KIAWAH RIVER PLANTATION (KRP) WASTEWATER TREATMENT PLANT (WWTP)

CONTRACT DOCUMENT AND TECHNICAL SPECIFICATIONS

PREPARED FOR:

KIAWAH RIVER PLANTATION HOLDINGS, LP
OCEAN BOULEVARD PROPERTIES, A SOUTH CAROLINA LIMITED PARTNERSHIP

T&H PROJECT NO.
J-25328

ADDENDUM NO. 3 — March 24, 2016

This Addendum forms a part of the Contract Documents

PART I – QUESTIONS

1. The 6"-REC & 8"-REC lines shown on OVIVO Sheets I-1.2 & I-1.6, are not provided in the 40 27 05 Piping Systems Schedule. Confirm these lines are to be Epoxy Lined Ductile Iron Pipe.
   Answer: These pipes shall meet the requirements of the RAS and RS.

2. Drawings 35-A-18 and 35-A-19 include details for the installation of the doors and louvers in CMU and metal stud walls. Can you provide details for doors and louvers installed in cast-in-place concrete locations (i.e. lower level of Waste Water Treatment Facility on Drawing 35-A-10)?
   Answer: See Revised Sheet 35-A-18 included with this addendum.

3. What kind of power will be supplied to the hoist?
   Answer: 5 hp. See Specification Section 41 22 13.

4. Can you provide specifications for the four (4) WAS pumps shown on Drawing 50-E-15?
   Answer: Specification for WAS pumps is attached. See Specification Section 43 21 22 "Self-Priming WAS Pumps".

PART II - REVISIONS

1. Drawings
   a. Due to Regulatory comments, see revised sheets attached to this addendum:
      - 01-G-02
      - 01-V-01
      - 02-C-01 thru 02-C-08
      - 05-C-02 thru 05-C-05
      - 05-C-05A
      - 05-C-10, 05-C-11

- 05-C-13 thru 05-C-14
- 05-C-14A (added)
- 06-C-01 thru 06-C-03
- 07-C-01
- 35-A-18
- 36-D-01

b. Add new Sheet 05-C-14A.
c. Sheet 02-C-09 is deleted.
d. Sheet 09-C-03
   - Under pipe bedding detail-clarification to Note 3, "Base bid price shall include 200 cy of granite stone bedding and 200 cy of control fill to be used if needed.

e. Sheet 15-D-01 – Notes
   - Note No. 2 shall be revised to read, "Interior of wetwell discharge piping and components within wetwell shall be lined with 125 wet film mils of Raven 405 ultra-high build epoxy or an acceptable equivalent".

f. Sheet 06-C-02
   - Add Note 4, "All manholes shall be coated with 125 wet film mils of Raven 405 ultra-high build epoxy or an acceptable equivalent".

2. Specifications
   a. Add Specification Section 43 21 22 – Self-Priming WAS Pumps
   b. Revise Specification Section 08 16 13 - Fiberglass Doors.
   c. Revise Specification Section 08 71 00 - Door Hardware.
   d. Sheet 05-L-01 – add four (4) LIN "Notchez" Crepe Myrtles, add six (6) "SM" Dwarf Palmetto, and add twenty (20) "TF" Dwarf Fakahatchee grass to plant schedule. Plant material to be installed around meter and BFP as located in the field with Engineer.

3. Contract Documents – Bid Form Section 00 41 43
   a. Delete Item B of Part III, "Listing of Subcontractors and Suppliers". This list shall be submitted by the two low bidders within 24 hours of bid opening.
   Note: all allowances shall be included in the base bid.

PART III – PRODUCT APPROVALS

1. Key Resin Company has been approved as a supplier for the resinous flooring materials. As with all substitutions, the contractor is responsible for ensuring that all necessary components are used in order to provide a comparable product. The following substitutions are permitted:
   a. Key Chip – 100 with Polyaspartic coating (with abrasion resistance where noted) in lieu of Stontec UTF product.
   b. Key vinyl ester binder/coating with Key vinyl ester primer (with abrasion resistance and integral cove base) in lieu of Stonchem 830.
2. Chatham Engineering Project approved – see e-mail of 3-11-2016 and Thermal Resource Sale, "Prior Approval Request", dated 3-4-2016.
3. Substitutions for resinous flooring:
   a. In lieu of Stontec UTF resinous flooring, PlexiFlake URF by Plexi-Chemi will be permitted. Anti-slip to be included in product applied to exterior concrete on 2nd level of building. In lieu of Stontec 800 resinous flooring, PlexiChemester VE will be permitted with degree of anti-slip to be selected by owner.

PART IV – PERMIT REQUIREMENT

1. Construction of the Project shall be subject to Charleston County's Livability Ordinance (Ordinance #1702).

THOMAS & HUTTON

Mark F. Yodice

Mark F. Yodice, P.E.
Project Manager/Engineer of Record

Attachments

END OF ADDENDUM NO. 3

SCHEDULE OF DRAWINGS

SHEET NO.	DESCRIPTION	BY
	01 - GENERAL	
01-G-00	COVER SHEET	T&H
01-G-01	LOCATION MAP	T&H
01-G-02	INDEX OF DRAWINGS	T&H
01-G-03	GENERAL CIVIL NOTES	T&H
01-G-04	GENERAL CIVIL NOTES	T&H
01-G-05	GENERAL CIVIL NOTES & LEGENDS	T&H
01-G-06	OVERALL PROCESS FLOW DIAGRAM	T&H
01-G-07	HYDRAULIC PROFILE	T&H
01-V-01	SURVEY CONTROL SHEET	T&H
01-S-01	STRUCTURAL NOTES & DETAILS	T&H
01-S-02	STRUCTURAL DETAILS	T&H
01-S-03	STRUCTURAL DETAILS	T&H
01-S-04	STRUCTURAL DETAILS	T&H
01-M-01	HVAC SCHEDULE, DETAILS AND SPECS	CHATM
01-P-01	PLUMBING NOTES, FIXTURES AND DETAILS	CHATM
	02 - WATER MAIN LINE	
02-C-01	WATER MAIN - SHEET INDEX	T&H
02-C-02	WATER MAIN - PLAN AND PROFILE	T&H
02-C-03	WATER MAIN - PLAN AND PROFILE	T&H
02-C-04	WATER MAIN - PLAN AND PROFILE	T&H
02-C-05	WATER MAIN - PLAN AND PROFILE	T&H
02-C-06	WATER MAIN - PLAN AND PROFILE	T&H
02-C-07	WATER MAIN - PLAN AND PROFILE	T&H
02-C-08	WATER MAIN - DETAILS	T&H
02-C-09	WATER MAIN - DETAILS	T&H
	05 - OVERALL SITE	
05-C-01	EXISTING SITE CONDITIONS	T&H
05-C-02	OVERALL SITE PLAN	T&H
05-C-03	WWTP & EFFLUENT LAGOON SITE PLAN	T&H
05-C-04	LAS SITE PLAN (PHASE 1)	T&H
05-C-05	EROSION & SEDIMENT CONTROL - INITIAL PHASE	T&H
05-C-05A	EROSION & SEDIMENT CONTROL - FINAL PHASE	T&H
05-C-06	SWPPP - NOTES	T&H
05-C-07	SWPPP - CHARTS	T&H
05-C-08	SWPPP - DETAILS	T&H
05-C-09	SWPPP - DETAILS	T&H
05-C-10	SITE PIPING PLAN - OVERALL SITE	T&H
05-C-11	CIVIL DETAILS	T&H
05-C-12	CIVIL DETAILS	T&H
05-C-13	CIVIL DETAILS	T&H
05-C-14	CIVIL DETAILS	T&H
3 05-C-14A	CIVIL DETAILS	T&H
2 ~~05-E-01~~	~~ELECTRICAL PLAN - OVERALL SITE~~	~~CH~~
05-L-01	LANDSCAPE PLAN	T&H
05-L-02	LANDSCAPE DETAILS & NOTES	T&H
05-L-03	LANDSCAPE SPECIFICATION	T&H
05-L-04	GRASSING SPECIFICATION	T&H
	06- WWTP SITE	
06-C-01	SITE LAYOUT PLAN	T&H
06-C-01A	TREE PROTECTION AND REMOVAL PLAN - WWTP	
06-C-02	PIPING PLAN - WWTP	T&H
06-C-03	PAVING, GRADING & DRAINAGE PLAN - WWTP	T&H
	07- TREATED EFFLUENT LAGOON	
07-C-01	PAVING, GRADING AND DRAINAGE PLAN - EFFLUENT LAGOON	T&H
07-C-02	PIPING PLAN - EFFLUENT LAGOON	T&H
07-C-03	DETAILS AND SECTIONS - EFFLUENT LAGOON	T&H
07-C-04	DETAILS AND SECTIONS - EFFLUENT LAGOON	T&H
	08 - SPRAYFIELD IRRIGATION PUMP STATION	
08-C-01	EFFLUENT PUMP STATION - PLAN AND SECTION	T&H
08-C-02	EFFLUENT PUMP STATION - SECTION AND DETAILS	T&H
2 ~~08-E-01~~	~~EFFLUENT ELECTRICAL PLAN AND DETAILS~~	~~CHATM~~

SCHEDULE OF DRAWINGS

SHEET NO.	DESCRIPTION	BY
	09 - LAND APPLICATION SPRAYFIELD (LAS)	
09-C-01	STAKING PLAN - LAS	T&H
09-C-02	SITE PIPING PLAN - LAS	T&H
09-C-03	DETAILS AND SECTIONS - LAS	T&H
09-C-04	DETAILS AND SECTIONS - LAS	T&H
09-C-05	INDIVIDUAL SPRINKLER COORDINATES AND NOZZLE SIZE	T&H
09-C-06	INDIVIDUAL SPRINKLER COORDINATES AND NOZZLE SIZE	T&H
	10 - INFLUENT SCREEN S- WWTP	
10-S-01	STRUCTURAL PLANS	T&H
10-S-02	SECTION & DETAILS	T&H
10-D-01	PIPING PLANS	T&H
10-D-02	PIPING SECTIONS	T&H
	15 - PLANT DRAIN PUMP STATION (WWTP)	
15-D-01	PIPING PLAN & SECTIONS	T&H
	30 - ODOROUS AIR TREATMENT	
30-D-01	GENERAL ARRANGEMENT	T&H
	35 - ANOXIC/AEROBIC/MBR/ARCH/MP	
35-A-01	LIFE SAFETY ANALYSIS	
35-A-02	LIFE SAFETY ANALYSIS	SWTAIL
35-A-03	LOWER FLOOR PLAN	SWTAIL
35-A-04	UPPER FLOOR PLAN	SWTAIL
35-A-05	ROOF PLAN	SWTAIL
35-A-06	SCHEDULES	SWTAIL
35-A-07	DETAILS & SCHEDULES	SWTAIL
35-A-08	REFLECTED CEILING PLAN	SWTAIL
35-A-09	NORTH ELEVATION	SWTAIL
35-A-10	WEST ELEVATION	SWTAIL
35-A-11	SOUTH ELEVATION	SWTAIL
35-A-12	EAST ELEVATION	SWTAIL
35-A-13	BUILDING SECTION	SWTAIL
35-A-14	BUILDING SECTION	SWTAIL
35-A-15	WALL SECTIONS	SWTAIL
35-A-16	WALL SECTIONS	SWTAIL
35-A-17	DETAILS	SWTAIL
35-A-18	DETAILS	SWTAIL
35-A-19	DETAILS & SCHEDULES	SWTAIL
35-S-01	FOUNDATION PLAN	T&H
35-S-02	LOWER PLAN	T&H
35-S-03	2ND FLOOR FRAMING PLAN	T&H
35-S-04	UPPER LEVEL OVERVIEW	T&H
35-S-05	ROOF FRAMING PLAN	T&H
35-S-06	BASINS & BUILDING SECTION	T&H
35-S-07	SECTIONS & DETAILS	T&H
35-S-08	SECTIONS & DETAILS	T&H
35-S-09	BUILDING DETAILS	T&H
35-S-10	BUILDING DETAILS	T&H
35-M-01	HVAC LOWER LEVEL PLAN AND DETAILS	CHATM
35-M-01	HVAC UPPER LEVEL PLAN AND DETAILS	CHATM
35-P-01	PLUMBING PLAN LOWER LEVEL	CHATM
35-P-02	PLUMBING PLAN UPPER LEVEL	CHATM
35-D-01	TREATMENT BASINS - LOWER LEVEL - PLAN	T&H
35-D-02	TREATMENT BASINS - UPPER LEVEL - PLAN	T&H
	36- CHLORINE CONTACT CHAMBER	
36-S-01	PLAN VIEW	T&H
36-S-02	SECTIONS & DETAILS	T&H
36-D-01	PIPING PLAN & SECTIONS	T&H
	40 - SLUDGE DEWATERING (CENTRIFUGE)	
40-A-01	LIFE SAFETY ANALYSIS	SWTAIL
40-A-02	BUILDING PLAN & ROOF PLAN	SWTAIL
40-A-03	BUILDING ELEVATIONS	SWTAIL
40-A-04	SCHEDULES	SWTAIL
40-S-01	SLAB PLAN	T&H
40-S-02	ROOF PLAN	T&H
40-S-03	SECTIONS	T&H
40-M-01	HVAC PLAN	CHATM
40-P-01	PLUMBING PLAN	CHATM
40-D-01	PIPING PLAN	T&H
40-D-02	MISCELLANEOUS DETAILS	T&H

SCHEDULE OF DRAWINGS

SHEET NO.	DESCRIPTION	BY
	45 - OPERATION BUILDING	
45-D-01	CHEMICAL ROOM - PROCESS PIPING	T&H
45-D-02	CHEMICAL ROOM - MISCELLANEOUS DETAILS	T&H
45-D-03	LOWER LEVEL - PLAN	T&H
	50 - ELECTRICAL	
50-E-01	LEGEND, ABBREVIATIONS & GENERAL NOTES	CHATM
50-E-02	ELECTRICAL DETAILS & FIXTURE SCHEDULE	CHATM
50-E-03	ELECTRICAL DETAILS	CHATM
50-E-04	OVERALL PROJECT PLAN - ELECTRICAL	CHATM
50-E-05	TREATMENT PLANT SITE - ELECTRICAL	CHATM
50-E-06	TREATMENT PLANT SITE - PHOTOMETRY	CHATM
50-E-07	WWTP BUILDING - GROUND FLOOR - POWER	CHATM
50-E-08	WWTP BUILDING - UPPER FLOOR - POWER	CHATM
50-E-09	WWTP BUILDING - GROUND FLOOR - LIGHTING	CHATM
00-E-10	WWTP BUILDING - UPPER FLOOR - LIGHTING	CHATM
50-E-11	CENTRIFUGE BUILDING - LIGHTING & POWER	CHATM
50-E-12	ONE-LINE DIAGRAM	CHATM
50-E-13	EFFLUENT PUMP STATION PLAN - ELECTRICAL	CHATM
50-E-14	SPRAYFIELD PLAN - ELECTRICAL	CHATM
50-E-15	MCC ELEVATIONS	CHATM
50-E-16	ONE-LINE DIAGRAM AND SCHEDULES	CHATM
50-E-17	MCC ELEVATIONS AND SCHEDULES	CHATM
50-E-18	OVIVO FIELD INSTRUMENT CONNECTIONS	CHATM
50-E-19	IN-PLANT SCADA FIELD INSTRUMENT CONN.	CHATM
50-E-20	IN-PLANT SCADA RISER DIAGRAM	CHATM

SCHEDULE OF DRAWINGS

SHEET NO.	DESCRIPTION	BY
60-I-01	PROCESS & INSTRUMENTATION DIAGRAM	T&H
	60 - INSTRUMENTATION AND CONTROL BY OVIVO	
I-1.00	COVER SHEET	OVIVO
I-1.01	EQUALIZATION BASIN	OVIVO
I-1.02	EQUALIZATION PUMPS	OVIVO
I-1.03	FINE SCREENS	OVIVO
I-1.04	ANOXIC BASIN	OVIVO
I-1.05	PRE-AERATION BASIN 01	OVIVO
I-1.06	PRE-AERATION/MEMBRANE THICKENING BASIN 02	OVIVO
I-1.07	FEED CHANNEL	OVIVO
I-1.08	MEMBRANE BIOREACTOR BASIN 01	OVIVO
I-1.09	MEMBRANE BIOREACTOR BASIN 02	OVIVO
I-1.10	RAS WET WELL	OVIVO
I-1.11	PERMEATE PUMPS	OVIVO
I-1.12	MBT PERMEATE PUMP	OVIVO
I-1.13	PRE-AERATION BLOWERS	OVIVO
I-1.14	MBR/ PRE-AIR BLOWERS	OVIVO
I-1.15	CHEMICAL CLEANING	OVIVO
I-1.16	CHEMICAL ADDITION	OVIVO
I-1.17	EMERGENCY STANDBY GENERATOR	OVIVO
I-1.18	ODOR CONTROL SYSTEM #2	OVIVO
I-1.19	CODES LEGEND	OVIVO
I-1.20	SYMBOLS LEGEND	OVIVO
1	MBR PLANT LAYOUT - PERSPECTIVE VIEW	OVIVO
2	MBR PLANT LAYOUT - PLAN	OVIVO
3	MBR PLANT LAYOUT - SECTIONS	OVIVO
4	MBR PLANT LAYOUT - SECTION	OVIVO
5	MBR PLANT LAYOUT - SECTION	OVIVO
6	MBR PLANT LAYOUT - SECTIONS	OVIVO

THE DRAWING NUMBERS FOR THIS PROJECT FOLLOW THE FOLLOWING GUIDELINE:

XX - N - ##

- XX: FACILITY NUMBER (2 DIGITS)
- N: DISCIPLINE DESIGNATOR
- ##: SEQUENTIAL NUMBERING (2 DIGITS)

FACILITY NUMBER	DISCIPLINE DESIGNATOR	SEQUENTIAL NUMBERING
01 - GENERAL	C CIVIL	01
02 - WATER SUPPLY LINE	A ARCHITECTURAL	02
05 - OVERALL SITE	S STRUCTURAL	03
06 - WASTEWATER TREATMENT PLANT SITE	E ELECTRICAL	ETC.
07 - TREATED EFFLUENT LAGOON	G GENERAL	
08 - SPRAYFIELD IRRIGATION PUMP STA.	D PROCESS MECHANICAL	
09 - LAND APPLICATION SYSTEM (LAS)	M MECHANICAL HVAC	
10 - PRIMARY INFLUENT SCREEN (WWTP)	P PLUMBING	
15 - PLANT DRAIN PUMP STATION (WWTP)	R INSTRUMENTATION & CONTROL	
30 - ODOROUS AIR TREATMENT	L LANDSCAPE	
35 - ANOXIC/AEROBIC/MBR/ARCH/MP	Y YARD PIPING	
36 - CHLORINE CONTACT CHAMBER	V SURVEYING	
40 - SLUDGE DEWATERING	I INSTRUMENTATION	
45 - OPERATION BUILDING/TREATMENT PROCESS		
50 - ELECTRICAL		
60 - INSTRUMENTATION & CONTROL		

PROJECT INFORMATION

OWNER:
KIAWAH RIVER PLANTATION HOLDINGS, LP AND OCEAN BOULEVARD PROPERTIES LIMITED PARTERSHIP
211 KING STREET, SUITE 300
CHARLESTON, SC 29401
(843) 722-2615

SITE/STRUCTURAL:
THOMAS & HUTTON
682 JOHNNIE DODDS BLVD.
SUITE 100
MT. PLEASANT SC, 29464
(843) 849-0200

ARCHITECTURAL:
SWALLOWTAIL ARCHITECTURE, LLC
814 N. CEDAR STREET
SUMMERVILLE SC, 29483
(843) 885-9400

MEP ENGINEERING:
CHATHAM ENGINEERING
109 PARK OF COMMERCE DRIVE
SAVANNAH, GA 31405
912-238-2400

WATER:
ST. JOHN'S WATER COMPANY
3362 MAYBANK HWY
JOHN'S ISLAND, SC 29455
(843) 768-0641

POWER:
BERKELEY ELECTRIC
ST. JOHNS DISTRICT
3351 MAYBANK HIGHWAY
P.O. BOX 1285
ST. JOHNS, SC 29455
(843)559-2458

TELEPHONE:
AT&T
975 SAVANNAH HWY, SUITE 301
CHARLESTON, SC 29407
(843)556-7611

SOUTH CAROLINA PROFESSIONAL ENGINEER — THOMAS & HUTTON ENGINEERING No. C00285 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER — No. 18293 — MARK F. YORK

NO.	REVISIONS	BY	DATE
3	BID ADDENDUM #3 COMMENTS	MFY	3/23/16
2	BID ADDENDUM #1 COMMENTS	MFY	3/7/16
1	GENERAL REVISIONS	MFY	12/2/15

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP

INDEX OF DRAWINGS

JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	KEN
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	NTS

01-G-02

NOTE:

1. TOPOGRAPHIC AND TREE SURVEY OF WASTEWATER TREATMENT AREA DONE BY THOMAS & HUTTON ON DECEMBER, 2014.
2. TOPOGRAPHIC SURVEY OF LAS SPRAY FIELD DONE BY METRO ENGINEERING & SURVEYING CO., INC. 186 SELFRIDGE ROAD, HAMPTON, GA 30228. TELEPHONE: (770)707-0777/1-800-594-8988, WWW.METRO-ENGINEERING.COM ON 02/29/2009
3. TOPOGRAPHIC AND TREE SURVEY AT BETSY KERRISON ROAD DONE BY THOMAS AND HUTTON ON MARCH, 2010.

THOMAS & HUTTON CONTROL POINT
3/4" IRON PIPE WITH CAP
N: 295,073.76
E: 2,264,206.11
ELEV.: 13.06 (NAVD 88)

BOHICKET ROAD (SIO-201)
(BETSY KERRISON PARKWAY)

EXISTING 24" WATER MAIN

EXISTING 16" WATER MAIN

BISHOP OF CHARLESTON
TMS NO. 202-00-00-070
DB 0170-376
PB CH-27

KIAWAH RIVER PLANTATION PROPERTY LINE

12" DIP WATER MAIN

FUTURE ROAD

THOMAS & HUTTON CONTROL POINT
3/4" IRON PIPE WITH CAP
N: 294,346.96
E: 2,263,576.95
ELEV.: 14.08 (NAVD 88)

OCEAN BOULEVARD CORPORATION
TMS NO. 212-00-00-001
DB V648-237
PB EA-322

WALNUT HILL PLANTATION LLC
TMS NO. 202-00-00-069
DB 0378-561
PB 0-95

KIAWAH RIVER PLANTATION PROPERTY LINE

KIAWAH RIVER PLANTATION PROPERTY LINE

OCEAN BOULEVARD CORPORATION
TMS NO. 212-00-00-001
DB V648-237
PB EA-322

NAOMI FREEMAN NELSON
TMS NO. 202-00-00-083
DB W138-301

JOYCE SIMMONS
TMS NO. 213-00-00-014
DB L341-105
PB BV-169

NELLIE MURRAY
TMS NO. 213-00-00-015
DB B218-379

LAS SPRAY FIELD

LOUIS WASHINGTON ETAL
TMS NO. 213-00-00-016
DB C076-090

MULLET HALL ROAD

BONNEAU RD

NANCY A BUTLER AND MAYBELL WRIGHT
TMS NO. 213-00-00-068
DB T245-293
PB DA-272

MAYBELL WRIGHT ETAL
TMS NO. 213-00-00-020
DB 0136-532
PB Q-37

MAYBELL WRIGHT AND VERMELL D BONNEAU
TMS NO. 213-00-00-094
DB X250-721
PB DA-272

ROBERT LEE WRIGHT
TMS NO. 213-00-00-018
DB 0416-798

T&H CONTROL POINT
DESCRIPTION: NAIL & MARKER
N: 292,864.38
E: 2,269,788.42
ELEV.: 11.56 (NAVD 88)

EFFLUENT STORAGE LAGOON

WWTP

T&H CONTROL POINT
DESCRIPTION: NAIL & MARKER
N: 292,229.69
E: 2,270,193.85
ELEV.: 10.85 (NAVD 88)

T&H CONTROL POINT
DESCRIPTION: NAIL & MARKER
N: 291,781.59
E: 2,269,448.90
ELEV.: 10.86 (NAVD 88)

GRAPHIC SCALE

300 0 150 300 600 1200

(IN FEET)
1 inch = 300 ft.

