DESIGN DEVELOPMENT REPORT AMENDMENT

WITHLACOOCHEE WPCP SECONDARY EQUALIZATION BASIN

CITY OF VALDOSTA UTILITIES DEPARTMENT

CIVIL ▪ AGRICULTURAL ▪ ENVIRONMENTAL

CELEBRATING 20 YEARS

1999 ▪ 2019

SEPTEMBER 2019

1.0 Project Purpose and Objectives Narrative

The City of Valdosta's Withlacoochee WPCP was constructed in 2016. The plant is rated for a maximum monthly average daily flow (MMADF) of 12 mgd and a maximum daily flow (MDF) of 22 mgd. Plant components include a 6 million gallon equalization basin, sequencing batch reactors (SBR) system, tertiary filtration cloth media filters, chlorination and dechlorination systems, a chemical feed system for phosphorus removal, and a dewatering system.

In December 2018, the Valdosta area received a significant amount of intensive rainfall for several days causing plant influent to spike to 37 mgd for an extended period due to a surge of inflow and infiltration (I/I) within the system. Plant operators immediately began diverting flow into the equalization basin. As the rainfall duration and intensity continued over the period, heavily diluted plant influent flow remained at unprecedented levels, eventually causing the equalization basin to overflow.

The City of Valdosta continues implementation of a program developed during recent years to address I/I in the wastewater collection system. Due to the time required for and cost magnitude of construction of the improvements required to continue addressing the I/I, the City proposes to construct additional equalization capacity at the plant as a stop-gap strategy to reduce the potential for overflows at the plant.

The project will involve extension of a 36-inch gravity overflow line from the existing equalization basin that directs overflow wastewater to a new, lined 7.26 million gallon secondary equalization basin. A return pump system will also be constructed that will pump wastewater from the secondary equalization basin to the existing basin.

A site plan is included in the Appendix.

2.0 Basis of Design

The basis of design for the secondary equalization basin is as follows:

1: Utilize the existing topography of the plant site to gravity flow from the existing equalization basin to the new basin to avoid the cost and maintenance of pumping.

2: Maximize the available space at the plant site for installation of a lined basin in lieu of constructing more costly tankage.

The following flow balance is referenced from Table 3 in the 2014 DDR for the New Withlacoochee WPCP:

	MMADF (mgd)	MDF (mgd)	PHF (mgd)
Flow Into Headworks	12.0	18.0	38.0
Return and Added Flow From Plant	0.4	0.5	1.3
Total Flow to Headworks	12.4	18.5	39.3
Controlled Max Flow to SBRs	22.0	22.0	22.0
Flow to Equalization Basin	0	0	17.3

Based on the design information above, peak hourly flows to the plant greater than 8.3 hours will more than likely result in an overflow of the existing equalization basin. The new secondary equalization basin will provide more than double the available storage for extended periods of operation at the peak hourly flow.

3.0 Flow Pattern During Draining and Filling Operations/Calculations For Secondary Equalization

Filling:
Flow to the secondary equalization basin will be conveyed from the existing equalization basin via the emergency 36-inch standpipe overflow located 1.5 feet below the top the tank wall. The capacity of the standpipe is 57.63 cfs. The 36-inch overflow line will transition outside of the existing equalization basin to a 24-inch ductile iron line with capacity of 59 cfs that will discharge into the secondary equalization basin.

The dimensions and storage capacity of the secondary equalization basin are as follows:

Length at top of slope:	815 ft
Width at top of slope:	130 ft
Side slope:	3:1
Maximum Depth:	19.2 ft

