of a conflict, the requirements of this specification section prevail. C. Unless otherwise specified, references to documents shall mean the latest published edition of the
- referenced document in effect at the bid date of the project. D. ANSI/AWWA (www.awwa.org)
- 1. ANSI/AWWA C901-08 Polyethylene (PE) Pressure Pipe and Tubing, ½ In. (13 mm) Through 3 In. (76 mm) for Water Service 2.ANSI/AWWA C906-07 Polyethylene (PE) Pressure Pipe and Fittings, 4 In. (100 mm) Through 63 In.
- (1,600 mm), for Water Distribution and Transmission 3. AWWA M55 Manual of Water Supply Practices, PE Pipe—Design and Installation
- E. Plastics Pipe Institute, PPI (www.plasticpipe.org)
- 1. PPI Handbook of Polyethylene Pipe 2009 (2ndEdition)
- 2.PPI TR-33 Generic Butt Fusion Joining Procedure for Polyethylene Gas Pipe 3.PPI TR-34 Disinfection of Newly Constructed Polyethylene Water Mains
- 4. PPI TR-41 Generic Saddle Fusion Joining Procedure for Polyethylene Gas Piping
- 5.PPI TN-42 Recommended Minimum Training Guidelines for PE Pipe Butt Fusion Joining Operators for Municipal and Industrial Projects (2009)
- F. ASTM (www.astm.org) 1. ASTM F 714 Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter
- 2. ASTM F905 Standard Practice for Qualification of Polyethylene Saddle-Fused Joints 3.ASTM F 1055 Standard Specification for Electrofusion Type Polyethylene Fittings for Outside
- Diameter Controlled Polyethylene Pipe and Tubing 4.ASTM F 1290 Standard Practice for Electrofusion Joining Polyolefin Pipe and Fittings
- 5. ASTM F 1412 Standard Specification for Polyolefin Pipe and Fittings for Corrosive Waste Drainage 6.ASTM F1417 Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using
- Low-Pressure Air4 December 2009 7.ASTM F 2164 Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure
- Piping Systems Using Hydrostatic Pressure 8.ASTM F2206 Standard Specification for Fabricated Fittings of Butt-Fused Polyethylene (PE) Plastic Pipe, Fittings, Sheet Stock, Plate Stock, or Block Stock
- 9.ASTM D 2239 Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter
- 10. ASTM D 2321 Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
- ASTM F 2620 Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings ASTM D 2683 Standard Specification for Socket-Type Polyethylene Fittings forOutside
- Diameter-Controlled Polyethylene Pipe and Tubing
- ASTM D 2737 Standard Specification for Polyethylene (PE) Plastic Tubing 14. ASTM D 2774 Standard Practice for Underground Installation of Thermoplastic Pressure
- ASTM D 3261 Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings
- for Polyethylene (PE) Plastic Pipe and Tubing ASTM D 3350-08 Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

1.3 SYSTEM DESIGN PARAMETERS

- A. The polyethylene system working pressure rating accommodates the normal operating pressure and the repetitive surges. The pressure rating applies at 80oF or less. Piping installed under this project may experience operating temperatures up to 95oF. Associated pressure rating at this elevated temperature shall not be less than 80% of the pressure rating at 90oF.
- B. Per AWWA 901 and C906, the repetitive surge pressure allowance is one half the pressure class of the pipe, and the occasional surge over pressure allowance is equal to the pressure class of the pipe. Allowable Total Pressure during Recurring Surge conditions equals 1.5 times the pipe's pressure class. Allowable Total Pressure during Occasional Surge conditions equals 2.0 times the pipe's

NON-VEHICULAR SLEEVING SCHEDULE

SLEEVING PIPE SIZE

pressure class.

Table 1 gives the Pressure Class per AWWA C906, Pressure Rating and Allowable Total Pressure during Recurring and Occasional Surge for PE4710 pipe at 80°F or less.

1.4 SUBMITTALS

- A. Quality Assurance / Control Submittals
 - 1. Affirmation that product shipped meets or exceeds the standards set forth in this specification. This shall be in the form of a written document from the manufacturer attesting to the
 - manufacturing process meeting the standards. 2. Manufacturers recommended fusion procedures for the products.

1.5 DELIVERY - STORAGE - HANDLING A. Handle the pipe in accordance with the PPI Handbook of Polyethylene Pipe (2nd Edition), Chapter 2 using approved strapping and equipment rated for the loads encountered. Do not use chains, wire rope, forklifts or other methods or equipment that may gouge or damage the pipe or endanger persons or property. Field storage is to be in compliance with AWWA Manual of Practice M55 Chapter 7. B. If any gouges, scrapes, or other damage to the pipe results in loss of 10% of the

PART 2 - PRODUCTS FOR 4 INCH THROUGH 54 INCH PIPE PER AWWA C906

pipe wall thickness, cut out that section or do not use.

- A. Polyethylene pipe shall be made from HDPE material having a material designation code of PE4710. The material shall meet the requirements of ASTM D 3350. The pipe segments shall be joined using flanges or the thermal butt fusion method.
- B. The pipe and fittings shall meet the requirements of AWWA C906.
- C. Approved manufacturers are: One of the following, or approved equal: 1. Performance Pipe
- 2. Flying W
- 3. J.M. Eagle
- 4. Pipeline Plastics WL Plastics

- A. Butt Fusion Fittings Fittings shall be made of HDPE material with a minimum material designation code of PE4710 and with a minimum Cell Classification as noted in 2.01A. Butt Fusion Fittings shall meet the requirements of ASTM D3261. Molded and fabricated fittings shall have a pressure rating equal to the pipe unless otherwise specified on the plans. All fittings shall meet the requirements of
- Markings for molded fittings shall comply with the requirements of ASTM D 3261. Fabricated fittings shall be marked in accordance with ASTM F 2206. Socket fittings shall meet ASTM D 2683. B. Electrofusion Fittings - Fittings shall be made of HDPE material with a minimum material
- designation code of PE4710 and with a minimum Cell Classification as noted in 2.01A. Electrofusion Fittings shall have a manufacturing standard of ASTM F1055. Fittings shall have a pressure rating equal to the pipe unless otherwise specified on the plans. All electrofusion fittings shall be suitable for use as pressure conduits, and have nominal burst values of four times the Working Pressure Rating (WPR) of the fitting. Markings shall be according to ASTM F 1055.
- C. Flanges and Mechanical Joint Adapters (MJ Adapters) Flanges and Mechanical Joint Adapters shall have a material designation code of PE4710 and a minimum Cell Classification as noted in 2.01A. Flanged and Mechanical Joint Adapters can be made to ASTM D 3261 or if machined, must meet the requirements of ASTM F 2206. Flanges and MJ Adapters shall have a pressure rating equal to the pipe unless otherwise specified on the plans. Markings for molded or machined flange adapters or MJ Adapters shall be per ASTM D 3261. Fabricated (including machined) flange adapters shall be

Van-Stone style, metallic (including stainless steel), convoluted or flat-plate, back-up rings and bolt materials shall follow the guidelines of Plastic Pipe Institute Technical Note # 38, and shall have the bolt-holes and bolt-circles conforming to one of these standards: ASME B-16.5 Class 150. ASME B-16.47 Series A Class 150, ASME B-16.1 Class 125, or AWWA C207 Class 150 Series B, D, or E. The back-up ring shall provide a long-term pressure rating equal to or greater than the pressure-class of the pipe with which the flange adapter assembly will be used, and such pressure rating shall be marked on the back-up ring. Flange assemblies shall be assembled and torqued according to PPI TN-38 "Bolt Torque for Polyethylene Flanged Joints.".

2.3 PIPE AND FITTING IDENTIFICATION

MAINLINE LOCATION, WHERE SHOWN, IS FOR GRAPHIC

CLARITY PURPOSES ONLY. INSTALL AT THE BACK OF CURB FRONT OF WALK, BACK OF WALK, OR ADJACENT TO OTHER

HARDSCAPES TO FACILITATE FUTURE LOCATION AND TO

ACCORDING TO THE IRRIGATION SPECIFICATIONS AND

DETAILS.

PROTECT FROM DAMAGE. ENSURE MAINLINE IS INSTALLED

A. The pipe shall be marked in accordance with the standards to which it is manufactured. B. Color identification by the use of stripes on pipe to identify pipe service shall be required. If used, stripes or colored exterior pipe product shall be blue for potable water, or green for wastewater/sewage, or purple (lavender) for reclaimed water.

PART 3 - EXECUTION

3.1 JOINING METHODS

- A. Butt Fusion: The pipe shall be joined by the butt fusion procedure outlined in ASTM F 2620 or PPI TR-33. All fusion joints shall be made in compliance with the pipe or fitting manufacturer's recommendations. Fusion joints shall be made by qualified fusion technicians per PPI TN-42.
- B. Saddle Fusion: Saddle fusion could be used to fuse branch saddles, tapping tees, and other HDPE constructs onto the wall of the main pipe. Saddle fusion shall be done in accordance with ASTM F 2620 or TR-41 or the fitting manufacturer's recommendations and PPI TR-
- 41. Saddle fusion joints shall be made by qualified fusion technicians. Qualification of the fusion technician shall be demonstrated by evidence of fusion training within the past year on the equipment to be utilized on this project (ASTM F905).
- C. Socket Fusion: Socket fusion is not allowed on this project. D. Electrofusion: Electrofusion joining shall be done in accordance with the manufacturers recommended procedure. Other sources of electrofusion joining information are ASTM F 1290 and PPI TN 34. The process of electrofusion requires an electric source, a transformer, commonly called an electrofusion box that has wire leads, a method to read electronically (by laser)or otherwise input the barcode of the fitting, and a fitting that is compatible with the type of electrofusion box used. The electrofusion box must be capable of reading and storing the input parameters and the fusion results for later download to a record file. Qualification of the fusion technician shall be demonstrated by evidence of electrofusion training within the past year on the equipment to be

utilized for this project.

- 1. Mechanical connection of HDPE to auxiliary equipment such as valves, pumps, and fittings shall use mechanical joint adapters and other devices in conformance with the PPI Handbook
- of Polyethylene Pipe, Chapter 9 and AWWA Manual of Practice M55, Chapter 6. 2.Mechanical connections on small pipe under 3" are available to connect HDPE pipe to other HDPE pipe, or a fittings, or to a transition to another material. The use of stab-fit style couplings is allowed, along with the use of metallic couplings of brass and other materials. When a compression type or mechanical type of coupling is used, the use of
- a rigid tubular insert stiffener inside the end of the pipe is recommended. 3. Mechanical couplings that wrap around the pipe and act as saddles are made by several manufacturers specifically for HDPE pipe. All such saddles, tapping saddles, couplings, clamps etc. shall be recommended by the manufacturer as being designed for use with HDPE pipe at the pressure class listed in this section.
- 4.Unless specified by the fitting manufacturer, a restraint harness or concrete anchor is recommended with mechanical couplings to prevent pullout. 5. Mechanical coupling shall be made by qualified technicians. Qualification of the field technician shall be demonstrated by evidence of mechanical coupling training within the past year.
- This training shall be on the equipment and pipe components to be utilized for this
- F. Flanged: Flanged connections shall consist of the following: 1. A polyethylene flange shall be thermally butt-fused to the stub end of the pipe.
- 2.A back-up ring shall mate with another back-up ring or flange, as required. 3. Connections shall be made with bolts and nuts.
- 4. Fanged connections shall be provided with a full-face neoprene gasket.
- 5.All materials shall be compatible to the application.