SOUTH CAROLINA — THOMAS & HUTTON ENGINEERING No. C00285 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA — PROFESSIONAL ENGINEER — No. 13293 — REGISTERED — MARK F. YORK

NO.	REVISIONS	BY	DATE
1	BID ADDENDUM #3 COMMENTS	CGB	3/23/16

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP

SURVEY CONTROL SHEET

JOB NO:	J-25326.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	MFY
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	1" = 300'

01-V-01

BOHICKET ROAD (S10-201)
(BETSY KARRISON PARKWAY)

12" DIP
WATER MAIN

EXISTING
16" WATER MAIN

EXISTING
24" WATER MAIN

KIAWAH RIVER PLANTATION
PROPERTY LINE

12" DIP
WATER MAIN

FUTURE ROAD

KIAWAH RIVER PLANTATION
PROPERTY LINE

KIAWAH RIVER PLANTATION
PROPERTY LINE

LAS SPRAY FIELD

12" DIP
WATER MAIN

KIAWAH RIVER PLANTATION
PROPERTY LINE

WWTP

12" DIP
WATER MAIN

02-C-02
02-C-03
02-C-04
02-C-05
02-C-06
02-C-07

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

SOUTH CAROLINA
THOMAS & HUTTON ENGINEERING CO.
No. C00285
CERTIFICATE OF AUTHORITY

SOUTH CAROLINA
PROFESSIONAL ENGINEER
No. 13293
REGISTERED
MARK F. YON
OFFICE

NO.	REVISIONS	BY	DATE
1	BID ADDENDUM #3 COMMENTS	MFY	3/23/16

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP

WATER MAIN - SHEET INDEX

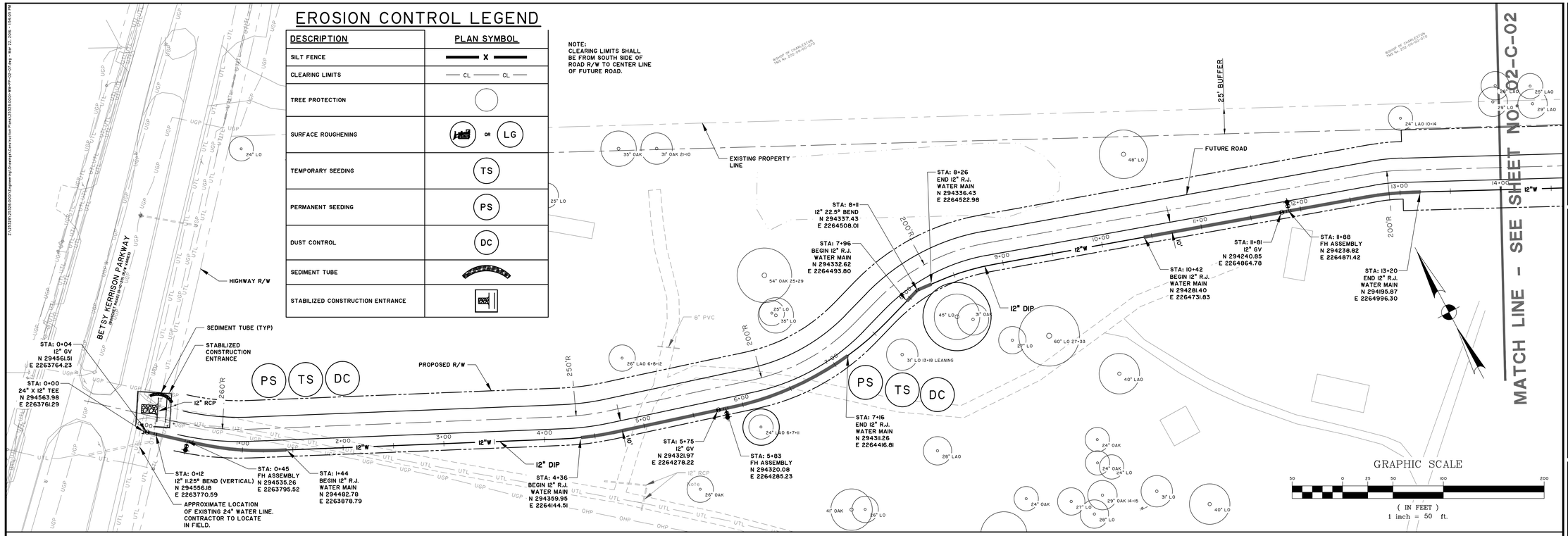
JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	MFY
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	1" = 200'

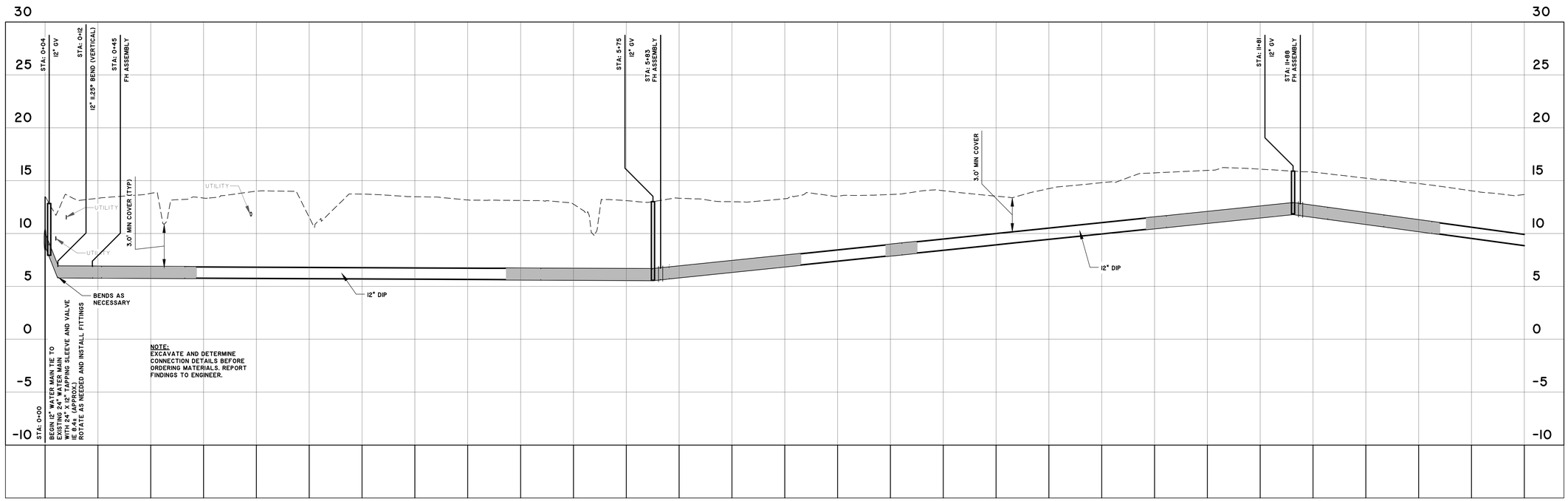
02-C-01

EROSION CONTROL LEGEND

DESCRIPTION	PLAN SYMBOL
SILT FENCE	X
CLEARING LIMITS	CL CL
TREE PROTECTION	
SURFACE ROUGHENING	OR LG
TEMPORARY SEEDING	TS
PERMANENT SEEDING	PS
DUST CONTROL	DC
SEDIMENT TUBE	
STABILIZED CONSTRUCTION ENTRANCE	

NOTE:
CLEARING LIMITS SHALL BE FROM SOUTH SIDE OF ROAD R/W TO CENTER LINE OF FUTURE ROAD.





25328.0001– 12 WATER LINE (REV1)
STATIONS: 0+00 – 14+00
SCALE: HORZ.: 1" = 50'
VERT.: 1" = 5'

SOUTH CAROLINA PROFESSIONAL ENGINEER — THOMAS & HUTTON ENGINEERING No. C00285 CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 13293 MARK F. YONCE

NO.	REVISIONS	BY	DATE
1	BID ADDENDUM #3 COMMENTS	MFY	3/23/16

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP

WATER MAIN - PLAN AND PROFILE

JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	DNF
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	AS NOTED

02-C-02

30

NOTE:
CLEARING LIMITS SHALL BE FROM SOUTH SIDE OF ROAD R/W TO CENTER LINE OF FUTURE ROAD.

MATCH LINE - SEE SHEET NO. 02-C-01

MATCH LINE - SEE SHEET NO. 02-C-03

PS TS

EXISTING PROPERTY LINE

25' BUFFER

54' (TYP)

10'

12" DIP

12"W

PROPOSED R/W

FUTURE ROAD

300'R

STA: 16+39
BEGIN 12" R.J. WATER MAIN
N 294058.11
E 2265283.46

STA: 17+78
12" GV
N 293997.99
E 2265408.79

STA: 17+85
FH ASSEMBLY
N 293994.92
E 2265415.20

STA: 19+17
END 12" R.J. WATER MAIN
N 293937.87
E 2265534.11

STA: 21+96
BEGIN 12" R.J. WATER MAIN
N 293816.97
E 2265786.14

STA: 23+36
12" GV
N 293752.02
E 2265909.03

STA: 23+42
FH ASSEMBLY
N 293747.83
E 2265914.54

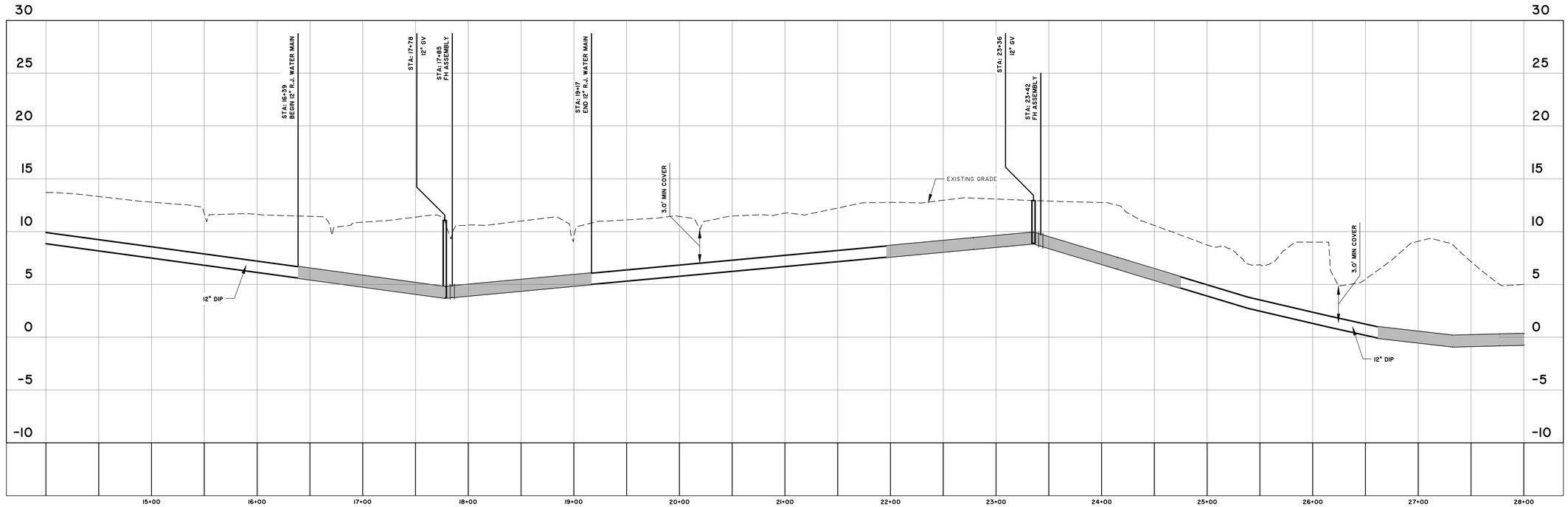
STA: 24+75
END 12" R.J. WATER MAIN
N 293649.82
E 2266003.24

STA: 26+62
BEGIN 12" R.J. WATER MAIN
N 293503.49
E 2266119.38

STA: 27+33
12" 90° BEND
N 293447.88
E 2266163.51

STA: 27+77
12" 90° BEND
N 293475.23
E 2266197.98

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.



25328.0001- 12 WATER LINE (REV1)
STATIONS: 14+00 - 28+00
SCALE: HORZ.: 1" = 50'
VERT.: 1" = 5'

SOUTH CAROLINA
THOMAS & HUTTON ENGINEERING
No. C00285
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA
PROFESSIONAL ENGINEER
No. 18293
REGISTERED
MARK F. YORK

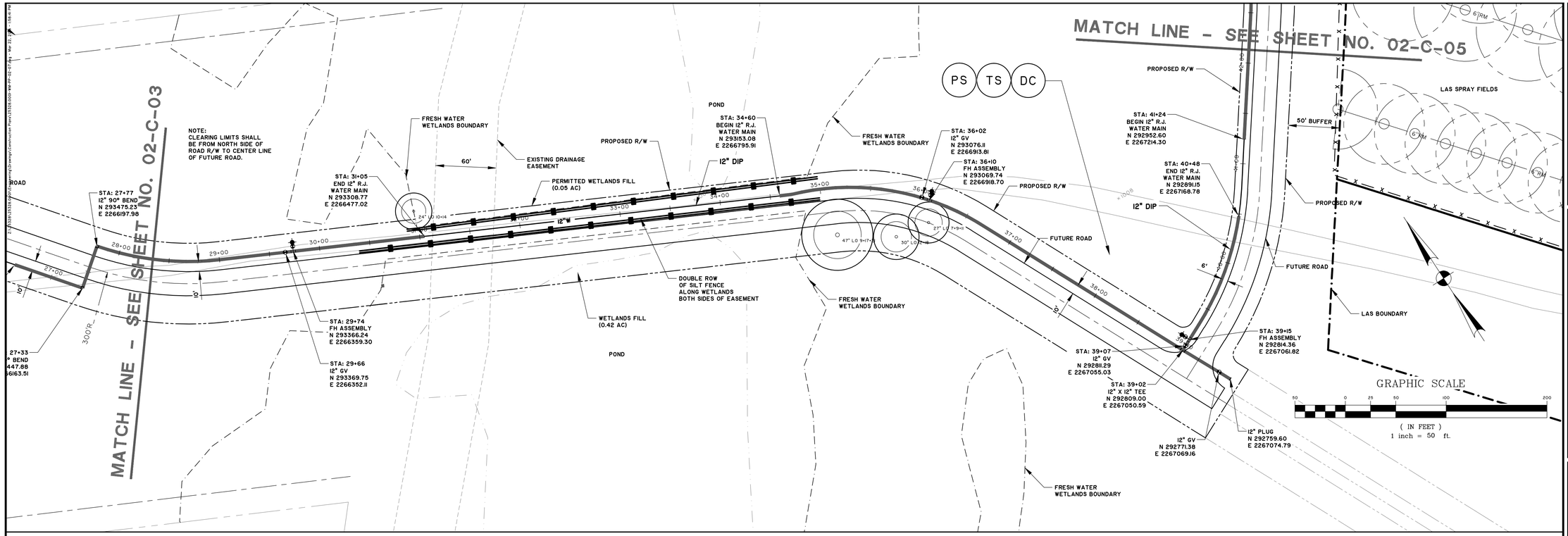
NO.	REVISIONS	BY	DATE
1	BID ADDENDUM #3 COMMENTS	MFY	3/23/16

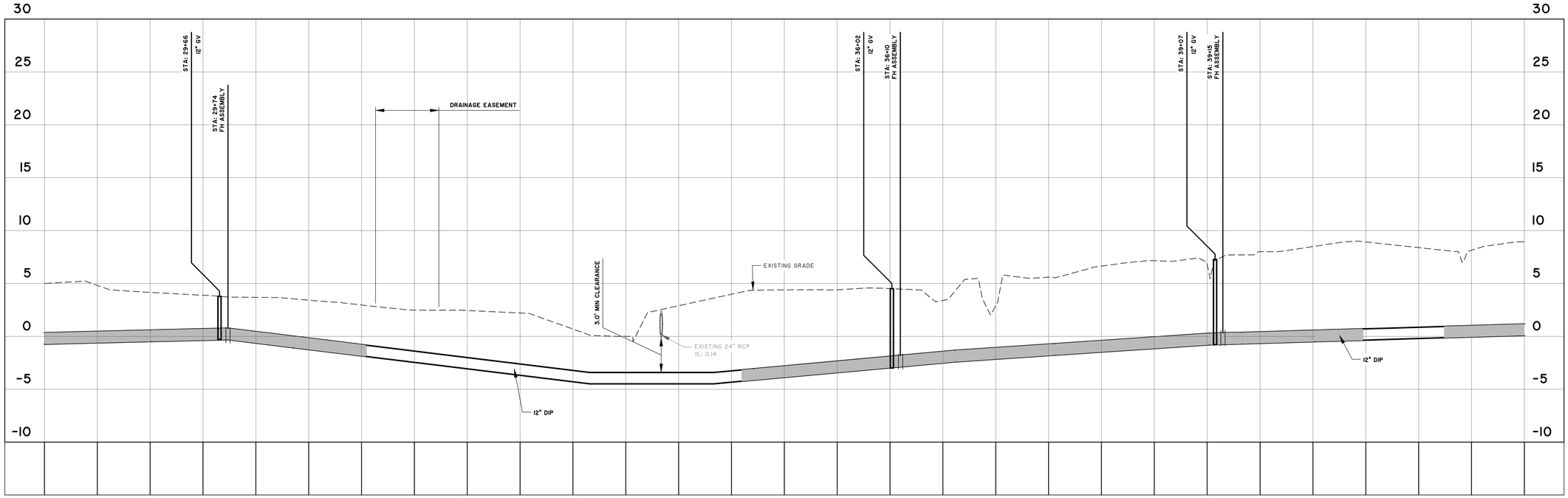
THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA
KIAWAH RIVER PLANTATION WWTP
WATER MAIN - PLAN AND PROFILE

JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	DNF
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	AS NOTED

02-C-03





25328.0001– 12 WATER LINE (REV1)
STATIONS: 28+00 – 42+00
SCALE: HORZ.: 1" = 50'
VERT.: 1" = 5'

SOUTH CAROLINA PROFESSIONAL ENGINEER
THOMAS & HUTTON ENGINEERING
No. C00285
CERTIFICATE OF AUTHORITY

SOUTH CAROLINA PROFESSIONAL ENGINEER
No. 19293
MARK F. YORK

NO.	REVISIONS	BY	DATE
1	BID ADDENDUM #3 COMMENTS	MFY	3/23/16

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP

WATER MAIN - PLAN AND PROFILE

JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	DNF
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	AS NOTED

02-C-04

NOTE:
CLEARING LIMITS SHALL BE FROM NORTH SIDE OF ROAD R/W TO CENTER LINE OF FUTURE ROAD.

MATCH LINE – SEE SHEET NO. 02-C-04

MATCH LINE – SEE SHEET NO. 02-C-06

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

STA: 41+24
12" R.J.
WATER MAIN
N 293932.60
E 2267214.30

PROPOSED R/W

STA: 44+02
END 12" R.J.
WATER MAIN
N 293181.57
E 2267371.91

STA: 44+90
BEGIN 12" R.J.
WATER MAIN
N 293254.94
E 2267420.82

STA: 46+29
12" GV
N 293368.97
E 2267500.30

STA: 46+37
FH ASSEMBLY
N 293374.99
E 2267505.57

PROPOSED R/W

50' BUFFER

LAS BOUNDARY

STA: 47+26
BEGIN 12" R.J.
WATER MAIN
N 293441.93
E 2267564.14

STA: 47+68
END 12" R.J.
WATER MAIN
N 293473.58
E 2267591.83

STA: 50+01
END 12" R.J.
WATER MAIN
N 293648.69
E 2267745.05

12" DIP

STA: 52+05
BEGIN 12" R.J.
WATER MAIN
N 293776.84
E 2267903.73

12"W

STA: 53+44
12" GV
N 293860.59
E 2268014.67

STA: 53+50
FH ASSEMBLY
N 293863.97
E 2268019.14

STA: 54+60
12" X 12" TEE
N 293930.06
E 2268106.70

STA: 54+60
12" GV
N 293934.73
E 2268112.88

PERMANENT 20' UTILITY EASEMENT

STA: 54+60
12" PLUG
N 293943.97
E 2268125.12

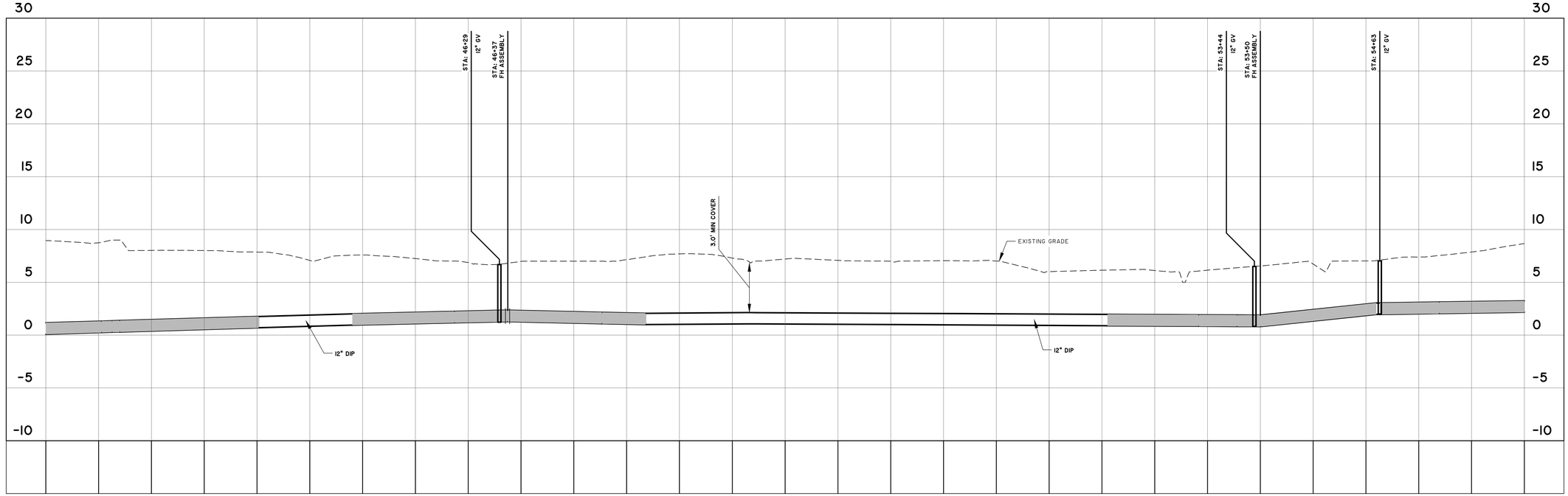
STA: 54+63
12" GV
N 293927.33
E 2268108.76

STA: 55+19
12" 45° BEND
N 293882.72
E 2268142.44

STA: 56+16
END 12" R.J.
WATER MAIN
N 293880.47
E 2268239.62

LAS SPRAY FIELDS

LAS SPRAY FIELDS



25328.0001– 12 WATER LINE (REV1)
STATIONS: 42+00 – 56+00
SCALE: HORZ.: 1" = 50'
VERT.: 1" = 5'

SOUTH CAROLINA
THOMAS & HUTTON ENGINEERING
No. C00285
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA
PROFESSIONAL ENGINEER
No. 19293
REGISTERED
MARK F. YORK

NO.	REVISIONS	BY	DATE
1	BID ADDENDUM #3 COMMENTS	MFY	3/23/16

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP

WATER MAIN – PLAN AND PROFILE

JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	DNF
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	AS NOTED

02-C-05

NOTE:
CLEARING LIMITS SHALL BE IN 20' EASEMENT.

STA: 62+00
12" 22.5° BEND
N 293866.97
E 2268823.11

STA: 62+71
END 12" R.J.
WATER MAIN
N 293818.20
E 2268865.42

PERMANENT 20' UTILITY EASEMENT

STA: 62+22
12" 11.25° BEND
N 293858.00
E 2268843.42

STA: 62+41
12" 22.5° BEND
N 293847.40
E 2268858.52

EXISTING PROPERTY LINE

12" DIP

STA: 59+45
BEGIN 12" R.J.
WATER MAIN
N 293872.87
E 2268568.20

STA: 64+27
BEGIN 12" R.J.
WATER MAIN
N 293665.80
E 2268901.43

STA: 65+13
FH ASSEMBLY
N 293582.11
E 2268921.21

STA: 65+99
END 12" R.J.
WATER MAIN
N 293498.41
E 2268940.99

STA: 66+46
END 12" R.J.
WATER MAIN
N 293452.36
E 2268951.87

LAS BOUNDARY

LAS SPRAY FIELDS

6"RM

MATCH LINE - SEE SHEET NO. 02-C-05

STA: 56+16
END 12" R.J.
WATER MAIN
N 293880.47
E 2268239.62

ERMANENT 20' ÷54+60
ITY EASEMENT 2" PLUG
N 293943.97
E 2268125.12

54+60
12" GV
934.73
6112.88

STA: 54+63
12" GV
N 293927.33

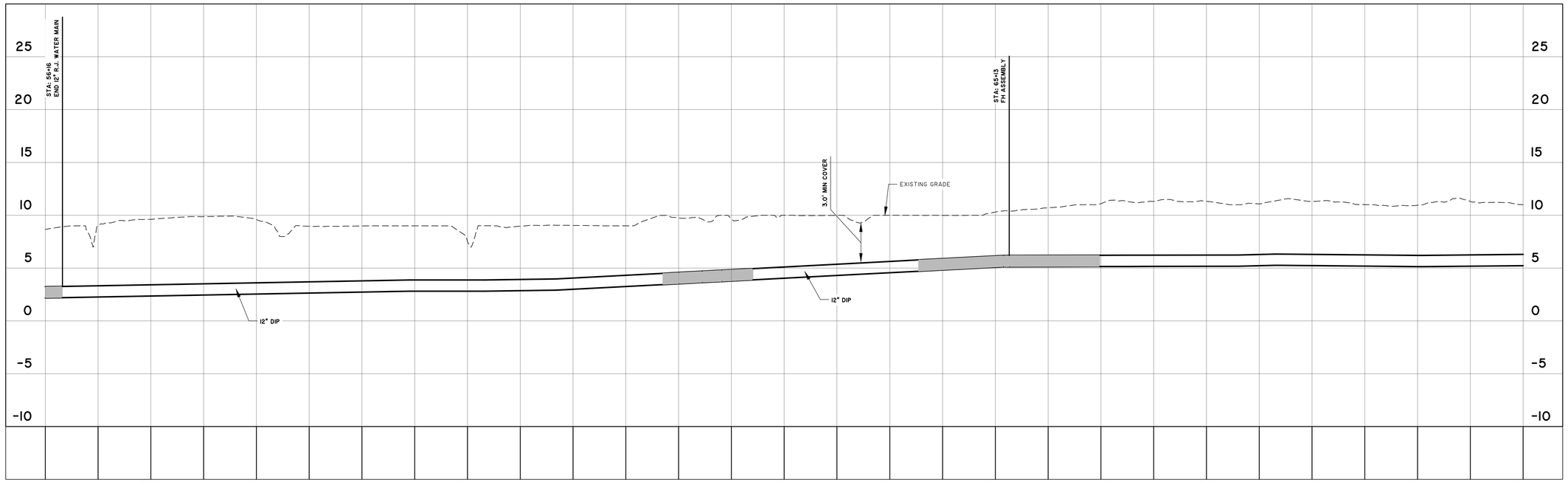
STA: 55+19
12" 45° BEND

MATCH LINE - SEE SHEET NO. 02-C-07

EXISTING PROPERTY LINE

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
1 inch = 50 ft.

