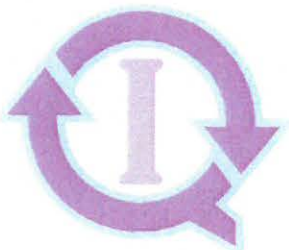


Reuse Irrigation Quality "IQ" Water



Construction Standards And Technical Specifications



Loxahatchee River District
2500 Jupiter Park Drive
Jupiter, Florida 33458-8964
(561) 747-5709

Revised April 2012

TABLE OF CONTENTS

Section	Title	Page
1	General and Administrative	1-1 to 1-20
2	Design Criteria	2-1 to 2-10
3	Installation Requirements	3-1 to 3-8
4	Standard Details	4-1 to 4-10
Appendix A	Standard Irrigation Quality Water Agreement - Retail	A-1 to A-6
Appendix B	Standard Reuse Details	B-1 to B-42

GENERAL

1.01

- The purpose of this manual is to provide the minimum construction standards for the design and construction work associated with reuse (IQ Water) systems within the **District** and is intended to supplement the requirements of other regulatory agencies. The design engineer is to use good engineering judgment in the design of IQ Water systems. The design engineer and the contractor are responsible to provide sound, workable, and long lasting systems.
- The intent of this section is to provide members of the development community with a brief introduction to the Loxahatchee River District its functions and procedures in regard to IQ Water systems.
- The Loxahatchee River Environmental Control District (LRECD), also known in the community as ENCON, is an agency of government which was created in 1971 for the purpose of providing utility and other environmental services within the 72 square mile basin of the Loxahatchee River.
- Currently the **District** owns, operates and maintains the regional wastewater treatment system and a reuse water system serving Jupiter, Tequesta, Juno Beach and the unincorporated areas of northern Palm Beach and southern Martin counties. (See Map)
- The **District** offices are located at 2500 Jupiter Park Drive, Jupiter, Florida 33458. Office hours are between the hours of 8:30 AM and 5:00 PM weekdays. The telephone number is during working hours is (561) 747-5700. In the event of an emergency situation after office hours the telephone number is (561) 747-5709.
- The **District** is the provider of irrigation quality (IQ) water to 12 golf courses throughout the **District's** service area, and has contracts for deliveries of more than 4.0 million gallons per day. The **District's** IQ Water program began deliveries in 1984 with service to the Loxahatchee Club. Until recently the IQ Water contracts were with large users for a non-pressurized delivery of water to an on-site lake or pond, where the user will pump it into their irrigation system.
- The ABACOA project is unique to the **District** in that IQ water will be delivered to two lakes located at the Southwest end of the property. From that point, the **District** will operate the pumps, lines and facilities to provide pressurized water to the various development pods located throughout ABACOA.

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The following pages are the

IQ WATER CUSTOMER DEMANDS

AND ANALYSIS MAPS

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Table 1 - Nodal Demands

Node	Allocated (7-Day Basis) Demand (gpm -max)	Components (Demand, gpm)	Allocated Gallons Per Day
4	107	FAU (split with J25 107/256)	76,900
16	100	2B Road Landscape	23,000
20	100	8I Road Landscape	18,250
21	26	Town Center Phase II	18,700
25	149	FAU (split with J4 149/256)	107,100
28	39	Retail Residential (Plaza CC-1)	28,000
30	100	3C Road Landscape	20,000
31	100	4D Road Landscape	20,000
32	38	Residential District #2B	27,000
36	161	Workplace Residential	116,000
37	100	7H Road Landscape	7,000
38	333	Neighborhood 7B (253) / Neighborhood Landscape (12) / Commercial District (18) / Workplace Residential (26) / Institutional Sites (24)	240,000
40	161	Neighborhood 6B	116,000
42	100	4E Road Landscape	18,000
43	100	5F Road Landscape	10,000
44	9	Commercial District	6,500
45	100	6G Road Landscape	19,750
46	147	Neighborhood 7A	106,000
47	15	Retail Residential and Workplace	10,500
48	73	Town Center West	52,500
50	46	Charleston Court	33,000
51	100	9J Road Landscape	23,350
52	94	Park	68,000
56	514	Neighborhood 4	370,000
58	181	Neighborhood 6A	130,000
60	100	18K Road Landscape	8,250
62	15	Retail Residential	11,000
63	100	21N Road Landscape	13,000
64	419	Neighborhood 1B (364)/ Institutional Site (55)	302,000
72	389	Neighborhood 3	280,000
74	229	Neighborhood 5	165,000
76	100	19L Road Landscape	20,000

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78	358	Neighborhood 2	257,500
79	100	20M Road Landscape	15,500
88	65	Residential District #2A	47,000
92	100, 65*	1A Road Landscape	24,000
96	46	Town center	33,000
98	460	Stadium	331,000
100	149	Island (Neighborhood 1A & Residential District #1)	107,000
Total			3,279,800

*POA Controller A to be run at 65 gpm between the time frame of 8 p.m. to 9 p.m.

Total Reuse (IQ) Water System Allocation: 3,279,800 GPD

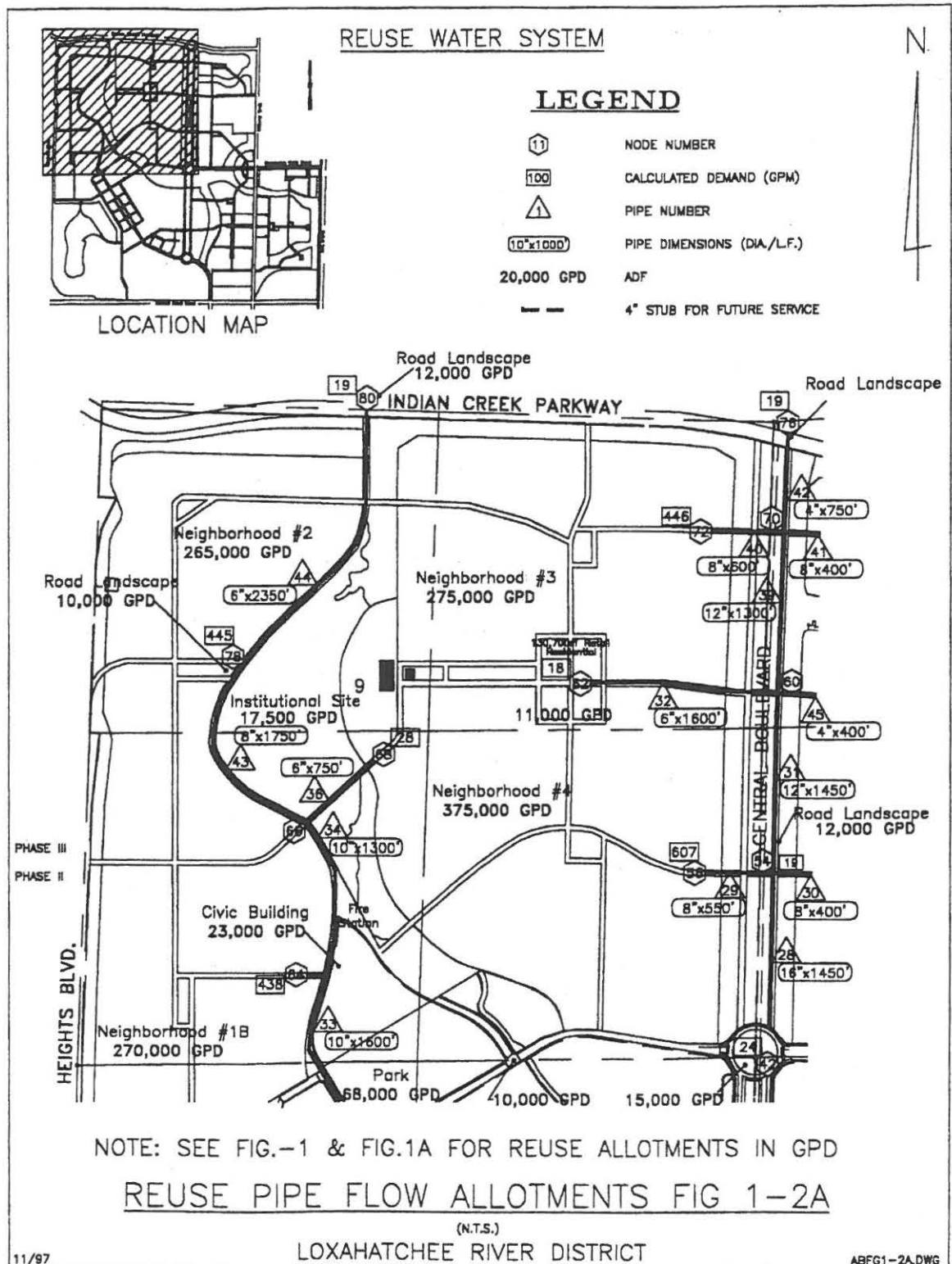
Golf Course Irrigation Allocation⁽¹⁾: 688,100 GPD

Total Allocation for Entire System: 3,967,900 GPD

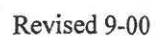
⁽¹⁾ From the LBFH, Inc. report "Abacoa Phases I, II, & III On-Site & Off-Site Reclaimed (I.Q.) Water System Engineering Report for Hydraulic Analysis", Feb. 1997.

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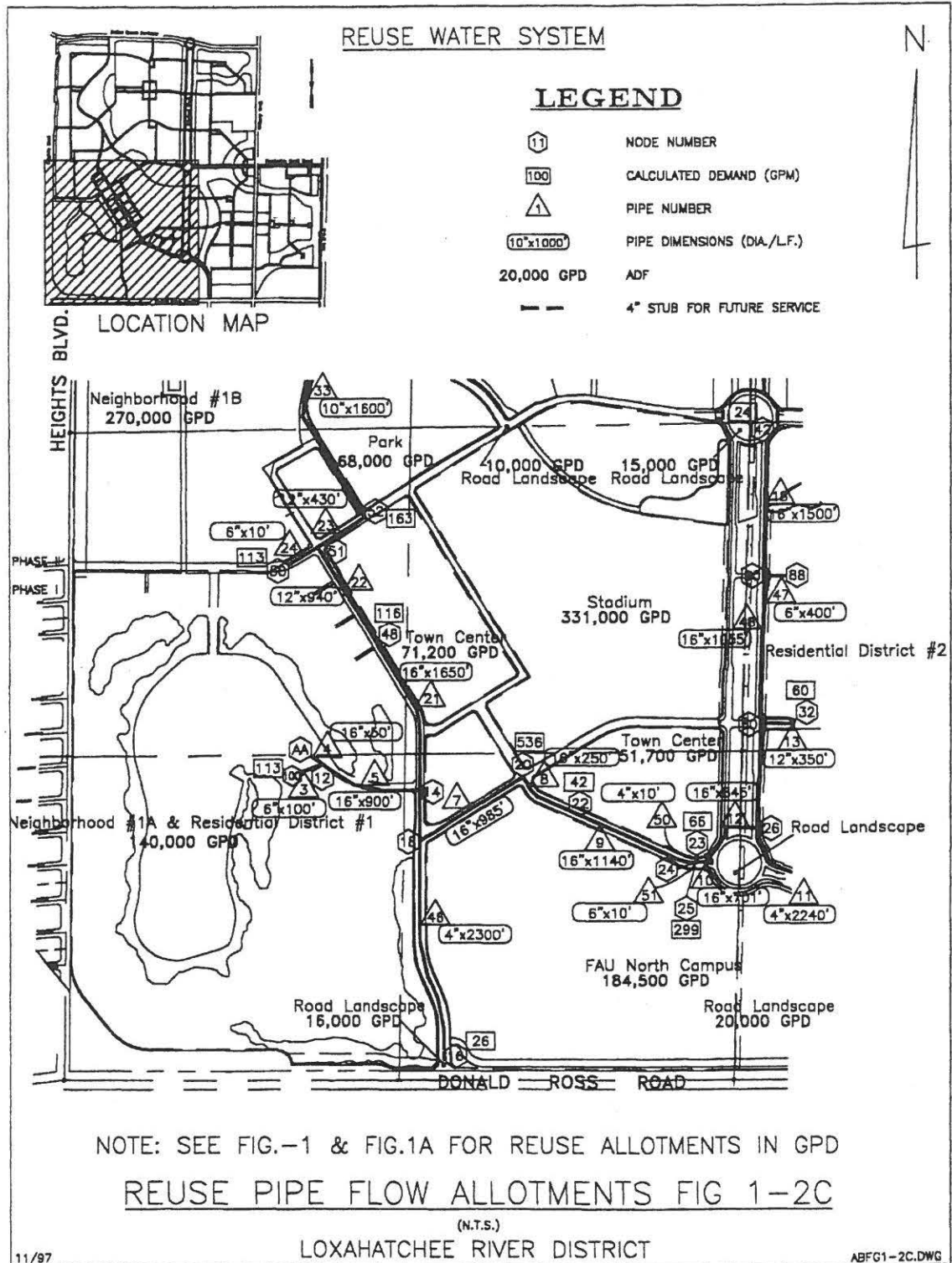
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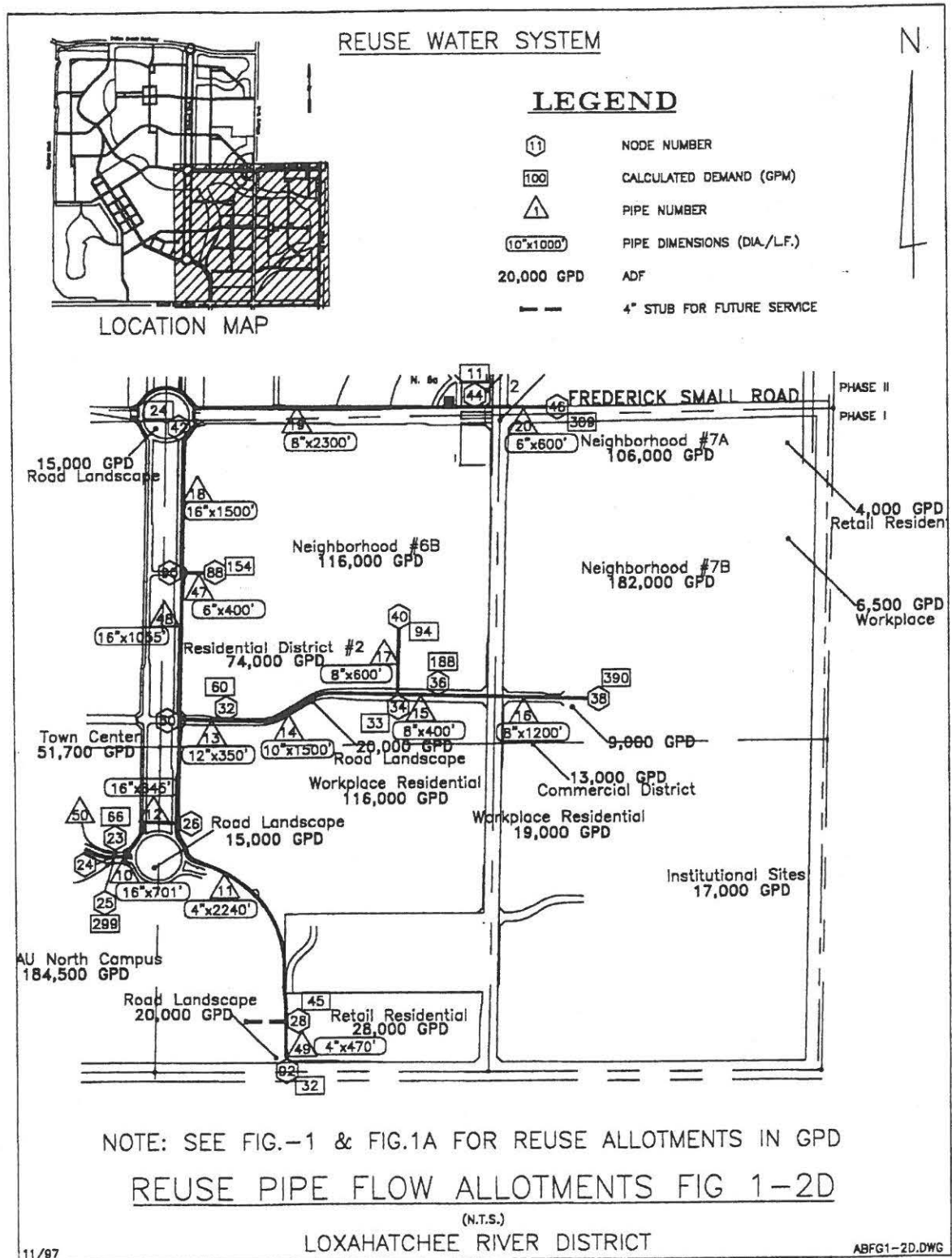
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ADMINISTRATIVE

1.02 Procedures Prior to Construction

1.02.1 Introductory Meeting:

- It is highly recommended that the project representative (owner, engineers), meet with the **District's** Deputy Director early in the planning stages of the development. At such time a review of the Standard IQ Water Agreement - Retail and availability of service will be determined.

1.02.2 Standard IQ Water Agreement:

- The submittal of a properly executed agreement, along with payment of certain charges is required prior to the **District's** review of engineering plans for distribution lines and irrigation system. Copies of the Standard IQ Water Agreement are available at the **District** Administrative Office and attached for review. (See attached)

1.02.3 Plan Review and Approval:

- **District** approval is required on all reuse system plans prior to submittal to local building departments for plan approval.
- An initial plan submittal is recommended. This submittal should contain: one (1) complete set of plans including reuse, sewer, water, drainage, paving, grading and landscaping; along with design calculations used in the design of the reuse/irrigation system. Upon review the design engineer will be notified of acceptance or comments which need to be addressed. If the development requiring reuse will also be submitting plans for sewer facilities, plans must be submitted concurrently. The **District** will not release plans for either sewer or reuse separately. The final submittal for approval will require two (2) additional plan sets for **District** files, and any additional sets for owner, and engineer records.
- Plan review will be for technical sufficiency and adherence to **District** Standards for the distribution of IQ Water. This review as well as plan approval by the **District** Engineer, does not relieve the design engineer of his liabilities or responsibility for a properly detailed design. **District** engineering staff will be available to work with the design engineer to assure the plans meet the requirements set forth in this manual.
- All plan submittals for systems in Public right-of-ways must be certified by an authorized design professional. Plans that are marked "Preliminary" or "Draft" will not be approved.

- Supplemental data to be furnished with the final plans submitted for approval includes the following:
 - a. Project Summary
 - 1. LF of distribution line (for each pipe size)
 - 2. Number of properties served
 - b. Basis of determination of design (pressure, quantity, and duration)

1.03 Developer Installed Facilities - Procedures During Construction

1.03.1 Periodic Inspection:

- Throughout construction the developer will look to his consulting engineering firm for progress reports. The **District** will be keeping track of progress by periodic inspections by our own personnel. If problems are encountered during construction, it will be the developer's responsibility through his engineer to resolve them to the **District's** satisfaction. Any revisions of substance to the approved plans shall be submitted to the **District** for approval and incorporation into the work.

1.03.2 Pre-Final Inspection Submittals:

- Upon completion of construction, but before final inspection, certain documents must be provided to the **District** for the **District Master Meter Station and Controls**, including:
 - **Bill of Sale**
 - **Grant of Easement /ingress/Egress**
 - Maintenance Bond or Letter of Credit-for the Metering Station
 - **Engineers Certification of Completion** - including pressure & leakage tests, and start-up of the Master Meter facility
 - **Record Drawings** - (1 mylar, 2 prints) signed & sealed by the project engineer, usually signed and sealed by the contractor's Professional Land Surveyor.
 - **Designation** - of an appropriate property owners entity for the operation and maintenance of the on-site facilities with daytime and emergency telephone numbers.

1.04 Procedures Following Construction

1.04.1 Project Completion:

- A project is not considered completed and prepared for **District** final inspection until such time as the following items are completed:
- All reuse system construction is completed in accordance with plans and specifications and inspected and certified by the engineer.
- Where reuse lines are constructed in paved areas, the compacted base material and prime coats must be completed (as a minimum requirement) prior to pressure testing.
- Areas over lines and laterals, which are not proposed to be paved, shall be brought to finish compacted grade.
- Electrical and telephone service shall be installed and active to the Master Meter Station and Controls.

1.04.2 Final Inspection:

- After the owner and project engineer have provided the necessary documents the engineering inspection staff will conduct a final inspection and recommend acceptance of the Master Meter Station and approval of the reuse lines that will be owned and operated by the Property Owners / Homeowners / Condominium Association. The **District** Engineering staff will conduct a final inspection and recommend acceptance or denial. If acceptance is denied, a letter will be sent to the project engineer advising of the denial and reasons for such. Subsequently, the project engineer should address the comments and request scheduling of a final re-inspection.

1.04.3 District Acceptance:

- Upon satisfactory finding of the final inspection, a Certificate of Completion will be executed by the Executive Director, thereby, accepting the Master Meter and approving the system for operation and maintenance,

1.04.4 Utility Billing:

- The **District's** Reuse Coordinator and Accounting Department will continue to work with the developer and property association in collection of the monthly IQ Water bill.

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DESIGN CRITERIA

2.01 DEFINITIONS

BACKFLOW PREVENTION - either; (1) a reduced pressure backflow prevention device, (2) a double check valve assembly, (3) a testable dual check valve, (4) or other device approved by the State of Florida Department of Environmental Protection. This protects the Town of Jupiter Water System at the service connection by isolating within the customers' premises actual or potential pollution or contamination through cross-connection.

COUNTY - shall mean Palm Beach County, a political subdivision of the State of Florida.

CROSS-CONNECTION - any physical connection or arrangement that could allow the movement of fluids between the potable water system and any other piping system, such as the reclaimed water system.

CUSTOMER - shall mean the actual user of the reclaimed water.

D.I.P. - shall mean ductile iron pipe.

DIRECTOR OF ENGINEERING - shall mean the **District's** staff engineer and manager of the *District's Engineering Department*.

DIRECTOR OF OPERATIONS - shall mean the individual responsible for the management of the activities of the Reclaimed Water Program of the *Loxahatchee River District*.

DISCONTINUATION OF SERVICE - shall mean cessation of a service or an appropriate method to insure that no service can be received.

DISTRIBUTION MAINS - shall mean those conduits receiving water from transmission lines used to supply reclaimed water to service lines.

DISTRICT - shall mean the *Loxahatchee River District*.

IQ WATER - shall mean the deliberate application of reclaimed water in compliance with the Florida Department of Environmental Protection and the Water Management District rules, for a beneficial purpose.

IRRIGATION CONTROL VALVE - shall mean the manually operated valve which controls total reclaimed water flow to the homeowner's/customer's property located at the point where the reclaimed service line crosses the property line.

PE - Polyethylene Pipe

PVC - polyvinyl chloride pipe.

RATES - shall mean those charges assessed on a metered consumption basis or flat rate and which are subject to change, as approved by the District, in relation to the costs of providing service.

REUSE COORDINATOR - shall mean the individual responsible for the technical and operational activities of the IQ Water reclaimed program.

RECLAIMED WATER - shall mean water that has received a level of treatment as required by Florida Department of Environmental Protection, and is reused after flowing out of a wastewater treatment facility.

SERVICE LINE - shall mean that conduit for reclaimed water from the distribution main to the property line.

TRUNK MAIN - shall mean those conduits used to supply reclaimed water from the pumping station or treatment plant to the distribution mains.

WYE STRAINER - shall mean a 20-mesh screen housed in a brass body with a self-cleaning blow-off outlet. On installations four inches or larger an iron body wye strainer may be used (optional).

MASTER METERING POINT - Main Gate of Development, which will be the location of the Meter, Maxi-Com System, FPL Electrical meter with disconnect, phone company junction box, and all of the control valves and appurtenances.

2.02 GENERAL PROCEDURES

2.02.1 District Service

- Reclaimed water service may be provided for properties located within ABACOA *Development*, which comply with the provisions for such service.

