

September 03, 2015

To Whom It May Concern:

The Polk County UTILITIES CODE COMMITTEE is charged with updating the seven REFERENCE MANUALS associated with Ordinance 10-081 (AKA: Utilities Code). In accordance with Section 11: Utilities Code Committee and Section 12: Reference Manual Revision Procedure, the UTILITIES CODE COMMITTEE recommends approval of revisions to portions of the following reference manuals:

- Utilities Standards and Specifications Manual (6B)
 - USSM Table of Contents
 - TOC – Detail Drawings
 - Chapter Two (2): Development Coordination
 - Section 210: Development Coordination
 - Update CIP and Development Cover Sheets
 - Chapter Three (3): General Requirements
 - Section 314: Directional Drilling Standards
 - Standard Drawing:
 - GR-04 Restrained Pipe Table
 - Chapter Four (4): Potable Water
 - Section 410: Location (Easements)
 - Section 450-B: Approved Materials Checklist
 - Form 450-I: Water System Schedule of Values
 - Chapter Five (5): Wastewater
 - Section 510: Location (Easements) and Gravity Wastewater System Standards
 - Section 512: Wastewater Lift Station Standards
 - Section 513: Wastewater Pipes, Valves, etc.
 - Section 550-A: Testing and Inspection for Acceptance
 - Section 550-C: Approved Materials Checklist
 - Form 550-J: Wastewater System Schedule of Values
 - Form 550-L: Gravity Air Test
 - Standard Drawings:
 - WW-09: Lift Station Notes
 - WW-10: Lift Station Notes (Cont'd)
 - WW-11: Duplex Lift Station (Typical) Site Plan
 - WW-12-1: Duplex Lift Station Plan View
 - WW-12-2: Duplex Lift Station Section View
 - WW-12-3: Duplex Lift Station Dimensions and Elevations
 - WW-12-5: Typical Lift Station HDPE Pipe Bracing

- WW-14-2: Triplex Lift Station Section View
- WW-14-3: Triplex Lift Station Dimensions and Elevations
- WW-20-2: Lift Station Control Panel Rear View
- Chapter Six (6): Reclaimed Water
 - Section 650-B: Approved Materials Checklist
 - Form 650-F: Reclaimed Water System Schedule of Values
- Reclaimed Water Policy Manual (6D)
 - Conservation, Retail Watering Schedule

Details concerning each respectively edited Manual, Section, Chapter, and Appendix are attached herewith for reference.

Pursuant to Ordinance 10-081, all of the above listed and subsequently described recommendations are hereby approved as noted. In accordance with Section 12 of the aforementioned Ordinance, the Utilities Director is authorized to approve these updates as recommended by the Utilities Code Committee. The effective date of these revisions shall be 30 calendar days from the date of this approval and shall supersede the prior content and detail drawings in the respective manuals. Similarly all approved revisions will be incorporated into the master set of Utilities Code Documents and Manuals in a clean form without markups within 30 calendar days from the date of this approval.

Each REFERENCE MANUAL that has been revised shall be formally presented to the BoCC and adopted by separate resolution before calendar year end of 2012.

Marjorie G. Craig, P.E.
Polk County Utilities Director



(Signature)



(Date)

- USSM Table of Contents
 - TOC – Detail Drawings

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STANDARD DRAWINGS

Rev September 2014

December 2010

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- DC-02 Community Investment Project Cover Sheet (Required Format)

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- GR-02 Bedding and Trenching - Type B
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- GR-04 Restrained Pipe Table
- GR-05 Thrust Collar
- GR-06 Bore and Jack
- GR-07 Gate Valve and Box (Shallow)
- GR-08 Butterfly Valve and Box (Shallow) (For Storage Tank Isolation Use Only)
- GR-09 Plug Valve (Shallow) (For Wastewater Treatment Facility Use Only)
- GR-10 Typical Valve Box Cover
- GR-11 Valve Box Assembly (Deep)
- GR-12 Valve Collar
- GR-13 Pipe Line Marker (Typical)
- GR-14-1 Pipe Locating Wire
- GR-14-2 Pipe Identification - Potable Water Mains
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- GR-15-1 Automatic Air Release Valve (Above Ground)
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- RW-03 Reclaimed Water Master Meter Assembly

- **Chapter Two (2): Development Coordination**
 - **Section 210: Development Coordination**
 - **Update CIP and Development Cover Sheets**

CHAPTER 2

DEVELOPMENT COORDINATION

Section 210

Development Coordination

December 2010

2. A bond payable to PCU shall be posted by the DEVELOPER that is executed by a financial institution authorized to do business in the State of Florida that is satisfactory to PCU. The bond shall be in the amount of +10 percent of the final construction costs of all required water, wastewater, and reclaimed water improvements to be owned and maintained by PCU. Such bond shall guarantee maintenance, materials, and workmanship of all improvements intended to be owned and maintained by PCU for a minimum of a one calendar year period commencing on the date of formal acceptance by the COUNTY. As an alternative to the provision of a surety bond, the DEVELOPER may provide for the deposit of cash in an escrow account at or a letter of credit from a financial institution authorized to do business in the State of Florida in a form acceptable to the COUNTY.
3. PCU shall perform an inspection of all improvements and the RECORD DRAWINGS approximately 30 calendar days prior to the expiration of the any warranty or bond. PCU shall notify the DEVELOPER and ENGINEER in writing of the inspection. The attendance of the DEVELOPER and ENGINEER shall be mandatory. A list of deficiencies shall be developed and transmitted to the DEVELOPER and ENGINEER. The DEVELOPER and ENGINEER shall correct all deficiencies within 30 calendar days of receipt and then notify PCU upon completion to request a re-inspection. The warranty or bond shall not expire until all deficiencies have been corrected.

C. Extent of PCU Maintenance

1. PCU shall be responsible only for the repair and maintenance of the public components of the PCU utility system. PCU shall not be responsible for the repair and maintenance of house connections or service laterals or for privately owned utility systems. PCU will maintain potable and reclaimed water lines up to and including meters only, and will not repair or maintain any component downstream of the meter, including house connections and service laterals.
2. PCU will only maintain sanitary sewer lines manhole to manhole. PCU will not repair or maintain any component upstream of the sewer line including clean outs, meters, house connections or service laterals.
3. No person shall do any work, or be reimbursed for any work or in connection with any work, on the PCU utility system unless written authorization from PCU is received prior to said work is being started.
4. PCU shall make a reasonable effort to inspect and keep its facilities in good repair, but assumes no liability for any damage caused by the utility system, including damage due to sewage back-ups, disruption of services, breaking of pipes, poor quality of water caused by unauthorized or illegal entry of foreign material into the system, faulty operation of fire protection facilities, or any other reasons.



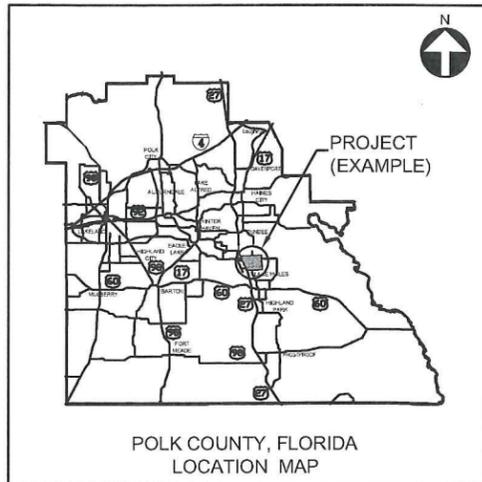
PROJECT NAME
PROJECT NAME

RANGE XX, TOWNSHIP XX, SECTION XX
(ADDRESS, IF APPLICABLE)
PARCEL ID # XXXXXX XXXXXX XXXXXX
PCU PROJECT # XXXX.XXX.XX.XX

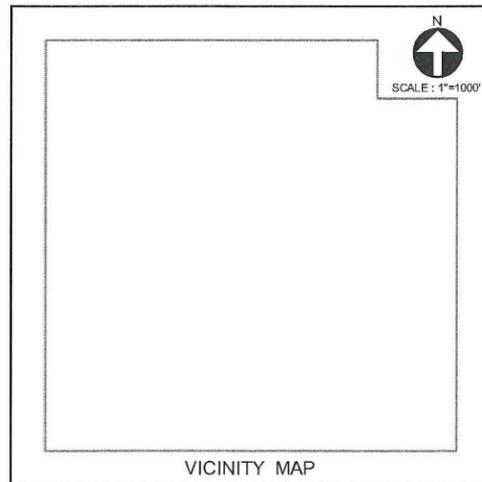
DRAWING INDEX
(SHEET NOS. 01 TO XX, NOT AS C-1 TO X-XX)

RESERVED FOR
COUNTY APPROVALS

DESIGN WATER PERMIT	#	_____
DESIGN SEWER PERMIT	#	_____
FDOT PERMIT	#	_____
FDOT RW PERMIT	#	_____
FDOT UTILITY PERMIT	#	_____
COUNTY RW PERMIT	#	_____
COUNTY BLDG PERMIT	#	_____
WMP PERMIT	#	_____
NPDES PERMIT	#	_____



POLK COUNTY, FLORIDA
LOCATION MAP



VICINITY MAP

UTILITIES PROVIDERS LIST

- CONTACT NAME
COMPANY NAME
XXX STREET NAME
CITY NAME, STATE NAME, ZIP
(XXX) XXX-XXXX
- CONTACT NAME
COMPANY NAME
XXX STREET NAME
CITY NAME, STATE NAME, ZIP
(XXX) XXX-XXXX
- CONTACT NAME
COMPANY NAME
XXX STREET NAME
CITY NAME, STATE NAME, ZIP
(XXX) XXX-XXXX
- CONTACT NAME
COMPANY NAME
XXX STREET NAME
CITY NAME, STATE NAME, ZIP
(XXX) XXX-XXXX
- CONTACT NAME
COMPANY NAME
XXX STREET NAME
CITY NAME, STATE NAME, ZIP
(XXX) XXX-XXXX

Delete empty block



DEVELOPER / OWNER:

NAME
COMPANY NAME
XXX STREET NAME
CITY NAME, STATE NAME, ZIP
PHONE # (XXX) XXX-XXXX
FAX # (XXX) XXX-XXXX

ENGINEER OF RECORD:

CONSULTANT NAME
XXX STREET NAME
CITY NAME, STATE NAME, ZIP
PHONE # (XXX) XXX-XXXX
FAX # (XXX) XXX-XXXX

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DIAL 811

811
Know what's below.
Call before you dig.

SUNSHINE STATE ONE CALL OF FLORIDA, INC.

CONSTRUCTION DRAWING
 RECORD DRAWING

ENGINEER _____
PRINT NAME _____

LICENSE # _____

ENGINEER _____
SIGNATURE _____

DATE _____

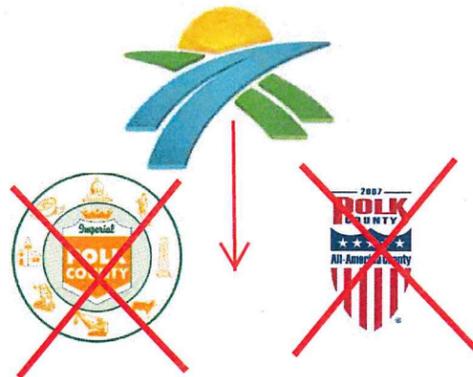
PROJECT NAME
PROJECT NAME

PCU PROJECT # XXXX.XXX.XX.XX XXXXX STREET NAME, CITY XXXXX XXXXXXX XXXXXXX XXXXXXX

(SAMPLE OF RECOMMENDED FORMAT)

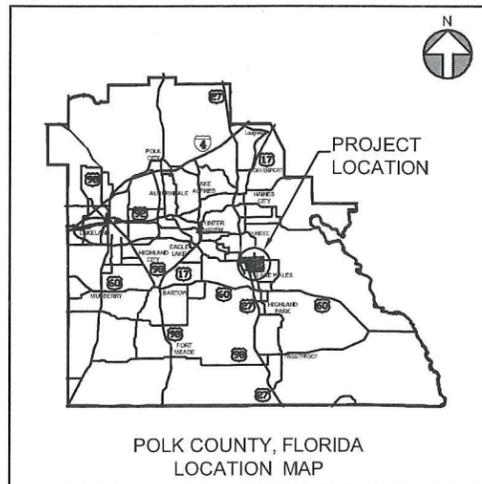
POLK COUNTY UTILITIES, FLORIDA

UTILITIES COMMUNITY INVESTMENT PROJECT



PROJECT NAME
PROJECT NAME

RANGE XX, TOWNSHIP XX, SECTION XX
(ADDRESS, IF APPLICABLE)
PARCEL ID # XXXXXX XXXXXX XXXXXX
PCU PROJECT # XXXX.XXX.XX.XX
ORACLE PROJECT # XXXXXXX



DRAWING INDEX

1. COVER
2. SURVEY
3. GENERAL NOTES
4. SHEET
5. SHEET

RESERVED FOR COUNTY APPROVALS

DEP WATER PERMIT	#	_____
DEP SEWER PERMIT	#	_____
FDOT PERMIT	#	_____
FDOT R/W PERMIT	#	_____
FDOT UTILITY PERMIT	#	_____
COUNTY LW PERMIT	#	_____
COUNTY BLDG PERMIT	#	_____
WIND PERMIT	#	_____
NFPDES PERMIT	#	_____

Delete empty block

UTILITIES PROVIDERS LIST

- 1 CONTACT NAME
COMPANY NAME
XXX STREET NAME
CITY NAME, STATE NAME, ZIP
(XXX) XXX-XXXX
- 2 CONTACT NAME
COMPANY NAME
XXX STREET NAME
CITY NAME, STATE NAME, ZIP
(XXX) XXX-XXXX
- 3 CONTACT NAME
COMPANY NAME
XXX STREET NAME
CITY NAME, STATE NAME, ZIP
(XXX) XXX-XXXX
- 4 CONTACT NAME
COMPANY NAME
XXX STREET NAME
CITY NAME, STATE NAME, ZIP
(XXX) XXX-XXXX
- 5 CONTACT NAME
COMPANY NAME
XXX STREET NAME
CITY NAME, STATE NAME, ZIP
(XXX) XXX-XXXX

BOARD OF COUNTY COMMISSIONERS

DISTRICT ONE : BOB ENGLISH
DISTRICT TWO : RANDY WILKINSON
DISTRICT THREE : JACK MYERS
DISTRICT FOUR : JEAN REED
DISTRICT FIVE : SAM JOHNSON

* DISTRICT IN WHICH PROJECT IS LOCATED

COUNTY MANAGER : MICHAEL HERR

UTILITIES DIRECTOR : GARY FRIES, P.E.

PROJECT MANAGER :

NAME
COMPANY NAME
XXX STREET NAME
CITY NAME, STATE NAME, ZIP
PHONE # (XXX) XXX-XXXX
FAX # (XXX) XXX-XXXX

ENGINEER OF RECORD:

CONSULTANT NAME
XXX STREET NAME
CITY NAME, STATE NAME, ZIP
PHONE # (XXX) XXX-XXXX
FAX # (XXX) XXX-XXXX

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DIAL 811

Know what's below.
Call before you dig.

SUNSHINE STATE ONE CALL OF FLORIDA, INC.

CONSTRUCTION DRAWING

RECORD DRAWING

ENGINEER _____
print name

LICENSE # _____

ENGINEER _____
signature

DATE _____

PROJECT NAME
PROJECT NAME

PCU PROJECT # XXXX.XXX.XX.XX XXXXX STREET NAME

- Chapter Three (3): General Requirements
 - Section 314: Directional Drilling Standards
 - Standard Drawing:
 - GR-04 Restrained Pipe Table

CHAPTER 3 GENERAL REQUIREMENTS

Section 314 Directional Drilling Standards and Specifications

December 2010

1. PVC restrained joint and Fusible PVC pipe shall have maximum dimension ratios equal to the following table.

Table 314-1. Maximum Dimension Ratios for PVC Pipe.

Type of Pipe System	Maximum Dimension Ratio
Wastewater	25 (4"-12"), 25 (16"+)
Reclaimed Water	18 (4"-12"), 25 (16"+)
Water	18 (4"-12"), 25 (16"+)

2. PVC pipe shall meet the requirements of AWWA C900 (C905 or C909). The pipe shall either be fused jointed or joined using separate couplings that have beveled edges, built-in sealing gaskets and restraining grooves or steel ring-and-pin gasketed joints. The restraining splines shall be square and made from Nylon 101. Pipe and couplings shall be Underwriters Laboratory and Factory Mutual approved.
3. Installation Curvature: The pipeline curvature shall not have a radius less than as shown in Table 314-2.

Table 314-2. PVC Pipe Deflection Information.

Pipe Diameter (inches)	Minimum Radius of Curvature (feet)	Offset per 20-ft Length (inches)	Deflection per 20-ft Length (degrees)
4	133	17.25	8.6
6	200	12.00	5.7
8	266	9.00	4.3
10	333	6.75	3.5
12	400	6.00	2.9
16	532	4.50	1.5

Note: Deflections for pipe diameters larger than 16" shall be in accordance with the pipe manufacturer's recommendations.

C. HDPE Pipe

1. HDPE pipe and related fittings shall be made with prime virgin resins exhibiting a minimum cell classification as defined in ASTM D3350 and meeting the PE 3408/PE 4710 code designation with maximum dimension ratios equal to the following.

Table 314-3. Maximum Dimension Ratios for HDPE Pipe.

Type of Pipe System	Maximum Dimension Ratio
Wastewater	11
Reclaimed Water	11

CHAPTER 3 GENERAL REQUIREMENTS

Section 314 Directional Drilling Standards and Specifications

December 2010

Water	11
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2. HDPE pipe 4-inch and larger nominal diameter shall be joined by means of zero leak-rate butt (thermal heat) fusion welds and/or approved flanged joints. Joints shall provide axial pullout resistance. Pipe shall meet the requirements of ANSI/AWWA C906, and have an outside diameter dimension of ductile iron pipe. Flanged joints shall not be used below finished grade for horizontal directional drilling applications. The use of separate couplings to join sections of HDPE pipe shall be restricted to non-paved areas and depths of less than 6 feet below finish grade.
3. HDPE pipe shall have been continuously marked by the manufacturer with permanent printing indicating at a minimum the following.
 - a. Nominal size (inches);
 - b. Dimension ratio (DR);
 - c. Pressure rating (psi);
 - d. Trade name;
 - e. Material classification (PE 3408/[PE 4710](#));
 - f. Plant, extruder and operator codes;
 - g. Resin supplier code;
 - h. Date produced; and
 - i. HDPE pipe used for portable water mains shall bear the NSF Seal of Approval.
4. HDPE pipe shall be black in color with permanent colored stripes extruded into the pipe along its entire length, a single painted stripe along its entire length, or shall be one solid color, per the applicable service.

Table 314-4. Pipe Color.

Pipe Use	Color Coding
Potable Water	Blue
Wastewater	Green
Reclaimed Water	Purple

5. Installation Curvature:
 The pipeline curvature shall not have a radius less than as shown in Table 314-5.

Table 314-5. HDPE Pipe Deflection Information.

Pipe Diameter (inches)	Minimum Radius of Curvature (feet)	Offset per 20-ft Length (inches)
4	23	9.3

MINIMUM LENGTH (FT) TO BE RESTRAINED ON EACH SIDE OF FITTING(S)												
TYPE	D.I.P. PIPE SIZE											
	4"	6"	8"	10"	12"	16"	20"	24"	30"	36"	42"	48"
90° BEND AND TEE	20	29	37	44	51	65	77	89	105	120	132	105
45° BEND	8	12	15	18	21	27	32	37	44	50	55	60
22-1/2° BEND	4	6	7	9	10	13	15	18	21	24	27	29
11-1/4° BEND	2	3	4	5	6	7	8	9	10	12	13	15
PLUG OR BRANCH OF TEE AND VALVE CAP	42	59	77	93	108	138	166	194	231	275	328	391
POINT OF CONNECTION WITH HDPE PIPE	40	40	40	40	40	40	40	40	44	50	55	60

MINIMUM LENGTH (FT) TO BE RESTRAINED ON EACH SIDE OF FITTING(S)												
TYPE	PVC OR HDPE PIPE SIZE											
	4"	6"	8"	10"	12"	16"	20"	24"	30"	36"	42"	48"
90° BEND AND TEE	25	37	47	55	64	82	97	112	132	156	172	188
45° BEND	10	15	19	23	27	34	40	47	55	65	72	78
22-1/2° BEND	5	8	9	12	13	17	19	23	27	32	35	38
11-1/4° BEND	3	4	5	7	8	9	10	12	13	16	17	19
PLUG OR BRANCH OF TEE AND VALVE CAP	53	74	97	117	135	173	208	243	289	344	410	488
POINT OF CONNECTION WITH HDPE PIPE	40	40	40	40	40	40	40	47	55	65	72	78

NOTES:

- FITTINGS SHALL BE RESTRAINED JOINTS UNLESS OTHERWISE INDICATED.
- INSTALL FULL LENGTH JOINTS WITH TOTAL LENGTH EQUAL TO OR GREATER THAN SHOWN IN THE TABLE.
- WHERE TWO OR MORE FITTINGS ARE TOGETHER, USE FITTING WHICH YIELDS GREATEST LENGTH OF RESTRAINED PIPE.
- ALL LINE VALVES AND THROUGH RUN OF TEES SHALL HAVE MJ RESTRAINTS.
- LENGTHS SHOWN IN THE TABLE HAVE BEEN CALCULATED IN ACCORDANCE WITH THE PROCEDURE OUTLINED IN "THRUST RESTRAINT DESIGN FOR DUCTILE IRON PIPE" AS PUBLISHED BY DIPRA, WITH THE FOLLOWING ASSUMPTIONS:
 WORKING PRESSURE: 150 PSI
 SOIL DESIGNATION: SM (SAND SILT)
 LAYING CONDITIONS: 3
- THE ENGINEER SHALL VERIFY THESE MINIMUM DESIGN ASSUMPTIONS AND INCREASE LENGTHS WITH THE APPROVAL OF PCU.
- DI PIPE WRAPPED WITH OR ENCASED IN POLYETHYLENE SHALL BE RESTRAINED SIMILAR TO PVC PIPE.

RESTRAINED PIPE TABLE	FIGURE GR-04
POLK COUNTY UTILITIES, FLORIDA	DECEMBER, 2010

- Chapter Four (4): Potable Water
 - Section 450-B: Approved Materials Checklist
 - Blow Off Valve alternative
 - Insert Valve MJ/Ductile Iron RWGV (New)
 - Restrained Joints, DIP, HDPE, and PVC
 - Tapping Sleeves, DIP, PVC
 - Facility Equipment: Categories 6-10 (New)
 - Form 450-I: Water System Schedule of Values

CHAPTER 4

WATER

Section 410

Potable Water Main Standards and Specifications

December 2010

PART 1 – GENERAL

- A. Potable water mains shall be designed for the estimated tributary population, as delineated in the approved PCU's MASTER PLAN (latest edition) for the subject RUSA. When the DEVELOPER's potable water MASTER PLANS are required, potable water mains shall be designed for the estimated ultimate build out, as approved by PCU. The DEVELOPER shall be required to satisfy the domestic water and fire protection design flow for their planned development (PD) or the development of regional impact (DRI).

PART 2 - LOCATION

- A. Mains shall be located within dedicated public rights-of-way or Polk County Utilities Easements.

1. Public Rights-of-Way

When installed in rights-of-way, mains shall maintain a consistent alignment with respect to the centerline of the road. In all cases, mains shall be installed along one side of the road with crossings kept to a minimum.

2. Polk County Utilities Easements

If a main is to be constructed within an easement, the centerline of the pipe shall be located along the centerline of the easement.

- a. When not adjacent to County or State rights of way, a minimum width of 20 feet for mains with inverts up to 5 feet below finish grade. For mains with inverts deeper than 5 feet below finish grade, the minimum width shall be twice the invert depth of the main plus 10 feet. All widths shall be rounded up to the nearest even foot. Width of the easement shall be based on the deepest invert depth of each segment of the subject main. Variations in easement size may be authorized by the COUNTY only when deemed appropriate provided that the existing or proposed level of service is maintained and operational maintenance and responsibility is established to the benefit of the COUNTY.
- b. Where multiple parallel mains are to be placed within a single easement, the FDEP required horizontal separation distance between the mains shall be added to the above minimum single main easement width and rounded up to the nearest even foot.
- c. Have a maximum length of 150 linear feet if the easement terminates in a dead end or an obstruction. Longer easements may be authorized if adequate turnaround and work zone area is provided as based on an AASHTO single unit vehicle. All locations and lengths of easements shall take in consideration the safety and accessibility of PCU vehicles and personnel.
- d. Be free of any permanent structures, such as footers, foundations, walls, screen walls, buildings, air conditioner pads, transformer pads, sign supports, roof overhangs, stormwater structure, swimming pools, storage sheds, patios, etc.

CHAPTER 4

WATER

Section 410

Potable Water Main Standards and Specifications

December 2010

- e. Be accessible at all times and not subject to standing water nor under the side slope or bottom of a lake, pond or stormwater retention area, except that perpendicular crossings under swales, small ditches and canals may be authorized in writing by PCU.
 - f. As designated by PCU for existing ~~and future~~ use, a Polk County Utilities Easement of not less than 15 feet in width shall be provided parallel to and directly adjacent to all County, State, and Federal rights-of-way. Notwithstanding PCU's easement requirements stated above and herein, easements in typical subdivision construction including those adjacent to internal subdivision roads shall be sized and conveyed in accordance with the LAND DEVELOPMENT CODE. ~~Alternately, and where it is advantageous to PCU, an easement of not less than 20 feet in width may be located to the rear of a commercial or multi family development of significant size, i.e., shopping center, multi family residential complex, office complex, etc., located in a quadrant of an intersection that is subject to widening or other improvements that may require the relocation of PCU infrastructure in the future.~~ The ultimate width of easements may be based on the number, type, size and depth of the utility lines within the easement.
 - g. Landscape buffers may be allowed to co-exist with Polk County Utilities Easements as long as raised landscape berms are not utilized. Walls shall be allowed as long as there are no potential conflicts with future repair or replacement of a main. Should PCU disturb or damage any landscaping or other installed improvements within the easement, PCU shall initiate repairs or install replacements in a timely manner at no cost to the property owner.
 - h. A triangular corner clip type of Polk County Utilities Easement, that has 20 foot long sides, shall be provided at all intersections of County, State, and Federal rights-of-way.
- B. Mains within easements shall not be placed under septic tanks or their drain fields, storm water management facilities, buildings, retention ponds, athletic courts, swimming pools, fountains, patios, or other structures. Privacy walls and foundations shall not be placed parallel over mains or within the structure's zone of influence as based on a soil angle of repose of 45 degrees. Mains shall not be located along interior side or rear lot lines, unless approved in writing by PCU. Placement of mains along storm water retention pond berms may be allowed by PCU on a case by case basis when placed in a casing and if such a configuration results in efficient placement and utilization of the system. Service laterals, valves, and other main related improvements shall not be placed along interior side or rear lot lines.
- C. Mains may be accepted for ownership and maintenance by PCU if the private streets are designed with an urban design cross section in accordance with the LAND DEVELOPMENT CODE. Polk County Utilities Easements shall be dedicated over the entire private street rights-of-way. In addition, sufficient area must be available outside of paved areas to maintain PCU mains.

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PLEASE TYPE OR PRINT CLEARLY IN BLACK INK

Project Name: _____

PCU Project File Number: _____

Contractor's Name: _____

Contractor's Address: _____

Contractor's Signature: _____

Engineer's Name: _____

Engineer's Address: _____

PCU Reviewer: _____	Date: _____
Approved: _____	Denied/Resubmit: _____
Comments:	

With the submission of this document, the CONTRACTOR understands that the use of the following selected items, as individually indicated by the use of an "X", is mandatory.

Substitutions using other items contained within this Checklist shall be initiated by the CONTRACTOR submitting a revised Checklist to PCU for its review and approval at least 10 calendar days in advance of need.

It is also understood by the CONTRACTOR that PCU shall reject materials and products not in accordance with this document and the MANUAL. Any material or product not contained within this Checklist shall be approved in advance by the Utilities Code Committee in accordance with the provisions of the Utilities Code.

Shop drawings shall be required for all structures and similar items not contained on this checklist, such as manholes, wet wells, and other castings.

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Four (4) sets of the CONTRACTOR's and ENGINEER's executed APPROVED MATERIALS CHECKLIST and any necessary shop drawings shall be submitted to PCU for its use and approval, plus the number of sets needed for the CONTRACTOR use. Ordering materials and products without specific written approval from PCU of the submitted list and shop drawings is NOT recommended and is done at the CONTRACTOR's sole expense and responsibility.

NOTE: The latest changes approved by the Utilities Code Committee are indicated by "underlining" and deleted items by "~~strikethroughs~~".

Water Category 1 of 510: VALVES AND ACCESSORIES			
ITEM TO BE USED	Manufacturer	Part Number	Comments
Automatic Combination Air / Vacuum Release Valves:			
	ARI	D-040	Combination
	ARI	S-050	Air Release Only
	ARI	S-010	Air Release Only
	Val-Matic	VM-38	Air Release Only – Plant, Facility Use Only
	Val-Matic	VM-45	Air Release Only – Plant, Facility Use Only
	Val-Matic	VM-200C	Combination – Plant, Facility Use Only
Air / Vacuum Release Valve Enclosure (Horizontal Venting and Medium Blue):			
	Water Plus	No. 40 (171730) <u>131632</u>	
	Channell	BPH 1730	
	Hydro-Guard	Safety-Guard 15100 Low Profile or 02100	
Air / Vacuum Release Valve Vault Frame And Cover:			
	US Foundry	USF-679-BK-M	
	CertainTeed	Pamrex 36"	Alternative – <u>Not to be used in paved roadways.</u>
Blow Off Valve:			
	Hydro Guard	HG-2 Low Profile	Automatic Blow Off (<u>Self-contained unit</u>)
	Water Plus	Series VB 2000	<u>Automatic Blow Off (Self-contained unit)</u>

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	<u>Charles Multi-Purpose Housing (CMPH) with individual parts to assemble</u>	<u>Series CMPH 5500 (Enclosure)</u>	<u>Alternative to all-in-one blow off valves.</u> <u>Enclosure color may be Blue, Sand Stone or Granite.</u> <u>Assembly required</u>
		<u>Solorain 8014N Programmable Actuator</u>	
		<u>HRC-990-SD-MD Latching Solenoid for HRC 990 Controller</u>	
		<u>HRC-990-04-MS Hydro-Rain 1-4 Zone Battery Controller</u>	
		<u>205T Glove Valve Npt Threads without FC Irritrol</u>	
	<u>Channell Budget Pedestal Housing (BPH) with individual parts to assemble</u>	<u>Series BPH 1230 (Enclosure)</u>	<u>Alternative to all-in-one blow off valves</u> <u>Enclosure color may be Blue, Sand Stone or Granite.</u> <u>Assembly required</u>
		<u>Solorain 8014N Programmable Actuator</u>	
		<u>HRC-990-SD-MD Latching Solenoid for HRC 990 Controller</u>	
		<u>HRC-990-04-MS Hydro-Rain 1-4 Zone Battery Controller</u>	
		<u>205T Glove Valve Npt Threads without FC Irritrol</u>	
Butterfly Valves 42-inch And Larger: (8 mil Epoxy Coated, Lined (AWWA), And For On-Site Water Production Facility Use Only):			
	M & H	4500	
	Mueller/Pratt	Linseal III / BV (Ground Hog)	
Butterfly Valves 16-inch And Larger: (Rubber Seated (AWWA):			
	Val-Matic	2000	To be utilized as directed by PCU.
Gate Valves 16-inch Through 48-inch (Resilient Seated Only With Side Actuators):			
	American Flow Control	Series 2500	
	Mueller	Series A-2361	
	M & H	Series 4067	
Gate Valves 12-inch And Smaller (Resilient Seated Only):			
	American Flow Control	Series 2500	
	M & H	Series 4067	
	Mueller	Series A-2360	
	Clow	Series F-6100	

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Hydraulically Operated Control Valves (Pressure Reducing/Sustaining Valves):			
	Cla-Val		Model or Series based on field application.
	OCV		Model or Series based on field application.
	Watts/Ames		Model or Series based on field application.
Sample Station (Above Grade) (Blue in Color):			
	Water Plus	Series 301 W	May be used as an alternative to the field assembled sample station.
	Hydro-Guard	Safety-Guard SGBSS-05 SS or -06 SS with S300 Enclosure	May be used as an alternative to the field assembled sample station.
Tapping Valves (Resilient Seated Only):			
	American Flow Control	Series 2500	
	M & H	Series 4751	
	Mueller	Series T-2360 & T-2361	
	Clow	Series F-6114	
Insertion Valves - MJ/Ductile Iron RWGV (In Place of Line Stop/Tapping Sleeve)			
	<u>Team Industrial Products</u>	<u>InsertValve</u>	<u>Available 4" through 12"</u>
Test Station Box For Buried Valves:			
	Bingham/Taylor	P200NFG2T	
Valve Boxes with Lids (5¼ -Inch, ASTM A48 30B Cast or Ductile Iron, With "WATER" cast into the lid top):			
	Bingham / Taylor Foundry	4905-X, 4905, 4904L	
	Tyler	Series 6850	
	American Flow Control*	Trench Adapter Models 1 through 9	* For mains with valve nuts that are 6' or deeper.
	Sigma	VB261, VB262, VB264, VB4650W	
	Mueller	MVB	Use w/ AJBV-4" Locking Bolt
	Star		Heavy Duty Screw or Slip Type

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Water Category 2 of <u>510</u>: SERVICE MATERIALS			
ITEM TO BE USED	Manufacturer	Part Number	Comments
Angle Stops Ball Type (1-inch And 2-inch CTS OD Tubing By 5/8-inch By 3/4-inch And 2-inch Meter):			
	Ford	BA43-242W, BFA43-777W	
	Mueller	P24258, P24276	
	McDonald	4642B-22, 4602B-22	
Angle Stops Ball Type (3/4-inch FIP By 5/8-inch By 3/4-inch Meter):			
	Ford	BA13-232W	
	Mueller	B24265R	
	McDonald	4604B	
Corporation Stops Ball Type (1-inch and 2-inch With AWWA Iron Pipe Threads Only/Pack Joint Outlet For CTS):			
	Ford	FB1000	
	Mueller	P25008	
	McDonald	4701B-22	
Curb Stops Straight Valves (Curb Stop To Be Ball Type, Reduced Port FIP By FIP 3/4-inch By 3/4-inch):			
	Ford	B11-233W	
	Mueller	B-20200-R	
	McDonald	6101W	
Curb Stops Straight Valves (Ball Type Compression By Meter, 1-inch And 2-inch CTS OD Tubing By 5/8-inch By 3/4-inch Meter):			
	Ford	B43-342W, BF43-777W	
	Mueller	P24350, B24337, B24335	
	McDonald	6100MW-22	
Curb Stops Straight Valves (Ball Type Compression By Compression):			
	Ford	BA44-444W	
	Mueller	P25146	
	McDonald	6100W-22	
Dual Check Valve (Two Independently Acting Spring-Loaded Check Valves)			
	Apollo	4NLF-3C5-5B	For 3/4-inch Meter
	Apollo	4NLF-3S6-5B	For 1-inch Meter
Polyethylene Tubing (Blue With UV Protection [SDR-9] 1-inch And 2-inch Only):			
	Endot	PE-4710 EndoPure	