EXISTING PORT ST. LUCIE BOTANICAL GARDENS IRRIGATION TO REMAIN. WESTMORELAND PARK TO UTILIZE EXISTING

CONTROLLER ON THE PSL BOTANICAL GARDENS SITE

- G. Joint Recording The critical parameters of each fusion joint, as required by the manufacturer
- and these specifications, shall be recorded either manually or by an electronic data logging device. All fusion joint data shall be included in the Fusion Technician's joint report.

3.2 INSTALLATION

- A. Buried HDPE pipe and fittings shall be installed in accordance with ASTM D2321 or ASTM D2774 for pressure systems and AWWA Manual of Practice M55 Chapter 7.
- B. For pipe buried in normal (dry) soils:

of 95% Proctor.

- a.Pipe embedment Embedment material should be Class I, Class II, or Class III, materials as defined by ASTM D-2321 Section 6. The use of Class IV and Class V materials is not recommended, however it may be used only with the approval of the engineer and appropriate b.Bedding: Pipe bedding shall be in conformance with ASTM D2321 Section 8. Compaction rates
- should be as specified in ASTM D2321. Deviations shall be approved by the engineer. c. Haunching and backfill shall be as specified in ASTM D 2321 Section 9 with Class I, II, or III
- materials. Compaction shall be in excess of 95% Proctor. C. For pipe buried in saturated (wet) soils:

a.Pipe embedment - Embedment material shall be #57 stone compacted in excess of 95% Proctor.

b.Bedding: Bedding material shall be #57 stone compacted in excess of 95% Proctor. c. Haunching and backfill shall be rip-rap or shot-rock from blasting activities compacted in excess

3.3 INSPECTION

A. Inspect the pipe for defects before installation and fusion. Defective, damaged or unsound pipe will

3.4 TESTING

A. Pressure testing shall be conducted in accordance with ASTM F2164, Field Leak Testing of Pressure Piping Systems Using Hydrostatic Pressure. The HDPE pipe shall be filled with Polvethylene test pressure and allowed to stabilize. The test pressure shall be 1.5 times the lowest point in the system. In accordance with section 9.8, the pipe shall operating pressure at the pass if the final pressure is within 5% of the test pressure for 1 hour. For safety reasons, hydrostatic testing only will be used.

B. Quality Control Testing (On Site Bend Back Test)

Prior to HDPE pipe being installed in the trench, at the beginning of the job, the contractor shall cut out the first butt fusion of each pipe size. The contractor shall prepare the sample for the test in accordance with the "Job Aid/ Bend Back Testing" procedure document prepared by ISCO Industries, LLC dated Oct. 26, 06 or as revised, and in accordance with ASTM D 2657. The samples shall be tested in the presence of the owner's representative and / or the irrigation consultant, all in accordance with testing procedures outlined in the ISCO document. All samples shall be labeled and saved. Testing must be done at 73 degrees F plus or minus 5 degrees. The test temperature and sample size are critical to testing. The purpose of the test is to determine if a good weld was made. A pass means no failures during the bend back test. This means a good weld. A break means a bad weld. Any failure shall require additional testing.

C. Contractor Qualifications

The contractor shall have successfully installed high density polyethylene pipe in golf/turf irrigation projects. References will be required. These reference(s) must provide a satisfactory response or the experience will not be accepted.

If a contractor has not previously successfully installed HDPE pipe for golf/turf irrigation projects, he will be required to have a qualified fusion technician from the pipe supplier for a period of three to five day (at the expense of the contractor). The length of time required for HDPE pipe (fusion and mechanical) training shall be determined by the owner or his representative. The technician must have been trained and have fusion certification. The training must have been completed within the past twelve months. A designated person or persons will be trained by the technician. The training will include the following:

- 1. butt fusion
- 2. socket fusion electrofusion
- 4. attachment of mechanical saddles.
- 5. If electrofused or side wall fusion is required, this training must also be complete while the technician is on site.

D. Contractor Equipment Qualifications

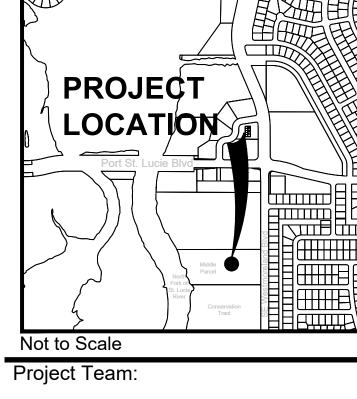
If the contractor owns butt fusion equipment, the equipment must be serviced prior to use for this project. The machine must be environmental friendly and satisfactory working order. The hydraulic system must be leak free. The pressure gage must be checked for accuracy and the thermometer

If a butt fusion machine is rented, it must be rented from company that has a fusion machine service center or centers certified by the butt fusion machine manufacturer. The machine must arrive with certification that the pressure gage and heater thermometer were accurate when shipped.

3.5 CONTRACTOR WARRANTY

LIMITED WARRANTY: Contractor warrants that, for a period of five years from the date of installation, it will re-fuse or repair a fusion connection that is defective in workmanship, provided that Buyer, upon discovery of a defect, promptly notifies Contractor of the defect and, allows the Contractor to inspect at the place of installation. If it is determined the fused connection to be defective. Contractor will re-fuse or repair the connection at the jobsite. Contractor does not warrant the product itself, only the fused connection. This warranty does not cover labor or other costs, only the fused connection. Buyer's sole remedy for defective connection shall be to receive replacement fusion of the pipe or fitting as provided in this Limited Warranty. Other than the above limited warranty. Contractor makes no warranty and expressly disclaims all other warranties, express or implied, including, but not limited to, the warranties of merchantability and fitness for a particular purpose.

Contractor's liability arising out of or related to this contract or any product or service supplied by contractor (whether such liability is alleged as a breach of contract, breach of liability or otherwise) shall in no even exceed the original purchase price of the defective connection plus applicable freight costs actually paid by buyer. Contractor will not be liable for any consequential, incidental, special, indirect or punitive damages, loss of profits, loss of business opportunity or other loss even if contractor knew or standard have known of the possibility of such damages or losses.



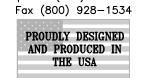
(772) 220-2100, Fax (772) 223-0220

701 S.E. Ocean Blvd., Stuart, Florida 34994

Key / Location:

Masuen Consulting LLC Water Management Consultants 301 S. Washington, Suite F

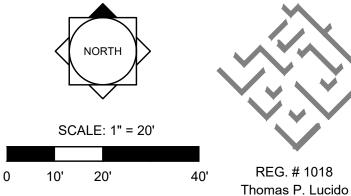
> Newport, WA 99156 Telephone (866) 928-1533



Westmoreland Riverwalk Irrigation Plan

Port St. Lucie, Florida Owner/Developer: City of Port St. Lucie

By Description)/29/21 JJ Resubmitta



20-110 Project Number

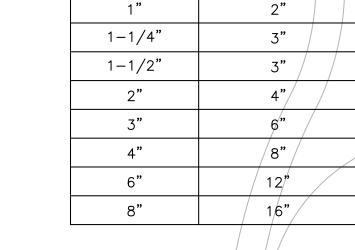
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Computer File

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20-110 Westmoreland_IR.dwg

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PIPE SIZE

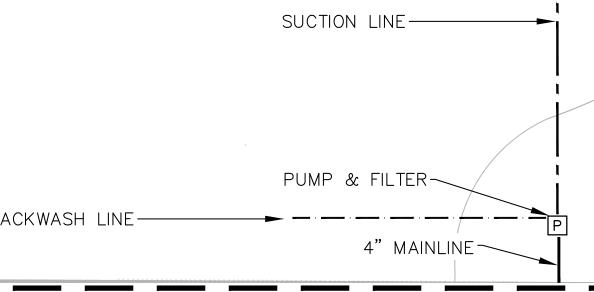
3/4"

SLEEVING NOTES:

- 1. VEHICULAR CROSSINGS ARE SHOWN AND SIZED ON THE
- 2. NON-VEHICULAR SLEEVES ARE SHOWN BUT NOT SIZED.
- 3. SIZE ALL NON-VEHICULAR \$LEEVES ACCORDING TO THE ABOVE CHART. 4. MAINLINE CROSSINGS MUST ALSO INCLUDE A 2" CONDUIT
- SLEEVE FOR CONTROL WIRE. 5. CONTRACTOR TO DUCT TAPE END OF SLEEVES TO KEEP
- SLEEVE CLEAN AND CLEAR. 6. CONTRACTOR TO STAKE END OF EACH SLEEVE ABOVE GROUND AND PAINT FLUORESCENT ORANGE. LABEL EACH
- STAKE WITH THE WORD 'SLEEVE' AND ITS SIZE. 7. CONTRACTOR TO PROVIDE A 3 FT MINIMUM DEPTH OF COVERAGE OVER ALL SLEEVES.