2.02.2 Availability of Service

- The existence of a reclaimed water main adjacent to or near the premises of an applicant for the service does not necessarily mean that service is available to that location.

2.02.3 Identification

- All pipes and above ground appurtenances installed shall be adequately identified by color AND marking tape.
- The approved identification standards for the following types of pipe material are:
 - **Ductile Iron** - shall be identified by means of an adhesive-backed three inch wide tape which is permanently attached to and which spirally wraps the length of pipe, or by wrapping all ductile iron pipe with purple colored polyethylene encasement. The marker tape shall be approved purple color and labeled "**Caution - Reclaimed Water Line Below**". The identifying colors shall be:

IQ Water = purple

- **PVC Pipe** - shall be identified by a purple color that has been added during manufacturing of the pipe by a coloring agent.
- In addition, **three inch** wide purple metallic detect-a-tape labeled "**CAUTION - Reclaimed Water Line Below**" shall be installed 18" below finished grade above ALL reclaimed water lines installed.
- ALL reclaimed water valves and outlets shall be appropriately tagged or labeled to warn the public and employees that the water is not intended for drinking. ALL piping, pipelines, valves and outlets shall be color-coded, or otherwise marked to differentiate reclaimed water from domestic or other water. ALL valve box covers for homes shall be, marked "Reclaimed Water," and colored **purple**. Approved valve box covers are USF 7503 or approved equal, as shown on the construction details.

2.02.4 Service Lines

- Service lines shall be as required for each property served. *Design Engineer* of the system shall determine size. Then minimum size shall be **one inch** for residential use.

2.02.5 Right to Refuse Service

- No payment of any costs, submittal of any petition or any other act to receive reclaimed water service shall guarantee such service. At all times, the **District** shall have the right to refuse to extend service on the basis of a use. This may be detrimental to the system, inadequate supply of reclaimed water, lack of payment of required fees, or for any other reason that, in the judgement of the **District**, will cause the extension not to be to the benefit of the **District**.

2.02.6 Extent of District's Maintenance

- All facilities that have been accepted by the **District** shall become the property of the **District** and will be operated and maintained by the **District**. No person shall do any work nor be reimbursed for any work, or in connection with any work, on the system unless written authorization from the **District** is received prior to the work being accomplished. The **District** shall make a reasonable effort to inspect and keep its facilities in good repair. However, assumes no liability for any damage caused by the system that is beyond the control of normal maintenance or due to situations not previously reported to the **District**. This shall include damage due to breaking of pipes, poor quality of water caused by unauthorized or illegal entry of foreign material into the system or other reasons. **The District's maintenance responsibility shall include the Master Meter Station and Controls. All piping downstream of this point shall be of the responsibility of the Developer.**

2.02.7 Maintenance by the Customer

- The property owner and/or customer shall be responsible for the maintenance downstream of all *reuse water* facilities, gate valves, irrigation lines and appurtenances, downstream the Master meter facility, on the property served by the **District**. The **District** reserves the right to disconnect the service to any property that does not maintain their system. In addition, should the customer require reclaimed water at different pressures, or different quality, or in any way different from that normally supplied by the **District**, he or she shall be responsible for the necessary devices to make these adjustments. Such devices and the repair thereof, shall be the sole responsibility of the property owner and/or customer.

2.02.8 Service Interruption

- **The District** reserves the right to temporarily discontinue service to any portion of, or the entire reclaimed water system, as deemed necessary by the **District**, caused by such matters as Acts of God, plant failure, or the inability of the **District** to meet water quality requirements. The **District** shall not be liable for any damages or loss suffered by the property owner and/or customer for such interruption of service.

2.02.9 Run Off Control

- The property owner and/or customer shall be responsible for the operation of their irrigation system to ensure that neither ponding nor run off from the spray site occurs as a result of the spray irrigation of the reclaimed water. The property owner and/or customer shall operate their irrigation system at all times in a prudent manner.

2.02.10 Unauthorized Work on Reuse Water System

- No person, unless expressly authorized in writing by the **District** shall tamper with, work on, or in any way alter or damage any **District**, owned and operated, reclaimed water facility. Such 'tampering' or "work" shall include but is not limited to opening or closing valves, or causing any water to flow from the system.

2.02.11 Set back Distances

- Set back distances from edge of wetting reclaimed water irrigation areas to potable water supply wells shall comply with regulations of *Florida Department of Environmental Protection* and other agencies having jurisdiction. The system shall comply with other set back distances as required by *Florida Department of Environmental Protection* in Regulation 62-610, FAC.

2.02.12 Inspection

- To insure that the **District's** regulations and procedures are being observed, the **District** reserves the right and privilege, but not the duty, of inspecting, removing and/or securing any or all devices installed by the customer which connect to or control the reclaimed water. Each reclaimed water customer shall, through their initial application for reclaimed water service, give prior written consent to entry upon their premises, and thereby waives any other written notice for such inspection, although attempts will be made to limit such inspection to day light hours. Failure of the **District** to obtain such a written waiver shall not affect the **District's** right to proceed with the inspection. Refusing to permit an authorized **District** representative, Palm Beach County Health Department, or other appropriate County representative to enter onto the premises, for the purpose of

- inspecting the customer's reclaimed water system pursuant to these regulations and procedures, shall be grounds for immediate discontinuation of reclaimed water service by the **District** to the subject premises. The owner or his representative shall give the district ample notice of his intent to construct any items of the irrigation system. A minimum of 24 hours notice shall be given to the **District** for any scheduled inspection. The Contractor shall be at risk for any items installed without being inspected by the **District**.

2.02.13 Signage

- Signs shall be posted at the entrances and at the various locations informing people that reclaimed water is being used for irrigation.



2.02.14 Owner Responsibility

- The irrigation system to be provided by the customer will consist of an underground system with permanently placed sprinkler devices. No system with a cross-connection to the potable water system or any other source of water will be considered for connection to the reclaimed water system. Temporary systems will not be considered for connection. The system shall not include devices, faucets or other connections that could permit the reclaimed water to be used for any purpose other than irrigation.

2.02.15 Irrigation Control Valve

- All connections to the reclaimed water system shall have an irrigation control valve (curb-cock) installed at the property line. For residential customers the irrigation control valve is to be located prior to the wye strainer and/or pressure-reducing valve, if required, and after the master control valve. All irrigation control valves are to be enclosed with a box approved by the **District**, as shown on the Standard Details.

2.02.16 Cross-Connection Control

- In all premises where reclaimed water service is provided, an approved testable back flow prevention device shall protect the public potable water supply. All devices and materials installed for cross-connection must be in accordance with requirements of the Florida Department of Environmental Protection and the Town of Jupiter Water Department.
- In all premises where there is reclaimed water or other auxiliary water supply, there shall be no physical connection between such non-potable supply and the customer's potable water system. Where such a cross connection is found, it shall be disconnected. Before reconnection of service, the public potable water system shall be protected against the possibility of future cross-connection as defined previously in this section. Additional devices may be required as specified by the Town of Jupiter Water Department and installed at the customer's expense.
- To determine the presence of any potential hazards to the public potable water systems, the Palm Beach County Health Department and/or other appropriate **District**, city, or county department shall have the right to enter upon the premises of any customer at any time, upon giving appropriate notice and show proper credentials, although attempts will be made to limit such inspection to daylight hours. Each customer of reclaimed water service shall by application, give prior written consent to such entry upon his premises.

2.02.17 Wye Strainer

- It is recommended but not required that all customers install a brass Wye strainer with a self-cleaning blow off outlet. The wye strainer is to be located in a separate box (painted purple) and installed on the service line between the irrigation control valve and pressure reducing valve (if used). Screen size shall be 20 mesh.

2.02.18 Master Metering Station and Controls

- The Master Metering Station and Control system shall be provided by the customer will consist of a Rainbird MAXI-COM System to include but not limited to telephone line, control valve, meter, Satellite Controller and Cluster Control unit as indicated on the standard details.

2.02.19 Residential Reclaimed Water Pre-inspection Checklist

1. A brass, **one-inch** shoulder nipple and one inch brass curb cock must be installed at the **District's** service connection.
2. Optional brass "Y" strainer and brass pressure reducing valve (if used) should be installed in a separate box (colored purple) located on the homeowner's property.
3. A below ground irrigation system is required.
4. No hose bibbs (spigots) are allowed on the irrigation system.
5. No direct irrigation of vegetable gardens will be permitted.
6. Sprinkler heads must be adjusted to eliminate over spray to non-turf areas. No ponding or run off is allowed.
7. The homeowner (or their representative) must be present during the inspection to operate the sprinkler system for our inspector.
8. No unauthorized use of the reclaimed water is allowed. The filling of swimming pools, car washing, drinking, use in residential air conditioners, etc., is not allowed. Reclaimed water may not be piped into any residential building.
9. **Temporary turn on of system for testing and adjustment can be requested by calling (747-5709 x109), 48 hours before scheduled inspections.**

10. In the event the customer fails inspection, reclaimed water service will be stopped until remedied.

CALL 747-5709 x109, if you have any questions.

RECLAIMED WATER SYSTEM

3.01 MATERIAL

3.01.1 Pipe Distribution & Transmission Mains

- All transmission piping **4"-24"** shall be PVC C-900, ductile iron, or PE 3048 Polyethylene. All distribution piping less than **four inches** in diameter may be PVC Class 200 with gasketed or solvent weld joints.
- Ductile iron pipe will be used in county and state road crossings.
- Ductile iron pipe shall be Pressure Class 250 for all sizes. The pipe shall conform to ANSI-A21.5 and AWWA C-151. Pipe interior shall have a cement mortar lining. PVC-900 shall have a minimum stiffness of DR-18. Polyethylene shall be minimum SDR-11.0.

3.01.2 Fittings

- All pressure pipe fittings of size **four inch** inside diameter and larger shall be PVC C-900 or ductile iron fittings with mechanical joints unless the plans specifically call for flanged joints. Mechanical joint fittings shall be used for buried installations. Flanged joints shall be used for above ground service only. PVC C-900, fittings shall be restrained with retainers approved by the **District**. Equal to "MEG-A-LUG", manufactured by EBBAA Iron or an approved equal. Mechanical joint fittings shall conform to ANSI/AWWA C-153/A 21.53. Glands for mechanical joint fittings shall be ductile iron. Tee bolts shall be cor-ten steel unless otherwise specified. Flanged fittings shall conform to ANSI/AWWA C-110/A21.10 and lined inside and outside as specified for the pipe. PVC fittings shall conform to AWWA standard C-907.
- Electronic Marking System - EMS Markers shall be placed six inches above all ductile pipe, PVC pipe and polyethylene pipe spaced no greater than 300' apart. EMS Markers shall be placed above all fitting 90's, 45's, 222's, and 113's MARKER #1258 (sewer). EMS peg markers shall be placed at all valves boxes, services taps, etc.
- All tapping sleeves shall be stainless steel for ductile, PVC C-900 pipe or PE Pipe.

3.01.3 Valves

- **Four inch** through **16"** valves shall be mechanical joint resilient seated gate valves conforming to the latest edition of AWWA C-509 (epoxy coated). Valves shall be equal to US Pipe and Foundry Co. "Metro-seal" or equal.
- Mainline valves less than **four-inch** diameter shall be PVC -type ball, curb stop valves equal to those manufactured by "PhilMad" or "ASAHI American".
- When any gate valve is deeper than 36," an extension will be required to bring operating nut within 24" of finished grade. A stainless steel pin will be inserted through the valve-operating nut to secure the extension stem.

3.01.4 Valve Boxes(for valves four inches or larger)

- ASTM A48 class 30, Gray Cast Iron, Domestic ONLY
- All valve boxes on four inch valve and larger shall be **three piece** cast iron construction with screw type riser sections. The Valve box lids shall carry the word "Reuse" and be the deep skirt type. Valve boxes must have a minimum inside diameter of 53". A square concrete collar that is 18"x18"x8" thick shall be placed at top of each valve box at finished grade.
- Height adjustments to valve boxes will require a screw type, cast iron extension. A Tyler Series 6850 (3 piece c.i.) valve box or equal will be used. No. 58 and No. 59 height extensions will be used, if necessary. No substitutions with PVC pipe will be allowed.
- Service valve boxes shall be per the standard details and shall be used for all valves **three inches** and smaller (see RU-02).

3.01.5 Services (taps in paved public right-of-ways)

- **Two-inch** Service Valves shall be PhilMad or ASahi American ball curb stop.
- **One-inch** corporation stops to be Ford FB 1001 with AWWA taper thread for P.E. tubing.
- **One-inch** and/or two inch tapping saddles shall be iron epoxy coated for ductile iron or a FC-202 epoxy coated saddle with CC outlet thread.

- **Three-quarter to two inch** services shall be H.D. polyethylene (P.E. 3408) ASTM-D2737 200 PSI SDR-9 with permanent specification markings. Color shall be purple throughout.

3.01.6. Distribution and Service Pipe (three inches or less) in Alleys, Easements, and Common Areas.

- Pipe shall be PVC Class 200, with gasketed or solvent-weld joints.
- In line and service valves shall be PhilMad or ASAHI American ball valves.
- Service boxes (at each individual property) shall be as show on detail RU-02.

3.02 INSTALLATION

3.02.1 General

- No work shall begin without applications and drawings approved by the **District**. Should one year pass after approval without initiation of construction, a resubmission will be required. Shop drawing(s) submittal will be required for approval by the **District** prior to placing of any orders for materials.
- A pre-construction meeting shall be held prior to the initiation of work. All necessary permits must be obtained and presented at the pre-construction meeting. Schedules of construction shall be submitted at this meeting.
- The **District** must be given 24 hour notice prior to the beginning of any construction. Call (561) 747-5700.
- All work must conform to the latest revisions of applicable AWWA, UNIBELL and **District** specifications.
- The **District** Inspector(s) may inspect all construction and materials and may also inspect preparation, fabrication or manufacture of components, materials, and supplies. The inspector is not authorized to revoke, alter, or waive any requirements of the specifications, but is authorized to call to the attention of the project engineer and/or contractor any failure of work or materials to conform to the plans or specifications. The inspector shall have the authority to reject materials or suspend the work until questions of the issue can be referred to and decided upon by all parties involved.

- An unanticipated conflict with other underground utilities must be brought to the attention of the **District**. Resolution for each conflict must receive approval by the **District**.
- The **District** must approve any deviation from the approved plans.
- All pipes are to be laid in a dry trench (see standard details).
- No large rocks or other deleterious material that may damage the pipe will be permitted over the pipe. (See details for bedding area.)

3.02.2 Grades

- The ground shall be rough graded prior to reuse main installation. Reuse main shall be installed with 30" of cover as a minimum and maximum of 48", unless authorized by the **District**.
- Sanitary sewer, force mains, reuse mains, and storm sewers should cross under water mains whenever possible. Sanitary sewers, force mains, storm sewers and reuse crossing water mains shall be laid to provide a minimum vertical distance of 18" between the invert of the upper pipe and the crown of the lower pipe whenever possible.

Where sanitary sewers, force mains, reuse mains, and storm sewers must cross a water main with less than 18" vertical distance, both the sewer and the water main shall be constructed of ductile iron pipe (DIP) at the crossing (DIP is not required for storm sewers). Sufficient lengths of DIP must be used to provide a minimum separation of 10' between any two joints. All joints on the water main within 20 feet of the crossing must be mechanically restrained. A minimum vertical clearance of 6" must be maintained at all crossings.

All crossings shall be arranged so that the Reuse pipe joints and the water main pipe joints are equidistant from the point of crossing (pipes centered on the crossing).

Where a new pipe conflicts with an existing pipe with less than 18" vertical clearance, the new pipe shall be constructed of DIP (except storm sewers) and the new pipe shall be arranged to meet the crossing requirements above. Coordination of affected utilities shall be required prior to commencement of work.

- A minimum **five foot** horizontal separation shall be maintained between any type of reuse and water main in parallel installations whenever possible.

In cases where it is not possible to maintain a **five foot** horizontal separation, the water main must be laid in a separate trench or on an undisturbed earth shelf located one side of the reuse at such an elevation that the bottom of the water main is at least 18" above the top of the reuse.

Where it is not possible to maintain a vertical distance of 18" in parallel installations, the water main shall be constructed of DIP and the sewer, reuse main, or the force main shall be constructed of DIP (except storm sewers) with a minimum vertical distance of six inches. The water main should always be above the reuse main. Joints on the water main shall be located as far apart as possible from joints on the reuse (staggered joints).

- All DIP shall be pressure class 350 or higher. Adequate protective measures against corrosion shall be used as determined by the design engineer.

3.02.3 Flushing

- A minimum of 24 hours notice to the **District** is required before flushing operations.
- All lines shall be flushed prior to conducting the pressure test. The **District** personnel shall be present and in control during the flushing. Contractors are NOT authorized to operate any **District** valves.
- The contractor is responsible for providing a flushing point capable of discharging the flushing water into a safe location. Any erosion or other damage that may occur is the responsibility of the contractor.

3.02.4 Construction safety

- The **District** signing as the applicant for any required permit, does NOT, and will NOT in any way, release the contractor from liability for any injuries, accidents, property damage or losses resulting from project construction.
- All work shall be performed in a safe and professional manner. The contractor shall comply with all applicable laws and regulations regarding the safety of persons and property. The responsibility for project safety rests solely and specifically with the contractor. The **District** and its employees and agents are specifically indemnified and held harmless from any actions of the contractor relating to the safety procedures implemented during construction and for any claims brought by any persons regarding safety, personal injury or property damage.
- The employees of the District are required to practice all applicable safety rules and regulations.

3.02.5 Testing

- The Engineer of Record must request witnessing of all pressure tests and provide a minimum of 24 hours notice to the **District**.
- The **District** personnel shall be present along with the Engineer of Record during all pressure tests.
- The Contractor shall perform a preliminary test prior to calling the Engineer of Record and the **District** for an official test.
- Pressure tests must be conducted for at least two hours at 150 psi in accordance with the latest revision of AWWA C-600. Allowable leakage will be as defined within AWWA C-600.
- All pressure testing equipment must be in good and proper operating condition. The test gauge shall be rated to 300 psi maximum with a reading a five psi increments. Glycerin filled type gauges are required, however, exceptions may be approved prior to the test at the sole discretion of the **District**.
- When testing between valved sections, the AWWA C-600 allowable leakage will apply.
- When testing more than one valved section, a maximum of 2500 linear feet is permitted.
- A loss of 10 psi or more regardless of the amount of leakage shall be considered a failing test.
- All tapping sleeves must be pressure tested at 150 psi for one hour with **District** personnel and/or the Engineer of Record present. All tapped coupons are to be given to the **District** Inspector. A minimum of 24 hours notice to the **District** is required prior to all such testing.

3.02.6 Miscellaneous

- Back flow preventers will be required (see the Town of Jupiter Water Dept. specifications).

3.02.7 Workmanship

- All contractors performing any work on a portion of the underground facilities, which will ultimately be dedicated to the **District** for ownership or which directly interacts

with the **District** (such as Reuse main), shall be properly licensed to do such work. All materials and equipment shall be installed in accordance with the manufacture's recommendations and specifications. Required workmanship shall be of a quality acceptable to the **District** and the **District** reserves the right to reject any and all work deemed to be of questionable quality. In the event that faulty workmanship is discovered, at any time within one year following the date of the final letter of acceptance, the **District** reserves the right to require the developer, its successors or assigns, and/or the contractor to replace or repair said faulty workmanship in a manner acceptable to the **District** at no cost to the **District**. In addition, said restored work will be further warranted for one year from the date of acceptance.

3.02.8 Guarantee

- All materials and equipment to be furnished and/or installed on water facilities by the contractor, under any contract on any project for which a developer intends to dedicated said facilities to the **District**, shall be new and shall carry a complete, indisputable guarantee against defective materials and equipment and faulty workmanship for a period of at least one year from the date of the **District's** final acceptance. In the event that any defective material and equipment and/or the faulty workmanship is discovered within the one year period, the **District** reserves the right to demand that the developer, his successors or assigns, and/or contractor to replace and/or repair said defects at no cost to the **District** and said materials and equipment shall be further warranted for a period of one year from the date of written acceptance of said replacement and/or repair. A one year maintenance bond or letter of credit in amount of \$10,000.00 shall be submitted by the developer at the completion of construction.

3.02.9 Record Drawings

- One set, Certified by an Engineer or Surveyor licensed by the State of Florida, of as-builts on mylar and two sets signed and sealed as-builts prints must be submitted to the **District** upon completion of Reuse lines and prior to the application of a request for release forms.
- Construction/as-builts drawings produced on a computer-aided drafting (CADD) or geographic information system (GIS), digital data (lot lines, right of ways, etc) will be required to be submitted:
 - Windows 95, 98 or NT 4.0 Operating Systems
 - 3.5" floppy disks or zip 100 disks
 - AutoCAD *.DWG file type
 - Files may be compressed by PKZIP/WINZIP compression programs, Colorado Backup, v2.70, or earlier

- Drawings must be full scale: one computer unit = one foot
- Record drawings must contain as-built information as follows:
 - *All fittings, including sleeves, and valves must be located by horizontal measurements and approximate right angles to adjacent permanent surface object. Each fitting or valve must be tied to two such surface objects, if practicable. Acceptable surface objects include power poles, fire hydrants, manholes and storm inlets. Edge of pavement, center, line of road and road intersections are not acceptable. Any deviations from the specified pipe cover must be shown.*
 - Services to individual lots shall be stationed along a base line (center of road preferred) and offset distances shall be indicated to each service valve box.

REUSE CONTROLS

4.01 General

It is the intent of this specification to provide the **District** a means to control and monitor the delivery of reuse water to each user connection point of the distribution system.

The controls, which are normally located at the delivery point of each development, will consist of the following components: (see details)

- A main control unit, commonly known as a CCU.
- A programmable satellite controller.
- A 117 VAC power supply terminating at a duplex receptacle.
- Standard telephone CAC-4000, Outside Network Interface (ONI).
- Stainless steel pedestal enclosure housing all components as detailed.
- A flow sensor device that transmits a signal to a pulse output transmitter.
- A master valve with, maximum flow/pressure reducing and 24 volt solenoid 2 shut-off.
- A pulse decoder that receives pulse signals from a pulse output transmitter.
- A pulse output transmitter that receives input signals from a flow sensor and sends pulse signals to a pulse decoder.
- Surge protection with three rods spaced eight feet in a triangular grid as detailed.

4.02 Controls

- **Cluster Control Unit (CCU)**

The CCU serves as an interface between the central computer, located at the **District's** plant site, and the field satellite controller.

The CCU shall be a single unit that receives information from the computer via telephone dial tone and communicates that information to the satellites via a

two-wire path. The CCU shall be a single unit containing a telephone modem card or an RS-232 serial connection card and the encoder module.

The CCU shall require 117 VAC power supply for the internal transformer. The CCU shall be grounded to earth ground.

The CCU shall receive "feed back" information from the field satellites and/or decoders and relays that information back to the central control computer during a download or upload.

The CCU shall maintain memory during power outages with a 10-year lithium battery backup system.

The CCU shall be housed in a single seamless stainless steel enclosure as shown on Detail RU-11.

A two-wire path shall be used to communicate from the CCU to the field satellite.

The CCU will be manufactured by RainBird Sprinkler Mfg., Corp., Glendora, CA, and be capable of operating up to six satellite units, output decoders, pulse decoders, or sensor decoders.

- **Satellite Controller**

The system controller shall combine Electro-mechanical and microprocessor-based circuitry capable of fully automatic and manual operation. The controller shall be housed in the same 16-gauge seamless stainless steel enclosure as the CCU. (See standard details.)

The controller shall operate on 117 VAC and be capable of actuating up to two 24 VAC 7VA solenoid valves per station, plus a master valve or pump start relay. The controller output shall be protected against severe electrical surge.