30 30



25328.0001– 12 WATER LINE (REV1)
STATIONS: 56+00 – 70+00
SCALE: HORZ.: 1" = 50'
VERT.: 1" = 5'

SOUTH CAROLINA
THOMAS & HUTTON ENGINEERING
No. C00285
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA
REGISTERED PROFESSIONAL ENGINEER
No. 19293
MARK F. YORK

NO.	REVISIONS	BY	DATE
1	BID ADDENDUM #3 COMMENTS	MFY	3/23/16

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

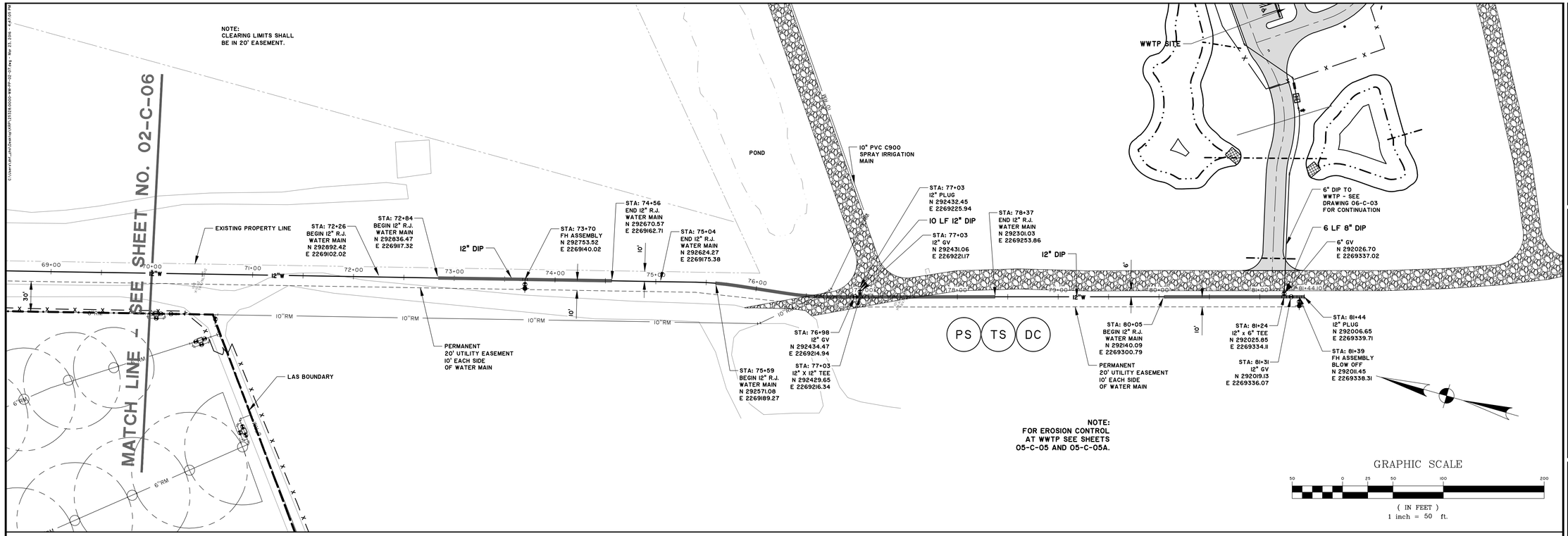
KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

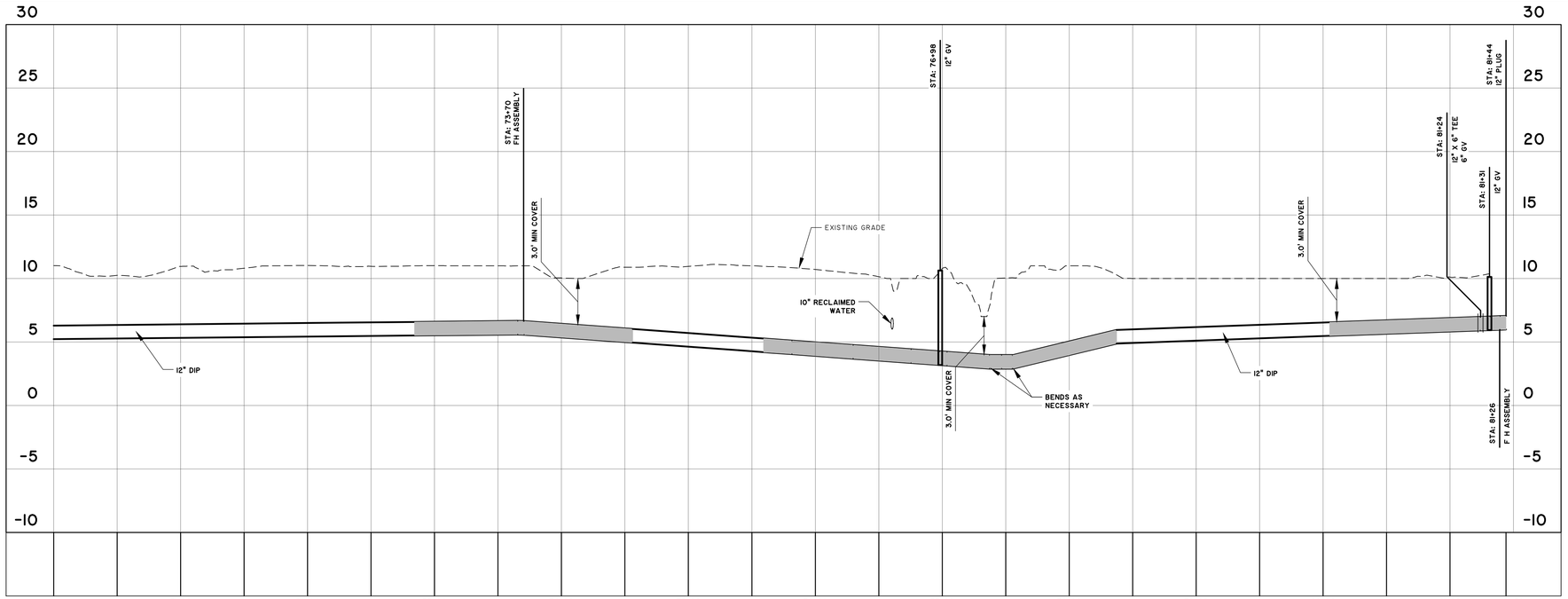
KIAWAH RIVER PLANTATION WWTP

WATER MAIN - PLAN AND PROFILE

JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	MFY
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	AS NOTED

02-C-06





25328.0001– 12 WATER LINE (REV1)
STATIONS: 70+00 – 81+50
SCALE: HORZ.: 1" = 50'
VERT.: 1" = 5'

SOUTH CAROLINA PROFESSIONAL ENGINEER
THOMAS & HUTTON ENGINEERING
No. C00285
CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA PROFESSIONAL ENGINEER
No. 19293
REGISTERED
MARK F. YORK

NO.	REVISIONS	BY	DATE
1	BID ADDENDUM #3 COMMENTS	MFY	3/23/16

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

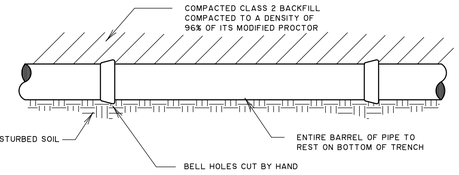
KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP

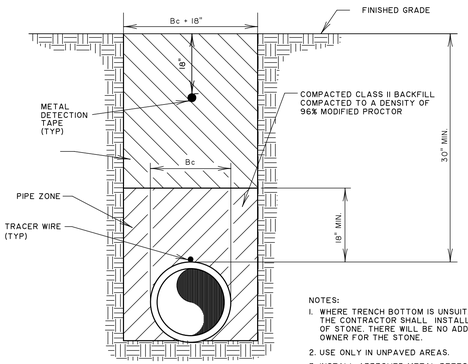
WATER MAIN – PLAN AND PROFILE

JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	DNF
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	AS NOTED

02-C-07



LONGITUDINAL SECTION



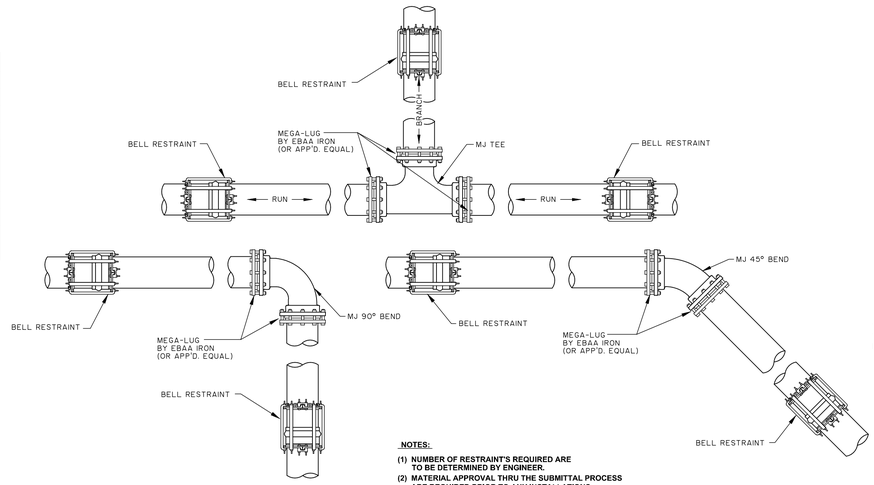
CROSS SECTION

NOTES:

1. WHERE TRENCH BOTTOM IS UNSUITABLE TO SUPPORT PIPE, THE CONTRACTOR SHALL INSTALL PIPE ON A MIN. 4" BED OF STONE. THERE WILL BE NO ADDITIONAL COST TO THE OWNER FOR THE STONE.
2. USE ONLY IN UNPAVED AREAS.
3. INSTALL APPROVED METAL DETECTION TAPE 18" FROM FINISHED GRADE.
4. FOR INFORMATION ON BACKFILL MATERIAL SEE DESCRIPTION OF BACKFILL MATERIAL CLASSIFICATION THIS SHEET.
5. DURING BACKFILL OF PIPE TRENCHES, CONTRACTOR SHALL ADHERE TO ALL SCDOT REQUIREMENTS FOR LIFT THICKNESS AND COMPACTION STANDARDS PER THE SCDOT 2007 STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

1 / 02-C-08 TYPICAL WATER LINE BEDDING DETAIL
NOT TO SCALE

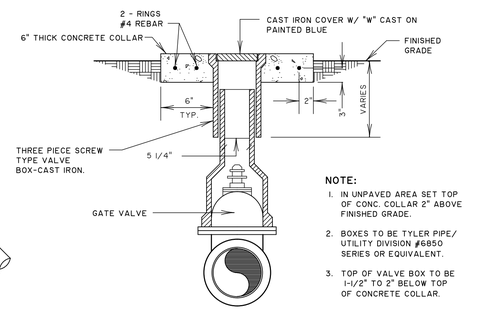
MAXIMUM TRENCH WIDTHS	
Bc - PIPE SIZE	WIDTH
2"	20"
2 1/2"	22"
3"	24"
4"	28"
6"	30"
8"	30"
10"	32"
12"	34"
14"	34"
16"	36"



NOTES:

(1) NUMBER OF RESTRAINT'S REQUIRED ARE TO BE DETERMINED BY ENGINEER.
(2) MATERIAL APPROVAL THRU THE SUBMITTAL PROCESS ARE REQUIRED PRIOR TO ANY INSTALLATIONS.

2 / 02-C-08 TYPICAL FITTING AND JOINT RESTRAINT
NOT TO SCALE

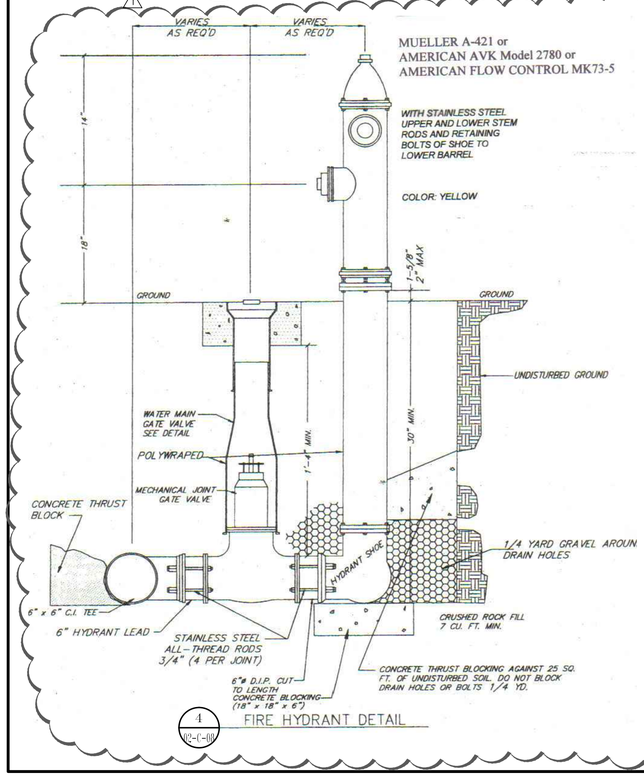


NOTE:

1. IN UNPAVED AREA SET TOP OF CONC. COLLAR 2" ABOVE FINISHED GRADE.
2. BOXES TO BE TYLER PIPE/ UTILITY DIVISION #6850 SERIES OR EQUIVALENT.
3. TOP OF VALVE BOX TO BE 1-1/2" TO 2" BELOW TOP OF CONCRETE COLLAR.

NOTE: VALVE BOXES SHALL BE SET TO MATCH FINISHED GRADES.

3 / 02-C-08 VALVE BOX DETAIL
NOT TO SCALE



4 / 02-C-08 FIRE HYDRANT DETAIL

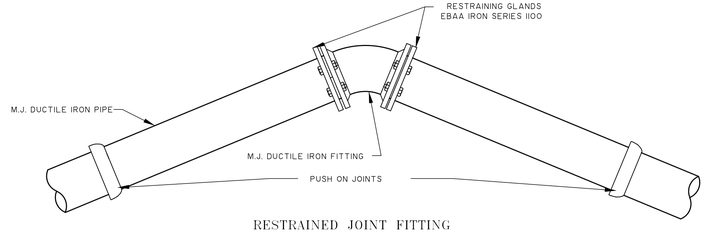
St. John's Water Company Standard Water Notes

1. Developer's engineer provides Written Notification of the Start of Construction to SJWC seven (7) days prior to commencement.
2. A Pre-Construction Conference is held at the SJWC offices. The developer or developer's engineer must inform SJWC of the engineering contract for construction oversight including the on-site inspector's name and phone number.
3. Developer's engineer or contractor must call SJWC **72 hours** prior to tapping the main water line, performing a pressure test, or conducting bacteriological tests. SJWC will have a company representative on site for each of these events. SJWC must also be notified and present for the inspection of all hydrants, valves, and thrust blocks prior to them being covered.
4. It is the responsibility of the contractor to make a water service tap on the newly constructed water line for each lot. The contractor will also be responsible for installing meter boxes at each location. SJWC will then place the meters in the meter boxes.
5. The developer's engineer is required to submit to SJWC the monthly inspection reports.
6. After a successful pressure test, the contractor must conduct bacteriological tests according to SC DHEC regulations in the presence of a SJWC representative. Two samples must show negative bacteriological results or the process must be repeated. The contractor is responsible for all costs of all testing, including water used in flushing.
7. All new fire hydrants should be tested for static and residual flows and the flows at 20 psi. These results should be documented and submitted to SJWC.
8. Conformance of construction to the approved plans and specifications is the responsibility of the developer's engineer. He will advise SJWC of any changes or modifications made during construction. SJWC shall have the right of entry to the construction site to observe and verify that the construction is in accordance with the approved plans and specifications and to witness testing of the system.
9. All valves shall open clockwise and hydrants open counterclockwise.
10. Install saw cuts at the curb to indicate the location of the meter boxes and valves. Please place a single slash in the curb for the location of a meter box, place a "V" in the curb at the valve locations, and place a "X" in the curb at all road crossing locations. If curbs are not installed on the project then pins must be placed in the asphalt roadway indicating the meter box locations.
11. The expansion connection, dual check, and two gaskets that accompany the ¾-inch Ford meter box must be given to SJWC.
12. SJWC requires five (5) paper copies of the final as-built record drawings which should have all water system appurtenances marked in the state plane coordinates. An electronic copy of the as-builts and the points file should be emailed to sjwceng@bellsouth.net.

NOTES:

1. THE FOLLOWING CONDITIONS WERE USED TO CALCULATE THE RESTRAINED LENGTHS:
   LAYING CONDITION IS TYPE 3;
   SOIL DESIGNATED AS SAND (SW);
   DEPTH IS 3 FT.;
   DESIGN PRESSURE (TEST) IS 150 PSI;
   SAFETY FACTOR IS 2.0.
2. FOR THE TEE (EACH LEG) AND REDUCER, LENGTHS ARE BASED ON BRANCHING AND REDUCING FROM THE NEXT LARGER SIZE IN THE TABLE. DEVIATIONS FROM THESE CONDITIONS MUST BE BASED ON THE ABOVE PARAMETERS.
3. FOR DUCTILE IRON PIPE PUSH ON JOINTS, GRIP RING TYPE PIPE MAY BE USED. FOR PVC PUSH ON JOINT HARNESS RESTRAINT (EBAA SERIES 1500 OR APPROVED EQUAL) SHALL BELOW. THE SUPPLY AND INSTALLATION OF THE HARNESS RESTRAINTS SHALL BE CONSIDERED INCIDENTAL TO THE PIPE INSTALLATION AND NO SEPARATE PAYMENT WILL BE MADE FOR THE HARNESS RESTRAINTS.

RESTRAINED JOINT TABLE LENGTH OF RESTRAINED JOINT REQUIRED (IN L.F. EACH SIDE OF THE BEND OR FITTING)								
SIZE	11 1/4°	22 1/2°	45°	90°	TEE (EACH LEG)	DEAD END	REDUCER	VALVE
8"	6	11	22	51	55	98	50	50
10"	6	13	26	61	78	118	50	118
12"	7	15	30	71	86	139	50	139
16"	10	20	32	76	110	143	106	143



RESTRAINED JOINT FITTING
(HORIZONTAL PIPE ONLY)
NOT TO SCALE

5 / 02-C-08 RESTRAINED JOINT FITTING DETAIL
NOT TO SCALE

SOUTH CAROLINA — CERTIFICATE OF AUTHORIZATION — THOMAS & HUTTON ENGINEERING CO. — No. C00285

SOUTH CAROLINA — REGISTERED PROFESSIONAL ENGINEER — No. 15293 — MARK F. YORK

NO.	REVISIONS	BY	DATE
1	BID ADDENDUM #3 COMMENTS	MFY	3/23/16

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA
KIAWAH RIVER PLANTATION WWTP
WATER MAIN DETAILS

JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	---
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	AS NOTED

02-C-08

EXISTING PROPERTY LINE
50' BUFFER
PHASE I LAS BOUNDARY
12"W
PHASE I LAS BOUNDARY
PROPOSED R/W
50' PROPOSED STREET R/W (BUFFER)
FUTURE ROAD
50' BUFFER
12" WATER LINE
6"RM
EXISTING PROPERTY LINE
EXISTING RESIDENCE
EXISTING RESIDENCE
50' BUFFER
EXISTING PROPERTY LINE
12" WATER LINE
EXISTING RESIDENCE
SPRAY IRRIGATION DISTRIBUTION SYSTEM MAIN PHASE I
10"RM
20' DOUBLE SWING GATE
EXISTING MONITORING WELL #5
LAND APPLICATION SYSTEM (LAS)
3 BOARD FENCE (TYP)
SPRAY IRRIGATION MAIN (TYP)
SPRAY DISTRIBUTION LINE (TYP)
SPRAY IRRIGATION HEAD – SPRAY RADIUS (TYP)
SPRAY IRRIGATION HEAD (TYP)
PHASE I LAS BOUNDARY
EXISTING MONITORING WELL #4
PHASE I LAS BOUNDARY
FUTURE ROAD
EXISTING MONITORING WELL #3
20' DOUBLE SWING GATE
EXISTING MONITORING WELL #1
END OF EXISTING PAVED MULLET HALL ROAD
EFFLUENT STORAGE LAGOON ACCESS ROAD
EXISTING PROPERTY LINE
MULLET HALL ROAD
EXISTING TREE LINE (TYP.)
SPRAY IRRIGATION PUMP STATION
ALL-WEATHER ACCESS ROAD
EFFLUENT STORAGE LAGOON SEE SHEET 05-C-03
SPRAY IRRIGATION DISTRIBUTION SYSTEM MAIN PHASE I
PROPOSED FENCE
EXISTING MONITORING WELL #6
WASTEWATER TREATMENT PLANT SITE SEE SHEET 05-C-03
TREATED EFFLUENT LINE TO STORAGE LAGOON
WWTP SITE BOUNDARY (TYP.)
POND
WWTP ACCESS ROAD
ALL-WEATHER ACCESS ROAD
PROPOSED WWTP PROPERTY LIMITS
POND
ALL-WEATHER ACCESS ROAD

NOTE:
1. DO NOT DISTURB EXISTING MONITORING WELLS DURING CONSTRUCTION.

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

SOUTH CAROLINA — THOMAS & HUTTON ENGINEERING — No. C00285 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA — PROFESSIONAL ENGINEER — No. 13293 — REGISTERED — MARK F. YOUNG

NO.	REVISIONS	BY	DATE
3	BID ADDENDUM #3 COMMENTS	MFY	3/23/16
2	BID ADDENDUM #1 COMMENTS	MFY	3/7/16
1	GENERAL REVISIONS	MFY	12/2/15

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP

OVERALL SITE PLAN

JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	KEN
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	1" = 100'

05-C-02

MATCH LINE - SEE SHEET NO. 05-C-04

PROPERTY LINE

EXTEND GRAVEL SURFACE TO END OF EXISTING PAVED ROAD

PROPOSED 20' WIDE ALL-WEATHER ACCESS ROAD

PROPOSED SPRAY IRRIGATION DISTRIBUTION MAIN

TREE LINE

SPRAY IRRIGATON PUMP STATION

TOE OF SLOPE

PROPOSED EFFLUENT STORAGE LAGOON ALL-WEATHER ACCESS ROAD

12" WATER LINE

WWTP SITE BOUNDARY

EXISTING MONITORING WELL #6

EXISTING DRAINAGE DITCH

180 LF 30" RCP (INTERIOR COATED) OR 30" C905 @ 0.5%

18' DOUBLE LEAF SWING GATE

CLEAN OUT EXISTING DITCH (TYP)

TOP OF SLOPE

BOTTOM SLOPE OF POND EL = 10.0'

INTAKE/OUTLET STRUCTURE SEE 2/07-C-04 TOP 9.0'

PROPOSED 20' WIDE ALL-WEATHER ACCESS ROAD

POND

TOP OF SLOPE

TOP OF WATER EL = 15.1'

MALLET HALL ROAD

TOE OF SLOPE

PROPOSED FENCE

TOP OF DIKE EL = 18.0'

TAPER GRAVEL ROAD TO MATCH EXISTING ROAD WIDTH OVER 50' DISTANCE

20' WIDE ACCESS ROAD

EXISTING TREE LINE (TYP.)

PROPOSED WWTP PROPERTY LIMITS

EXISTING DRAINAGE DITCH

20' SLIDE GATE

CENTRIFUGE BUILDING

FILL EXISTING DITCH (HATCHED AREA)

ODOROUS AIR TREATMENT

PLANT DRAIN PUMP STATION

TREATED EFFLUENT FORCE MAIN

ODOROUS AIR TREATMENT

POND

CHLORINE CONTACT CHAMBER

SECURITY FENCE (TYP.)

WASTEWATER TREATMENT FACILITY

18' SLIDE GATE

PROPOSED 18' WIDE ALL-WEATHER ACCESS ROAD

NOTE:
1. DO NOT DISTURB EXISTING MONITORING WELLS DURING CONSTRUCTION.

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 20285 THOMAS & HUTTON ENGINEERING CO. CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 13293 MARK F. YORK

NO.	REVISIONS	BY	DATE
3	BID ADDENDUM #3 COMMENTS	MFY	3/23/16
2	BID ADDENDUM #1 COMMENTS	MFY	3/7/16
1	GENERAL REVISIONS	MFY	12/2/15

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

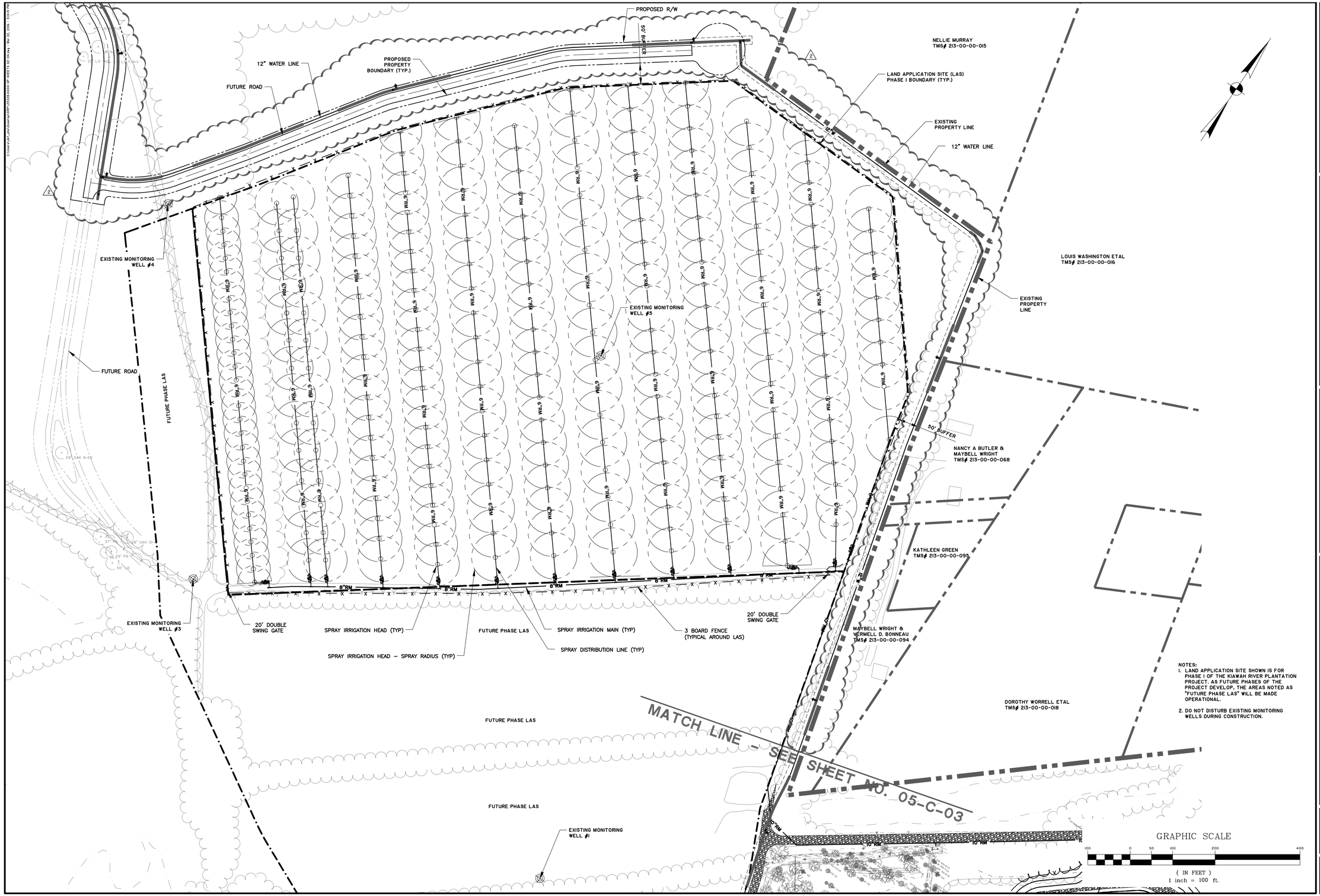
KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP

WWTP & EFFLUENT LAGOON SITE PLAN

JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	KEN
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	1"=60'

05-C-03



SOUTH CAROLINA PROFESSIONAL ENGINEER No. 13293 REGISTERED MARK F. YORK

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING No. C00285 CERTIFICATE OF AUTHORIZATION