SLEEVE LABEL:

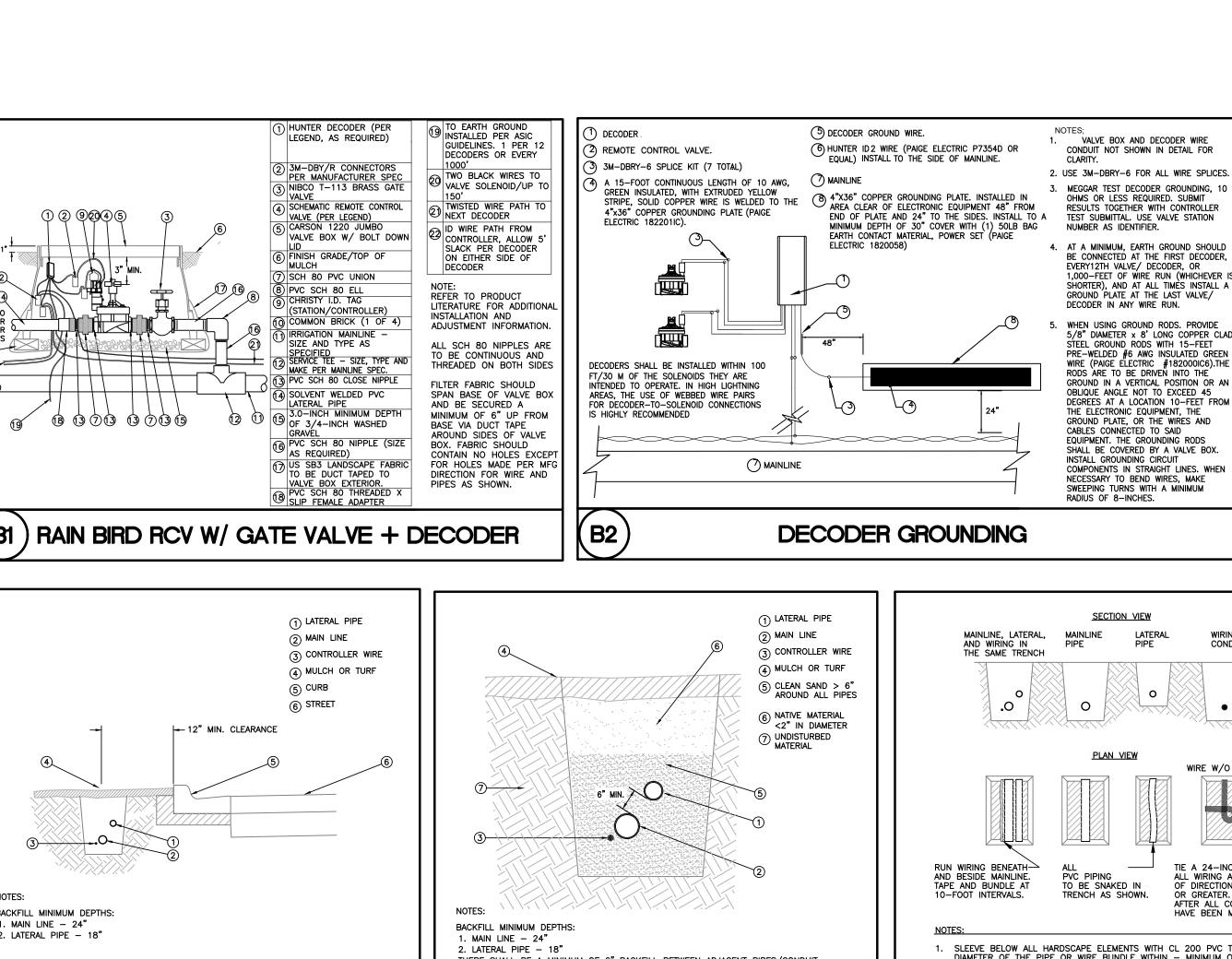
12"/6"/2" SLEEVES MEANS TO INSTALL ONE 12", ONE 6" AND ONE 2" SLEEVE.