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	Endot	PE-4710 EndoTrace	Alternative Pipe and Locating Wire Combo
	Charter Plastics	PE-4710	
	ARNCO	PE-4710 Perma-Guard	
	ARNCO	PE-4710 Perma-Find	Alternative Pipe and Locating Wire Combo
	ADS	CTS 200 PSI DR-9 PE4710	Service Tubing
Service Saddles (Epoxy Or Nylon Coated Ductile Iron Body with Stainless Steel 18-8-Type 304 Straps, CC Threads – 2-inch To Be Iron Pipe Threads Controlled OD Saddles To Be Used On C-900 And IPS OD PVC Pipe, Double Straps To Be 2-inch Minimum Width Each):			
	Ford	Series FC202	
	JCM	Series 406	
	Mueller	DR2S, DR2SOD	
	McDonald	3855, 3855	
	Cascade	CNS 1, CNS 2	
	Romac	202N	
	Romac	202N-H	For Use With HDPE Pipe
Y Branch (1-inch By 2-inch):			
	Ford	U-48-43	
	Mueller	P15363	
	McDonald	08U2M	
Y Branch Assemblies With Angle Ball Valves (1-inch By 2-inch):			
	Ford	UVB43-42W	
	Mueller	P15363-05	
	McDonald	09U2BW	
Meter Boxes w/ Cast Iron Lids (Black, HDPE):			
	Carson	10152026 (Box) 10151033 (Combo)	10154018 (Lid)
	DFW Alliance	DFW1200-12-Body (Box) DFW1200-12-1C (Combo Unit)	DFW1200-1C-LID (Lid)

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Water Category 3 of 510: PIPE MATERIAL			
ITEM TO BE USED	Manufacturer	Part Number	Comments
Casing Spacers (All Sizes) Stainless Steel With Vinyl Runners:			
	Cascade	Series CCS / CCPS / AZ	
	PSI	Series S-G-2	
	PSI-Ranger	Ranger II	
	RACI	S/T, F/G, P/Q, M/N, E/H	
	CCI	CSS8, CSS12	
	Advanced Systems		
Ductile Iron Pipe Cement Lined (4-inch To 12-inch = PC 350, 16-inch To 20-inch= PC 250, 24-inch = PC 200, 30-inch To 64-inch = PC 150) (DI Flanges As Applicable, AWWA C115):			
	American		
	Clow		
	Griffin		
	McWane		
	US Pipe		
Paint: Aerial Pipe, Fittings, And Valves (Field and Factory Primer):			
	Color Wheel	635 Primer Red	
	Glidden	Alkyd Metal Primer	
	Porter/International	286 U-Primer	
	Tnemec	37H-77 Chem-Primer	
	Tnemec	Pota-Pox Plus NI40	
	Wasser	Ferro Clad Primer	
Paint: Finish (Exterior):			
	Color Wheel	600 Alkyd Enamel	
	Glidden	Alkyd Industrial Enamel	
	Porter/International	2749 Alkyd Gloss	
	Tnemec	Tnemec - Gloss 2H	
	Tnemec	Pota-Pox 100 Series 22	
PVC (Blue) 4-inch Through 12-inch Pipe (AWWA C-900, DR18) and 16-inch and larger pipe (AWWA C-905 or C-909, DR 25):			
	Bristolpipe	4" to 12"	
	Certainteed	Certa-Lok 4" to 12"	
	Diamond Plastic		
	Ipex		

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	<u>J-M Manufacturing</u> <u>JM-Eagle</u>		
	National Pipe		
	NAPCO		North American Pipe Company
	Upinor ETI 9	Ultra Blue-C-909	
	Underground Solutions	Fusible PVC	<u>For Horizontal Directional Drill Use Only</u>
HDPE Pipe DR11 (Blue Striped):			
	Chevron/Phillips	Performance Pipe / ISCO Pipe	
	CSR	Polypipe/Charter Plastics	
	JM-Eagle		
	National Plastics		
	ARNCO		
Potable Water Main Identification Tape (Blue, 6-Inches Wide, 2-Inch High Black Lettering, Adhesive Backed):			
Buried Potable Water Main Warning Tape (Blue, 3-inches Wide, 1-Inch High Black Lettering, Non-Adhesive Backed):			
Locating Wire (Single Strand 14-Gauge Solid Copper Wire with Blue Colored Insulated Covering):			
	Copperhead	Reinforced Locating Wire	Alternative
Locating Marker Systems (Potable Water) (Blue In Color):			
	3M	Scotch Mark EMSII Electronic Marker Blue Locator #1265	
	3M	Scotch Marker Electronic Ball Marker #1404	
Curb and Pavement Markers (Blue in Color, Imprinted With The Words "POLK COUNTY UTILITIES" And "CALL 811 BEFORE YOU DIG" With "POTABLE WATER SERVICE" or "POTABLE WATER VALVE" As Applicable):			
	Rhino	ATAGNCT-C (Custom Imprinting)	New Construction
	Rhino	ATAGRFT-C (Custom Imprinting)	Retrofit to Existing Improvements
	DAS Manufacturing	Reflective Duracast Style (Custom Imprinting)	New Construction or Retrofit

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Water Category 4 of 510: PIPE FITTINGS			
ITEM TO BE USED	Manufacturer	Part Number	Comments
Expansion Joints:			
	EBA Iron		
	Metraflex		
	Star	Star Flex Series 5000, 5100, & 5200	
	Proco		
	Mercer Rubber		
Fittings C153 SSB / C110 Flange (Cement Mortar Lined And Asphaltic Coated In Accordance With C104) (Outside Surfaces Shall Be Prime Coated Only If Located Aboveground And Painted):			
	American		
	Union/Tyler		
	US Pipe		
	Sigma		
	Star Pipe		
Restrained Joints - Ductile Iron Pipe:			
	American	Fast Grip Gasket Flex Ring Field Flex Ring Lok Ring	
	EBA Iron Inc.	Mega-lug Series 1100 Series 1700 Bell Restrainer Series RS-3800 Restrainer - sleeve included	
	Sigma	One LOK SLD	
	Sigma	LOK Series PVP and PVPF	

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	Star	Stargrip Series 3000, 3000S,& 3000OS Series 3100S & 3100P Flange Adapter Series 200 & 400 Retainer Gland Series 600 Series 1000, 1100, & 1200 Adapter Flange Series 3200 & 4200	
	<u>Tyler/Union</u>	<u>Tuf Grip TLD Series 1000, 1000S</u> <u>Tuf Grip Dual Wedge Restraint Series 1500</u>	<u>For DI Pipe Use</u> <u>For PVC, DIP, HDPE pipe use</u>
Restrained Joints - PVC Pipe:			
	EBAA Iron Inc.	Mega-lug Series 2000PV Series 1500 & 1600 Bell Restrainer (4-inch to 12-inch) Series RS-3800 Restrainer – sleeve included	
	JCM	620 Sur-Grip Bell Joint 621 Sur-Grip Bell Joint	
	Uni-Flange/Ford	1350 Bell Restrainer 1360 Bell Restrainer 1390 Bell Restrainer 900 Adapter Flange 1300 Fitting Restrainer 1500 Series	
	Sigma	One LOK SLC	
	Sigma	PV LOK Series PVP and PVPF	
	Star	PVC Stargrip Series 4000 & 4000P PVC Harness Series 1000, 1100, & 1200 Adapter Flange Series 3200 & 4200 Adapter Flange Series 200 & 400	
	<u>Tyler/Union</u>	<u>Tuf Grip TLD Series</u>	<u>For DI Pipe Use</u>

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	Tyler/Union	<u>Tuf Grip TLP Series 2000, 2000S</u>	For PVC Pipe Use
		<u>Tuf Grip Dual Wedge Restraint Series 1500</u>	<u>For PVC, DIP, HDPE pipe use</u>
		<u>Bell Joint Restraints Series 3000: 32U, 33U, 34U, 35U</u>	<u>For PVC Pipe Use</u>
Tapping Sleeves (For All Taps On IPS OD PVC pipe, Including Size On Size (18-8 Type 304 Stainless Steel Body, Flange And Bolts), Flange To Accept Standard Tapping Sleeves):			
	Ford	Series FTSS	
	JCM	Model 432	
	Mueller	Series H-304 S/S	
	Cascade	CST-EX	
	<u>Total Piping Solutions</u>	<u>Triple Tap</u>	
Tapping Sleeves (Mechanical Joint For All Taps On Cast Iron, Ductile Iron, PVC-900 & AC Pipe, All Taps Including Size On Size):			
	American Flow Control	Series 2800	
	Mueller	Series H-615, H-616, H-619	
	JCM	Series 432	
	<u>Total Piping Solutions</u>	<u>Triple Tap</u>	
Tapping Sleeves (Fabricated Steel, Mechanical Joint, Fusion Bonded Epoxy Coated):			
	JCM	Series 414	

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Water Category 5 of 10: FIRE HYDRANT ASSEMBLIES			
ITEM TO BE USED	Manufacturer	Part Number	Comments
Fire Hydrants (5 1/4 Inch Valve Opening, Final Exterior Color - Painted International Orange):			
	American Flow Control	B-84-B	
	Kennedy	K81A	
	Mueller	Super Centurion 250	
Anti-Terrorism Valve for Fire Hydrants (5 1/4 Inch Valve Opening) (For Installation in New and Existing Non-HS Type Fire Hydrants):			
	Davidson	ATV	To be utilized as directed by PCU for potable water system security purposes.

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<u>Water Category 6 of 10: VALVES AND ACCESSORIES (PLANTS AND REMOTE FACILITIES)</u>			
<u>ITEM TO BE USED</u>	<u>Manufacturer</u>	<u>Part Number</u>	<u>Comments</u>
<u>Automatic Combination Air / Vacuum Release Valves:</u>			
	<u>Val-Matic</u>	<u>VM-38</u>	<u>Air Release Only – Plant, Facility Use Only</u>
	<u>Val-Matic</u>	<u>VM-45</u>	<u>Air Release Only – Plant, Facility Use Only</u>
	<u>Val-Matic</u>	<u>VM-200C</u>	<u>Combination – Plant, Facility Use Only</u>
<u>Gate Valves, Butterfly Valves</u>			
	<u>DeZurik</u>	<u>BAW Series Butterfly</u>	<u>According to Application.</u>
	<u>DeZurik</u>	<u>Knife Gate Valve</u>	<u>According to Application</u>
	<u>Val-Matic</u>	<u>American BFV Butterfly</u>	<u>According to Application.</u>
	<u>Val-Matic</u>	<u>Ductile Iron RSGV</u>	<u>According to Application.</u>
<u>Valve Actuators</u>			
	<u>Beck</u>	<u>Model 11</u>	<u>Remote Indication or Position Display According to Application</u>
	<u>Auma</u>	<u>SA</u>	<u>Remote Indication or AumaMatic. According to Application</u>
<u>Hydraulically Operated Control Valves (Pressure Reducing/Sustaining Valves):</u>			
	<u>Cla-Val</u>		<u>Model or Series based on field application.</u>
	<u>OCV</u>		<u>Model or Series based on field application.</u>
	<u>Watts/Ames</u>		<u>Model or Series based on field application.</u>
<u>Water Category 7 of 10: PUMPS, CHEMICAL FEED SYSTEMS</u>			
<u>ITEM TO BE USED</u>	<u>Manufacturer</u>	<u>Part Number</u>	<u>Comments</u>
<u>Vertical Turbine</u>			
	<u>Goulds</u>		

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	<u>Flowsolve</u>	<u>VIC, VIT, SMVT, or DWT</u>	<u>based on application.</u>
	<u>Deming</u>		<u>(AKA: Process Systems, Inc.)</u>
	<u>National</u>		
<u>Centrifugal/Split Case</u>			
	<u>Aurora</u>		
	<u>Flowsolve</u>		
	<u>Goulds</u>		
<u>Chemical Pumps</u>			
	<u>Prominent</u>		<u>Appropriate series based on flow rate. Degassing heads for NaOCl.</u>
<u>Skid, Shelf Mounted Feed Systems</u>			
	<u>Blue Planet</u>		<u>Utilize "Polk County" junction box with hour meter/operating indication.</u>
<u>Chemical Tanks</u>			
	<u>Snyder</u>	<u>Captor/Dual Containment</u>	<u>HDLPE with NaOCl Resin</u>
	<u>Poly Processing Co.</u>	<u>Saf-T tank.</u>	<u>XLPE with OR 1000 Inner Coating</u>
<u>Water Category 8 of 10: TANKS and GENERATORS</u>			
<u>ITEM TO BE USED</u>	<u>Manufacturer</u>	<u>Part Number</u>	<u>Comments</u>
<u>Pre-stressed Concrete Tanks</u>			
	<u>Crom</u>		
	<u>Pre-con</u>		
<u>Hydro-pneumatic</u>			
	<u>Modern Welding</u>		<u>15,000 gallons unless otherwise determined by PCU. All coatings shall be approved by Polk County Utilities in accordance with NSF, AWWA, FDEP or other recognized authority for potable water service.</u>
<u>Standby Power Generators</u>			

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	<u>Kohler</u>		<u>3-Ph. 480V Diesel</u>
	<u>Caterpillar</u>		<u>3-Ph. 480V Diesel</u>
	<u>Cummins</u>		<u>3-Ph. 480V Diesel</u>
<u>Fuel Tanks (Stand-alone)</u>			
	<u>Convault</u>		<u>Pneumercator level/leak detection systems also required. LC 1000 w/ LS600 and LS610.</u>
	<u>Modern Welding</u>		<u>Pneumercator level/leak detection systems also required. LC 1000 w/ LS600 and LS610.</u>
	<u>Phoenix</u>		<u>Pneumercator level/leak detection systems also required. LC 1000 w/ LS600 and LS610.</u>
<u>Water Category 9 of 10: FLOW METERS</u>			
<u>ITEM TO BE USED</u>	<u>Manufacturer</u>	<u>Part Number</u>	<u>Comments</u>
<u>Flow Meters (Electro-magnetic)</u>			
	<u>Siemens</u>	<u>Sitrans FM Mag. 5000 series unless using bussed network.</u>	
	<u>ABB</u>	<u>WaterMaster Series</u>	
	<u>Foxboro</u>	<u>9100A w/ IMT 25</u>	
<u>Water Category 10 of 10: ELECTRICAL</u>			
<u>ITEM TO BE USED</u>	<u>Manufacturer</u>	<u>Part Number</u>	<u>Comments</u>
<u>VFDs, Relays, Breakers</u>			
	<u>Schneider-Electric</u>	<u>Square D</u>	
<u>Security/Surveillance System</u>			
	<u>Axis</u>		<u>Camera/Equipment</u>
	<u>Bosch</u>		<u>Camera/Equipment</u>
	<u>Pelco</u>		<u>Camera/Equipment</u>
	<u>Exaqvision</u>		<u>Software</u>

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Water System Schedule of Values

December 2010

Date: _____

Contractor: _____

Project: _____

PCU Project No.: _____

Item No.	Item Description	Qty.	Unit	Unit Cost (\$)	Extended Cost (\$)
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1	Single Service, Long				
2	Single Service, Short				
3	Double Service, Long				
4	Double Service, Short				
5	Blow-Off Assembly, Complete				
6	Fire Hydrant Assembly, Complete Including Branch Valve				
7					
8					
9					
10	4" PVC, AWWA C-900, DR 18, Blue				
11	4" DIP, Pressure Class 350, Cement-Lined, Bituminous Coated				
12	4" Gate Valve Assembly, Complete				
13	4" 11 ¼ Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
14	4" 22 ½ Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
15	4" 45 Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
16	4" 90 Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
17	4" Tee, CI, C153, Cement-Lined, Bituminous Coated				
18	4" Cross, DI, C153, Cement-Lined, Bituminous Coated				
19					
20	4" HDPE				
21					
22	6" PVC, AWWA C-900, DR 18, Blue				

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23	6" DIP, Pressure Class 350, Cement-Lined, Bituminous Coated				
24	6" Gate Valve Assembly, Complete				
25	6" 11 ¼ Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
26	6" 22 ½ Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
27	6" 45 Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
28	6" 90 Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
29	6" Tee, DI, C153, Cement-Lined, Bituminous Coated				
30	6" Cross, DI, C153, Cement-Lined, Bituminous Coated				
31					
32	6" HDPE				
33					
34	8" PVC, AWWA C-900, DR 18, Blue				
35	8" DIP, Pressure Class 350 Cement-Lined, Bituminous Coated				
36	8" Gate Valve Assembly, Complete				
37	8" 11 ¼ Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
38	8" 22 ½ Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
39	8" 45 Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
40	8" 90 Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
41	8" Tee, DI, C153, Cement-Lined, Bituminous Coated				
42	8" Cross, DI, C153, Cement-Lined, Bituminous Coated				
43					
44	8" HDPE				
45					
46	10" PVC, AWWA C-900, DR 18, Blue				
47	10" DIP, Pressure Class 350, Cement-Lined, Bituminous Coated				
48	10" Gate Valve Assembly, Complete				

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49	10" 11 ¼ Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
50	10" 22 ½ Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
51	10" 45 Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
52	10" 90 Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
53	10" Tee, DI, C153, Cement-Lined, Bituminous Coated				
54	10" Cross, DI, C153, Cement-Lined, Bituminous Coated				
55					
56	10" HDPE				
57					
58	12" PVC, AWWA C-900, DR 18, Blue				
59	12" DIP, Pressure Class 350, Cement-Lined, Bituminous Coated				
60	12" Gate Valve Assembly, Complete				
61	12" 11 ¼ Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
62	12" 22 ½ Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
63	12" 45 Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
64	12" 90 Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
65	12" Tee, DI, C153 Cement-Lined, Bituminous Coated				
66	12" Cross, DI, C153, Cement-Lined, Bituminous Coated				
67					
68	12" HDPE				
69					
70	16" PVC, AWWA C-905, DR 25, Blue				
71	16" DIP, Pressure Class 350, Cement-Lined, Bituminous Coated				
72	16" Gate Valve Assembly, Complete				
73	16" 11 ¼ Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				

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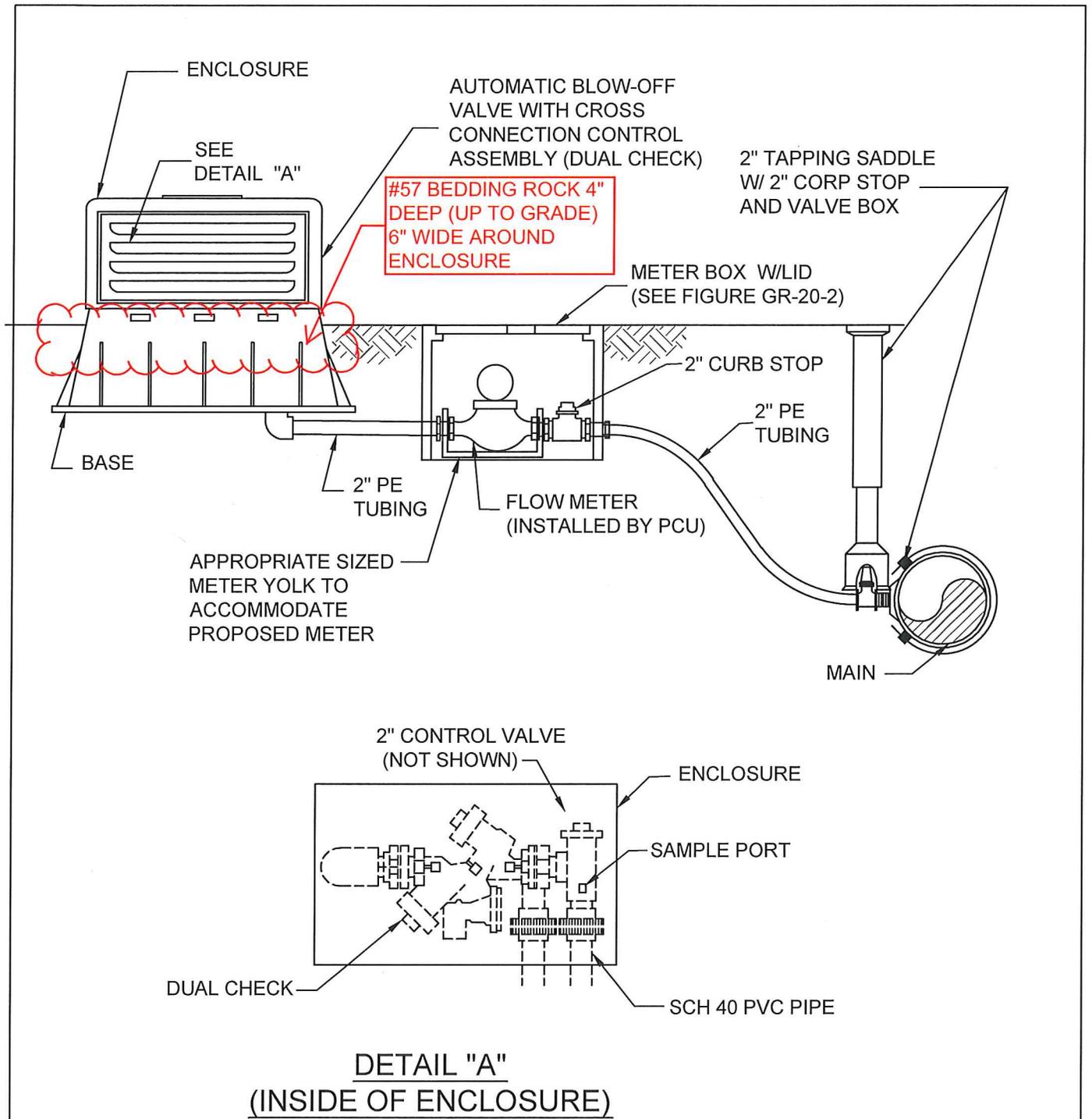
74	16" 22 ½ Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
75	16" 45 Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
76	16" 90 Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
77	16" Tee, DI, C153 Cement-Lined, Bituminous Coated				
78	16" Cross, DI, C153, Cement-Lined, Bituminous Coated				
79					
80	16" HDPE				
81					
82					
83					
84	18" PVC, AWWA C-905, DR 25, Blue				
85	18" DIP, Pressure Class 350, Cement-Lined, Bituminous Coated				
86	18" Gate Valve Assembly, Complete				
87	18" 11 ¼ Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
88	18" 22 ½ Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
89	18" 45 Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
90	18" 90 Degree Bend, DI, C153, Cement-Lined, Bituminous Coated				
91	18" Tee, DI, C153 Cement-Lined, Bituminous Coated				
92	18" Cross, DI, C153, Cement-Lined, Bituminous Coated				
93					
94	18" HDPE				
95					
96					
97					

Total Constructed Value: \$ _____

Reviewer: _____

Date: _____

Comments _____



NOTES:

1. COLOR OF ENCLOSURE AND BASE SHALL BE :
POTABLE WATER - BLUE
2. METER BOX SHALL BE IN ACCORDANCE WITH FIGURE GR-20-2.
3. NO AUTOMATIC BLOW OFF VALVE WILL BE INSTALLED ON RECLAIMED WATER SYSTEMS.

REV. : SEPTEMBER, 2014

BLOW OFF VALVE (ABOVE GROUND) AUTOMATIC	FIGURE WA-01-2
POLK COUNTY UTILITIES, FLORIDA	DECEMBER, 2010

- **Chapter Five (5): Wastewater**
 - **Section 510: Gravity Wastewater System Standards**
 - **Section 512: Wastewater Lift Station Standards**
 - **Section 513: Wastewater Pipes, Valves, etc.**
 - **Section 550-A: Testing and Inspection for Acceptance**
 - **Section 550-C: Approved Materials Checklist**
 - **Form 550-J: Wastewater System Schedule of Values**
 - **Form 550-L: Gravity Air Test**
 - **Standard Drawings:**
 - **WW-09: Lift Station Notes**
 - **WW-10: Lift Station Notes (Cont'd)**
 - **WW-11: Duplex Lift Station (Typical) Site Plan**
 - **WW-12-1: Duplex Lift Station Plan View**
 - **WW-12-2: Duplex Lift Station Section View**
 - **WW-12-3: Duplex Lift Station Dimensions and Elevations**
 - **WW-12-5: Typical Lift Station HDPE Pipe Bracing**
 - **WW-14-2: Triplex Lift Station Section View**
 - **WW-14-3: Triplex Lift Station Dimensions and Elevations**
 - **WW-20-2: Lift Station Control Panel Rear View**

CHAPTER 5 WASTEWATER

Section 510 Gravity Wastewater System Standards and Specifications December 2010

PART 1 - GENERAL

- A. PCU will not approve PLANS for combined wastewater gravity systems. Gravity mains shall be designed to exclude infiltration/inflow.
- B. Wastewater gravity system shall be designed for the estimated ultimate tributary population, as delineated in the approved PCU's MASTER PLAN (latest edition). When the DEVELOPER's MASTER PLAN is required, wastewater gravity mains shall be designed for the estimated ultimate build out of that DEVELOPMENT, as approved by PCU

PART 2 - LOCATION

- A. Mains shall be located within dedicated public rights-of-way or Polk County Utilities Easements.
 - 1. Public Rights-of-Way

When installed in rights-of-way, mains shall maintain a consistent alignment with respect to the centerline of the road. In all cases, mains shall be installed along one side of the road with crossings kept to a minimum.
 - 2. Polk County Utilities Easements

If a main is to be constructed within an easement, the centerline of the pipe shall be located along the centerline of the easement.

 - a. When not adjacent to County or State rights of way, a minimum width of 20 feet shall be provided for mains with inverts located up to 5 feet below finish grade. For mains with inverts located deeper than 5 feet below finish grade, the minimum width shall be twice the invert depth of the main plus 10 feet. All widths shall be rounded up to the nearest even foot. Width of the easement shall be based on the deepest invert depth of each segment of the subject main.
 - b. Where multiple parallel mains are to be placed within a single easement, the FDEP required horizontal separation distance between the mains shall be added to the above minimum single main easement width and rounded up to the nearest even foot.
 - c. Have a maximum length of 150 linear feet if the easement terminates in a dead end or an obstruction. Longer easements may be authorized if adequate turnaround and work zone is provided as based on an AASHTO single unit vehicle. All locations and lengths of easements shall take in consideration the safety and accessibility of PCU vehicles and personnel.
 - d. Be free of any permanent structures, such as footers, foundations, walls, screen walls, buildings, air conditioner pads, transformer pads, sign supports, roof overhangs, stormwater structure, swimming pools, storage sheds, patios, etc.
 - e. Be accessible at all times and not subject to standing water nor under the side slope or bottom of a lake, pond or stormwater retention area, except that

CHAPTER 5 WASTEWATER

Section 510 Gravity Wastewater System Standards and Specifications December 2010

perpendicular crossings under swales, small ditches and canals may be authorized in writing by PCU.

- f. As designated by PCU for existing ~~and future~~ use, a Polk County Utilities Easement of not less than 15 feet in width shall be provided parallel to and directly adjacent to all County, State, and Federal rights-of-way. Notwithstanding PCU's easement requirements stated above and herein, easements in typical subdivision construction including those adjacent to internal subdivision roads shall be sized and conveyed in accordance with the LAND DEVELOPMENT CODE. Alternately, and where it is advantageous to PCU, an easement of not less than 20 feet in width may be located to the rear of a commercial or multi family development of significant size, i.e., shopping center, multi family residential complex, office complex, etc., located in a quadrant of an intersection that is subject to widening or other improvements that may require the relocation of PCU infrastructure in the future. The ultimate width of easements may be based on the number, type, size and depth of the utility lines within the easement.
 - g. Landscape buffers may be allowed to co-exist with Polk County Utilities Easements as long as landscape berms are not utilized. Should PCU disturb or damage any landscaping or other installed improvements within the easement, PCU shall initiate repairs or install replacements in a timely manner at no cost to the property owner.
 - h. A triangular corner clip type of Polk County Utilities Easement, that has 20 foot long sides, shall be provided at all intersections of County, State, and Federal rights-of-way.
- B. Mains within easements shall not be placed under septic tanks, storm water management facilities, buildings, retention ponds, athletic courts, swimming pools, fountains, patios, or other structures. Privacy walls and foundations shall not be placed parallel over mains or within the structure's zone of influence as based on a soil angle of repose of 45 degrees. Mains shall not be located along interior side or rear lot lines, unless approved in writing by PCU. Placement of mains along storm water retention pond berms may be allowed by PCU on a case by case basis when placed in a casing and if such a configuration results in efficient placement and utilization of the system. Service laterals, clean-outs, and other main related improvements shall not be placed along interior side or rear lot lines.
- C. Mains may be accepted for maintenance if the private streets are designed with a urban design cross section in accordance with the LAND DEVELOPMENT CODE. Polk County Utilities Easements shall be dedicated over the entire private street rights-of-way. In addition, sufficient area must be available outside of paved areas to maintain PCU mains.
- D. Offsite mains for all developments shall be extended along the entire frontage of each development. The minimum size of the main to be extended by the DEVELOPER shall be the same size that is the minimum main size required to serve the

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with inverts located deeper than 4 feet below finish grade, the minimum distance of 10 feet shall be increased by one foot for each one foot of increased depth of the main's invert. All horizontal distances shall be rounded up to the nearest whole foot.

- F. Unless specifically determined by PCU to be of benefit to its overall system, gravity wastewater infrastructure installed within a non-residential or multi-residential development shall not be subject to ownership, maintenance, or operation by PCU.

PART 3 - DESIGN BASIS

- A. Average Daily Flow:

The gravity main design shall be based on ultimate development or projected flow. Average daily wastewater flow shall be calculated by the Equivalent Residential Connections (ERC) flow factors as outlined in the "Utilities Administration Manual".

- B. Peak Design Flow:

- 1. Gravity mains shall be designed on the basis of ultimate development maximum rates of flow, which shall be the product of selected peak factors multiplied by the accumulative average daily flow as calculated above. The minimum peaking factor, provided in Table 510-1 shall be applicable for the range of average daily flow rates.

Table 510-1. Wastewater Peaking Factors.

Minimum Flow Range (gpd)	Peak Factor
Flows up to 100,000	4.0
100,001 to 250,000	3.5
250,000 to 500,000	3.2
500,000 to 1,000,000	3.0
Flows greater than 1,000,000	2.5

- C. Design Calculations:

DEVELOPER's ENGINEER shall submit signed, sealed and dated design calculations with the PLANS for all sewer projects. Calculations shall show that gravity mains will have sufficient hydraulic capacity to transport all design flows.

PART 4 - DESIGN AND CONSTRUCTION

- A. Minimum Size:

Gravity mains conveying wastewater shall be eight inches in diameter or greater.

- B. Pipe Cover:

The minimum cover over gravity mains shall be no less than 36 inches below the finished grade unless approved otherwise by PCU. Gravity main invert depths shall not

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Section 510 Gravity Wastewater System Standards and Specifications December 2010

exceed 20 feet below finished grade. System design shall minimize pipe invert depths and the number of utility conflicts.

C. Slope:

1. Gravity mains shall be designed and constructed to provide minimum velocities, when flowing full, of no less than two feet per second, based on Manning's formula using an "n" value of 0.013. The minimum slopes as shown in Table 510-2 shall be provided; however, slopes greater than these are desirable.
2. Gravity mains shall have uniform slope between manholes.

Table 510-2. Minimum Design Slope Requirements of Gravity Mains.

Gravity Main Diameter (inches)	Percent Slope (%)
8	0.400
10	0.280
12	0.220
15	0.150
18	0.120
21	0.100
24	0.080
27	0.067
30	0.058
36	0.046
42	0.037

D. Size and Alignments:

Pipe size shall remain constant between manholes and pipe alignment must remain straight between manholes.

E. Additional Requirements:

Storm-water management and drain systems, air conditioner and refrigeration condensation lines, and water-to-water air conditioner lines shall not connect to the gravity main system. All gravity main extensions for future connections shall terminate at a manhole.

PART 5 - MANHOLES

A. Location:

Manholes shall be installed at the end of each gravity main, at all changes in grade, size, or alignment, at all gravity main intersections, and at distances not greater than 400 feet. Private gravity main systems eight inches or larger shall be separated from the PCU gravity main system by a manhole located within and adjacent to the right-of-way line.

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B. Type:

1. Standard Manhole:

Where the difference in elevation between the incoming gravity main invert and the manhole invert is less than 24 inches, the manhole invert shall be filleted to prevent solids deposition. All standard manholes shall be coated in accordance with the appropriate "Approved Materials Checklist".

2. Drop Manhole:

An interior drop pipe shall be provided for wastewater gravity main entering a manhole where the invert elevation is 24 inches or more above the manhole invert. All drop manholes shall be lined or coated in accordance with the appropriate "Approved Materials Checklist".

3. Master Manhole:

All gravity and force mains shall discharge their flows into a master manhole prior to the wet well of a wastewater lift station. Force mains intersecting gravity main systems shall discharge into a master manhole at a maximum angle of 45 degrees to the flow path in the manhole. All master manholes shall be lined or coated and have a minimum interior diameter in accordance with Table 510-3.

C. Personnel Access Opening:

Manhole covers and frames shall provide a 24 inch minimum access clearance through the frame opening.

D. Diameter:

Manholes shall have minimum interior diameters from the structure's base to the bottom of the top conical section as based on the main diameter in accordance with Table 510-3.

Table 510-3. Minimum Manhole Diameters.

Gravity Main Diameter (inches)	Minimum Inside Manhole Diameter (inches)
8 to 24	48 (60 for Master Manholes)
24 to 36	60
36 and larger	72

E. Flow Channel:

The flow channel through manholes shall be made to conform in shape and slope to that of the gravity mains. Flow direction changes in excess of 90 degrees shall not be included in gravity main alignments without written permission from PCU. Flow line elevation drop of 0.1 feet across manholes shall be provided. Benching shall have a minimum downward slope of 1/2 inch per foot from the wall of the manhole towards the rim of the flow channel. No bricks shall be used to construct channels.

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F. Materials:

1. Manholes shall be constructed of precast units as specified in this Section. Brick or cast-in-place manholes may be permitted on a case by case basis for retrofitting or repair purposes as approved by PCU.
2. Wastewater pipes, valves, and appurtenances shall be constructed of materials as specified in the Section entitled "Wastewater Pipes, Valves, and Appurtenances Specifications".