NO.	REVISIONS	BY	DATE
2	BID ADDENDUM #3 COMMENTS	MFY	3/23/16
1	GENERAL REVISIONS	MFY	12/2/15

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

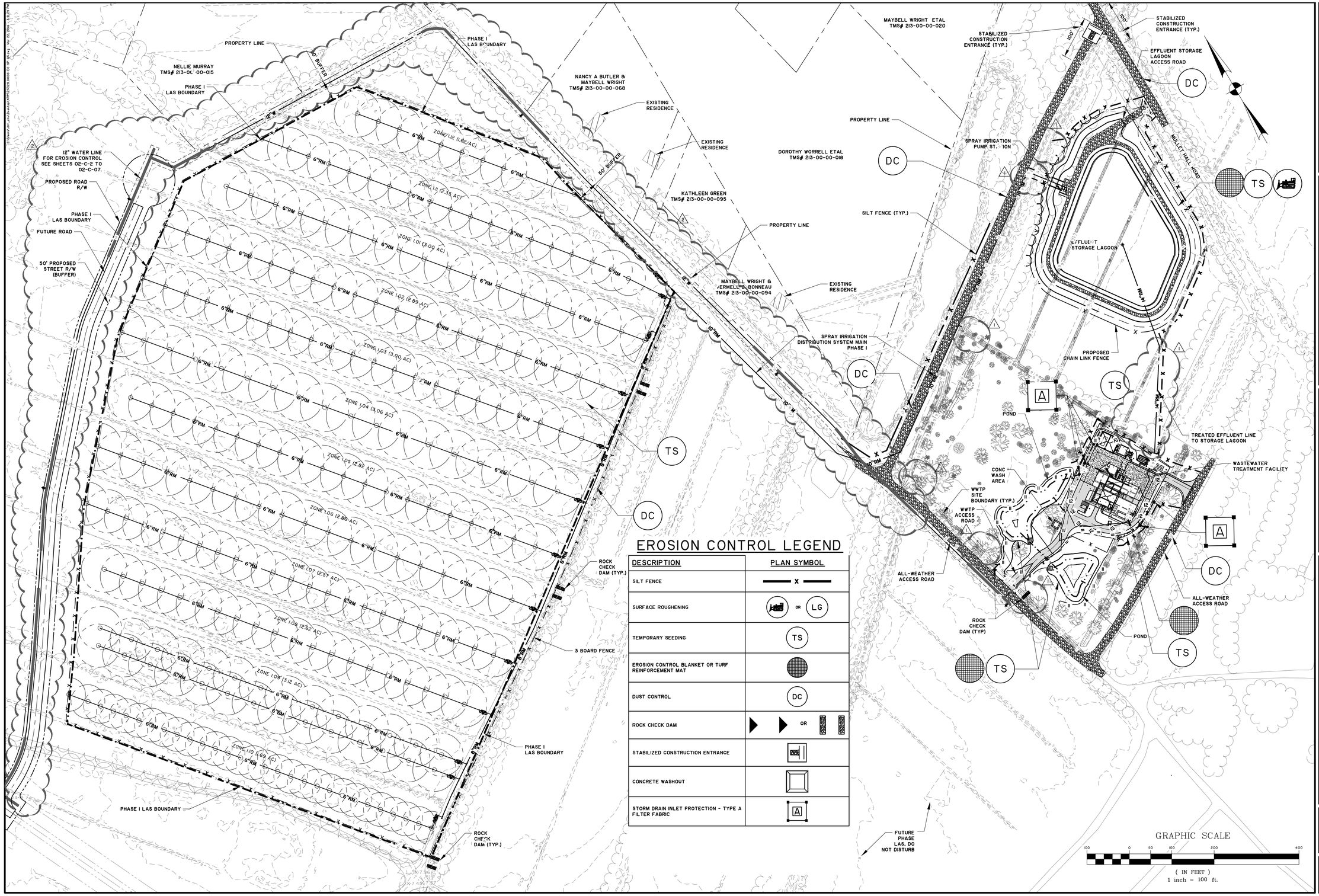
KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP

LAS SITE PLAN - PHASE I

JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	KEN
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	1" = 100'

05-C-04



EROSION CONTROL LEGEND

DESCRIPTION	PLAN SYMBOL
SILT FENCE	x
SURFACE ROUGHENING	OR LG
TEMPORARY SEEDING	TS
EROSION CONTROL BLANKET OR TURF REINFORCEMENT MAT	
DUST CONTROL	DC
ROCK CHECK DAM	OR
STABILIZED CONSTRUCTION ENTRANCE	
CONCRETE WASHOUT	
STORM DRAIN INLET PROTECTION - TYPE A FILTER FABRIC	A

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 03285 THOMAS & HUTTON ENGINEERING No. C00285 CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 13293 MAIRE F. YORK

NO.	REVISIONS	BY	DATE
2	BID ADDENDUM #3 COMMENTS	MFY	3/23/16
1	BID ADDENDUM #1 COMMENTS	MFY	3/7/16

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

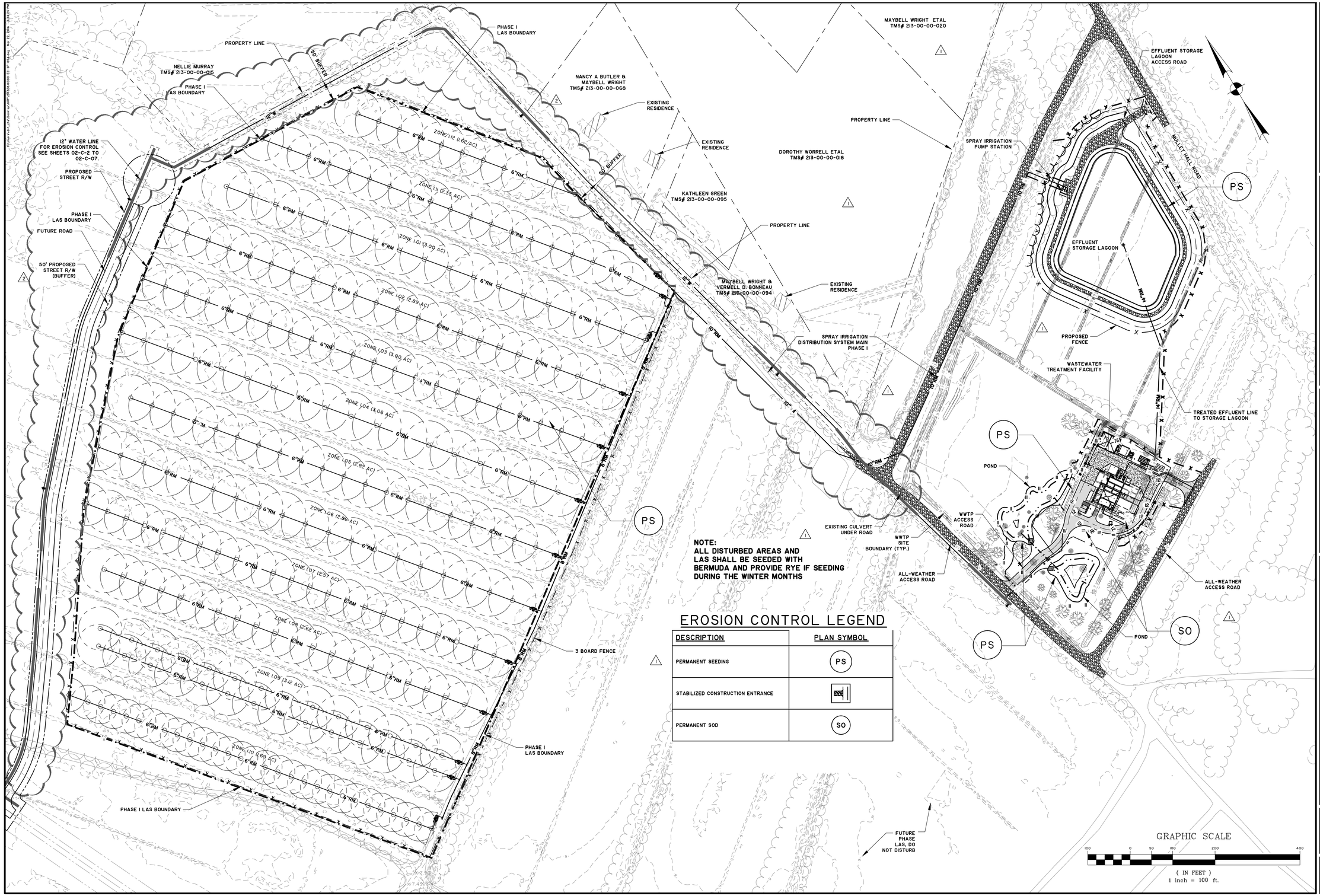
KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP

EROSION & SEDIMENT CONTROL PLAN - INITIAL PHASE

JOB NO:	J-25328.0000
DATE:	7/31/15
DRAWN:	DNF
DESIGNED:	KEN
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	1"=100'

05-C-05



SOUTH CAROLINA PROFESSIONAL ENGINEER — THOMAS & HUTTON ENGINEERING — No. C00285 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER — No. 13293 — MARK F. YORK

NO.	REVISIONS	BY	DATE
2	BID ADDENDUM #3 COMMENTS	MFY	3/23/16
1	BID ADDENDUM #1 COMMENTS	MFY	3/7/16

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

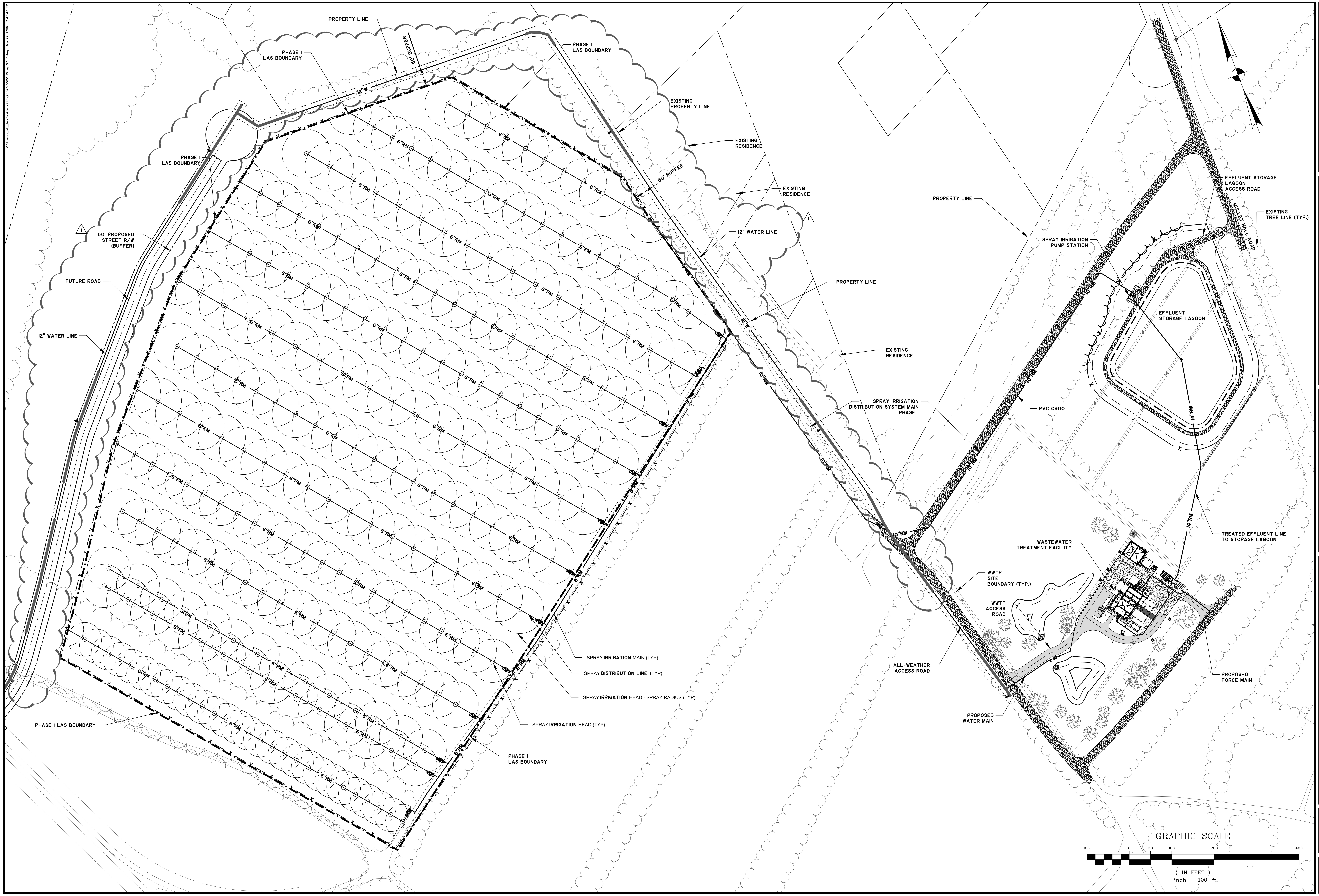
KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP

EROSION & SEDIMENT CONTROL PLAN - FINAL PHASE

JOB NO:	J-25328.0000
DATE:	7/31/15
DRAWN:	DNF
DESIGNED:	KEN
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	1"=100'

05-C-05A



PROPERTY LINE
50' BUFFER
PHASE I LAS BOUNDARY
PHASE I LAS BOUNDARY
EXISTING PROPERTY LINE
EXISTING RESIDENCE
50' BUFFER
EXISTING RESIDENCE
12" WATER LINE
50' PROPOSED STREET R/W (BUFFER)
FUTURE ROAD
12" WATER LINE
PROPERTY LINE
EXISTING RESIDENCE
PROPERTY LINE
SPRAY IRRIGATION DISTRIBUTION SYSTEM MAIN PHASE I
PVC C900
SPRAY IRRIGATION PUMP STATION
EFFLUENT STORAGE LAGOON ACCESS ROAD
MULLET HALL ROAD
EXISTING TREE LINE (TYP.)
EFFLUENT STORAGE LAGOON
TREATED EFFLUENT LINE TO STORAGE LAGOON
WASTEWATER TREATMENT FACILITY
WWTP SITE BOUNDARY (TYP.)
WWTP ACCESS ROAD
ALL-WEATHER ACCESS ROAD
PROPOSED WATER MAIN
PROPOSED FORCE MAIN
SPRAY IRRIGATION MAIN (TYP)
SPRAY DISTRIBUTION LINE (TYP)
SPRAY IRRIGATION HEAD - SPRAY RADIUS (TYP)
SPRAY IRRIGATION HEAD (TYP)
PHASE I LAS BOUNDARY
PHASE I LAS BOUNDARY
GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

SOUTH CAROLINA THOMAS & HUTTON ENGINEERING CO. No. C00285 CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 13293 MARK F. YODICE

NO.	REVISIONS	BY	DATE
1	BID ADDENDUM #3 COMMENTS	MFY	3/23/16

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

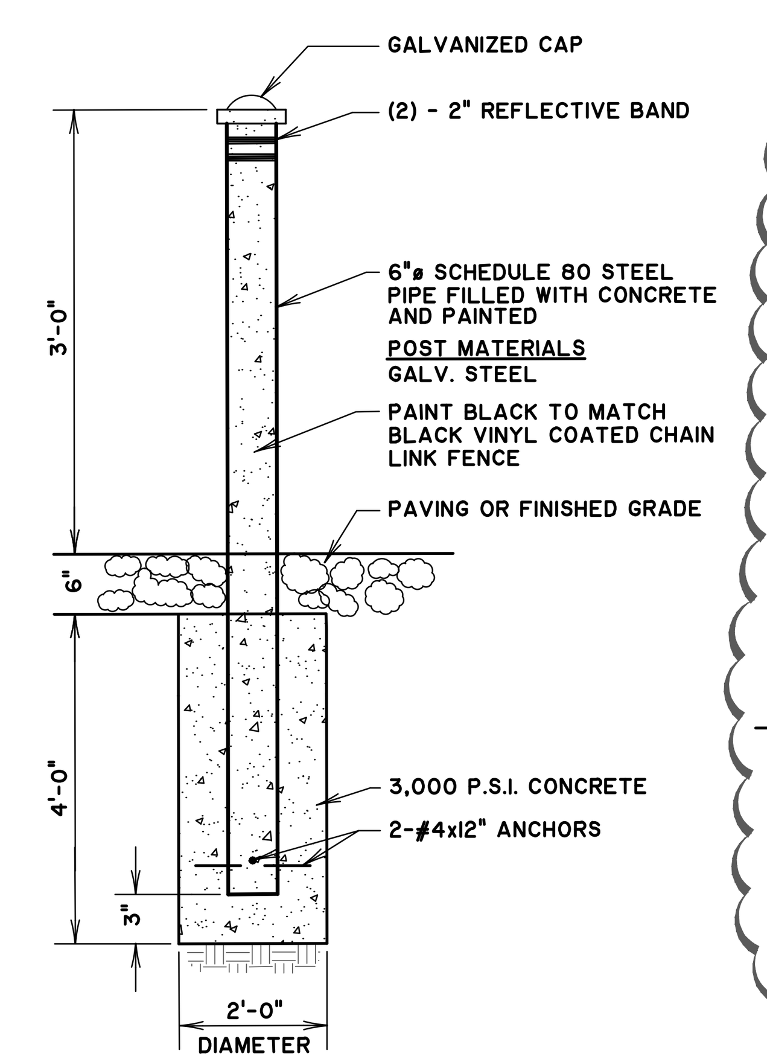
KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP

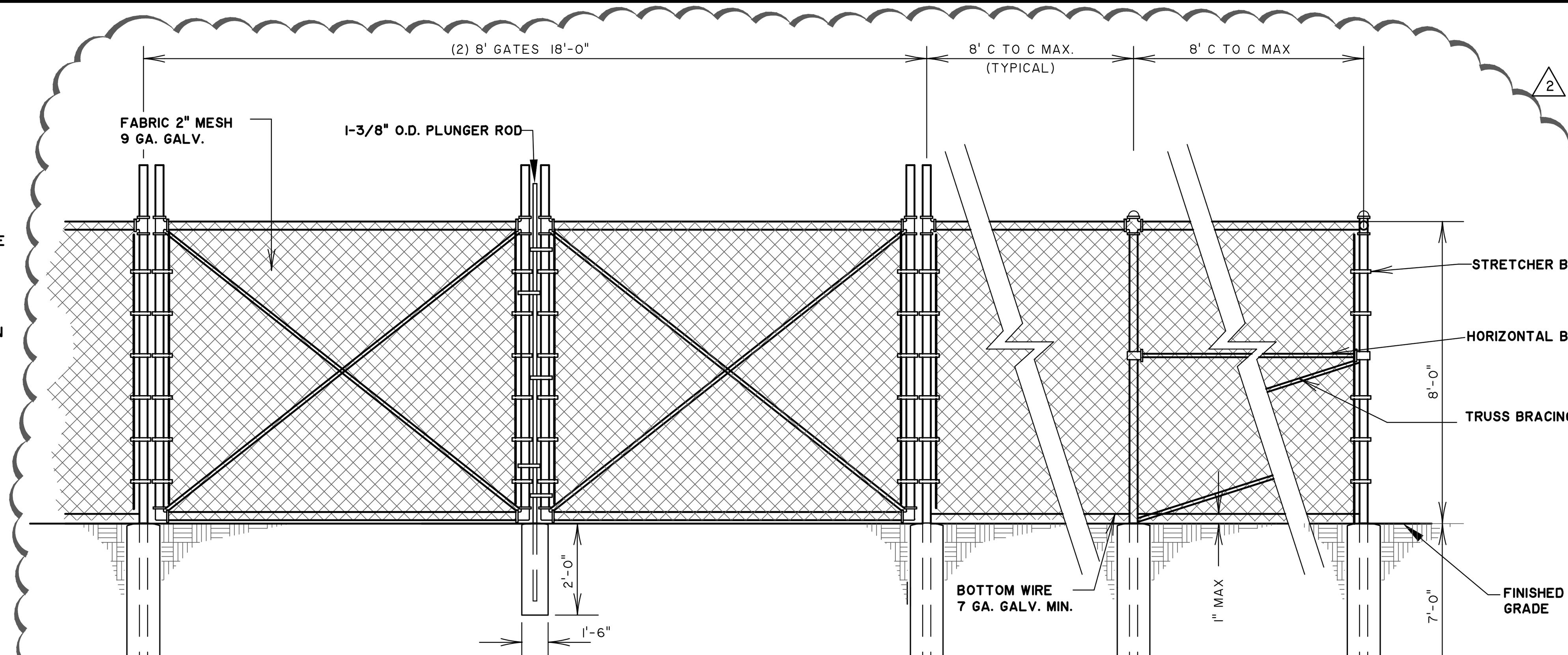
SITE PIPING PLAN OVERALL SITE

JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	KEN
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	1" = 100'

05-C-10

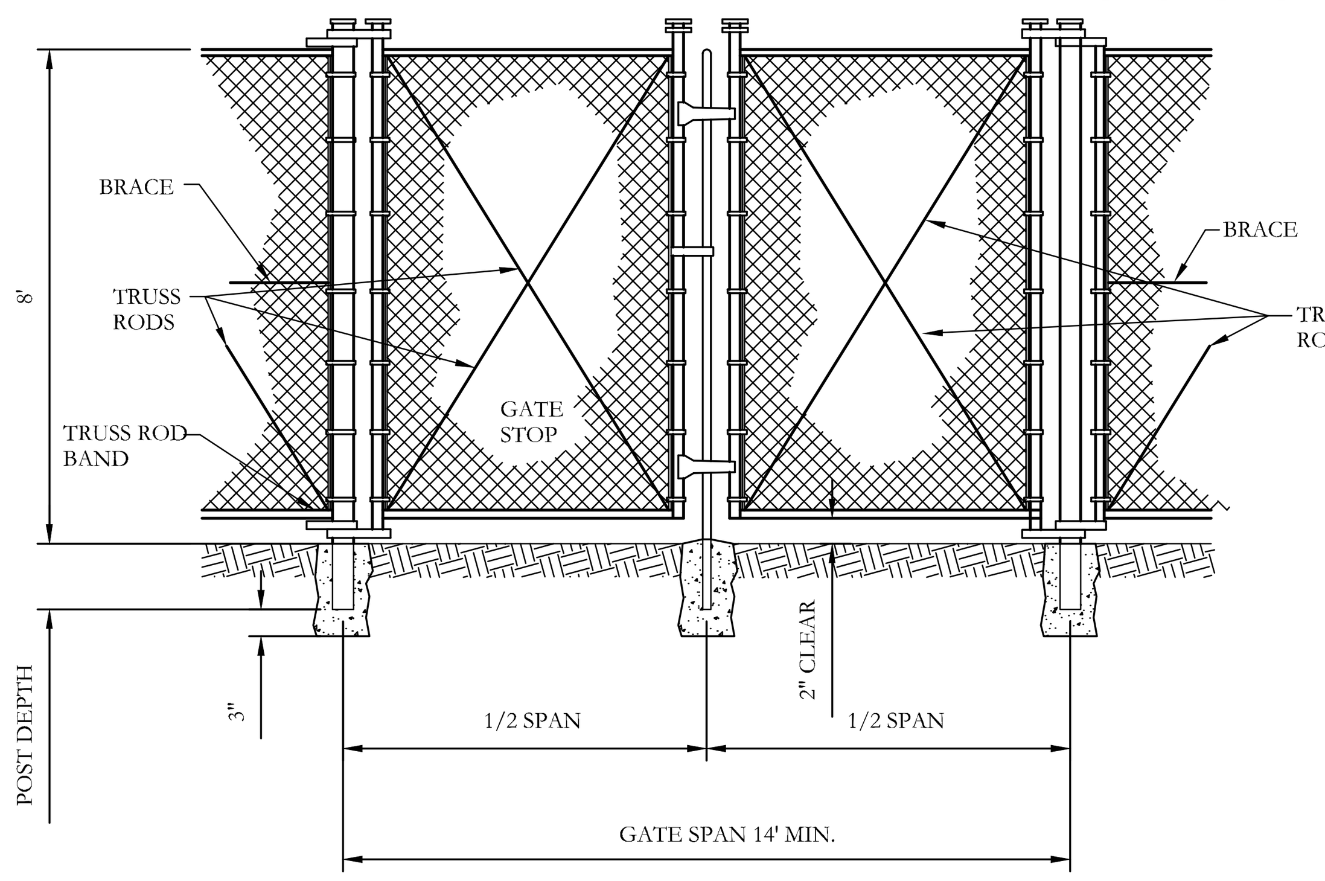


1 BOLLARD DETAIL
05-C-11 SCALE: N.T.S.

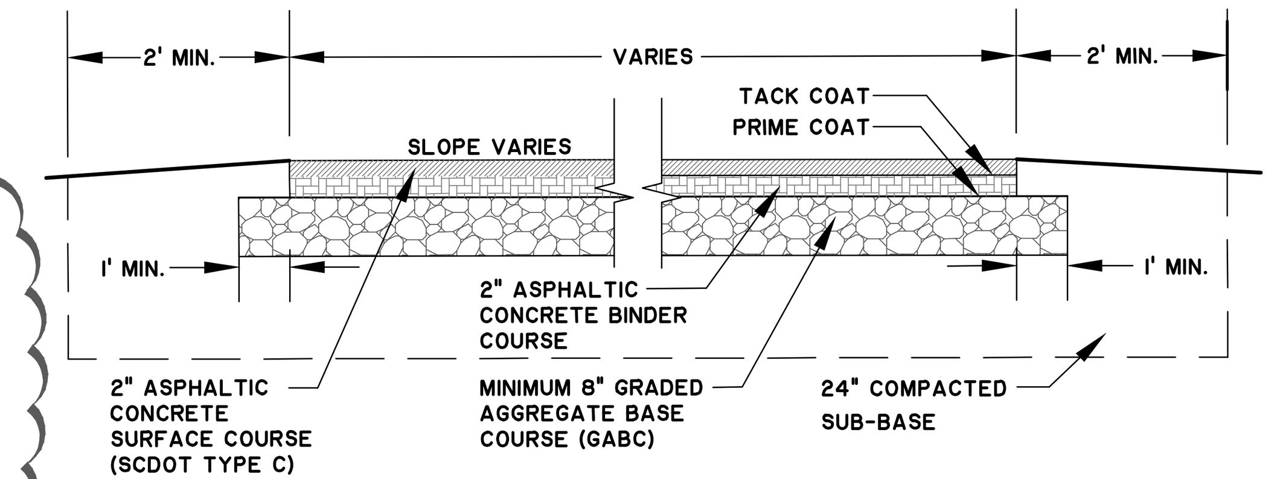


NOTE:
1. FENCE POSTS, RAILS, BRACING ETC. TO BE DESIGNED BY FENCE MFR FOR APPLICABLE LOADS FOR PROJECT LOCATION. ANY SIZES SPECIFIED HEREIN ARE PROVIDED AS MINIMUMS.
2. TOP RAIL TO TOP OF FABRIC SHALL BE 2" MAXIMUM.
3. FABRIC SHALL BE ATTACHED TO LINE POSTS W/ SELF-LOCKING BANDS AT 12" MAXIMUM SPACING.
4. FABRIC SHALL BE ATTACHED TO HORIZONTAL RAILS W/ TIE WIRES AT 24" MAXIMUM SPACING.
5. FABRIC SHALL BE ATTACHED TO TENSION WIRES W/ HOG RINGS AT 24" MAXIMUM SPACING.
6. FENCE MESH POSTS, GATES, HARDWARE ETC., TO HAVE BLACK VINYL COATING
7. SET ALL POSTS IN CONCRETE -CLASS C CONCRETE

2 FENCE DETAILS
05-C-11 SCALE: N.T.S.



3 DOUBLE SWING DRIVE GATE
05-C-11 SCALE: N.T.S.



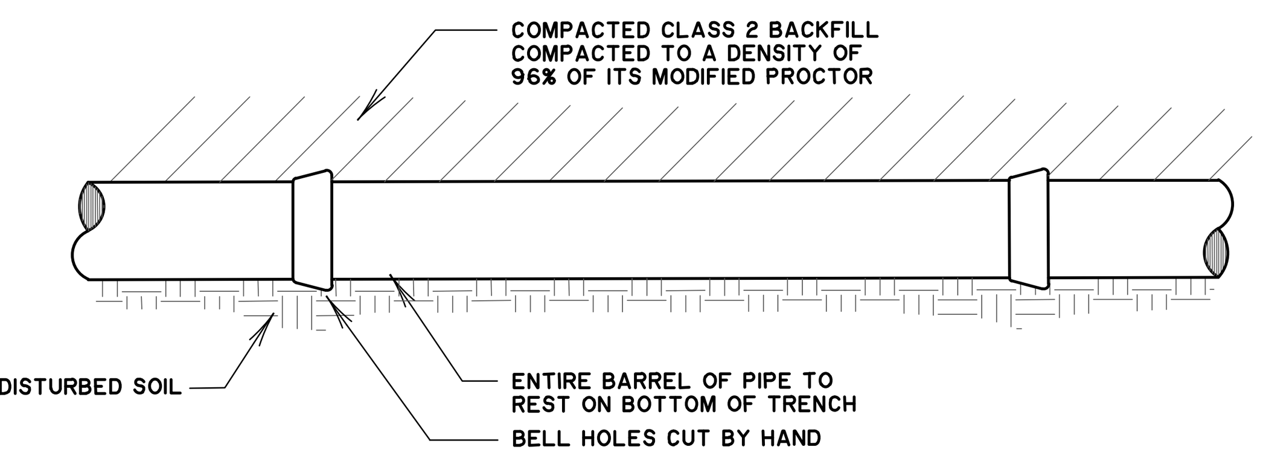
NOTES:
1. GRADED AGGREGATE BASE COURSE (G.A.B.C.) SHALL MEET SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION (SCDOT) STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
2. THE SURFACE COURSE SHALL MEET THE REQUIREMENTS OF SCDOT STANDARD SPECIFICATIONS, SECTIONS 401 & 403.
3. THE SUBGRADE SHALL BE COMPACTED TO 98% MAXIMUM DENSITY AND SHALL BE PREPARED ACCORDING TO SEXTION 208 OF THE SCDOT STANDARD SPECIFICATIONS.
4. THE BASE COURSE SHALL BE COMPACTED TO 98% MAXIMUM LABORATORY DRY DENSITY AS DETERMINED BY THE MODIFIED PROCTOR COMPACTION TEST (ASTM D-1557).
5. THE SURFACE COURSE SHALL BE COMPACTED TO 98% LABORATORY COMPACTED DENSITY.
6. COMPACTION TESTS SHALL BE PERFORMED ON THE SUBGRADE, BASE AND WEARING SURFACE AND SUPPLIED TO THE ENGINEER.
7. IF SUBGRADE DOES NOT MEET CRITERIA FOR CONTROL FILL, CONTRACTOR SHALL REMOVE AND REPLACE 12 INCHES MIN. OF EXISTING SOIL WITH CONTROL FILL AT NO ADDITIONAL COST.