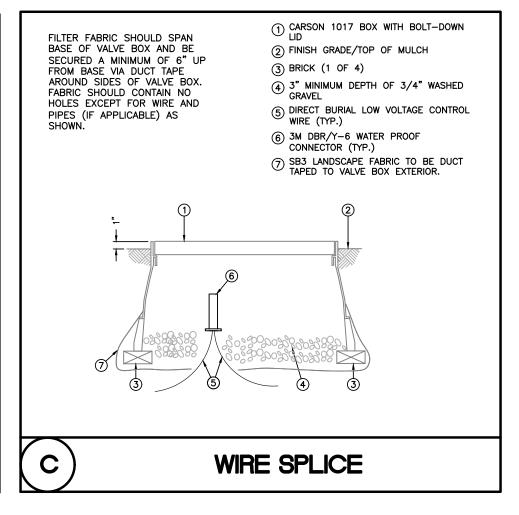


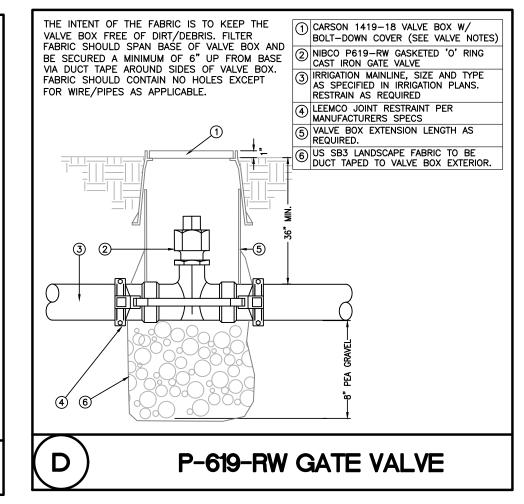
BACKWASH LINE-

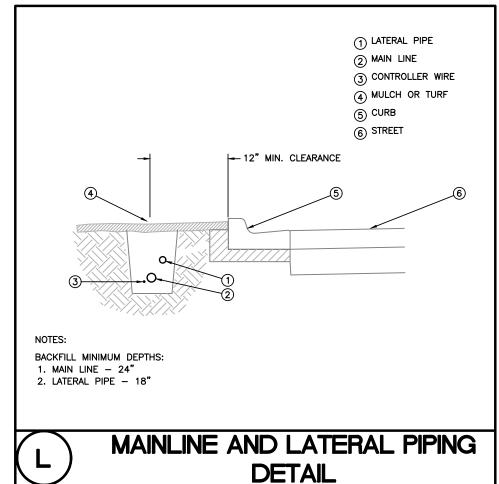
SEE SHEET IR-1 FOR CONTINUATION

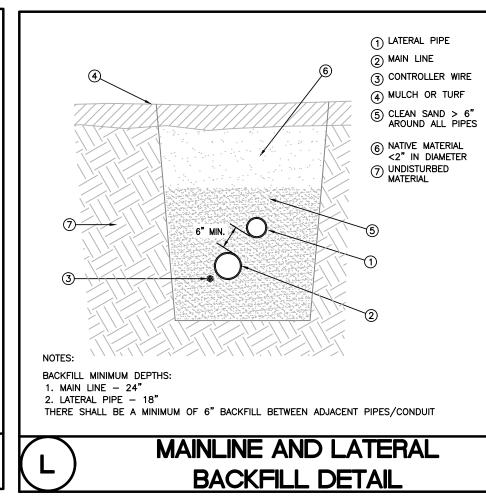
SEE SHEET IR-2 FOR CONTINUATION

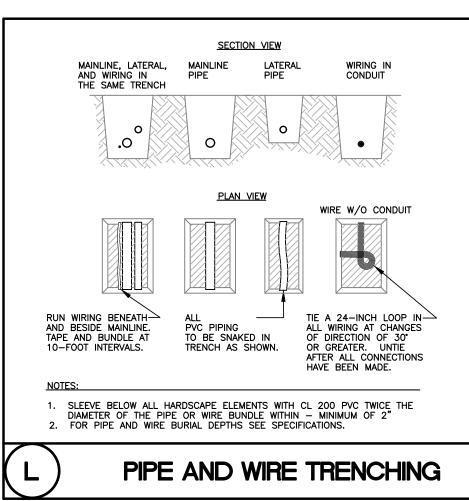


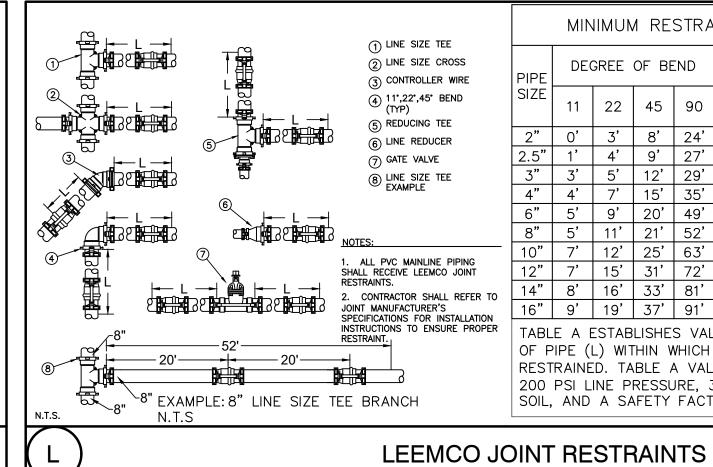


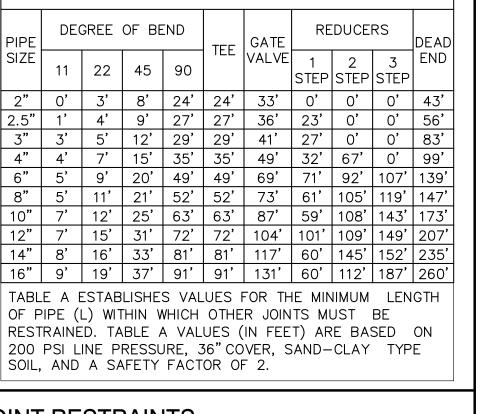




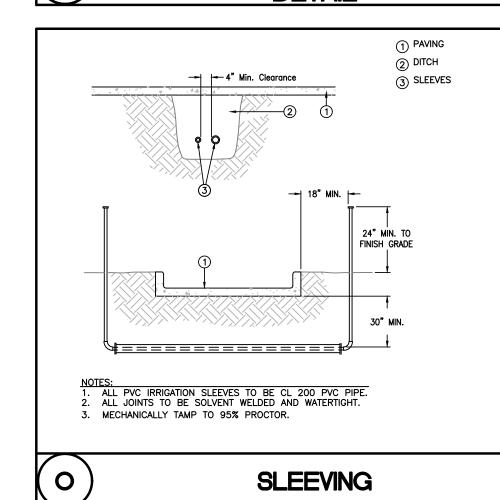


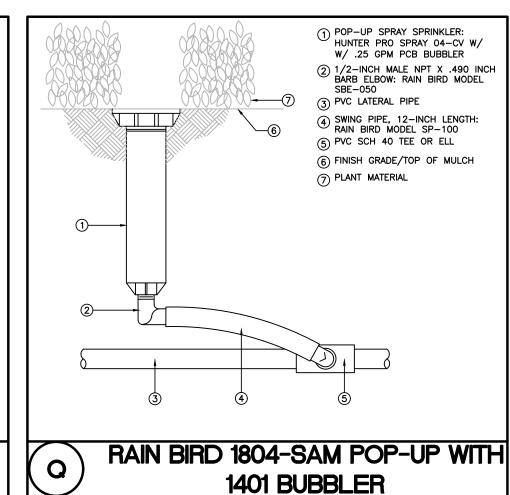


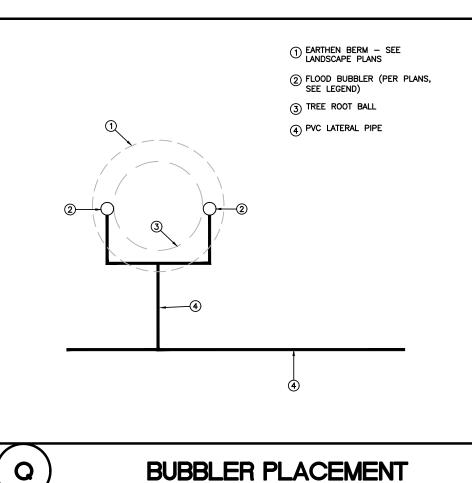


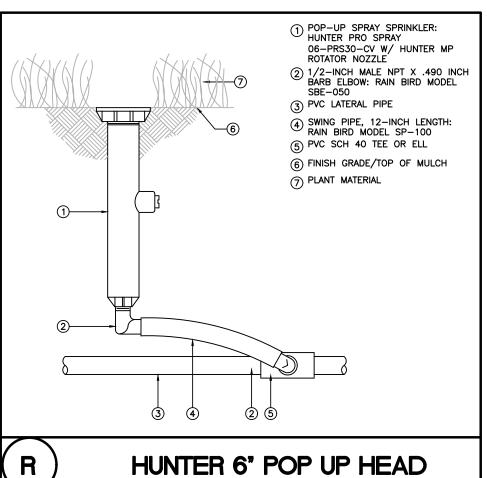


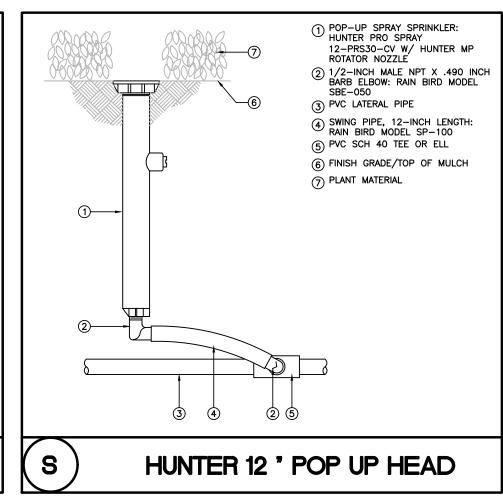
MINIMUM RESTRAINED LENGTH IN FEET

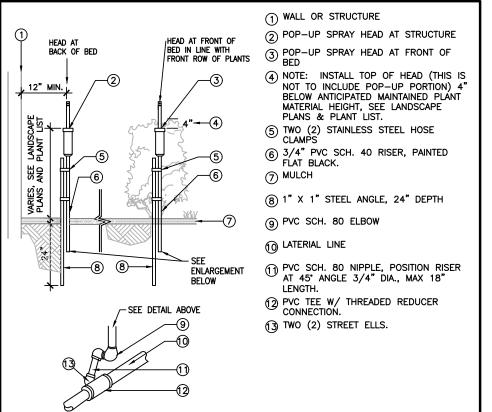




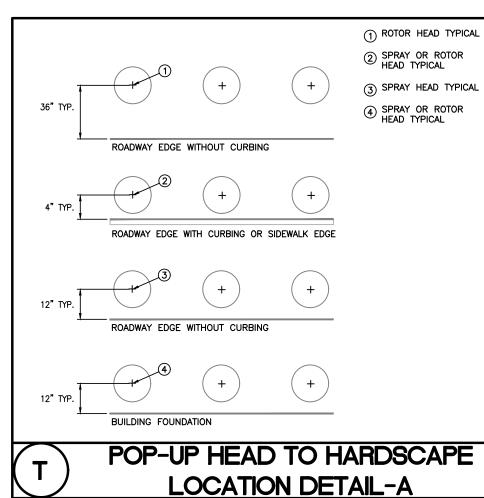


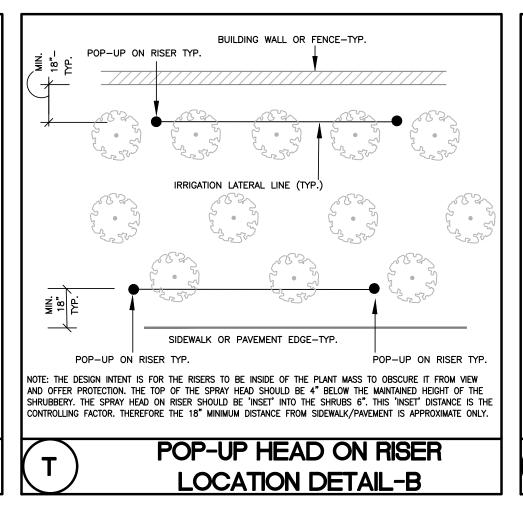


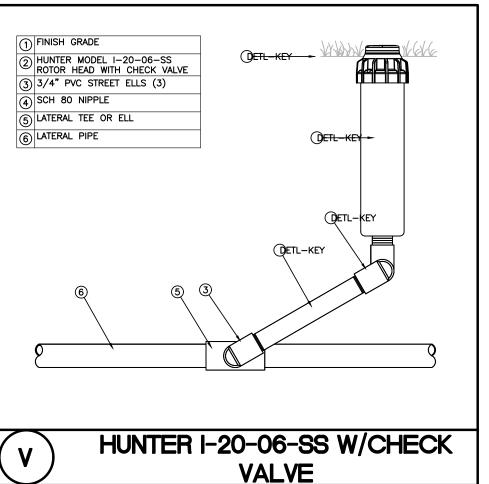


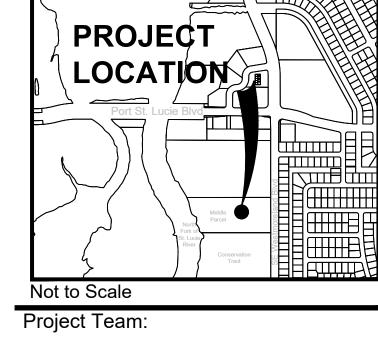


POP-UP HEAD ON RISER









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Masuen Consulting LLC Water Management Consultants

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Key / Location:

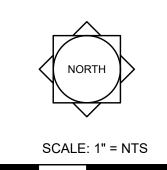
301 S. Washington, Suite F Newport, WA 99156 Telephone (866) 928-1533 Fax (800) 928-1534 PROUDLY DESIGNED AND PRODUCED IN

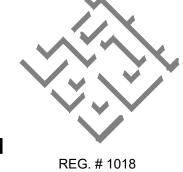
THE USA

Westmoreland Riverwalk Irrigation Plan

Port St. Lucie, Florida Owner/Developer: City of Port St. Lucie

By Description 0/29/21 JJ Resubmitta



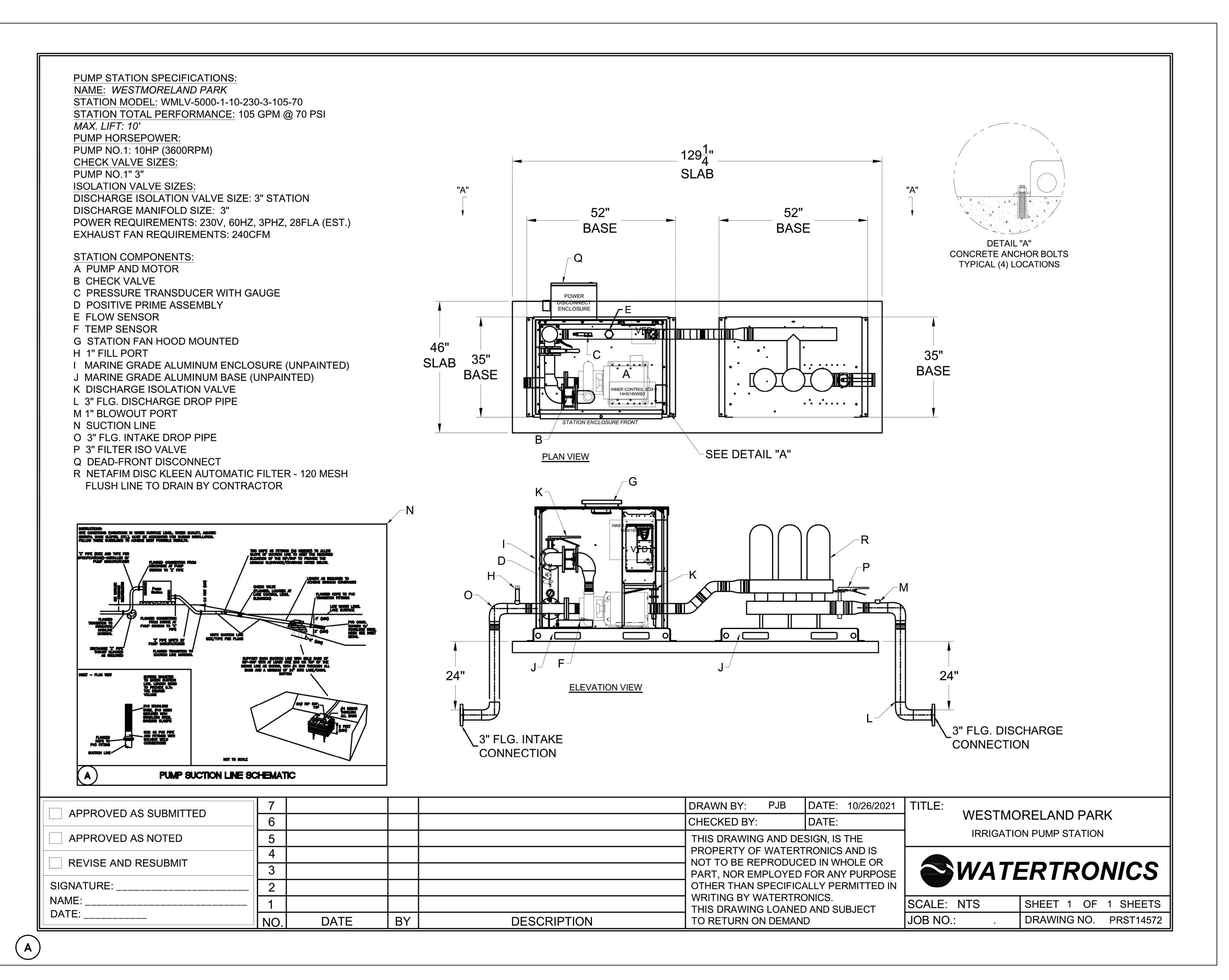


Thomas P. Lucido

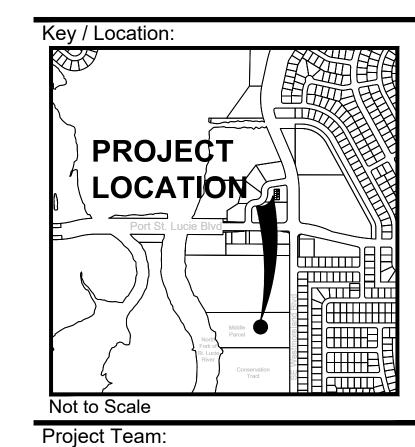
20-110 Project Number P17-004-A2 Municipal Number