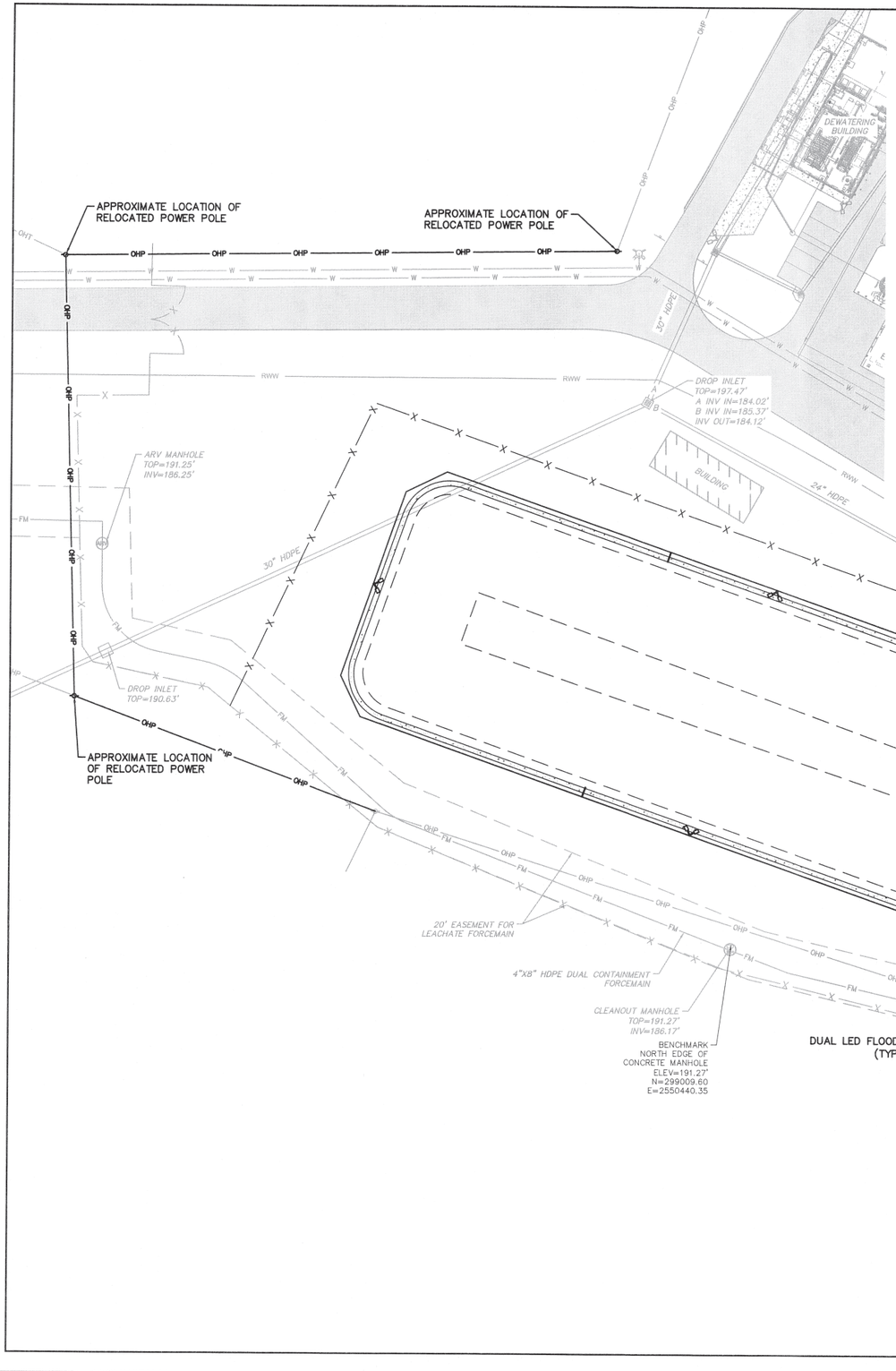
A stage-storage table is included in the Appendix.

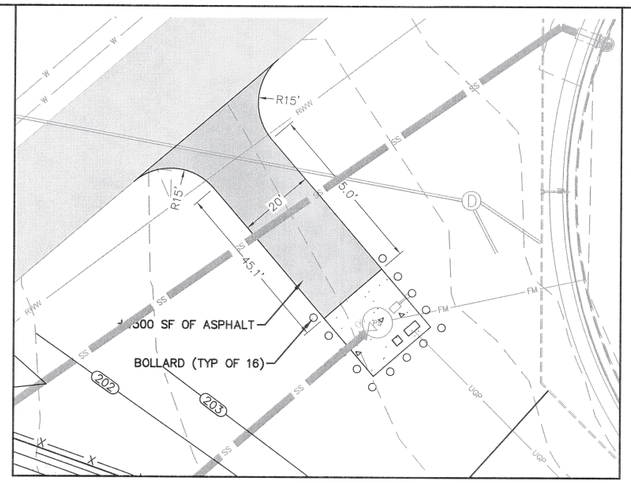
Draining/Pumping:
Flow will be conveyed from the secondary equalization basin back to the existing equalization basin via a duplex pump station. The station will include (2) Flygt 20 HP pumps at 900 gpm each.

4.0 Plant Flow Diagram

A plant flow diagram is included in the Appendix.