G. Castings:

All manhole frame and cover sets shall be in accordance with the STANDARD DRAWINGS and the appropriate "Approved Materials Checklist." Manholes that have 5 foot and larger inside diameters shall be provided with two piece covers in accordance with the STANDARD DRAWINGS. Bolt down covers shall be provided where manholes are located in areas outside of improved right-of-way and subject to ponding or flooding.

H. Vehicular Access:

A 12-foot wide access road shall be provided for all manholes that are located outside of State, COUNTY, or local roadways. The access road shall have a sub-base that is stabilized to a Florida Bearing value of 75 psi, and a base that is compacted to 98 percent of AASHTO T-180.

I. Coating or Lining:

A special coating or liner shall be provided for master manholes, drop manholes or any manhole that directly receives a discharge from a force main, as a minimum. A ~~liner or standard~~ coating ~~may be is~~ required for other manholes ~~as directed by PCU~~. All coatings and liners shall be in accordance with the appropriate "Approved Materials Checklist".

J. Manhole Inserts:

All manhole cover and ring assemblies shall be furnished and installed complete with an insert. The purpose of the insert is to prevent intrusion of storm water, dirt, debris, and to help control emission of odors.

The manhole insert shall be manufactured from corrosion-proof material, such as HDPE, polypropylene, or stainless steel, suitable for atmospheres containing hydrogen sulfide and diluted sulfuric acid and other gases associated with wastewater collection systems. The minimum continuous uniform thickness of a polymer based insert, including all angles, shall be 1/8 inch.

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The body of the HPDE insert shall be made of high density polyethylene co-polymer material that meets ASTM D1248, Class A, Category 5, Type 111, and have a minimum impact brittleness temperature of – 180° F. As a minimum, the material used in the manufacture of the body of the stainless steel insert shall be 16 gage Type 304 stainless steel.

The insert shall be manufactured to the dimensions of the manhole opening to allow easy installation within the manhole frame. The manhole insert shall be manufactured to fit the manhole frame rim upon which the manhole cover rests.

The gasket shall be made of closed cell neoprene. The gasket shall have a pressure sensitive adhesive on one side and be placed under the weight-bearing surface of the insert by the manufacturer. The adhesive shall be compatible with the insert material so as to form a long-lasting bond in either wet or dry conditions.

A lift strap shall be attached to the rising edge of the bowl insert. The lift strap shall be made of 1" wide woven polypropylene web and shall be seared on all cut ends to prevent unraveling. The lift strap shall be attached to the insert by means of a stainless steel rivet. Location of the strap shall provide easy visual location.

Ventilation of the insert shall be by means of a vent hole located on the side wall of the dish ¾" below the lip. The hole thus placed allows a maximum release of 10 gallons per 24 hours and is not affected by debris that might collect in the bottom of the bowl.

The insert shall have proof of durability in traffic impact loads and shall have engineer certified proof of test passing a collapse load of 2200 pounds minimum applied to a 5.5" square area in the center of the insert.

The manhole frame shall be cleaned of all dirt and debris before placing the manhole insert on the rim. The manhole insert shall be fully seated around the manhole frame rim to retard water from seeping between the cover and the manhole frame rim.

K. Pre-Cast Concrete Sections:

1. Pre-cast manholes shall conform to specifications for ASTM C 478 "Pre-cast Reinforced Concrete Manhole Sections", except as otherwise specified below.
2. The minimum wall thickness shall be five inches. Pre-cast manholes shall be constructed with a pre-cast monolithic base structure as shown on the STANDARD DRAWINGS. The minimum base thickness shall be eight inches.
3. Concrete for manholes shall be Type II, 4000 psi at 28 days. Barrel, top and base sections shall have tongue and groove joints. All jointing material shall be a cold

adhesive preformed plastic gasket, conforming to ASTM C 443 "Manhole Section Connections". Manholes shall be leak-free.

4. Sections shall be cured by an approved method as per ASTM C 478 for at least 28 days prior to coating and shall not be shipped until at least two days after having been coated.
5. Concrete surfaces shall have form oil, curing compounds, dust, dirt and other interfering materials removed by brush sand blasting and shall be fully cured prior to the application of any coatings.
6. The date of manufacture and the name or trademark of the manufacturer shall be clearly marked on each pre-cast section after coating on exterior surface.
7. Pre-cast concrete top slabs shall be used where cover over the top of the pipe is less than four feet.
8. Lift rings or non-penetrating lift holes shall be provided for handling pre-cast manhole sections.
9. With the exception of master manholes, drop manholes or manholes that have force mains directly discharging into them, the interior surfaces of all manholes shall have a protective bituminous epoxy or epoxy coating formulated to resist corrosion from a wastewater environment. The interior surfaces of master manholes, drop manholes, or manholes that have force mains directly discharging into them shall have a protective cementitious-~~or~~ polymer, high build epoxy, or elastomer-based coating or lining in accordance with the appropriate "Approved Materials Checklist". All exterior surfaces of all manholes shall have a protective bituminous epoxy or epoxy coating capable of sealing out moisture. Coatings or liners shall be as specified in the appropriate "Approved Materials Checklist" and applied in strict accordance with the coating or liner manufacturer's recommendations. All coatings and liners shall have a minimum of a one year manufacturer's warranty from the date of installation.

L. Liners and Coatings:

1. HDPE Liner:

The light colored HDPE embedment sheeting shall be mechanically bonded to the concrete by integral studs. The liner shall be cast in place by the precast manufacturer and the CONTRACTOR shall field weld the joints. Minimum thickness of liner is 80 mils. All inserts and sleeves for piping shall be in accordance with the liner manufacturer's recommendations and shall result in complete coverage of all pre-cast sections and be capable of passing a spark test.

2. Coatings:

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Coatings shall be light in color. The receiving surface shall be prepared using a wet or dry sand blasting surface preparation process in accordance with the manufacturer's recommendations. Coatings shall be applied in accordance with the manufacturer's recommendations. All coatings shall be selected in accordance with the appropriate "Approved Materials Checklist".

M. Encapsulation:

1. Where a structure is subject to a high ground water condition, is within the boundaries of a storm water management facility, or is subject to flooding, the cone, grade rings, joints, and iron frame shall be encapsulated with a heat shrink-wrap with a minimum final thickness of 100 mils unless otherwise approved by Polk County. The wrap shall have a cross-linked polyolefin backing coated with a protective heat activated adhesive. The wrap shall effectively bond to the substrate in order to provide corrosion and moisture protection. The PLANS shall specifically identify each structure that is designated to receive encapsulation.

N. Castings:

1. Gray iron castings for manhole frames, covers, adjustment rings and other items shall conform to the ASTM A 48, Class 30B. Castings shall be true to pattern in form and dimensions and free of pouring faults and other defects which would impair their strength or otherwise make them unfit for the service intended. The seating surfaces between frames and covers shall be machined to fit true. No plugging or filling will be allowed. Lifting or "pick" holes shall be provided, but shall not penetrate the cover. Casting patterns shall conform to those shown or indicated on the STANDARD DRAWINGS. All manhole frames and covers shall be traffic bearing to meet AASHTO H-20 loadings. Frames shall be suitable for the future addition of a cast iron ring for upward adjustment of top elevation.

O. Precast Concrete Manhole Installation:

1. Bedding, excavation, and backfill shall be in accordance with the Section entitled "Excavations, Backfill, Compaction, and Grading Specifications".
2. Placing Pre-Cast Sections:
 - a. The pre-cast base section shall be carefully placed on the prepared bedding so as to be fully and uniformly supported, in true alignment, and ensure that all pipes entering the structure shall be inserted to the proper grade.
 - b. Pre-cast manhole sections shall be handled by lift rings or non-penetrating lift holes. Such holes shall be filled with non-shrink grout after installation of the manhole and coated. Lifting of manhole sections shall be as per

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manufacturer's recommendation.

- c. Sections shall be uniformly supported by the base structure, and shall not bear directly on any of the pipes. Influent and effluent pipes shall be properly installed so as to form an integral watertight unit.
 - d. Sections shall be placed and aligned to provide vertical alignment with a 1/4-inch maximum tolerance per five feet of depth.
 - e. The completed manhole shall be rigid, true to dimensions, and watertight.
3. Placing Castings:
- a. Casting shall be fully bedded in mortar with adjustment courses placed between the frame and manhole. Bricks shall be a minimum two and maximum four courses. Mortar shall conform to ASTM C 270, type M and the bricks shall be clay and conform to ASTM C 216, grade SW, size 3-1/2 inches wide by 8 inches long by 2-1/4 inches high. Adjustment by other approved materials shall be equal to a minimum of 4-1/2 inches and a maximum of 9 inches.
 - b. Top of manhole castings located in pavement, shouldered areas, and sidewalks shall be set flush with grade. Top of manhole castings located outside these areas shall be placed in accordance with the STANDARD DRAWINGS.
4. Channels:
- Manhole flow channels shall be constructed with smooth and carefully shaped bottoms, built up sides and benching using cement and brick with no voids. Channels shall conform to the dimension of the adjacent pipe and provide changes in size, grade and alignment evenly. Cement shall be Portland Cement Type II only.
5. Pipe Connections:
- Special care shall be taken to ensure that the openings through which pipes enter the structure are provided with watertight connections. Pipe connections shall conform to ASTM C 923, "Standard Specifications for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals".

P. Cleaning:

- 1. Newly constructed manholes shall be cleaned of any accumulation of silt, debris, or foreign matter of any kind and shall be free from such accumulations at the time of final inspection.

Q. Inspection for Acceptance:

- 1. The quality of materials, the process of manufacture and the finished sections shall be subject to inspection and approval by PCU. Such inspection may be made at the

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place of manufacture, at the site after delivery or at both places and the sections shall be subject to rejection at any time due to failure to meet any of the specification requirements; even though sample sections may have been accepted as satisfactory at the place of manufacture. Sections rejected after delivery to the job shall be marked for identification and shall be removed from the job at once. Sections that have been damaged after delivery will be rejected and if already installed, removed and replaced, entirely at the CONTRACTOR's expense.

2. At the time of inspection, the sections will be carefully examined for compliance with the specified ASTM designation and with the approved manufacturer's drawings. Sections shall be inspected for general appearance, dimension, "scratch-strength" blisters, cracks, roughness, soundness, etc. The surface shall be dense and close-textured.
3. Manholes shall be inspected by PCU and defective manholes replaced by the CONTRACTOR. Pressure grouting of manholes for repair shall not be accepted.

PART 6 - SERVICE LATERAL CONNECTIONS

- A. Service connections shall be as shown in the STANDARD DRAWINGS.
- B. Service connections shall be permanently marked by cutting an "S" in the curb in direct alignment with the wye and the installation of a stake at the temporary plug to indicate the location of the service pipe as per the STANDARD DRAWINGS.
- C. Size and Length:
Service laterals and fittings shall be a minimum of four inches in diameter for single services and six inches in diameter for double services. Service laterals shall be laid perpendicular to the receiving main, except in cul-de-sacs where service laterals may be connected to an upstream terminal manhole. Service laterals shall not exceed 150 feet. Service laterals shall terminate with a temporary plug at the right-of-way with individual cleanouts installed by the building's plumber in accordance with the STANDARD DRAWINGS.
- D. Slope:
Service laterals shall have a minimum slope of one percent.
- E. If a floor slab elevation is lower than the closest manhole top elevation, then a private prefabricated pump station with a check valve (for each occurrence) shall be required to pump wastewater to the lateral at the cleanout in the road right-of-way. The private pump station shall be operated and maintained by the property OWNER.
- F. Connection:

Service laterals shall not be directly connected to sanitary manholes, except at terminal manholes. A maximum of three service laterals maybe connected directly to a terminal manhole. Incoming flows shall not be more than 90 degrees to the flow path in the manhole.

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PART 7 - GREASE TRAPS, INTERCEPTORS, AND SEPARATORS

- A. Grease interceptors shall be required for all commercial establishments where food will be processed or cooked in any way. The grease interceptor will be sized as defined below and will have a minimum volume of 750 gallons. All kitchen waste lines will be routed through the grease interceptor. However, no domestic waste will be allowed to enter the grease interceptor. All wastewater flow from the kitchen areas of these establishments shall flow through approved grease interceptors prior to entering the PCU system. In some cases, a grinder may be required for meat and fish processing plants.
- B. Grease interceptors shall be located outside of buildings.
- C. Sizing:
Refer to Table 510-4 for sizing requirements.
- D. Grease interceptors shall be placed where the proposed food waste line will have adequate slope and be accessible for maintenance and inspection at all times.
- E. Under-the-Counter Grease Traps:
 - 1. Where location of an outside grease interceptor is determined not feasible by PCU, PCU may approve an under-the-counter grease trap on a case-by-case basis. A commercial establishment where food will be processed or handled will only be considered for an under-the-counter grease trap if it meets all of the following criteria:
 - a. The building must be in existence at the time the under-the-counter grease trap is being proposed;
 - b. The restaurant or food preparation establishment must have less than 600 gpd of wastewater flow;
 - c. An under-the-counter grease trap must be installed on all drain fixtures in the food preparation areas; and
 - d. ENGINEER shall consult with PCU personnel before finalizing the design.

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Table 510-4. Sizing Requirements for Grease Traps, Interceptors, and Separators.

Type	Unit	Grease Interceptor/ Trap Capacity Single (gallons)	Grease Interceptor/ Trap Capacity In Series (gallons)	Grease, Oil, or Sand Separator Capacity (gallons)	Lint & Sand Separator Capacity (gallons)
Restaurant	seat	20	10		
Restaurant – Fast Food	seat	10	5		
Restaurant – 24-hour	seat	30	15		
Convention Center/ Manufacturing Cafeteria	meal	3	1.5		
Vehicle Repair, Maintenance, or Equipment Wash Facility	bay			200*	
Facility Using Commercial-Type Laundry Machines	machine				100*

* Minimum volume of 750 gallons.

PART 8 - SERVICE LOCATION AND IDENTIFICATION

- A. The location of all service lines shall be as shown on the STANDARD DRAWINGS. On curbed streets, the exact location of each service shall be adequately and permanently identified using durable plastic green colored pavement markers that states “Wastewater Service” and “Call Before You Dig” as specified by the appropriate “Approved Materials Checklist”. Each marker shall be securely attached to the curb in accordance with the manufacturer’s guidelines approximately 6 inches from the top of the curb.
- B. Where no curb exists, the exact location of each service shall be adequately and permanently identified using durable plastic green colored pavement markers that states “Wastewater Service” and “Call Before You Dig” as specified by the appropriate “Approved Materials Checklist”. Each marker shall be securely attached to the pavement in accordance with the manufacturer’s guidelines approximately 6

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inches from the edge of pavement.

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PART 1 – GENERAL

- A. The design standards outlined in this Section apply to all wastewater lift stations within the jurisdiction of this MANUAL. All stations shall be submersible type stations. The basis of design shall be reviewed and approved by PCU.
- B. Lift stations shall be designed for the estimated ultimate tributary population, as delineated in one of the approved PCU MASTER PLANS (latest edition) for the subject RUSA. When a DEVELOPER's master plan is required, lift stations shall be designed for the estimated ultimate build out of that DEVELOPMENT, as approved by PCU.
- C. Unless specifically determined by PCU to be of benefit to its overall system, wastewater lift stations installed within a non-residential or multi-residential development shall not be subject to ownership, maintenance, or operation by PCU.
- D. Regional lift stations shall have wet wells designed and constructed to serve the lowest developable point on all adjacent vacant tracts of land surrounding a project by means of gravity flow only. The appropriate sized Polk County Utilities Easement(s) shall be provided by the DEVELOPER so that the gravity wastewater mains from all such vacant tracts of land can easily be connected to the wet well of the regional lift station.
- E. All lift stations to be dedicated to and operated by PCU shall be of the municipal rated type.

PART 2 – LOCATION

- A. With the exception of private lift stations serving single owner properties, all lift stations shall be located on fee simple tracts of land adjacent to rights-of-way and preferably sharing the same general location as storm-water management facilities. Private lift stations shall not be located directly adjacent to public thoroughfares. No part of a lift station, regardless of ownership, shall be located in a roadway median, in the middle of a cul-de-sac, within any portion of a public or private right-of-way, directly in front or behind of an occupied structure on the same side of the roadway, or less than 50 feet perpendicularly from the intersection of two or more rights-of-way. The actual location of all equipment within a lift station site shall be in accordance with the STANDARD DRAWINGS or as approved by PCU.
- B. No public or private easement or non-PCU infrastructure of any kind shall be permitted to cross a tract containing a PCU lift station **without written approval by PCU**. Where conflicts are unavoidable in the opinion of PCU, the depth of the lift station tract shall be extended so that the required minimum dimensioned lift station site is located directly behind and adjacent to the conflicting easement or infrastructure.
- C. Permanent and temporary vehicular access to a lift station shall freely accommodate the turning movements of a 40 foot long and 9 foot wide single unit truck vehicle with a 28 foot wheelbase as specified by the Institute of Transportation Engineers. Vehicular backup distance shall not exceed 60 linear feet. A T-shaped turn-around with the

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appropriate radii and pavement lengths may be considered as part of the access design. The design of the access driveway or roadway shall insure that the ramp break-over angle of a two wheel drive pickup truck with a standard wheelbase is accommodated along its entire length.

- D. Driveways to lift stations along low traffic volume two lane residential roadways shall not be less than ~~30~~ 23 feet in length from the lift station's gates to the adjacent roadway's edge of pavement or back of curb so as not to totally block both lanes of travel. The driveway length along all other roadways shall not be less than 45 feet so as to accommodate the entire length of the vehicle described above without impeding traffic in any travel lane. Driveway within PCU lift station tract shall be a minimum of 40 feet in length to accommodate the entire length of the vehicle described above within the tract.

Comment [FC1]: This is based on the actual layout. Total = 45+8 (53') to pavement from back of lot - 30 feet pad size = 23'.

PART 3 - DESIGN BASIS

- A. Average Daily Flow:
The wastewater lift station design shall be based on ultimate development or projected flow. Average daily wastewater flow shall be calculated by the Equivalent Residential Unit flow factors as outlined in the "Utilities Administration Manual".
- B. Peak Design Flow:
The design pumping capability of the station shall be based upon the peak design flow, which shall be calculated by multiplying the design average flow with the applicable minimum peaking factors as outlined in Table 510-1, "Wastewater Peaking Factors".
- C. Number of Pumps:
Minimum number of pumps is determined by the peak design flow as shown in Table 512-1 below.

Table 512-1. Required Number of Pumps Based on Peak Design Flow.

Peak Design Flow (gpm)	Number of Pumps
Less than 1,000	2
1,000 to less than 2,500	3
2,500 to less than 4,000	4
4,000 or greater	5

- D. Pump and Motor Selection:
The lift station shall be capable of pumping the peak design flow with the largest pumping unit out of service. Pumps shall be capable of meeting all system hydraulic conditions without overloading the motors.
- E. Design Calculations:

The ENGINEER shall submit signed, sealed and dated design calculations for all wastewater lift stations. Calculations shall include high head and low head condition system curves plotted on the manufacturer's pump curve, hydraulic analysis of force main system including all friction and minor losses, operating cycles with wet well sizing, and buoyancy calculations. The design basis for all calculations shall provide for 100 percent of all receiving system pumps to be operating at the time that the proposed lift station is to be operating. System curves shall verify that the pumps are operating at peak efficiency in accordance with the manufacturer's specifications and are suitable for the design flow application. Pump and motor selection shall be designed based on the hydraulic grade line at the point of connection as based on PCU's MASTER PLAN model for the regional utility service area affected by the proposed development. Each component of the lift station shall be designed to accommodate the development's design flow at the prevailing system conditions at the time of build out, i.e., utilize impeller change-outs to adjust initial flow and head pressure to meet final conditions, etc.

PART 4 - DESIGN

A. Flooding:

1. When siting the lift station, the ENGINEER shall consider the potential for damage or interruption of operation because of flooding. Lift station structures, electrical equipment, and mechanical equipment shall be designed to be protected from physical damage by a 100-year 24-hour storm event. The bottom of all station control and electrical boxes shall be no lower than the 100-year 24-hour Flood Elevation. In no case shall the top elevation of the control panel exceed the maximum distance from the lift station's concrete pad that is allowed by the NEC. In such cases, the elevation of the lift station's entire concrete pad shall be raised until the maximum distance allowed by the NEC is achieved.
2. Wastewater lift stations shall remain fully operational and accessible during a 25-year 24-hour storm event. The top elevation of the wet well shall be no lower than the 25-year 24-hour Flood Elevation. On a case-by-case basis, the top elevation of the wet well may be lower if it can be shown that no drainage runoff from the surrounding areas will flow to the lift station site at any time.
3. No occupied structures shall have a floor, which is connected by gravity flow to a PCU wastewater system, with a finish floor elevation below the top elevation of the lift station that serves it. Regulations of local, state and federal agencies regarding flood plains shall be considered.
4. The lift station site design shall insure positive storm water drainage radiates outward from the center of the wet well to the boundaries of the site and away from the lift station site. The access driveway or roadway shall not allow storm water to be conveyed onto the lift station site.

B. Accessibility:

The lift station shall be readily accessible by maintenance vehicles during all weather

conditions including a 25-year 24-hour storm event. The lift station driveway shall be concrete onsite while the offsite portion may be either concrete or asphaltic concrete in accordance with the STANDARD DRAWINGS. In a phased development, a temporary 12 foot wide paved asphalt access road (1½ inch thick FDOT SP-9.5 Asphaltic Concrete, 6 inch thick LBR 40 Limerock Base, and 6 inch thick FBV 75 Sub-Base) within the appropriately sized Polk County Utilities Easement, shall be provided by the DEVELOPER and utilized by PCU until the temporary access is replaced with a platted roadway that complies with this MANUAL.

C. Boundary Survey:

A current BOUNDARY SURVEY shall be required at the lift station startup test and inspection. The DEVELOPER shall bear the entire expense of rectifying WORK improperly installed due to the construction of improvements not totally within the fee simple site to be dedicated to PCU. An electronic version and three copies of the certified BOUNDARY SURVEY shall be required.

D. Pump Requirements:

1. Pump rails and base elbows shall be capable of accepting a “Hydromatic” brand pump by sliding a pump down the rails and accomplish a positive seal to the base elbow with no adapters. When other pump brands are considered as specified in the appropriate “Approved Materials Checklist”, they shall be required to be adaptable to the above “Hydromatic” standards. Submersible pumps shall be readily removable and replaceable without dewatering the wet well or disconnecting any piping in the wet well.
2. Pumps shall be capable of handling raw sewage and passing solids of at least three inches in diameter. Pump suction and discharge openings shall be at least four inches in diameter. No pumps with less than five horsepower motors will be acceptable.

E. Major Component Requirements:

The major requirements for a lift station are specified in the following table.

Table 512-2. Lift Station Major Component Requirements.

COMPONENT		NUMBER OF PUMPS		
		2	3	4 or More
1	Site Plan	see #1 below	see #1 below	see #1 below
2	Number of Wet Wells	1	1	2
	Wet Well Structure Type	precast	precast	cast-in-place or precast
3	Piping (below or above ground)	below or above *	above	above

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4	Site Enclosure	chain link	chain link or wall	wall
4a	Access Gate	swing	swing or sliding	swing or sliding
5	Flow Meters	no	yes	yes
6	Odor Control System	*	*	*
7	SCADA and Control Panel	yes	yes	yes
8	Generator	*	yes	yes
9	A/C MCC	no	no	yes
10	VFD	no	*	*
11	Wet Well / Valve Vault Coating/ Liner	yes	yes	yes
12	Level Control	float ball and transducer	float ball and transducer	float ball and transducer
13	Automatic Gear Actuator	*	*	*
14	Wet Well Fall Protection System	yes	yes	yes

NOTE: Please refer below for component explanation.

** In accordance with MANUAL or as determined by PCU for proper system operation.*

1. Site Sizing, Tract, and Easement Requirements:

Lift station sites shall be sized as delineated in the STANDARD DRAWINGS for the duplex, triplex, or more than three pumps per the lift station site plans. The DEVELOPER shall dedicate the lift station site and driveway by plat or separate instrument to PCU. Dedicated easements shall be shown as specified on the lift station site plans in the STANDARD DRAWINGS. All temporary access roads shall be improved to accommodate heavy truck traffic and dedicated to PCU, with a minimum 20 foot wide Polk County Utilities Easement that provides for ingress and egress to the lift station.

2. Wet Well Requirements:

a. Single wet well:

- i. The wet well for a duplex lift station shall have a minimum six feet inside diameter. If the design requirements require 35 horsepower pumps or larger for a duplex lift station (less than 1000 gpm), a minimum 10-foot inside diameter wet well shall be required. Sufficient depth shall be provided to accommodate cycle time and motor submergence.

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- ii. The wet well for a triplex lift station shall have a minimum 12-foot inside diameter. Sufficient depth shall be provided to accommodate cycle time and motor submergence.
- iii. In determining the cycle time, no consideration of volume shall be used for the volume below the top of the pump or the manufacturer's minimum submergence recommendation, whichever is greater.
- iv. Pumping levels shall be set to provide a minimum capacity between operational water levels sufficient to allow a minimum of ten minutes in one pumping cycle. The minimum time between successive starts of the same pump shall be ten minutes.
- v. For duplex lift stations (less than 1,000 GPM), the effective volume (from pump off elevation to the invert of the gravity pipe) shall be based on a fill time of 30 minutes at Average Daily Flow (ADF). For triplex lift stations, the fill time shall not exceed 10 minutes at ADF. The high liquid level in the wet well (storage capacity) shall not exceed the invert elevation of the lowest inflow pipe. When new development proposes connection to an existing lift station, vertical storage criteria within the wet well shall not be applied to the existing lift station without consideration of other factors including, but not limited to generator installation.
- vi. Pump-off water levels shall provide adequate submergence to preclude pump inlet cavitations. Design maximum water levels shall not exceed the invert elevation of the influent pipe.
- vii. The wet well floor shall have a minimum slope of one to one to the hopper bottom. The horizontal area of the hopper bottom shall be no greater than necessary for proper installation and function of the pump inlet.
- viii. Interior ladders shall not be permitted.
- ix. Only one inlet connection shall be permitted to a wet well.
 - x. For buoyancy calculations, the soil ring weight (from the outer face of the bottom slab to the outer edge of the wet well) shall be 100 percent of the total weight of the soil ring. The net density of the soil shall be used for calculating weight, i.e., soil density less the water density (62.4 pounds per cubic foot). A minimum safety factor of 1.1 shall be achieved.
- b. Dual wet wells:

When required, dual wet wells shall be designed with the same criteria as a single wet well; except with master manhole and valving to separate either wet well. The influent slope of the wet well floor shall have a minimum slope one inch per foot to the hopper bottom.
3. Piping ~~in Valve Vault or~~ Above Ground:

Piping shall be installed ~~in a valve vault or~~ above ground with a concrete slab ~~for a duplex lift station. Above ground piping with a concrete slab shall be installed for lift stations with more than two pumps. In general, all lift stations servicing non-~~

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~~residential, industrial, and commercial developments shall utilize above ground piping. The use of above ground piping for duplex lift stations servicing residential developments may be permitted if desired by the DEVELOPER.~~

4. Site Enclosures:

All lift station sites shall be enclosed. Duplex lift stations shall have six-foot high factory applied black vinyl security type chain link fencing with two offset six foot high chain link double swing gates or one single six foot high chain link rolling type gate as specified by PCU. PCU may require that lift stations with more than two pumps have eight-foot high concrete masonry unit perimeter walls and two offset eight-foot high minimum aluminum, double-hung swing gates instead of the required chain link fencing and gates. The use or substitution of chain link fencing slats, vinyl fencing, or wood fencing instead of or in addition to the black vinyl coated chain link fencing shall be prohibited. Three strands of barb wire shall be installed on top of the chain link fencing at the direction of PCU if it is determined to be necessary for site security.

Florida-Friendly Landscaping may be permitted along the outside perimeter fencing of the lift station site as long as the center of all trees are no closer than fifteen feet and the center of all other non-tree type plantings are no closer than five feet. Maintenance and irrigation of the landscaping shall be the responsibility of the installing entity and not PCU.

5. Flow Meters:

Indicating, totalizing, and recording flow measurement devices shall be provided at lift stations where required in Table 512-2. Bypass piping around the meter shall be provided for all stations with flow meters to facilitate meter maintenance.

6. Odor Control System:

Provide a complete system for the control of hydrogen sulfide gas and other wastewater odors as required and specified by PCU.

7. SCADA:

a. Control Panel:

Panel shall be of type to match lift station configuration (number of pumps, control features, etc) as determined by PCU. Refer to the Section 517 entitled "SCADA and Control Panel Specifications" for additional information.

8. Emergency Generator:

a. Permanent stationary emergency generator sets shall be provided for all lift stations that utilize a 12 inch and larger force main, receive flows from one or more contributing lift stations, that receive flow from a generator equipped tributary lift station, pump more than 1000 gallons per minute, or as required by FDEP.

b. The ENGINEER shall size the generator and fuel tank as required by PCU and submit the name of the manufacturer, burn rate specifications, and sizing

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calculations to PCU for review and approval. The generator and fuel tank manufacturer shall be as specified in the appropriate "Approved Materials Checklist".

- c. Lift stations shall be provided with manual transfer switches or emergency power receptacles, except for those lift stations with permanent stationary emergency generator sets, as specified in the Section 516 entitled "Wastewater Lift Station Electrical System Specifications".
9. Air Conditioned Motor Control Center:
When a motor control center is required, a fully enclosed structure of concrete masonry unit construction with a stucco exterior on a concrete slab, prestressed concrete roof slab with built-up roofing, R-4 insulated or greater interior walls, and R-19 insulated suspended ceiling shall be provided. As specifically approved by PCU, low maintenance and long life prefabricated modular structures may be substituted for the above required concrete masonry unit based structures. A high temperature alarm with dry contact shall be provided for connection to the SCADA control panel.
10. Variable Frequency Drive Motors:
Where variable frequency drives (VFDs) are installed, motors shall be rated for inverter duty operation and shall indicate inverter duty rated on the nameplate.
11. Wet Well Liner:
Wet well liner to be provided as specified in the appropriate "Approved Materials Checklist".
12. Level Control:
Requirements in the Section entitled "Wastewater Lift Station Electrical System Specifications" shall apply.
13. Structural Bearing Design:
 - a. All wet wells, ~~valve vaults~~, and other such buried structure that are not subject to vehicular traffic, including their associated lids and covers, shall be designed utilizing a minimum 300 pound per square foot load bearing design.
 - b. All wet wells, ~~valve vaults~~, and other such buried structures that are subject to vehicular traffic, including their associated lids and covers, shall be designed utilizing a H-20 traffic load bearing design.
- F. Electrical Equipment, Power Supply and Power Cords:
Requirements in the Sections entitled "Submersible Wastewater Pump Specifications" and "Wastewater Lift Station Electrical System Specifications" shall apply.
- G. Controls:
Requirements in the Sections 516 and 517 entitled "Wastewater Lift Station Electrical

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System Specifications” and “SCADA and Control Panel Specifications” shall apply.

PART 5 - CONSTRUCTION

5.01 SCOPE OF WORK

- A. This Section applies to the equipment, materials, site work, fences or walls, and appurtenances for the installation of wastewater lift stations.
- B. Shop drawings for all components of a proposed lift station, not addressed in the appropriate “Approved Materials Checklist”, shall be submitted to PCU for review and approval prior to construction.
- C. All liners and coatings shall have a minimum of a one year warranty from the date of installation.

5.02 WET WELL

A. Wet Well Liners and Coatings:

1. HDPE Liner:

The light colored HDPE embedment sheeting shall be mechanically bonded to the concrete by integral studs. The liner shall be cast in place by the precast manufacturer and the CONTRACTOR shall field weld the joints. Minimum thickness of liner is 80 mils. All inserts and sleeves for piping shall be in accordance with the liner manufacturer’s recommendations and shall result in complete coverage of all pre-cast sections and be capable of passing a spark test.

2. Coatings:

Coatings shall be light in color, applied in accordance with the manufacturer’s recommendations using dry sand blasting surface preparations, and in accordance with the appropriate “Approved Materials Checklist”.

B. Pre-cast Concrete Sections:

- 1. Pre-cast wet wells shall conform to specifications for ASTM C 478 “Pre-cast Reinforced Concrete Manhole Sections”, except as otherwise specified below.
- 2. The minimum wall thickness shall be eight inches. Pre-cast wet-wells shall be constructed with a pre-cast monolithic base structure as shown on the STANDARD DRAWINGS. The minimum base thickness shall be eight inches.
- 3. Concrete shall be Type II, 4000 psi at 28 days. All sections shall have tongue and groove joints except for top slab. All jointing material shall be a cold adhesive preformed plastic gasket, conforming to ASTM C 443 “Manhole Section Connections”.
- 4. The date of manufacture and the name or trademark of the manufacturer shall be

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clearly marked on each pre-cast section.

5. Sections shall be cured by an approved method as per ASTM C 478 for at least 28 days prior to coating and shall not be shipped until at least two days after having been coated.
6. Pre-cast concrete top slabs shall be used.
7. Lift rings or non-penetrating lift holes shall be provided for handling pre-cast sections. Non-penetrating lift holes shall be filled with non-shrink grout after installation of the sections. The grout shall be coated after it is cured.
8. Concrete surfaces shall have form oil, curing compounds, dust, dirt and other interfering materials removed by brush and/or sand blasting and shall be fully cured prior to the application of any coatings.
9. Exterior surfaces shall have a protective coating, which shall be applied in strict accordance with the coating manufacturer's recommendations. All interior wall and underside top surfaces shall have a protective liner as specified above.

C. Cast-in-Place Bases:

Cast-in-place bases shall be utilized only when specifically approved by PCU. Unless otherwise specified, cast-in-place bases shall be at least eight inches in thickness. Reinforcement and connection to the riser sections shall be designed by the ENGINEER and submitted to PCU for approval.

D. Pipe Penetration:

The void between the opening in the wet well structure and the exterior of the force main piping that penetrates the walls of the wet well shall be sealed by using compression type wall seals or non-shrink cement grout.