5 PLANT PAVEMENT SECTION
05-C-11 SCALE: N.T.S.

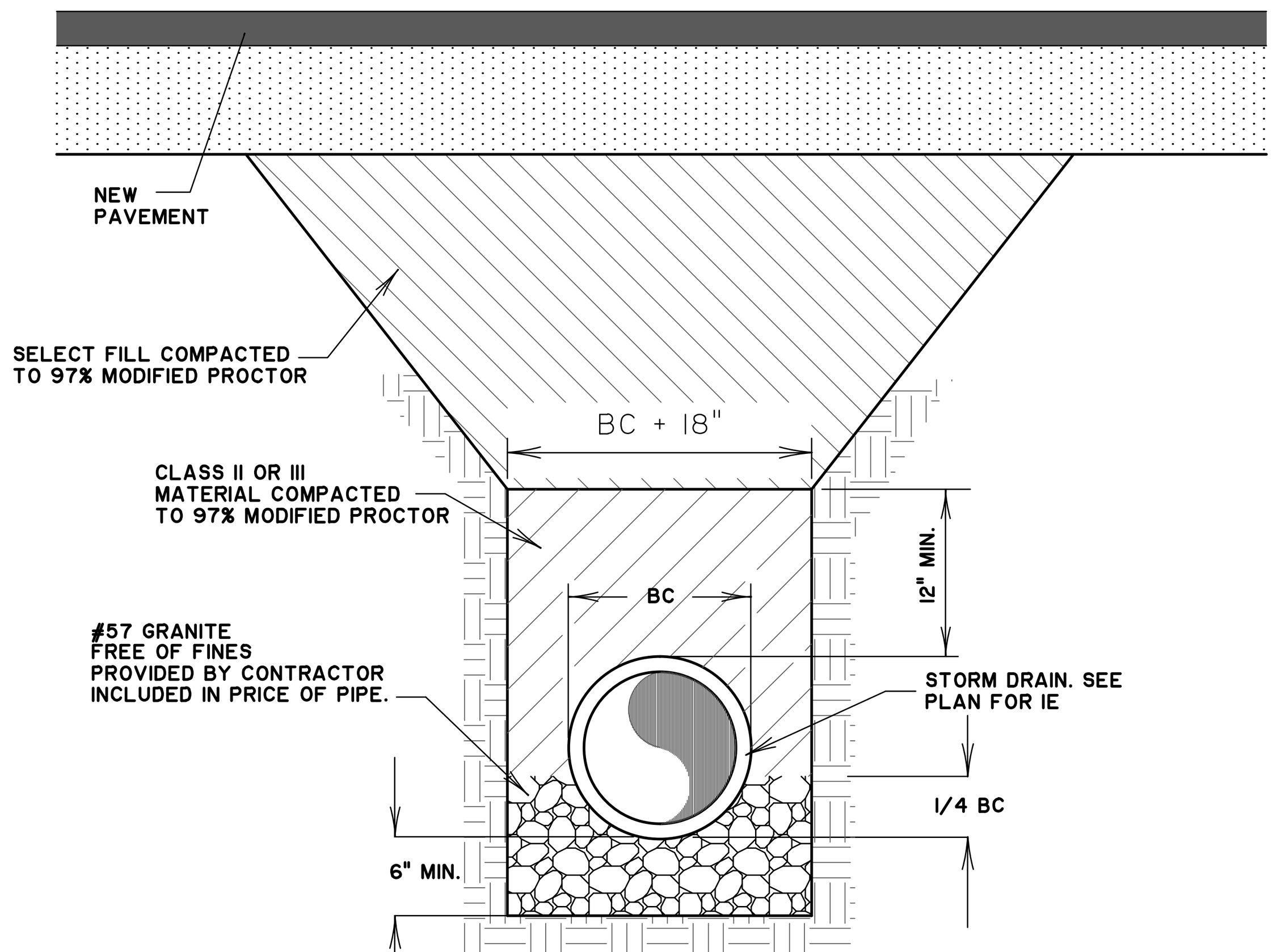
DESCRIPTION OF BACKFILL MATERIAL CLASSIFICATION
UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

SOIL CLASS	SOIL TYPE (USCS)	DESCRIPTION OF MATERIAL CLASSIFICATION
CLASS I SOILS*	—	MANUFACTURED ANGULAR, GRANULAR MATERIAL, 1/4 TO 1-1/2 INCHES (6 TO 40 mm) SIZE, INCLUDING MATERIALS HAVING REGIONAL SIGNIFICANCE SUCH AS CRUSHED STONE OR ROCK, BROKEN CORAL, CRUSHED SLAG, CINDERS, OF CRUSHED SHELLS.
CLASS II SOILS**	GW	WELL-GRADED GRAVELS AND GRAVEL-SAND MIXTURES, LITTLE OR NO FINES. 50% OR MORE RETAINED ON NO. 4 SIEVE. MORE THAN 95% RETAINED ON NO. 200 SIEVE. CLEAN.
	GP	POORLY GRADED GRAVELS AND GRAVEL-SAND MIXTURES, LITTLE OR NO FINES. 50% OR MORE RETAINED ON NO. 4 SIEVE. MORE THAN 95% RETAINED ON NO. 200 SIEVE. CLEAN.
	SW	WELL-GRADES SANDS AND GRAVELLY SANDS, LITTLE OR NO FINES. MORE THAN 50% PASSES NO. 4 SIEVE. MORE THAN 95% RETAINED ON NO. 200 SIEVE. CLEAN.
	SP	POORLY GRADED SANDS AND GRAVELLY SANDS, LITTLE OR NO FINES. MORE THAN 50% PASSES NO. 4 SIEVE. MORE THAN 95% RETAINED ON NO. 200 SIEVE. CLEAN.
CLASS III SOILS***	GM	SILTY GRAVELS, GRAVEL-SAND MIXTURES. 50% OR MORE RETAINED ON NO. 4 SIEVE. MORE THAN 50% RETAINED ON NO. 200 SIEVE.
	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES. 50% OR MORE RETAINED ON NO. 4 SIEVE. MORE THAN 50% RETAINED ON NO. 200 SIEVE.
	SM	SILTY SANDS, SAND-SILT MIXTURES. MORE THAN 50% PASSES NO. 4 SIEVE. MORE THAN 50% RETAINED ON NO. 200 SIEVE.
	SC	CLAYEY SANDS, SAND-CLAY MIXTURES. MORE THAN 50% PASSES NO. 4 SIEVE. MORE THAN 50% RETIANED ON NO. 200 SIEVE.
CLASS IV SOILS	ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS. LIQUID LIMIT 50% OR LESS. 50% OR MORE PASSES NO. 200 SIEVE.
	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS. LIQUID LIMIT 50% OR LESS. 50% OR MORE PASSES NO. 200 SIEVE.
	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDS OR SILTS, ELASTIC SILTS. LIQUID LIMIT GREATER THAN 50%. 50% OR MORE PASSES NO. 200 SIEVE.
	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS. LIQUID LIMIT GREATER THAN 50%. 50% OR MORE PASSES NO. 200 SIEVE.
CLASS V SOILS	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY. LIQUID LIMIT 50% OR LESS. 50% OR MORE PASSES NO. 200 SIEVE.
	OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY. LIQUID LIMIT GREATER THAN 50%. 50% OR MORE PASSES NO. 200 SIEVE.
	PT	PEAT, MUCK AND OTHER HIGHLY ORGANIC SOILS.

*SOILS DEFINED AS CLASS I MATERIALS ARE NOT DEFINED IN ASTM D2487.
**IN ACCORDANCE WITH ASTM D2487, LESS THAN 5% PAS NO. 200 SIEVE.
***IN ACCORDANCE WITH ASTM D2487, MORE THAN 12% PASS NO. 200 SIEVE. SOILS WITH 5% TO 12% NO. 200 SIEVE FALL IN BORDERLINE CLASSIFICATION, E.G., GP-GC.

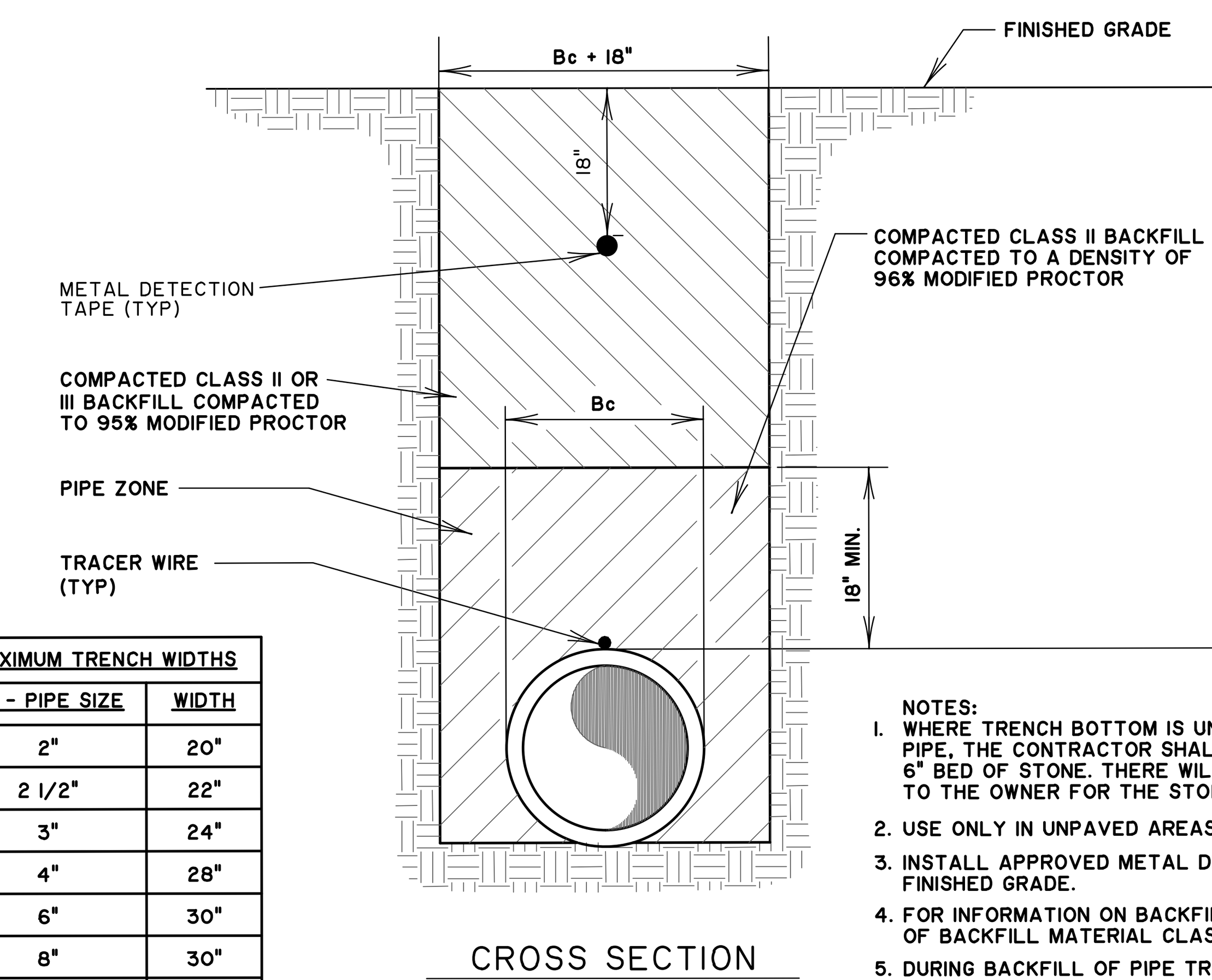


LONGITUDINAL SECTION



NOTE:
1. AGGREGATE INCLUDED IN THE PRICE FOR STORM DRAIN PIPE
2. CLASS II SOILS: GW, GP, SW, SP
3. CLASS III SOILS: GM, GC, SM, SC

4A TYPICAL STORM DRAIN BEDDING DETAIL
05-C-11 SCALE: N.T.S.

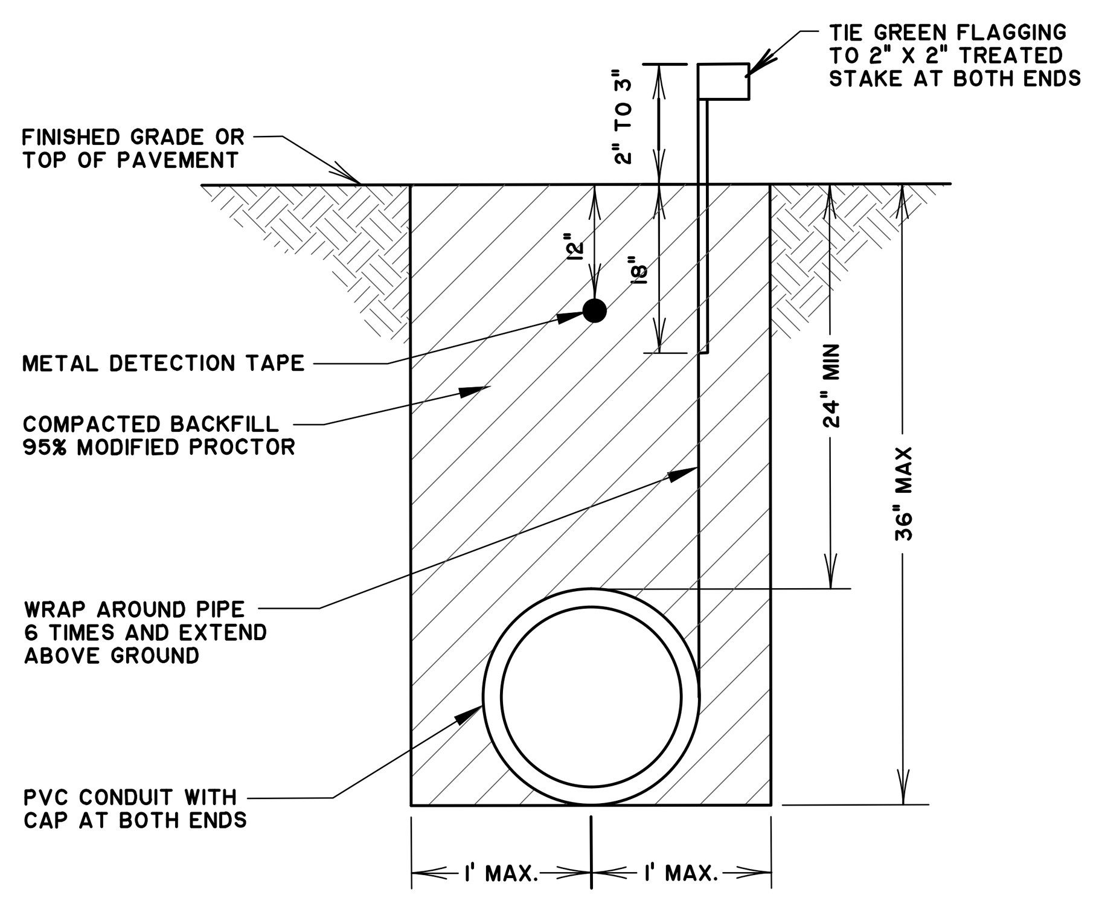


CROSS SECTION

MAXIMUM TRENCH WIDTHS	
Bc - PIPE SIZE	WIDTH
2"	20"
2 1/2"	22"
3"	24"
4"	28"
6"	30"
8"	30"
10"	32"
12"	34"
14"	34"
16"	36"

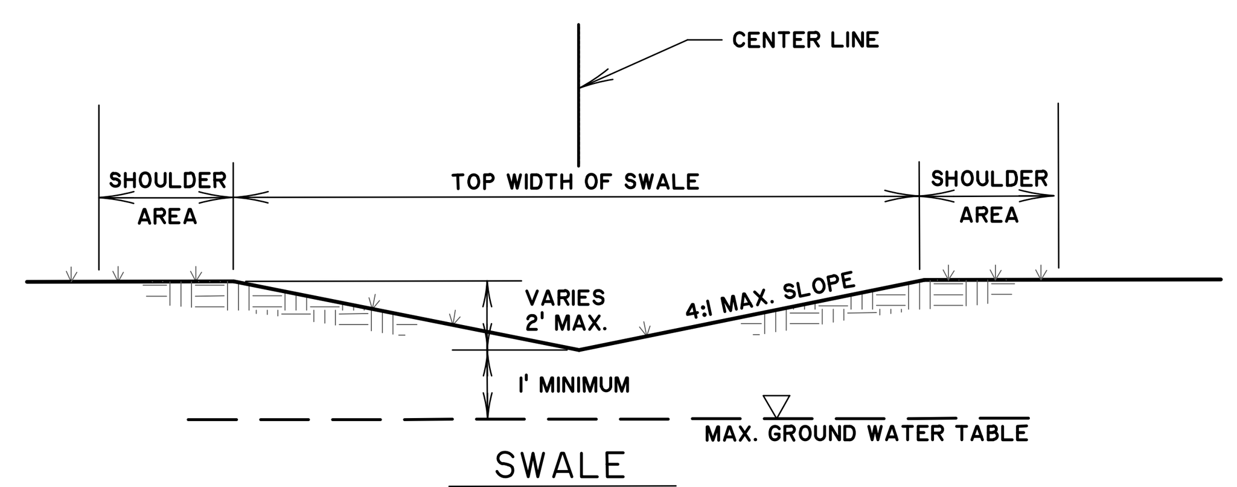
NOTES:
1. WHERE TRENCH BOTTOM IS UNSUITABLE TO SUPPORT PIPE, THE CONTRACTOR SHALL INSTALL PIPE ON A MIN. 6" BED OF STONE. THERE WILL BE NO ADDITIONAL COST TO THE OWNER FOR THE STONE.
2. USE ONLY IN UNPAVED AREAS.
3. INSTALL APPROVED METAL DETECTION TAPE 18" FROM FINISHED GRADE.
4. FOR INFORMATION ON BACKFILL MATERIAL SEE DESCRIPTION OF BACKFILL MATERIAL CLASSIFICATION THIS SHEET.
5. DURING BACKFILL OF PIPE TRENCHES, CONTRACTOR SHALL ADHERE TO ALL SCDOT REQUIREMENTS FOR LIFT THICKNESS AND COMPACTION STANDARDS PER THE SCDOT 2007 STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

4 TYPICAL STORM DRAIN BEDDING DETAIL
05-C-11 SCALE: N.T.S.



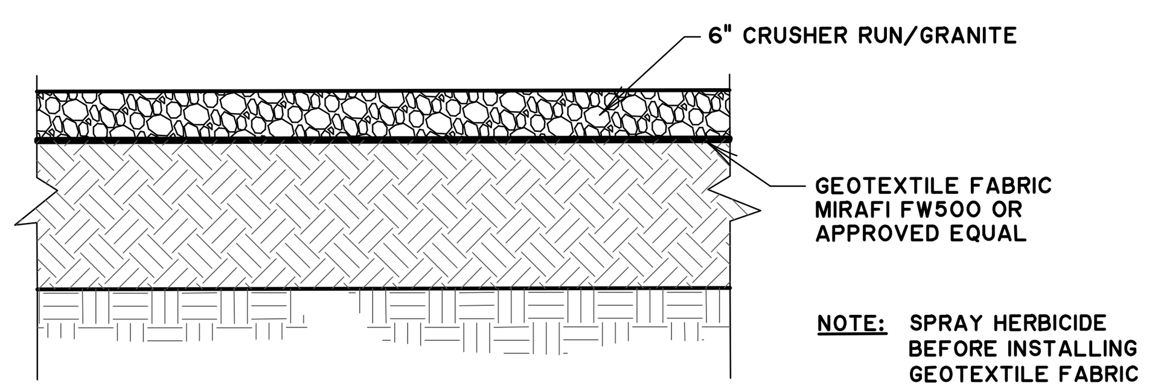
NOTES:
1. ALL CONDUIT TO BE PVC SCHEDULE 80 UNLESS OTHERWISE SPECIFIED.
2. PLUG ALL ENDS OF CONDUIT.
3. TERMINATE CONDUIT AS FOLLOWS:
   - 2 FEET BEHIND ALL WALKS
   - 3 FEET BEHIND ALL CURBS
   - 2 FEET BEHIND ALL PAVEMENT
4. COORDINATE DEPTH WITH OTHER CONDUITS AND UTILITIES.

6 CONDUIT DETAIL
05-C-11 SCALE: N.T.S.



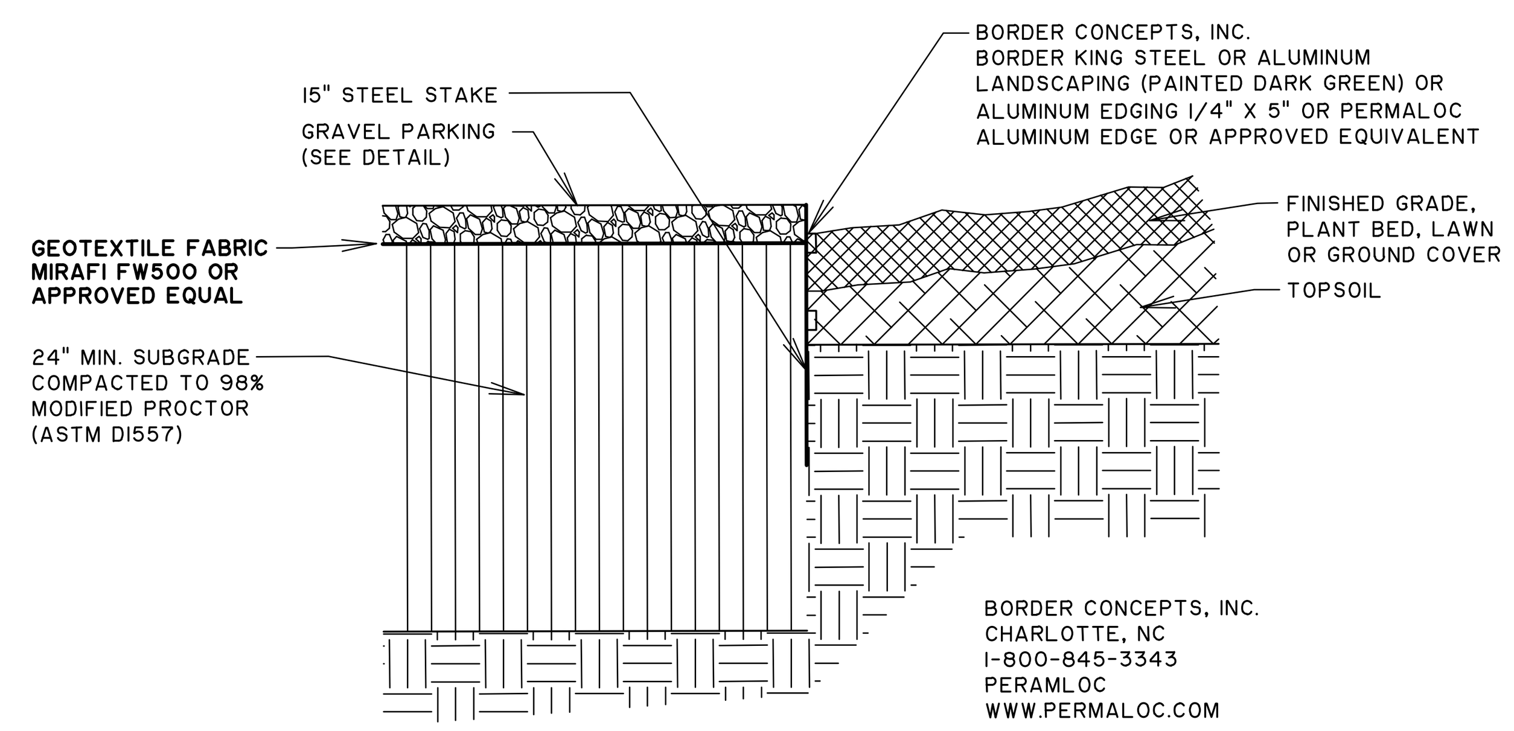
NOTE: 1. SWALES TO BE GRASSED IMMEDIATELY AFTER INSTALLATION.
2. FINAL LOCATION TO BE FIELD LOCATED W/ OWNER TO AVOID TREES, ETC.