Computer File

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Masuen Consulting LLC
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301 S. Washington, Suite F
Newport, WA 99156

Newport, WA 99156 elephone (866) 928-1533 Fax (800) 928-1534 PROUDLY DESIGNED

Westmoreland Riverwalk Irrigation Pump

Port St. Lucie, Florida
Owner/Developer: City of Port St. Lucie

Date 10/29/21	By	Description Resubmittal	
10/29/21	JJ	Resubmittal	
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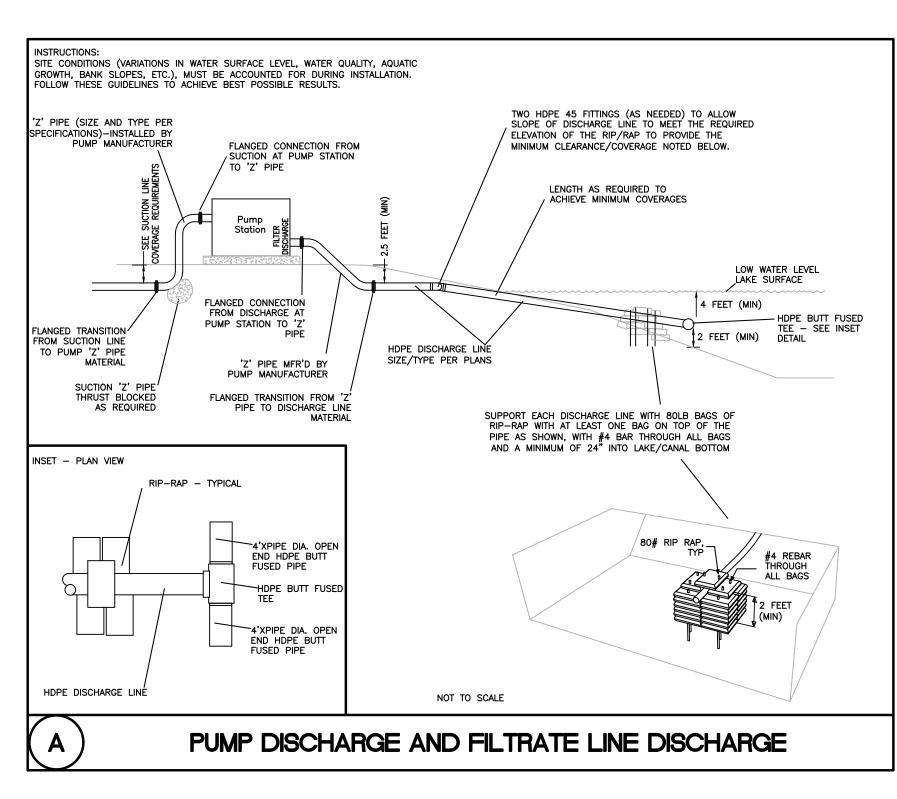
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TECHNICAL SPECIFICATIONS

Horizontal Centrifugal, automatic pump station Design criteria:

WMLV-5000-1-10-230-3-105-70 Pump station model #: **Quantity of pumps:**

Pump station capacity:

105 GPM @ 70 PSI Discharge Pressure

3 Phase, 230 Volt, 60 Hertz Power supply:

Dead-Front **Disconnect Style:**

Marine Grade Aluminum Pump station enclosure type: Variable Frequency Drive Station pressure regulation:

Pump Station Requirements

Parameter	Pump		
Pump type	Horizontal Centrifugal		
Pump Flow at design point	105 GPM		
Pump pressure (TDH) at design point	180'		
Pump efficiency at design point	64%		
Motor RPM (nominal)	3600		
Motor horsepower	10 HP		
Motor full load amps (FLA)	24 Amps		
Motor efficiency @ FL	90.2%		
Starting current (locked rotor)	86.3 Amps		
Motor power factor @ FL	86%		
Motor service factor	1.15		
Pressure regulation type	VFD		
Low PSI cutout set point	20 PSI below regulate		
Low PSI cutout time delay	240 Seconds		
High PSI cutout set point	11 PSI above regulate		
High PSI cutout time delay	120 Seconds		
High volute temperature cutout setpoint	120 Degrees F		

Additional Station Details

Automatic Filter	Netafim Apollo Disc Kleen w/ 120 Mesh Screen
Dead Front Disconnect	Yes
Intake and Discharge Drop Pipes	Yes

WATERMAX-5000

VARIABLE FREQUENCY DRIVE PUMP STATION

GENERAL SPECIFICATION

Project Name: Westmoreland Park Project Location: PSL

SCOPE OF WORK

It is the intention of this specification to describe a self—enclosed automatic pump station for a turf irrigation system. This shall be accomplished by using a completely prefabricated pump station conforming to the following specifications. The water supply type shall be identified in the accompanying Technical Specifications and shall call out the suction lift or incoming pressure in feet of head, (TDH).

The pumping station shall be WaterMax Model Number WMLV-5000-1-10-230-3-105-70 as manufactured by WATERTRONICS, INC. 525 Industrial Drive, P.O. Box 530, Hartland, Wisconsin 53029-0530, <u>www.watertronics.com.</u>

SECTION 1: GENERAL

- 1.1 The pump station performance at enclosure limits shall be as noted in the technical specifications. The capacity, discharge pressure, and pump inlet pressure shall be per the technical specifications. The pump shall operate at no more than 3600 RPM. The power supply to the station shall be as noted in the technical specifications.
- 1.2 The station shall be completely wired, piped, dynamically flow and pressure tested prior to shipment.
- 1.3 Operational sequence: The pump shall activate automatically upon detecting a drop in pressure in the irrigation main line, or a remote start signal. Operation shall be maintained at an adjustable minimum demand. The pump shall be automatically retired when the demand falls below the minimum adjustable set point for an adjustable time delay.
- 1.4 Construction: Construction shall be of modular form utilizing a base structurally adequate to support pumps, piping, and electrical equipment as a single integral assembly. All nuts, bolts washers, and fasteners shall be stainless steel, zinc or cadmium plated for corrosion resistance.

SECTION 2: PUMP AND MOTOR

2.1 PUMP

Pump shall be electric motor driven, horizontal centrifugal with mechanical shaft seal, volute case and impeller. The shaft seal shall be a self_adjusting mechanical type to prevent leakage and eliminate the need for a drain piping. The volute case shall be precision machined from gray cast iron and engineered to modern hydraulic standards. It shall be possible to rotate the discharge connection to any of four positions. A heavy cast iron bracket shall maintain alignment between the motor and volute case. The impeller shall be an enclosed type and balanced to provide smooth operation. The impeller shall be keyed to the shaft and locked with a special cap screw and washer. The motor shaft is to be manufactured from high grade steel and of reduced length to increase shaft rigidity, extend bearing life, and reduce the overall length of the pump and motor assembly. The pump shaft shall be protected with a replaceable stainless steel sleeve. The pump, motor and impeller shall be removable from the back of volute case for service without disturbing the plumbing.

2.2 MOTOR

Pump motor shall be a squirrel cage induction horizontal solid shaft type. The pump impeller shall be direct mounted and keyed to the motor shaft with a stainless steel protective sleeve. The temperature rise of the motor shall be to NEMA Standard for class B or Class F insulation. Radial and thrust bearings of ample capacity to accommodate the hydraulic thrust of the pump shall be incorporated into the motor.

PIPING MANIFOLD, VALVES, GAUGES AND OTHER MECHANICAL SECTION 3: **EQUIPMENT**

3.1 FABRICATED PIPING

All fabricated piping shall conform to ASTM specifications A53 for Grade B welded or seamless schedule 40 pipe. All welded flanges shall be forged steel, slip_on or weld neck type. All welded fittings shall be seamless, ASTM Specification A234, with pressure rating not less than

3.2 CHECK VALVE

Pump check valve shall be cast iron bodied with a spring loaded single disc. Check valves shall be sized according to the maximum discharge flow of the pump. Pressure drop across the check valve shall not exceed 2.5 PSI at full flow.

3.3 STATION DISCHARGE ISOLATION VALVE

Pump shall be isolated by means of a butterfly valve after the check valve and before the piping exits the station enclosure. Isolation valves shall be butterfly type with ten position lever, rated for 200 PSI WOG working pressure. Trim shall include stainless steel stem, bronze or nickel coated iron streamlined disk with full faced resilient seat design to eliminate need for flange gaskets.

3.4 DRAIN VALVES

Drains shall be provided from all low points in the system and shall consist of 1/4" petcocks or ball valves.

3.5 PRESSURE GAUGES

Pressure gauges shall be located upstream and downstream of the pump for easy reading of the intake and discharge pressure. Pressure gauges shall be 304 stainless steel case and bezel construction. Gauges shall be 2-1/2" diameter, liquid filled. Pressure sensing connection shall be 1/4" NPT lower gauge connection.

SECTION 4: ELECTRICAL CONTROLS

4.1 CONTROL HARDWARE

The pump sequence controller shall be an industrial grade PLC with diagnostic LEDs for monitoring of discrete inputs and outputs. Not less than two additional analog inputs and outputs shall be standard for monitoring and control purposes. The PLC shall contain RS232 and RS485 communication ports for monitoring and programming purposes. The PLC shall contain an EEPROM, battery backed RAM and non-volatile memory for storage of critical configuration data. The PLC will have a high speed counter, clock and calendar function with year, month, day, hour, minute, and day of week

4.1A Automatic Pressure Regulation Based on Variable Flow

The pump station controls shall be capable of changing the regulated downstream pressure while in operation, based on discharge flow or discrete input as called out by the technical specifications. The pump station controls shall also be capable of up to six, user adjustable pressure regulation set points based on discharge flow or one additional set point based on a discrete input. In addition to adjustment of downstream pressure, the controls shall be capable of up six pressure regulation algorithms to insure accurate pressure regulation regardless of regulated

pressure, discharge flow or connected pump combination.

4.1B Color Touchscreen Operator Interface

Operator interface shall be a full color STN active matrix LCD display unit mounted in the enclosure door. Operator interface shall be used for logical display of all pump station functions. The operator interface shall be NEMA 4 rated. The operator interface shall be touch sensitive with intuitive on—screen user instruction for ease of operator use. The use of buttons or keys or off-screen user instructions shall not be permitted. The operator interface shall be LCD color display type with no less than 640 x 480 pixel resolution, with viewing area measuring not less than 7" diagonal. User memory for storing critical pump operation data shall not be less than required for up to 1 year of data.