5.03 VALVE VAULT

- A. ~~The utilization of a valve vault within a residential development may be considered optional if the DEVELOPER desires to use an above ground pipe assembly in accordance with the STANDARD DRAWINGS.~~
- B. ~~Piping assemblies that are eight inches and larger in diameter shall be located above ground in accordance with the STANDARD DRAWINGS.~~
- C. ~~Valve vaults for piping assemblies up to 6 inches in diameter shall have inside dimensions that provide a minimum of 18 inches of clearance between any portion of the piping assembly and the inside wall surface of the vault.~~
- D. ~~The void between the opening in the valve vault structure and the exterior of the force main piping that penetrates the walls of the valve vault shall be sealed by using compression type wall seals or non-shrink cement grout.~~
- E. ~~The valve vault shall be sealed to prevent ground water infiltration.~~

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- ~~F. The surface of the vault shall be cleaned prior to application of approved coating inside and outside of vault.~~

5.03 ACCESS FRAMES AND DOORS

- A. ~~Both~~ The wet well and the valve vault shall be furnished with an access frame and door(s) along with an integrated fall protection system as specified in the appropriate "Approved Materials Checklist". Equipment furnished shall include the necessary aluminum access frames, complete with hinged and slide bar equipped doors, stainless steel upper guide holder, and level sensor cable holder. Doors shall be of aluminum diamond plate.
- B. Wet well access doors shall be sized according to the pump manufacturer's recommendations. As a minimum, doors shall be sized to allow pumps to pass through the hatch opening with a 1 inch clearance between the back of the pump volute and the door. The front hatch frame shall have a minimum 8 inch clearance from the front of the pump volute. Double doors shall be used wherever possible.
- ~~C. Valve vault access doors shall be sized to closely match the inside dimensions of the opening of the valve vault structure. Double doors shall be used wherever possible.~~
- ~~D.C.~~ Wet well and valve vault hinges shall not be mounted on the same side as the guide rails and float/control ball rack.
- ~~E.D.~~ The access frame and door(s) shall have stainless steel hardware.
- ~~F.E.~~ Access doors that are not exposed to vehicular traffic shall have a load rating of 300 pounds per square foot. Access doors exposed to vehicular traffic shall have a H-20 traffic load rating. The support beam for load rating shall be mounted on the door.

5.04 ODOR CONTROL SYSTEM

- A. In general, it shall be PCU's responsibility to furnish and install a complete system for the control of hydrogen sulfide gas and other sewer odors unless otherwise determined by PCU. Refer to the appropriate "Approved Materials Checklist".

5.05 CHAIN LINK FENCE

- A. The CONTRACTOR shall furnish and erect a chain link fence as required in this Section.
- B. Materials:
1. The fabric, posts, fastenings, fittings and other accessories for chain link fence shall meet the requirements of AASHTO M 181 with the following changes:
 - a. The weight of coating of wire fabric shall be 1.2 ounces of zinc per square foot (Class B);
 - b. The galvanizing of steel materials shall be hot-dipped galvanized; and
 - c. The weight of coating on posts and braces shall be 1.8 ounces of zinc per square

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- foot, both inside and outside to meet the requirements of AASHTO M 111.
2. The base metal of the fabric shall be a good commercial quality 9-gauge steel wire. The fabric shall be of uniform quality and shall be 6-foot high with a 2-inch mesh size
 3. All posts and rails shall be in accordance with the following schedule:
 - a. End, corner and pull posts – 2-3/8 inches OD, Schedule 40;
 - b. Line posts and gate frames, as needed for support of gate size Schedule 40; and
 - c. Gate Posts – 3-inch OD, Schedule 40
 - i. Post braces and top rail – 1-5/8-inch OD, Schedule 20;
 - ii. All gate openings shall be a minimum of 16 feet wide, double hung.
 4. Tension wire shall be 0.177 inch coiled spring wire tensioned along the bottom of the fabric and shall be coated similarly to the wire fabric.
 5. Miscellaneous fittings and hardware shall be zinc coated commercial quality or better steel or zinc coated cast or malleable iron as appropriate for the article.
 6. All surfaces of the fabric, posts, fittings, and miscellaneous hardware shall have a factory applied black vinyl coating.
 7. Post caps, designed to provide a drive fit over the top of the tubular post to exclude moisture, shall be provided.
 8. All gates shall be capable of being secured by the use of a security type padlock with a standard length shank. The gates shall be securely positioned in line with the adjacent fence sections by the use of an attached vertically sliding steel rod inserted in a slightly larger one inch deep drilled hole in the concrete driveway.
 9. Where required by PCU, galvanized steel barbed wire shall be installed on top of the lift station perimeter fence, including the gates, to an additional height of 1 vertical foot utilizing 3 strands of wire evenly placed upon galvanized steel supports that angle outwardly 45 degrees. The supports on the gates shall be installed in the vertical position inline with the gate fabric.

5.06 BLOCK WALL

- A. The CONTRACTOR shall furnish and erect a block wall as required in this Section .
- B. Block wall shall be one-sided split face concrete masonry unit type construction and shall be painted with graffiti resistant material. Split face concrete masonry units shall conform to ASTM C90 normal weight Type 2, solid load bearing units. Units shall be 8-inch by 8-inch by 16-inch nominal size. Minimum compressive strength on the net area (average of three units) when tested in accordance with ASTM C140 shall be 2,000 psi on the net area. Minimum compressive strength of any individual unit shall be not less than 80 percent of the required three-unit average. Units shall be colored with integrally mixed, alkali-stable, lightfast and weather-resistant pigment. Color shall be maintained uniformly throughout the job within the normal manufacturing tolerances. Integral water repellent shall be a liquid polymer admixture resistant to water

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penetration with a Class E rating in accordance with ASTM E514-74. Top two courses of wall shall be poured and finished.

5.07 GATES

A. Chain Link Fencing Gates:

1. Swing gates shall be two, 8-foot wide double-hung gates as indicated on the STANDARD DRAWINGS and hinged to swing through 180 degrees from closed to open. Gates shall be complete with latches, locking device, stops keeper, hinges, fabric and braces. Gates shall be the same height as the fence and the gate fabric shall be the same as the fence fabric.
2. Gate leaves shall have truss rods or intermediate braces. Gate leaves eight feet or more in width shall have intermediate braces and diagonal truss rods or shall have tubular members as necessary to provide rigid construction, free from sag or twist.

B. Block Wall Gates:

When block walls are required, two, 8-foot wide ornamental aluminum double-hung gates shall be installed. The gates shall be the same height as the wall. The aluminum gates shall be either black anodized or painted black. Gates shall swing through 180 degrees from closed to open and shall be complete with latches, locking device, stops keeper, hinges, fabric and braces.

5.08 WEED CONTROL

- A. A 60 mil thick geo-fabric shall be installed under all graveled and rocked areas for weed control. The fabric shall be a heat bonded, non-woven, polypropylene, which is inert to biological degradation and resistant to naturally encountered chemicals, alkalis and acids. The fabric shall provide passage of air and liquids.

5.09 STAINLESS STEEL SLUICE GATES

- A. When it is necessary to design wet wells with 3 pumps or more to allow for the isolation of individual pumps using chambers, stainless steel sluice gates shall be utilized. Each sluice gate shall be of the rising stem type, self-contained, and permit separate lifting.
1. Sluice gates, frames, guides, wedges, fasteners, and anchors shall be fabricated type 316 stainless steel construction with resilient seats. A de-seating system shall be incorporated into each gate.
 2. Actuator pedestals shall be galvanized steel and stem guides shall be stainless steel with adjustable guide bushing.
 3. Minimum material thickness shall be 3/8-inch. Frame member shall be 3/8-inch by 3-inch by 3-inch hot rolled angle.
 4. The gate seat shall have a neoprene or hypalon seal around the perimeter.

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5. Gates shall be supplied with accessories, including lift and lift stem, extension stem, stem guides, stem covers, wall thimbles, brackets and stop nuts. Gates shall be designed to meet seating and unseating heads.
 6. Sluice gates and accessories shall operate satisfactory under the conditions of installation, including operating frequency ranging from twice daily to periods of prolonged idleness.
 7. Opposing gate and frame mounted wedges shall be factory set to provide zero leakage at the design head pressures with factory certified test reports available.
- B. Wedges:
1. Factory fixed to provide tight shutoff over an extended life and repeated use of the gate.
 2. Stainless steel 316 (same material as the gate) welded into position on the gate at both the top and bottom.
 3. Designed with intermediate wedges to eliminate any bowing or gate deflection when seated.
- C. Seat:
1. The gate seat shall have a mechanically retained neoprene or hypalon seal around the entire perimeter of the gate opening.
 2. The rubber seat to stainless steel combination shall be as specified in AWWA C-504.
 3. The seat shall be raised away from the frame to allow a clearance area so that solids and debris can be pushed aside by the gate. The design of the seat shall be such that solids or debris does not get trapped on the seat and cause a leak path or damage.
 4. The resilient seat is mechanically retained with stainless steel fasteners and field replaceable.
- D. Wall Thimble:
1. Wall thimble shall be fabricated type 316 stainless steel or sufficient section to resist permanent distortion and shall be provided by the gate manufacturer.
 2. Wall thimbles shall be of bent leg design or F-Type and of a depth equal to the thickness of the structure wall upon which the gate is mounted.
- E. Stem and Couplings:
1. Operating stem shall be 316 stainless steel designed to transmit in compression at least two times the rated output of the operating manual mechanism with a 40-pound effort on the crank or hand-wheel.
 2. The threaded portion of the stem shall have machined cut or rolled threads of the Acme type and shall have a surface finish of 32 microns or less.
 3. When hydraulic, pneumatic or electric operators are used, including portable operators, stem design force shall not be less than 1.25 times the output thrust of

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the hydraulic or pneumatic cylinder with a pressure equal to the maximum working pressure of the supply, or 1.25 times the output thrust of the electric or hydraulic motor in the stalled condition. Sections of stem assemblies of diameter 1-3/4 inches and larger shall be joined together with solid couplings. The couplings shall be grooved and keyed and shall be of greater strength than the stem.

4. Gates having widths equal to or greater than two times the height shall be provided with two lifting mechanisms connected by a tandem shaft.
 5. Clear acrylic threaded stem cover with graduated markings to show the position of the gate.
- F. Stem Guides:
1. Stem guides shall be fabricated from type 316L stainless steel and ultra high molecular weight polyethylene (UHMWPE) bushed where required by the manufacturer.
 2. Guides shall be adjustable in two directions and shall be spaced in accordance with manufacturer's recommendation.
 3. Stem guides shall not be located on the threaded portion of the stem.
- G. Thrust Nut:
1. For rising stem arrangement, the thrust nut shall be located at the operator level.

5.10 FENCE INSTALLATION

- A. Post Setting:
1. All posts shall be core drilled twice the diameter of the actual post and secured in place by high strength cement into the lift station site's concrete slab to a depth of three feet.
 2. After the post has been set, aligned and plumbed, the hole shall be filled with 2,500 psi concrete. The concrete shall be thoroughly worked into the hole so as to leave no voids. The exposed surface of the concrete shall be crowned to shed water.
 3. End, corner, pull and gate posts shall be braced to the nearest post with horizontal brace used as a compression member and a galvanized 3/8-inch steel truss rod and truss tightener used as a tension member. Corner posts and corner bracing shall be constructed at all changes of fence alignment of 30 degrees or more. All chain link fences shall be constructed with a top rail and bottom tension wire.
- B. Placing Fabric:
1. The fabric shall not be placed until the posts have been permanently positioned and concrete foundations have attained adequate strength. The fabric shall be placed by securing one end and applying sufficient tension to remove all slack before making permanent attachments at intermediate points.
 2. The fabric shall be fastened to all corner, end and pull posts by substantial and

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approved means. Tension for stretching the fabric shall be applied by mechanical fence stretchers.

5.11 WET WELL AND VALVE VAULT INSTALLATION

A. Bedding:

The wet well, ~~and valve vault where applicable,~~ shall be placed on bedding rock conforming to the requirements in the Section entitled "Excavations, Backfill, Compaction, and Grading Specifications". The bedding rock shall be firmly tamped and made smooth and level to assure uniform contact and support of the pre-cast element.

B. Pre-cast Sections:

1. The pre-cast base section shall be carefully placed on the prepared bedding so as to be fully and uniformly supported, in true alignment, and ensure that all pipes entering the structure shall be inserted to the proper grade.
2. Pre-cast sections shall be handled by lift rings or non-penetrating lift holes. Such holes shall be filled with non-shrink grout after installation of the wet well and coated. Lifting of sections shall be as per manufacturer's recommendation.
3. Sections shall be uniformly supported by the base structure, and shall not bear directly on any of the pipes. Influent and effluent pipes shall be properly installed so as to form an integral watertight unit.
4. Sections shall be placed and aligned to provide vertical alignment with a 1/4-inch maximum tolerance per five feet of depth.
5. The completed wet well shall be rigid, true to dimensions, and watertight.
6. Wherever practicable, all wet well excavations shall be dewatered and pre-cast sections installed in the dry.

C. Excavation and Backfilling:

Requirements of the Section entitled "Excavations, Backfill, Compaction, and Grading" Specifications" shall apply.

D. Pipe Connections:

Special care shall be taken to ensure that the openings through which pipes enter the structure are provided with watertight connections. Pipe connections shall conform to ASTM C 923, "Standard Specifications for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals".

E. Doors:

Wet well ~~and valve vault~~ frames shall be securely mounted and doors shall open above the pumps. Wet well ~~and valve vault~~ hinges shall not be mounted on the same side as guide rails and cable rack.

F. Power Cable:

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Each pump power cable shall be supported on a separate 3/8-inch Type 316 stainless steel hook located within six inches of guide rail bracket for each pump. Each pump power cable shall be run as not to restrict removal of pumps.

5.12 CLEANING

- A. All newly constructed wet wells shall be cleaned of any accumulation of silt, debris, or foreign matter of any kind and shall be free from such accumulations at the time of final inspection.

5.13 SLUICE GATE INSTALLATION AND TESTING

- A. The manufacturer shall guarantee the sluice gate, actuator, and appurtenance items for a period of three years covering the equipment and installation from the date of service.
- B. After installation, all gates shall be tested for leakage. Each gate shall be operated through one complete cycle and then closed for testing, zero leakage tight shutoff as detailed in the manufacturer's manual.

5.14 WATER SUPPLY

- A. All wastewater lift stations shall be provided with a water system with adequate capacity and pressure for station wash down and other requirements. The water supply shall be supplied with a water meter and equipped with a PCU approved reduced pressure zone (RPZ) principle cross connection control assembly. The RPZ shall be installed and located inside the fenced area as described in the STANDARD DRAWINGS.

5.15 WET WELL ~~AND VALVE VAULT~~ FALL PROTECTION SYSTEM

- A. A grate based wet well ~~and valve vault~~ fall protection system shall be furnished and installed by the CONTRACTOR. A system shall be installed when the door(s) is fabricated or field installed on existing door(s). The system shall be installed in accordance with the manufacturer's recommendations.
- B. The System shall be:
 - 1. Designed to support a 300 PSF live load.
 - 2. Highly visible in color.
 - 3. Capable of locking in the fully open position.
 - 4. Provided with lift assistance for ease of operation.
 - 5. UV and corrosion resistant.
 - 6. Lockable to prevent unauthorized opening.
 - 7. Supported with a load bearing bar(s) that provide continuous support.
 - 8. Made of aluminum or one piece fiberglass.
- C. Lift Assistance: A torsion rod shall be incorporated into the grating panel design to

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provide lift assistance when opening the grating panel.

- D. Hold Open Feature: A hold open arm shall be provided to lock the cover in a fully open 90 degree position. A release handle shall be provided to allow the grating panel to be closed.
- E. Hardware: All hardware (mounting brackets, hinges, torsion rod, hold open arm, padlock loop, and fasteners) shall be Type 316 stainless steel.

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PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. These specifications cover wastewater pipes, valves, and appurtenances used for the wastewater collection systems and lift stations.
- B. The CONTRACTOR shall be responsible for all stored material furnished for the project. The CONTRACTOR shall, if requested by PCU, furnish certificates, affidavits of compliance, test reports or samples for any of the materials specified herein. All materials delivered to project site for installation are subject to random testing for compliance with the designated specifications.
- C. Wastewater mains, service lateral piping, and connections shall be installed as indicated in the STANDARD DRAWINGS.

PART 2 - PRODUCTS

2.01 PIPE MATERIALS

A. PVC Gravity Pipe:

1. PVC gravity pipe shall conform to ASTM F679 with a SDR of 26. Uniform minimum "pipe stiffness" at five percent deflection shall be 46 psi. The joints shall be integral bell elastomeric gasket joints manufactured in accordance with ASTM D3212 and ASTM F477. The applicable UNI-Bell Plastic Pipe Association standard is UNI-B-7.

B. PVC Pressure Pipe:

All PVC pipe shall bear the NSF-DW seal. The minimum standard length of pipe shall be 13 feet.

1. All PVC pipe shall be manufactured in accordance with AWWA Standard C900. Pipe that is 4 to 12 inches in diameter shall be C900 and have a dimension ratio of 18. Pipe larger than 12 inches in diameter shall be C905 or C909 and have a dimension ratio of 25. Pipe shall be the same outside diameter as ductile iron pipe.

C. HDPE Pressure Pipe:

Materials used for the manufacture of high-density polyethylene pipe and fittings shall comply with all requirements of ASTM D1248 and Plastic Pipe Institute (PPI) designation PE3408/[PE4710](#). Manufacturer shall be a member in good standing of the Plastic Pipe Institute. HDPE pipe and fittings shall comply or exceed AWWA Standards C901/C906, ASTM D2513, ASTM D3035 and ASTM F714. The manufacturer shall supply a letter of certification stating compliance to all the above standards prior to shipping any material to project site. The HDPE material shall have ultraviolet inhibitors to resist degradation by direct and prolonged sunlight. The design of HDPE materials shall be based on the hydrostatic design basis (HDB) of 1,600 psi at 73.4 degrees Fahrenheit. Pipe shall be designed and produced to ductile iron diameters and to a maximum dimension ratio of 11. In the event that HDPE pipe with

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42 inch and larger diameters are not available due to general industry limitations, PCU may consider the use of outside diameters based on iron pipe sizes.

D. Ductile Iron Pressure Pipe:

The use of DI pipe for new wastewater applications shall be restricted to onsite use inside the limits of wastewater lift stations and treatment facilities. Unless otherwise stated, all DI pipe and fittings shall comply with the material requirements contained within Section 2.04 (A) below.

2.02 JOINT MATERIALS

A. PVC Gravity Pipe:

PVC gravity pipe joints shall have push on type joints with flexible elastomeric seals per ASTM D 3212.

B. PVC Pressure Pipe:

1. PVC pressure pipe shall have integral bell push on type joints conforming to ASTM D3139.
2. Fusible PVC pressure pipe lengths shall be assembled in the field with butt fused joints. The CONTRACTOR shall follow the pipe supplier's written guidelines for this procedure. All fusion joints shall be completed as specified by the pipe supplier and this MANUAL.

C. HDPE Pressure Pipe:

HDPE joints shall conform to AWWA C906.

D. Restrained Joints:

Restrained joint devices shall be made specifically for PVC pipe and meet or exceed the requirements in ASTM F-1674.

E. Joints for Dissimilar Pipe:

Joining of dissimilar pipe and pipe between lift station wet well ~~and valve vault~~ shall conform to the Table 513-1 below.

Table 513-1. Joints for Dissimilar Pipe.

Type of Line	Material	Material	Use
Gravity	C-900	SDR-26	PVC Adapter
Force Main	PVC	Ductile Iron	Restrained MJ Sleeve

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Force Main	PVC	HDPE	Restrained MJ Sleeve to Fused PVC Adapter
Force Main	PVC	AC	Coupler
<u>Lift Station Wet Well to Valve Box</u>	<u>HDPE</u>	<u>Ductile Iron</u>	<u>Electrofusion and Restrained MJ Sleeve to Fused MJ DIP Adapter</u>
Lift Station Wet Well to Valve Box	Ductile Iron	Ductile Iron	MJ Sleeve

F. Pipe Markings:

Pipes shall have the manufacturer’s home-mark on the spigot. On field cut pipe, the CONTRACTOR shall provide home-mark on the spigot in accordance with the manufacturer’s recommendations.

2.03 FITTINGS

A. PVC Gravity Pipe:

1. Branches:

Unless otherwise specified, wye branches shall be provided in the gravity main for service lateral connections. Wyes shall be sized in accordance with the STANDARD DRAWINGS. All fittings shall be of the same material as the pipe.

2. Plugs:

Plugs for stub outs shall be of the same material as the pipe, and gasketed with the same gasket material as the pipe joint, or be of material approved by PCU. The plug shall be secured to withstand specified test pressures.

B. PVC Pressure Pipe:

Fittings shall be restrained mechanical joint compact ductile iron fittings that conform to ANSI/AWWA A21.53/C153. Interior and exterior coatings of ductile iron pipe fittings shall be as specified in the appropriate “Approved Materials Checklist”.

C. HDPE Pressure Pipe:

Fittings used with HDPE pipe shall be mechanical joint ductile iron compact fittings in accordance with ANSI/AWWA A21.53/C153 unless otherwise specifically approved by PCU. HDPE fittings in wet well shall be in accordance with section 2.04 below.

2.04 DUCTILE IRON PIPE OR HDPE PIPE AND FITTINGS FOR LIFT STATIONS

A. All lift station pipe and fittings from the pump discharge, ~~through the valve vault as applicable,~~ to the first pipe ~~joint-fitting~~ outside of the lift station ~~concrete site pad~~ wet well shall be either all ductile iron with ductile iron flanges in accordance with AWWA

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C115 or all HDPE piping and HDPE fittings and flanges in accordance with AWWA C906 and C207. All other lift station piping and fittings shall be ductile iron with ductile iron flanges.

1. Ductile Iron Pipe:

Ductile iron pipe of nominal diameter 4 through 64 inches shall conform to ANSI/AWWA A21.51/C151. A minimum of CL 53 pipe shall be supplied for all sizes of pipe unless a higher-class pipe is specifically called out in the PLANS or required by PCU.

2. Fittings:

Fittings shall be mechanical joint ductile iron compact fittings in accordance with ANSI/AWWA A21.53/C153.

3. Joints:

Joints shall be flanged conforming to ANSI/AWWA A21.11/C111, unless otherwise called for on the PLANS. Restrained or flanged joints shall be provided where called for on the PLANS. Flanged joints shall conform to AWWA C115.

4. Exterior Coatings:

Ductile iron pipe and fittings shall be coated as specified in the appropriate "Approved Materials Checklist". Primer and field coats shall be compatible and shall be applied in accordance with the manufacturer's recommendations. Final field coat color shall be green for wastewater.

5. Interior Coatings and Linings:

Ductile iron pipe and fittings shall have an interior protective coating or lining as specified in the appropriate "Approved Materials Checklist".

6. -HDPE Pipe:

HDPE pipe of nominal diameter 4 through 63 inches shall conform to ANSI/AWWA C906 with dimensions conforming to ANSI/AWWA C110/A21.10. A minimum diameter ratio of DR 11 pipe shall be supplied for all sizes of pipe unless a higher-class pipe is specifically called out in the PLANS or required by PCU. Vertical piping must be supported at a minimum of 8 feet on center. Spacing may be less if recommended by material manufacturer.

7. HDPE Fittings:

Fittings shall be butt-weld joint HDPE fittings in accordance with ANSI/AWWA C906 and ASTM D3261.

8. HDPE Joints:

Joints with flanges shall be conforming to ANSI/AWWA C207 and ANSI B16.5, unless otherwise called for on the PLANS. Restrained or flanged joints shall be provided where called for on the PLANS. Flanged joints shall be fabricated to mate with ductile iron fittings in accordance with AWWA C115. All flanged joints shall have a backup ring of materials identified in PLANS, either stainless

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steel or ductile iron. Dimension of ring shall conform to C906 and ANSI B16.5.

2.05 AUTOMATIC AIR RELEASE VALVES

A. General:

Wastewater force mains shall be equipped with automatic air release or automatic combination air and vacuum release valves, located as shown on the PLANS, and as specified in the Section entitled "Wastewater Force Main Standards. Valves shall be located in above ground enclosures as detailed on the STANDARD DRAWINGS.

B. Valve:

The valve body shall be conical in shape and shall be either fusion bonded epoxy coated steel (inside and out) or stainless steel with a funnel shape lower body to automatically drain sewage back into the system. All internal parts shall be corrosion resistant stainless steel or non-metallic plastic materials.

2.06 VALVES

A. General:

In general, plug valves shall not be installed within a force main system, except at wastewater lift stations. Gate valves shall be placed in a vertical position at all other locations within a force main system.

B. Gate Valves:

Refer to the Section entitled "Potable Water System Standards and Specifications".

C. Plug Valves:

When it is proven by the ENGINEER that it is necessary to install a plug valve within the wastewater transmission system, the following criteria shall apply.

1. Plug valves shall be either eccentric or ballcentric.
2. Plug valves shall be installed complete with operating hand wheels, extension stems, operator, operating nuts or wrenches as required for normal operation.
3. Valves shall have the name of the manufacturer and the size of the valve cast or molded onto the valve body. A permanent plate shall be attached to the valve or operator indicating serial number, order number, accessories, operator model and manufacturer, etc.
4. Eccentric plug valves shall be of the non-lubricated type with 80 percent port areas. The port area for valves 4 to 20 inches shall have a minimum 80 percent nominal pipe diameter. Valves 24 inches and larger shall have a minimum port area of 70 percent of nominal pipe diameter.

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5. Minimum pressure rating of valves 4 to 12 inches shall be 175 psi; valves 14 to 72 inches shall be 150 psi. Valve bodies shall be cast iron ASTM A 126, Class B. Valve ends shall be screwed, flanged or mechanical joint as indicated on the drawings. Plugs shall be cast iron or ductile iron with neoprene facing and shall be of the single piece design. The plug shall be of the same configuration for all valves and shall require no stiffening member opposite the plug for balance or support. Valve body seats shall have a welded in overlay of not less than 90 percent nickel. Packing shall be adjustable and safely replaceable. Brushing shall be Type 316 stainless steel in both upper and lower journals. The valve should be capable of drip tight shut off with flow in either direction at the full pressure of the valve. All exposed nuts, bolts, springs and washers on buried service valves shall be stainless steel.
6. Face to face dimensions shall be in conformance to ASME B16.10 and the following dimensions from Table 513-2 below:

Table 513-2. Lift Station Plug Valve Flange Face to Face Dimensions.

Valve Size (inches)	Face to Face (inches)
4	9.0
6	10.5
8	11.5
12	14.0
16	17.75
20	23.5
24	42.0

D. Valve Testing:

Plug valves shall be tested in accordance with AWWA C504. Each valve shall meet the performance, leakage, and hydrostatic tests described in AWWA C504. The leakage test shall be applied to the face of the plug tending to unseat the valve. The manufacturer shall furnish certified copies of reports covering proof of design testing as described in AWWA C504.

E. Actuators:

Manual valves shall have lever or gear actuators and tee wrenches, extension stems, floor stands, etc. as indicated on the PLANS. All valves 6-inch and larger shall be equipped with gear actuators. All gearing shall be enclosed in a semi-steel housing and be suitable for running in a lubricant with seals provided on all shafts to prevent entry of dirt and water into the actuator. All actuator shafts shall be supported on permanently lubricated bronze bearings. Actuators shall clearly indicate valve

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position and an adjustable stop shall be provided to set closing torque. All exposed nuts, bolts and washers shall be zinc or cadmium plated. Valve packing adjustment shall be accessible without disassembly of the actuator.

2.07 VALVE BOXES

A. Standard Three-Piece Cast Iron Valve Box:

Three-piece valve boxes are required for mains less than six feet below finished grade as indicated in the STANDARD DRAWINGS. Valve boxes shall be provided with suitable heavy duty ductile or cast iron bonnets and shall extend to such elevation at or slightly above the finished grade surface as directed by PCU. The barrel shall be screw type only and have a 5-1/4-inch shaft. The upper section shall have a flange at the bottom having sufficient bearing area to prevent settling and shall be complete with cast iron covers. Covers shall have "SEWER" cast into the top for all mains.

B. Valve Box Assembly:

Valve box assemblies, as indicated in the STANDARD DRAWINGS, are required for any size main whenever the top of the valve nut is six feet or deeper below the finished surface elevation that is directly above the valve location. Valve boxes shall be one complete assembled unit composed of the ductile or cast iron valve box with a 5-1/4 inch barrel shaft and steel extension stem that attaches to the valve body. All moving parts of the extension stem shall be enclosed in a housing to prevent contact with the soil. Valve box assembly shall be adjustable to accommodate variable depths.

C. The stem assembly shall be of a telescoping design that allows for variable adjustment length. The material shall be galvanized square steel tubing. The stem assembly shall have a built-in device that prevents the stem assembly from disengaging at its fully extended length. The extension stem must be capable of surviving a torque test to 1,000 ft-lb without failure.

D. Valve boxes, located in roadways with speed limits above 30 miles per hour or on mains that are 16 inches in diameter or larger, shall have locking lids utilizing a five sided nut with a special wrench needed to open. Valve lids to be made as shown in the STANDARD DRAWINGS.

E. A test station box shall be installed into the valve pad for the placement of the locating wire as shown in the STANDARD DRAWINGS. The test station box shall be as specified in the appropriate "Approved Materials Checklist".

F. Locating wire shall be 14-gauge single strand solid core copper wire with insulation. The color of the insulation shall be the same color as the color code for the pipe being installed.

G. Each valve marker shall be made of bronze with each specific valve's information clearly imprinted on its top surface, provided with a hanger pin, and installed in each valve collar as shown in the STANDARD DRAWINGS.

2.08 PRESSURE GAUGES

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- A. Pressure gauges shall be installed on each lift station discharge pipe as indicated on the STANDARD DRAWINGS. Each pressure gauge shall be direct mounted, diaphragm (type) gauge, stainless steel case, stainless steel sensing element, liquid (oil) filled, with a 4-1/2-inch diameter dial, and furnished with a clear glass crystal window, 1/4-inch shut-off (isolation) valve. Gauges shall be weatherproofed. The face dial shall be white finished aluminum with jet-black graduations and figures. The face dial shall indicate the units of pressure measured in psi, with a zero to 150 psi range.

PART 3 - CONSTRUCTION

3.01 MATERIAL IDENTIFICATION AND TESTING

- A. Pipe Identification and Location:
1. Each length of pipe shall bear the name or trademark of the manufacturer, the location of the manufacturing plant and the class or strength classification of the pipe. The markings shall be plainly visible on the pipe barrel. Pipe, which is not clearly marked, is subject to rejection. The CONTRACTOR shall remove all rejected pipe from the project site within five NORMAL WORKING DAYS.
 2. All PVC pipe and other pipe that is factory color-coded on the outside surface of the pipe shall be identified and locatable as specified in the STANDARD DRAWINGS. All Ductile Iron Pipe, and other pipe not factory color-coded on the outside surface of the pipe, shall be identified and locatable as specified in the STANDARD DRAWINGS. Where the above type of identification method is not considered to be practical by PCU, the pipe shall have a field applied three inch wide permanent blue paint stripe down the top outside center of the pipe along its entire length.
- B. Material Testing Requirements:
1. If requested by PCU, a sample of pipe to be tested shall be selected at random by PCU or the testing laboratory hired by PCU.
 2. When the samples tested conform to applicable standards, all pipe represented by such samples shall be considered acceptable based on the test parameters measured. Copies of test reports shall be available before the pipe is installed on the project.
 3. In the event that any of the test samples fail to meet the applicable standards, all pipe represented by such tests shall be subjected to rejection. The CONTRACTOR may furnish two additional test samples from the same shipment or delivery, for each sample that failed and the pipe will be considered acceptable if all of these additional samples meet the requirements of the applicable standards. All such retesting shall be at the CONTRACTOR's expense.
 4. Pipe that has been rejected by PCU shall be removed from the site of the work by the CONTRACTOR and replaced with pipe that meets these specifications.

3.02 SEPARATION OF MAINS

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- A. Separation of all mains shall be in accordance with the STANDARD DRAWINGS.

3.03 INSTALLATION OF VALVES

- A. All valves shall be inspected upon delivery in the field to insure proper working order before installation. They shall be set and jointed to the pipe in the manner as set forth in the AWWA Standards for the type of connection ends furnished. All valves and appurtenances shall be installed true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of PCU before they are installed.

3.04 NOTIFICATION OF CONNECTION TO EXISTING MAINS

- A. PCU shall be notified at least five NORMAL WORKING DAYS in advance to schedule main connections and valve operations. All existing valves are to be operated only by PCU. All valves installed are to remain closed during construction.

The CONTRACTOR shall exercise extreme caution when excavating in proximity of PCU mains. PCU main locations shown on plans are not exact or guaranteed. The CONTRACTOR is responsible for field verifying existing utility locations. PCU dispatch operator shall be notified immediately in the event of a force main, water main, or reclaimed water main break or damage. The CONTRACTOR shall immediately repair all damage to PCU mains, at the CONTRACTOR's expense. If the repair is not made in a timely manner, as determined by the PCU Inspector, PCU may perform repairs and the CONTRACTOR will be charged for repairs.

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WASTEWATER

Section 550-A

Testing & Inspection for Acceptance

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PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. These specifications cover the testing and inspection for acceptance of wastewater collection and transmission systems.
- B. Requests for testing and acceptance of wastewater collection and transmission systems shall be executed in accordance with the Section entitled "Field Testing and Inspection Procedures".
- C. Gravity Mains:

Mains shall be inspected with CCTV for alignment, grade variations, separated pipes, leaks, deflections, cracks, breaks, or otherwise defective pipe to ensure overall pipe integrity. The CCTV inspection contractor shall perform the CCTV inspection(s) at the CONTRACTOR's sole expense and submit the report(s) to PCU for review and consideration for approval. Should PCU so determine, all or part of the CCTV inspection shall be repeated at the sole expense of the CONTRACTOR.
- D. Pressure Mains:

Hydrostatic tests shall be conducted for pressure pipes, joints and valves for allowable limits of pressure and leakage. Air testing of pressure pipes will not be permitted under any circumstance. All pressure mains shall be hydraulically cleaned with a polypropylene swab (pig) to remove dirt, sand, and debris from the main prior to hydrostatic testing.

PART 2 - GRAVITY MAIN CCTV INSPECTION

2.01 STANDARDS

- A. Gravity mains shall be televised from manhole to manhole utilizing a 360-degree pan and tilt color camera. The camera shall be of the self-propelled tractor type with a measuring device mounted to the front capable of being read as the tractor moves and capable of accurately measuring depth of standing water up to, and including, three inches.
- B. Closed Circuit Television (CCTV) data shall be recorded and submitted in digital format.
- C. CCTV operators inputting the CCTV data shall be certified users who have successfully completed the Pipeline Assessment and Certification Program (PACP) user course from the National Association Sewer Service Companies (NASSCO).
- D. CCTV operators shall be able to demonstrate proficiency in televising and recording using PACP codes, as required by PCU.
- E. CCTV inspections shall use unique identification numbers established and provided by PCU in pipe segment reference, upstream manhole number and the downstream manhole number fields

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- F. Reports generated by the computer software shall be consistent with PACP requirements, observation report with still images; and CCTV inspection results with a pipe run graph.