7 GRASSED SWALE DETAIL
05-C-15 SCALE: N.T.S.



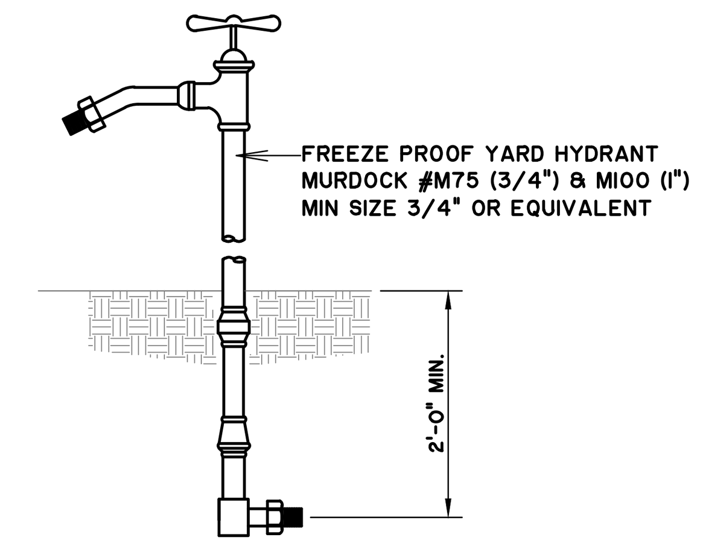
NOTE: SPRAY HERBICIDE BEFORE INSTALLING GEOTEXTILE FABRIC

8 GRAVEL SECTION
05-C-11 SCALE: N.T.S.

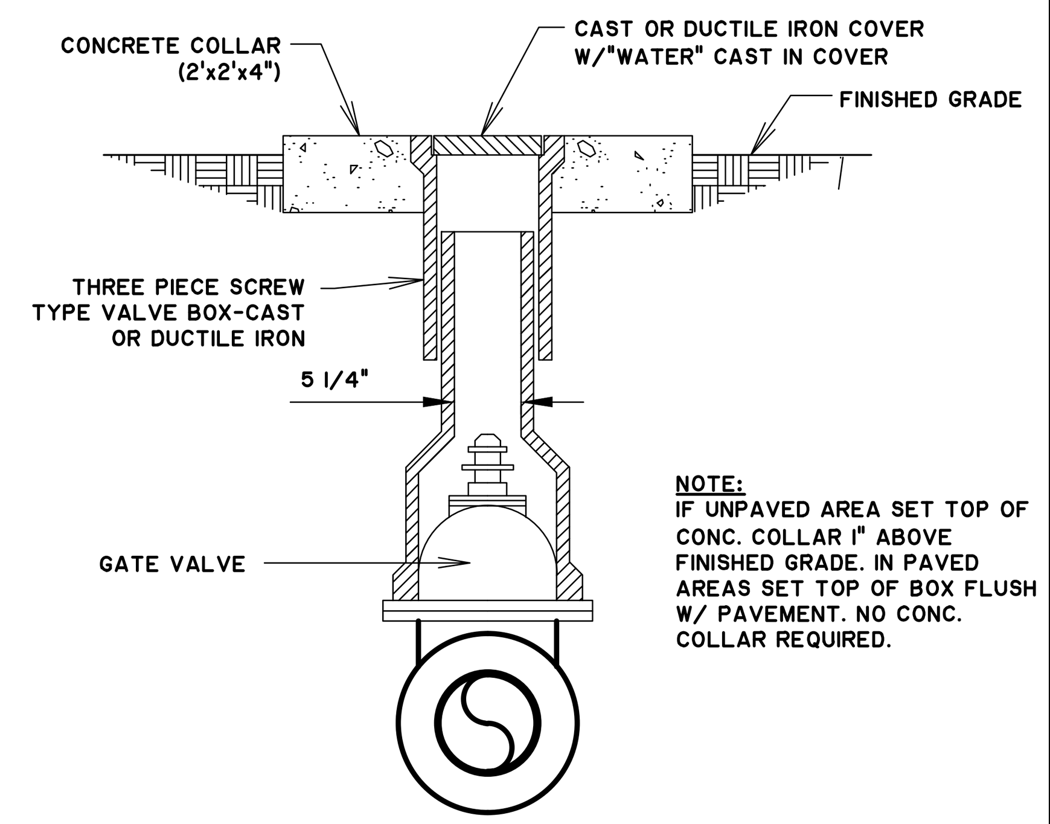


BORDER CONCEPTS, INC.
CHARLOTTE, NC
1-800-845-3343
PERAMLOC
WWW.PERMALOC.COM

9 EDGING GRAVEL
05-C-11 SCALE: N.T.S.

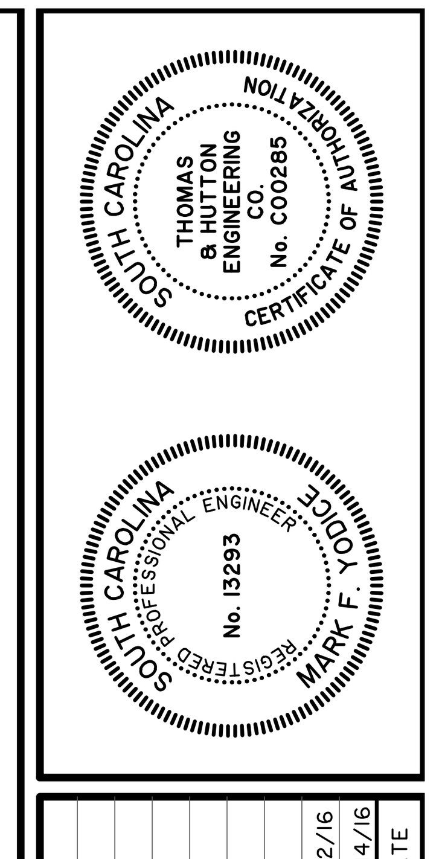


10 YARD HYDRANT DETAIL
05-C-11 SCALE: N.T.S.



NOTE:
IF UNPAVED AREA SET TOP OF CONC. COLLAR 1" ABOVE FINISHED GRADE. IN PAVED AREAS SET TOP OF BOX FLUSH W/ PAVEMENT. NO CONC. COLLAR REQUIRED.

11 VALVE BOX DETAILS
05-C-11 SCALE: N.T.S.



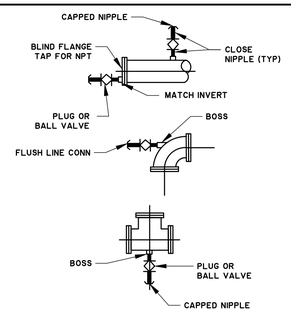
NO.	REVISIONS	BY	DATE
2	BID ADDENDUM NO.3	JAH	3/22/16
1	BID ADDENDUM NO.2	MFY	03/14/16

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA
KIAWAH RIVER PLANTATION WWTP
CIVIL DETAILS

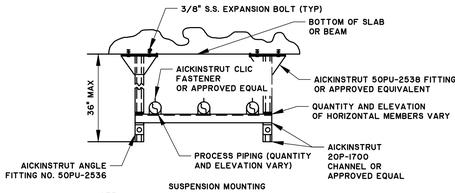
JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	KEN
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	AS NOTED

05-C-11



CONTRACTOR SHALL SIZE FLUSH LINE CONNECTION

1 05-C-13 **TYP FLUSHING CONNECTION DETAILS**
NOT TO SCALE

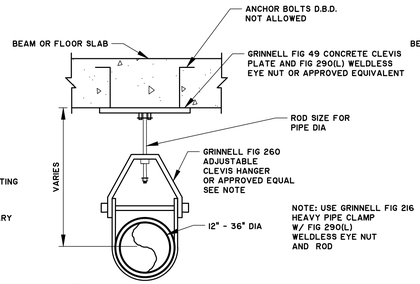


SUSPENSION MOUNTING

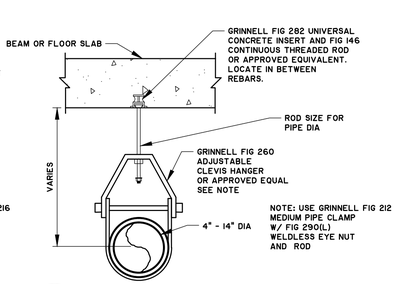
NOTE:

1. SUPPORTS SHALL BE PROVIDED AT SPACES IN ACCORDANCE WITH SPECIFICATIONS AND/OR AS RECOMMENDED BY MANUFACTURER TAKING LOAD CRITERIA INTO ACCOUNT

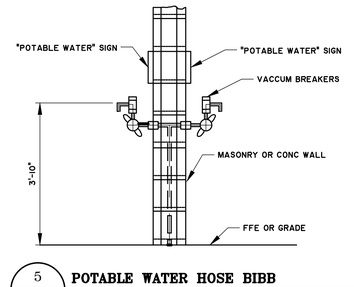
2 05-C-13 **PIPE SUPPORT**
NOT TO SCALE



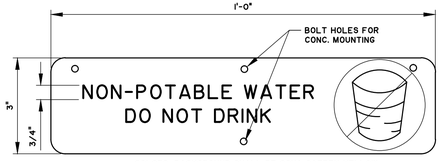
3 05-C-13 **HEAVY-DUTY PIPE HANGER DETAIL**
NOT TO SCALE



4 05-C-13 **PIPE HANGER DETAIL FOR FRP PIPE**
NOT TO SCALE



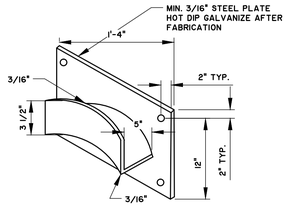
5 05-C-13 **POTABLE WATER HOSE BIBB**
NOT TO SCALE



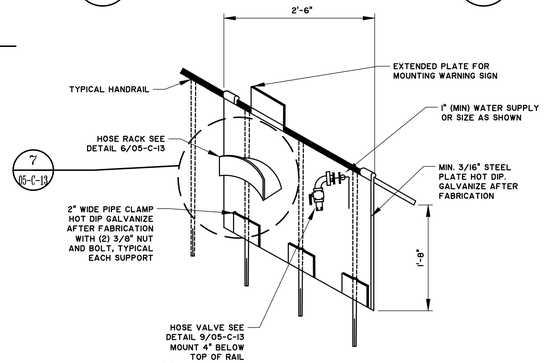
COLORS: BACKGROUND SHALL BE OSHA SAFETY YELLOW LETTERS SHALL BE RECESSED BLACK

NOTE: ONE SIGN REQUIRED AT EACH EFFLUENT WATER HOSE RACK AND BIBB AND ALL OTHER LOCATIONS WHERE ACCESS TO THE RECLAIMED WATER SUPPLY. MAY BE MADE BY VALVE, FAUCET, OR OTHER FIXTURES. SECURE THROUGH HANDRAILS W/ (2) SS SASH CHAINS SECURE TO CONCRETE W (2) 3/16" SS EXP BOLTS

6 05-C-13 **NON-POTABLE WATER SIGN**
NOT TO SCALE



7 05-C-13 **HOSE RACK**
NOT TO SCALE

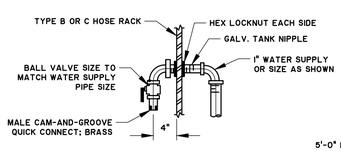


7 05-C-13

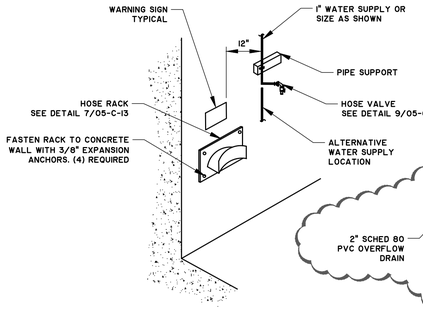
8 05-C-13 **RAIL MOUNT UTILITY STATION**
NOT TO SCALE

GENERAL NOTES:

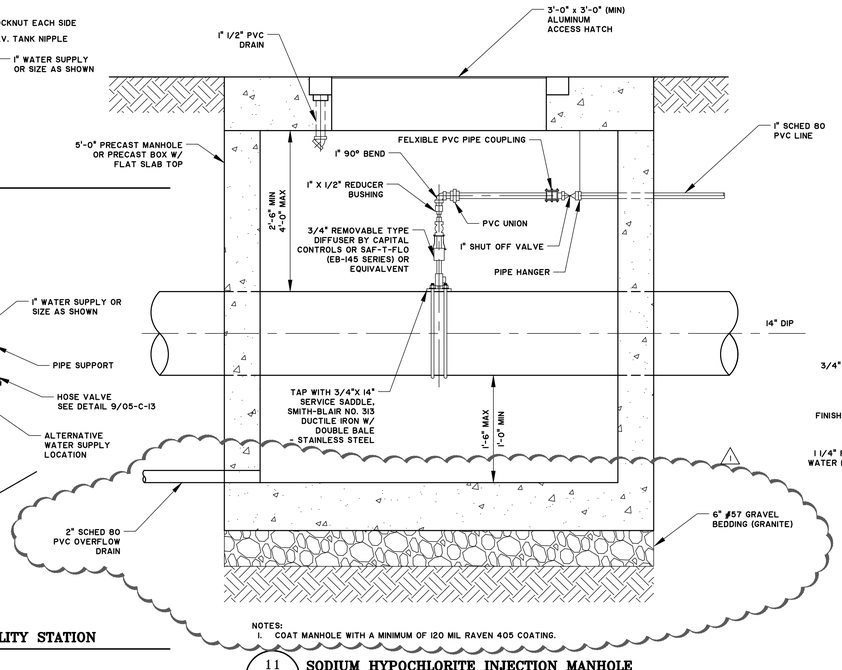
1. UNLESS OTHERWISE SPECIFIED, HANGERS AND SUPPORTS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION. NUTS, BOLTS, AND WASHERS MUST ALSO BE HOT DIP GALVANIZED EXCEPT THOSE SUBJECT TO MOISTURE OR CORROSIVE ATMOSPHERE SHALL BE TYPE 316 STAINLESS STEEL.
2. UNLESS OTHERWISE SPECIFIED, TRAPEZE AND PIPE RACK COMPONENTS SHALL HAVE A MINIMUM STEEL THICKNESS OF 12-GAGE WITH A MAXIMUM DEFLECTION OF 1/240 OF THE SPAN. MINIMUM CHANNEL COMPONENT SIZE SHALL BE 1 5/8" SQUARE AS MANUFACTURED BY SUPER STRUT, UNISTRUT, ELCEN OR EQUAL.
3. UTILITY STATION (TYPE A OR B) LOCATED OUTDOORS OR SUSCEPTIBLE TO WEATHER CONDITIONS OF 35° F AND BELOW SHALL BE PROTECTED FROM FREEZING BY HEAT TRACING. PIPE AND VALVES FOR EXPOSED LOCATIONS SHALL BE HEAT TRACED CONTINUOUSLY FROM THE HOSE CONNECTION POINT TO AN AREA OF TEMPERATURES ABOVE 35° F YEAR ROUND. FOR BELOW GROUND INSTALLATIONS HEAT TRACING SHALL EXTEND TO A MINIMUM DEPTH OF 2 FOOT OR THE FROST LINE, WHICH EVER IS GREATER. THE CONTRACTOR IS INSTRUCTED TO INSURE THAT HEAT TRACING SHALL BE ROUTED AS SPECIFIED ABOVE, WEATHER SHOWN ON THE PLANS OR NOT.
4. FOR EACH HOSE STATION INSTALLED UNDER THIS CONTRACT, PROVIDE A 50-FOOT COUPLED HOSE ASSEMBLY, UL-LISTED BRASS HEAVY DUTY SPRAY/STREAM NOZZLE (McMASTER CARR 6470T12 OR EQUAL), AND AN ADAPTERS NECESSARY TO CONNECT TO THE NOZZLE AND HOSE VALVE. HOSE ASSEMBLIES AND NOZZLES SHALL BE SIZED TO MATCH THE HOSE VALVE, AND PROVIDED WITH BRASS CAM-AND-GROOVE QUICK CONNECT FOR ATTACHMENT TO THE HOSE VALVE. HOSE ASSEMBLIES SHALL BE POLYESTER REINFORCED BUNA-N/SBR WITH 125 PSI MINIMUM WORKING PRESSURE (McMASTER CARR 5268K68 FOR 1.5", 5268K61 FOR 1", OR EQUAL). PROVIDE 6 ADDITIONAL HOSE ASSEMBLIES, ADAPTERS, AND NOZZLES EACH IN 1" AND 1.5" SIZE



9 05-C-13 **HOSE VALVE**
NOT TO SCALE

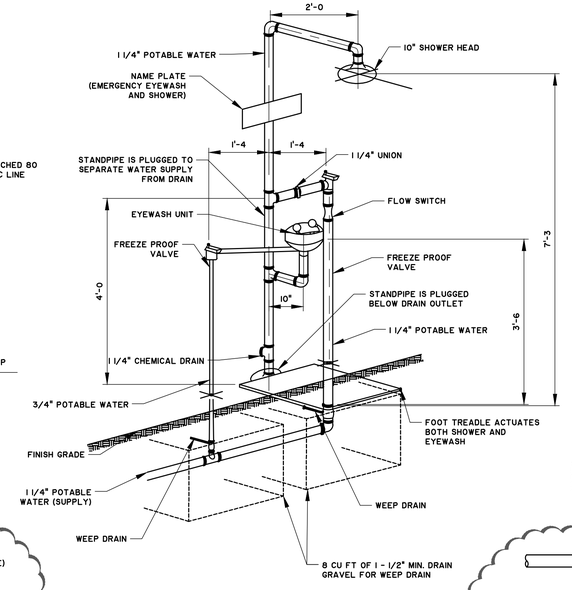


10 05-C-13 **WALL MOUNT UTILITY STATION**
NOT TO SCALE



NOTES:
1. COAT MANHOLE WITH A MINIMUM OF 120 MIL RAVEN 405 COATING.

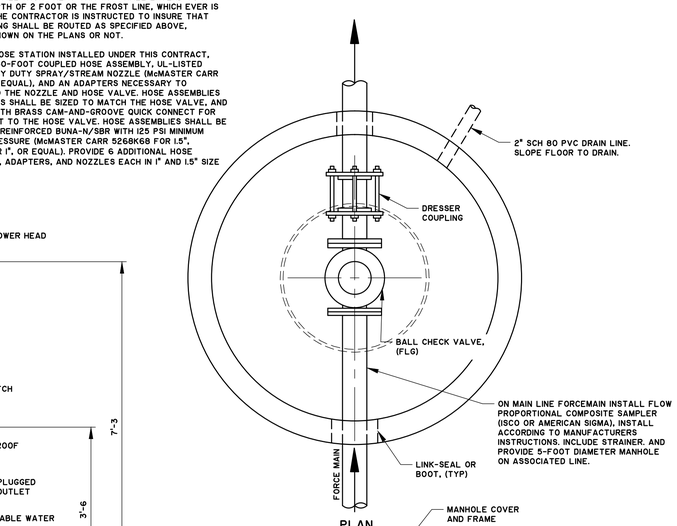
11 05-C-13 **SODIUM HYPOCHLORITE INJECTION MANHOLE**
1"=1'-0"



NOTE:

WHEN LOCATED INSIDE A STRUCTURE, THE WATER SUPPLY IS ABOVE GRADE AND THE SHOWER AND EYEWASH VALVES ARE NOT FREEZE-PROOF. THE SUPPLY IS FED TO THE BACK OF THE STANDPIPE ABOVE EYEWASH DRAIN AND IS PLUGGED SIMILAR TO THE ABOVE DETAIL TO SEPARATE THE SUPPLY FROM THE DRAIN.

12 05-C-13 **EMERGENCY EYEWASH AND SHOWER**
NOT TO SCALE



13 05-C-13 **CHECK VALVE IN MANHOLE**
1"=1'-0"

SOUTH CAROLINA PROFESSIONAL ENGINEER THOMAS & HUTTON ENGINEERING No. C00285 CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 19293 REGISTERED MARK F. YORK

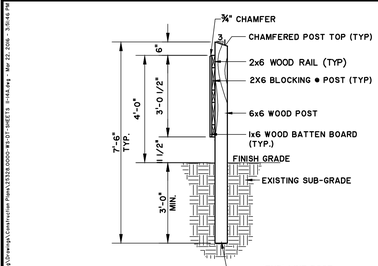
NO.	REVISIONS	BY	DATE
1	BID ADDENDUM #3 COMMENTS	MFY	3/23/16

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

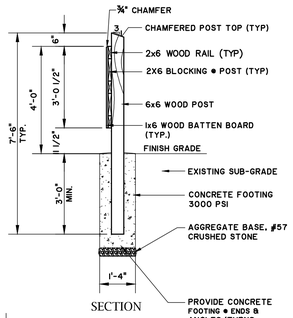
KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA
KIAWAH RIVER PLANTATION WWTP
CIVIL DETAILS

JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	KEN
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	AS NOTED

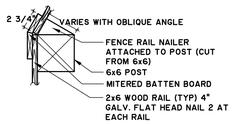
05-C-13



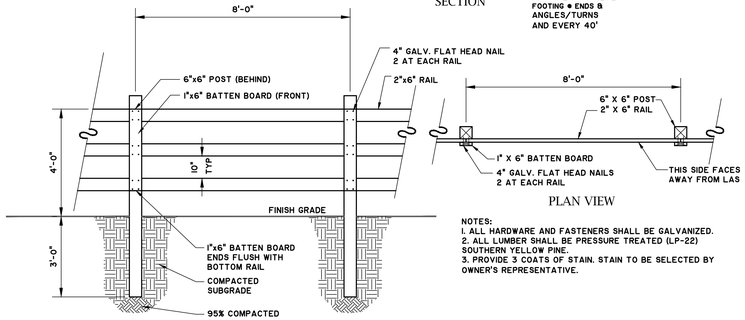
SECTION



SECTION



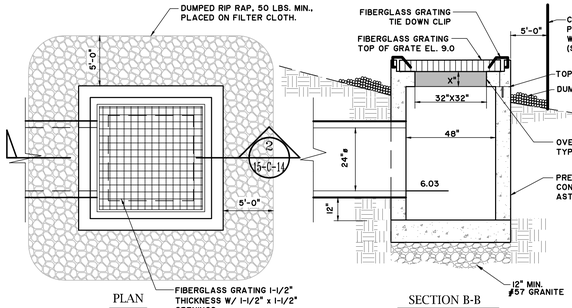
OBLIQUE FENCE DETAIL (N.T.S.)



PLAN VIEW

NOTES:
1. ALL HARDWARE AND FASTENERS SHALL BE GALVANIZED.
2. ALL LUMBER SHALL BE PRESSURE TREATED (LP-22) SOUTHERN YELLOW PINE.
3. PROVIDE 3 COATS OF STAIN. STAIN TO BE SELECTED BY OWNER'S REPRESENTATIVE.

1 THREE BOARD FENCE DETAIL
05-C-14 SCALE: N.T.S.



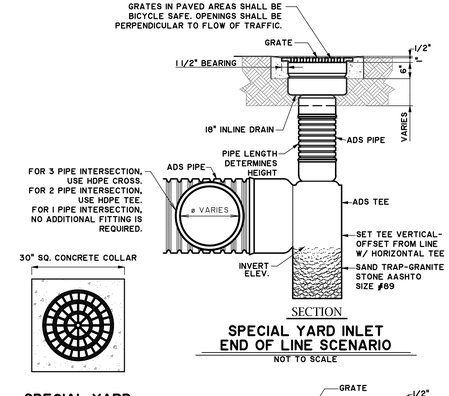
PLAN SECTION B-B

NOTES:
1. STRUCTURE, GRATE, & FRAME SHALL BE APPROVED BY ENGINEER PRIOR TO ORDERING.