The operator interface shall allow the user to view and modify all pertinent operation parameters. The operator interface shall incorporate password protection for modification of critical pump station parameters. The operator interface capabilities shall include but are not limited to the

- Overview screen showing pump system configuration. Screen shall show if each individual pump is enable or disabled, the number of hours on each pump, station full flow and pressure design criteria
- b. System screen with information on current regulation pressure, setpoint, regulation pressure, System status, restarts remaining, VFD reference speed, pressure regulation method (VFD), and adjust settings button. Adjust settings button will allow changing parameters etc after entering password.
- c. Settings menu to allow changes to pressure regulation settings, pipe saver mode, VFD manual mode, analog calibration, flow calibration, program or register settings.
- d. Flow screen will display pressure in PSI, flow in GPM and total gallons pumped in thousands of gallons. Separate display for total gallons pumped since last reset.
- Alarm status with time stamping, display of pump station conditions at shutdown and restart. Alarms will be displayed in red when activated and a separate listing will be displayed in green when the alarm is reset. Alarms will be logged to a compact flash disk allowing the service technician to upload data to a spreadsheet type program.
- f. Full control of and capability of monitoring, adjusting and viewing any options present such as water level, inlet strainer, wye strainer, filtration, chemical injection, or liquid tank levels. Adjustment of automatic/manual pressure regulation set points.
- g. Graphing capability for up to 1 full year detailing flow rate and pressure. Graphing function shall give option to graph and plot a point every minute. The graph function will be selectable by day, month and year as well as the time of desired graph. All data will be logged to a compact flash disk allowing the service technician to upload data to a spreadsheet type program.

4.1 DEAD-FRONT MAIN STATION DISCONNECT

A three_pole, service rated main station disconnect shall be mounted in a separate NEMA 4 enclosure outside the pump station enclosure to completely isolate the pump station electrical system from incoming

The incoming high voltage disconnect shall be supplied as a Dead Front

4.2 PUMP THERMAL SWITCH

The temperature of the pump shall be sensed by a thermal switch. The thermal switch shall be located on the pump volute. Externally mounted snap disc type thermal switches will not be accepted. The thermal switch shall activate upon a temperature rise above 120 degrees Fahrenheit.

4.3 FLOW SENSOR

The pump station discharge manifold shall incorporate an insertion type, pulse frequency output flow sensor for continuous output to pump station controls. The flow sensor output pulse shall be conditioned and fed directly to the processor for conversion and display in Gallons Per Minute and totalize. Flow sensor accuracy shall be no less than 2% for flow velocities ranging from 1 - 30 feet per second.

4.4 PRESSURE TRANSDUCER

A solid state pressure transducer shall provide a noise free, linear output proportional to discharge pressure. Transducer shall be solid state, strain gauge type with integral voltage regulating and output accuracy not less than 0.5%. Transducer shall be constructed of stainless steel and rated for the maximum pump station discharge pressure.

4.5 VARIABLE FREQUENCY DRIVE (VFD)

The variable frequency drive shall be IGBT based with selectable carrier frequency up to 15 KHZ. The VFD shall include terminals for incoming power, motor output power and control terminals. The VFD shall generate a sine-coded, variable voltage/frequency, three-phase output for optimum speed control. The VFD shall incorporate power loss ride—through. VFD protective features shall include current limit, short circuit protection, electronic motor overload protection and ground fault protection. The VFD shall have push button programming display for easy access to operation parameters. VFD must be designed for operation in 50 degree C temperature condition.

4.6 NATIONAL ELECTRICAL CODE STANDARDS

Electrical controls shall conform to National Electrical Code Standards.

CONTROL ALARMS:

4.7 LOW SYSTEM PRESSURE SAFETY SHUTDOWN

When the station discharge pressure remains below an adjustable set point for the time called out in the Technical Specifications, the pumps will be de_energized and remain so until the alarm is manually reset. The Low Pressure alarm will be indicated on the processor display.

4.8 HIGH SYSTEM PRESSURE SAFETY SHUTDOWN

When the station discharge pressure remains above an adjustable set point for the time called out in the Technical Specifications, the pumps will be de_energized and remain so until the alarm is manually reset. The High Pressure alarm will be indicated on the processor display.

4.9 HIGH PUMP VOLUTE TEMPERATURE SHUTDOWN

If the pump volute case temperature rises above 120 degrees F. for the pre—programmed time, the pump will be de_energized and remain so until the alarm is manually reset. The High Temperature alarm will be indicated on the processor display.

4.10 MOTOR OVERLOAD SHUTDOWN

If the over current condition lasts longer than the pre-programmed limit the motor will be de-energized and remain so until the alarm is manually reset. The overload alarm will be indicated on the processor display.

4.11VFD FAULT SHUTDOWN

The VFD shall sense additional internal faults that will cause the VFD to shutdown for system protection. These faults will be indicated on the processor display.

4.13 LIGHTNING ARRESTOR

The main power supply to the pump station shall be equipped with a secondary lighting arrestor having a breakdown current rating of not less than 60,000 Amps at 14,000 Volts discharge. Power supplies 300 Volts and less shall use a 300 Volt arrestor with an 800 Volt spark—over Voltage. Power supplies up to 600 Volts shall use a 600 Volt rated arrestor with a 1,000 Volt spark—over Voltage.

4.14 CORROSION INHIBITING MODULES

Corrosion inhibiting modules shall be installed in the main electrical control enclosure in accordance with the manufacture's recommendations.

SECTION 5: MOUNTING BASE AND ENCLOSURE

5.1 MARINE GRADE ALUMINUM MOUNTING BASE

Construction shall include a fabricated base assembly to support all components during shipping and to serve as the installed mounting base. Pump station base shall be formed from a single sheet of 1/4" plate resulting in a seamless, one piece base with rounded edges and corners. The base shall be strategically reinforced beneath as required to provide additional support and strength. The base shall be drilled and tapped allowing the pump to be secured to the base.

5.2 MARINE GRADE ALUMINUM ENCLOSURE

Construction shall include a weather resistant, marine grade aluminum enclosure. The front side of the enclosure shall have oversized cooling vents. The enclosure is to be supplied with a two internally mounted gas struts that shall extend to keep the access door open. All components are to be accessible from top and front sides with the door completely open. Enclosure is to be suitable for mounting to the pump station base and shall include openings for suction and discharge piping.

5.3 EXHAUST FAN

For the purpose of cooling the pump motor, switchgear and control logic, an exhaust fan shall be located inside the pump enclosure, mounted to the enclosure lid. The exhaust fan shall be activated upon pump start and shall run until the pump stops. The fan shall be black die-cast aluminum construction with UL94V-0 rated polycarbonate propeller and rated for not less than 240 CFM. Fan motor shall be permanent split capacitor type with stainless steel ball bearings, class B insulation and automatic thermal protection.

SECTION 6: PAINTING (Piping)

Painting of internal piping shall consist of a multi_step coating system which includes metal preparation, rust inhibitive baked epoxy prime coat, and a two part ultraviolet light insensitive baked polyurethane finish having total dry film thickness of not less than 5 mils. Prime coat and finish coat shall be baked at 165 degrees for not less than 30 minutes to achieve a high gloss, corrosion resistant finish.

SECTION 8: TESTING

The pump station and all its component parts shall undergo a complete hydraulic and electrical test prior to shipment from the factory. Testing shall be dynamic and include operation over the entire flow range of the pump station under specified suction and net discharge pressure conditions. A plot containing actual flow, pressure, KW consumption and motor RPM shall be furnished as part of the owners manual.

SECTION 9: OWNERS MANUAL

Complete start up instructions shall be provided by the manufacturer in the form of an owners manual.

SECTION 10: WARRANTY

The manufacturer shall warrant the pump station to be free of defects for one year from date of start up or fifteen months after shipment, whichever occurs first. Failures caused by lightning strikes, power surges, vandalism, operator abuse, or acts of God are excluded from warranty coverage.

SECTION 11: MANUFACTURER

days a week.

The pump station shall be manufactured by Watertronics, Inc., Hartland,

To be considered as "equal" the following information must be furnished by the contractor or manufacturer's representative at least 10 days prior to the date of the bid opening: 1. A complete specification and submittal of all major components for

the proposed pump station with individual pump performance

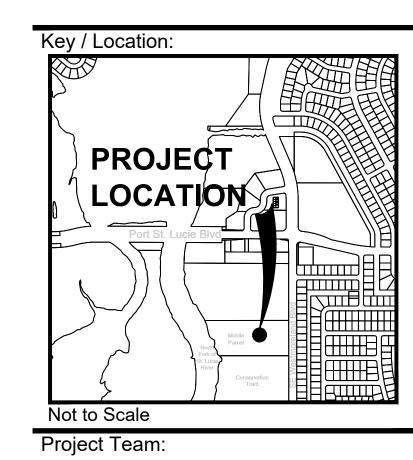
- 2. A detailed pumping station proposal drawing complete with component location, sizes and dimensions specific to the installation. 3. A complete electrical schematic for all high and low voltage circuits showing all circuit breakers, fuses and wire sizes. All wire numbering
- and colors must also be designated. 4. Pump station manufacturer's U.L. file number for the electrical controls and pump station.
- 5. A copy of the manufacturer's certificate of insurance. 6. Product support technicians shall be capable of accessing all information pertaining to the pumping equipment, e.g. electrical schematics, pump curves, program data, bill of materials, etc. The

manufacturer shall have no less than two technicians on call seven

7. The pump station manufacturer shall provide factory authorized or factory direct service personnel for the set, start-up, preventative maintenance and general service of the pump system. A factory authorized or factory direct service technician must be located within one-hundred (100) mile radius of the project site. The pump systems technician must have a minimum of 5 years' experience. The pump station manufacturer shall provide technical phone support twenty-four hours a day seven days a week.



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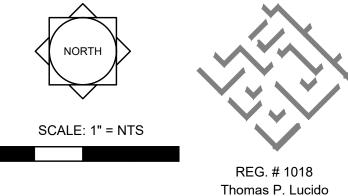
AND PRODUCED IN

THE USA

Westmoreland Riverwalk **Irrigation Pump**

Port St. Lucie, Florida Owner/Developer: City of Port St. Lucie

Date 10/29/21	By	Description Resubmittal
10/29/21	JJ	Resubmittal
_		~



Designer Manager MW 20-110 Project Number Municipal Number P17-004-A2

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IRRIGATION NOTES & SPECIFICATIONS

Irrigation design based on the Lucido & Associates landscape plan dated 5/6/21. Contractor shall refer to these plans to coordinate sprinkler and pipe locations.