2.02 PREPARATION

- A. All manhole channels shall be constructed and coated (if applicable) prior to CCTV inspection.
- B. The CONTRACTOR shall clean gravity mains to remove debris and remove stains prior to televising. Flushing water or debris will not be allowed to enter pump station wet wells. Water will be pumped from the sewer system during flushing to an acceptable discharge location. A visual inspection shall be made and all obstructions removed.
- C. Mains that are dirty (dirty walls and/or debris in the inverts) shall be re-flushed and cleaned before rescheduling a CCTV inspection. If necessary, swabbing may be required of specific sections of pipe.
- D. Dewatering system shall not be operated within 48 hours prior to CCTV inspection.
- E. Backfill from the gravity main to the subgrade shall be compacted and stabilized for inspection and cleaning vehicle access prior to CCTV.
- F. Inverts will be constructed in manholes prior to televising.

2.03 EXECUTION

- A. Wherever possible, gravity mains shall be televised in the downstream direction.
- B. Sufficient water shall be run through each section of main until water runs through each downstream manhole no more than 48 hours prior to televising. Lines that are dry or that enough water has not run through to reach the end of each section shall not be televised.
- C. The sewer line shall be inspected manhole to manhole with a crawler and pan and tilt camera driven through at a moderate rate of speed.
- D. Lighting should be set to allow for clear visibility without excessive reflection and should allow realistic colors to be visible.
- E. The iris of the camera should be adjusted to allow for a sharp focused image and the lens should be kept clean and free of obstructions.
- F. The operator should follow the manufacturer's instructions to achieve the proper color correction.
- G. All notes or coded references shall have footages recorded with them
- H. The camera should be centered within the pipe.
- I. The distance between manhole centers shall be accurate within 1 percent.
- J. The camera shall be stopped at all laterals adjusted for a clear picture and an orbital scan of the lateral taken pausing at the invert at the service lateral to detect dirt or infiltration.

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- K. The camera shall also be stopped at any suspected or confirmed defects, the focus properly adjusted and a clear digital video taken.
- L. Areas suspected of leaking shall be paused long enough to determine if a leak exists currently or if deposits have occurred.
- M. A digital photo shall be taken of all areas noted on the report including laterals and any confirmed or suspected defects.
- N. Manholes shall be measured from rim to invert and the depth recorded on the inspection header.
- O. Manhole material and defects shall be noted.

PART 3 - GRAVITY MAIN TESTING

3.01 LEAKAGE TESTING

- A. The CONTRACTOR, with PCU representation present, shall perform leakage testing. The CONTRACTOR shall be responsible for furnishing all necessary labor and equipment to conduct such testing.

Leakage tests shall be by the low-pressure air test. Each test section shall not exceed 400 feet in length and shall be tested between adjacent manholes. Leakage testing shall be conducted in accordance with the procedure for "Recommended Practice for Low Pressure Air Testing of Installed Sewer Pipe" as established by the Uni-Bell PVC Pipe Association. The pipe shall pass the current most stringent UNI-B-6 Uni-Bell standards for testing gravity sewers and shall have no evidence of leaks in the pipe or connections.

Low-pressure Air Test Procedure:

1. Isolate each section of the gravity wastewater main to be tested between manholes using inflatable air plugs that are securely placed at the ends of the section of the main to be tested.
2. Introduce air pressure slowly to approximately 4 psig.
3. Determine groundwater elevation above the spring line of the pipe. For every foot of groundwater above the spring line of the pipe, increase the starting air test pressure by 0.43 psig. Do not increase the pressure above 10 psig.
4. Allow the pressure to stabilize for at least five minutes. Adjust the pressure to 3.5 psig or increase the test pressure as determined above when groundwater is present.
5. Start the test.
6. Determine the test duration for each sewer section with a single pipe size from the following table. Do not make allowance for laterals.

Table 550-A-1. Allowable Leakage - Low Pressure Air Test

Nominal Pipe Size (inches)	Minimum Test Time (min/ 100 feet)
8	1.2
10	1.5
12	1.8
15	2.1
18	2.4
21	3.0
24	3.6
27	4.2
30	4.8
36	6.0

7. Record the drop in pressure during the test period. If the air pressure has dropped more than 1.0 psig during the test period, the section of main being tested has failed. Otherwise, the section of main being tested has passed.
8. When a section of main fails the test, the CONTRACTOR shall determine the source of the air leakage, make the appropriate corrections, and retest. If necessary, testing shall be conducted incrementally by individual pipe sections until all leaks are isolated. After all leaks are repaired, the CONTRACTOR shall retest the entire section of the main between manholes.
9. All testing results, including the quantity of acceptable leakage, shall be documented and certified using the PCU approved Low Pressure Air Test Form.

3.02 CAUSES FOR REJECTION OF GRAVITY MAINS

- A. The CONTRACTOR shall be required to replace the pipeline if the acceptance or bond CCTV inspection reveals cracked, broken, or defective pipe, and/or in the case of PVC pipe a ring deflection in excess of five percent.
- B. After backfilling of trenches, all PVC sewer pipe shall be tested by the CONTRACTOR for initial diametric deflections by the use of a Go-No-Go type mandrel which is acceptable to PCU. The initial diametric deflection shall not exceed five percent (5%) of the base inside diameter as defined by ASTM D-3034.
- C. Joint separation shall be no greater than two inch between the spigot and bell of the pipe.
- D. No evidence of leakage will be acceptable for private gravity mains connecting to the PCU collection system.
- E. The following NASSCO PACP codes or notes shall be cause for rejection of gravity

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sewer systems

1. PACP coding of "Line" (L) shall be accompanied by a measurement of the line, grade or angular deviation. Variance of established line and grade at any point along the length of the pipe shall not be greater than 1-1/2 inches, provided such variation does not result in a level or reverse sloping invert. An approved method shall be used to determine this deviation. A PACP coding of MWLS with a percentage of pipe greater than 18.75% on 8-inch sewer, 15% on 10-inch sewer etc. will be corrected by excavation and repair.
2. PACP coding of "Infiltration" (I) for pipe joints shall be replaced or the pipe joint shall be resealed at the joint. Grouting shall not be considered a method of repair and will not be accepted. Replace the leaking gravity main segment if there is visible infiltration at any point other than the pipe joint.
3. Any PACP coding in the category of "Structural Family".
4. PVC pipe having ID tears will be rejected.
5. PACP condition grading of "OB" (obstruction) in pipe shall be rejected, the obstruction shall be removed and the line cleaned and re-televised.

3.03 ACCEPTANCE OF GRAVITY MAINS

- A. Successful passage of both the leakage test and CCTV inspection is required before acceptance by PCU.
- B. Prior to repair or replacement of failed sewer pipe, the method of repair or replacement shall be submitted to PCU for review and consideration for approval. Pressure grouting of pipe or manholes shall not be considered as an acceptable method of repair.

PART 4 - MANHOLE TESTING

4.01 TESTING AND INSPECTION OF MANHOLES

- A. Leakage Test:
There shall be no visible leakage through the walls or pipe connections.
- B. Vacuum Test:
All manholes shall be required to meet the requirements of the vacuum test as per the current ASTM C 1244 "Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test" prior to acceptance.

ASTM C1244 states that a vacuum test is intended to be used as a preliminary test to enable the installer to demonstrate the condition of the concrete manhole prior to backfill.

ASTM C1244 requires that a vacuum of 10 inches Hg to be drawn on the manhole after all lift holes are plugged and pipes entering the manhole are temporarily plugged and securely braced. The time is measured for the vacuum to drop to 9 inches Hg. The

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manhole is accepted if the measured time meets or exceeds the values presented in Table 550-A-2 below or Table 1 of ASTM C1244, whichever is more restrictive. If the manhole fails the initial test, it may be repaired by an approved method until a satisfactory test is obtained.

Table 550-A-2. Minimum Duration – Manhole Vacuum Test

<u>Manhole Diameter (Feet)</u>	<u>Test Period (Seconds)</u>
<u>4</u>	<u>60</u>
<u>5</u>	<u>75</u>
<u>6</u>	<u>90</u>

Vacuum testing after backfilling should be performed only after a successful non-backfill test has been completed in accordance with ASTM C1244.

Vacuum testing backfilled manhole systems is not recommended, especially in the presence of ground water as the hydrostatic pressure may exceed the design limits of critical flexible connectors leading to a system failure.

All testing shall be documented and certified using the PCU approved Vacuum Test Form.

C. Manhole Inspections:

1. The quality of all materials, the process of manufacture, and the finished sections shall be subject to inspection and approval by PCU. Such inspection may be made at the place of manufacture and/or at the site after delivery, or at both places. The sections shall be subject to rejection at any time on account of failure to meet any of the specification requirements; even though sample sections may have been accepted as satisfactory at the place of manufacture. Sections rejected after delivery to the job shall be marked for identification and shall be immediately removed from the job. All sections, which have been damaged, will be rejected. If already installed, rejected section shall be removed and replaced entirely at the CONTRACTOR's expense.
2. At the time of inspection, the sections will be carefully examined for compliance with the specified ASTM designation, and with the approved manufacturer's drawings. All sections shall be inspected for general appearance, dimension, "scratch-strength" blisters, cracks, roughness, soundness, etc. The surface shall be dense and close-textured. Installed manholes shall be inspected for proper filling and coating of the lifting holes and proper installation of any liner, coating or shrink-wrap.

PART 5 TESTING OF WASTEWATER FORCE MAINS

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A. Locating Wire System:

All wastewater force mains shall be installed with a continuous green insulated copper locating wire. Locating wire shall be installed in accordance with the STANDARD DRAWINGS and pass a continuity check with an approved tracing system before acceptance by PCU.

B. Inspection of Automatic Combination Air and Vacuum Release Valves:

After completion of the pressure test the ARV shutoff valve shall be opened and PCU shall test the ARV for proper connection and operation.

C. Inspection of Valves and Valve Boxes:

Valves shall be opened wide, then tightly closed, and the various nut and bolts shall be tested for tightness. Any valve that does not operate correctly shall be replaced. Buried valves shall have an operating nut within two feet of finished grade. Valve boxes shall be properly marked and checked for installation in accordance with the STANDARD DRAWINGS. Operating nuts, extensions, and upper guides shall not interfere with valve operation. Before acceptance by PCU valve boxes shall be adjusted to finished grade with the operating nut properly centered and shall have a "V" notched in the curb or street in the absence of a curb directly opposite the valve box.

D. Swabbing:

1. All mains shall be hydraulically cleaned with a polypropylene swabbing (also known as pigging) device to remove dirt, sand, and debris from main.
2. If swabbing access and egress points are not provided in the design drawings, it will be the responsibility of the CONTRACTOR to provide and remove temporary access and egress points for the cleaning, as required.
3. Passage of cleaning poly swabs through the system shall be constantly monitored, controlled, and all poly swabs entered into the system shall be individually marked and identified so that the exiting of the poly swabs from the system can be confirmed.
4. Cleaning of the system shall be done in conjunction with the initial filling of the system for its hydrostatic test.
5. The line to be cleaned shall only be connected to the existing distribution system at a single connection point.
6. The CONTRACTOR shall locate and open all new in-line valves beyond the point of connection on the pipeline to be cleaned during the swabbing operation.
7. At the receiver or exit point for the poly swab, the CONTRACTOR is responsible for creating a safe environment for collection of debris, water, and the swab. The CONTRACTOR shall provide for the protection of surrounding personnel and property and the safe retrieval of the swab.
8. Only PCU personnel shall operate the supply valve from the existing distribution system. Cleaning and flushing shall be accomplished by propelling the swab down

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the pipeline to the exit point with potable water. Flushing shall continue until the water is completely clear and swab is retrieved.

- i. Re-apply a series of individual swabs in varying diameters and/or densities as required, to attain proper cleanliness of pipeline.
 - ii. Swabbing speed shall range between two and five feet per second.
9. After the swabbing process, pressure testing and disinfection of the pipe shall be completed in accordance with this MANUAL.

E. Hydrostatic Pressure Testing of Ductile Iron and PVC Pressure Pipe:

1. Hydrostatic tests shall consist of pressure and leakage tests for non-butt welded jointed pipes. Air testing of pressure pipes will not be permitted under any circumstance. Testing shall be performed from in-line valve to in-line valve with a depressurized section behind each valve, whenever possible. Testing shall be performed from in-line valve to in-line valve with a depressurized section behind each valve, whenever possible.
2. The CONTRACTOR shall furnish all necessary testing material and equipment. PCU will monitor and approve a satisfactory test.
3. All pipe sections to be pressure tested shall be subjected to a hydrostatic pressure of ~~100~~-150 psi. The duration of each pressure test shall be for a period of two hours. If during the test, the integrity of the tested line is in question, PCU may require a 6-hour pressure test. The basic provisions of AWWA C600 shall be applicable.

4. Procedure for Pressure Test:

Each section of pipe to be tested, as determined by PCU, shall be slowly filled with water and the specified test pressure shall be applied by means of a pump connected to the pipe in a satisfactory manner. Before applying the specified test pressure, all air shall be expelled from the pipe. To accomplish this, taps shall be made and appropriate valves installed to ensure bleeding of all air from the main. If defective pipes, fittings or valves are discovered during this pressure test, all such items shall be removed and replaced by the CONTRACTOR with sound material and the test shall be repeated until satisfactory results are obtained. Provisions of the current AWWA C600, where applicable, shall apply.

F. Hydrostatic Pressure Testing of HDPE and Fusible PVC Pressure Pipe:

1. After installation, the butt welded jointed pipe shall be tested in accordance with this MANUAL with the following modifications:

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- a. Test Duration: The total test time including initial pressurization, initial expansion, and time at test pressure, shall not exceed five hours. If the test is not completed due to leakage, equipment failure, etc., the test section shall be depressurized and allowed to "relax" for a minimum of eight hours before it is brought back up to test pressure. The test procedure consists of initial expansion phase and leakage test phase.

- b. Prior to Hydrostatic Pressure Testing Procedure:

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- 1) Hydraulically clean the main to be tested with a polypropylene swab (pig) to remove dirt, sand, and debris from the main prior to hydrostatic testing.
- 2) Insure that main to be tested is restrained against horizontal and vertical movement. Exposing joints only is allowed.
- c. Hydrostatic Pressure Testing Procedure:
 - 1) Fill main slowly with water to remove air.
 - 2) Pressurize up to 1.5 times the Pressure Class of the pipe used at the lowest point of the main being tested.
 - 3) Maintain for 4 hours while adding water as needed in non-monitored amounts as pipe will expand while until pressure.
 - 4) Reduce pressure by 10 psi and monitor for 1 hour.
 - 5) Main passes if there are no leaks within 5 percent of the remaining pressure after reduction.
- F. Hydrostatic Leakage Testing:
 1. Procedure for Leakage Test:

After completion of the pressure test, a leakage test shall be conducted to determine the quantity of water lost by leakage under the specified test pressure. Applicable provisions of AWWA C600 shall apply.

 - a. Allowable leakage in gallons per hour for pipeline shall not be greater than that determined by the formula:
$$L = \frac{ND(P)^{1/2}}{7,400}$$

Note:
L - Allowable leakage in gallons per hour.
N - Number of joints in the tested line.
D - Nominal diameter of the pipe in inches.
P - Average test pressure during leakage test in pounds per square inch gauge.
 - b. Leakage is defined as the quantity of water to be supplied in the installed pipe or any valve section under test, which is necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled. Should any test of pipe installed disclose leakage greater than that allowed, the CONTRACTOR shall locate and replace or repair the defective joints, pipe or valve until subsequent testing is within the specified leakage allowance.
- F. All testing and the quantity of acceptable leakage shall be documented and certified using the PCU approved Pressure Test Form.

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PLEASE TYPE OR PRINT CLEARLY IN BLACK INK

Project Name: _____

PCU Project File Number: _____

Contractor's Name: _____

Contractor's Address: _____

Contractor's Signature: _____

Engineer's Name: _____

Engineer's Address: _____

PCU Reviewer: _____	Date: _____
Approved: _____	Denied/Resubmit: _____
Comments:	

With the submission of this document, the CONTRACTOR understands that the use of the following selected items, as individually indicated by the use of an "X", is mandatory.

Substitutions using other items contained within this Checklist shall be initiated by the CONTRACTOR submitting a revised Checklist to PCU for its review and approval at least 10 calendar days in advance of need.

It is also understood by the CONTRACTOR that PCU shall reject materials and products not in accordance with this document and the MANUAL. Any material or product not contained within this Checklist shall be approved in advance by the Utilities Code Committee in accordance with the provisions of the Utilities Code.

Shop drawings shall be required for all structures and similar items not contained within this checklist, such as manholes, wet wells, and other castings.

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Four (4) sets of the CONTRACTOR's and ENGINEER's executed APPROVED MATERIALS CHECKLIST and any necessary shop drawings shall be submitted to PCU for its use and approval, plus the number of sets needed for the CONTRACTOR use. Ordering materials and products without specific written approval from PCU of the submitted list and shop drawings is NOT recommended and is done at the CONTRACTOR's sole expense and responsibility.

NOTE: The latest changes approved by the Utilities Code Committee are indicated by "underlining" and deleted items by "~~strike-throughs~~".

Wastewater Category 1 of <u>510</u>: VALVES AND ACCESSORIES			
ITEM TO BE USED	Manufacturer	Part Number	Comments
Automatic Air Release Valves:			
	Val-Matic	48ABW	Epoxy Lined
	ARI	S-020-T02	FBE Coated
	ARI	S-020-SST02	Stainless Steel
Automatic Combination Air / Vacuum Release Valves:			
	Val-Matic	802ABW	Epoxy Lined
	ARI	D-025-PT02	Reinforced Nylon
	ARI	D-025-SST02	Stainless Steel
Air / Vacuum Release Valve Enclosures (Horizontal Venting and Medium Green):			
	Water Plus	No. 40 (171730) <u>131632</u>	
	Channell	BPH 1730	
	Hydro-Guard	Safety-Guard 15100 Low Profile or 02100	
Air / Vacuum Release Valve and Large Diameter Manholes Frame and Cover:			
	US Foundry	USF 679-BK-M	
	CertainTeed	Pamrex 36"	Alternative – <u>Not to be used in paved roadways.</u>
Air / Vacuum Release Valve Service Saddles (Epoxy With Stainless Steel Straps):			
	Ford	Series FC202	
	JCM	406	
	Mueller	DR2S	
	Cascade	CNS 2	
Plug Valves – MJ & Flanged (8mil Fusion Bonded Epoxy Lined With Stainless Steel Bolts, Gear Operator To Be Sized For Rated Pressure Of The Valve, And For Use Only Within A Lift Station):			

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	Dezurik	Series – PEC	
	Pratt	Ballcentric	
Gate Valves 16-inch Through 48-inch (Resilient Seated Only):			
	American Flow Control	Series 2500	
	Clow	Series F-6100	
	Mueller	Series A-2361	
	U.S. Pipe	Series 5460	
	Kennedy	Series 4571	
	M & H	Series 4067	
Gate Valves 12-inch And Smaller (Resilient Seated Only):			
	American Flow Control	Series 2500	
	American R/D	Series 2000	
	AVK	Series 25	
	Clow	Series F-6100	
	Kennedy	Series 4571	
	M & H	Series 4067	
	Mueller	Series A-2360	
	U.S. Pipe	Metroseal 250	
	Waterous	Series 500	
Tapping Sleeve (Fabricated Steel Mechanical Joint (Fusion Bonded)):			
	JCM	Series 414	
Tapping Sleeve (For All Taps On IPS O.D. PVC Pipe, Including Size On Size (18-8 Type 304 Stainless Steel Body, Flange, and Bolts), Flange To Accept Standard Tapping Valves.):			
	Ford	Series FTSS	
	JCM	Model 432	
	Mueller	Series H-304 S/S	
	Cascade	CFT-EX	
	<u>Total Piping Solutions</u>	<u>Triple Tap</u>	
Tapping Sleeve (Mechanical Joint For Cast Iron, Ductile Iron, PVC C-900 & AC Pipe; All Taps Including Size On Size.)			
	Mueller	H615 / H616 / H619	
	American Flow Control	2800	
	JCM	Model 432	
	<u>Total Piping Solutions</u>	<u>Triple Tap</u>	
Tapping Valves - MJ/Ductile Iron			
	M & H	Series 4751	
	American Flow Control	Series 2500	
	Mueller	T-2360 & T-2361	
	Clow	Series F-6114	

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<u>Insertion Valves - MJ/Ductile Iron RWGV (In Place of Line Stop/Tapping Sleeve)</u>			
	<u>Team Industrial Products</u>	<u>InsertValve</u>	<u>Available 4" through 12"</u>
Locate Wire Access Box For Buried Valves			
	Bingham/Taylor	P 200NFG TEST 2T	
Valve Box With Lids (5/4 -Inch, ASTM A48 30B Cast or Ductile Iron, With "SEWER" cast into the lid top):			
	Bingham/Taylor Foundry	4905-X, 4905, 4904-L	
	American Flow Control*	Trench Adapter	* For mains with valve nuts that are 6 feet or deeper.
	Sigma	VB261, VB262, VB264, VB4650W	
	Star		Heavy Duty Screw or Slip Type
	Mueller	MVB	Use w/ AJBV-4" Locking Bolt

Wastewater Category 2 of 510: PIPE MATERIALS			
<i>ITEM TO BE USED</i>	Manufacturer	Part Number	Comments
Casing Spacers (All Sizes) Stainless Steel With Vinyl Runners Centering			
	Cascade	Series CCS / CCPS / AZ	
	PSI	C-G-2 Series	
	RACI	S/T, F/G, P/Q, M/N, E/H	
	PSI-Ranger	Ranger II	
	CCI	CSS8, CSS12	
	Advance Systems		
Ductile Iron Pipe For Valve Vaults (4-inch To 12-inch = PC 350, 16-inch To 20-inch = PC 250, 24-inch = PC200, 30-inch To 64-inch = PC 150) (DI Flanges, AWWA C115):			
	American Ductile Iron Pipe	Protecto 401	Wasser Ferro Clad Primer
	Griffin Pipe Products	Protecto 401	
	US Ductile Iron Pipe	Protecto 401	
Ductile Iron Pipe Coatings, Linings, and Wrappings (For Use In Lift Station Wet Wells)			
	Superior Environmental Products	Interior – SP 2000 Exterior – SC 3300 with Wrapidseal applied	

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	Wrapidseal	Interior – Protecto 401 Exterior – Permite with Wrapidseal	
HDPE Pipe DR11 (Green Striped) (Use For Directional Bores Is Prohibited Except With Specific PCU Approval)			
Rev March 2012			
	Chevron/Phillips	Performance Pipe / ISCO Pipe	
	CSR	Polypipe/Charter Plastics	
	ARNCO		
	J-M-Eagle		
	National Pipe		
Painting Finish Aerial Piping, Fittings, and Valves (Field Primer)			
	Porter/International	286 U-Primer	
	Tnemec	37-77H Chem-Primer	
	Glidden	Alkyd Industrial Enamel	
	Colorwheel	635 Red Primer	
Painting Finish (Exterior)			
	Porter/International	2749 Light Base	
	Tnemec	Tnemec-Gloss 2H	
	Glidden	Alkyd Industrial Enamel	
	Colorwheel	600 Exterior Finish	
PVC (Light Green) 4-inch Through 12-inch Pipe (AWWA C-900, DR18) and 16-inch and larger pipe (AWWA C-905 or C-909, DR 25):			
	Bristolpipe		
	Certainteed	Certa-Lok	
	J-M Manufacturing IM- Eagle		
	Ipex		
	Diamond Plastics		
	National Pipe		
	NAPCO	North American Pipe Company	
	Uponor ETI	Ultra-Blue C909 (green)	
	Underground Solutions	Fusible PVC	For Pressure Main Use Only
PVC Gravity Pipe – Mains and Services (SDR 26, Light Green In Color)			
	Certainteed		
	Can-Tex		
	J-M Manufacturing IM- Eagle		
	Diamond Plastics		

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	Bristolpipe		
	National Pipe		
	Vassallo		
	NAPCO	North American Pipe Company	
Pipe Lining Material – Gravity Mains (Must Meet ASTM F1216 And Be Equal To Materials Listed Below)			
Rev September 2014			
	Insituform	CIP Liner	
	National Liner	CIP Liner	
	LMK Enterprises	Performance Liner	
	Steven’s Technologies	CIP Liner 2 part 100% epoxy	
	Inner Cure Technologies	Reichhold/DION CIP Liner	
	Lanzo Lining	Lanzo CIP Lining System	
	Reynolds Inliner	Reichhold/Intech	
	FirstLiner	FirstLiner CIP Lining System	
	Premier Pipe	Premier Pipe CIP Lining System	
Force Main Identification Tape (Light Green, 6-Inches Wide, 2-inches High Black Lettering, Adhesive Backed):			
Buried Force Main Warning Tape (Light Green, 3-inches Wide, 1-Inch High Black Lettering, Non-Adhesive Backed):			
Force Main Locating Wire (Single Strand 14-Gauge Solid Copper Wire with Light Green Colored Insulated Covering):			
	Copperhead	Reinforced Locating Wire	Alternative
Locating Marker Systems (Force Main) (Green In Color):			
	3M	Scotch Mark EMSII Electronic Marker Locator #1265	
	3M	Scotch Marker Electronic Ball Marker #1404	
Curb and Pavement Markers (Green in Color, Imprinted With The Words “POLK COUNTY UTILITIES” And “CALL 811 BEFORE YOU DIG” With “SANITARY SEWER SERVICE” or “FORCE MAIN VALVE” As Applicable):			

Wastewater Category 3 of 510: PIPE FITTINGS

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ITEM TO BE USED	Manufacturer	Part Number	Comments
Expansion Joints			
	EBAA Iron Inc.		Rev March 2012
	Fernco		
	Star Pipe	Star Flex 5000, 5100, & 5200	
Fittings – Ductile Iron (C153 SSB/C110 FLG) (Cement Mortar Lined and Coated In Accordance With AWWA C104) (Outside Surfaces Shall Be Prime Coated Only If Located Aboveground And Painted):			
	Union/Tyler		
	US Pipe		
	American		
	Sigma		
	Star Pipe		
Fittings, Adapters, And Plugs - Gravity PVC (SDR 26, Light Green in Color):			
	Harco		
	J-M Manufacturing Manufacturing Eagle		
	Multi-Fittings		
	Plastic Trends		
Clean-Outs With Caps – PVC (White in Color, Exterior Nut):			
	USSI	Clean-Out Smart Plug with Plug Seat	For Use On PCU Operated Infrastructure As Required By PCU
Restrained Joints (Ductile Iron Pipe):			
	EBAA Iron Inc.	Mega-lug 1100 (3-inch to 48-inch) Mega-lug 1100HD (10-inch to 48-inch) Mega-lug 2100 (3-inch to 12-inch) Series RS 3800 Restrainer	RS 3800 Includes Sleeve
	American	Fast Grip Gaskets Flex Ring Field Flex Ring Lok Ring	
	Ford	Series 1400-D	
	Sigma	One LOK SLD	

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	Sigma Star Pipe	LOK Series PVP and PVPF Stargrip Series 3000, 3000S, 3000OS, 3100P, & 3100S Flange Adapter Series 200 & 400 Retainer Gland Series 600 Restrainer Series 1000, 1100, & 1200 Flange Adapter Series 3200 Series 4000 & 4100P Series 3200 & 4200	
	Tyler/Union	Tuf Grip TLD Series <u>1000, 1000S</u> <u>Tuf Grip Dual Wedge Restraint</u> <u>Series 1500</u>	<u>For DI Pipe Use</u> <u>For PVC, DIP, HDPE</u> <u>pipe use</u>
Restrained Joints (PVC Pipe):			
	EBAA Iron Inc.	Mega-lug 2000 PV (4-inch to 36- inch) F/IPS, DR25, DR18, DR14 & DR41 Mega-lug 2000 SV (4-inch to 12- inch) Mega-lug 2100 Flange Adapter (3-inch to 12-inch) Mega-lug 1500 Bell Restraint (4-inch to 12-inch) Mega-lug 1600 Bell Restraint (4-inch to 12-inch) F/PVC C-900 Bell Restraint 2800 Series (14-inch to 42-inch) F/PVC C-905 Bell Restraint	
	Uni-Flange/Ford	1350 Bell Restrainer (2-inch to 12-inch) 1350 Bell Restrainer (2-inch to 8- inch) (14-inch to 24-inch) 1390 Bell Restrainer (4-inch to 12-inch) (12-inch to 24-inch) 900 Adapter Flange (4-inch to 12- inch) 1500 Series "CIRCLE LOCK" 1300 Fitting Restrainer (14-inch to 24-inch)	

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	JCM	610 Sur-Grip Bell Joint Restrainer (14-inch to 24-inch) 621 Sur-Grip Bell Joint Restrainer (14-inch to 24-inch) 610 Fitting Restrainer (4-inch to 30-inch) 620 Bell Restrainer (4-inch to 12-inch) 621 Bell Restrainer (14-inch to 30-inch)	
	Sigma	One LOK SLC	
	Sigma	PV LOK Series PVP and PVPF	
	Star	Stargrip PVC Series 4000 Series 1100 PVC Harness Series 1200 PVC Harness Series 4000 & 4100P Series 3200 & 4200 Restrainer Series 1000, 1100, & 1200 Flange Series 3200 & 4200 Adapter Flange Series 200 & 400	
	<u>Tyler/Union</u>	<u>Tuf Grip TLP Series 2000, 2000S</u> <u>Tuf Grip Dual Wedge Restraint Series 1500</u> <u>Bell Joint Restraints Series 3000: 32U, 33U, 34U, 35U</u>	<u>For PVC Pipe Use</u> <u>For PVC, DIP, HDPE pipe use</u> <u>For PVC Pipe Use</u>

Wastewater Category 4 of §10: MANHOLES AND ACCESSORIES

<i>ITEM TO BE USED</i>	Manufacturer	Part Number	Comments
Encapsulation and Joint Seal (12 inch minimum width):			
	Canusa	Wrapid Seal / Wrapid Tape	
	Cretex	Wrap External Joint Seal	

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	PSI	Boa Tape	
Frame and Cover (With "POLK COUNTY", "SANITARY", "FLORIDA" cast into the top of the cover):			
	US Foundry	USF 225-AS	Regular (4' Inside Dia.) Manholes
	US Foundry <u>EJ</u>	USF 926 <u>Ergo</u>	Hinged Cover and Frame Alternative for Regular Dia. Manholes – <u>Not for use in paved roadways.</u>
	CertainTeed	Pamrex 24"	Hinged Cover and Frame Alternative for Regular Dia. Manholes – <u>Not for use in paved roadways.</u>
	US Foundry	USF 667-CR-XB	Large (5' and Larger Inside Dia.) Manholes
	CertainTeed	Pamrex 36"	Hinged Cover and Frame Alternative for Large Dia. Manholes – <u>Not for use in paved roadways.</u>
	<u>EJ</u>	<u>Ergo XL</u>	<u>Hinged Cover and Frame Alternative for Large Dia. Manholes – Not for use in paved roadways.</u>
Manhole Insert (No Ventilation Hole)			
	Bay Area Plastics	Tight Seal Insert - Black	Polypropylene with 1/8" Minimum Continuous Polymer Thickness.
	USSI-USA	Inflow Defender - Black	HDPE with 1/8" Minimum Continuous Polymer Thickness.
	Inflow Systems	Inflow Shield	16 Gage Type 304 SS
Jointing Material			
	K.T. Snyder Co, Inc.	Ram-Nek	

Comment [FC1]: A review of materials found that the EJ and CertainTeed hinged lids are Ductile Iron while the US Foundry is gray iron. It is recommended that the US Foundry be removed from list of allowable hinged covers due to brittleness of a gray iron hinge.