WEIR TABLE

VERT WEIR 1 = EL 7.5'
SPAN = 24"
RISE = 6"
VERT WEIR 2 = EL 8.0'
SPAN = 48"
RISE = 12"

2 BUBBLER SYSTEM
05-C-14 NOT TO SCALE

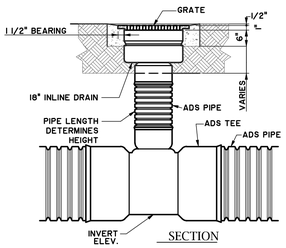


SECTION

SPECIAL YARD INLET END OF LINE SCENARIO
NOT TO SCALE

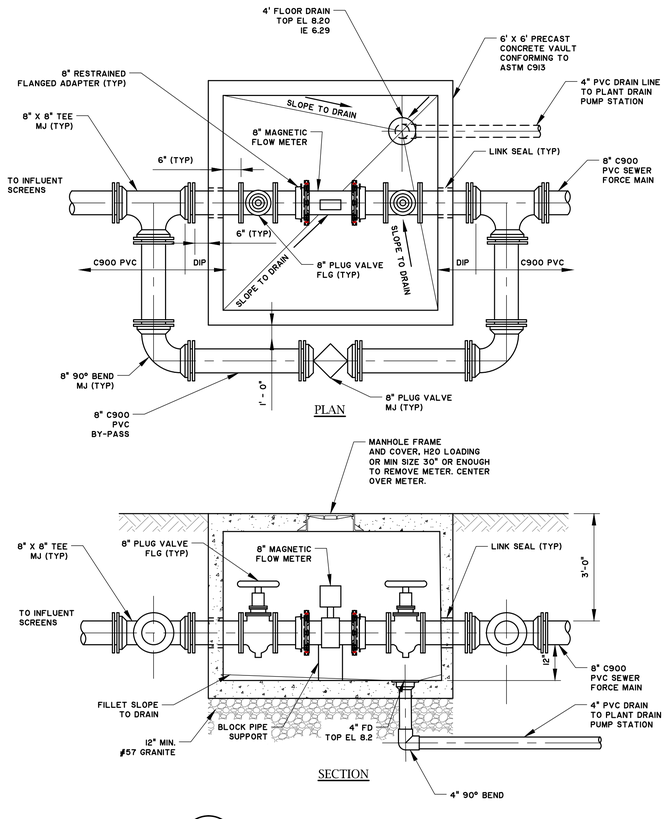
SPECIAL YARD INLET COVER

NOTE:
USE SOLID LID FOR SPECIAL MANHOLE



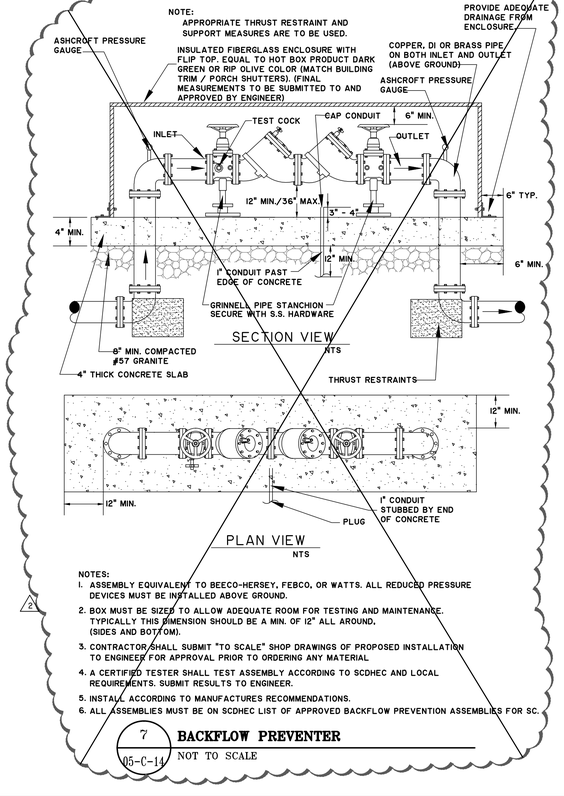
SECTION

3 SPECIAL YARD INLET DETAIL
05-C-14 NOT TO SCALE



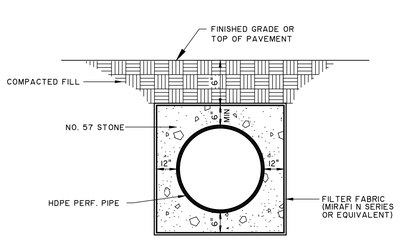
PLAN SECTION

6 FLOW METER AND CONCRETE VAULT DETAIL
05-C-14 1/2"=1'-0"

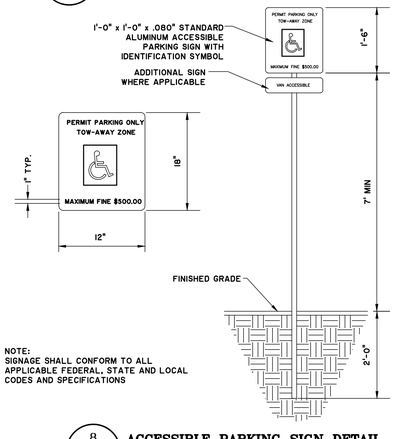


NOTES:
1. ASSEMBLY EQUIVALENT TO BEECO-HERSEY, FEBCO, OR WATTS. ALL REDUCED PRESSURE DEVICES MUST BE INSTALLED ABOVE GROUND.
2. BOX MUST BE SIZED TO ALLOW ADEQUATE ROOM FOR TESTING AND MAINTENANCE. TYPICALLY THIS DIMENSION SHOULD BE A MIN. OF 12" ALL AROUND, (SIDES AND BOTTOM).
3. CONTRACTOR SHALL SUBMIT "TO SCALE" SHOP DRAWINGS OF PROPOSED INSTALLATION TO ENGINEER FOR APPROVAL PRIOR TO ORDERING ANY MATERIAL
4. A CERTIFIED TESTER SHALL TEST ASSEMBLY ACCORDING TO SCDHEC AND LOCAL REQUIREMENTS. SUBMIT RESULTS TO ENGINEER.
5. INSTALL ACCORDING TO MANUFACTURES RECOMMENDATIONS.
6. ALL ASSEMBLIES MUST BE ON SCDHEC LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES FOR SC.

7 BACKFLOW PREVENTER
05-C-14 NOT TO SCALE

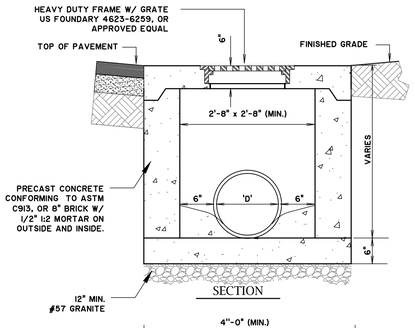


4 PERFORATED PIPE DETAIL
05-C-14 NOT TO SCALE

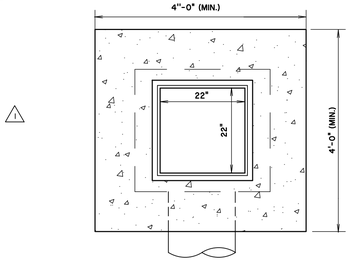


NOTE:
SIGNAGE SHALL CONFORM TO ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND SPECIFICATIONS

8 ACCESSIBLE PARKING SIGN DETAIL
05-C-14 NOT TO SCALE



SECTION



PLAN

5 STANDARD INLET - GRATE TYPE
05-C-14 NOT TO SCALE

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

NO.	DATE	BY	REVISIONS
2	3/23/16	MFY	BID ADDENDUM #3 COMMENTS
1	3/7/16	MFY	BID ADDENDUM #1 COMMENTS

KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP

CIVIL DETAILS

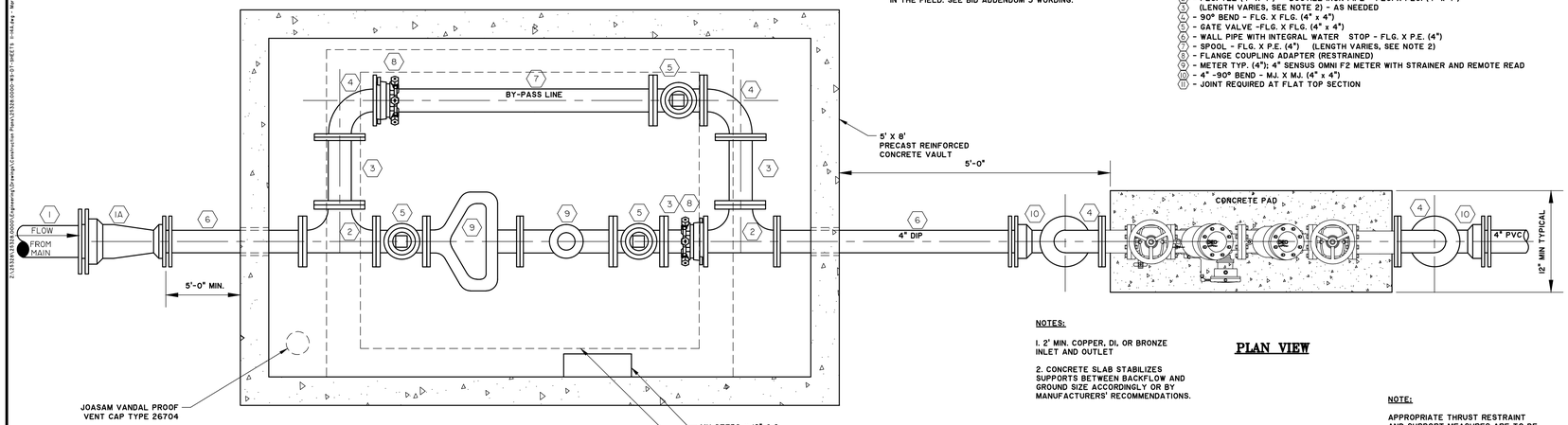
JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	KEN
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	AS NOTED

05-C-14

NOTE:
LOCATE LANDSCAPE PLANT SCREENING MATERIAL WITH ENGINEER AND OWNER IN THE FIELD. SEE BID ADDENDUM 3 WORDING.

SCHEDULE

(1) - WATER MAIN (6" DIP)
(1A) - REDUCER - M.J. X M.J. (6" X 4") MEGALUG
(2) - FLG. TEE (4" X 4") - DUCTILE IRON PIPE - FLG. X FLG. (4" x 4")
(3) (LENGTH VARIES, SEE NOTE 2) - AS NEEDED
(4) - 90° BEND - FLG. X FLG. (4" x 4")
(5) - GATE VALVE -FLG. X FLG. (4" x 4")
(6) - WALL PIPE WITH INTEGRAL WATER STOP - FLG. X P.E. (4")
(7) - SPOOL - FLG. X P.E. (4") (LENGTH VARIES, SEE NOTE 2)
(8) - FLANGE COUPLING ADAPTER (RESTRAINED)
(9) - METER TYP. (4"); 4" SENSUS OMNI F2 METER WITH STRAINER AND REMOTE READ
(10) - 4" -90° BEND - M.J. X M.J. (4" x 4")
(11) - JOINT REQUIRED AT FLAT TOP SECTION



PLAN VIEW

TYPICAL METER VAULT BELOW TOP SLAB

NOTES:

1. 2" MIN. COPPER, DI, OR BRONZE INLET AND OUTLET

2. CONCRETE SLAB STABILIZES SUPPORTS BETWEEN BACKFLOW AND GROUND SIZE ACCORDINGLY OR BY MANUFACTURERS' RECOMMENDATIONS.

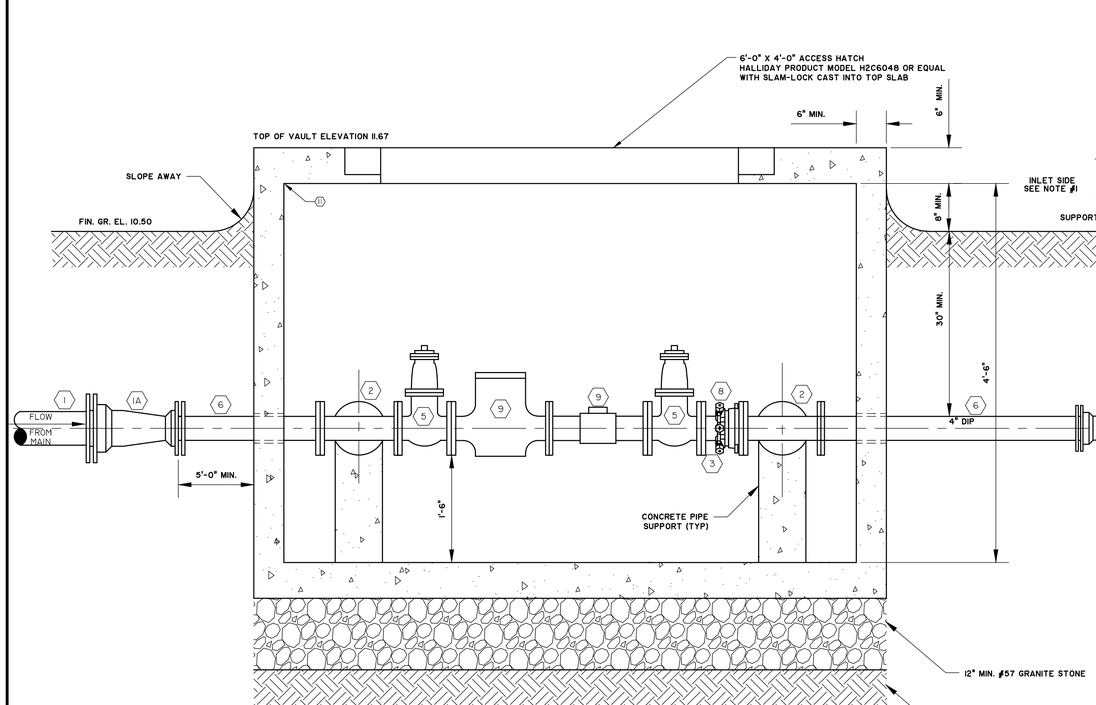
PLAN VIEW

NOTE:

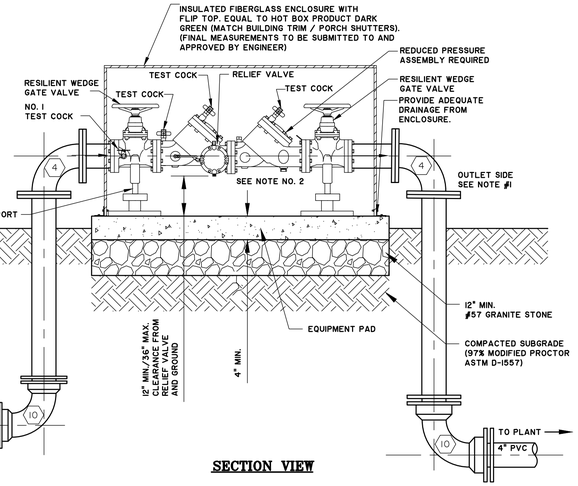
APPROPRIATE THRUST RESTRAINT AND SUPPORT MEASURES ARE TO BE DETERMINED BY UTILITY/INSTALLER.

METER AND FLOW CONTROL VALVE VAULT NOTES:

1. HATCHES SHALL BE H20 TRAFFIC RATED. HATCHWAY SHALL BE ¼" MIN. ALUMINUM DIAMOND PLATE COVER WITH EXTRUDED ALUMINUM FRAME. HATCH TO BE FURNISHED WITH 316 STAINLESS STEEL SNAP LOCK & BRASS HINGES.
2. THE PIPE SIZE UPSTREAM OF THE METER SHALL MATCH THE METER SIZE FOR A DISTANCE OF AT LEAST 8 PIPE DIAMETERS AND THE PIPE SIZE DOWNSTREAM OF THE METER SHALL MATCH THE METER SIZE FOR AT LEAST A DISTANCE OF 10 PIPE DIAMETERS. THE PIPE SIZE SHALL REMAIN THE SAME BETWEEN THE METER AND THE FLOW CONTROL VALVE.
3. ALL PIPING INSIDE METER BOX SHALL BE DIP. THE PIPE IN VAULT IS TO BE FLANGED JOINT DUCTILE IRON, CLASS 53 MINIMUM.
4. THE DISTANCE BETWEEN RUNGS, CLEATS AND STEPS SHALL NOT EXCEED 12 INCHES AND SHALL BE UNIFORM THROUGHOUT THE LENGTH OF THE LADDER.
5. ALL FLANGE HARDWARE (BOLT/WASHER/NUT) SHALL BE STAINLESS STEEL - TYPE 304 WITH ANTI-SEIZE COMPOUND.
6. VAULT SHALL BE SIZED AS NEEDED FOR MINIMUM CLEARANCE AS SHOWN AND RATED PER SCDOT HS-20-44 WHEEL LOADING - SUBMIT SHOP DRAWINGS / SC PE SEALED FOR REVIEW. VAULT STRUCTURE IS TO BE PRECAST CONCRETE. ALL MEASUREMENTS SHALL BE SHOWN AND VERIFIED AS PART OF THE SHOP DRAWING SUBMITTAL PROCESS AND DOCUMENTED IN AS-BUILTS.
7. ALL CONCRETE SHALL BE MINIMUM 4,000 PSI COMPRESSIVE STRENGTH.
8. DESIGN SHALL CONFORM TO ASTM C858 - SPECIFICATIONS FOR "UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURE".
9. STEEL REINFORCING DESIGN SHALL CONFORM TO ASTM C857.
10. REBARS SHALL BE GRADE 60 PER ASTM A615.
11. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.
12. ALL CONCRETE STRUCTURES SHALL BE WATER TIGHT. THE CONTRACTOR WILL BE REQUIRED TO TAKE SUCH MEANS NECESSARY TO CORRECT ANY AND ALL LEAKAGE THRU FLOORS OR WALLS OF STRUCTURE, WITHOUT ADDITIONAL COMPENSATION.
13. METER AND PIPING TO BE SET BEFORE INSTALLING ROOF SLABS ON VAULTS.
14. VAULTS SHALL BE FURNISHED WITH ALUMINUM STEPS. ALL OPENINGS IN METER VAULTS SHALL BE SEALED WITH "NO SHRINK" GROUT. PROVIDE ADEQUATE WATER PROOFING AS APPLICABLE.
15. INTERIOR SURFACES OF VAULT WALLS ARE TO BE COATED WITH CONCRETE WATER PROOFING SURFACE TREATMENT SIMILAR TO KRYSTOL (KRYTON INTERNATIONAL) T1 AND T2 WATERPROOFING APPLICATION. INSTALL ACCORDING TO MANUFACTURER'S DIRECTIONS.
16. INSTALL ALUMINUM I-BEAMS & PANEL ADJACENT TO VAULT FOR INSTALLATION OF ELECTRIC DEVICES, INSTRUMENT UNITS, REMOTE READ DEVICE, AC POWER, ETC. INSTALL 1 INCH DIAMETER PVC CONDUIT FROM INSIDE OF VAULT TO POST, EXTENDING CONDUIT UP TO TOP OF POST. INSTALL REMOTE READ OR RADIO READ DEVICE AND ALL WIRE. CONTRACTOR SHALL SUBMIT CONCEPTUAL LAYOUT FOR APPROVAL. INSTALL ALUMINUM RACK (MIN I-BEAM) WITH SPACE FOR KIU TO INSTALL MISSION UNIT AND AC POWER. COORDINATE REQUIREMENT WITH KIU.
17. METER TO BE PROVIDED BY THE CONTRACTOR AND INSTALLED BY CONTRACTOR. METER TO BE 4" OMNI SERIES F2 METER WITH STRAINER BY SENSUS. CONFIRM METER SELECTION WITH ST. JOHNS WATER COMPANY (SJWC) PRIOR TO ORDERING METER.
18. METER SHALL BE APPROVED BY SJWC BEFORE ORDERING.
20. FINISHED GRADE SHALL SLOPE AWAY FROM THE VAULT COVER TO PREVENT PONDING AROUND COVER/VAULT.
21. ALL VALVES SHALL BE 2" SQUARE NUTS.



TYPICAL METER VAULT - SECTION



SECTION VIEW

TYPICAL REDUCED PRESSURE PRINCIPLE ASSEMBLY
BACKFLOW PREVENTION ASSEMBLY
ABOVE GROUND INSTALLATION

PRECAST CONCRETE STRUCTURE NOTE:

THE PRECAST MANUFACTURE IS TO PREPARE AND SUBMIT TO THE ENGINEER DESIGN DETAILS AND CALCULATIONS FOR THE STRUCTURES SHOWN BASED ON THE DESIGN CRITERIA SPECIFIED. THE DESIGN SHALL BE PERFORMED UNDER THE DIRECT SUPERVISION AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF SOUTH CAROLINA EXPERIENCED IN THE DESIGN OF PRECAST CONCRETE. THE DESIGN SHALL INCLUDE PROVISIONS FOR HANDLING STRESSES AND CONSTRUCTION LOADS. REPRODUCED COPIES OF ASTM C789 "STANDARD SPECIFICATIONS FOR PRECAST REINFORCED CONCRETE BOX SECTIONS FOR CULVERTS, STORM DRAINS, AND SEWERS" WILL NOT BE ACCEPTED AS A SUBSTITUTE FOR DESIGN.

BACKFLOW PREVENTION ASSEMBLIES INSTALLATION REQUIREMENTS
REDUCED PRESSURE PRINCIPLE ASSEMBLIES

1. ABOVE GROUND BACKFLOW PREVENTION ASSEMBLY INSTALLATION REQUIRED (ENCLOSURE OPTIONAL).
2. ONLY COPPER, BRONZE, OR CEMENT-LINED DUCTILE IRON PIPE IS ACCEPTABLE FOR BACKFLOW PREVENTION ASSEMBLIES PIPING INSTALLATION. THE USE OF BLACK IRON/STEEL PIPE IN THE UPSTREAM PIPING OF ANY BACKFLOW PREVENTER IA A PLUMBING CODE VIOLATION, AND WILL NOT BE ACCEPTED.
3. BACKFLOW PREVENTION ASSEMBLIES MUST BE READILY ASSESSABLE FOR IN-LINE MAINTENANCE AND TESTING
4. BACKFLOW PREVENTION ASSEMBLIES MUST BE INSTALLED ACCORDING TO MANUFACTURES SPECIFICATIONS AND APPROVED BY SJWC ONLY ON THE PRIVATE PROPERTY SIDE OF THE WATER METER AND PRIOR TO THE FIRST SERVICE CONNECTION.
5. SJWC STRONGLY RECOMMENDS ABOVE GROUND INSTALLATION OF BACKFLOW PREVENTION ASSEMBLIES BE PROTECTED FROM FREEZING. THE MANUFACTURER'S IDENTIFICATION PLATE, TEST COCKS, AIR-INLET VALVE BONNET OR RELIEF VALVE VENT OPENING SHALL NOT BE OBSTRUCTED WITH ANY TYPE OF INSULATION MATERIAL. AS AN OPTION TO WRAPPING THE ASSEMBLY, SEVERAL VENDORS OFFER A REMOVABLE INSULATED BOX, REMOVABLE SOFT COVER, OR AN INEXPENSIVE FREEZE PROTECTION VALVE.
6. A MINIMUM OF TWO (2') FEET OF COPPER, BRONZE, OR CEMENT-LINED DUCTILE IRON PIPE MUST BE EXTENDED ON INLET AND OUTLET SIDES OF BACKFLOW PREVENTION ASSEMBLIES FOR RIGID STABILITY.
7. CONNECTIONS TO ANY OF THE FOUR (4) TEST COCKS WILL NOT BE PERMITTED. CONNECTIONS INCLUDE, BUT ARE NOT LIMITED TO HOSE BIBS, PIPE, WIRE, GAUGES, OR ANY OTHER FITTINGS.
8. ALL RESILIENT WEDGE GATE VALVES AND QUARTER-TURN BALL VALVES MUST BE PHYSICALLY ATTACHED TO THE BACKFLOW PREVENTION DEVISE FOR OPERATION AT THE ASSEMBLY, NOT ON AN OUTSIDE WALL OR APPURTENANCE.
9. SJWC REQUIRES AN APPROVED BACKFLOW PREVENTION ASSEMBLY ON ALL FIRE SPRINKLER SYSTEMS. THIS INCLUDES WET AND DRY SYSTEMS.
10. BACKFLOW PREVENTION ASSEMBLIES MUST BE TESTED BY CERTIFIED TESTER IMMEDIATELY AFTER INSTALLATION AND/OR BEING PLACED IN SERVICE, AND A MINIMUM OF ONCE EACH SUBSEQUENT YEAR. SJWC RESERVES THE RIGHT TO REQUIRE MORE MORE FREQUENT TESTING DEPENDING UPON THE DEGREE OF HAZARD.
11. RELIEF VALVE VENT SHALL NEVER BECOME SUBMERGED. RELIEF VALVE VENT DRAIN FUNNEL MUST MEET APPROVED AIR-GAP REQUIREMENTS. THE AIR-GAP AND DRAIN FUNNEL IS ONLY REQUIRED FOR INSTALLATIONS INSIDE A BUILDING WHERE WATER EXITING THE RELIEF VALVE VENT NEEDS TO BE CHANNELED TO ATMOSPHERE VALVE VENT OPENING. AIR-GAP REQUIREMENT IS EQUAL TO TWO (2) TIMES THE SUPPLY PIPE DIAMETER OR ONE (1") INCH, WHICHEVER IS GREATER.
12. IF ABOVE GROUND ENCLOSURES IS USED TWO (2) DRAIN HOLES EQUAL IN SIZE TO THE RELIEF VALVE VENT OPENING SHALL BE MADE AT THE BASE OF THE ENCLOSURE TO ENSURE ADEQUATE DRAINAGE.
13. A MINIMUM OF TWELVE (12") INCHES AND MAXIMUM OR THIRTY-SIX (36") INCHES OF CLEARANCE BETWEEN THE RELIEF VALVE VENT AND THE FINISHED GRADE UNDER THE RELIEF VALVE VENT IS REQUIRED ON ALL REDUCED PRESSURE PRINCIPLE BACKFLOW ASSEMBLIES.

LIST OF APPROVED BACKFLOW PREVENTION ASSEMBLIES
REDUCED PRESSURE PRINCIPLE ASSEMBLIES

THIS LIST INCLUDES ONLY APPROVED REDUCED PRESSURE PRINCIPLE ASSEMBLIES (RP) TO PROTECT THE POTABLE WATER SYSTEM FROM BACKFLOW WHEN AN ACTUAL OR POTENTIAL HEALTH HAZARD IS DETERMINED. THE TERM "HEALTH HAZARD" SHALL MEAN AN ACTUAL OR POTENTIAL THREAT OF CONTAMINATION OF A PHYSICAL OR TOXIC NATURE TO THE PUBLIC POTABLE WATER SYSTEM TO SUCH A DEGREE OF INTENSITY THAT THE RESULT WOULD BE A DANGER TO HEALTH.