The system has been designed to conform with the requirements of all applicable codes, laws, ordinances, rules, regulations and conventions. Should any conflict exist, the requirements of the codes shall prevail. It is the responsibility of the owner/installation contractor to ensure the entire system is installed as designed. Irrigation contractor responsible for obtaining all required permits according to federal, state and local laws.

The scope of work is shown on the plans, notes and details. The Irrigation Contractor shall be certified as a CERTIFIED IRRIGATION CONTRACTOR by the Irrigation Association. The certification shall be current and in good standing.

THE WORK

The work specified in this section consists of furnishing all components necessary for the installation, testing, and delivery of a complete, fully functional automatic landscape irrigation system that complies with the irrigation plans, specifications, notes, and details. This work shall include, but not be limited to, the providing of all required material if applicable (pump(s), backflows, pipes, valves, fittings, controllers, wire, primer, glue, etc.), layout, protection to the public, excavation, assembly, installation, back filling, compacting, repair of road surfaces, controller and low voltage feeds to valves, cleanup, maintenance, guarantee and as-built plans.

All irrigated areas shall provide 100% head—to—head coverage from a fully automatic irrigation system with a rain/freeze shut off device. The rain sensor shall be installed to prevent activation by adjacent heads and in a visually un-obtrusive location approved by owner. Zones are prioritized first by public safety and then by hydraulic concerns. This sequencing will be a mandatory punch list item.

These plans have been designed to satisfy/exceed the Florida Building Code (FBC) Appendix F and the Florida Irrigation Society Standards and Specifications for Turf and Landscape Irrigation Systems, fourth edition. All products should be installed per manufacturer's recommendation. Contractor shall verify all underground utilities 72 hours prior to commencement of work.

It is the responsibility of the irrigation contractor to familiarize themselves with all grade differences. location of walls, retaining walls, structures and utilities. Do not willfully install the sprinkler system as shown on the drawings when it is obvious in the field that unknown obstruction, grade differences or differences in the area dimensions exist that might not have been considered in the engineering. Such obstructions, or differences, should be brought to the attention of the owner's authorized representative. In the event this notification is not performed, the irrigation contractor shall assume full responsibility for any revisions necessary.

Irrigation contractor shall repair or replace all items damaged by their work. Irrigation contractor shall coordinate their work with other contractors for the location and installation of pipe sleeves and laterals through walls, under roadways and paving, etc.

The contractor shall take immediate steps to repair, replace, or restore all services to any utilities which are disrupted due to their operations. All costs involved in disruption of service and repairs due to negligence on the part of the contractor shall be their responsibility.

POINT OF CONNECTION (P.O.C.)

The P.O.C. is a new 10 hp Watertronics Centrifugal pump station model # WMLV-5000-1-10-230-3-105-70 utilizing the on site lake as the water source. The P.O.C. must be capable of delivering a minimum of 105 GPM at 70 PSI downstream of the pump discharge.

Contractor to verify these minimum conditions can be met prior to ordering of materials and the beginning of installation. If the conditions can not be met, the contractor must notify the designer prior to proceeding with the work. If the contractor does not do so, the contractor proceeds at their own risk and becomes responsible for any future work required to make the system perform as required.

THE PIPE

Pipe locations shown on the plan are schematic and shall be adjusted in the field. When laying out mainlines place a minimum of 18" away from either the back of curb, front of walk, back of walk, or other hardscape to allow for ease in locating and protection from physical damage. Install all lateral pipe near edges of pavement or against buildings whenever possible to allow space for plant root balls. Always install piping inside project's property boundary.

All pipes are to be placed in planting beds. If it is necessary to have piping under hardscapes, such as roads, walks, and patios, the pipes must be sleeved using Class 200 PVC with the sleeve diameter being twice the size of the pipe it is carrying with a minimum sleeve size of 2". No sleeve shall have turns or fittings that prevent a pipe from being manually pushed/pulled through after it is installed.

Pipe sizes shall conform to those shown on the drawings. No substitutions of smaller pipe sizes shall be permitted, but substitutions of larger sizes may be approved. All damaged and rejected pipe shall be removed from the site at the time of said rejection.

Mainline shall be Class 200 gasketted PVC with Leemco Ductile Iron fittings & Mechanical joint restraints.

Contractor to ensure all mainline piping is properly restrained using mechanical joint fittings, restraining collars, threaded rods, thrust blocks, etc.., as and where required. Contractor shall refer to pipe manufacturers recommended installation practices for further

PVC pipe joint compound and primer: The PVC cement shall be Weld-On 711 (grey, slow-drying, heavy duty) and the primer shall be Weld-On P70 (purple tinted, compatible with cement), or approved equals.

ELECTRICAL POWER SUPPLY

Electrical supply for irrigation pump to be provided by irrigation contractor. Contractor to coordinate with local utilities for the installation of, and connection to, site available power supplies for required electrical components as set forth in the irrigation plans.

All electrical work is to comply with the National Electrical Code and any, and all, other applicable electrical codes, laws and regulations. A licensed electrician shall perform all electrical hook—ups. Power for each controller shall be a dedicated 120 volt, 20 amp circuit unless otherwise specified in the plans. Power for each pump to be according to pump specifications indicated in these plans.

WIRING

The 2-wire irrigation control path shall be Paige 14-2 yellow twisted pair thermoplastic solid copper with pull boxes at 300' oc maximum, and grounded as identified in plans and per manufacturer recommendation.

SPARE WIRES

No spare wires required on a two wire system.

CONTROLLER AND PUMP STATION CONTROL PANEL GROUNDING

Contractor to utilize 4"X96"X0.0625" copper grounding plates, 5/8"X10' copper clad grounding rods, Cadweld "One—Shot" at all connection points, #6 insulated copper wire, and earth contact material. Install these and other required components as outlined in the details. Contractor to verify that the earth to ground resistance does not exceed 10 ohms.

Contractor shall provide a written certification, on a licensed electrical contractors letter head, showing the date of the test, pump location, and test results. Pump shall be so grounded and tested.

Two wire path grounding — contractor shall install grounding rods every 1000' along the two wire path and at least one on any wire stub-out shorter than 1000'. At each grounding rod, the contractor shall install an surge kit using a properly sized copper split bolt and grease filled water proof tube for the connection from the #6 insulated copper grounding wire from the grounding rod and the two wire path. Where acceptable, 3M-DBY/R connectors can be utilized. The connection to the grounding rod must be completed by a 'One Strike' CAD weld. This grounding effort must be in strict compliance with manufacturers warranty requirements.

LAYOUT

Lay out irrigation system mainlines and lateral lines. Make the necessary adjustments as required to take into account all site obstructions and limitations prior to excavating

Stake all sprinkler head locations. Adjust location and make the necessary modifications to nozzle types, etc. required to ensure 100% head to head coverage. Refer to the Edge of Pavement Detail on the Irrigation Detail Sheet.

Spray heads shall be installed 4" from sidewalks or curbed roadways and 12" from uncurbed roadways and building foundations. Rotors shall be installed 4" from sidewalks or curbed roadways, 12" from building foundations, and 36" from uncurbed roadways.

Shrub heads shall be installed on 3/4" Sch 40 PVC risers. The risers shall be set at a minimum of 18" off sidewalks, roadway curbing, building foundations, and/or any other hardscaped areas. Shrub heads shall be installed to a standard height of 4" below maintained height of plants and shall be installed a minimum of 6" within planted masses to be less visible and offer protection. Paint all shrub risers with flat black or forest green paint, unless irrigation system will utilize reuse water; in this case the risers shall be purple PVC and shall not be painted.

Locate valves prior to excavation. Ensure that their location provides for easy access and that there is no interference with physical structures, plants, trees, poles, etc. Valve boxes must be placed a minimum of 12" and a maximum of 15" from the edge of pavement, curbs, etc. and the top of the box must be 2" above finish grade. No valve boxes shall be installed in turf areas without approval by the irrigation designer — only in shrub beds. Never install in sport field areas.

Sequence all valves so that the farthest valve from the P.O.C. operates first and the closest to the P.O.C. operates last. The closest valve to the P.O.C. should be the last valve in the programmed sequence.

Adjust the flow control on each RCV to ensure shut off in 10 seconds after deactivation by the irrigation controller.

Using an electric branding iron, brand the valve I.D. letter/number on the lid of each valve box. This brand must be 2"-3" tall and easily legible.

EQUIPMENT

All pop-up heads and shrub risers shall be pressure compensating. All pop-up heads shall be mounted on flex-type swing joints. All rotors shall be installed with PVC triple swing joints unless otherwise detailed. In line check valves shall be installed if elevation changes dictate, refer to manufacturer's specifications.

All sprinkler equipment, not otherwise detailed or specified on these plans, shall be installed as per manufacturer's recommendations and specifications, and according to local and state laws.

Excavate straight and vertical trenches with smooth, flat or sloping bottoms. Trench width and depth should be sufficient to allow for the proper vertical and horizontal separation between piping as shown in the pipe installation detail on the detail sheet.

Protect existing landscaped areas. Remove and replant any damaged plant material upon job completion. The replacement material shall be of the same genus and species, and of the same size as the material it is replacing. The final determination as to what needs to be replaced and the acceptability of the replacement material shall be solely up to the owner or owner's representative.

INSTALLATION

Solvent Weld Pipe: Cut all pipe square and deburr. Clean pipe and fittings of foreign material; then apply a small amount of primer while ensuring that any excess is wiped off immediately. Primer should not puddle or drip from pipe or fittings. Next apply a thin coat of PVC cement; first apply a thin layer to the pipe, next a thin layer inside the fitting, and finally another very thin layer on the pipe. Insert the pipe into the fitting. Insure that the pipe is inserted to the bottom of the fitting, then turn the pipe a 1/4 turn and hold for 10 seconds. Make sure that the pipe doesn't recede from the fitting. If the pipe isn't at the bottom of the fitting upon completion, the glue joint is unacceptable and must be discarded.

Pipes must cure a minimum of 30 minutes prior to handling and placing into trenches. A longer curing time may be required; refer to the manufacturer's specifications. The pipe must cure a minimum of 24 hours prior to filling with water.

Gasketed Pipe: With pipe in the trench, cut pipe square, deburr, and place beveled edge on male portion of pipe, if not using a piece with a factory bevel. Clean pipe and fittings of foreign material; then apply a small amount of pipe grease to the rubber gasket on the female end. Fully insert the male end of the pipe into the bell end of adjacent pipe until the bevel is fully seated into the bell. Restrain pipe as required.

BACKFILL

The Backfill 6" below, 6" above, and around all piping shall be of clean sand and anything beyond that in the trench can be of native material but nothing larger than 2" in diameter. In all planting beds backfill all trenches to 85% Proctor and all trenches under hardscapes to be backfilled and compacted to 95% Proctor.