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Material – Concrete			
	Mack Precast		Precast
	Standard Precast		Precast
	Hanson Pipe & Product		Precast
	Oldcastle Precast		Precast
	Atlantic TNG		Precast
	Allied Precast		Precast
Pipe Seals, Force Main Entering Wet Well And/Or Valve Box			
	Link Seal	Model S-316 Link Seal Modular Seal	
Pipe Seals, Manhole – Gravity Less Than 12-inch			
	Atlantic Concrete	A-Lok (cast-in-place)	
	NPC	Kor-N-Seal Model WS	
Pipe Seals, Manhole – Gravity Greater Than Or Equal To 12-inch			
	Atlantic Concrete	A-Lok (cast-in-place)	
Surface Coatings – Exterior (Manholes, Wet Wells, and Valve Vaults)			
	Carboline	Bitumastic 300M	
	Conseal	CS-55	
<u>Surface Coatings – Interior (Standard Manholes only)</u>			
	<u>Carboline</u>	<u>Bitumastic 300M</u>	
	<u>Conseal</u>	<u>CS-55</u>	
Surface Coatings – Interior (Light Colors) (<u>Master/Drop/FM Receiving</u> Manholes, Wet Wells, and Valve Vaults)			
	Sauereisen	SewerGuard 210	
	Sauereisen	F-170	
	<u>I.E.T., Inc. / IET Systems/CoREZYN</u>	<u>IET-Crete COR75-AQ-010</u>	<u>Two-Part Resin, 10-Year Warranty</u>
	Kerneos Aluminates Technologies	Sewpercoat	
	CCI Spectrum, Inc.	Spectrashield	
	Strong Company	Strong-Seal Systems	
	Sherwin-Williams	Cor-Cote SC	Sewer Cote Epoxy
	Sherwin-Williams	Sherflex	Polyurethane Elastomer
	Raven Lining	Raven 404	
	Raven Lining	Raven 405	
Top Adjusting Rings (Use Must Be Approved In Advance By FDOT Or Polk County Transportation):			
	Ladtech, Inc.		HDPE

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	Cretex	Pro-Ring	Expanded Polypropylene (EPP)
			Reinforced Concrete
	<u>EJ</u>	<u>Riser Rings</u>	
Lining Systems (Light Colors) (<u>Master/Drop/FM Receiving</u> Manholes, Wet Wells, and Valve Vaults)			
	AGRU Liner	HDPE Liner	Factory Installed
	GSE Studliner	HDPE Liner	Factory Installed
	GU Liner	Polypropylene (PP) Liner	Factory Installed

Wastewater Category 5 of §10: LIFT STATION MATERIALS AND ACCESSORIES			
ITEM TO BE USED	Manufacturer	Part Number	Comments
Odor Control System and Equipment:			
	Premier Chemicals	Thioguard	
Alarm Horn (AH)			
	Federal Signal	450 series	
	Edwards	871P-G1	
Alarm Light (AL)			
	Federal Signal	225 XST	
	Edwards		
Block Walls - Anti-Graffiti Paint			
	American Building	Polyshield Restoration	
	Richard's Paint	Professional Water Seal & Graffiti	
	Environmental Products	Graffiti-Proof	
Control Panels (CP)			
	Curry Controls Company		
	DCR Engineering		
	Revere Control Systems		
	Rocha Controls		
	Unitron Controls		
Control Panel - Control Circuit Breaker			
	Square D	QOU120 or Multi-9 series	
Control Panel - Control Circuit Transformer			
	Square D	EO-18	

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Control Panel - Electric Box Mounts			
	Unistrut	P1110T	
Control Panel - Emergency Circuit Breaker (ECB)			
	Square D		Required where transfer switch is not provided.
Control Panel – Enclosure (with the appropriate Arc Flash Label on Panel Door)			
	Hoffman		
	Rittal		
	Schaefer		
Control Panel - Explosion-Proof Seal- Off			
	Crouse-Hinds		
	OZ/Gedney		
Control Panel - Float Regulator (FR)			
	Anchor Scientific	Roto-Float	Mount floats to stainless steel cable with 15 lbs. anchor using stainless steel cable ties/clamps.
	Siemens	9G	
	Contegra	FS 96	
Control Panel - Fuses (F)			
	Bussmann		
Control Panel - Hand-Auto-Off Selector (HOA)			
	Square D	9001-SKS	
Control Panel - Horn Silence Button (HSS)			
	Square D	9001-SKR-IU	
Control Panel – Moisture and Temperature Failure Relays			
	MPE	PMR	
	Flygt	Mini-CAS	
	ATC Diversified	SPM	
Control Panel - Motor Circuit Breaker (MB)			
	Square D		
Control Panel - Motor Starter (MS)			
	Square D		
Control Panel - Solid State Overload			
	Square D	TeSysT	
Control Panel - Supplemental Protector Breaker – 3-pole, 1-amp			

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	Square D	MG24532	
Control Panel - Surge Protector (UL 1449, Latest Edition Listed And Labeled), , Voltage, and Phase To Match Service, Rated 80,000-amps Per Mode (Minimum 10-Year Warranty).			
	Eaton	SPD	
	Innovative Technologies	PTE	
Control Panel - Terminal Strip (TS)			
	Square D	9070GR6	
Flow Meters With Replaceable Sensors (Pipe Length Before And After Meter Is To Be 5 Times The Diameter Of The Pipe.)			
	Foxboro		
	Siemens		
	ABB		
Generator Circuit Breaker			
	Square D		
Generator Fuel Tanks (Double Walled And For Fixed Generator Systems Only)			
	Convault		
	Modern Welding		
	Phoenix		
Generator Systems, Fixed			
	Caterpillar		
	Cummins		
	Kohler		
Generator Systems, Portable			
	Caterpillar		
	Cummins		
	Kohler		
Generator Receptacle (GR)			
	Russelstoll	JRSB 1044 FR (100 amp)	For \leq 25 Hp Pumps. Required when transfer switch not provided.
	Russelstoll	JRSB 2044 (200 amp)	For 25 Hp > Pumps. Required when transfer switch not provided.
Generator Automatic Transfer Switch			
	Emerson/ASCO.		

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	Cummins.		
	Ruselectric.		
	Eaton/Cutler-Hammer		
Generator Manual Transfer Switch			
	ESL Power Systems	Stormswitch	Replaces service entrance breaker and generator breaker and receptacle.
Human Machine Interface (HMI)			
	Schneider Electric	Magelis	
Main Service Disconnect Breaker			
	Square D		
Main Circuit Breaker (MCB)			
	Square D		
Main Circuit Transformer (MCT)			
	Square D	500SV43F	
Odor Control Monitoring Instrument			
	Precision Control	Model SRC-1	
Pressure Gauges:			
	Ashcroft	1279	0-60 PSI
	Ametek	1980	
	Wika	XSEL	
Pressure Gauges (Diaphragm Seals)			
	Ashcroft	Type 201	
Level Hydrostatic Pressure Transducers- 0 To 15 psi Range			
	Endress Hauser	FMX 21	42mm Heavy Duty version.
	Keller America	LevelRat	
	Blue Ribbon Ind.	Birdcage Pressure Transducer	
Sluice Gate For Wet Well			
	BNW	Model 77	316 ss
	Fontaine	Model 20	316 ss
Submersible Pumps With Enclosed Impellers			
	Hydromatic		
	Flygt		

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Check Valves 4-inch And Larger (8 mil Epoxy Lined)			
	M & H	159	
	Mueller	Series 2600 (Up to 12 inches)	
	Mueller	Series 8001 (16" and Larger)	
	American Flow Control	Series 600 or 50 line	
Cushion Check Valves (Oil Filled)			
	GA		
	APCO		
	CCNE		
Variable Frequency Drives			
	Schneider-Electric Square D	Altivar	
Variable Frequency Motors			
	U.S. Motors	Rated for inverter duty only	
	Baldor	Rated for inverter duty only	
	Reliance	Rated for inverter duty only	
Wet Well and Valve Vault Access Frames and Covers (A minimum non-traffic bearing load rating of 300 PSF or, if subject to vehicular traffic, a H-20 traffic bearing load rating)			
	Halliday Products		
	Bilco Company		
	USF Fabrication, Inc.		
Lift Station Wet Well Fall Protection System			
	Halliday Products	Retro Grate Fall Thru Protection System	
	Bilco	Fall Protection Grating System	
	USF Fabrication, Inc.	Hinged Hatch Safety Grate	
Pad Locks			
	Videx CyberLock	PL-01KR, PL-02KR, PL-03KR (Key Retaining)	CL-6P3WR (Installed in Schlage Pad Lock w/ 1" or 2" or 3" SS Shackle, as appropriate for each application)

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	Videx CyberLock	PL-01, PL-02, PL-03 (Non-Key Retaining)	CL-6P3WR (Installed in Schlage Pad Lock w/ 1" or 2" or 3" SS Shackle, as appropriate for each application)
Uninterruptable Power Supply (UPS)			
	Transtronics	BVUPS	Provide with (2) worker batteries or equal
Electric Override Key Switch			
	Knox Key Switch	3500 Series	For Use with Facilities with Electrically Operated Gated Access

Wastewater Category 6 of 10: VALVES AND ACCESSORIES (PLANTS AND REMOTE FACILITIES)

<u>ITEM TO BE USED</u>	<u>Manufacturer</u>	<u>Part Number</u>	<u>Comments</u>
<u>Automatic Combination Air / Vacuum Release Valves:</u>			
	<u>Val-Matic</u>	<u>VM-38</u>	<u>Air Release Only – Plant, Facility Use Only</u>
	<u>Val-Matic</u>	<u>VM-45</u>	<u>Air Release Only – Plant, Facility Use Only</u>
	<u>Val-Matic</u>	<u>VM-200C</u>	<u>Combination – Plant, Facility Use Only</u>
<u>Gate Valves, Plug Valves</u>			
	<u>DeZurik</u>	<u>PEF Series Plug Valve</u>	<u>According to Application.</u>
	<u>DeZurik</u>	<u>Knife Gate Valves</u>	<u>According to Application</u>
	<u>Val-Matic</u>		<u>According to Application.</u>
<u>Valve Actuators</u>			
	<u>Beck</u>	<u>Model 11</u>	<u>Remote Indication or Position Display According to Application</u>
	<u>Auma</u>	<u>SA</u>	<u>Remote Indication or AumaMatic. According to Application</u>

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<u>Hydraulically Operated Control Valves (Pressure Reducing/Sustaining Valves):</u>			
	<u>Cla-Val</u>		<u>Model or Series based on field application.</u>
	<u>OCV</u>		<u>Model or Series based on field application.</u>
	<u>Watts/Ames</u>		<u>Model or Series based on field application.</u>
<u>Wastewater Category 7 of 10: PUMPS, CHEMICAL FEED SYSTEMS</u>			
<u>ITEM TO BE USED</u>	<u>Manufacturer</u>	<u>Part Number</u>	<u>Comments</u>
<u>Vertical Turbine</u>			
	<u>Goulds</u>		
	<u>Flowserve</u>	<u>VIC, VIT, SMVT, or DWT</u>	<u>based on application.</u> <u>(AKA: Process Systems, Inc.)</u>
	<u>Deming National</u>		
<u>Centrifugal/Split Case/Submersible/End Suction</u>			
	<u>Aurora</u>		
	<u>Flowserve</u>		
	<u>Flygt</u>	<u>N or C Series submersible</u>	
	<u>Goulds</u>		
<u>Chemical Pumps</u>			
	<u>Prominent</u>		<u>Appropriate series based on flow rate. Degassing heads for NaOCl.</u>
<u>Skid, Shelf Mounted Feed Systems</u>			
	<u>Blue Planet</u>		<u>Utilize "Polk County" junction box with hour meter/operating indication.</u>
<u>Chemical Tanks</u>			
	<u>Snyder</u>	<u>Captor/Dual Containment</u>	<u>HDLPE with NaOCl Resin</u>
	<u>Poly Processing Co.</u>	<u>Saf-T tank</u>	<u>XLPE with OR 1000 Inner Coating</u>
<u>Sludge Transfer Pumps – Rotary Lobe</u>			

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	<u>Boerger</u>	<u>Model PL, CL, or FL, typical.</u>	<u>Sized Based on Application.</u>
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Wastewater Category 8 of 10: TANKS and GENERATORS

<u>ITEM TO BE USED</u>	<u>Manufacturer</u>	<u>Part Number</u>	<u>Comments</u>
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Pre-stressed Concrete Tanks

	<u>Crom</u>		
	<u>Pre-con</u>		

Standby Power Generators

	<u>Kohler</u>		<u>3-Ph. 480V Diesel</u>
	<u>Caterpillar</u>		<u>3-Ph. 480V Diesel</u>
	<u>Cummins</u>		<u>3-Ph. 480V Diesel</u>

Fuel Tanks (Stand-alone)

	<u>Convault</u>		<u>Pneumercator level/leak detection systems also required. LC 1000 w/ LS600 and LS610.</u>
	<u>Modern Welding</u>		<u>Pneumercator level/leak detection systems also required. LC 1000 w/ LS600 and LS610.</u>
	<u>Phoenix</u>		<u>Pneumercator level/leak detection systems also required. LC 1000 w/ LS600 and LS610.</u>

Wastewater Category 9 of 10: FLOW METERS

<u>ITEM TO BE USED</u>	<u>Manufacturer</u>	<u>Part Number</u>	<u>Comments</u>
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Flow Meters (Electro-magnetic)

	<u>Siemens</u>	<u>Sitrans FM Mag. 5000 series unless using bussed network.</u>	
	<u>ABB</u>	<u>WaterMaster Series</u>	
	<u>Foxboro</u>	<u>9100A w/ IMT 25</u>	

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<u>Wastewater Category 10 of 10: ELECTRICAL</u>			
<u>ITEM TO BE USED</u>	<u>Manufacturer</u>	<u>Part Number</u>	<u>Comments</u>
<u>VFDs, Relays, Breakers</u>			
	<u>Schneider-Electric</u>	<u>Square D</u>	
<u>Security/Surveillance System</u>			
	<u>Axis</u>		<u>Camera/Equipment</u>
	<u>Bosch</u>		<u>Camera/Equipment</u>
	<u>Pelco</u>		<u>Camera/Equipment</u>
	<u>Exaqvision</u>		<u>Software</u>

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Wastewater System Schedule of Valves

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Date: _____

Contractor: _____

Project: _____

PCU Project No.: _____

Item No.	Item Description	Qty.	Unit	Unit Cost (\$)	Extended Cost (\$)
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1	Single Service, Long				
2	Single Service, Short				
3	Double Service, Long				
4	Double Service, Short				
5	8" PVC, SDR-26, 0'-6' deep				
6	8" PVC, SDR-26, 6'-8' deep				
7	8" PVC, SDR-26, 8'-10' deep				
8	8" PVC, SDR-26, 10'-12' deep				
9	8" PVC, SDR-26, 12'-14' deep				
10	8" PVC, SDR-26, 14'-16' deep				
11	10" PVC, SDR-26, 0'-6' deep				
12	10" PVC, SDR-26, 6'-8' deep				
13	10" PVC, SDR-26, 8'-10' deep				
14	10" PVC, SDR-26, 10'-12' deep				
15	10" PVC, SDR-26, 12'-14' deep				
16	10" PVC, SDR-26, 14'-16' deep				
17	12" PVC, SDR-26, 0'-6' deep				
18	12" PVC, SDR-26, 6'-8' deep				
19	12" PVC, SDR-26, 8'-10' deep				
20	12" PVC, SDR-26, 10'-12' deep				
21	12" PVC, SDR-26, 12'-14' deep				
22	12" PVC, SDR-26, 14'-16' deep				
23	15" PVC, SDR-26, 0'-6' deep				
24	15" PVC, SDR-26, 6'-8' deep				
25	15" PVC, SDR-26, 8'-10' deep				
26	15" PVC, SDR-26, 10'-12' deep				
27	15" PVC, SDR-26, 12'-14' deep				
28	15" PVC, SDR-26, 14'-16' deep				
29	Standard Precast Manhole with Ring and Cover, 0'-6' deep				

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Wastewater System Schedule of Valves

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30	Standard Precast Manhole with Ring and Cover, 6'-8' deep				
31	Standard Precast Manhole with Ring and Cover, 8'-10' deep				
32	Standard Precast Manhole with Ring and Cover, 10'-12' deep				
33	Standard Precast Manhole with Ring and Cover, 12'-14' deep				
34	Standard Precast Manhole with Ring and Cover, 14'-16' deep				
35	Pump Station, Duplex Complete				
36	Pump Station, Triplex Complete				
37	Standby Generator Set				
38	Odor Control System				
39					
40					
41	4" PVC, AWWA C-900, DR 18, Green				
42	4' DIP, Pressure Class 350, Epoxy-Lined, Bituminous Coated				
43	4" Gate Valve Assembly, Complete				
44	4" 11 ¼ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
45	4" 22 ½ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
46	4" 45 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
47	4" 90 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
48	4" Tee, DI, C153, Epoxy-Lined, Bituminous Coated				
49	4" Cross, DI, C153, Epoxy-Lined, Bituminous Coated				
50					
51	4" HDPE				
52					
53	6" PVC, AWWA C-900, DR 18, Green				
54	6" DIP, Pressure Class 350, Epoxy-Lined, Bituminous Coated				
55	6" Gate Valve Assembly, Complete				

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Wastewater System Schedule of Valves

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56	6" 11 ¼ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
57	6" 22 ½ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
58	6" 45 Degree Bend, DI, C153 Epoxy-Lined, Bituminous Coated				
59	6" 90 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
60	6" Tee, DI, C153, Epoxy-Lined, Bituminous Coated				
61	6" Cross, DI, C153, Epoxy-Lined, Bituminous Coated				
62					
63	6" HDPE				
64					
65	8" PVC, AWWA C-900, DR 18, Green				
66	8" DIP, Pressure Class 350 Epoxy-Lined, Bituminous Coated				
67	8" Gate Valve Assembly, Complete				
68	8" 11 ¼ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
69	8" 22 ½ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
70	8" 45 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
71	8" 90 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
72	8" Tee, DI, C153, Epoxy-Lined, Bituminous Coated				
73	8" Cross, DI, C153, Epoxy-Lined, Bituminous Coated				
74					
75	8" HDPE				
76					
77	10" PVC, AWWA C-900, DR 18, Green				
78	10" DIP, Pressure Class 350 Epoxy-Lined, Bituminous Coated				
79	10" Gate Valve Assembly, Complete				
80	10" 11 ¼ Degree Bend, DI, C153,				

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Wastewater System Schedule of Valves

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	Epoxy-Lined, Bituminous Coated				
81	10" 22 ½ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
82	10" 45 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
83	10" 90 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
84	10" Tee, DI, C153, Epoxy-Lined, Bituminous Coated				
85	10" Cross, DI, C153, Epoxy-Lined, Bituminous Coated				
86					
87	10" HDPE				
88					
89	12" PVC, AWWA C-900, DR 18, Green				
90	12" DIP, Pressure Class 350 Epoxy-Lined, Bituminous Coated				
91	12" Gate Valve Assembly, Complete				
92	12" 11 ¼ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
93	12" 22 ½ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
94	12" 45 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
95	12" 90 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
96	12" Tee, DI, C153, Epoxy-Lined, Bituminous Coated				
97	12" Cross, DI, C153, Epoxy-Lined, Bituminous Coated				
98					
99	12" HDPE				

Total Constructed Value: _____

Reviewer: _____

Date: _____

Comments _____

CHAPTER 5 WASTEWATER

**Section 550-L Gravity Main Low-Pressure Air Test Form
 (PVC and Ductile Iron Pipe)**

Project: _____
 PCU Project No.: _____

Procedures for conducting this test shall be in strict conformance with UNI-B-6 Uni-Bell standards for testing gravity sewer main lines.

Date: _____ Specified Maximum Pressure Drop: _____ psig

TESTING PARAMETERS & SYSTEM INFORMATION

Specified Maximum Pressure Drop
Date of Test
Identification of Pipe Material Installed

Pipe Under Test				Spec Time	Field Test Operations Data					
Upstream MH #	Downstream MH #	Dia D (in.)	Length L (ft.)	Refer to UNI-B-6 (min:sec)	Pressure Initially Raised to (psig)	Time Allowed for Pressure to Stabilize	Start Test Pressure (psig)	Stop Test Pressure (psig)	Elapsed Time (min:sec)	Pass or Fail (P or F)

CONTRACTOR & INSPECTOR PERSONNEL INFORMATION

	Contractor	Inspector
Signature:		
Printed Name:		
Company Name:		
Phone Number:		
Date:		

This test form was derived from UNI-B-6-98, Appendix 2, Air Test Data Sheet. The purpose of this form is to assist in obtaining information from field testing of wastewater pipes as well as to assist in evaluating acceptability of construction.

Leakage testing shall be conducted in accordance with the procedure for “Recommended Practice for Low Pressure Air Testing of Installed Sewer Pipe” as established by the Uni-Bell PVC Pipe Association. The pipe shall pass the current most stringent UNI-B-6 Uni-Bell standards for testing gravity sewers and shall have no evidence of leaks in the pipe or connections.

All ref's to valve vault removed.

GENERAL NOTES:

1. ALL INTERIOR METAL SURFACES SHALL BE PAINTED WITH 2 COATS OF BITUMINOUS EPOXY PAINT.
2. EXTERIOR OF WET WELL SHALL RECEIVE TWO (2) COATS BITUMINOUS EPOXY.
3. INTERIOR OF WET WELL SHALL HAVE PCU APPROVED FACTORY INSTALLED LINER OR FIELD COATING.
4. VALVE VAULTS ARE ONLY TO BE USED WITH PRIOR PCU APPROVAL.
5. ALL LOCATIONS WHERE PIPES ENTER OR LEAVE THE WET WELL SHALL BE MADE WATER TIGHT BY USE OF A RUBBER TYPE PIPE BOOT w/ NON-SHRINK GROUT.
6. THERE SHALL BE NO VALVES OR ELECTRICAL JUNCTION BOXES EXCEPT FLOAT CABLES IN WET WELL.
7. WET WELL COVERS THAT ARE NOT SUBJECT TO VEHICULAR TRAFFIC SHALL BE (300 PSF RATED) ALUMINUM WITH 316 S.S. HARDWARE AND LOCK BRACKET. IF SUBJECT TO VEHICULAR TRAFFIC, WET WELL COVERS SHALL BE H-20 RATED. SIZE OF WET WELL COVER AS REQUIRED BY PUMP MANUFACTURER AND AS APPROVED BY PCU.
8. PUMPS 25 H.P. AND LARGER SHALL BE 240V/480V, 3-PHASE, W/ SOFT STARTS, SMALLER PUMPS SHALL BE 240V/480V, 3-PHASE, 60 Hz MOTOR, SUBMERSIBLE PUMP AS MANUFACTURED BY HYDROMATIC OR FLYGT ONLY. PUMP MUST BE CAPABLE OF PASSING 3" SOLIDS. ROTO PHASE POWER UNITS ARE STRICTLY PROHIBITED.
MANUFACTURER: _____ MODEL: _____ IMP: _____ DIA: _____
SPEED: _____ RPM, DISCHARGE SIZE: _____ IN., VOLTAGE _____, PHASE: 3Ø
H.P. _____, MIN. SOLID SIZE: _____ IN., CURVE: _____
9. OPERATING CONDITIONS SHALL BE _____ GPM AT _____ FEET TDH.
10. ALL HARDWARE IN WET WELL TO BE 316 STAINLESS STEEL.
11. 4" PLUG VALVES MAY HAVE LEVERS, ALL OTHERS SHALL HAVE GEARBOX W/ HAND WHEELS.
12. WET WELL SHALL BE PROVIDED WITH A GRATE BASED FALL PROTECTION SYSTEM.
13. ALL LOCATIONS WHERE GRAVITY PIPES ENTER OR LEAVE THE WET WELL SHALL BE MADE WATERTIGHT WITH AN APPROVED BOOT.

CONTINUED FIGURE WW-10

LIFT STATION NOTES POLK COUNTY UTILITIES, FLORIDA	FIGURE WW-09
POLK COUNTY UTILITIES, FLORIDA	APRIL, 2015

GENERAL NOTES (CONTINUED):

All ref's to valve vaults removed.

(SEE FIGURE WW-09 FOR NOTES 1 TO 13)

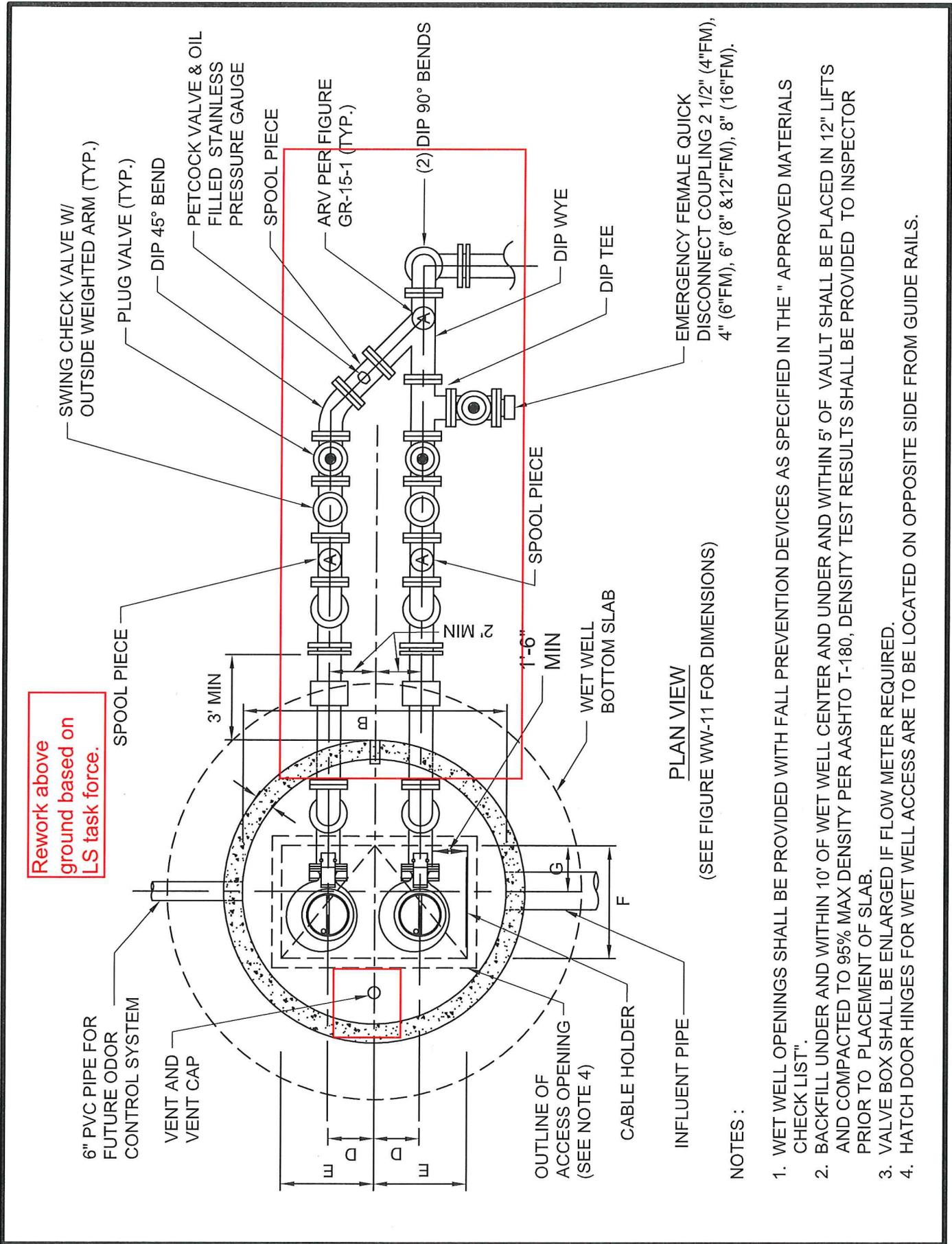
14. ALL LOCATIONS WHERE PRESSURE PIPES ENTER THE WET WELL SHALL BE MADE WATERTIGHT WITH A WALL SLEEVE AND SEAL OR NON-SHRINKAGE GROUT.
15. THERE SHALL BE NO VALVES OR ELECTRICAL JUNCTION BOXES EXCEPT FLOAT CABLES IN THE WET WELL.
16. ALL HARDWARE IN WET WELL SHALL BE 316 STAINLESS STEEL.
17. ALL CONNECTIONS IN THE WET WELL SHALL BE FLANGED JOINTS. ALL REMAINING CONNECTIONS BETWEEN THE WET WELL AND THE CONNECTION TO THE EXISTING FORCE MAIN SHALL BE RESTRAINED MECHANICAL JOINTS.
18. CHECK VALVE ARM SHALL BE LOCATED WITH THE SAME ORIENTATION (i.e. ALL ARMS ON THE LEFT SIDE OF VALVE).
19. ALL MATERIALS SHALL BE IN ACCORDANCE WITH THE "APPROVED MATERIALS CHECKLIST".

**LIFT STATION NOTES
(CONTINUED)**

POLK COUNTY UTILITIES, FLORIDA

**FIGURE
WW-10**

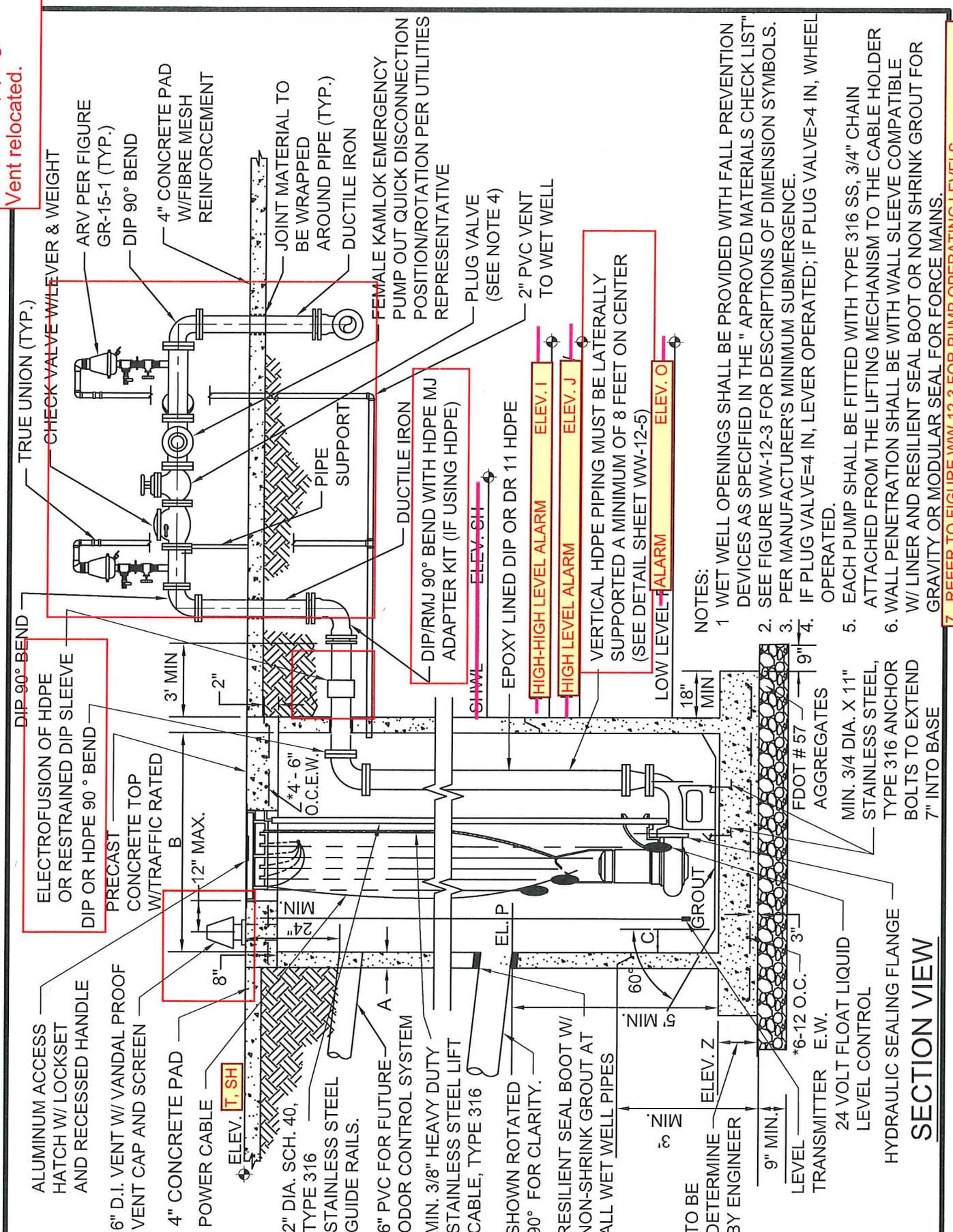
APRIL, 2015



**DUPLEX LIFT STATION
PLAN VIEW**

**FIGURE
WW-12-1**

Rework based on task force meeting and HDPE piping. Vent relocated.



ALUMINUM ACCESS HATCH W/ LOCKSET AND RECESSED HANDLE

6" D.I. VENT W/ VANDAL PROOF VENT CAP AND SCREEN

4" CONCRETE PAD

POWER CABLE

2" DIA. SCH. 40, STAINLESS STEEL GUIDE RAILS.

6" PVC FOR FUTURE ODOR CONTROL SYSTEM

MIN. 3/8" HEAVY DUTY STAINLESS STEEL LIFT CABLE, TYPE 316

SHOWN ROTATED 90° FOR CLARITY.

RESILIENT SEAL BOOT W/ NON-SHRINK GROUT AT ALL WET WELL PIPES

TO BE DETERMINE BY ENGINEER

9" MIN. LEVEL TRANSMITTER E.W.

24 VOLT FLOAT LIQUID LEVEL CONTROL

HYDRAULIC SEALING FLANGE

9" MIN. LEVEL TRANSMITTER E.W.

24 VOLT FLOAT LIQUID LEVEL CONTROL

HYDRAULIC SEALING FLANGE

- NOTES:
- 1 WET WELL OPENINGS SHALL BE PROVIDED WITH FALL PREVENTION DEVICES AS SPECIFIED IN THE "APPROVED MATERIALS CHECK LIST"
 2. SEE FIGURE WW-12-3 FOR DESCRIPTIONS OF DIMENSION SYMBOLS.
 3. PER MANUFACTURER'S MINIMUM SUBMERGENCE.
 4. IF PLUG VALVE=4 IN, LEVER OPERATED; IF PLUG VALVE>4 IN, WHEEL OPERATED.
 5. EACH PUMP SHALL BE FITTED WITH TYPE 316 SS, 3/4" CHAIN ATTACHED FROM THE LIFTING MECHANISM TO THE CABLE HOLDER
 6. WALL PENETRATION SHALL BE WITH WALL SLEEVE COMPATIBLE W/ LINER AND RESILIENT SEAL BOOT OR NON SHRINK GROUT FOR GRAVITY OR MODULAR SEAL FOR FORCE MAINS.

SECTION VIEW

FIGURE WW-12-2

DESCRIPTION	SYMBOL	DIMENSION	ELEVATION
THICKNESS OF WALL (8" MIN.)	A		—
DIAMETER OF WET WELL (6' MIN.)	B		—
WIDTH OF BOTTOM FILLET	C	SEE NOTE 1	—
C/L TO C/L OF PUMPS	D	SEE NOTE 1	—
LENGTH OF PUMP ACCESS OPENING	E	SEE NOTE 1	—
WIDTH OF PUMP ACCESS OPENING	F	SEE NOTE 1	—
BASE ELBOW TO EDGE OF PIT	G	SEE NOTE 1	—
VALVE BOX HATCH OPENING	H		
VALVE BOX HATCH OPENING	I		
TOP OF WET WELL	T	—	
FINISHED GRADE	U	—	
INVERT OF GRAVITY PIPE	P	—	
HIGH-HIGH LEVEL ALARM, (P 6")	V		
HIGH LEVEL PUMP ON	W		
HIGH AND LOW LEVEL OFF (TOP OF PUMP VOLUTE)	Y		
FLOOR OF WET WELL	Z	—	
SEASONAL HIGH WATER ELEVATION (SEE NOTE 3)	SH	—	

NOTE:

1. PER PUMP MANUFACTURER'S REQUIREMENTS

~~2. ELEVATION X - ELEVATION Y ≥ 4.5 FEET MINIMUM.~~

2. TOP OF PUMP STATION SHALL BE NO LOWER THAN THE 25 YEAR FLOOD 24 HOUR ELEVATION. THE BOTTOM OF STATION CONTROL AND ELECTRICAL BOXES SHALL BE NO LOWER THAN THE 100 YEAR 24-HOUR FLOOD ELEVATION.