The satellite controller shall be capable of manual operation and can be programmed to run four programs at the same time with a total of eight 24 VAC solenoid valves in operation.

The controller shall have a nine VDC rechargeable battery and recharging circuit to compensate for power outages.

The controller shall have a status indicator light and a master valve indicator light. These lights will indicate station operation and circuit integrity.

The controller shall be "MAXICOM" Satellite as manufactured by RainBird Sprinkler Mfg. Corp., Glendora, CA.

- **Setup and Field Testing**

Prior to acceptance by the **District**, the contractor installing the control system shall engage the equipment manufacturer's representative to calibrate and field test all the control units and satellites to insure proper communication link and control strategy between the **District** computer terminal and the control units via telephone lines.

4.03 Reuse Water Sensor

- **Scope of the Work**

The scope of the work is to provide a correctly installed Data Industrial Flow Measurement System providing accurate, reliable flow data to the **District's** reuse system manager.

- **Sensor Selection**

Unless specified by model number on the drawings, the flow sensor shall be selected by mounting location and by flow measurement range.

All flow sensors in vaults shall be IR type sensors.

Sensors shall be selected/sized by the required flow measurement range. Refer to page 4-4 (Hardware) and RU-12 Appendix B page B-35 (POC Detail).

- **Mechanical Installation**

- ♦ **General**

The accuracy of flow measurement for all flow measuring devices is highly dependent on proper location of the sensor in the piping system. Irregular flow velocity profiles caused by valves, fittings, pipe bends, etc. can lead to inaccurate overall flow rate indications even though local flow velocity measurement may be accurate. Data Industrial flow sensors are designed to operate reliably under adverse conditions, but the following recommendations should be followed to ensure maximum system accuracy:

- ❖ Choose a location along the pipe where 10 pipe diameters upstream and five pipe diameters downstream of the sensor provide no flow disturbance. Pipe bends, valves, other fittings, pipe enlargements and reductions should not be present in this length of pipe.
- ❖ The preferred location around the circumference of a horizontal pipe is on top. The sensor should never be located at the bottom of the pipe, as sediment may collect there. Locations off top dead center cause the impeller friction to increase, which may affect performance at low flow rates. (See detail RU-12.)

◆ Hardware

Point of connection (P.O.C.) piping and control valve shall be no smaller than two inches (RU-12).

2" P.O.C. - All piping will be BRASS

Flow Sensor - Model 228BR-2001-1211 with TEE supplied by Data Industrial
Flow Sensor & Tee are calibrated at factory, no adjustment needed.

Ball Valve - Brass

All nuts & bolts are to be Stainless Steel

22" P.O.C. - All piping will be BRASS

Flow Sensor - Model 228BR-2501-1211 with TEE supplied by Data Industrial
Flow Sensor & Tee are calibrated at factory no adjustment needed

Ball Valve - Brass

All nuts & bolts are to be Stainless Steel

3" and up P.O.C. - Piping will be Ductile Iron

Flow Sensor - Model IR220 SS

S.S. Tap & Saddle to match flow sensor size

Shut Off Valve - Resilient seat gate valve (U.S. Pipe "METRO SEAL" or equal)

All nuts & bolts are to be Stainless Steel

Reducing bushings shall not be allowed

◆ Depth and alignment - Insert Style Sensor

The flow sensor shall be installed in strict accordance with the procedure in the owner's manual. The sensor shall always be installed with the bottom of the sensor sleeve, placed according to manufacturer recommendations based on the size of pipe, from the inside wall of the pipe. The sensor shall also be

aligned with the impeller shaft, perpendicular to the flow, and with the flow direction arrow pointing in the direction of flow (downstream).

- **Electrical Wiring**

- ◆ **Sensor Specifications**

The sensor produces a nominal 8 Volt DC square wave digital pulse proportional to flow in the range of 0 - 120 Hz, when connected to a Data Industrial transmitter/monitor along a two wire path that serves as both power supply and signal return.

- ◆ **Wiring Distance**

The maximum wire run distance between the flow sensor and the loop powered analog transmitter, Data Industrial Series 500, shall be 500 feet. The maximum wire run distance between the flow sensor and all other Data Industrial transmitter/monitors shall be 2,000 feet.

- ◆ All data communications wire connecting flow sensors to the electronics that is buried below grade, with or without conduit, shall be constructed to direct burial specifications, similar to Telecommunications Exchange Cable (REA PE-89).

Single pair cables shall be constructed of 18AWG or larger copper conductor. Multipair cable shall be constructed of 20AWG or large copper conductors twisted into pairs of varying lengths to prevent cross talk. Conductors shall be insulated with polyethylene with a suggested working voltage of 350 Volts. The cable shall feature an aluminum-polyester shield and be finished with a black high-density polyethylene jacket. Cable should be equivalent to Belden No. 9883 or Annixter E00319 DFC.

Check cable with ohmmeter prior to making splices to insure that cable is intact and free of ground faults.

- ◆ **Wire Splices**

It is important that all wire connections be absolutely watertight with no leakage to ground nor shorting from one conductor to another. The contractor shall use an epoxy-type wire connector kit, such as 3M Series 3500 Scotch-Lok Connector packs or 3M Series 7000 Epoxy Wire Kits. If one connector is used for both wire connections, splices shall be staggered to prevent shorting. Follow the manufacturer's instructions on the package.

If multi-pair telecommunications cable is used, individual splices shall be made with Scotch-Lox sealant filled butt connectors, Models UAL, ULG, UR, UP3.

After individual wires are spliced, the cable ends shall then be enclosed in a waterproof splice closure, similar to Performed Line Products Catalog #8006039.

◆ **Grounding**

Grounding systems meeting a minimum resistance of 5 Ohms or less shall be installed at each transmitter location. Ground rods shall be 5/8" diameter X8'0" copper clad steel. Connectors shall be solid copper clamps with connecting wire at least one size larger than any other wire on the same device. The number and pattern of ground rods shall be chosen to provide the required maximum resistance.

Series 600: Isolated 24 VAC Power Supply to 600 - tie 600 sensor shield to earth ground and cable shield wire to ground.

Non-isolated 24 VAC Power Supply: Tie sensor cable shield to ground.

Series 1500: Tie sensor cable shield and Power Supply terminal to ground.

◆ **Surge Arrestors**

In areas of known problems associated with electrical storm supplemental protection will be required. At the prior written instruction of the owner/specify, the contractor shall install Data Industrial line surge suppressors. Model A-1017 suppressor with flying leads shall be used at the sensor end of the cable. Model A-1022 with barrier strip shall be used at the monitor/transmitter end of the cable. Wire according to the attached Drawing #600DCLS.

● **Transmitters/Monitors/Receivers**

The flow sensor shall be connected to a device that interprets the digital signal and provides either: a signal that will interface with the control system, a visual display of the flow rate and total, or both. Different control systems require different interface signals. The installer shall confirm the selection of monitor/transmitter with the owner/specify prior to the time of the order.

◆ Mounting

Transmitters shall be mounted in the Reuse CCU/Satellite enclosure. Enclosures shall be attached with the cable exit located at the bottom. The installer shall tighten the cable fitting and secure the enclosure cover.

Monitors shall be furnished in a panel mount configuration. The installer shall follow the diagrams in the owners' manual to make the correct sized panel opening to mount the unit.

◆ Wiring

All power supply, sensor, and interface output wiring shall be made in a workmanlike manner conforming to the National Electrical Code and local ordinances. All wiring shall be color-coded or tagged to maintain functionality and polarity. Any wire connections not made to product terminal strips shall be made to auxiliary screw type terminal strips using crimp on spade lug connections of the appropriate size.

● Start-up Procedure

When the installation is complete, the **District** or RainBird representative shall verify that all the equipment has been installed and transmitter/monitors have been correctly programmed. With the system running, the **District** or RainBird representative shall verify output signals from each sensor, inputs to transmitter/monitors and correct transmitter outputs.

A 12 hour time window (7 days a week) for irrigation will be set at all site satellite/CCU enclosure, beginning at 8:00 PM and finished by 8:00 AM. The **District** must approve any deviation from this schedule.

4.04 Automatic Control Valve

The Automatic Control Valve shall maintain a maximum (adjustable) flow rate regardless of changes in demand or inlet pressure variations. The valve will also modulate to maintain a constant (adjustable) downstream pressure. The valve shall be equipped with a solenoid intercept that will close the valve drip-tight upon actuation. Valve manufacturer for pilot set points and individual orifice bore sizes shall determine control ranges. The valve shall be equipped with an orifice bore assembly that will fit between two standard pipeline flanges; no pilot tubes shall be allowed.

The valve shall be hydraulically operated, diaphragm actuated and angle pattern. The valve shall be single chamber with a single diaphragm. The diaphragm assembly shall be the only moving part and shall form a sealed chamber between the valve body and cover, allowing for a separation of operating pressure and pipeline pressures. Internal packing glands are not permitted within the main valve. The valve body shall be stainless steel or heat fused epoxy coated iron construction with stainless steel trim. the valve shall have 125/150 lb. flanged ends. The valve must be fully serviceable in the pipeline, and the diaphragm may not be used as a seating surface. The main valve and controls shall be manufactured in the United States of America.

The main valve shall have a single removable stainless steel seat that seals against a resilient, synthetic rubber disc. This disc shall have a rectangular cross section and be surrounded on three and one-half sides of the cross section by the module formed by the disc retainer and the stainless steel contoured disc guide. No O-ring type discs shall be permitted as the seating surface interface. The main valve stem shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the stainless steel seat. The seat shall have a five-degree higher taper on the seat diameter, so as to insure drip tight shut off. The cover bearing shall be aligned so as to permit freedom of movement of the diaphragm assembly; center guides in a single chamber valve are not permitted.

Machined surfaces in the body and cover shall fully support the diaphragm throughout the valve stroke and over the entire 360 degrees of the diaphragm radius. The flexible, non-wicking diaphragm shall be FDA approved and consist of nylon fabric bonded with synthetic rubber compatible with the pipeline operating fluid. The center hole accommodating the main valve stem must be sealed by vulcanized process or rubber grommet. The diaphragm must withstand a Mullins Burst Test of a minimum of 600 psi per layer of nylon fabric and shall be cycle tested 100,000 cycles to insure material longevity.

The control valve shall be warranted, by the manufacturer, to be free from defects in material and workmanship for a period of three years from the date of shipment, provided the valve is installed and used in accordance with published instructions and application recommendations. Components supplied part of the pilot control circuitry, but not manufactured by the valve manufacturer shall convey individual warranties; these warranties shall never be less than one year from date of assembled valve shipment. The valve manufacturer shall be capable of providing a complete cavitation profile to the Loxahatchee River District for each subject valve installation. A factory-trained representative shall provide start-up and training services to the Loxahatchee River District at no charge. The control valve representative must be fully qualified for warranty and non warranty service and not subcontract for these services.

Valve shall be inch angle pattern, with 125/150 lb. flanged ends. The valve shall be AMES Co., Inc., Model 951/651 A-15-43-02-38-KX-Y, as manufactured by AMES Co., Inc., Woodland, Ca. 95776, or CLA-Valve Model 49A-03-B-S-SS-KC-Y.

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LRECD - 100 Dated: 5-21-98
 Prepared By & Return To:
 Clinton R. Yerkes
 Loxahatchee River District
 2500 Jupiter Park Drive
 Jupiter, FL 33458
 (561) 747-5700

STANDARD IRRIGATION QUALITY WATER AGREEMENT

1998 Revision

THIS AGREEMENT MADE AND ENTERED INTO this _____ day of _____, 19____, by and between LOXAHATCHEE RIVER ENVIRONMENTAL CONTROL DISTRICT, herein referred to as the "District", and _____, authorized to do business in the State of Florida, its successors and assigns, herein referred to as "Owner", with regard to the property described in Exhibit "A" attached hereto and made a part hereof, (the "Property").

IN CONSIDERATION of the covenants and agreements herein set forth, the receipt and sufficiency of such consideration being hereby acknowledged as adequate, the parties agree as follows:

1. **PROVISION OF IRRIGATION QUALITY WATER AVAILABILITY.** The District shall provide "Reclaimed Water" availability as defined in the Department of Environmental Protection rule Chapter 62-610.100, 62-610.200, and 62-610.300, Florida Administrative Code, incorporated herein by reference, (herein referred to as the "Reuse Rule") in the amount of _____ gallons per day ("G.P.D.") (herein referred to as the "Requested G.P.D."). Reclaimed Water shall be referred to hereafter as "Irrigation Quality" or "I.Q." Water. Owner shall have no obligation to take such Irrigation Quality Water, but it shall be provided as set forth herein, and Owner shall pay the charges set forth in Paragraph 4 herein regardless of whether or not Owner takes Irrigation Quality Water when available. The Requested G.P.D. will be delivered during a portion of the 24-hour period as the operational requirements of the District may necessitate.

2. **COMMENCEMENT DATE.** Availability of the Requested G.P.D. is scheduled to commence on the first of _____, 19____, (herein referred to as "Commencement Date"), unless an earlier or later Commencement Date is mutually agreed to between the parties or unless a later Commencement Date is necessitated by the unavailability of the Irrigation Quality Water.

3. **APPLICATION FEE.** Upon signing this Agreement, Owner shall pay to the District the sum of \$_____ as the "Application Fee". The Application Fee is based on

the greater of (a) six months of charges at the I.Q. Rate for the Requested G.P.D., or (b) \$18,000.00. The Application Fee is nonrefundable and is the property of the District along with any and all interest accrued thereon. The Application Fee is applied to the payments due from Owner once I.Q. Water delivery begins.

4. I.Q. RATE AND INCREASE. The Owner agrees that Owner shall pay to the District the sum of 27.0 cents per 1,000 gallons (herein referred to as "I.Q. Rate") for the Requested G.P.D. Said billing of the I.Q. Rate shall be made monthly as delivered, or such other billing cycle period as the District may determine. The District shall have the right to increase the I.Q. Rate from time to time hereunder, upon providing 30 days prior written notice of costs increase. Any increase in the I.Q. Rate shall only arise from the District's increase in costs representing: (a) operation and maintenance of the facilities including capital expenses and replacements to supply the Irrigation Quality Water, and/or; (b) any capital improvements required to the facilities or the District's treatment plant and related processes resulting from any change or alteration of the specifications for the Irrigation Quality Water as set forth in Paragraph 1 herein.

5. I.Q. FACILITIES.

a) District I.Q. Line and Facilities. Owner will prepare, at Owner's cost, plans and specifications for the lines and facilities to bring a delivery line from the existing District I.Q. Facilities to the District Metering Station (herein referred to as the "District I.Q. Line"), and plans and specifications for the on-site facilities to receive the Irrigation Quality Water at the Owner's side of the District Metering Station (herein referred to as "Owner I.Q. Facilities"). Owner shall submit these plans and specifications in order to obtain all construction and operating permits required by both Owner and District for the construction, delivery, use for irrigation, monitoring, and storage of Irrigation Quality Water. Owner shall also obtain any rights-of-way, easements, or permits to bring and maintain the delivery line from the existing District I.Q. Facilities to the District Metering Station. District will cooperate as necessary in the permitting process. Owner shall prepay all engineering and permitting costs incurred either by Owner or the District. All costs, tests, fees, engineering, feasibility or other requirements of any Permitting Agency will be solely those of the Owner, provided that District or Owner will not be required to change the construction, delivery, or storage requirements for Irrigation Quality Water to any standard or requirement over and above the existing Reuse Rule. The Owner, at Owner's sole cost shall construct the District I.Q. Line from the existing District I.Q. Facilities to the District Metering Station. A final inspection shall be conducted by District to insure conformance with the approved plans and specifications and generally accepted construction and engineering standards. The District I.Q. Line shall be completed and transferred to the District prior to the completion of the golf course. The District I.Q. Line, upon completion, shall be conveyed to the District by provision of the following items: (1) Bill of Sale, (2) Grant of Easement, (3) Maintenance Bond or Letter of Credit, (4) As Built Drawings, and (5) Certification by Project Engineer.

b) District Metering Station. The Owner shall design, permit, construct, and install, at Owner's cost, an on-site metering station (herein referred to as "District Metering Station"). Owner will grant to the District, for no additional consideration, a general warranty deed for the District Metering Station area, and an ingress-egress easement for the installation, maintenance, operation, and monitoring of any such on-site District I.Q. Lines and District Metering Station. Owner shall prepay all costs for the design, permitting, construction, and installation of the District Metering Station as determined by the District, including the meter, meter valve, actuator, controls, and telemetry system.

c) Owner I.Q. Facilities. The Owner shall be solely responsible to design, construct, own, operate and maintain the facilities necessary to pump to the District Metering Station and to receive the Irrigation Quality Water at the Owner's side of the District Metering Station, and to provide all necessary transmission, storage, pumping, and irrigation facilities on-site (herein referred to as the "Owner I.Q. Facilities"). Owner shall construct and complete all of the Owner I.Q. Facilities prior to the completion of the golf course. All Owner I.Q. Facilities shall be constructed at the Owner's expense in accordance with final plans and specifications approved by the District and the Department of Environmental Regulation. Owner shall comply with the provisions of the Reuse Rule such as signage, spray regulations, and color coding.

6. I.Q. WATER DELIVERY.

a) Phase In. In the interest of water conservation, it is agreed by both parties that, if I.Q. Water is available to Owner as determined by the District, Owner shall take delivery of I.Q. Water prior to the Commencement Date, and shall pay the I.Q. Rate only for the amount of I.Q. Water actually delivered.

7. ALLOCATION OF IRRIGATION QUALITY WATER AVAILABILITY. If more water is available as determined by the District and Owner desires to receive it, then it shall be delivered at no cost to Owner. In the event that from time to time, the availability of Irrigation Quality Water is insufficient to meet the expected demand, the District shall allocate available Irrigation Quality Water hereunder on a proportional basis with all its Irrigation Quality Water customers, provided however, the District shall use its best efforts not to oversell its Irrigation Quality Water. If the Requested G.P.D. is not available, then Owner shall only be obligated to pay based on the pro rata share of the lesser flow which is available. Failure of Owner to take Irrigation Quality Water when available from the District shall not relieve Owner from paying the charges set forth in Paragraph 4 herein.

8. TERM. The term of this Agreement shall run for twenty (20) years from the date hereof.

9. DEFAULT; LIEN; ATTORNEY'S FEES; VENUE. Upon failure of the Owner to pay any monies due under this Agreement for any period greater than thirty (30) days from the date they become due, the Owner shall be deemed in default and the District shall

terminate this Agreement without prejudice to the District's rights and remedies set forth in its Charter, Rules, or herein. The District shall have a lien on the Property and premises served by it for all charges under this Agreement, until paid, which lien shall be prior to all other liens, except that such lien shall be on parity with the lien of state, county, and municipal taxes, and any lien for charges for services created pursuant to Section 159.17, Florida Statutes. Such lien shall be perfected by the District by recording in the official records of the county in which the Property is located a claim of lien in form substantially as provided in Section 713.08, Florida Statutes. A copy of the claim of lien shall be served as provided in Section 713.18, Florida Statutes, within ten (10) days after the claim of lien is recorded. If thirty (30) days after service has been made liens created under this section remain delinquent, such liens shall be foreclosed by the District in the manner provided by the laws of Florida for the foreclosure of mortgages on real property, and the District shall be entitled to reasonable interest and attorneys' fees and other court costs. The District shall bring legal action against Owner to collect monies due and in default, and/or to obtain injunctive and/or declaratory relief. In the event of any litigation arising hereunder, the prevailing party shall be entitled to recovery of costs and reasonable attorney's fees. Any such litigation shall have jurisdiction and venue in Palm Beach County, Florida. It is mutually agreed by and between the respective parties to hereby waive trial by jury in any action, proceeding or counterclaim brought by either of them against the other on any matter arising out of or in any way connected with this Agreement.

10. TRANSFERABILITY OF AGREEMENT. The Irrigation Quality Water to be provided under this Agreement may not be transferred from the Property to any other property, but ownership of the Property may change from time to time and the Agreement shall run with the Property.

11. RECORDATION. A copy of this Agreement or Memorandum may be filed in the public records of the county where the Property is located. If this Agreement is terminated before the end of its term, then a Notice of Termination signed by Owner and the District, and recorded shall discharge this Agreement of public record.

12. INDEMNIFICATION. In the event the Owner shall fail to comply with any rule, regulation, or order of any Federal, State, County, Municipality, or other agency, or commit a violation of any permit granted with regard to the construction, operation, maintenance, or use of the Irrigation Quality Water on the Property, Owner shall indemnify the District, its officers, governing board, employees and agents against all claims, demands, causes of action, suits, judgments, fines, penalties, or losses, including all costs suffered or incurred by the District by reason of such failure or violation.

13. GENERAL PROVISIONS.

a) Authority. Owner agrees to furnish promptly upon demand, a corporate resolution, proof of due authorization by partners, or other appropriate documentation evidencing the due authorization of Owner to enter into this Agreement.

b) Captions. The captions inserted in this Agreement are for convenience only and in no way define, limit or otherwise describe the scope of intent of this Agreement, or any provision hereof, or in any way affect the interpretation of this Agreement.

c) Amendment. This Agreement may not be altered, changed or amended except by an instrument in writing signed by both parties hereto.

d) Severability. If any clause, provision or portion of this Agreement or the application thereof to any person or circumstance shall be invalid or unenforceable under applicable law, such event shall not affect, impair or render invalid or unenforceable the remainder of this Agreement nor any other clause, phrase, provision or portion hereof, nor shall it affect the application of any clause, phrase, provision or portion hereof to other persons or circumstances, and it is also the intention of the parties to this Agreement that in lieu of each such clause, phrase, provision or portion of this Agreement that is invalid or unenforceable, there be added as a part to this Agreement a clause, phrase, provision or portion as similar in terms to such invalid or unenforceable clause, phrase, provision or portion as may be possible and be valid and enforceable.

IN WITNESS WHEREOF, the parties hereto have set their hands and seals this _____ day of _____, 19____.

Signed, Sealed and Delivered
in the presence of:

LOXAHATCHEE RIVER ENVIRONMENTAL
CONTROL DISTRICT

WITNESS

Print Name _____

By: _____

RICHARD C. DENT, II

EXECUTIVE DIRECTOR

WITNESS

Print Name _____

(DISTRICT SEAL)

STATE OF FLORIDA
COUNTY OF PALM BEACH

The foregoing instrument was acknowledged before me this _____ day of _____, 19____, by RICHARD C. DENT, II, Executive Director, on behalf of the Loxahatchee River Environmental Control District. He is personally known to me or produced _____ as identification.

(NOTARY SEAL)

NOTARY PUBLIC, STATE OF FLORIDA

Print Name _____

My Commission Expires: _____

Signed, Sealed and Delivered
in the presence of:

OWNER: _____

WITNESS

Print Name _____

BY: _____

TITLE: _____

WITNESS

Print Name _____

ATTEST: _____

TITLE: _____

(CORPORATE SEAL)

STATE OF FLORIDA
COUNTY OF PALM BEACH

The foregoing instrument was acknowledged before me this _____ day of _____, 19____, by _____, as _____ and _____, as _____ on behalf of _____. He/She/They are personally known to me or produced _____ as identification.