Mainline pipe depth measured to the top of pipe shall be:

- 24" minimum for 3/4"-2 1/2" PVC with a 30" minimum at vehicular crossings;
- 30" minimum for 3" & 4" PVC with a 36" minimum at vehicular crossings.

Lateral line depths measured to top of pipe shall be:

- 18" minimum for 3/4"-3" PVC with a 30" minimum at vehicular crossings. • 24" minimum for 4" PVC and above with a 30" minimum at vehicular crossings.
- Contractor shall backfill all piping, both mainline and laterals, prior to performing any pressure tests. The pipe shall be backfilled with the exception of 2' on each side of every joint (bell fittings, 90's, tees, 45's, etc.). These joints shall not be backfilled until all piping has satisfactorily passed its appropriate pressure test as outlined below.

FLUSHING

Prior to the placement of valves, flush all mainlines for a minimum of 10 minutes or until lines are completely clean of debris, whichever is longer.

Prior to the placement of heads, flush all lateral lines for a minimum of 10 minutes or until lines are completely clean of debris, whichever is longer.

Use screens in heads and adjust heads for proper coverage avoiding excess water on walls, walks and paving.

TESTING

Soil: At a minimum of 2 locations on the site, soil tests for infiltration and texture shall be performed according to the USDA Soil Quality Test Kit Guide. The tests shall be documented in a USDA Soil Worksheet. (All of the above is available at: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/health/assessment/?cid=nrcs142p2_053873 Acceptance of required controller charts and placement inside of controllers.

The completed worksheet shall be submitted to the owners representative for review/approval. Do not proceed without written direction from the owner/owner's representative.

Schedule testing with Owner's Representative a minimum of three (3) days in advance of

Contractor to utilize soil test data to inform the irrigation scheduling at the project, using BMP's issued by the Irrigation Association which can be download on line at: https://irrigation.org/IA/Advocacy/Standards-Best-Practices/Landscape-Irrigation-BMPs/IA/ $\underline{Advocacy/Landscape-Irrigation-BMPs.aspx?hkey=93b546ad-c87a-41b8-bf70-8c4fd2cff931}$ (link at bottom of the webpage).

Read pages 47-52 in Appendix C for how to create irrigation schedules.

Mainline: Remove all remote control valves and cap using a threaded cap on SCH 80 nipple. Hose bibs and gate valves shall not be tested against during a pressure test unless authorized by written permission from the owner. Fill mainline with water and pressurize the system to 125 PSI using a hydrostatic pump. Monitor the system pressure at two gauge locations; the gauge locations must be at opposite ends of the mainline. With the same respective pressures, monitor the gauges for two hours. There can be no loss in pressure at either gauge for solvent—welded pipe. For HDPE pipe, see HDPE notes. For gasketed pipe, testing requires measurement of the water pumped into the mainline system, using a hydrostatic pump, to maintain 125 PSI — this water volume shall be no more than the result of the following formula:

- $L=(ND\sqrt{P})/7400$
- L=Allowable leakage in gallons per hour
- N=Number of joints in pipe tested
- D=Nominal diameter of pipe (in inches) P=Average Test Pressure (in PSI)

If these parameters are exceeded, locate the problem; repair it; wait 24 hours and retry the test. This procedure must be followed until the mainline passes the test.

<u>Lateral Lines</u>: The lateral lines must be fully filled to operational pressure and visually checked for leaks. Any leaks detected must be repaired.

Operational Testing —Once the mainline and lateral lines have passed their respective tests, and the system is completely operational, a coverage test and demonstration of the system is required. The irrigation contractor must demonstrate to the owner and/or owner's representative, that proper coverage is obtained and the system works automatically from the controller. This demonstration requires each zone to be turned on. in the proper sequence as shown on the plans, from the controller. Each zone will be inspected for proper coverage and function. The determination of proper coverage and function is at the sole discretion of the owner and/or owner's representative.

Upon completion of the operational test, run each zone until water begins to puddle or run off. This will allow you to determine the number of irrigation start times necessary to meet the weekly evapotranspiration requirements of the planting material in each zone. In fine sandy soils, it is possible no puddling will occur. If this is experienced, then theoretical calculations for run times will be required for controller programming.

SUBMITTALS

<u>Pre-Construction:</u> Provide owner and/or owner's representative a PDF package of equipment cut sheet submittals within ten (10) working days from date of Notice to Proceed. PDF shall have a table of contents and index sheet. Index sections for different components and label with specification section number and name of component. Furnish submittals for all components on material list. Indicate or highlight which items are being supplied on catalog cut sheets when multiple items are shown on one sheet. Incomplete submittals will be returned without review.

After project completion:

As a condition of final acceptance, the irrigation contractor shall provide the owner with:

- 1. Irrigations As-builts shall be provided utilizing a sub-foot Global Navigation Satellite System (GNSS) to accurately locate all mainlines, sleeves, remote control valves, gate valves, independent wire runs, wire splice boxes, controllers, high voltage supply sources/conduit path, control mechanisms, sensors, wells and water source connections, including backflow (if applicable) in Florida East State Plane, NAD 83, and CORS 96 format. The data collected shall be in POINT format and include an ID for each data point with Manufacturer, Type, Size, and Depth. All mainline and independent runs of wire shall be located every 30' for straight runs and at every change of direction. Sleeves will be located at end points and every 20' of length. All underground items shall include depth in inch format. These POINTS once collected shall be imported into an AutoCAD DWG geo-referenced base file to be labeled accordingly. The completed AS-Built shall be a Geo-Referenced DWF file and delivered digitally to the owner.
- 2. Controller charts Upon completion of "as-built" prepare controller charts; one per controller. Indicate on each chart the area controlled by a remote control valve using a different color for each zone. This chart shall be reduced to a size that will fit inside of the controller door. The chart shall be laminated.
- 3. Grounding Certification Provide ground certification results for each controller and pump panel grounding grid installed. This must be on a licensed electrician letter head indicating location tested (using IR plan symbols), date, time, test method, and testing results.

INSPECTIONS AND COORDINATION MEETINGS REQUIRED - Contractor is required to schedule, perform, and attend the following, and demonstrate to the owner and/or owner's representative to their satisfaction, as follows:

- 1. Pre—construction meeting Designer and contractor to review entire install process and schedule with owner/general contractor. 2. Mainline installation inspection(s) - All mainline must be inspected for proper pipe,
- fittings, depth of coverage, backfill, and installation method. 3. Mainline pressure test — All mainline shall be pressure tested according to design requirements.
- 4. Flow meter calibration All flow meters must be calibrated. A certified calibration report shall be provided for all flow meters.
- 5. USDA soil quality tests for infiltration/texture 6. Coverage and operational test

7. Punch list inspection 8. Final inspection

FINAL ACCEPTANCE

Final acceptance of the irrigation system will be given after the following documents and conditions have been completed and approved. Final payment will not be released until these conditions are satisfied.

1. All above inspections are completed, documented, and approved by owner. 2. Completion and acceptance of 'as-built' drawings.

 $\overline{4}$. All other submittals have be made to the satisfaction of the owner.

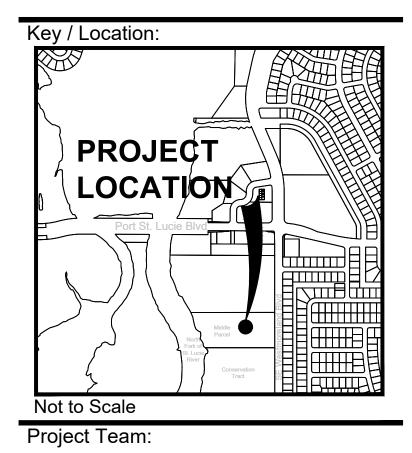
GUARANTEE

The irrigation system shall be guaranteed for a minimum of one calendar year from the

MINIMUM RECOMMENDED IRRIGATION MAINTENANCE PROCEDURES

- 1. Every irrigation zone should be checked monthly and have written reports generated describing the date(s) each zone was inspected, problems identified, date problems repaired, and a list of materials used in the repair. At minimum, these inspections should include the following tasks:
- A. Turn on each zone from the controller to verify automatic operation. B. Check schedules to ensure they are appropriate for the season, plant type, soil type, and irrigation method. Consult an I.A. certified auditor for
- methods used in determining proper irrigation scheduling requirements. C. Check remote control valves to ensure proper operation.
- D. Check setting on pressure regulators to verify proper setting, if present. E. Check flow control and adjust as needed; ensure valve closure within
- 10-15 seconds after deactivation by controller.
- F. Check for leaks mainline, lateral lines, valves, heads, etc.
- G. Check all heads as follows: a. Set proper height (top of sprinkler is 1" below mow height).
- b. Verify head pop-up height: 6" in turf, 12" in ground cover, and pop-up on riser in shrub beds.
- c. Check wiper seal for leaks. If leaking, clean head and re—inspect. Replace head with an identical head if leaking cannot be stopped.
- e. Check all nozzles for proper pattern, clogging, leaks, make/model, etc. Replace as needed.
- f. Check for proper alignment (perfectly vertical), proper coverage area, and
- minimal overspray onto hardscapes. Ensure riser height is raised or lowered to accommodate plant growth
- thereby providing proper coverage.
- h. Verify the pop—up riser retracts after operation. Repair or replace
- 2. Check controller grounds for resistance (10 ohms or less) once per year. Submit written reports to owner and/or owner's representative.
- 3. Check rain shut off device monthly to ensure proper function.
- 4. Inspect all filters monthly. Clean, repair, or replace as needed. 5. Inspect all valve boxes to ensure they are in good condition, lids are in place
- 6. Exercise all gate valves per manufacturer guidelines and recommendations to prevent
- valves from seizing. Check pump stations for proper operation, pressures, filtration, settings, etc. Refer to
- pump station operation manual as needed. 8. Check and clean intake screens on all suction lines quarterly, at minimum.
- Clean and/or repair, as needed. 9. Winterize as weather in your area dictates. Follow manufacturer recommendations and blow out all lines and equipment using compressed air. Perform seasonal startup of
- system as per manufacturer recommendations. 10. Conduct additional inspections, maintenance tasks, etc. that are particular for your



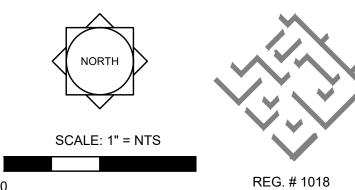


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Westmoreland Riverwalk **Irrigation Notes**

Port St. Lucie, Florida Owner/Developer: City of Port St. Lucie

By Description 0/29/21 JJ Resubmitta



Designer Manager Project Number

Municipal Number P17-004-A2

20-110

Thomas P. Lucido

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