3. SEASONAL HIGH GROUND WATER ELEVATION 'SH' SHALL BE CONSIDERED THE SAME AS THE TOP OF WET WELL ELEVATION.

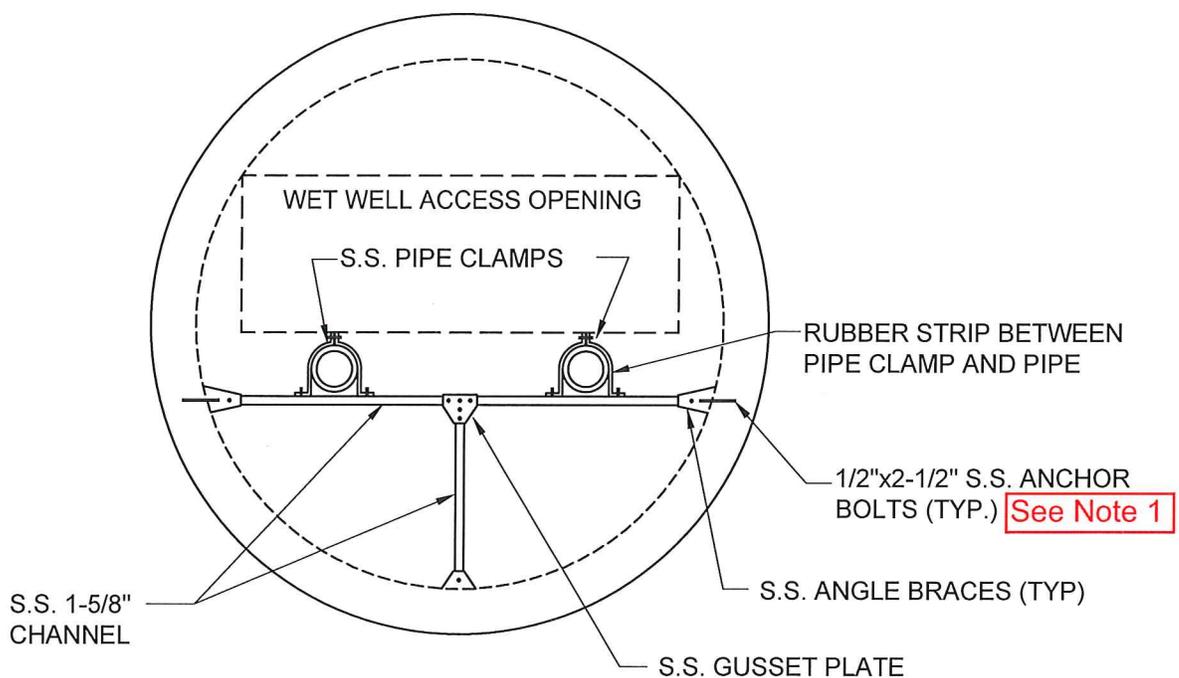
DESCRIPTION	SYMBOL	TRANSMITTER ELEVATION	FLOAT ELEVATION
HIGH-HIGH LEVEL ALARM	I		
HIGH LEVEL ALARM	J		
LAG PUMP ON	L		----
LEAD PUMP ON	M		----
BOTH PUMPS OFF	N		----
LOW LEVEL ALARM	O		

DUPLEX LIFT STATION
DIMENSIONS AND ELEVATIONS TABLE

POLK COUNTY UTILITIES, FLORIDA

FIGURE
WW-12-3

DECEMBER, 2010

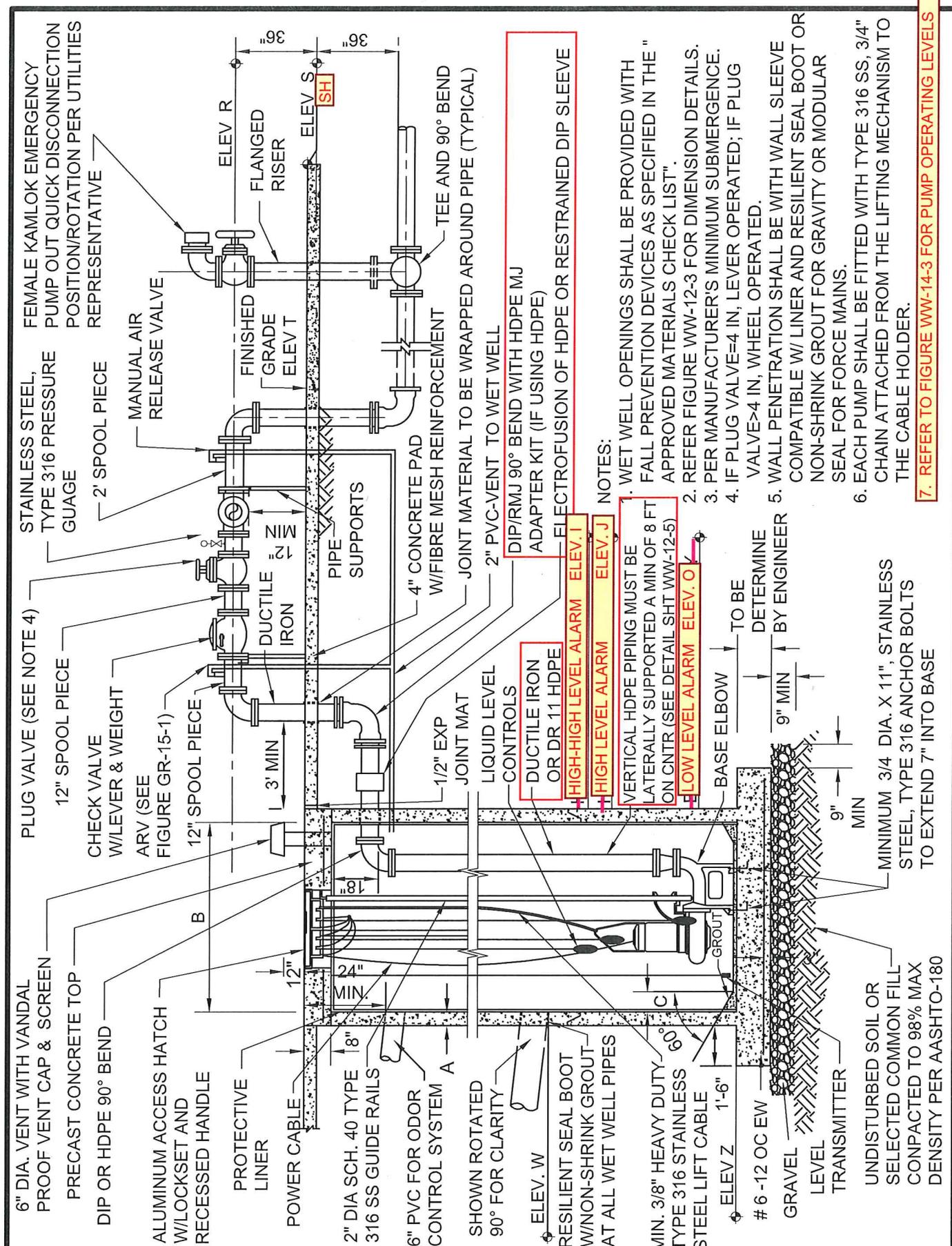


1. BOND ANCHOR BOLTS USING HIGH STRENGTH ANCHORING EPOXY FOR CONCRETE

Entire detail is new, as is the detail number. It is based on Manatee County's US-20 detail for bracing their HDPE piping.

REV. : FEBRUARY, 2015

<p>TYPICAL LIFT STATION HDPE PIPE BRACING</p>	<p>FIGURE WW-12-5</p>
<p>POLK COUNTY UTILITIES, FLORIDA</p>	<p>FEBRUARY, 2015</p>



STAINLESS STEEL, TYPE 316 PRESSURE GUAGE
 2' SPOOL PIECE
 MANUAL AIR RELEASE VALVE
 FINISHED GRADE ELEV T
 FLANGED RISER
 ELEV R
 ELEV S

PLUG VALVE (SEE NOTE 4)
 12" SPOOL PIECE
 CHECK VALVE W/LEVER & WEIGHT ARV (SEE FIGURE GR-15-1)
 12" SPOOL PIECE
 DUCTILE IRON
 PIPE SUPPORTS

6" DIA. VENT WITH VANDAL PROOF VENT CAP & SCREEN
 PRECAST CONCRETE TOP
 DIP OR HDPE 90° BEND
 ALUMINUM ACCESS HATCH W/LOCKSET AND RECESSED HANDLE
 PROTECTIVE LINER
 POWER CABLE
 2" DIA SCH. 40 TYPE 316 SS GUIDE RAILS
 6" PVC FOR ODOR CONTROL SYSTEM
 SHOWN ROTATED 90° FOR CLARITY
 ELEV. W
 RESILIENT SEAL BOOT W/NON-SHRINK GROUT AT ALL WET WELL PIPES

4" CONCRETE PAD W/FIBRE MESH REINFORCEMENT
 JOINT MATERIAL TO BE WRAPPED AROUND PIPE (TYPICAL)
 2" PVC-VENT TO WET WELL
 DIP/RMJ 90° BEND WITH HDPE MJ ADAPTER KIT (IF USING HDPE)
 ELECTROFUSION OF HDPE OR RESTRAINED DIP SLEEVE

1/2" EXP JOINT MAT
 LIQUID LEVEL CONTROLS
 DUCTILE IRON OR DR 11 HDPE
 HIGH-HIGH LEVEL ALARM ELEV. I
 HIGH LEVEL ALARM ELEV. J

MIN. 3/8" HEAVY DUTY TYPE 316 STAINLESS STEEL LIFT CABLE
 # 6-12 OC EW
 GRAVEL LEVEL
 TRANSMITTER
 UNDISTURBED SOIL OR SELECTED COMMON FILL COMPACTED TO 98% MAX DENSITY PER AASHTO-180

TEE AND 90° BEND
 TEE AND 90° BEND

TO BE DETERMINE BY ENGINEER
 9" MIN

MINIMUM 3/4 DIA. X 11", STAINLESS STEEL, TYPE 316 ANCHOR BOLTS TO EXTEND 7" INTO BASE

NOTES:
 1. WET WELL OPENINGS SHALL BE PROVIDED WITH FALL PREVENTION DEVICES AS SPECIFIED IN THE APPROVED MATERIALS CHECK LIST".
 2. REFER FIGURE WW-12-3 FOR DIMENSION DETAILS.
 3. PER MANUFACTURER'S MINIMUM SUBMERGENCE.
 4. IF PLUG VALVE=4 IN, LEVER OPERATED; IF PLUG VALVE>4 IN, WHEEL OPERATED.
 5. WALL PENETRATION SHALL BE WITH WALL SLEEVE COMPATIBLE W/ LINER AND RESILIENT SEAL BOOT OR NON-SHRINK GROUT FOR GRAVITY OR MODULAR SEAL FOR FORCE MAINS.
 6. EACH PUMP SHALL BE FITTED WITH TYPE 316 SS, 3/4" CHAIN ATTACHED FROM THE LIFTING MECHANISM TO THE CABLE HOLDER.
 7. REFER TO FIGURE WW-14-3 FOR PUMP OPERATING LEVELS

VERTICAL HDPE PIPING MUST BE LATERALLY SUPPORTED A MIN OF 8 FT ON CNTR (SEE DETAIL SHT WW-12-5)
 FLOW LEVEL ALARM ELEV. O

TO BE DETERMINE BY ENGINEER
 9" MIN

**TRIPLEX LIFT STATION (ABOVE GROUND PIPING)
 SECTION VIEW**

**FIGURE
 WW-14-2**

DESCRIPTION	SYMBOLS	DIMENSIONS	ELEVATIONS
THICKNESS OF WALL 8" (MIN)	A		----
DIAMETER OF WET WELL 10' (MIN)	B		----
WIDTH OF BOTTOM FILLET	C	SEE NOTE 1	----
C/L TO C/L OF PUMPS	D	SEE NOTE 1	----
LENGTH OF PUMP ACCESS	E	SEE NOTE 1	----
WIDTH OF PUMP ACCESS	F	SEE NOTE 1	----
BASE ELBOW TO EDGE OF PIT	G	SEE NOTE 1	----
CENTERLINE OF HEADER PIPE	R	----	
TOP OF WELL	S	----	
FINISH GRADE	T	----	
INVERT OF GRAVITY PIPE	P	----	
HIGH - HIGH LEVEL ALARM (P-6")	U	----	----
HIGH LEVEL - PUMP ON	V	----	----
LOW LEVEL PUMPS OFF (TOP OF PUMP VOLUTE)	Y	----	----
FLOOR OF WET WELL	Z	----	
SEASONAL HIGH WATER ELEVATION (SEE NOTE 4) 3	SH	----	

NOTE :

1. THESE DIMENSIONS SHALL BE SET AS PER PUMP MANUFACTURERS REQUIREMENTS.
2. TOP OF PUMP STATION SHALL BE NO LOWER THAN THE 25 YEAR 24 HOUR FLOOD ELEVATION. THE BOTTOM OF STATION CONTROL AND ELECTRICAL BOXES SHALL BE NO LOWER THAN THE 100 YEAR 24 HOUR FLOOD ELEVATION.
3. SEASONAL HIGH GROUND WATER ELEVATION (SH) SHALL BE CONSIDERED THE SAME AS THE TOP OF WET WELL ELEVATION.

DESCRIPTION	SYMBOL	TRANSMITTER ELEVATION	FLOAT ELEVATION
HIGH-HIGH LEVEL ALARM	I		
HIGH LEVEL ALARM	J		
LAG-LAG PUMP	L-1		----
LAG PUMP ON	L-2		----
LEAD PUMP ON	M		----
BOTH PUMPS OFF	N		----
LOW LEVEL ALARM	O		

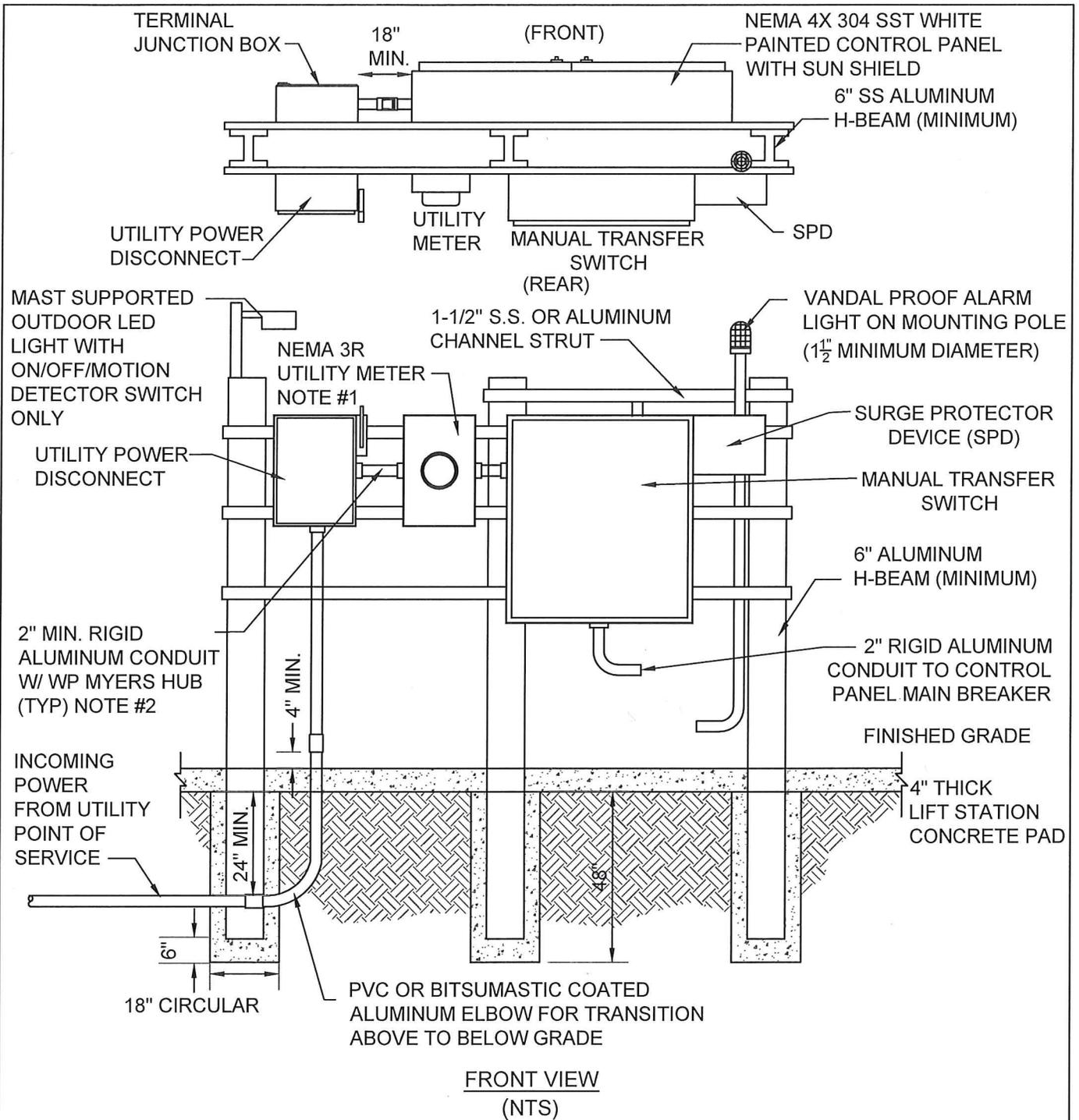
REV. : SEPTEMBER, 2014

**TRIPLEX LIFT STATION
DIMENSIONS AND ELEVATIONS TABLE**

POLK COUNTY UTILITIES, FLORIDA

**FIGURE
WW-14-3**

DECEMBER, 2010



PANEL INSTALLATION NOTES:

1. PROVIDE METER BASE AS REQUIRED BY THE ELECTRICAL UTILITY.
2. POWER SUPPLY SHALL BE 3 PHASE AND UNDERGROUND FROM THE LIFT STATION PANEL TO THE 3-PHASE SOURCE.
3. ALL MOUNTING HARDWARE & BRACKETS SHALL BE 316 STAINLESS STEEL.
4. THE ENGINEER SHALL INCREASE THE SIZE OF THE VERTICAL SUPPORT MEMBERS DEPENDING ON WIND LOAD REQUIREMENTS.

5. PROVIDE DISCONNECT BEFORE UTILITY METER WHERE REQUIRED BY THE LOCAL ELECTRIC UTILITY

REV. : SEPTEMBER, 2014

**LIFT STATION CONTROL PANEL
REAR VIEW**

**FIGURE
WW-20-2**

POLK COUNTY UTILITIES, FLORIDA

DECEMBER, 2010

- **Chapter Six (6): Reclaimed Water**
 - **Section 650-B: Approved Materials Checklist**
 - **Form 650-F: Reclaimed Water System Schedule of Values**

CHAPTER 6

RECLAIMED WATER

Section 650-B

Approved Materials Checklist

December 2010

PLEASE TYPE OR PRINT CLEARLY IN BLACK INK

Project Name: _____

PCU Project File Number: _____

Contractor's Name: _____

Contractor's Address: _____

Contractor's Signature: _____

Engineer's Name: _____

Engineer's Address: _____

PCU Reviewer: _____	Date: _____
Approved: _____	Denied/Resubmit: _____
Comments:	

With the submission of this document, the CONTRACTOR understands that the use of the following selected items, as individually indicated by the use of an "X", is mandatory.

Substitutions using other items contained within this Checklist shall be initiated by the CONTRACTOR submitting a revised Checklist to PCU for its review and approval at least 10 calendar days in advance of need.

It is also understood by the CONTRACTOR that PCU shall reject materials and products not in accordance with this document and the MANUAL. Any material or product not contained within this Checklist shall be approved in advance by the Utilities Code Committee in accordance with the provisions of the Utilities Code.

Shop drawings shall be required for all structures and similar items not contained within this checklist, such as manholes, wet wells, and other castings.

CHAPTER 6
Section 650-B

RECLAIMED WATER
Approved Materials Checklist

Rev November 2013
 December 2010

Four (4) sets of the CONTRACTOR's and ENGINEER's executed APPROVED MATERIALS CHECKLIST and any necessary shop drawings shall be submitted to PCU for its use and approval, plus the number of sets needed for the CONTRACTOR use.

Ordering materials and products without specific written approval from PCU of the submitted checklist and shop drawings is NOT recommended and is done at the CONTRACTOR's sole expense and responsibility.

NOTE: The latest changes approved by the Utilities Code Committee are indicated by "underlining" and deleted items by "~~strikethroughs~~".

Reclaimed Water Category 1 of 49: VALVES AND ACCESSORIES			
ITEM TO BE USED	Manufacturer	Part Number	Comments
Automatic Combination Air / Vacuum Release Valves:			
	ARI	D-040-PT02, ,	Combination
	ARI	D-21-PT01 (1"), D-021-PT02 (2")	Combination
	ARI	S-21-PT01 (1"), S-021-PT02 (2")	Air Release Only
	Val-Matic	VM-38	Air Release Only – Plant, Facility Use Only
	Val-Matic	VM-45	Air Release Only – Plant, Facility Use Only
	Val-Matic	VM-200C	Combination – Plant, Facility Use Only
Air / Vacuum Release Valve Enclosure (Horizontal Venting and Pantone 522-C Purple):			
	Water Plus	No. 40 (171730) <u>I31632</u>	
	Channell	BPH 1730	
	Hydro-Guard	Safety-Guard 15100 Low Profile or 02100	
Air / Vacuum Release Valve Vault Frame And Cover:			
	US Foundry	USF-679-BK-M	
	CertainTeed	Pamrex 36"	Alternative – <u>Not to be used in paved roadways.</u>
Blow Off Valve:			
	Hydro Guard	<u>HG-2 Low Profile</u>	<u>Automatic Blow Off</u>
	Water Plus	Series VB-2000	

CHAPTER 6 RECLAIMED WATER
Section 650-B Approved Materials Checklist

Butterfly Valves 42-inch And Larger: (8 mil Epoxy Coated And Lined (AWWA)):			
	M & H	4500	
	Mueller/Pratt	Linseal III / BV Ground Hog	
Butterfly Valves 16-inch And Larger: (Rubber Seated (AWWA)):			
	Val-Matic	2000	To be utilized as directed by PCU.
Gate Valves 16-inch Through 48-inch (Resilient Seated Only With Side Actuators):			
	American Flow Control	Series 2500	
	Mueller	Series A-2361	
	M & H	Series 4067	
Gate Valves 12-inch And Smaller (Resilient Seated Only):			
	American Flow Control	Series 2500	
	M & H	Series 4067	
	Mueller	Series A-2360	
	Clow	Series F-6100	
Tapping Valves (Resilient Seated Only):			
	American Flow Control	Series 2500	
	M & H	Series 4751	
	Mueller	Series T-2360 & T-2361	
	Clow	Series F-6114	
<u>Insertion Valves - MJ/Ductile Iron RWGV (In Place of Line Stop/Tapping Sleeve)</u>			
	<u>Team Industrial Products</u>	<u>InsertValve</u>	<u>Available 4" through 12"</u>
Test Station Box For Buried Valves:			
	Bingham/Taylor	P200NFG2T	
Valve Boxes With Lids (5¼ -Inch, ASTM A48 30B Cast or Ductile Iron, With "RECLAIMED" cast into the lid top):			
	Bingham / Taylor Foundry	4905-X, 4905, 4904L	
	Tyler	Series 6850	
	American Flow Control*	Trench Adapter Models 1 through 9	* For mains that have valve nuts that are 6' or deeper.
	Sigma	VB261, VB262, VB264, VB4650W	
	Mueller	MVB	Use w/ AJBV-4" Locking Bolt
	<u>Star</u>		<u>Heavy Duty Screw or Slip Type</u>

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CHAPTER 6
Section 650-B

RECLAIMED WATER
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Reclaimed Water Category 2 of 49: SERVICE MATERIALS			
ITEM TO BE USED	Manufacturer	Part Number	Comments
Angle Stops Ball Type (1-inch And 2-inch CTS OD Tubing By 5/8-inch By 3/4-inch And 2-inch Meter):			
	Ford	BA43-242W, BFA43-777W	
	Mueller	P24258, P24276	
	McDonald	4642B-22, 4602B-22	
Angle Stops Ball Type (3/4-inch FIP By 5/8-inch By 3/4-inch Meter):			
	Ford	BA13-232W	
	Mueller	B24265R	
	McDonald	4604B	
Brass Service Saddles (Service Saddles Can Be Hinged Or Bolt Controlled OD Saddles To Be Used On C-900 And IPS OD PVC Pipe):			
	Ford	Series S-70, S-90	
	Mueller	Series S-13000 / H-13000	
	McDonald	3801, 3891	
Corporation Stops Ball Type (1-inch and 2-inch With AWWA Iron Pipe Threads Only/Pack Joint Outlet For CTS):			
	Ford	FB1000	
	Mueller	P25008	
	McDonald	4701B-22	
Curb Stops Straight Valves (Curb Stop To Be Ball Type, Reduced Port FIP By FIP 3/4-inch By 3/4-inch):			
	Ford	B11-233W	
	Mueller	B-20200-R	
	McDonald	6101W	
Curb Stops Straight Valves (Ball Type Compression By Meter, 1-inch And 2-inch CTS OD Tubing By 5/8-inch By 3/4-inch Meter):			
	Ford	B43-342W, BF43-777W	
	Mueller	P24350, B24337, B24335	
	McDonald	6101MW-22	
Curb Stops Straight Valves (Ball Type Compression By Compression):			
	Ford	BA44-444W	
	Mueller	P25146	
	McDonald	6101MW-22	
Polyethylene Tubing (Pantone 522-C Purple With UV Protection [SDR-9] 1-inch And 2-inch Only):			

Rev September 2014
 Rev November 2013
 Rev March 2012

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	Endot	PE-4710 EndoPure	
	Endot	PE-4710 EndoTrace	Alternative Pipe and Locating Wire Combo
	Charter Plastics	PE-4710	
	ARNCO	PE-4710 Perma-Guard	
	ARNCO	PE-4710 Perma-Find	Alternative Pipe and Locating Wire Combo
	ADS	CTS 200 PSI DR-9 PE4710	Service Tubing
Service Saddles (Epoxy Or Nylon Coated Stainless Steel 18-8-Type 304 Straps, Iron Pipe Threads – 2-inch To Be Iron Pipe Threads Controlled OD Saddles To Be Used On C-900 And IPS OD PVC Pipe, Double Straps To Be 2-inch Minimum Width Each.):			
	Ford	Series FC202	
	JCM	Series 406	
	Mueller	DR2S, DR2SOD	
	McDonald	3835, 3855	
	Romac	202N-H	For Use With HDPE Pipe
Y Branch (1-inch By 2-inch):			
	Ford	U-48-43	
	Mueller	P15363	
	McDonald	08U2M	
Y Branch Assemblies With Angle Ball Valves (1-inch By 2-inch):			
	Ford	UVB43-42W	
	Mueller	P15363-05	
	McDonald	09U2BW	
Meter Boxes w/ Cast Iron Lids (Pantone 522-C Purple, HDPE, with English and Spanish Identification and Warning Wording plus International “Do Not Drink” Symbol on Top):			
	Carson PolyPlastic	10152026 (Box) 10151019 (Combo)	10154008 (Lid)
	DFW Alliance	DFW1200D5-12-Body(Box) DFW 1200D5-12-5C (Combo Unit)	DFW1200-5C-LID (Lid)

CHAPTER 6

RECLAIMED WATER

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Reclaimed Water Category 3 of 49: PIPE MATERIAL			
ITEM TO BE USED	Manufacturer	Part Number	Comments
Casing Spacers (All Sizes) Stainless Steel With Vinyl Runners:			
	Cascade	Series CCS / CCPS / AZ	
	PSI	Series S-G-2	
	PSI-Ranger	Ranger II	
	RACI	S/T, F/G, P/Q, M/N, E/H	
	CCI	CCS8, CCS12	
	Advance Systems		
Ductile Iron Pipe Cement Lined (4-inch To 12-inch = PC 350, 16-inch To 20-inch = PC 250, 24-inch = PC 200, 30-inch To 64-inch = PC 150) (DI Flanges As Applicable, AWWA C153):			
	American		
	Clow		
	Griffin		
	McWane		
	US Pipe		
Paint: Aerial Pipe, Fittings, And Valves (Field and Factory Primer):			
	Color Wheel	635 Primer Red	
	Glidden	Alkyd Metal Primer	
	Porter/International	286 U-Primer	
	Tnemec	37H-77 Chem-Primer	
	Wasser	Ferro Clad Primer	
Paint: Finish (Exterior):			
	Color Wheel	600 Alkyd Enamel	
	Glidden	Alkyd Industrial Enamel	
	Porter/International	2749 Alkyd Gloss	
	Tnemec	Tnemec - Gloss 2H	
PVC (Pantone 522-C Purple) 4-inch Through 12-inch Pipe (AWWA C-900, DR18) and 16-inch and larger pipe (AWWA C-905 or C-909, DR 25):			
	Bristolpipe 4" to 12"		
	Certainteed 4" to 12"	Certa-Lok	
	Diamond Plastic		
	Ipex		
	J-M Manufacturing JM-Eagle		
	National Pipe		

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	NAPCO		North American Pipe Company
	Upinor ETI 9		
	Underground Solutions	Fusible PVC	<u>For Horizontal Directional Drill Use Only</u>
HDPE Pipe DR11 (Pantone 522-C Purple Striped):			
	Chevron/Phillips	Performance Pipe / ISCO Pipe	
	CSR	Polypipe/Charter Plastics	
	ARNCO		
	J-M--Eagle		
	National Pipe		
Reclaimed Water Main Identification Tape (Pantone 522-C Purple, 6-Inches Wide, 2-Inches High Black Lettering, Adhesive Backed):			
Buried Reclaimed Water Main Warning Tape (Pantone 522-C Purple, 3-inches Wide, 1-Inch High Black Lettering, Non-Adhesive Backed):			
Reclaimed Water Locating Wire (Single Strand 14-Gauge Solid Copper Wire with Pantone 522-C Purple Colored Insulated Covering):			
	Copperhead	Locating Tracer Wire	Alternative
Locating Marker Systems (Reclaimed Water) (Pantone 522-C Purple In Color):			
	3M	Scotch Mark EMSII Electronic Marker Purple Locator #1265	
	3M	Scotch Marker Electronic Ball Marker #1404	
Curb and Pavement Markers (Pantone 522-C Purple in Color, Imprinted With The Words "POLK COUNTY UTILITIES" And "CALL 811 BEFORE YOU DIG" With "RECLAIMED WATER SERVICE" or "RECLAIMED WATER VALVE" As Applicable):			
	Rhino	ATAGNCT-C (Custom Imprinting)	New Construction
	Rhino	ATAGRFT-C (Custom Imprinting)	Retrofit to Existing Improvements
	DAS Manufacturing	Reflective Duracast Style (Custom Imprinting)	New Construction or Retrofit

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Reclaimed Water Category 4 of 49: PIPE FITTINGS			
ITEM TO BE USED	Manufacturer	Part Number	Comments
Expansion Joints:			
	EBA Iron		
	Metraflex		
Fittings C153 SSB / C110 Flange (Cement Mortar Lined and Asphaltic Coated In Accordance With AWWA C104) (Outside Surfaces Shall Be Prime Coated Only If Located Aboveground And Painted):			
	American		
	Union/Tyler		
	US Pipe		
	Sigma		
	Star Pipe		
Restrained Joints - Ductile Iron Pipe:			
	American	Fast Grip Gasket Flex Ring Field Flex Ring Lok Ring	
	EBA Iron Inc.	Mega-lug Series 1100 Series 1700 Bell Restrainer Series RS-3800 Restrainer - sleeve included	
	Sigma	One LOK SLD	
	Sigma	LOK Series PVP and PVPF	
	Star	Stargrip Series 3000, 3000OS, 3100P & 3100S Flange Adapter Series 200 & 400 Retainer Gland Series 600 Adapter Flange Series 3200 Series 4000 & 4100P Series 3200 & 4200 Series 1000, 1100, & 1200 Flange Series 3200 & 4200 Adapter Flange Series 200 & 400 Star Flex Series 5000, 5100, & 5200	

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	Tyler/Union	Tuf Grip TLD Series <u>1000, 1000S</u> <u>Tuf Grip Dual Wedge Restraint Series 1500</u>	<u>For DI Pipe Use</u> <u>For PVC, DIP, HDPE pipe use</u>
Restrained Joints - PVC Pipe:			
	EBAA Iron Inc.	Mega-lug Series 2000PV Series 1500 & 1600 Bell Restrainer (4-inch to 12-inch) Series RS-3800 Restrainer – sleeve included	
	JCM	620 Sur-Grip Bell Joint 621 Sur-Grip Bell Joint	
	Uni-Flange/Ford	1350 Bell Restrainer 1360 Bell Restrainer 1390 Bell Restrainer 900 Adapter Flange 1300 Fitting Restrainer 1500 Series	
	Sigma	One LOK SLC	
	Sigma	PV LOK Series PVP and PVPF	
	Star	Stargrip PVC Series 4000 PVC Harness Series 1100 & 1200	
	Tyler/Union	<u>Tuf Grip TLP Series 2000, 2000S</u> <u>Tuf Grip Dual Wedge Restraint Series 1500</u> <u>Bell Joint Restraints Series 3000: 32U, 33U, 34U, 35U</u> <u>Tuf Grip TLP Series</u>	<u>For PVC Pipe Use</u> <u>For PVC, DIP, HDPE pipe use</u> <u>For PVC Pipe Use</u>
Tapping Sleeves (For All Taps On IPS OD PVC pipe, Including Size On Size (18-8 Type 304 Stainless Steel Body, Flange, And Bolts), Flange To Accept Standard Tapping Sleeves):			
	Ford	Series FTSS	
	JCM	Model 432	
	Mueller	Series H-304 S/S	
	CST	EX	
	<u>Total Piping Solutions</u>	<u>Triple Tap</u>	
Tapping Sleeves (Mechanical Joint For All Taps On Cast Iron, Ductile Iron, PVC-900 & AC Pipe, All Taps Including Size On Size):			

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	American Flow Control	Series 2800	
	Mueller	Series H-615, H-616, H-619	
	JCM	Model 432	
	<u>Total Piping Solutions</u>	<u>Triple Tap</u>	
Tapping Sleeves (Fabricated Steel, Mechanical Joint, Fusion Bonded Epoxy Coated):			
	JCM	Series 414	

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<u>Reclaimed Water Category 5 of 9: VALVES AND ACCESSORIES (PLANTS AND REMOTE FACILITIES)</u>			
<u>ITEM TO BE USED</u>	<u>Manufacturer</u>	<u>Part Number</u>	<u>Comments</u>
<u>Automatic Combination Air / Vacuum Release Valves:</u>			
	<u>Val-Matic</u>	<u>VM-38</u>	<u>Air Release Only – Plant. Facility Use Only</u>
	<u>Val-Matic</u>	<u>VM-45</u>	<u>Air Release Only – Plant. Facility Use Only</u>
	<u>Val-Matic</u>	<u>VM-200C</u>	<u>Combination – Plant. Facility Use Only</u>
<u>Gate Valves, Butterfly Valves</u>			
	<u>DeZurik</u>	<u>BAW Series Butterfly</u>	<u>According to Application.</u>
	<u>DeZurik</u>	<u>Knife Gate Valve</u>	<u>According to Application</u>
	<u>Val-Matic</u>	<u>American BFV Butterfly</u>	<u>According to Application.</u>
	<u>Val-Matic</u>	<u>Ductile Iron RSGV</u>	<u>According to Application.</u>
<u>Valve Actuators</u>			
	<u>Beck</u>	<u>Model 11</u>	<u>Remote Indication or Position Display According to Application</u>
	<u>Auma</u>	<u>SA</u>	<u>Remote Indication or AumaMatic. According to Application</u>
<u>Hydraulically Operated Control Valves (Pressure Reducing/Sustaining Valves):</u>			
	<u>Cla-Val</u>		<u>Model or Series based on field application.</u>
	<u>OCV</u>		<u>Model or Series based on field application.</u>
	<u>Watts/Ames</u>		<u>Model or Series based on field application.</u>