(NOTARY SEAL)

NOTARY PUBLIC, STATE OF FLORIDA

Print Name _____

My Commission Expires: _____

APPENDIX “B”

**LOXAHATCHEE RIVER DISTRICT
STANDARD REUSE DETAILS INDEX**

RU-1 TYPICAL LOCATION REUSE SERVICE CONNECTION
 RU-2 TYPICAL REUSE SERVICE CONNECTION 1" - 2" IN PAVED PUBLIC ROAD AREAS
 RU-3 TYPICAL REUSE SERVICE CONNECTION IN UNPAVED COMMON AREAS, PUBLIC ALLEYS OR EASEMENTS
 RU-4 TYPICAL REUSE DIP EMBEDMENT
 RU-5 TYPICAL REUSE PVC PIPE EMBEDMENT
 RU-6 TYPICAL REUSE THRUST BLOCK
 RU-7 TYPICAL REUSE BURIED VALVE DETAIL
 RU-8 TYPICAL TAPPING REUSE WATER MAIN
 RU-9 TYPICAL ALTERNATE REUSE AIR RELEASE VALVE DETAIL
 RU-10 AUTOMATIC AIR RELEASE VALVE DETAIL
 RU-11 TYPICAL SAMPLING / REUSE FLUSHING PORT DETAIL
 RU-12 REUSE WATER SYSTEM CCU / SATELLITE ENCLOSURE FOR SINGLE POINT OF CONNECTION
 RU-13 REUSE WATER SYSTEM CCU / SATELLITE ENCLOSURE FOR MULTIPLE POINTS OF CONNECTION
 RU-14 TYPICAL REUSE POWER PEDESTAL
 RU-15 SATELLITE SERIES CONTROLLER WITH S.S. ENCLOSURE FOR SINGLE POINT OF CONNECTION
 RU-16 REUSE WATER POINT OF CONNECTION DETAIL
 RU-17 TYPICAL CONTROL VALVE SCHEMATIC
 RU-18 PIPE PAINTING SPECIFICATIONS FOR ALL REUSE WATER POINT OF CONNECTIONS
 RU-19 3-ROD GROUNDING GRID DETAIL
 RU-20 SIGNAGE
 RU-21 REUSE RECORD DRAWING SUBMITTAL GUIDE
 RU-22 RECLAIMED WATER RTU DETAIL & SPECIFICATIONS
 RU-23 RECLAIMED WATER IQ STANDARD METERING STATION
 RU-24 RECLAIMED WATER IQ POINT OF DELIVERY STANDARD CONTROL PANEL

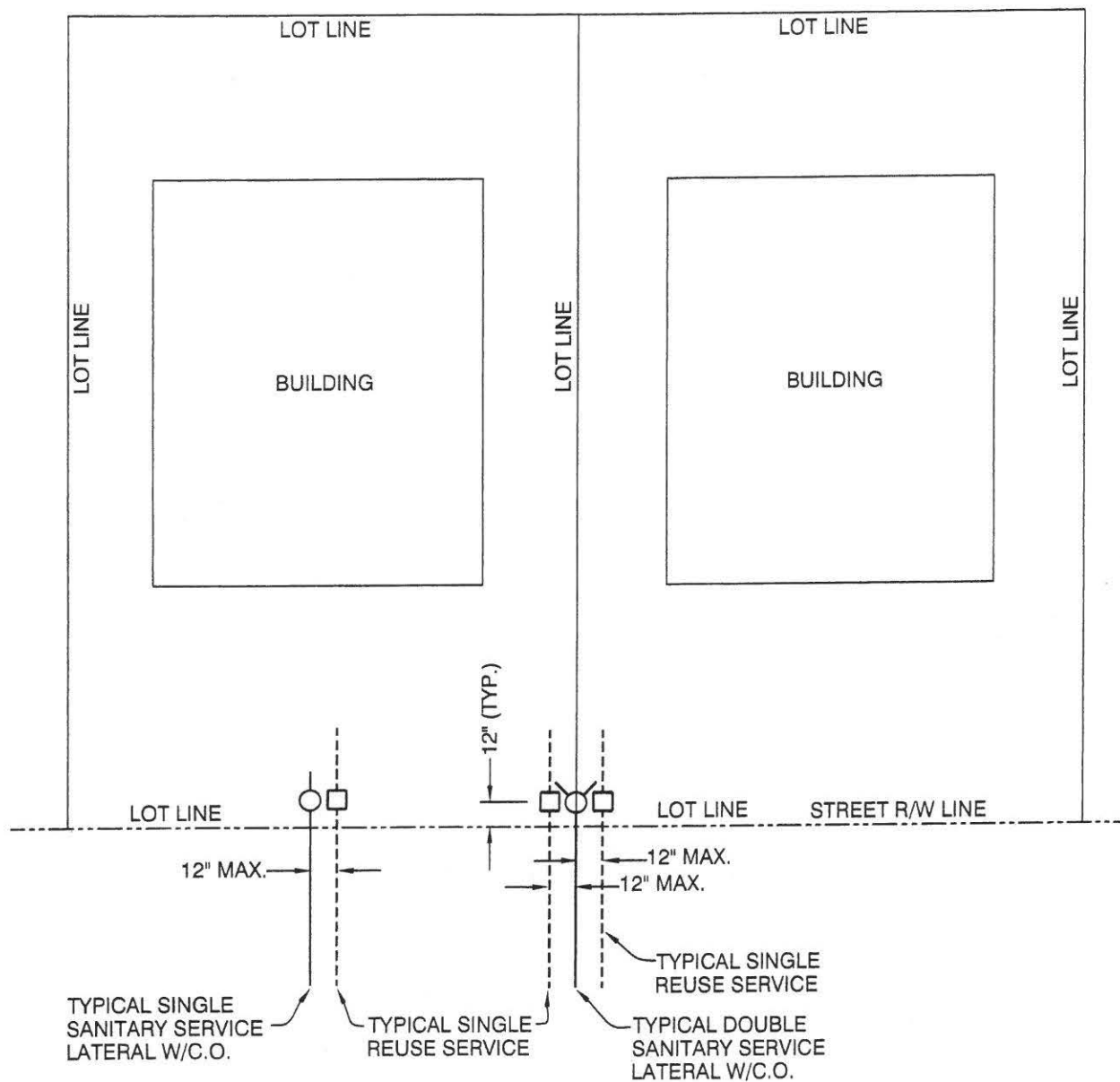
LOXAHATCHEE RIVER DISTRICT

N.T.S.

REVISION:
 APRIL, 2012

STANDARD REUSE DETAILS INDEX

SRDI



NOTES:

REUSE SERVICE BOXES AND VALVES SHALL NOT BE PLACED IN ANY PAVED DRIVEWAY AREAS.

LOXAHATCHEE RIVER DISTRICT

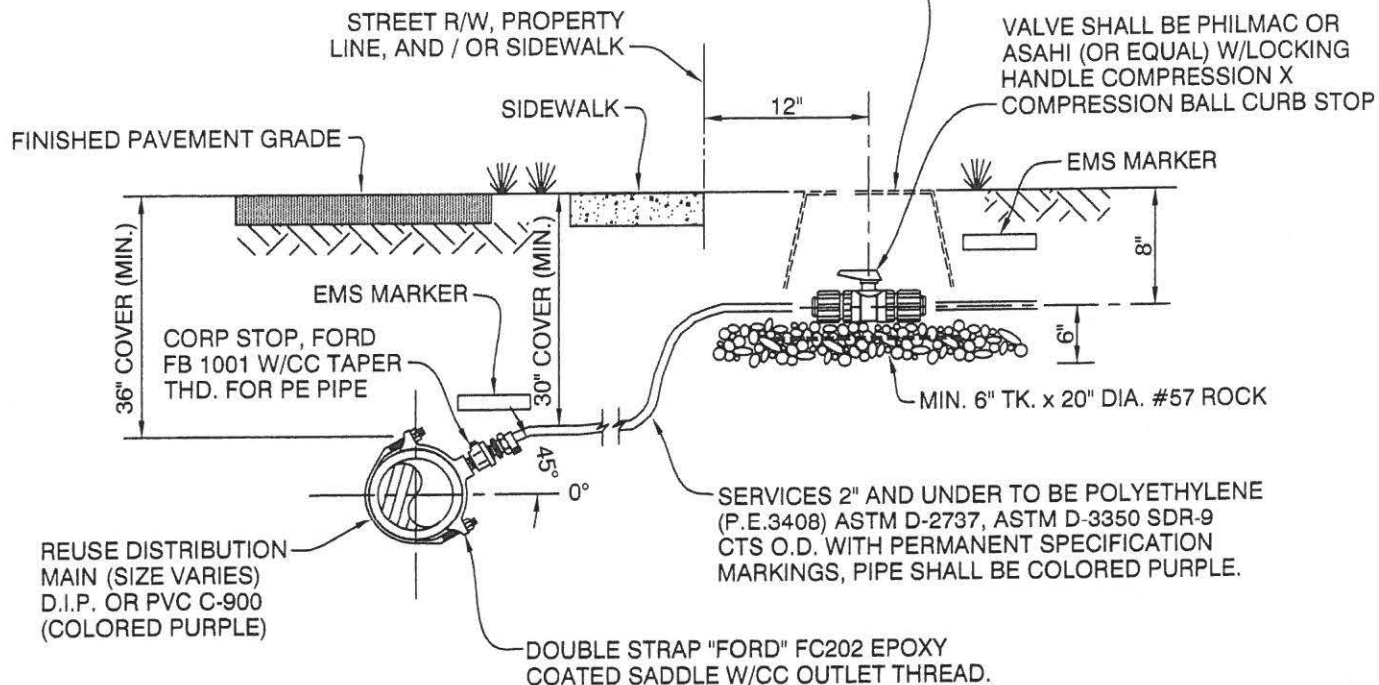
TYPICAL LOCATION REUSE SERVICE CONNECTION

RU-1

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HDPE BOX SHALL BE MANUFACTURED BY CARSON-BROOKS PLASTICS INC., MODEL 910 WITH BOLT DOWN COVER MARKED "RE-USE VALVE"; ENTIRE BOX (INCLUDING COVER) SHALL BE COLORED PURPLE. KNOCK OUT OPENING SHALL BE SUPPLIED. ~



ELEVATION

NOTES:

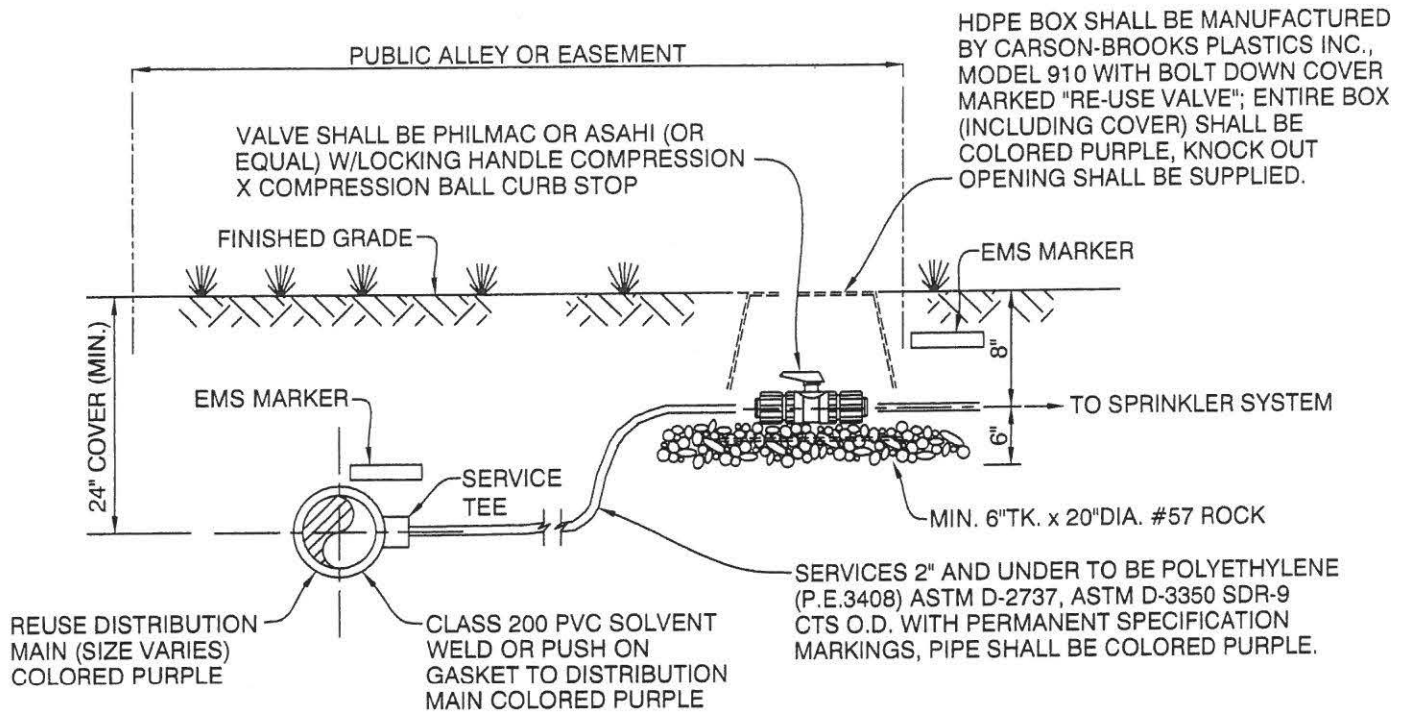
- *ALL SERVICE TAPS FOR 1" & 2" PIPE SHALL BE TAPPED AT 0°. POLY TUBING FITTINGS REQUIRE METAL (S.S.) INSERTS. ALL SIZES TO BE DETERMINED BY ENGINEER AND/OR IRRIGATION SPECIALIST. EMS "PEG" MARKERS SHALL BE PLACED DIRECTLY OVER TAPPING SADDLE AND AT 10" SERVICE BOX

LOXAHATCHEE RIVER DISTRICT

N.T.S.
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TYPICAL REUSE SERVICE CONNECTION 1" - 2"
IN PAVED PUBLIC ROAD AREAS

RU-2



ELEVATION

NOTES:

ALL SIZES TO BE DETERMINED BY ENGINEER AND/OR IRRIGATION SPECIALIST.
 EMS "PEG" MARKERS SHALL BE PLACED DIRECTLY OVER SERVICE TEE AND AT 10" SERVICE BOX.

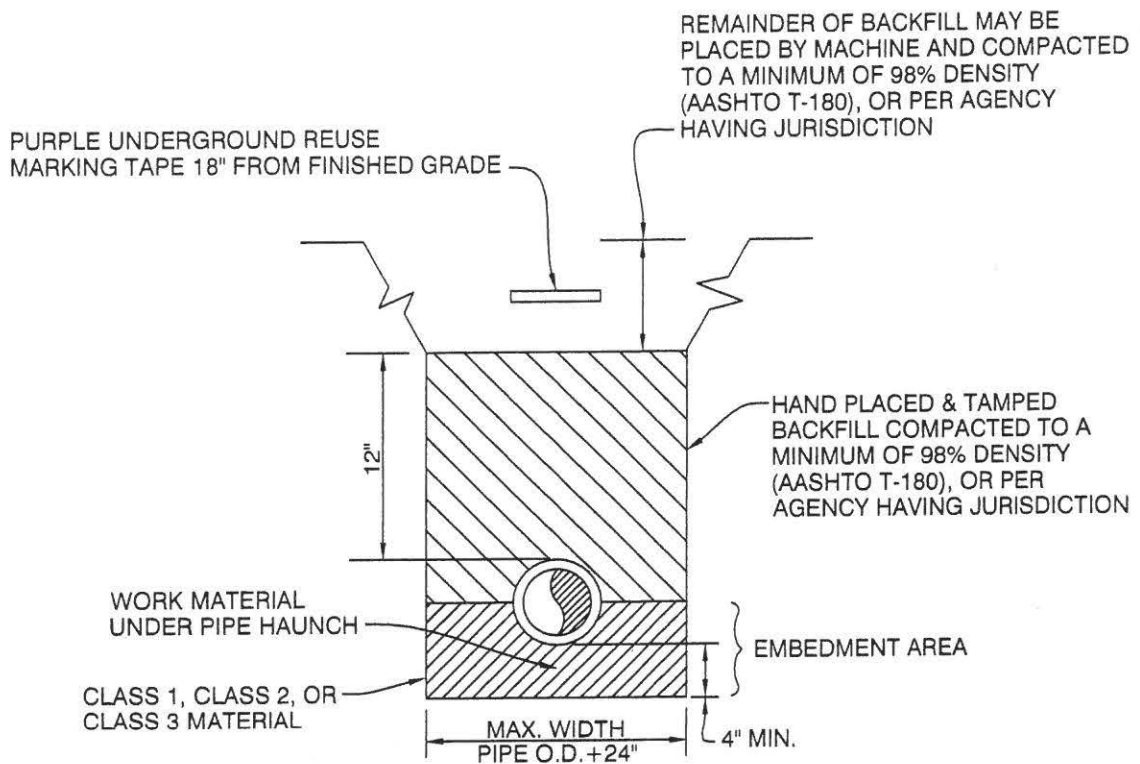
LOXAHATCHEE RIVER DISTRICT

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**TYPICAL REUSE SERVICE CONNECTION IN UNPAVED
 COMMON AREAS, PUBLIC ALLEYS OR EASEMENTS**

RU-3



NOTES:

CLASS 1 MATERIAL - ANGULAR .25" TO .75" GRADED STONE SUCH AS CORAL, CRUSHED STONE, OR CRUSHED SHELLS OR BEDDING ROCK (100% PASSING 1" SIEVE).

CLASS 2 MATERIAL - COURSE SAND AND GRAVEL'S WITH MAXIMUM PARTICLE SIZE OF .75" WITH SMALL PERCENTAGE OF FINES COMPACTED TO A MINIMUM OF 90% STANDARD PROCTOR DENSITY.

CLASS 3 MATERIAL - FINE SAND AND CLAYEY GRAVEL'S, INCLUDING FINE SANDS, SAND-CLAY MIXTURES AND GRAVEL-CLAY MIXTURES, COMPACTED TO A MINIMUM OF 90% STANDARD PROCTOR DENSITY. INCLUDED IN CLASS 3 ARE EXISTING SOIL TYPES CLASSIFIED AS SELECT BACKFILL.

IF CLASS 1 MATERIAL IS USED FOR BEDDING, IT MUST BE USED FOR THE ENTIRE EMBEDMENT. A DRY TRENCH SHALL BE MAINTAINED WHEN USING CLASS 2 AND CLASS 3 MATERIAL.

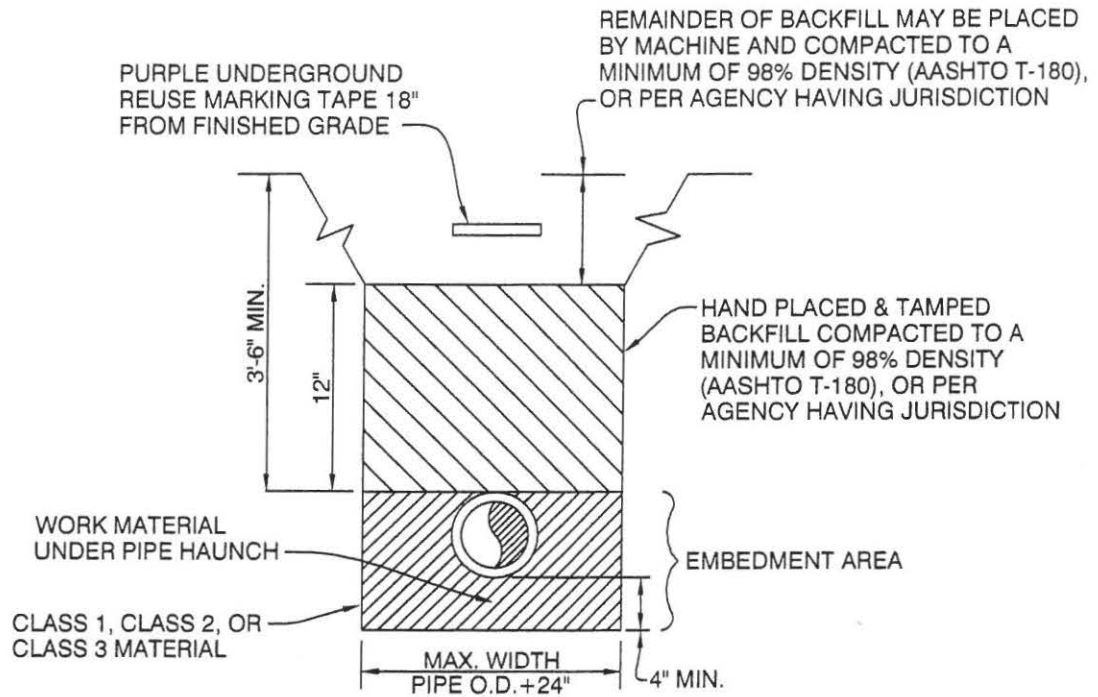
LOXAHATCHEE RIVER DISTRICT

N.T.S.

REVISION:
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TYPICAL REUSE DIP EMBEDMENT

RU-4



NOTES:

CLASS 1 MATERIAL - ANGULAR .25" TO .75" GRADED STONE SUCH AS CORAL, CRUSHED STONE, OR CRUSHED SHELLS OR BEDDING ROCK (100% PASSING 1" SIEVE).

CLASS 2 MATERIAL - COURSE SAND AND GRAVEL'S WITH MAXIMUM PARTICLE SIZE OF .75" WITH SMALL PERCENTAGE OF FINES COMPACTED TO A MINIMUM OF 90% STANDARD PROCTOR DENSITY.

CLASS 3 MATERIAL - FINE SAND AND CLAYEY GRAVEL'S, INCLUDING FINE SANDS, SAND-CLAY MIXTURES AND GRAVEL-CLAY MIXTURES, COMPACTED TO A MINIMUM OF 90% STANDARD PROCTOR DENSITY. INCLUDED IN CLASS 3 ARE EXISTING SOIL TYPES CLASSIFIED AS SELECT BACKFILL.

IF CLASS 1 MATERIAL IS USED FOR BEDDING, IT MUST BE USED FOR THE ENTIRE EMBEDMENT. A DRY TRENCH SHALL BE MAINTAINED WHEN USING CLASS 2 AND CLASS 3 MATERIAL.