APPENDIX





DETAILED PUMP STATION AREA

SCALE: 1" = 20'

GENERAL CONSTRUCTION NOTES:

1. AN AS-BUILT SURVEY IS REQUIRED.
2. WHILE WORKING WITHIN THE CONSTRUCTION LIMITS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEARING & GRUBBING AND THE REMOVAL OF ALL DEBRIS.
3. CONTRACTOR SHALL HAVE ALL EROSION CONTROL MEASURES IN PLACE PRIOR TO CONSTRUCTION.
4. CONTRACTOR TO NOTIFY UTILITY PROTECTION CENTER A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION.
5. CONTRACTOR TO VERIFY ALL HORIZONTAL & VERTICAL LOCATIONS OF ALL EXISTING AND PROPOSED STRUCTURES PRIOR TO CONSTRUCTION.
6. CONTRACTOR TO NOTIFY ENGINEER OF ANY CONFLICTS IN THE PLANS PRIOR TO AND DURING CONSTRUCTION. FAILURE TO NOTIFY ENGINEER WILL RESULT IN CONTRACTOR RESPONSIBILITY TO REPAIR AT OWN EXPENSE.
7. CONTRACTOR RESPONSIBLE FOR ALL DAMAGED UTILITIES DURING CONSTRUCTION.
8. PEDESTRIAN AND LOCAL TRAFFIC SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION. SAFETY DEVICES AND FLAGGERS WILL BE PROVIDED AT CONTRACTOR EXPENSE.
9. CONTRACTOR TO PROVIDE ALL CONSTRUCTION STAKING.
10. ALL WORK SHALL BE IN ACCORDANCE WITH CITY OF VALDOSTA STANDARDS AND SPECIFICATIONS.
11. ALL EXTENSIONS AND ADDITIONS TO THE SYSTEM SHALL BE PERFORMED BY A GEORGIA LICENSED UTILITY CONTRACTOR.
12. A MINIMUM OF 18" OF VERTICAL AND 10' OF HORIZONTAL SEPARATION SHALL BE MAINTAINED BETWEEN ALL UTILITIES.
13. ALL T'S AND BENDS SHALL BE DUCTILE IRON.

LEA
CIVIL ▪ AGRICULTURAL ▪ ENVIRONMENTAL

GA CORP# 0419099
FL CORP# F04000002135
P.O. Box 2830
3998 Inner Perimeter Road
Valdosta, GA 31604
Telephone: 229-253-0900
Fax: 229-253-1842
E-mail: lea@lea-pc.com

CITY OF VALDOSTA
WITHLACOOCHEE WWTP
SECONDARY EQUALIZATION BASIN

LAND LOT 63 OF THE 11TH LAND DISTRICT
LOWNDES COUNTY - STATE OF GEORGIA

REVISIONS	
DATE	DESCRIPTION

GRAPHIC SCALE

0 20 40 80

(IN FEET)
1 INCH = 40 FEET

NORTH

SCALE:	1"=40'
DESIGNED BY:	MCM
CHECKED BY:	JSL
SUBMITTAL DATE:	08/30/19
JOB NO.	0026-33

THESE DRAWINGS ARE THE PROPERTY OF THE ENGINEER AND MAY NOT BE REPRODUCED OR REUSED WITHOUT PERMISSION AND CREDIT.
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GEORGIA REGISTERED No. 34187 PROFESSIONAL ENGINEER MICHAEL CLAYTON MILLIGAN
9/3/19

GSWCC LEVEL II CERT. #49262

SITE AND UTILITY PLAN

C-3

3 OF 16 SHEETS

S:\0026-33 (City of Valdosta, Secondary EQ Basin)\Withlacoochee Secondary EQ Basin.dwg 9/3/2019 1:56 PM

Pond Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v2019.2 — Wednesday, 09 / 25 / 2019

Pond No. 1 - Secondary Equalization Basin

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 182.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	182.50	00	0	0
0.50	183.00	1,305	217	217
1.50	184.00	6,926	3,745	3,963
2.50	185.00	14,420	10,446	14,408
3.50	186.00	23,871	18,946	33,355
4.50	187.00	28,073	25,941	59,296
5.50	188.00	32,393	30,204	89,500
6.50	189.00	36,826	34,582	124,082
7.50	190.00	41,373	39,074	163,156
8.50	191.00	46,032	43,677	206,833
9.50	192.00	50,805	48,394	255,227
10.50	193.00	55,691	53,224	308,451
11.50	194.00	60,689	58,166	366,618
12.50	195.00	65,801	63,221	429,839
13.50	196.00	71,026	68,390	498,229
14.50	197.00	76,364	73,672	571,901
15.50	198.00	81,815	79,066	650,966
16.50	199.00	87,379	84,573	735,540
17.50	200.00	93,056	90,194	825,733
18.50	201.00	98,714	95,862	921,595
19.00	201.50	101,444	50,033	971,628