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<u>Reclaimed Water Category 6 of 9: PUMPS, CHEMICAL FEED SYSTEMS</u>			
<u>ITEM TO BE USED</u>	<u>Manufacturer</u>	<u>Part Number</u>	<u>Comments</u>
<u>Vertical Turbine</u>			
	<u>Goulds</u>		
	<u>Flowserve</u>	<u>VIC, VIT, SMVT, or DWT</u>	<u>based on application.</u>
	<u>Deming</u>		<u>(AKA: Process Systems, Inc.)</u>
	<u>National</u>		
<u>Centrifugal/Split Case/End Suction</u>			
	<u>Aurora</u>		
	<u>Flowserve</u>		
	<u>Goulds</u>		
<u>Chemical Pumps</u>			
	<u>Prominent</u>		<u>Appropriate series based on flow rate. Degassing heads for NaOCl.</u>
<u>Skid, Shelf Mounted Feed Systems</u>			
	<u>Blue Planet</u>		<u>Utilize "Polk County" junction box with hour meter/operating indication.</u>
<u>Chemical Tanks</u>			
	<u>Snyder</u>	<u>Captor/Dual Containment</u>	<u>HDLPE with NaOCl Resin</u>
	<u>Poly Processing Co.</u>	<u>Saf-T tank</u>	<u>XLPE with OR 1000 Inner Coating</u>
<u>Reclaimed Water Category 7 of 9: TANKS and GENERATORS</u>			
<u>ITEM TO BE USED</u>	<u>Manufacturer</u>	<u>Part Number</u>	<u>Comments</u>
<u>Pre-stressed Concrete Tanks</u>			
	<u>Crom</u>		
	<u>Pre-con</u>		
<u>Standby Power Generators</u>			
	<u>Kohler</u>		<u>3-Ph. 480V Diesel</u>
	<u>Caterpillar</u>		<u>3-Ph. 480V Diesel</u>

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	<u>Cummings</u>		<u>3-Ph, 480V Diesel</u>
<u>Fuel Tanks (Stand-alone)</u>			
	<u>Convault</u>		<u>Pneumercator level/leak detection systems also required. LC 1000 w/ LS600 and LS610.</u>
	<u>Modern Welding</u>		<u>Pneumercator level/leak detection systems also required. LC 1000 w/ LS600 and LS610.</u>
	<u>Phoenix</u>		<u>Pneumercator level/leak detection systems also required. LC 1000 w/ LS600 and LS610.</u>
<u>Reclaimed Water Category 8 of 9: FLOW METERS</u>			
<u>ITEM TO BE USED</u>	<u>Manufacturer</u>	<u>Part Number</u>	<u>Comments</u>
<u>Flow Meters (Electro-magnetic)</u>			
	<u>Siemens</u>	<u>Sitrans FM Mag. 5000 series unless using bussed network</u>	
	<u>ABB</u>	<u>WaterMaster Series</u>	
	<u>Foxboro</u>	<u>9100A w/ IMT 25</u>	
<u>Reclaimed Water Category 9 of 9: ELECTRICAL</u>			
<u>ITEM TO BE USED</u>	<u>Manufacturer</u>	<u>Part Number</u>	<u>Comments</u>
<u>VFDs, Relays, Breakers</u>			
	<u>Schneider-Electric</u>	<u>Square D</u>	
<u>Security/Surveillance System</u>			
	<u>Axis</u>		<u>Camera/Equipment</u>
	<u>Bosch</u>		<u>Camera/Equipment</u>
	<u>Pelco</u>		<u>Camera/Equipment</u>
	<u>Exaqvision</u>		<u>Software</u>

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CHAPTER 6 RECLAIMED WATER

Section 650-F RECLAIMED WATER SCHEDULE OF VALUES

December 2010

Date: _____

Contractor: _____

Project: _____

PCU Project No.: _____

Item No.	Item Description	Qty.	Unit	Unit Cost (\$)	Extended Cost (\$)
1	Single Service, Long				
2	Single Service, Short				
3	Double Service, Long				
4	Double Service, Short				
5	Blow-Off Assembly, Complete				
6					
7					
8					
9					
10	4" PVC, AWWA C-900, DR 18, Purple				
11	4" DIP, Pressure Class 350, Epoxy-Lined, Bituminous Coated				
12	4" Gate Valve Assembly, Complete				
13	4" 11 ¼ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
14	4" 22 ½ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
15	4" 45 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
16	4" 90 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
17	4" Tee, DI, C153, Epoxy-Lined, Bituminous Coated				
18	4" Cross, DI, C153, Epoxy-Lined, Bituminous Coated				
19					
20	4" HDPE				
21					
22	6" PVC, AWWA C-900, DR 18,				

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Section 650-F

RECLAIMED WATER SCHEDULE OF VALUES

December 2010

	Purple				
23	6" DIP, Pressure Class 350, Epoxy-Lined, Bituminous Coated				
24	6" Gate Valve Assembly, Complete				
25	6" 11 ¼ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
26	6" 22 ½ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
27	6" 45 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
28	6" 90 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
29	6" Tee, DI, C153, Epoxy-Lined, Bituminous Coated				
30	6" Cross, DI, C153, Epoxy-Lined, Bituminous Coated				
31					
32	6" HDPE				
33					
34	8" PVC, AWWA C-900, DR 18, Purple				
35	8" DIP, Pressure Class 350, Epoxy-Lined, Bituminous Coated				
36	8" Gate Valve Assembly, Complete				
37	8" 11 ¼ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
38	8" 22 ½ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
39	8" 45 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
40	8" 90 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
41	8" Tee, DI, C153, Epoxy-Lined, Bituminous Coated				
42	8" Cross, DI, C153, Epoxy-Lined, Bituminous Coated				
43					
44	8" HDPE				
45					
46	10" PVC, AWWA C-900, DR 18, Purple				
47	10" DIP, Pressure Class 350 Epoxy-Lined, Bituminous Coated				

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RECLAIMED WATER

Section 650-F

RECLAIMED WATER SCHEDULE OF VALUES

December 2010

48	10" Gate Valve Assembly, Complete				
49	10" 11 ¼ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
50	10" 22 ½ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
51	10" 45 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
52	10" 90 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
53	10" Tee, DI, C153, Epoxy-Lined, Bituminous Coated				
54	10" Cross, DI, C153, Epoxy-Lined, Bituminous Coated				
55					
56	10" HDPE				
57					
58	12" PVC, AWWA C-900, DR 18, Purple				
59	12" DIP, Pressure Class 350, Epoxy-Lined, Bituminous Coated				
60	12" Gate Valve Assembly, Complete				
61	12" 11 ¼ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
62	12" 22 ½ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
63	12" 45 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
64	12" 90 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
65	12" Tee, DI, C153, Epoxy-Lined, Bituminous Coated				
66	12" Cross, DI, C153, Epoxy-Lined, Bituminous Coated				
67					
68	12" HDPE				
69					
70	16" PVC, AWWA C-905, DR 25, Purple				
71	16" DIP, Pressure Class 350, Epoxy-Lined, Bituminous Coated				
72	16" Gate Valve Assembly,				

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RECLAIMED WATER

Section 650-F

RECLAIMED WATER SCHEDULE OF VALUES

December 2010

	Complete				
73	16" 11 ¼ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
74	16" 22 ½ Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
75	16" 45 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
76	16" 90 Degree Bend, DI, C153, Epoxy-Lined, Bituminous Coated				
77	16" Tee, DI, C153, Epoxy-Lined, Bituminous Coated				
78	16" Cross, DI, C153, Epoxy-Lined, Bituminous Coated				
79					
80	16" HDPE				

Total Constructed Value: \$ _____

Reviewer: _____

Date: _____

Comments _____

- **Reclaimed Water Policy Manual (6D)**
 - **Conservation, Retail Watering Schedule**

1.0 INTRODUCTION

1.1 General

Potable water is a valuable resource which needs to be conserved, and reclaimed water is also a valuable water resource which can be used safely for irrigation and other non-potable purposes, thereby substantially contributing to the conservation of potable water. The COUNTY has determined to establish and construct a reclaimed water system which will make reclaimed water available in certain areas of the county for irrigation and other authorized non-potable uses. This MANUAL establishes certain terms and conditions regarding the use of the reclaimed water system.

1.2 Intent

It shall be the policy of Polk County Utilities (PCU) to make reclaimed water available for irrigation purposes and other authorized non-potable uses in certain areas of the county where it is determined that the construction of a reclaimed water transmission/distribution system is necessary, practical, and beneficial in accordance with the LAND DEVELOPMENT CODE and the COMPREHENSIVE PLAN. The reclaimed water system shall be constructed in sections to provide service to designated areas as determined by PCU pursuant to the terms and conditions set forth herein.

1.3 Purpose

It is the purpose of this MANUAL to promote the public health, safety, and welfare by the establishment of a Reclaimed Water Program, by regulating the construction of reclaimed water transmission/distribution systems determined to be necessary and beneficial, and by governing the use of reclaimed water.

1.4 Applicability

The provisions of this MANUAL shall apply to certain areas of the COUNTY where it is determined that the construction of a reclaimed water system is practical, necessary, and beneficial in accordance with the LAND DEVELOPMENT CODE and the COMPREHENSIVE PLAN. The reclaimed water distribution system shall be constructed to provide service to designated areas determined by PCU pursuant to the terms and conditions set forth herein.

2.0 DEFINITIONS

The following words, terms, and phrases, when used in this MANUAL, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning.

ACTIVE: PCU owned line or system charged with reclaimed water.

AVAILABLE: the definition of this term as utilized in the Polk County Land Development Code regarding the availability of reclaimed water service.

BACKFLOW: the undesirable reversal of water flow or mixtures of water or other liquids, gases, or other substances into the distribution pipes of the potable water system from any source or sources as defined by rule 62-555 F.A.C.

CONCURRENCY AND ENTITLEMENTS DIVISION (CED) – Polk County Division that grants exceptions for requests to reclaimed water system.

COMPREHENSIVE PLAN: the Polk County Comprehensive Plan.

COUNTY: Polk County Board of County Commissioners, Polk County, Florida and/or its designated representative or the political subdivision of the State of Florida.

CROSS CONNECTION CONTROL ASSEMBLY (CCC): an assembly that has been manufactured in full conformance with AWWA standards and meets the laboratory and feed performance specifications of the FCCHR cross connection control assemblies that also comply with the requirement of Rule 62-555, FAC

CROSS-CONNECTION: a connection or potential connection between any part of a potable water system and any other environment containing other substances in a manner that, under any circumstances would allow such substances to enter the potable water system. Other substances may be gases, liquids, or solids, such as chemicals, waste products, steam, water from other sources (potable or non-potable), or any matter that may change the color or add odor to the water.

CUSTOMER OR USER: any person, firm, or corporation, or governmental entity, using or receiving water from the PCU reclaimed water system. Reclaimed water customers are further classified as follows:

- **Retail:** any individual customer served by a single meter that is 3-inches or less in size, where access to another source of non-potable water for irrigation is unavailable. Includes but is not limited to: residential customers; individual commercial establishments such as small office and retail centers; common areas and greenways of subdivisions (billed to Homeowners Association or Property Owners Association); etc.
- **Bulk-Priority:** any commercial or industrial customer served by one or more meters 3-inches in size or greater, downstream of which there are no retail customers and where storage and/or access to another source of non-potable water for irrigation and other uses is unavailable. May include, but not limited to: certain

multi-family residential complexes; commercial tracts occupied by more than one tenant; industrial users; parks and playgrounds; schools; cemeteries; etc.

- **Bulk-Interruptible:** any commercial or industrial user served by one or more meters 3-inches in size or greater, downstream of which there are no metered retail customers and where storage and/or access to another source of non-potable water for irrigation and other uses is available. May include, but not limited to: golf courses; certain multi-family residential complexes; industrial users; etc.

The difference between the two classes of Bulk users is the availability of an access to an alternate supply of non-potable water, which determines the degree of interruptibility of the two classes. Because Bulk-interruptible customers have storage capability and/or an alternate supply, they will be the first to be shut down in the event of a reclaimed water shortage. Therefore, they may expect to pay less for the service. Bulk-priority customers are less likely to be shut down in the event of a reclaimed water shortage than Bulk-interruptible customers, but more likely to be interrupted than Retail customers. Therefore, Bulk-priority customers may expect to pay more than Bulk-interruptible customers and less than Retail customers for the service.

Retail customers are the least interruptible class of customers. Therefore, retail customers will be the last customers to be shut down in the event of a reclaimed water shortage and may expect to pay higher rates for the service than the other two classes of customers.

DIRECTOR: the person who is responsible for the day to day administration and management of Polk County Utilities.

DISTRIBUTION MAINS: conduits used to supply reclaimed water from transmission mains to service lines.

DISTRICT: the Water Management District and/or Florida Department of Environmental Protection (FDEP) having jurisdiction within the Regional Utility Service Area.

ENGINEER: an individual currently licensed to practice engineering in the State of Florida.

LAND DEVELOPMENT CODE: the Polk County Land Development Code.

NON-RESIDENTIAL: a land development project intended for construction of infrastructure improvements for non-residential unit(s) and/or use. Non-residential units and/or uses include all units/uses that are not individually metered single family dwellings, including, but not limited to: commercial, industrial, institutional, short-term rental, and other business enterprises, and all master-metered residential developments, such as duplex, triplex, quadruplex, apartment, condominium, and other multi-family units/complexes, mobile home parks, recreational vehicle parks, etc.

POLK COUNTY UTILITIES (PCU): the Polk County entity which has the responsibility of administering, operating, and maintaining the Utility Systems.

POTABLE WATER: water from any source which has been approved for human consumption by the COUNTY and appropriate regulatory agencies.

RECLAIMED WATER: in the context of this MANUAL, wastewater that has received at least advanced secondary treatment, high-level disinfection, and filtration after treatment and discharge from a domestic wastewater treatment facility as specified in Rule 62-610.460 Florida Administrative Code (FAC), for the purpose of reclaimed water in areas of unrestricted public access. Reclaimed water may also include non-potable water obtained from augmentation wells and other sources.

REFERENCE MANUAL 6(A): the Polk County Utilities Administration Manual, adopted by reference herein.

REFERENCE MANUAL 6(B): the Polk County Utilities Standards and Specifications Manual, adopted by reference herein.

REFERENCE MANUAL 6(C): the Polk County Utilities Cross-Connection Control Policy Manual, adopted by reference herein.

REFERENCE MANUAL 6(D): this Manual, the Polk County Utilities Reclaimed Water Policy Manual (MANUAL), adopted by reference herein.

REFERENCE MANUAL 6(E): the Polk County Industrial Wastewater Pre-Treatment Policy Manual, adopted by reference herein.

REFERENCE MANUAL 6(F): the Polk County Utilities Water Conservation Policy Manual, adopted by reference herein.

REFERENCE MANUAL 6(G): the Polk County Utilities Fats, Oils, and Grease Policy Manual, adopted by reference herein.

REGIONAL UTILITY SERVICE AREA: those designated portions of Polk County in which PCU maintains the exclusive right to provide public utility systems.

RESIDENTIAL: a user which is a single residential dwelling unit served by an individual meter, not including a short-term rental unit.

REUSE OR USE: in the context of reclaimed water, the deliberate application and use of reclaimed water, in compliance with FDEP and Water Management District rules.

SERVICE CONNECTION: the point at which the customer's irrigation system is connected to the PCU reclaimed water system. For individual residential customers, the service connection shall be located inside a purple meter box as described in the "Utilities Standards and Specifications Manual". For commercial customers, the service connection shall be located immediately downstream of the reclaimed water meter and isolation valves.

SERVICE LINE: that conduit used to supply reclaimed water from the distribution main to the property line.

SHORT-TERM RENTAL: a dwelling unit which is made available more than three times a year for periods of fewer than 30 calendar days or one calendar month at a time, whichever is less, for use, occupancy or possession by the public, regardless of the form of ownership of the unit. Dwelling units commonly referred to as "timeshares," "vacation rentals," and "holiday rentals" which possess the above characteristics are included within this definition.

TRANSMISSION MAINS: those conduits used to supply reclaimed water from the pumping station or treatment plant to the distribution mains.

3.0 AUTHORITY

3.1 Authority to Adopt Rules and Regulations

The COUNTY shall have the authority to establish reasonable rules and regulations concerning the use of reclaimed water, or to amend existing rules and regulations so as to remain in compliance with applicable State and Federal regulations.

3.2 Authority to Adopt Rates, Fees, and Charges

The COUNTY shall have the authority to establish rates, fees, and charges for the reclaimed water system and to provide terms and conditions for the payment and collection of same.

3.3 Water Management Districts

The jurisdiction of the COUNTY includes lands located in both the Southwest Florida Water Management District and the South Florida Water Management District. It would be advantageous, under most hydrologic conditions, for the COUNTY's population to be subject to one consistent set of year-round water conservation measures, and when necessary, one consistent set of temporary water shortage restrictions on a countywide basis. Given that the majority of the population in the county and the majority of the public water supplies and domestic wells that serve this population are currently located within the Southwest Florida Water Management District, the most logical set of related rules to follow would be those of the Southwest Florida Water Management District.

The COUNTY shall have the authority to adopt ordinances and policies to protect the water resources of the county from inefficient use at all times and over-utilization during periods of water shortage by assisting the Southwest Florida Water Management District in the implementation of its Year-Round Water Conservation Measures and Water Shortage Plan.

The COUNTY has adopted a Year-Round Water Conservation Measures and Water Shortage Ordinance to establish that the use of reclaimed water shall adhere to the irrigation restrictions established by the Southwest Florida Water Management District for groundwater and other sources regulated by the water management districts. This includes establishing provisions and enforcement policies related to relaxation of these restrictions for reclaimed water when deemed necessary by the County Manager.

4.0 CONNECTION AND USE

4.1 Availability of Service

Other than Bulk Users, reclaimed water service will not be provided to any customer that does not have an active potable water source in place, except as specified in Section 6.0 of this MANUAL. Single family residential lots shall have active potable water service prior to activation of reclaimed water service. A developer may submit a written request to the ~~Land Development~~ Concurrency and Entitlements Division for an exception to the requirement of this Section if the certificate of occupancy has not been issued, structures are unoccupied, and no irrigation well or alternative source of water exists for the establishment of landscaping in the development.

The required distance for a development to construct an off-site reclaimed water main in order to connect to an existing reclaimed water system with available capacity shall be as specified in the LAND DEVELOPMENT CODE and the COMPREHENSIVE PLAN. A developer or other interested person, after contacting the PCU Capacity Engineer, shall refer to the current Master Plan to determine the time frame of reclaimed water service availability within a particular Regional Utilities Service Area.

4.2 Requirement to Install Onsite Distribution and Irrigation Systems

Where a proposed development or any parcel of land is to be served by a wastewater treatment facility that has available capacity to produce public access quality reclaimed water suitable for reclaimed water in areas of unrestricted public access as stipulated in Chapter 62-610, Part III, FAC, PCU shall require a developer or user, in accordance with the provisions of the LAND DEVELOPMENT CODE and the COMPREHENSIVE PLAN, to install, at his cost, the necessary onsite and offsite mains, valves, pumps, meters, common area irrigation systems, signage, storage facilities, and other appropriate appurtenances for the reuse of reclaimed water. Such installation shall be a condition of system acceptance or development approval and shall be completed prior to issuance of certificate of occupancy.

A developer or other user may request to be excused from the requirement of reclaimed water usage only when he can establish to the satisfaction of PCU that reclaimed water is not reasonable for use on his property, such as proven environmental concerns or other considerations. A request for an exception from the requirements of this Section shall be in writing from the developer or property owner and shall set forth the reasons for the desired exception. In the event an exception is granted by PCU, which has been coordinated with the ~~Growth Management~~ Concurrency and Entitlements Division ~~Department~~, the developer or property owner may still be required, at their cost, to extend reclaimed water mains around or across his property and convey the necessary unencumbered Polk County Utilities Easements and/or public rights-of-way to the COUNTY to facilitate the transmission of reclaimed water to adjoining or nearby properties for reclaimed water reuse or disposal.

4.3 Requirements to Connect

It shall be unlawful to use the PCU potable water system for irrigation purposes after reclaimed water becomes active at a particular site. Customers with existing underground irrigation systems using the PCU potable water system shall be required to disconnect said systems from the PCU potable water system and connect to the reclaimed water system within 90 calendar days of written notice of activation.

All new irrigation systems constructed after the initial effective date of March 5, 2003 in areas where PCU plans to make reclaimed water available shall connect to the PCU reclaimed water system upon the earlier of the following two dates:

- A. When reclaimed water has not been activated at the time of construction of the irrigation system, then connection shall be required within 90 days after receipt of written notice from PCU that reclaimed water has been activated.
- B. When reclaimed water is available and active at the time of construction of the irrigation system, then connection shall be required immediately and such connection shall be a condition to connection of the improvements on said property to the PCU potable water system.

Customers may continue to use existing irrigation wells for irrigation purposes after reclaimed water is available if there is an existing valid permit for the well on the subject property. In such case, the customer may request and be granted permission in writing from PCU to wait until that permit expires before connecting to the active reclaimed water system. The irrigation well permit shall not be renewed. A copy of the permit shall be provided to PCU along with the request for an exception from the requirements of this Section. PCU will coordinate time extensions due to permit expirations with the Concurrency & Entitlements Division.

Customers with existing irrigation wells who wish to connect to the reclaimed water system must first physically disconnect the irrigation system from the existing irrigation well and provide evidence of an air gap separation between the well and the irrigation system, or

otherwise provide, at the customer's own expense, a cross connection control assembly and valving system between the irrigation well and the irrigation system meeting the specifications stipulated by PCU.

4.4 Application for Connection

Customers in designated Regional Utility Service Areas shall connect to the reclaimed water system when service is available and upon submission of a proper application in accordance with the "Utilities Administration Manual" and compliance with all PCU requirements. Compliance with this MANUAL in no way relieves the property owner or user from the responsibility for obtaining and fulfilling the requirements of construction or other permits required by and issued by agencies other than PCU.

Application for connection to the reclaimed water system shall be made to PCU on the form provided for that purpose. Such service charges and inspection fees as established by the Board shall be paid to PCU at the time the application is filed.

In accordance with the "Utilities Standards and Specifications Manual", construction plans and hydraulic calculations for an irrigation system meeting the requirements of these regulations shall be submitted to PCU for approval for reclaimed water distribution systems, where required for new subdivisions and other new developments. The plans and calculations shall be prepared by a professional engineer licensed in the State of Florida and shall comply with the provisions of the "Utilities Standards and Specifications Manual". FDEP construction permits, if applicable under current regulations, will be required for installation of reclaimed water distribution systems.

4.5 Limitations of Use

- A. Use of reclaimed water shall be limited to irrigation of residential lawns, golf courses, cemeteries, parks, greenways, common areas, open spaces, landscaped areas, decorative water features, highway medians, rights-of-ways, and other similar areas which the developer or user plans to irrigate; or other uses specifically approved by PCU and allowed under Chapter 62-610, FAC.
- B. Reclaimed water shall not be used inside any residential dwelling, or to fill swimming pools, hot tubs, spas, or wading pools or other open waters where human contact or immersion may occur.
- C. Reclaimed water shall not be applied to areas within 100 feet of any public outdoor eating, drinking, or bathing facility, unless aerosol formation is minimized.
- D. Reclaimed water shall not be applied to impervious surfaces that allow drainage to surface waters.

- E. Detailed limitations governing the use of Reclaimed Water are contained in the “Reclaimed Water Use Acknowledgment and Application,” that is located in the “Utilities Administration Manual.”
- F. Reclaimed water shall not be utilized for toilet flushing or fire suppression except in extreme emergency situations as required by the Fire Marshall and approved by PCU in accordance with Chapter 62-610.476, FAC.
- G. Reclaimed water is considered a valuable water resource and shall be protected from inefficient use at all times and over-utilization during periods of water shortage under the ordinances and policies adopted by the COUNTY.

4.6 Discontinuance of Service

PCU may discontinue reclaimed water service to any customer due to a violation of the provisions of this MANUAL or other COUNTY regulations, for non-payment of bills, for tampering with any service, for plumbing cross-connections with another water source, for acts detrimental to the system, or for the convenience of PCU. PCU has the right to cease service until the condition is corrected and all costs due PCU are paid. These costs may include delinquent billings and payment for any damage caused to the system. Should discontinued service be reconnected without authorization, then PCU shall remove the service and make such additional charges as are established by the COUNTY.

Reconnection of a reclaimed water system to a potable water system shall not be allowed except in extreme cases where PCU has made non-potable water service no longer available and there is a clear and necessary justification for doing so.

5.0 INSTALLATION OF IRRIGATION SYSTEMS

5.1 General

- A. All construction of reclaimed water facilities shall be in conformance with the “Utilities Standards and Specifications Manual”.
- B. Wells connected to existing irrigation systems shall be disconnected prior to connection to the reclaimed water system, except as specified in Section 4.3 of this MANUAL and in the “Reclaimed Water Use Acknowledgment and Application,” located in the “Utilities Administration Manual”.
- C. Existing irrigation systems shall be disconnected from potable water systems prior to connection to the reclaimed water system.

- D. Irrigation systems for single family residential customers shall be in-ground fully automatic type irrigation systems. Hose bibs or other hand operated irrigation devices shall not be present on irrigation systems connected to the reclaimed water system.
- E. Irrigation systems for multi-family residential customers shall be in-ground irrigation systems. Hose bibs or other hand operated irrigation devices shall not be present on irrigation systems connected to the reclaimed water system.
- F. Reclaimed water meter boxes and valve boxes shall be of the size and design required by PCU and shall meet the labeling specifications in accordance with the “Utilities Standards and Specifications Manual”.
- G. Detailed requirements are contained in the “Reclaimed Water Use Acknowledgment and Application,” located in the “Utilities Administration Manual”.

5.2 Public Right-of-Way or Polk County Utilities Easements

No reclaimed water facilities will be accepted by PCU unless they are installed in a dedicated public right-of-way or approved Polk County Utilities Easement, in accordance with the “Utilities Standards and Specifications Manual”. Any new easement shall be adequately sized to accommodate construction and maintenance of any new reclaimed water system component.

5.3 Cross Connection Control

An approved testable cross connection control assembly shall be installed on the potable water supply to a property at the property owner’s or customer’s expense prior to connection to the reclaimed water system, in accordance with the “Cross-Connection Control Policy Manual”.

On new potable water service installations, PCU shall install as part of the service connection the necessary approved cross connection control assembly. In addition, an approved cross connection control assembly shall be installed on the customer’s irrigation system immediately downstream of the service connection at the property owner’s or customer’s expense to prevent the return of reclaimed water to PCU’s distribution system through backflow or back siphonage. Installation, operation, maintenance, and inspection of cross connection control assembly shall be in accordance with the “Cross Connection Control Policy Manual” and other applicable COUNTY regulations.

5.4 Color-Coding and Tagging

All reclaimed water air release and blow off assemblies shall be appropriately tagged or labeled with the words in English and Spanish: “Do Not Drink,” together with the equivalent standard international symbol to warn the public and employees that the water is not intended for drinking. All mains, tubing, valve covers, and meters shall be color coded using Pantone

Purple 522C, or otherwise marked, to differentiate reclaimed water from domestic or other water. Irrigation piping shall be purple in color or color coded using Pantone Purple 522C paint applied to the exterior top of the piping. Individual residential service connections shall consist of a lockable curb-stop connection and shall be located in a purple meter box on the opposite property corner from the potable water service connection. The lid of the reclaimed water meter box shall be labeled bearing the words in English and Spanish: "Do Not Drink," together with the equivalent standard international symbol.

Underground pipe which is not manufactured of metallic materials shall be color coded for reclaimed water transmission and distribution systems using Pantone Purple 522C with light stable colorants. Underground metallic pipe shall be color coded or marked using purple as a prominent color. If tape is used to mark the pipe, the tape shall be permanently affixed along the axis of the pipe. Visible, above ground portions of the reclaimed water transmission and distribution system shall be clearly color coded or marked using purple as a prominent color. Materials and installation shall be in accordance with the "Utilities Standards and Specifications Manual".

5.5 Advisory Signs

The public shall be notified of the use of reclaimed water by the customer. This shall be accomplished by the posting of advisory signs designating the nature of the reclaimed water project where reuse is practiced. Advisory signs shall include the following text in English and Spanish: "Do Not Drink," together with the equivalent standard international symbol, and shall use purple as a prominent color as graphically specified within the "Utilities Standards and Specifications Manual". Advisory signs shall be posted at the following locations where reclaimed water is used:

- A. Adjacent to lakes or ponds used to store reclaimed water not located at the wastewater treatment facility, including golf course irrigation ponds. Advisory signs posted adjacent to ponds shall include the following text in English and Spanish: "Do Not Drink" and "Do Not Swim" together with the equivalent international symbols;
- B. At the 1st and 10th tees of golf courses;
- C. Adjacent to decorative water features using reclaimed water, such as waterfalls or fountains. Advisory signs posted adjacent to decorative water features shall include the following text in English and Spanish: "Do Not Drink" and "Do Not Swim" together with the equivalent international symbols;
- D. At each entrance to residential neighborhoods using reclaimed water;
- E. Along medians and rights-of-way where reclaimed water is used that are located outside residential neighborhoods; and

- F. At each entrance to parks, playgrounds, cemeteries, common areas, and schools using reclaimed water.

6.0 INSPECTIONS

Pursuant to Chapter 62-610.469(7)(h), FAC, in order to verify proper connections, monitor proper use of reclaimed water, and minimize the potential for cross-connections, PCU will inspect the customer's irrigation system at the time of connection to the reclaimed water system and periodically thereafter, as specified in the "Cross Connection Control Policy Manual". Exception may be made only for new irrigation systems installed by professional irrigation system installers at unoccupied dwellings under construction as outlined in the paragraph below.

For developers, contractors, and/or builders who wish to have temporary access to the reclaimed water supply for the purpose of installing, flushing and testing of new irrigation systems and/or to irrigate landscaping at unoccupied dwellings under construction, the following procedures and conditions apply:

- A. The builder/contractor will apply for reclaimed water service via the form provided by PCU for that purpose as specified in the "Utilities Administration Manual" at the same time application is made for the potable water meter set.
- B. PCU will set the reclaimed water meter and lock it off using a special lock.
- C. PCU will provide key(s) for the special locks to the construction superintendent on the job who is responsible for construction of the dwelling.
- D. The construction superintendent or developer shall assume responsibility for the control of the reclaimed water meter connection and shall agree to the following conditions, by means of a signed and dated form entitled "Reclaimed Water Use Acknowledgement and Application," located in the "Utilities Administration Manual".
 - 1. The new irrigation system will be constructed in accordance with applicable rules and regulations including, but not limited to:
 - a) Hose bibs, faucets, or other connections that could permit usage of reclaimed water for any other purpose than to supply in-ground irrigation systems are not allowed.
 - b) Irrigation systems may not be connected to any other source of water, including public or private potable water systems, lakes, streams, ponds, or private wells (potable or non-potable), etc. Interconnections to neighboring irrigation systems are not allowed unless approved specifically in writing by PCU.

- c) The irrigation system must be maintained in good working condition and must be adjusted properly to minimize spray onto roads, common sidewalks (pivoting sprinkler heads may **NOT** be installed between sidewalks and street curbs), gutters, neighboring property, or impervious surfaces that allow run-off. Over spray into swimming or wading pools is not allowed.
2. Only PCU, the construction superintendent, and the professional irrigation system installer under the superintendent's supervision shall have access to the reclaimed water meter connection.
3. Reclaimed water may **only** be used for construction, flushing, and testing of new irrigation systems at unoccupied dwellings under construction until such time as PCU conducts the initial inspection/activation.
4. The construction superintendent shall lock off the reclaimed water meter, using the same special lock, immediately upon completion of the irrigation system installation and shall call or fax PCU for the initial inspection/activation.
5. The construction superintendent shall send, on Friday of each calendar week via fax to PCU, a list of street addresses of dwelling construction sites in the PCU reclaimed water service areas where irrigation systems are scheduled for installation during the following week. In the absence of a street address in a new development, the construction superintendent may identify the location by subdivision name, phase, and lot number.
6. PCU will conduct the initial inspection and activation within one calendar week after notification by the construction superintendent that the irrigation system installation is complete.

7.0 OWNERSHIP AND MAINTENANCE RESPONSIBILITY

7.1 PCU Responsibilities

- A. PCU shall own and maintain all reclaimed water transmission and distribution systems within the public right-of-way and public easements.
- B. PCU will make a reasonable effort to inspect and maintain its reclaimed water system in good repair, but assumes no liability for any damage caused by the system that is beyond the control of normal maintenance.
- C. Production of reclaimed water is a function of wastewater treatment facility operational criteria and is controlled by PCU. PCU reserves the right to limit availability during

certain hours, to temporarily shut off the system without notice for repairs, maintenance or operational reasons, and to limit supply quantities.

7.2 Customer Responsibilities

- A. The property owner will be responsible for maintenance of the irrigation system on his property downstream (customer side) from the service connection.
- B. The property owner and/or customer shall be responsible for the operation of his reclaimed water irrigation system to prevent ponding or run-off from the irrigated area.
- C. The property owner and/or customer shall be responsible for the maintenance of all irrigation lines and appurtenances on the property served by PCU. PCU reserves the right to disconnect the service to any property when the irrigation system and appurtenances are not properly maintained. In addition, should the customer require reclaimed water at different pressures, or different quality, or in any way different from that normally supplied by PCU, he shall be responsible for the necessary devices to make these adjustments and for obtaining approval by PCU.

D. The property owner and/or customer shall be responsible for obtaining and adhering to the irrigation restrictions established for reclaimed water by and for the county. This information is available on the Polk County Board of County Commissioners' website (www.polk-county.net/utilities.aspx).

The Polk County Year-Round Water Conservation Measures and Water Shortage Ordinance (04-07) has established that the water conservation measures or water shortage orders adopted by the Southwest Florida Water Management District applicable to Polk County, or any portion thereof, shall be subject to enforcement action. The Ordinance provides that the measures or orders for the use of groundwater or other water resources that are regulated by the water management districts are applicable to the use of reclaimed water, unless specifically relaxed under the provisions of Section 4 of the Ordinance.