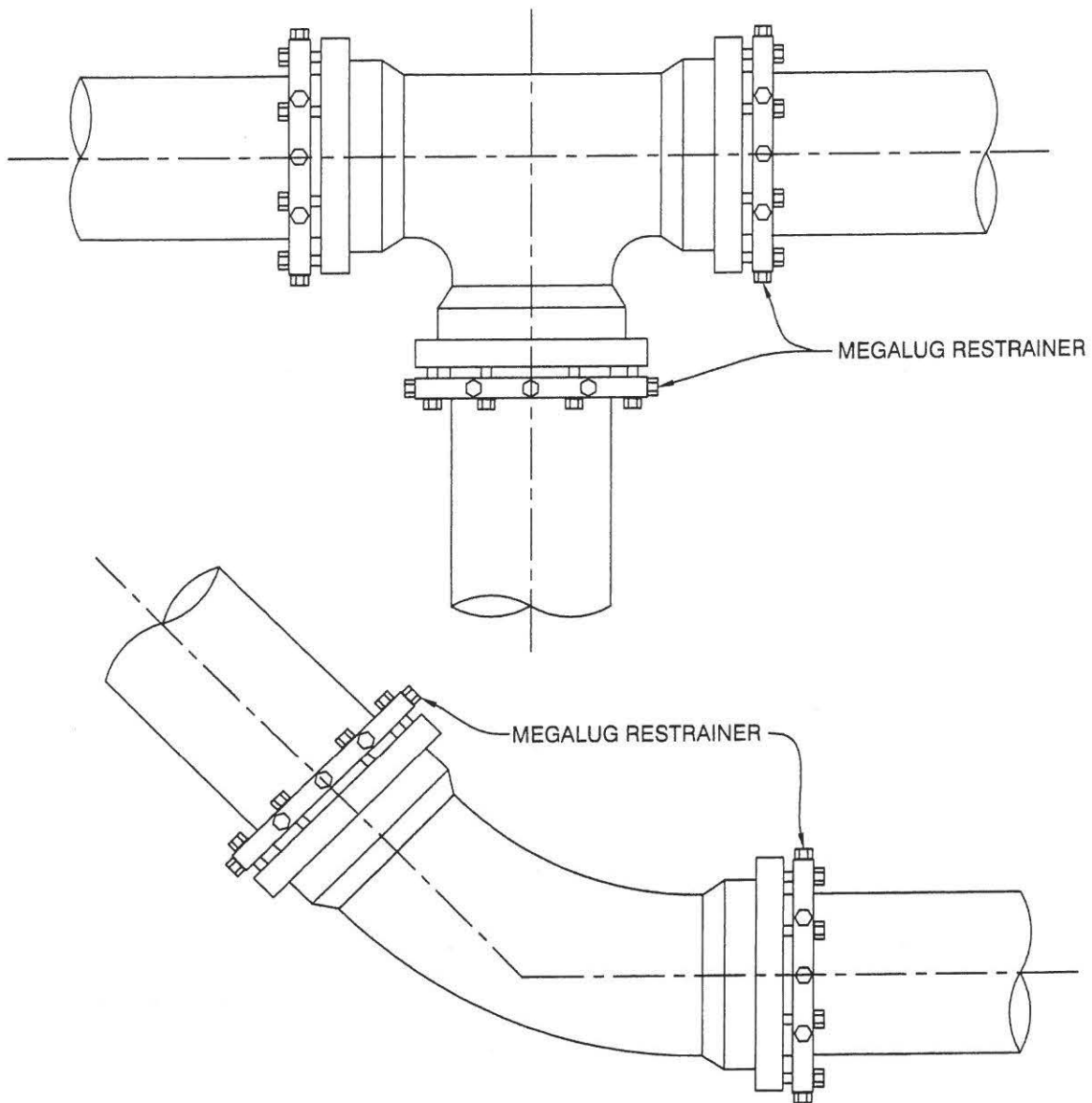
LOXAHATCHEE RIVER DISTRICT

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TYPICAL REUSE PVC PIPE EMBEDMENT

RU-5



NOTES:

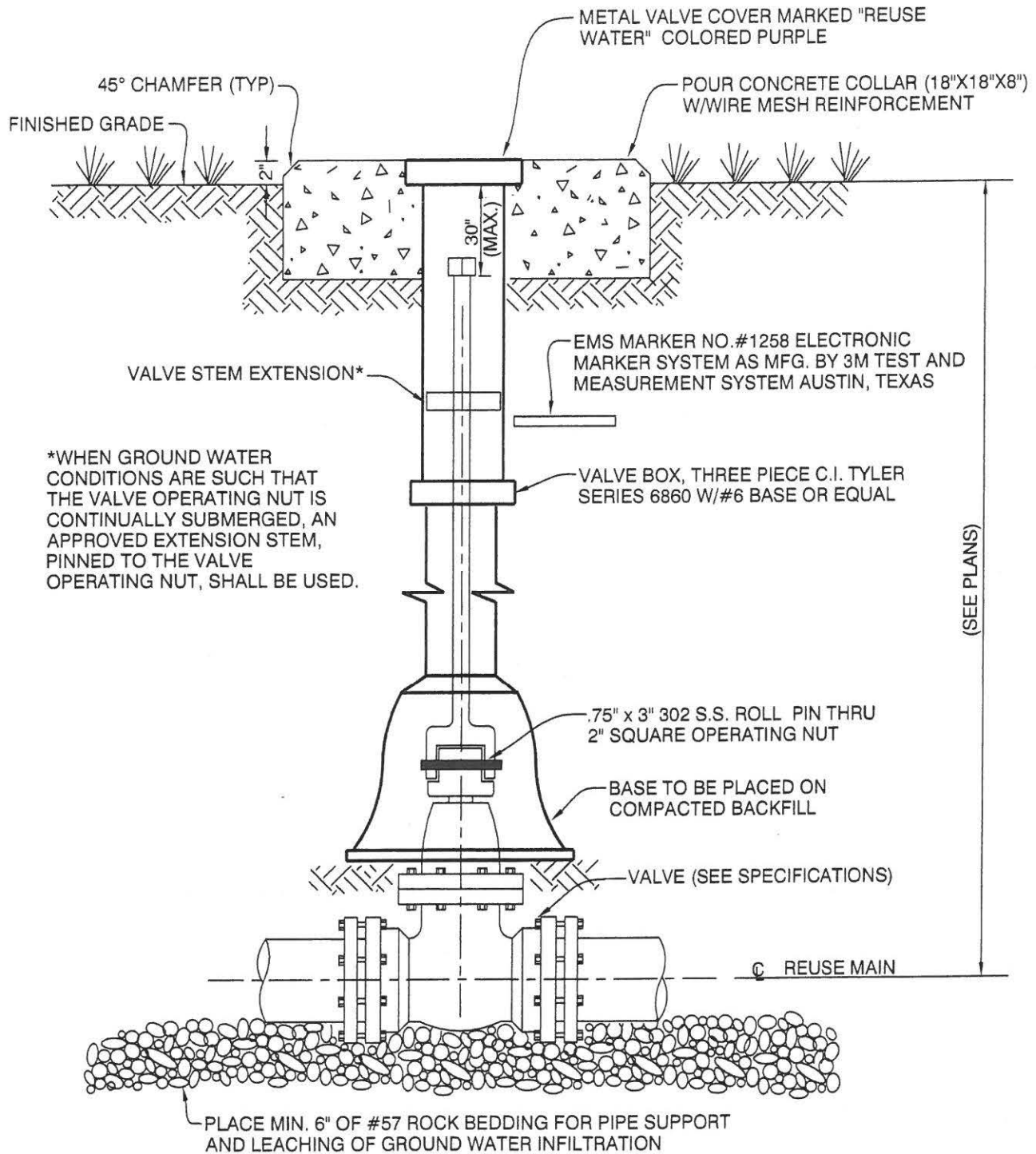
1. RETAINER GLANDS FOR PVC PIPE OR DUCTILE IRON PIPE SHALL BE USED AT BEND'S OR TEE'S; RETAINER GLANDS SHALL BE MANUFACTURED BY UNI-FLANGE CORP., OR "MEGALUG" BY EBAA IRON SALES INC., OR DISTRICT APPROVED EQUAL.
2. THE NUMBER OF JOINTS RESTRAINED EACH SIDE OF ANY FITTING OR VALVE SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS' RECOMMENDATION.
3. ALL BEND'S & TEE'S SHALL HAVE AN EMS INSTALLED.

LOXAHATCHEE RIVER DISTRICT

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TYPICAL REUSE THRUST BLOCK

RU-6



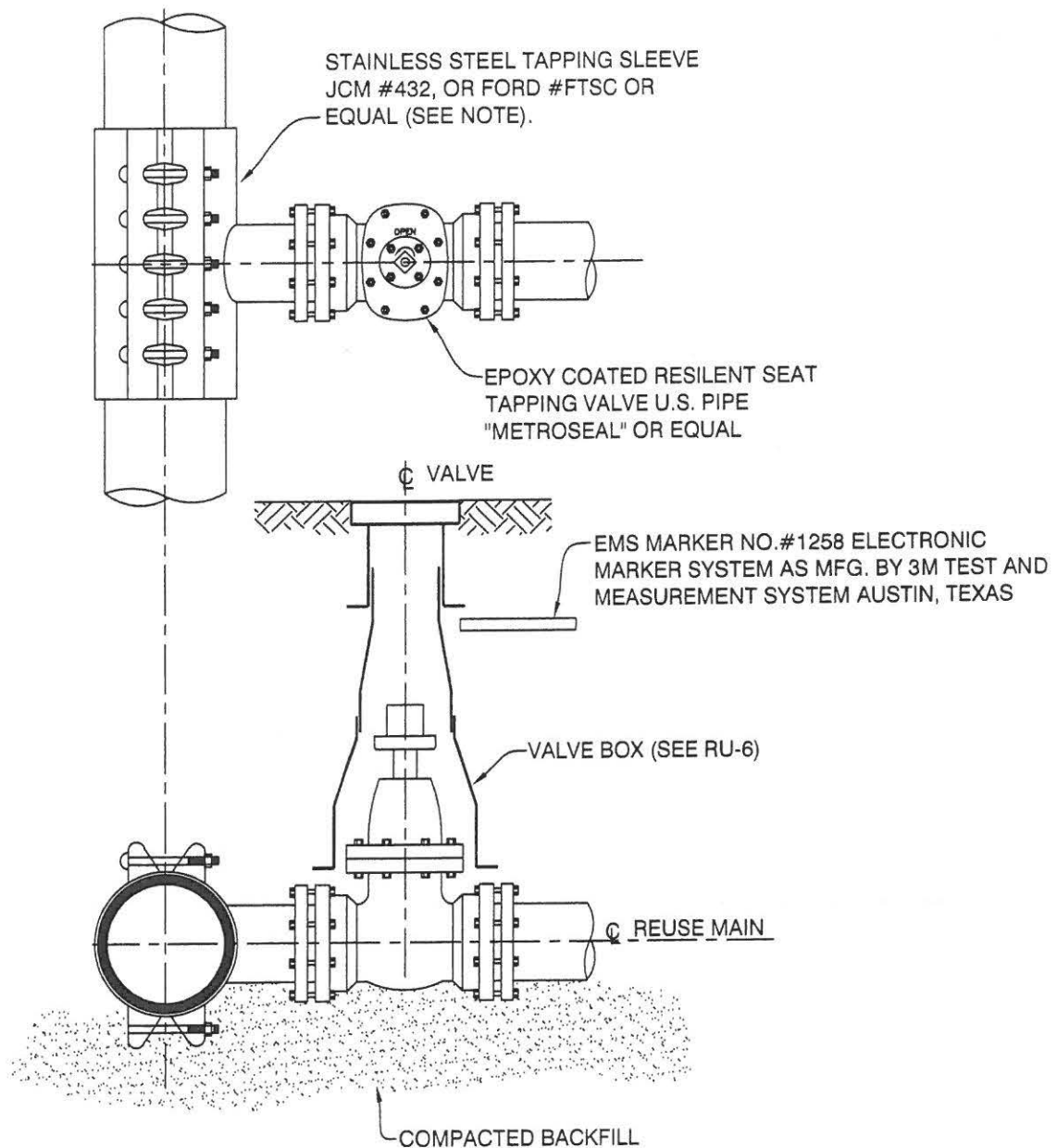
LOXAHATCHEE RIVER DISTRICT

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REVISION:
APRIL, 2012

TYPICAL REUSE BURIED VALVE DETAIL

RU-7



NOTES:

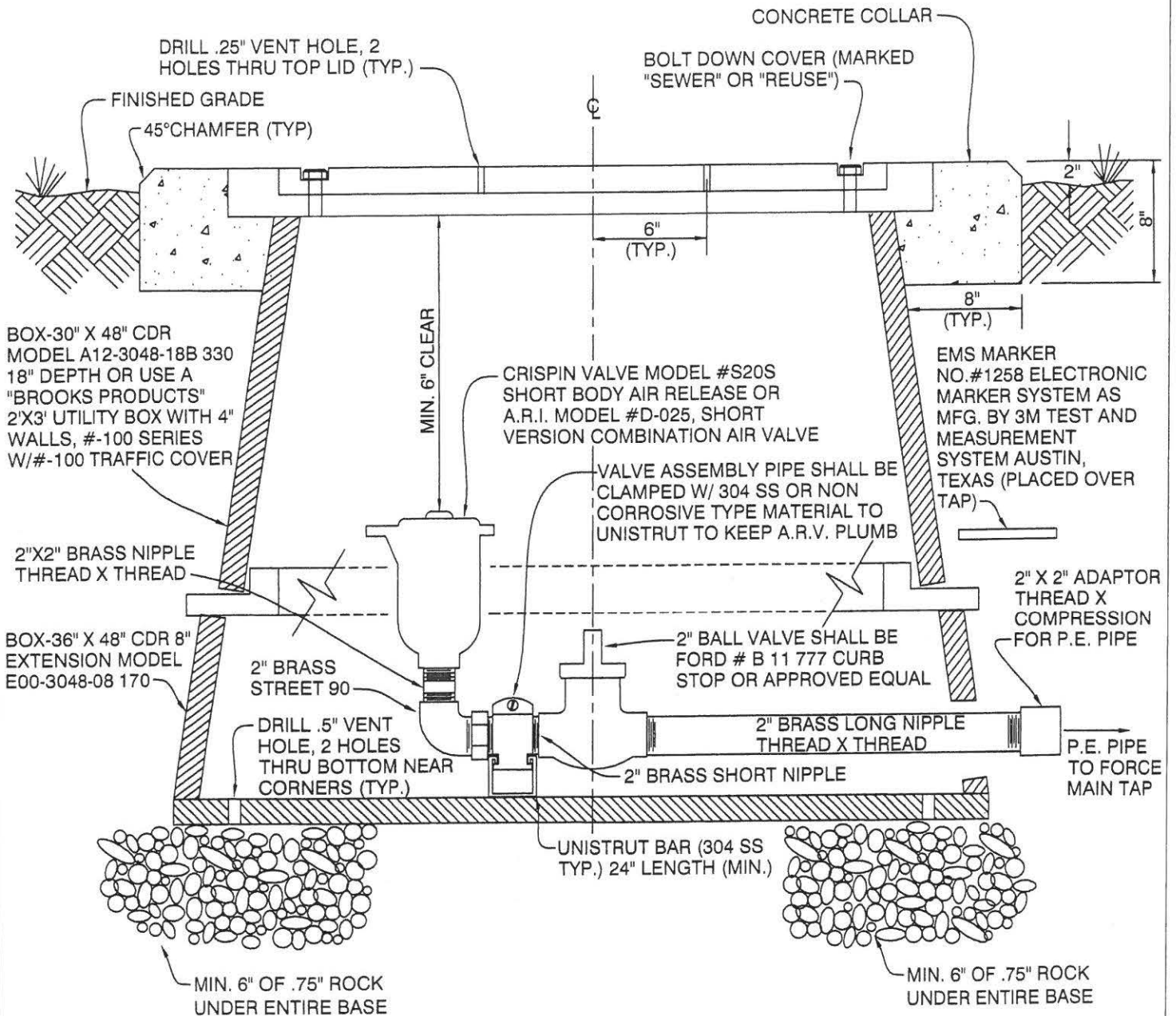
STAINLESS STEEL TAPPING SLEEVE WITH 304 S.S. BOLTS AND NUTS AND FUSION BONDED EPOXY COATING (12 MIL. MINIMUM), OR EQUAL.
ALL SLEEVES SHALL BE PRESSURE TESTED.

LOXAHATCHEE RIVER DISTRICT

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TYPICAL TAPPING REUSE WATER MAIN

RU-8



NOTE:

THIS DETAIL TO BE USED ONLY WITH DISTRICTS' PRIOR APPROVAL

LOXAHATCHEE RIVER DISTRICT

**TYPICAL ALTERNATE
REUSE AIR RELEASE VALVE DETAIL**

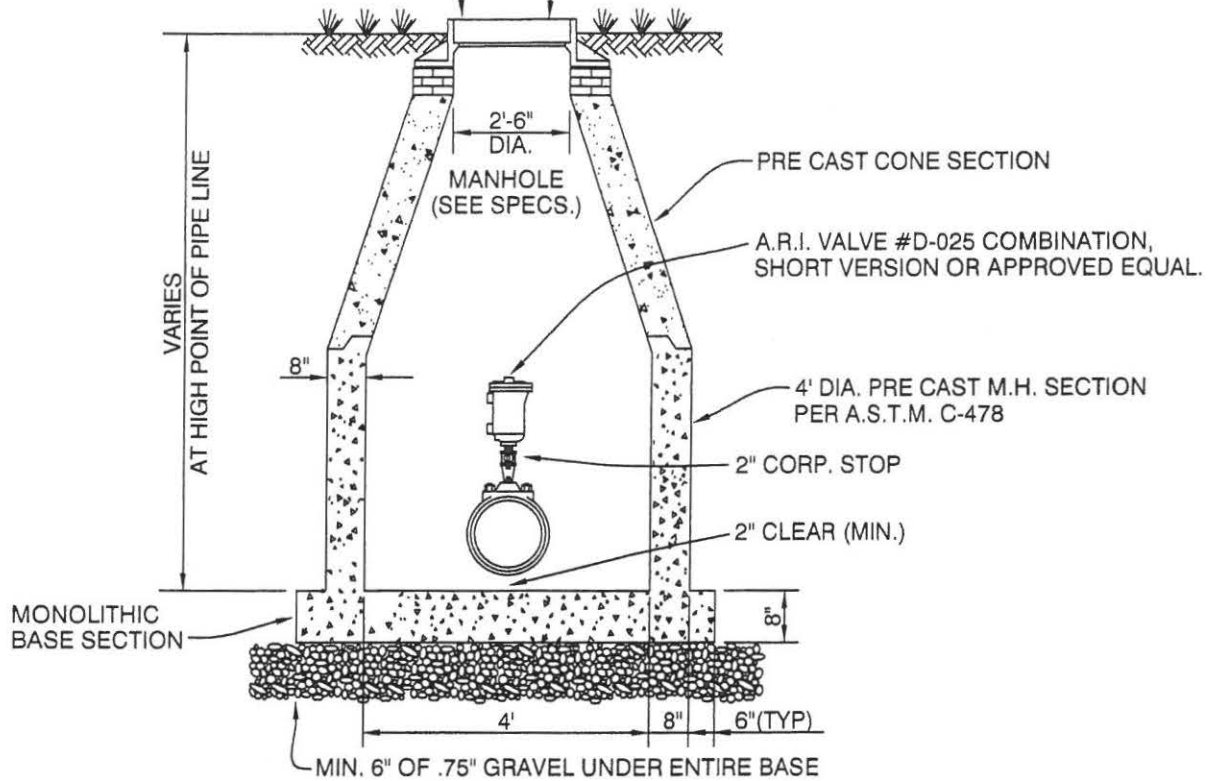
RU-9

N.T.S.

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M.H. COVER TO BE PLACED 2" ABOVE
FINISHED GRADE IN LANDSCAPED AREAS

FRAME AND DOUBLE COVER U.S.
FOUNDRY #230-AB-M OR EQUAL



NOTES:

1. IF OFFSET CONDITION IS UTILIZED, AIR VALVE IN MANHOLE STRUCTURE SHALL BE ADEQUATELY SUPPORTED ON A 4" THICK CONCRETE PAD ON M.H. FLOOR.
2. IN SITUATIONS WHERE A FORCE MAIN CROSSES A CANAL OR IS ATTACHED TO A BRIDGE, WHERE A STRUCTURE IS NOT NECESSARY, AN A.R.V TYPE A.R.I. MODEL #S-050-C SHALL BE USED.

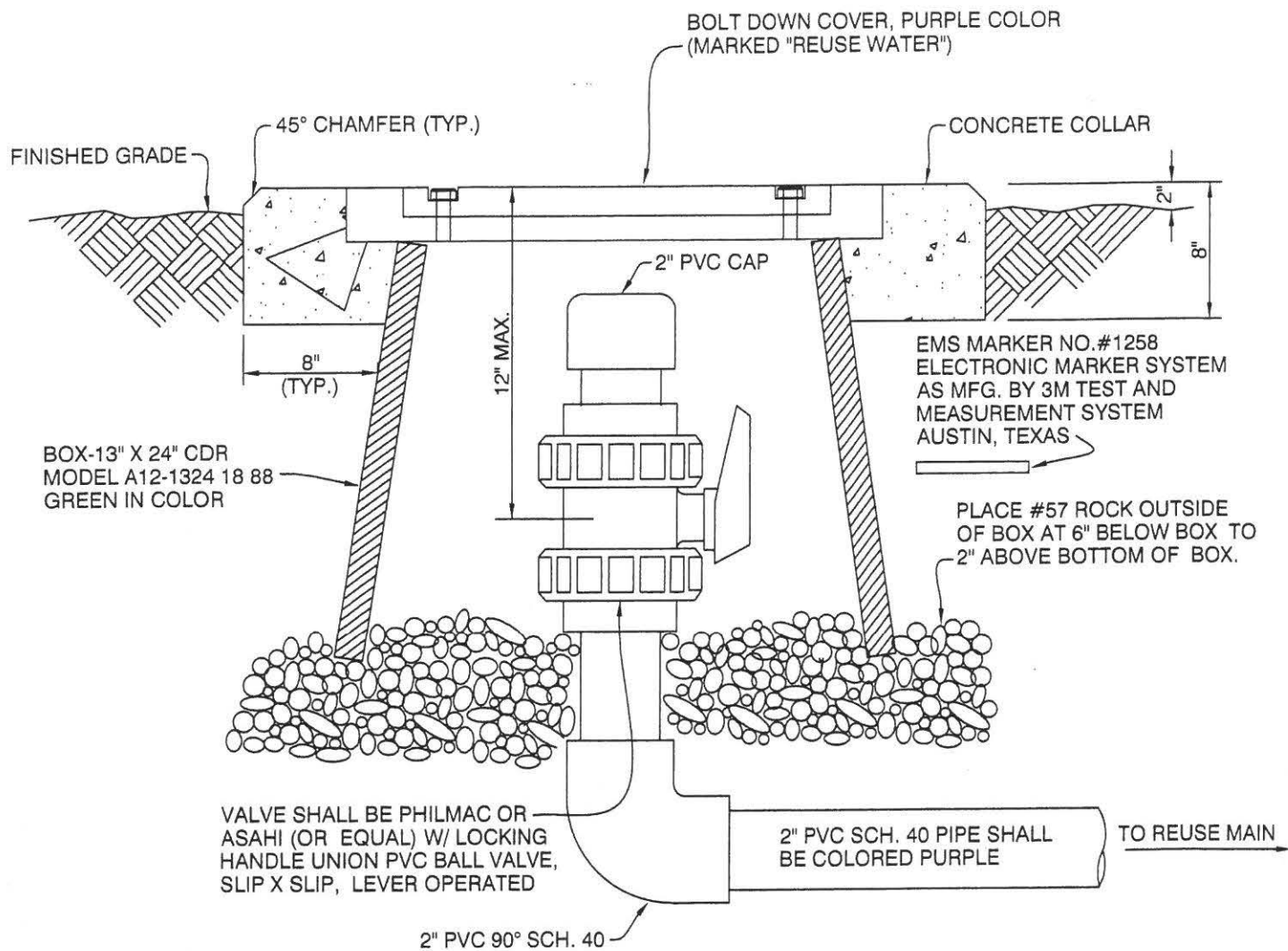
LOXAHATCHEE RIVER DISTRICT

N.T.S.