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .000	.000	.000	n/a
Orifice Coeff.	= 0.00	0.00	0.00	0.00
Multi-Stage	= n/a	No	No	No

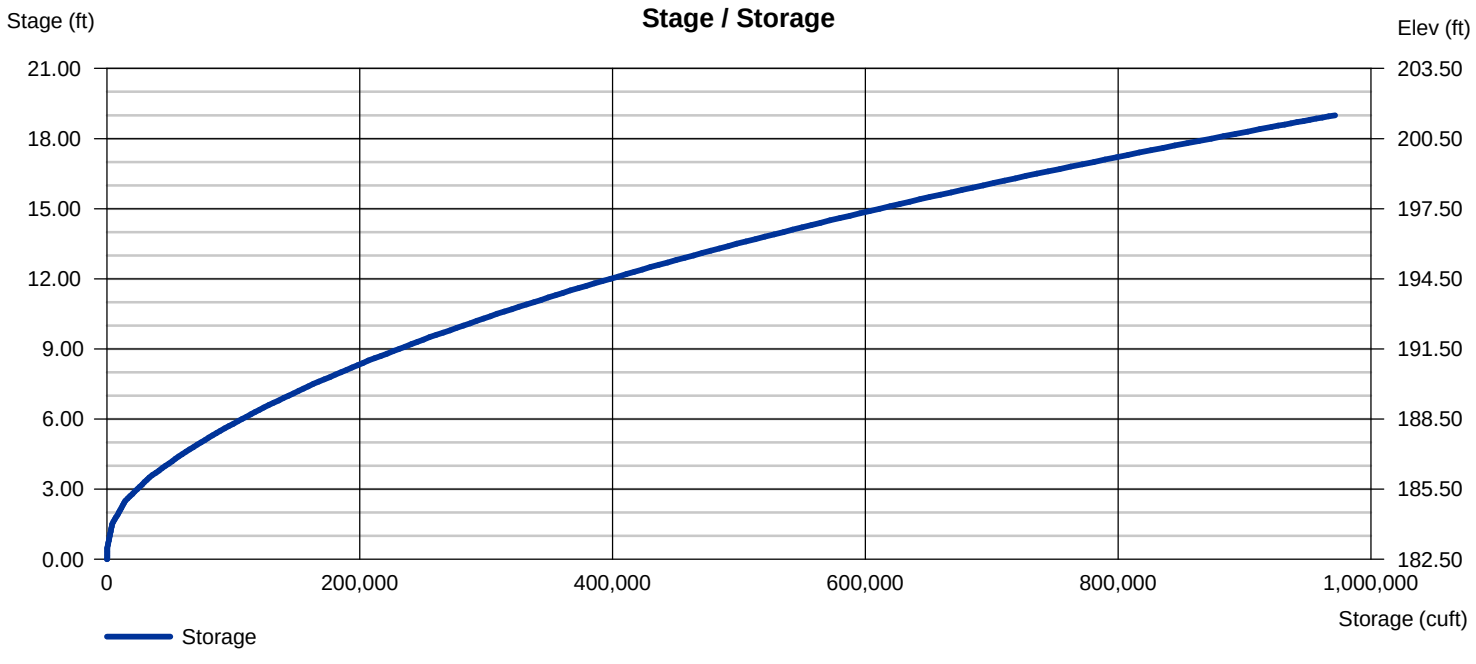
Weir Structures

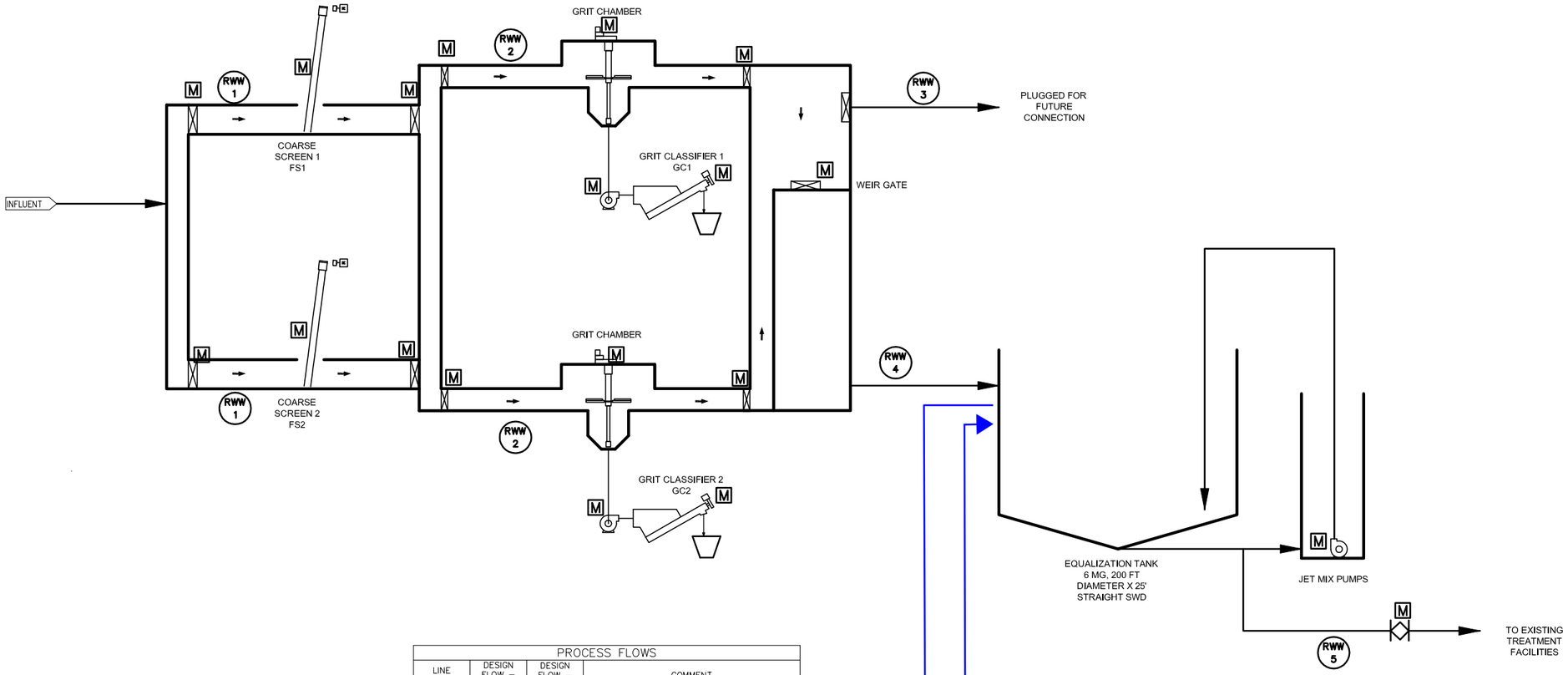
	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 0.00	0.00	0.00	0.00
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).





PROCESS FLOWS			
LINE NUMBER	DESIGN FLOW – PEAK, MGD	DESIGN FLOW – MMADF	COMMENT
RWW1	38	NA	COARSE SCREENS – 1 DUTY/1 STANDBY
RWW2	14	NA	GRIT CHAMBERS – 2 DUTY
RWW3	TBD	TBD	FUTURE TREATMENT FACILITIES
RWW4	38	NA	TOTAL FLOW TO EQUALIZATION
RWW5	22	12 (WINTER)	EQUALIZED FLOW TO EXISTING FACILITIES

By	Description	Date	Rev
	DESIGN DEVELOPMENT REPORT		A

Job No. 260384
Designed PC
Drawn PG
Checked XX
Reviewed XX
Approved XX
Reg. No.
Date 3/16/11

Issue Certification

PARSONS
WATER & INFRASTRUCTURE INC.
3577 PARKWAY LANE, SUITE 100
NORCROSS, GA 30092
PHONE: 770-446-4900
FAX: 770-446-4910

City of Valdosta
UTILITIES DEPARTMENT
1016 Myrtle Street, Valdosta, GA 31603
Phone: 229-293-3892

WITHLACOOCHEE WATER POLLUTION CONTROL PLANT
AND SEWER SYSTEM IMPROVEMENTS

FORWARD FLOW SCHEMATIC

DRAWING NO. G06
REV 0

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