REVISION:
APRIL, 2012

AUTOMATIC AIR RELEASE VALVE DETAIL

RU-10

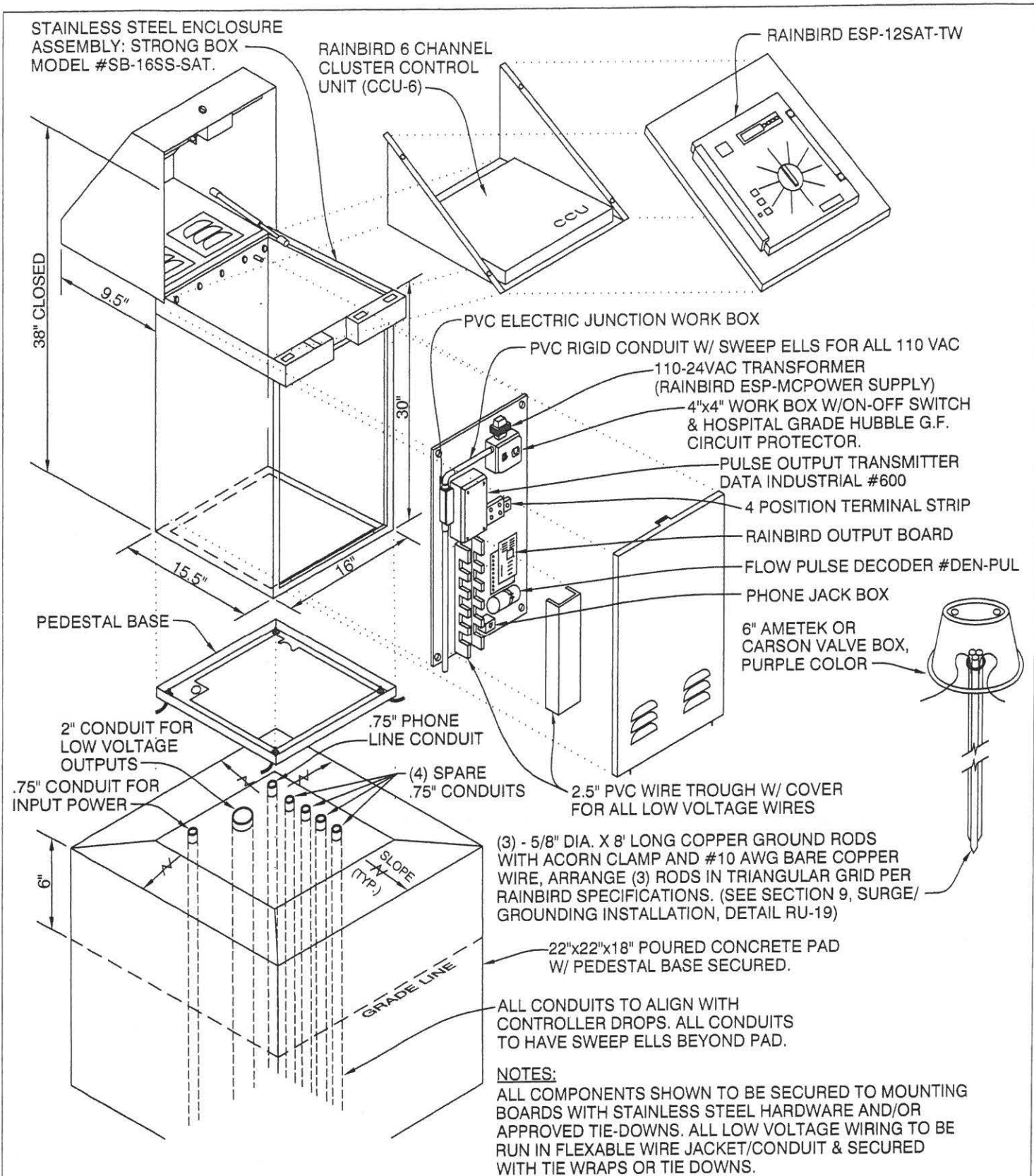


LOXAHATCHEE RIVER DISTRICT

TYPICAL SAMPLING / REUSE
FLUSHING PORT DETAIL

RU-11

N.T.S.
REVISION:
APRIL, 2012

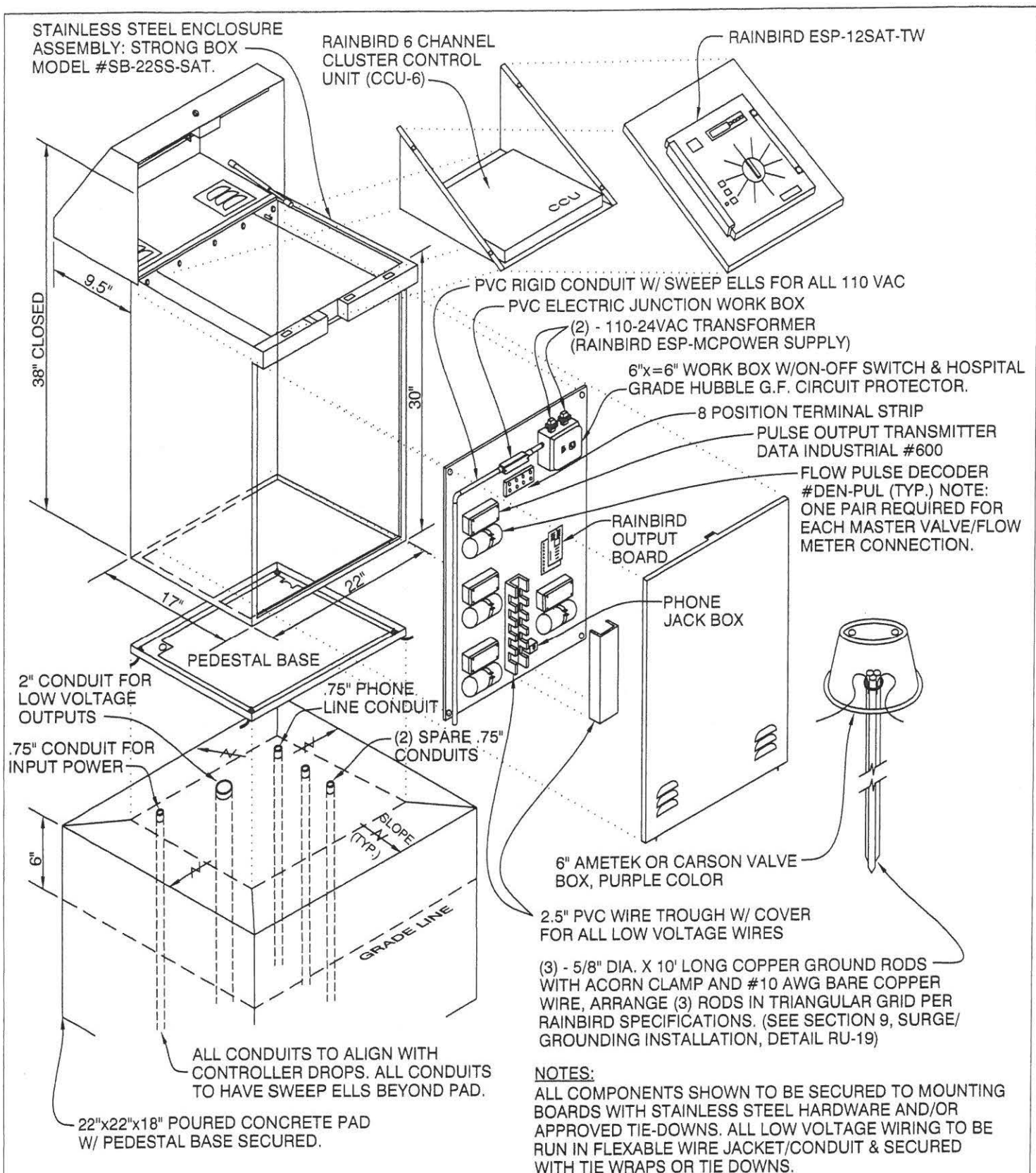


LOXAHATCHEE RIVER DISTRICT

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REUSE WATER SYSTEM CCU / SATELLITE ENCLOSURE FOR SINGLE POINT OF CONNECTION

RU-12

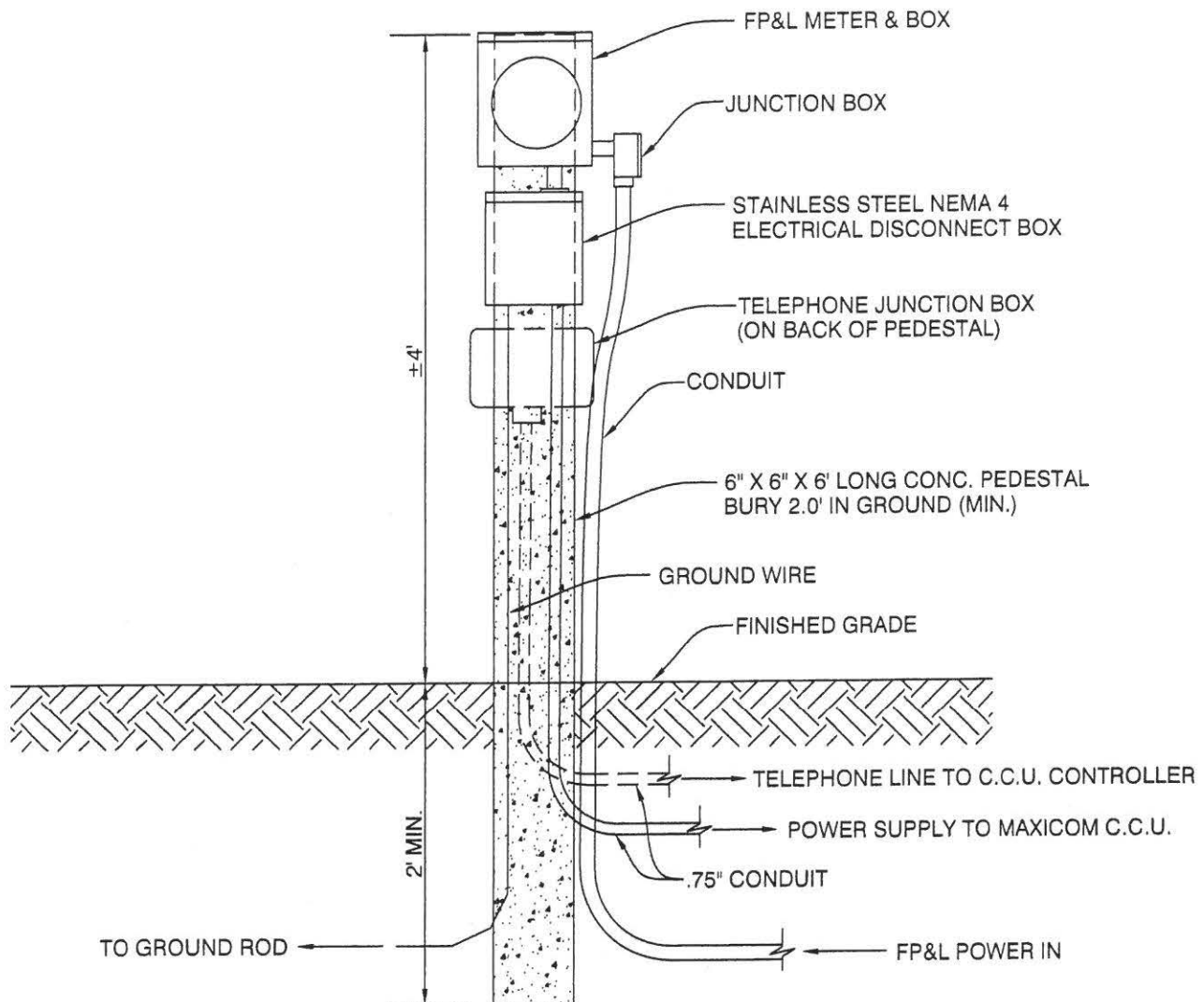


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REUSE WATER SYSTEM CCU / SATELLITE ENCLOSURE FOR MULTIPLE POINT OF CONNECTION

RU-13



NOTES:

CONTRACTOR SHALL FURNISH AND INSTALL CONCRETE PEDESTAL AND STAINLESS STEEL NEMA 4 DISCONNECT SWITCH AND ENCLOSURE.
CONTRACTOR SHALL FURNISH AND INSTALL ALL CONDUIT AND WIRES BETWEEN PEDESTAL FIXTURES AND CCU/ SATELLITE ENCLOSURE.

LOXAHATCHEE RIVER DISTRICT

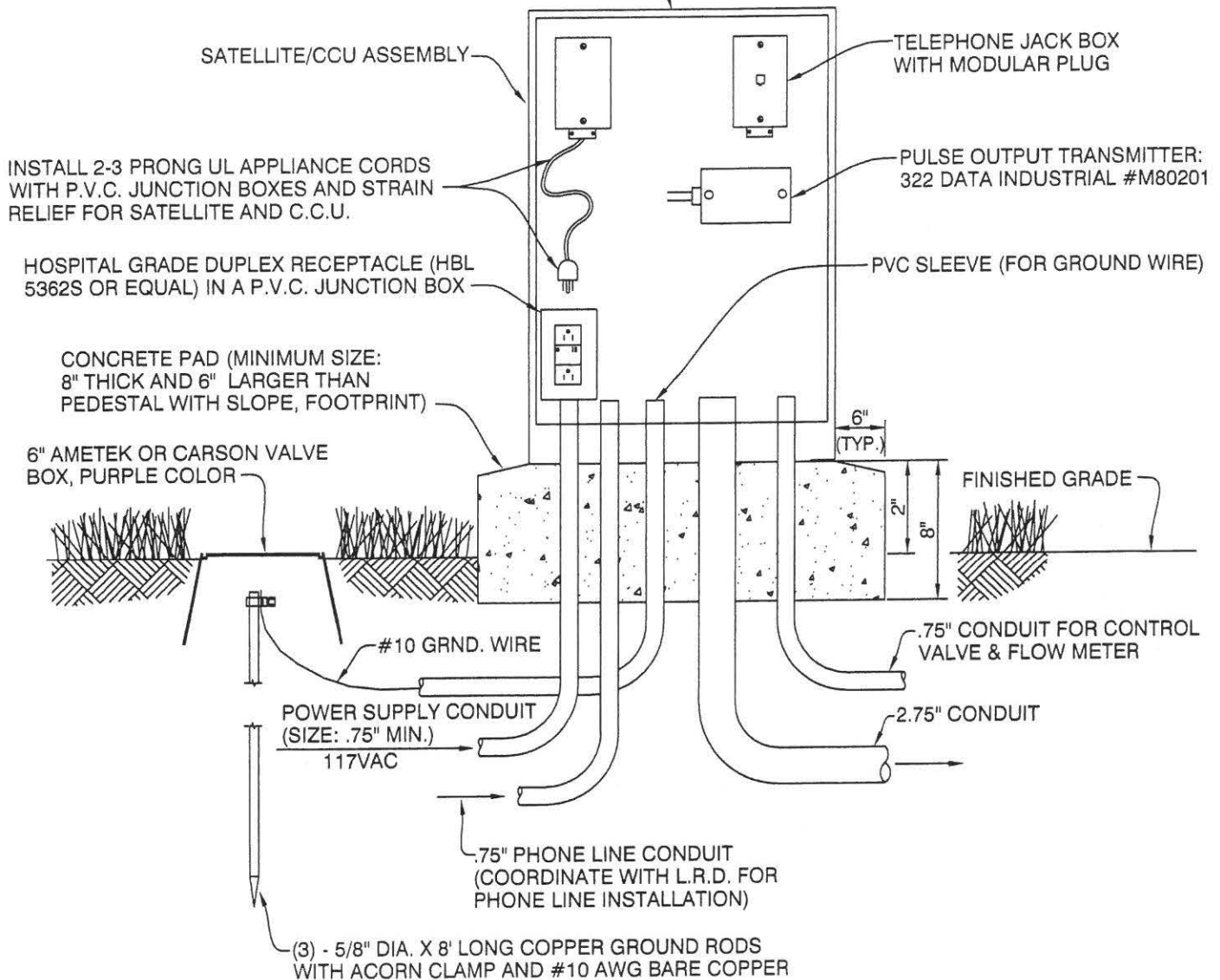
N.T.S.

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APRIL, 2012

TYPICAL REUSE POWER PEDESTAL

RU-14

ESP-SITE-SAT-12 STATION CLUSTER CONTROL-6 UNIT IN
STAINLESS STEEL PEDESTAL ENCLOSURE: (RAIN BIRD)
ESP-SITE SATELLITE SERIES CONTROLLER #M45800
(REQUIRES 120-VOLT 60-CYCLE POWER SUPPLY)



NOTE:

ALL CONDUITS TO HAVE SWEEP ELL'S, ALL INTERNAL COMPONENTS
SHALL BE MOUNTED WITH STAINLESS STEEL HARDWARE.

RAINBIRD SPECIFICATIONS, (SEE SECTION 9, SURGE/ GROUNDING INSTALLATION.)

LOXAHATCHEE RIVER DISTRICT

N.T.S.

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APRIL, 2012

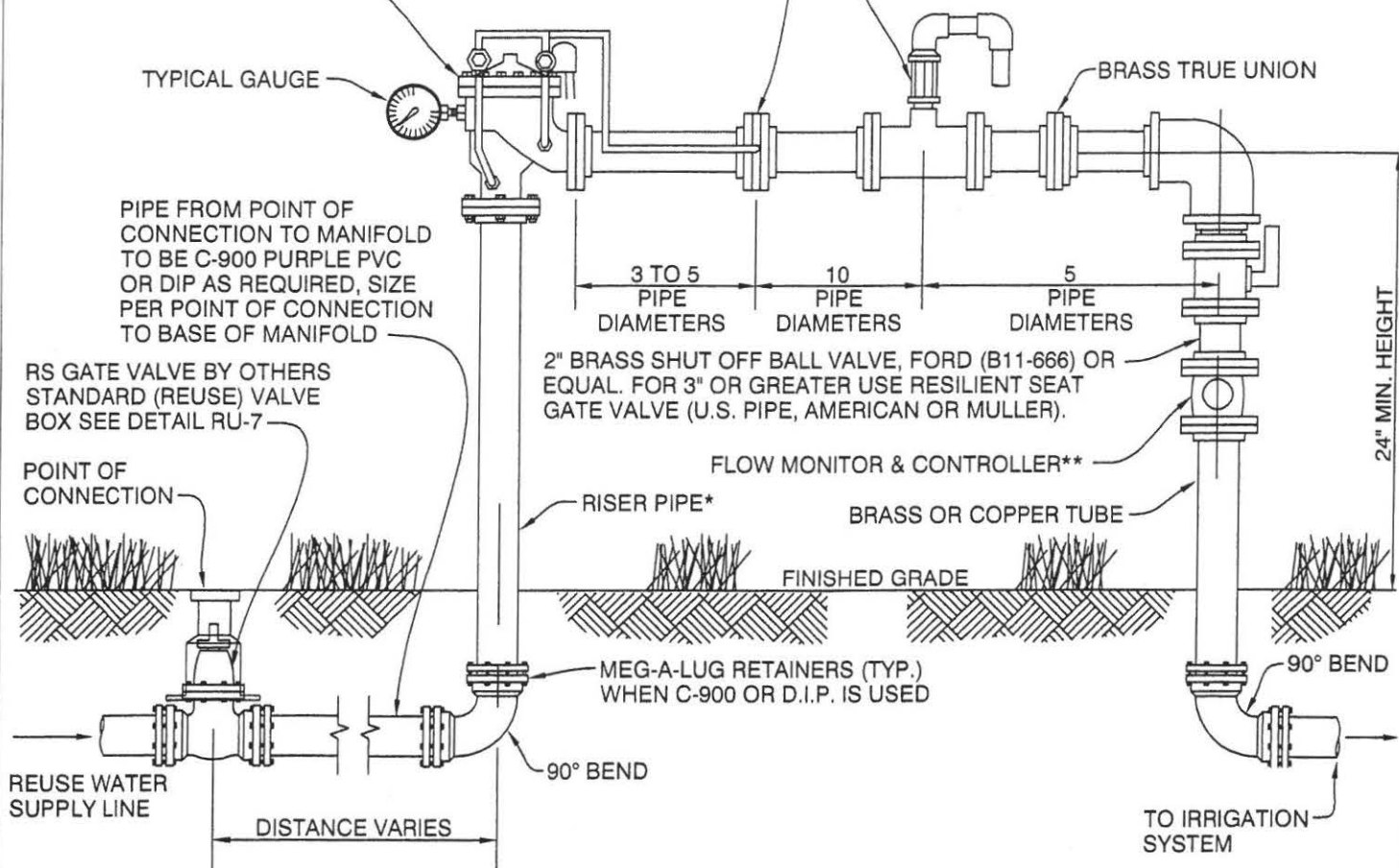
**SATELLITE SERIES CONTROLLER WITH S.S.
ENCLOSURE FOR SINGLE POINT OF CONNECTION**

RU-15

CONTROL VALVE: - AMES CO. MODEL 951-651A-15-43-02-38-KX-Y OR CLA-VALVE MODEL 49A-03-B-S-SS-KC-Y COMBINATION RATE OF FLOW/ PRESSURE REDUCING/SOLENOID SHUT OFF (24 VAC.) N.C. ANGLE CONFIGURATION FLANGED. VALVE BODY TO BE EPOXY COATED WITH STAINLESS STEEL TRIM. ORIFICE PLATE AS SPECIFIED. SIZE TO BE DETERMINED BY IRRIGATION DESIGNER.

ORIFICE PLATE: SIZED TO MATCH VALVE, SHOP DRAWING SUBMITTAL REQUIRED TO VERIFY FLOW RATE.

FLOW SENSOR: DATA INDUSTRIAL #IR STAINLESS STEEL SERIES: 2" #228 BR 2001 - 1211 IPS (TAPPING SADDLE FOR PIPE OVER 3")



ENTIRE MANIFOLD (EXCLUDING ELECTRICAL CONNECTIONS AND ADJUSTING CONTROLS) SHALL BE PRIMED AND PAINTED, (SEE DETAIL #RU-18)

*MANIFOLD FABRICATION: MANIFOLDS TO BE FABRICATED USING DUCTILE IRON, BRASS PIPING, OR COPPER TUBE, MIN. SIZE-2".

**IN ORDER TO CONTROL DOWNSTREAM FLOWS A PRESSURE FLOW MONITORING DEVICE SHALL BE FURNISHED AND INSTALLED BY THE OWNER. THE CONTROLLER SHALL SHOW TOTAL FLOW, IN GPD AND GPM. FLOW CONTROL DEVICE SHALL BE SIMILAR TO THAT AS MFG. BY "RAINBIRD" SAT- SITE OR "HOOVER" HYDRO FLOW METER.

NOTE:

PRESSURE GAGES SHALL BE INSTALLED ON HIGH AND LOW SIDE PORTS OF CONTROL VALVE.

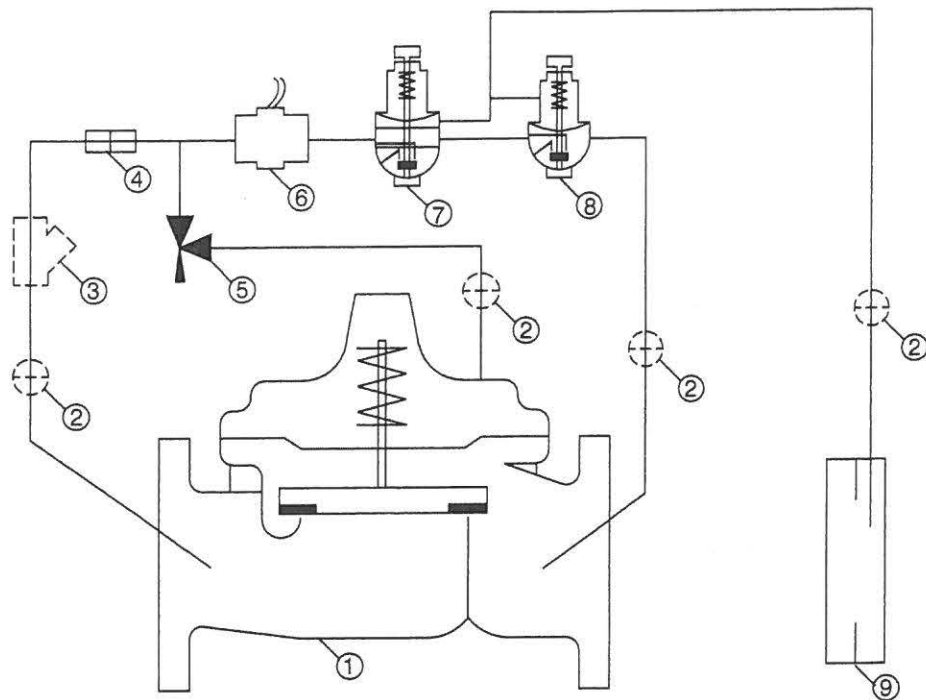
LOXAHATCHEE RIVER DISTRICT

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APRIL, 2012

REUSE WATER POINT OF CONNECTION DETAIL

RU-16



1. CONTROL VALVE
2. ISOLATION COCKS
3. LARGE CONTROL FILTER
4. RESTRICTION FITTING
5. OPENING SPEED CONTROL
6. TWO-WAY SOLENOID (24VAC)
7. PRESSURE REDUCING PILOT
8. RATE OF FLOW PILOT
9. ORIFICE PLATE ASSEMBLY

NOTES:

ORIFICE PLATE ASSEMBLY SHOULD BE INSTALLED 1 TO 5
PIPE DIAMETERS DOWNSTREAM OF MAIN VALVE OUTLET.

RATE OF FLOW, PRESSURE REDUCING & SOLENOID SHUTOFF VALVE
EQUIPPED WITH LARGE CONTROL FILTER AND SPEED CONTROL

LOXAHATCHEE RIVER DISTRICT

N.T.S.

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TYPICAL CONTROL VALVE SCHEMATIC

RU-17

SPECIFICATIONS:

A. DUCTILE IRON, FERROUS METALS, BRASS AND COPPER

1. SANDBLAST OR POWER TOOL CLEAN REMOVING ALL RUST OR ASPHALTIC COATINGS.
2. APPLY ONE COAT OF TNEMEC 135 ALUMINUM EPOXY AT 6 MILS WET
3. APPLY ONE COAT OF TNEMEC 135 PIGMENTED EPOXY AT 6 MILS WET
4. INSTALL SIKA 1A CAULKING IN ANY OPEN GAPS
5. APPLY ONE TNEMEC 73 SERIES URETHANE IN COLOR "SAFETY PURPLE" SCO8A AT 6 MILS WET

B. BRASS AND COPPER

1. SOLVENT CLEAN WITH R-97 SOLVENT
2. APPLY ONE FULL COAT OF TNEMEC 135 PIGMENT EPOXY AT 6 MILS WET
3. APPLY ONE TNEMEC 73 SERIES URETHANE IN COLOR "SAFETY PURPLE" SCO8A AT 6 MILS WET

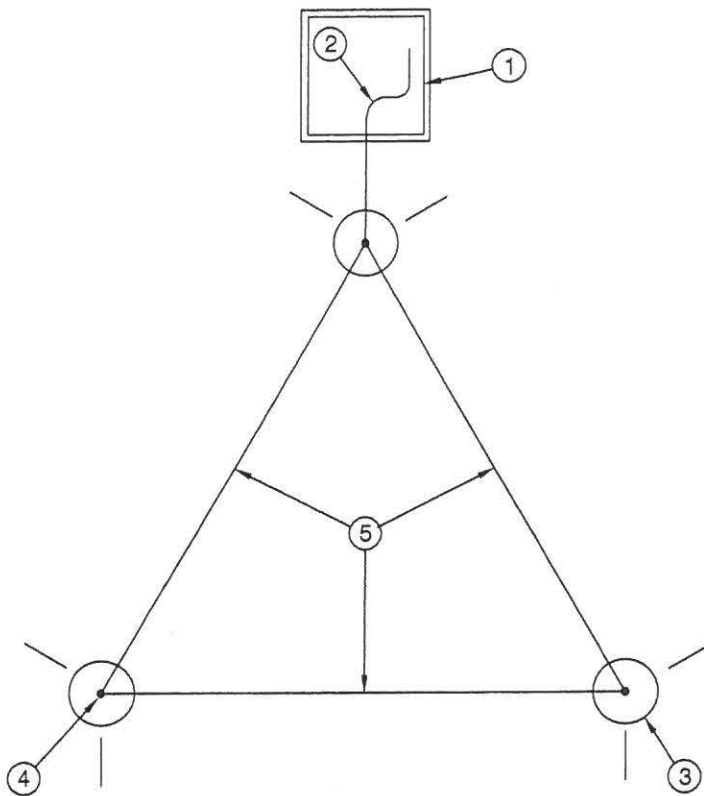
LOXAHATCHEE RIVER DISTRICT

N.T.S.

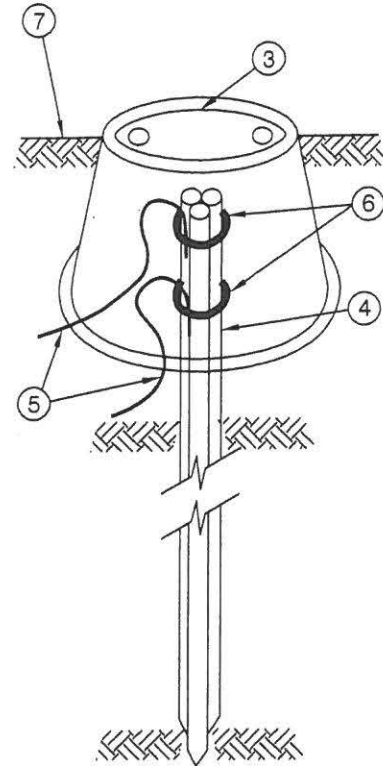
REVISION:
APRIL, 2012

PIPE PAINTING SPECIFICATIONS FOR ALL
REUSE WATER POINT OF CONNECTIONS

RU-18



GROUND ROD LAYOUT



GROUND ROD ASSEMBLY

LEGEND:

1. FIELD SATELLITE OR CCU ASSEMBLY.
2. #10 AWG SOLID BARE COPPER WIRE FROM GROUNDING ROD TO SATELLITE OR CCU. MAKE WIRE AS SHORT AND STRAIGHT AS POSSIBLE.
3. COVER GROUNDING ROD WITH 10" ROUND VALVE BOX.
4. 5/8" X 8' COPPER CLAD GROUNDING ROD. INSTALL RODS IN SOIL IN A TRIANGULAR PATTERN SPACED A MINIMUM OF 8' APART FROM EACH OTHER. GROUNDING GRID TO HAVE A RESISTANCE OF 5 OHMS OR LESS.
5. #10 AWG BARE COPPER BETWEEN GROUNDING RODS.
6. BRASS WIRE CLAMP. USE SEPERATE CLAMP FOR EACH WIRE.
7. FINISH GRADE.

3-ROD GROUNDING GRID INSTALLATION:

THE 3 RODS SHALL BE DRIVEN INTO THE GROUND WITH THE TOP OF THE ROD AT LEAST 6" BELOW THE FINISH GRADE. THE RODS SHALL BE TIED TOGETHER BELOW GRADE WITH #10 GAUGE OR LARGER BARE COPPER WIRE. THE WIRE SHALL BE ATTACHED TO THE ROD USING A BRASS CLAMP. A SEPARATE BRASS CLAMP SHALL BE USED FOR EACH ATTACHMENT.

NOTE! NO MORE THAN ONE WIRE SHALL BE USED IN ANY INDIVIDUAL CLAMP - MULTIPLE WIRES SHALL NOT BE ALLOWED. ANY ROD THAT HAS A GROUND WIRE CONNECTED TO IT, COMING FROM THE SURGE ARRESTOR AT THE EQUIPMENT OR GROUNDING THE EQUIPMENT, SHALL HAVE A 6" AMETEK OR CARSON VALVE BOX, PURPLE COLOR INSTALLED AROUND THE TOP OF THE ROD. THIS SHALL PROVIDE FUTURE ACCESS FOR MAINTENANCE.

LOXAHATCHEE RIVER DISTRICT

N.T.S.

REVISION:
APRIL, 2012

3-ROD GROUNDING GRID DETAIL

RU-19

RECLAIMED WATER IN USE FOR IRRIGATION



Do not drink
No beber
No swimming
No nadar



Loxahatchee River District
Preserving Nature by Design™

RECLAIMED WATER IN USE FOR IRRIGATION

Do not
Drink



No
Beber



Loxahatchee River District
Preserving Nature by Design™

LOXAHATCHEE RIVER DISTRICT

N.T.S.

REVISION:
APRIL, 2012

SIGNAGE

RU-20

1. TWO (2) SETS OF PRINTS SHALL BE SUBMITTED TO THE DISTRICT FOR REVIEW 48 HOURS PRIOR TO REQUESTING INSPECTIONS SUCH AS, FINAL INSPECTION, PRESSURE TESTS, SANITARY SEWER LAMPING OR ANY OTHER ELEMENT OF THE SYSTEM WHICH IS DETERMINED BY THE DISTRICT TO REQUIRE CLARIFICATION.
2. THE DRAWINGS WILL BE REVIEWED BY THE DISTRICT FOR DEFICIENCIES. DEFICIENCIES WILL BE INDICATED ON ONE (1) SET OF PRINTS WHICH WILL BE RETURNED TO THE E.O.R. FOR NECESSARY CORRECTIVE ACTION.
3. UPON CORRECTION, TWO (2) SETS OF PRINTS (SIGNED AND SEALED BY A FLORIDA REGISTERED ENGINEER) SHALL BE SUBMITTED.
4. NO DISCLAIMERS ON DRAWINGS WILL BE ACCEPTED.
5. UPON FINAL SUBMITTAL OF AS BUILT DRAWINGS, AN AUTOCAD VER. 2006 TO 2009 AND ADOBE .PDF ELECTRONIC DATA FILE SHALL BE FURNISHED ON A CD-R DISK TO THE DISTRICT.
6. ALL SEWER ITEMS SHALL BE CATEGORIZED AND ASSIGNED TO THE FOLLOWING DRAWING LAYERS:
I.Q. MAIN, VALVES, TEES, FITTINGS, JOINTS, ARV, LOW POINT DRAIN, AND APPURTENANCES.

REQUIRED INFORMATION ON AS BUILT DRAWINGS

THE FOLLOWING LIST OF REQUIRED INFORMATION IS TO BE USED AS A GUIDE FOR SUBMITTAL OF RECORD DRAWINGS TO THE DISTRICT. ADDITIONAL INFORMATION MAY BE REQUIRED BY THE DISTRICT IF IT IS DETERMINED BY THE DISTRICT THAT THE INFORMATION SUPPLIED WOULD BE INSUFFICIENT FOR A UTILITY WORKER, WITH NO SURVEYING EXPERIENCE, TO BE ABLE TO LOCATE MAINS, FITTINGS, ETC.

GENERAL

1. DRAWINGS ON 24" X 36" BOND PAPER THAT WILL REPRODUCE LEGIBLY.
2. LABEL DRAWINGS "RECORD DRAWINGS" WITH DATE.
3. COMPLETE TITLE BLOCK WITH CURRENT FILE NAME.
4. CORRECT STREET/ROAD NAMES AND LOT AND BLOCK NUMBERS.
5. SHOW AS-BUILT CONSTRUCTED REUSE FACILITIES HEAVIED UP, BOLD OR BOXED OUT TO STAND OUT FROM REST OF EACH DRAWING.
6. THE AS BUILTS SHALL BE GEOREFERENCED TO THE STATE PLANE COORDINATES IN NAD 83/90, EAST ZONE, OR OTHER APPROVED PROJECTION, THE VERTICAL DATUM SHALL BE NGVD 29 OR NAVD 88 MINIMUM ACCURACY TOLERANCE MUST EQUAL 10 CENTIMETERS (3.94 INCHES).

PRESSURE PIPE

1. AS-BUILT DISTANCE OF MAINS AT 100' INTERVALS FROM CENTER LINE OF ROAD, EASEMENT, RIGHT-OF-WAY LINE, BUILDINGS, SEWER MAINS OR AS DETERMINED BY THE LOXAHATCHEE RIVER DISTRICT. EXTENSIONS OF AN IMAGINARY LINE WILL NOT BE ACCEPTABLE AS REFERENCED POINTS.
2. STATIONING OF EACH VALVE, FITTING, AIR RELEASE VALVE, SERVICE LINE, TAP, ETC., AND RADIAL DIMENSIONS (TIES) FROM A NEARBY PERMANENT OBJECT WHERE POSSIBLE. (SEE NOTE NO. 6 ABOVE).
3. TYPE OF MATERIALS INSTALLED - PIPE AND APPURTENANCES. INDICATE ALL LOCATIONS OF CHANGE OF MATERIAL INCLUDING JOINT TYPE (M.J., SLIP, RESTRAINED).
4. VALVE TYPE (BUTTERFLY, GATE, PLUG).
5. AS-BUILT LENGTH OF ALL JACK AND BORE CASINGS INDICATING DISTANCE FROM CENTER LINE OF PAVING TO EACH END OF CASING. THE AS-BUILT INVERT ELEVATION OF EACH END OF CASING, AND AS-BUILT DISTANCE FROM EACH END OF CASING TO LIMITS OF MECHANICAL JOINT PIPE IS ALSO REQUIRED.
6. AS-BUILT ELEVATIONS AT 100' INTERVALS AS WELL AS ANY MAJOR CHANGES IN DIRECTION AND/OR ELEVATION. ELEVATIONS SHOWN AT THESE INTERVALS AND CHANGES MUST SHOW TOP OF PIPE ELEVATION AND FINISHED GRADE ELEVATION AT THAT LOCATION. SHOW LOCATION OF EMS MARKERS.
7. UTILITY EASEMENTS SHALL BE CORRECTLY SHOWN AND DIMENSIONED WITH REFERENCED SEWER FACILITY.

LOXAHATCHEE RIVER DISTRICT

N.T.S.	REUSE RECORD DRAWING SUBMITTAL GUIDE	RU-21
REVISION: APRIL, 2012		

RECLAIMED WATER RTU DETAIL & SPECIFICATIONS

1. DESCRIPTION OF WORK

The specific attention of the Contractor is directed to the fact that the Owner has an existing Radio Telemetry System as manufactured by Data Flow Systems, Melbourne, Florida (321) 259-5009. For compatibility purposes, the Contractor will be required to obtain the Remote Terminal Unit (RTU) specified herein from Data Flow Systems (DFS) 321-259-5009. The Contractor shall furnish all materials, labor, tools, equipment, and appurtenances necessary for the proper completion of the work included in this Contract. The work covered by these specifications consists of providing all design, labor, tools, materials, and testing necessary for the supply of the RTU as described herein. The Contractor shall provide station(s) physical location information to DFS for radio communication study purposes. Information shall be provided in the form of GPS readings or street map with actual site location(s) clearly marked.

2. GENERAL

The RTU shall be DFS Model RTU204 and housed in a separate enclosure. The RTU enclosure shall be mounted on the antenna tower. The RTU shall be powered by 120 VAC commercial power, monitor local statuses and transmit those statuses to the existing central site when polled by the master radio. An Uninterruptible Power Source (UPS) shall be included with the RTU.

3. EQUIPMENT SPECIFICATION

3.1 REMOTE TERMINAL UNIT W/PLC BYPASS OPTION (RTU204)

The remote terminal unit shall be DFS Model RTU204. The RTU will be configured with the DFS Bypass Card. The RTU shall communicate with the central site via a two-way radio link and designed to accommodate the required plug-in function modules. Function module card connectors shall be gold-over-nickel plated to inhibit corrosion. The RTU shall be housed in a white color NEMA 4X 316 SS enclosure. All mounting hardware utilized shall be stainless steel. The enclosure shall be capable of being locked. The latches utilized to secure the door of each enclosure shall not require the use of a screwdriver to open or close.

3.2 POWER SUPPLY MODULE (PSM003)

The RTU shall include a Power Supply Module (PSM003). All function modules in the RTU shall run off DC voltage from +7.5 volts to +13 volts. The PSM shall supply +12 volts. A battery backup shall be provided in event of power failure. The power supply shall be surge protected. The power supply shall be short circuit protected by current limiting. Normal operation shall automatically resume when the short circuit overload is removed. The power supply shall be sized to operate the system with the battery removed. The power supply module shall provide a battery backed, isolated bias voltage source. The circuit breaker for the power supply module shall be part of the power supply module. Neither the use of tools nor the disconnection of any wires shall be required to replace the power supply module.

3.3 BACKUP BATTERY (UPS)

The RTU shall have the uninterruptible power supply (UPS) function built in. The RTU's internal Power Supply Module shall keep the battery at a float charge. The battery shall not be damaged by deep discharges.

3.4 RADIO INTERFACE MODULE

The RTU shall include a Radio Interface Module (RIM006). The RIM shall control the terminal radio during the polling sequence. The radio interface module shall have a service port to provide communications link monitoring. The service port shall also provide the capability to directly monitor and/or control each module in the remote terminal unit. The radio interface module utilized at the remote terminal units shall be interchangeable with the radio interface module at the central site. All communications shall be in ASCII and utilize an error detecting and correction data transfer protocol. Each radio interface module shall have a radio transceiver mounted to it. The radio shall be an FM transceiver. Replacement of the radio interface module shall trigger an automatic configuration of the new module to accommodate the site address and function (plug & play).

3.5 DIGITAL CONTROL MODULE (DCM003-4)

The RTU shall include a Digital Control / Monitor Module (DMM003-4). The DCM003-4 shall provide for remote control of four (4) independent devices up to 60 volts DC or 280 volts AC. The control relays shall be AC/DC mechanical relays. Each control point shall be capable of driving a 1.5 amp load @ 60 volts DC or a 1 amp load at 280 volts AC. Any discrete control point shall have the capability of being automatically controlled by any discrete monitor point, at the same RTU or at any other RTU. This shall be accomplished during configuration at the central site computer system and shall be available for an unlimited number of control points. The DCM003-4 shall also accept eight (8) ON/OFF inputs of 12 to 30 volts AC or DC. Voltages from 100 to 300 Volts AC or DC shall be accommodated with the use of an inline voltage converter device. Status reporting of these inputs shall have an accuracy of ±2 seconds - accuracy being defined as time of an occurrence to actual time recorded by the central site computer. The module shall not require interfacing relays to monitor 24 VDC, 115 VAC, 220

VAC or 480 VAC. The configuration of the monitor points as alarm points or monitor points (pump run time monitors) shall be operator selectable. The configuration shall not require any software or firmware changes in the system. The DCM003-4 shall have LEDs to indicate: the status of each output point; the status of each input point; receive communications; transmit communications; CPU fault; and power status. Replacement of the DCM003-4 shall trigger an automatic configuration of the new module by the central site computer (plug & play).

3.6 ANALOG MONITOR MODULE (AMM002)

The RTU shall include a Analog Monitor Module (AMM002). The AMM002 shall monitor up to 4 analog inputs. The AMM002 shall be capable of accepting 4-20 ma or 0-5 VDC on each of the inputs. The analog input shall have 12-bit accuracy. The AMM002 shall have support-configurable reporting granularity and alarm thresholds. The configuration parameters shall be downloaded over the radio link from the central site computer. All configurable parameters shall be operator-controlled. The AMM002 shall have LEDs to indicate: the status of each qualifier input point; receive communications; transmit communications; CPU fault; and power status. The AMM002 shall supply a 24 VDC power source for the 4-20 ma loops. Replacement of the AMM002 shall trigger an automatic configuration of the new module by the central site computer (plug & play). The AMM002 shall include one 4-20 MA surge protector for the flow meter input.

3.7 ANTENNA SUBSYSTEM

DFS shall determine the antenna type and height required for reliable communications. A high gain directional or omni antenna shall be used to transmit and receive data. The antenna mast/pole shall be hot dipped galvanized for corrosion protection. All mounting hardware shall be made of stainless steel. The coax cable shall be the type that utilizes an inert semi-liquid compound to flood the copper braid. The coax cable shall be of the RG-8 construction type and have the RF-loss characteristic of foam flex. The coax cable shall be RTC 400 as supplied by DFS. Type N connectors shall be utilized at both ends of the coax and sealed with 3-inch sections of Alpha FIT321-1-0 sealant shrink tubing. The coax cable shall be secured to the mast/pole with AE112 Bandit EVA-coated 316 stainless steel cable ties. The RTU shall be protected from electrical surge or transients entering through the coaxial cable by use of a IS-B50LN-C2 Polyphaser coaxial cable surge protector. (SEE DETAIL RU-24)

3.8 RTU MONITOR AND CONTROL POINTS

The RTU shall accommodate the following monitor and control points.

Discrete Input (DI)

- 1. VALVE OPENED
- 2. VALVE CLOSED
- 3. HIGH POND LEVEL

Discrete Output (DO)

- 1. VALVE OPEN
- 2. VALVE CLOSE Analog Input (AI)
- 1. FLOW RATE
- 2. FLOW VOLUME

4. INSTALLATION

In order to insure total system integration with the existing system, the contractor shall secure and provide the services of Data Flow Systems, Inc. for RTU hardware.

5. PROGRAMMING

Due to the implementation of the VTSCADA central station package, DFS is unable to provide the following services: antenna alignment fine-tuning procedure, configuration of RTU into the system, RTU point-by point verification at the central computer, and RTU screen generation. The provision of these services is the customer's responsibility. DFS services are limited to only those that can be performed at the RTU location.

6. WARRANTY

DFS shall warrant all hardware provided under this contract against all defects in material and workmanship for a period of one year. The RTU plug-in modules shall carry an additional 2-year return-to-manufacturer warranty and shall be covered against damage due to lightning and surge the entire three year period.

7. SPARE PARTS

Loxahatchee River District will provide the spare parts for the RTU:

DATA FLOW SYSTEMS PHONE:
321-259-5009 FAX: 321-259-4006
SALES REP.: RANDY WYATT
E-MAIL: randy@dataflowsys.com

DFS BILL OF MATERIALS:

- (1) RTU204, includes:
 - (1) Stainless Steel Enclosure
 - (1) Modular Backplane
 - (1) RF Pigtail
 - (1) Radio Interface Module/radio
 - (1) Analog Monitor Module
 - (1) Power Supply Module
 - (3) Spare Module Positions
 - (1) RTU Surge Protection Kit
 - (1) Polyphaser Coaxial Surge Protector
 - (1) Backup Battery
 - (1) 0-10 PSI Submersible Pressure Transducer
 - (1) Edco DRS-036 Analog Loop Isolator

- (1) RTU wiring services

- (1) Complete Antenna Subsystem, includes:

- (1) RTA411 Antenna & Coaxial Cable Assembly

- (1) Antenna Subsystem Installation

- (1) FCC Licensing services

RTU I/O

Analog Input: 1. Water Level

RTU I/O Input / Output Wiring Notes

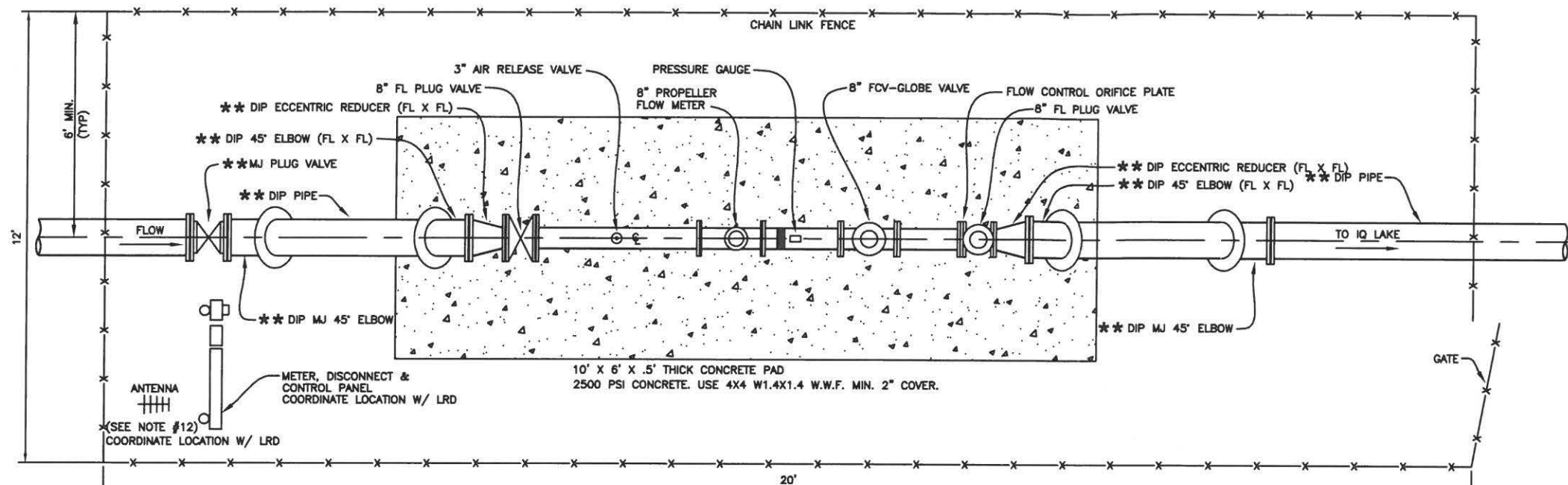
All analog inputs and outputs will be 4-20 mA

4-20 mA signals at minimum to provide 500 ohm impedance drive.

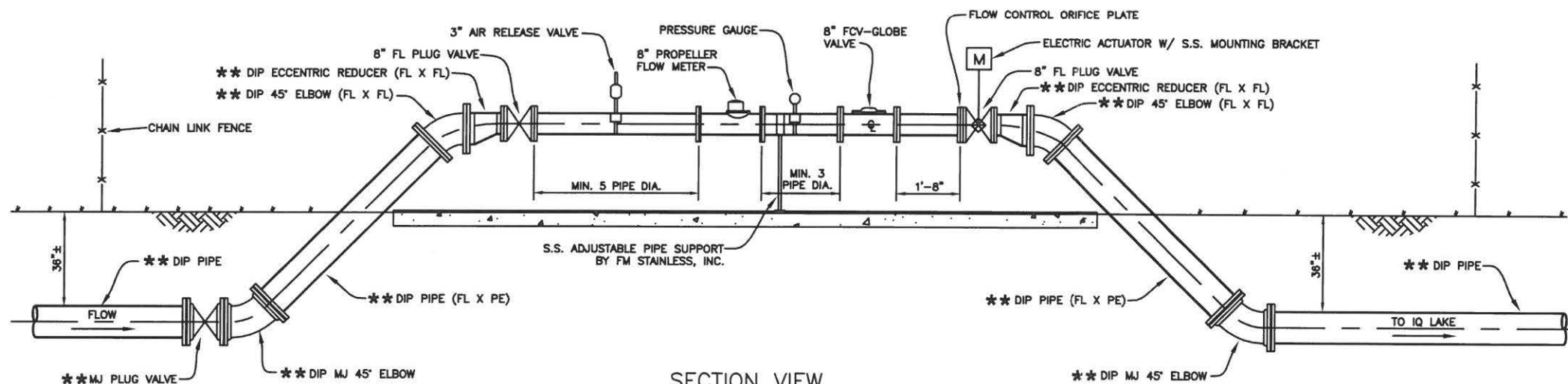
NOTES:

- 1. Due to the implementation of the VTSCADA central station package, DFS is unable to provide the following services: antenna alignment fine-tuning procedure, configuration of RTU into the system, RTU point-by point verification at the central computer, and RTU screen generation. Services are limited to only those that can be performed at the RTU location. Please note that DFS is now unable to dial into the system to perform remote diagnostics and troubleshooting. DFS is not responsible for any driver incompatibility with their new products. Any service related visit to this RTU location would be chargeable unless the visit is a direct result of their providing material or workmanship, which is warranted for a period of one year following installation.
- 2. DSF requests site names and locations are provided at time of ordering to allow radio study documents and FCC licensing services to be provided ASAP.
- 3. This spec is based on Loxahatchee River Environmental Control District's current standard telemetry requirements. If requirements differ a revised spec will follow.
- 4. The pressure transducer would be shipped to the customer for installation purposes.
- 5. All required conduit must be provided and installed by others before scheduling installation services.
- 6. All required underground locate information must be provided before DFS installation services can be scheduled. DFS will provide an underground locate information form. The Customer will be the underground locate Point of Contact. The Customer must provide a contact name and phone number for use by locate services should they need to gain access to a secured construction area or are unable to find the site based on locate info provided by the customer.
- 7. DFS services provide for the installation and termination of standard RTU wiring requirements.
- 8. This spec assumes that entry by DFS employees into "Confined Spaces" and/or "Permit-Required Confined Spaces" as defined by OSHA is not required by the scope of the work to be performed by DFS.
- 9. This quotation assumes that all electrical equipment to be accessed by DFS employees can be temporarily removed from service.
- 10. Only thoes items and services specifically listed above in the Bill of Material are included.

RECLAIMED WATER IQ STANDARD METERING STATION



PLAN VIEW
N.T.S.



SECTION VIEW
N.T.S.

NOTES:

- ALL FLANGED PIPE AND FITTINGS SHALL BE CLASS 53 DUCTILE IRON CEMENT LINED.
- MECHANICAL JOINT FITTINGS SHALL BE REQUIRED UNDERGROUND AND FLANGED FITTINGS ABOVE GROUND USE, NO UNIFLANGES PERMITTED.
- PAINT THE ABOVE GROUND ASSEMBLY, INCLUDING ENTIRE LENGTH OF THE RODS, IN ACCORDANCE WITH LRD CONSTRUCTION STANDARDS, AFTER MANUFACTURERS RECOMMENDED SURFACE PREPARATION IS COMPLETED. DO NOT PAINT OVER NAME/SERIAL PLATE, STAINLESS STEEL OR BRASS FITTINGS.
- SPOOL PIECES SHALL BE A MINIMUM IN LENGTH OF 5 TIMES THE DIAMETER OF THE PIPE UPSTREAM OF THE METER AND A MINIMUM IN LENGTH OF 3 TIMES THE DIAMETER OF THE PIPE DOWNSTREAM OF THE METER. IF THE METER MANUFACTURERS CRITERIA EXCEEDS THESE MINIMUM LENGTHS, THAT CRITERIA SHALL GOVERN.
- ENGINEER OF RECORD TO FOLLOW DESIGN CRITERIA TO ENSURE THAT THE RECLAIMED WATER DELIVERY SYSTEM REMAINS FULL OF LIQUID AT ALL TIMES. VACUUM BREAKER OR SIPHON BREAKER MAY BE REQUIRED AT POND DISCHARGE.
- TWO OF THE FOLLOWING FORMS OF RESTRAINT SHALL BE USED WHEN PIPE IS GREATER THAN 12".
 - APPROVED MECHANICAL JOINT RESTRAINT (i.e. MEGALUG)
 - TIE RODS AND NUTS EQUAL IN DIA. TO TEE BOLTS AND NUTS, COATED WITH KOP-COAT 300 -M OR APPROVED EQUAL.
- GROUND COVER WITHIN FENCED AREA SHALL BE SOD GRADED TO PROMOTE RUN OFF.
- PROVIDE A 30 INCH WALK-IN GATE. BOX HINGES ONLY.
- THE CHAIN LINK FABRIC SHALL BE PVC COATED 6 MIL (0.15 MM) TO 10 MIL (0.25 MM) THICKNESS, THERMALLY FUSED TO ZINC-COATED STEEL CORE WIRE: PER ASTM F668 CLASS 2B. FABRIC SHALL BE HELICALLY WOUND AND WOVEN TO A HEIGHT OF 6 FEET WITH 2" DIAMOND MESH, 9 GAUGE, WITH A CORE WIRE DIAMETER OF 0.148" AND A MINIMUM BREAKING STRENGTH OF 1290 LBF. COLOR SHALL BE GREEN ASTM F934. SELVAGE OF FABRIC KNUCKLED AT BOTTOM.
- ALL POSTS, RAILS AND APPURTENANCES SHALL BE HOT-DIPPED ZINC-COATED STEEL. PIPE POSTS SHALL HAVE TOPS WHICH EXCLUDE MOISTURE. ALL POSTS SHALL BE BRACED WITH A TENSION WIRE CONTINUOUS 6" ABOVE FINISHED GRADE.
- TOP RAILS AND HORIZONTAL BRACES SHALL BE 1.66" IN DIAMETER AND STANDARD WEIGHT OF 2.27 LBS/FT. THE HORIZONTAL BRACES SHALL BE PLACED MIDPOINT ALONG THE FENCE HEIGHT, ONLY AT EACH SIDE OF A CORNER POST. INTERMEDIATE POSTS SHALL BE 2.375" IN DIAMETER AND A STANDARD WEIGHT OF 3.65 LBS/FT. CORNER POSTS SHALL BE 2.875" IN DIAMETER WITH A STANDARD WEIGHT OF 5.79 LBS/FT, AND GATE POSTS SHALL BE 4.00" IN DIAMETER WITH A STANDARD WEIGHT OF 8.65 LBS/FT.
- POLYOLEFIN COATED FINISH FOR FENCE POSTS, POST CAPS, SWING GATES, RAILS, ETC: IN ACCORDANCE WITH ASTM F1043, APPLY SUPPLEMENTAL COLOR COATING OF MINIMUM 10 MILS (0.254 MM) OF THERMALLY FUSED POLYOLEFIN IN GREEN COLOR TO MATCH FABRIC.
- PVC-COATED TENSION WIRE - SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM 1684 WHICH REQUIRES A (1) HEAVY DUTY 7 GAUGE, 0.177 IN. (4.50 MM) METALLIC COATED CORE WIRE HAVING A BREAKING STRENGTH OF 1950 LBS/FT. THE PVC COATING SHALL BE CLASS 2B FUSED AND ADHERED.
- THIS DRAWING DEPICTS A GENERAL SITE PLAN ONLY. THE ENGINEER OF RECORD SHALL COORDINATE THE SPECIFIC SITE PLAN REQUIREMENTS WITH LRD.
- ALL POSTS SHALL EXTEND A MINIMUM OF 30 INCHES INTO THE GROUND AND SHALL BE ENCASED IN CONCRETE. THIS ENCASEMENT SHALL EXTEND 30 INCHES INTO THE GROUND AND HAVE A MINIMUM DIAMETER OF 18 INCHES. WHERE POSTS COME IN CONTACT WITH CONCRETE THEY SHALL BE COATED WITH KOP-COAT 300-M OR APPROVED EQUAL.
- AIR RELEASE VALVE SHALL BE VAL-MATIC 3" AIR RELEASE VALVE: MODEL NO. 45.2. ARV SHALL HAVE A 3" BRASS BALL VALVE W/ OPERATING LEVER (304 S.S.)

* ALL MECHANICAL JOINT FITTINGS SHALL BE RESTRAINED WITH "MEG-A-LUG" RETAINER GLAND'S

** PIPE SIZES MAY VARY DEPENDENT UPON LOCATION AND FLOW DEMANDS

8" PROPELLER METER PACKAGE

- WATER SPECIALTIES ML-03 FLANGED TUBE PROPELLER METER WITH THE FOLLOWING:
 - 8 - INCH, STANDARD CAPACITY PROPELLER
 - 150 LB FLANGE
 - FLOW RANGE: 150 - 2000 GPM

INDICATOR: TR-15 SOLID STATE TRANSMITTER & TOTALIZER:

- POWER 24 VDC LOOP
- OUTPUT 4 - 20 MA DC

FLOW CONTROL VALVE (FCV)

FLOW CONTROL VALVE SHALL BE A RATE-OF-FLOW VALVE WITH PRESSURE SUSTAINING FEATURE BY AMES CO.

- MODEL 952 GS

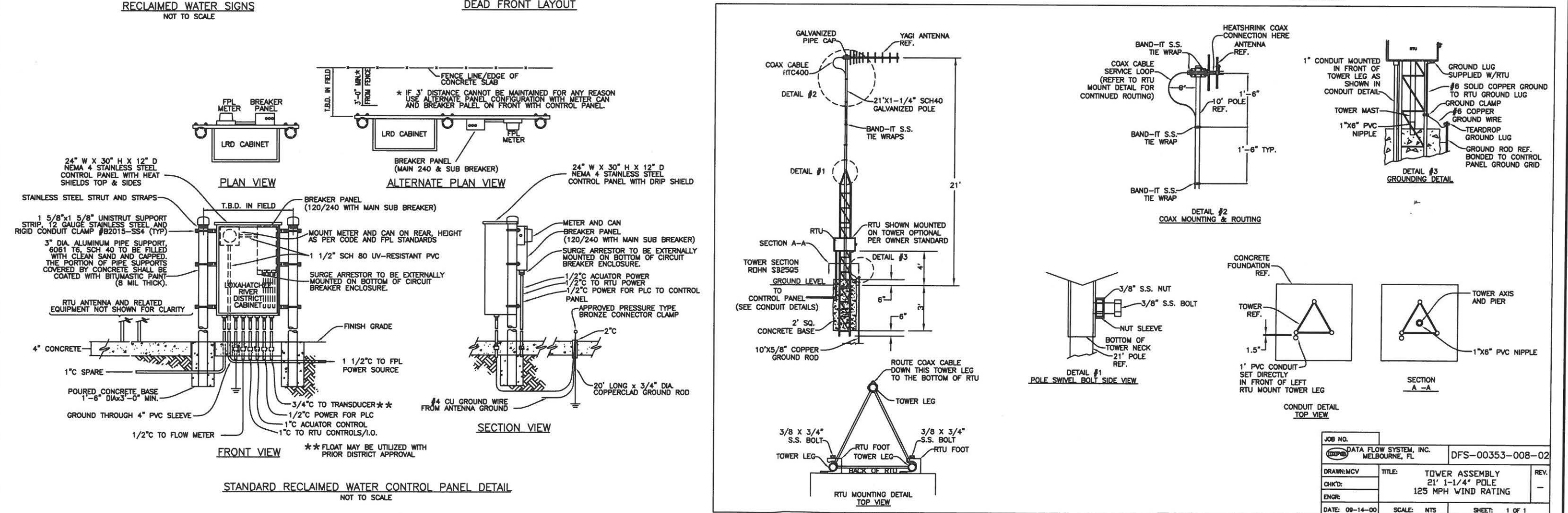
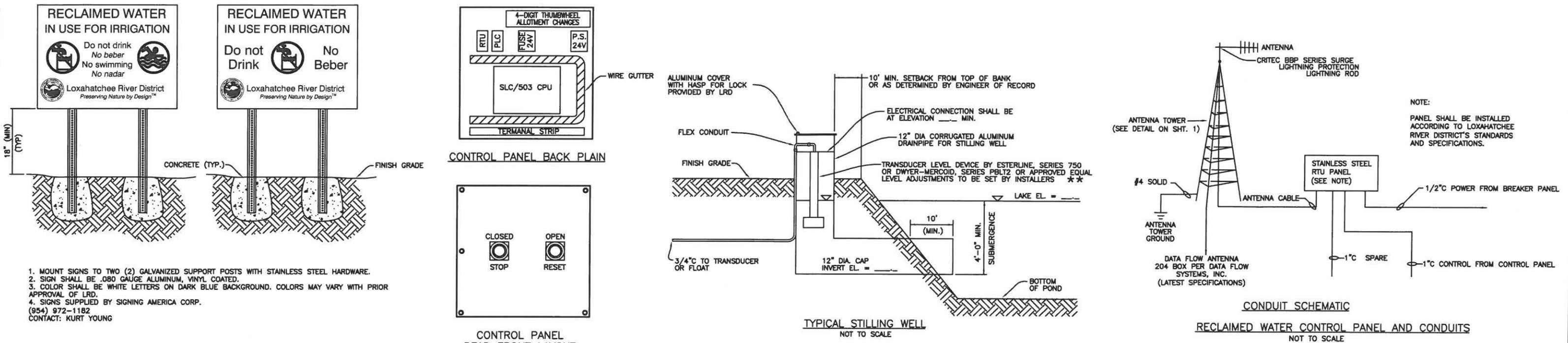
PLUG VALVES & AUMA

- PLUG VALVE SHALL BE A MILLIKEN MILLICENTRIC MODEL 602 NO
- ACTIVATOR EQUIPMENT SHALL BE AUMA:

- ACTUATOR: SG SERIES FOR PLUG VALVES
- INTEGRAL CONTROLLER: AUMA MATIC AM

- PLUG VALVE & ACTIVATOR W/ INTEGRATED CONTROLLER TO BE SUPPLIED AND SETUP BY DILLER - BROWN & ASSOCIATES (407) 673-2800.

RECLAIMED WATER IQ POINT OF DELIVERY STANDARD CONTROL PANEL



REMOTE TERMINAL UNIT (RTU) – IQ Site
TECHNICAL SPECIFICATION
LOXAHATCHEE RIVER ENVIRONMENTAL CONTROL DISTRICT
FEBRUARY 2007

1. DESCRIPTION OF WORK

The specific attention of the Contractor is directed to the fact that the Owner has an existing Radio Telemetry System as manufactured by Data Flow Systems, Melbourne, Florida (321) 259-5009. For compatibility purposes, the Contractor will be required to obtain the Remote Terminal Unit (RTU) specified herein from Data Flow Systems (DFS) 321-259-5009. The Contractor shall furnish all materials, labor, tools, equipment, and appurtenances necessary for the proper completion of the work included in this Contract. The work covered by these specifications consists of providing all design, labor, tools, materials, and testing necessary for the supply of the RTU as described herein.

The Contractor shall provide station(s) physical location information to DFS for radio communication study purposes. Information shall be provided in the form of GPS readings or street map with actual site location(s) clearly marked.

2. GENERAL

The RTU shall be DFS Model RTU204 and housed in a separate enclosure. The RTU enclosure shall be mounted on the antenna tower. The RTU shall be powered by 120 VAC commercial power, monitor local statuses and transmit those statuses to the existing central site when polled by the master radio. An Uninterruptible Power Source (UPS) shall be included with the RTU.

3. EQUIPMENT SPECIFICATION

3.1 REMOTE TERMINAL UNIT W/PLC BYPASS OPTION (RTU204)

The remote terminal unit shall be DFS Model RTU204. The RTU will be configured with the DFS Bypass Card. The RTU shall communicate with the central site via a two-way radio link and designed to accommodate the required plug-in function modules. Function module card connectors shall be gold-over-nickel plated to inhibit corrosion. The RTU shall be housed in a white color NEMA 4X 316 SS enclosure. All mounting hardware utilized shall be stainless steel. The enclosure shall be capable of being locked. The latches utilized to secure the door of each enclosure shall not require the use of a screwdriver to open or close.

3.2 POWER SUPPLY MODULE (PSM003)

The RTU shall include a Power Supply Module (PSM003). All function modules in the RTU shall run off DC voltage from +7.5 volts to +13 volts. The PSM shall supply +12 volts. A battery backup shall be provided in event of power failure. The power supply shall be surge protected. The power supply shall be short circuit protected by current limiting. Normal operation shall automatically resume when the short circuit overload is removed. The power supply shall be sized to operate the system with the battery removed. The power supply module shall provide a battery backed, isolated bias voltage source. The circuit breaker for the power supply module shall be part of the power supply module. Neither the use of tools nor the disconnection of any wires shall be required to replace the power supply module.

3.3 BACKUP BATTERY (UPS)

The RTU shall have the uninterruptible power supply (UPS) function built in. The RTU's internal Power Supply Module shall keep the battery at a float charge. The battery shall not be damaged by deep discharges.

3.4 RADIO INTERFACE MODULE (RIM006)

The RTU shall include a Radio Interface Module (RIM006). The RIM shall control the terminal radio during the polling sequence. The radio interface module shall have a service port to provide communications link monitoring. The service port shall also provide the capability to directly monitor and/or control each module in the remote terminal unit. The radio interface module utilized at the remote terminal units shall be interchangeable with the radio interface module at the central site. All communications shall be in ASCII and utilize an error detecting and correction data transfer protocol. Each radio interface module shall have a radio transceiver mounted to it. The radio shall be an FM transceiver. Replacement of the radio interface module shall trigger an automatic configuration of the new module to accommodate the site address and function (plug & play).

3.5 DIGITAL CONTROL / MONITOR MODULE (DCM003-2)

The RTU shall include a Digital Control / Monitor Module (DCM003-2). The DCM003-2 shall provide for remote control of four (4) independent 60 to 280 volt AC devices. The control relays shall be solid-state devices with zero crossover detection. Each control point shall be capable of driving a .5 amp load @ 280 volts AC (140 VA), with inrush current of 5 amps. Any discrete control point shall have the capability of being automatically controlled by any discrete monitor point, at the same RTU or at any other RTU. This shall be accomplished during configuration at the central site computer system and shall be available for an unlimited number of control points. The DCM003-2 shall also accept eight (8) ON/OFF inputs of 12 to 30 volts AC or DC. Voltages from 100 to 300 Volts AC or DC shall be accommodated with the use of an inline voltage converter device. Status reporting of these inputs shall have an accuracy of +/- 2 seconds - accuracy being defined as time of an occurrence to actual time recorded by the central site computer. The module shall not require interfacing relays to monitor 24 VDC, 115 VAC, 220 VAC or 480 VAC. The configuration of the monitor points as alarm points or monitor points (pump run time monitors) shall be operator selectable. The configuration shall not require any software or firmware changes in the system. The DCM003-2 shall have LEDs to indicate: the status of each output point; the status of each input point; receive communications; transmit communications; CPU fault; and power status. Replacement of the DCM003-2 shall trigger an automatic configuration of the new module by the central site computer (plug & play).

3.6 ANALOG MONITOR MODULE (AMM002)

The RTU shall include a Analog Monitor Module (AMM002). The AMM002 shall monitor up to 4 analog inputs. The AMM002 shall be capable of accepting 4-20 ma or 0-5 VDC on each of the inputs. The analog input shall have 12-bit accuracy. The AMM002 shall have support-configurable reporting granularity and alarm thresholds. The configuration parameters shall be downloaded over the radio link from the central site computer. All configurable parameters shall be operator-controlled. The AMM002 shall have LEDs to indicate: the status of each qualifier input point; receive communications; transmit communications; CPU fault; and power status. The AMM002 shall supply a 24 VDC power source for the 4-20 ma loops. Replacement of the AMM002 shall trigger an automatic configuration of the new module by the central site computer (plug & play). The AMM002 shall include one 4-20 MA surge protector for the flow meter input.

3.7 ANTENNA SUBSYSTEM

DFS shall determine the antenna type and height required for reliable communications. A high gain directional or omni antenna shall be used to transmit and receive data. The antenna mast/pole shall be hot dipped galvanized for corrosion protection. All mounting hardware shall be made of stainless steel. The coax cable shall be the type that utilizes an inert semi-liquid compound to flood the copper braid. The coax cable shall be of the RG-8 construction type and have the RF-loss characteristic of foam flex. The coax cable shall be RTC 400 as supplied by DFS. Type N connectors shall be utilized at both ends of the coax and sealed with 3-inch sections of Alpha FIT321-1-0 sealant shrink tubing. The coax cable shall be secured to the mast/pole with AE112 Bandit EVA-coated 316 stainless steel cable ties. The RTU shall be protected from electrical surge or transients entering through the coaxial cable by use of a IS-B50LN-C2 Polyphaser coaxial cable surge protector.

3.8 RTU MONITOR AND CONTROL POINTS

The RTU shall accommodate the following monitor and control points.

Discrete Input (DI)

1. VALVE OPENED
2. VALVE CLOSED
3. HIGH POND LEVEL

Discrete Output (DO)

1. VALVE OPEN
2. VALVE CLOSE

Analog Input (AI)

1. FLOW RATE
2. FLOW VOLUME

4. INSTALLATION

In order to insure total system integration with the existing system, the contractor shall secure and provide the services of Data Flow Systems, Inc. for RTU hardware.

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Due to the implementation of the VTSCADA central station package, DFS is unable to provide the following services: antenna alignment fine-tuning procedure, configuration of RTU into the system, RTU point-by point verification at the central computer, and RTU screen generation. The provision of these services is the customer's responsibility. DFS services are limited to only those that can be performed at the RTU location.

5. WARRANTY

DFS shall warrant all hardware provided under this contract against all defects in material and workmanship for a period of one year. The RTU plug-in modules shall carry an additional 2-year return-to-manufacturer warranty and shall be covered against damage due to lightning and surge the entire three year period.

6. SPARE PARTS

Provide the following spare parts with the RTU:

- a. (1) Radio Interface Module (RIM006)
- b. (1) Power Supply Module (PSM003)
- c. (1) Digital Control / Monitor Module (DCM003-2)
- d. (1) Analog Monitor Module
- e. (1) Backup Battery
- f. (1) RTU Antenna