MAKE	MODEL	SIZE
AMES	4000B	1/2" THRU 2"
AMES	4000SS	2-1/2" THRU 4"
CONBRACO	40 - 20 SERIES	1/4" THRU 10"
FEBCO	825Y, 825YD	3/4" THRU 2"
FEBCO	860, 826YD	3/4" THRU 8"
FEBCO	880/V	2-1/2" THRU 10"
FLOMATIC	RPZ-II	1/2" THRU 3/4"
HERSEY	FRP-II	3/4" THRU 2"
HERSEY	6CM	2-1/2" THRU 10"
WATTS	009	2-1/2" THRU 6"
WATTS	909	3/4" THRU 10" (MANY MODIFICATIONS ARE AVAILABLE CHECK APPROVAL FOR MI, SS HWM, ETC.)
WATTS	994	2-1/2" THRU 4"
WILKINS	975	3/4" THRU 10"
WILKINS	975XL	3/4" THRU 10"

METER AND REDUCED PRESSURE BPA DETAIL (1 / 05-C-14A)
NOT TO SCALE

SOUTH CAROLINA CERTIFICATE OF AUTHORIZATION THOMAS & HUTTON ENGINEERING No. C00285

SOUTH CAROLINA PROFESSIONAL ENGINEER REGISTERED No. 13293 MARK F. YORK

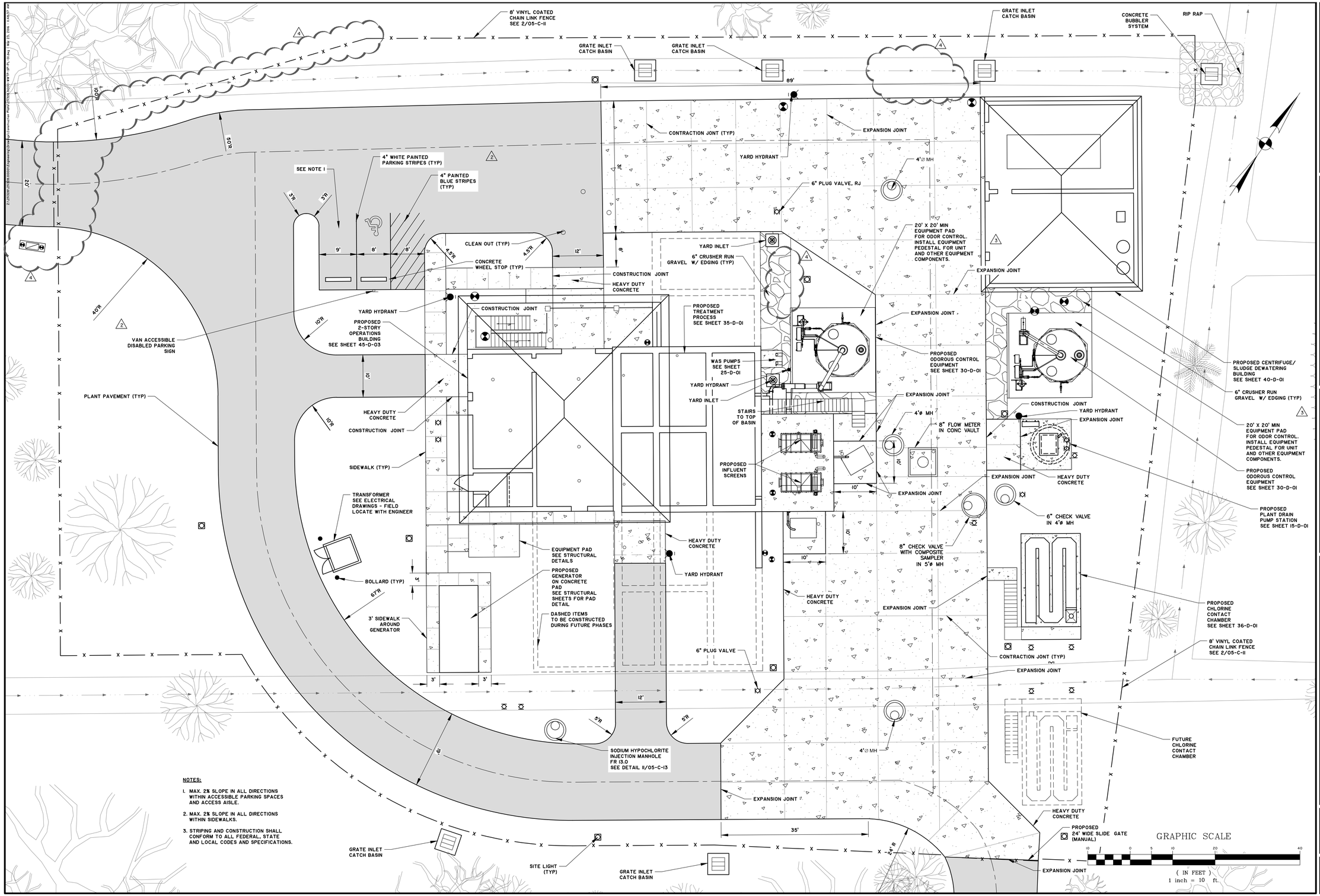
NO.	REVISIONS	BY	DATE
1	BID ADDENDUM #3 COMMENTS	MFY	3/23/16

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA
KIAWAH RIVER PLANTATION WWTP
CIVIL DETAILS

JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	KEN
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	AS NOTED

05-C-14A



NOTES:

1. MAX. 2% SLOPE IN ALL DIRECTIONS WITHIN ACCESSIBLE PARKING SPACES AND ACCESS AISLE.
2. MAX. 2% SLOPE IN ALL DIRECTIONS WITHIN SIDEWALKS.
3. STRIPING AND CONSTRUCTION SHALL CONFORM TO ALL FEDERAL, STATE AND LOCAL CODES AND SPECIFICATIONS.

SOUTH CAROLINA PROFESSIONAL ENGINEER — THOMAS & HUTTON ENGINEERING No. C00285 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER — No. 13293 — MARK F. YOUNG

NO.	REVISIONS	BY	DATE
4	BID ADDENDUM #3 COMMENTS	MFY	3/23/16
3	BID ADDENDUM #1 COMMENTS	MFY	3/7/16
2	CHARLESTON COUNTY COMMENTS	MFY	2/15/16
1	GENERAL REVISIONS	MFY	12/22/15

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

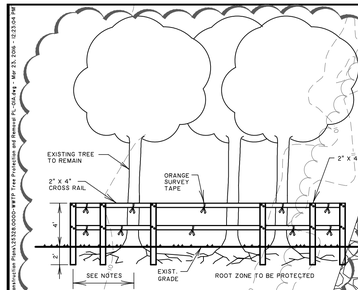
KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP

SITE LAYOUT - WWTP

JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	KEN
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	1" = 10'

06-C-01



NOTES:

1. ALL TREE PROTECTION BARRICADES MUST HAVE TWO HORIZONTAL CROSS RAILS.
2. BARRICADES SHALL BE ERECTED AT A MINIMUM DISTANCE FROM THE BASE OF PROTECTED TREES AND GRAND TREES ACCORDING TO THE FOLLOWING STANDARDS:
   A. FOR PROTECTED TREES TEN INCHES (10") OR LESS D.B.H. (DIAMETER BREAST HEIGHT), PROTECTIVE BARRICADES SHALL BE PLACED A MINIMUM DISTANCE OF TEN FEET (10') FROM THE BASE OF EACH PROTECTED TREE; AND,
   B. FOR PROTECTED TREES GREATER THAN TEN INCHES (10") D.B.H. AND GRAND TREES, PROTECTIVE BARRICADES SHALL PROVIDE A DIAMETER OF PROTECTION AROUND THE TREE EQUAL TO THE DIAMETER BREAST HEIGHT OF THE TREE (I.E., A 24" DIAMETER TREE WOULD REQUIRE A 24 FOOT DIAMETER PROTECTIVE BARRICADE.)

TREE PROTECTION DETAIL

NOT TO SCALE

EXISTING TREE SYMBOLS	
ABBREVIATION	DESCRIPTION
CHR	CHERRY
GUM	GUM
LAO	LAUREL OAK
LO	LIVE OAK
MAG	MAGNOLIA
OAK	MISC. OAK
PEC	PECAN
PM	PALM/PALMETTO
WATO	WATER OAK

TREE REMOVAL SCHEDULE		
TYPE	TRUNK DIAMETER	DIAMETER TOTAL INCHES
CHR	(3)8", 9", 11", 12", 16", 18", 20"	110
GUM	(7)8", 10", 11", (2)13", (2)14", 15", 16", 17", 18", 19", 22", 34"	272
LAO	9", 11", 15", 10"	45
LO	12"	12
OAK	12", 14", (2)18"	62
WATO	13"	13
PEC	13"	13
TOTAL		527

LEGEND

ABBREVIATION/SYMBOL	DESCRIPTION
	TREE PROTECTION
X	TREE TO BE REMOVED
⊗	DISEASED TREE

NO.	REVISIONS	BY	DATE
3	BID ADDENDUM #3 COMMENTS	MFY	3/23/16
2	BID ADDENDUM #1 COMMENTS	MFY	3/7/16
1	CHARLESTON COUNTY COMMENTS	MFY	2/15/16

SOUTH CAROLINA PROFESSIONAL ENGINEER — THOMAS & HUTTON ENGINEERING — No. C00285 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA PROFESSIONAL ENGINEER — No. 13293 — REGISTERED — MARK F. YORK

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP

TREE PROTECTION AND REMOVAL PLAN - WWTP

JOB NO:	J-25326.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	MFY
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	1" = 20'

06-C-01A

MATCH LINE - SEE SHEET NO. 06-C-03

4" 45° BEND, RJ
4" X 3" TEE, RJ
40 LF 24" CLASS III RCP @ 0.6%
30 LF 24" CLASS III RCP @0.6%
50 LF 24" CLASS III RCP @ 0.6%
YARD HYDRANT
3" 90° BEND, RJ
GRATE INLET CATCH BASIN FR 13.5 IE IN 5.72
52 LF 24" CLASS III RCP @ 0.6%
CONCRETE BUBBLER SYSTEM IE 6.03
4" C900 PVC 4"W
3" GATE VALVE, RJ
GRATE INLET CATCH BASIN FR 12.7 IE IN 5.24 IE OUT 5.24
GRATE INLET CATCH BASIN FR 13.0 IE IN 5.42 IN IN 10.30 (S) IE OUT 5.42
4" X 3" TEE, RJ
3" PVC WL 3"W
CLEAN OUT IE 4.75
6" WYE IE 4.70
40 LF 12" CLASS IV RCP @ 0.5% 6" SDR 26 PVC
4'Ø MH FR 13.90 IE IN 4.00 IE OUT 3.80
6" SDR 26 PVC
6" WYE IE 4.80
6" WYE IE 7.15
6" PLUG VALVE, RJ
12" X 6" WYE IE 3.77
3" FM
3" SCHED 80 PVC
CLEAN OUT IE 4.85
6" WYE IE 7.55
6" WYE IE 7.50
6" 45° BEND (TYP)
YARD INLET FR 13.40 IN 11.00 IE OUT 10.50
33 LF 6" HDPE @ 1.96% SEE NOTE 1
CENTRIFUGE INFLUENT
6" 45° BEND
8" SDR 26 PVC
2" GATE VALVE, RJ
YARD HYDRANT
6" DIP @ 1.0%
4" WYE
CONNECT TO 12" SUCTION LINE WITH 12" X 4" TEE
3" GATE VALVE, RJ
CLEAN OUT
PROPOSED 2-STORY OPERATIONS BUILDING SEE SHEET 45-D-03
PROPOSED TREATMENT PROCESS SEE SHEET 35-D-01
3" PVC WL
3" DIP
2" SCHED 80 PVC
12" X 4" WYE W/ 4" PLUG TAPPED FOR 2" NPT IE 3.70
PROPOSED CENTRIFUGE/ SLUDGE DEWATERING BUILDING SEE SHEET 40-D-01
2" PVC WL
4" 90° BEND
4" 45° BEND (TYP)
6" X 4" WYE
3" BV
WAS PUMPS SEE SHEET 25-D-01
YARD HYDRANT
YARD INLET FR 12.80 IE 11.15
STAIRS TO TOP OF BASIN
PROPOSED ODOROUS CONTROL EQUIPMENT SEE SHEET 30-D-01
12" X 4" WYE W/ 4" PLUG TAPPED FOR 2" NPT IE 3.59
12" SDR 26 PVC @ 0.4%
4'Ø MH FR 13.10 IE IN 3.56 (N) IE IN 4.25 (S) IE IN 4.45 (W) IE OUT 3.56
4" FD TOP 13.0 IE 11.03
4" FD IE 6.29
4" SDR 26 PVC
8" C900 PVC INFLUENT
YARD HYDRANT
4" X 4" WYE IE 6.21
PROPOSED ODOROUS CONTROL EQUIPMENT SEE SHEET 30-D-01
4" SCHEDULE 80 PVC ODOR CONTROL LINE
4" 45° BEND
PROPOSED PLANT DRAIN PUMP STATION SEE SHEET 15-D-01
10" C900 PVC (TYP)
10" 45° BEND, RJ (TYP)
14" X 10" REDUCER, RJ
14" 45° BEND, RJ
14" X 10" WYE, RJ
10" PLUG VALVE, RJ (TYP)
PROPOSED INFLUENT SCREENS
6" WYE IE 8.35
1" SCHED 80 PVC SODIUM HYPOCHLORITE SOLUTION LINE
6" PLUG IE 5.50
6" CLEAN OUT IE 8.40
6" PLUG IE 8.55
6" PLUG IE 8.35
2" PVC WL
6" FD TOP EL 13.40 IE 8.40
PROPOSED GENERATOR SEE ELECTRICAL DRAWINGS
YARD HYDRANT
2" GATE VALVE
3" GATE VALVE W/ PLUG
6" FLOW METER IN CONC VAULT TOP EL 12.87
10" SDR 26 PVC
10" 45° BEND
TOP 13.00 IE 11.50
10" FD TOP 13.00 IE 11.53
8" C900 PVC INFLUENT
8" 45° BENDS, RJ
8" X 6" WYE, RJ
12" X 10" WYE IE 4.32
8" CHECK VALVE WITH COMPOSITE SAMPLER IN 5'Ø MH FR 12.50
2" SCHED 80 PVC DRAIN
6" 45° BEND, RJ IE 3.41 IE 6.19
6" SDR 26 PVC
6" 45° BENDS, RJ
6" PLUG VALVE, RJ
6" CHECK VALVE IN 4'Ø MH FR 12.50 SEE DETAIL 13/05-C-13
8" PLUG VALVE, RJ
PROPOSED CHLORINE CONTACT CHAMBER SEE SHEET 36-D-01
DASHED ITEMS TO BE CONSTRUCTED DURING FUTURE PHASES
10" PLUGS, RJ
10" PLUG VALVE, RJ (TYP)
10" 45° BEND, RJ (TYP)
14" X 10" WYE, RJ (TYP)
14" 45° BEND, RJ
6" PLUG VALVE
12" X 6" WYE IE 4.47
6" PLUG IE 4.82
6" PLUG IE 4.90
6" 45° BEND
6" SDR 26 PVC
14" C900 PVC
14" C900 PVC TO EFFLUENT POND
IE 8.10
SODIUM HYPOCHLORITE INJECTION MANHOLE FR 13.0 SEE DETAIL 11/05-C-13
4'Ø MH FR 12.10 IE 4.50
14" 45° BEND, RJ
8" 45° BEND, RJ
SITE LIGHT (TYP)
63 LF 12" RCP CLASS III @ 0.4%
65 LF 12" RCP CLASS III @ 0.4%
GRATE INLET CATCH BASIN FR 10.70 IE 8.35
GRATE INLET CATCH BASIN FR 10.70
MATCH LINE - SEE SHEET NO. 06-C-03

NOTES:

1. PROVIDE PERFORATED 6" HDPE WRAPPED IN A FILTER SOCK AND BEDDED IN #57 STONE (GRANITE) 2' WIDE BY A MIN OF 1.5' DEEP. COMPLETELY WRAP TRENCH (MIRAFI 140N OR EQUIVALENT.
2. ALL CLEANOUTS AND MANHOLE COVERS SHALL BE WATERTIGHT.
3. PIPES UNDER STRUCTURES SHALL BE DIP UNLESS OTHERWISE NOTED AND SHALL BE ENCASED IN CONCRETE.

GRAPHIC SCALE
(IN FEET)
1 inch = 10 ft.

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 20285 THOMAS & HUTTON ENGINEERING CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA PROFESSIONAL ENGINEER No. 13293 REGISTERED MAJOR F. YORK

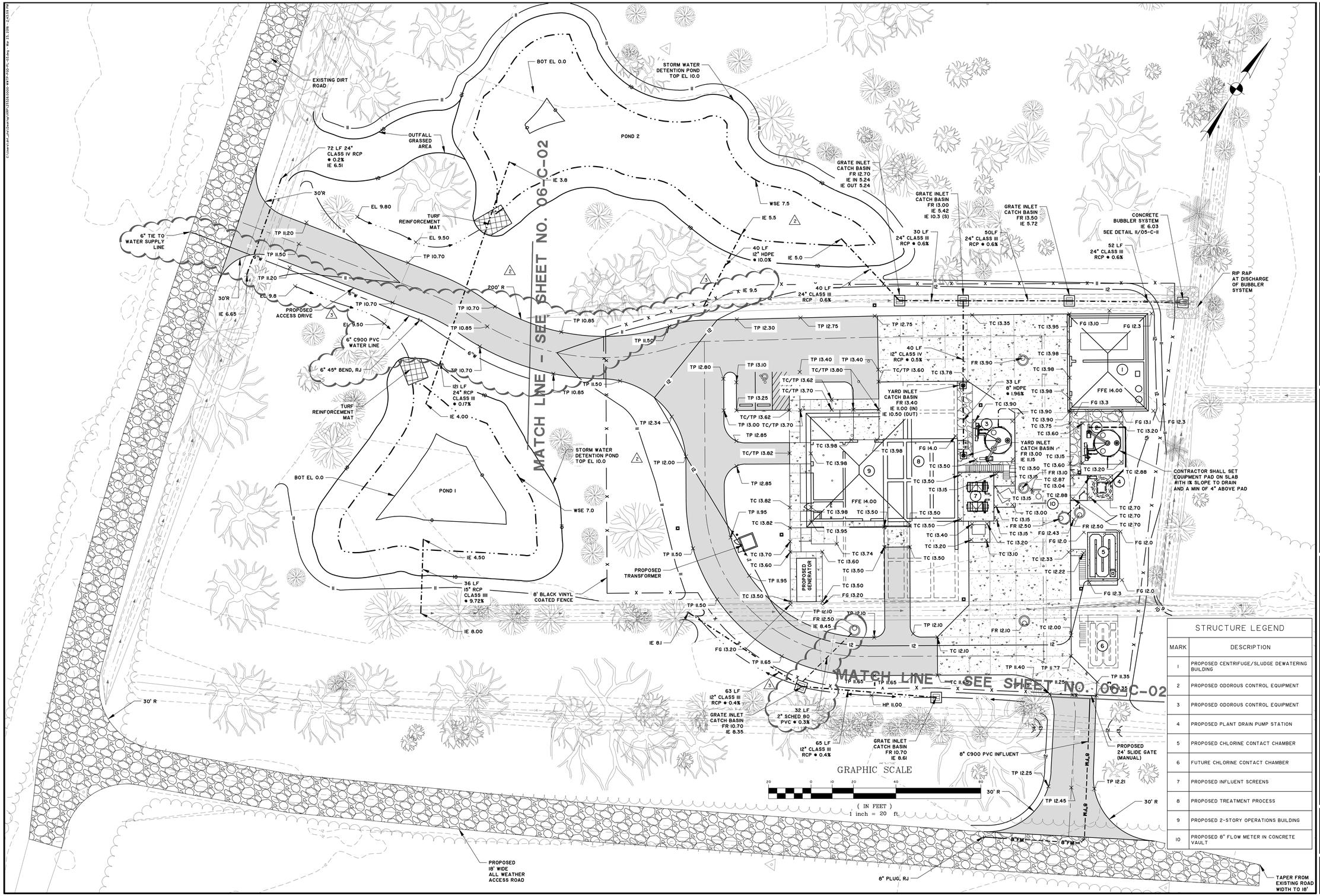
NO.	REVISIONS	BY	DATE
1	GENERAL REVISIONS	MFY	12/2/15
2	BID ADDENDUM #1 COMMENTS	MFY	3/7/16

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA
KIAWAH RIVER PLANTATION WWTP
PIPING PLAN - WWTP

JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	KEN
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	1" = 10'

06-C-02



STRUCTURE LEGEND	
MARK	DESCRIPTION
1	PROPOSED CENTRIFUGE/SLUDGE DEWATERING BUILDING
2	PROPOSED ODOROUS CONTROL EQUIPMENT
3	PROPOSED ODOROUS CONTROL EQUIPMENT
4	PROPOSED PLANT DRAIN PUMP STATION
5	PROPOSED CHLORINE CONTACT CHAMBER
6	FUTURE CHLORINE CONTACT CHAMBER
7	PROPOSED INFLUENT SCREENS
8	PROPOSED TREATMENT PROCESS
9	PROPOSED 2-STORY OPERATIONS BUILDING
10	PROPOSED 8" FLOW METER IN CONCRETE VAULT

SOUTH CAROLINA — THOMAS & HUTTON ENGINEERING No. C00285 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA — REGISTERED PROFESSIONAL ENGINEER — No. 13293 — MARK F. YORK

NO.	REVISIONS	BY	DATE
3	BID ADDENDUM #3 COMMNETS	MFY	3/23/16
2	BID ADDENDUM #1 COMMENTS	MFY	3/7/16
1	GENERAL REVISIONS	MFY	12/2/15

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP

PAVING GRADING & DRAINAGE PLAN - WWTP

JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	KEN
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	1" = 20'

06-C-03

PROPOSED SPRAY IRRIGATION DISTRIBUTION MAIN

TOE OF SLOPE

PROPOSED EFFLUENT STORAGE LAGOON ALL-WEATHER ROAD

SPRAY IRRIGATION PUMP STATION TOP EL. 18.25 (SEE SHEETS NO. 08-C-01 & 08-C-02)

TREE LINE

EXISTING DRAINAGE DITCH

TOP OF SLOPE

2'-0" WIDE GRASSED SHOULDER

18' DOUBLE LEAF SWING GATE

MATCH EXISTING INVERT

32 LF 15" RCP CLASS IV

MATCH EXISTING INVERT

MILLET HALL ROAD

TOE OF SLOPE

12' MIN.

TOP OF DIKE EL. 18.0'

180 LF 30" RCP (INTERIOR COATED) OR 30" C905 @ 0.50%

10' WIDE TOP OF DIKE

TOP OF SLOPE

INTAKE/OUTLET STRUCTURE FRAME EL. 8.7'

TOP OF WATER EL. = 15.1'

EXISTING TREE LINE

EXISTING DRAINAGE DITCH

8' BLACK VINYL COATED CHAIN LINK FENCE

8' BLACK VINYL COATED CHAIN LINK FENCE

PROPOSED TREATED EFFLUENT FORCE MAIN

TOE OF SLOPE

12' MIN. SEE NOTE 1

PVC C905

EDGE OF ACCESS WAY

EXISTING DRAINAGE DITCH

NOTES:
1. INSTALL FENCE SO AS TO PROVIDE A MINIMUM OF 12' ACCESS WIDTH FROM TOE OF SLOPE.

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

SOUTH CAROLINA — THOMAS & HUTTON ENGINEERING — No. C00285 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA — PROFESSIONAL ENGINEER — No. 13293 — REGISTERED — MARK F. YORK

NO.	REVISIONS	BY	DATE
1	BID ADDENDUM #3 COMMENTS	CGB	3/23/16

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

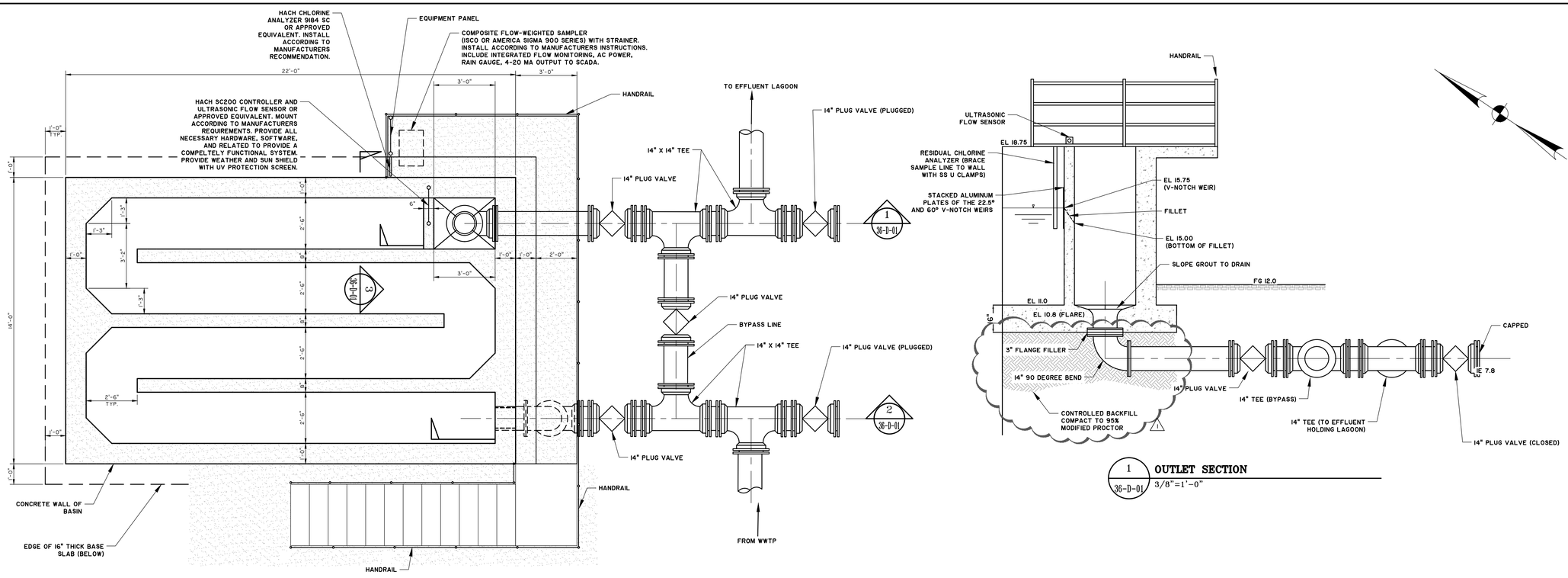
KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP

PAVING GRADING AND DRAINAGE PLAN - EFFLUENT LAGOON

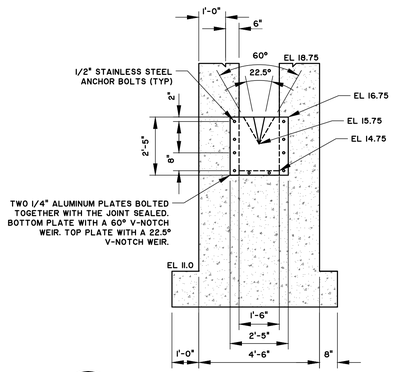
JOB NO:	J-25328.0000
DATE:	12/18/15
DRAWN:	DNF
DESIGNED:	KEN
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	1" = 20'

07-C-01

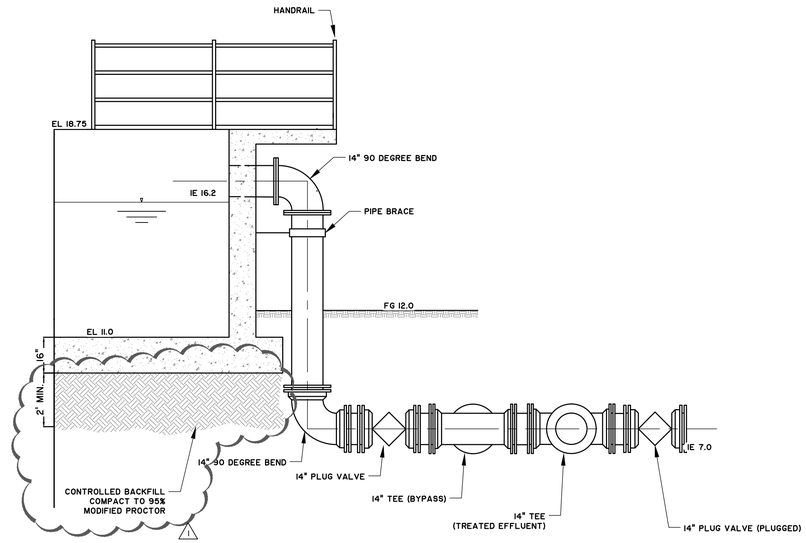


A / 36-D-01 **CHLORINE CONTACT CHAMBER – PLAN**
3/8"=1'-0"

1 / 36-D-01 **OUTLET SECTION**
3/8"=1'-0"



3 / 36-D-01 **V-NOTCH WEIR SECTION**
3/8"=1'-0"



2 / 36-D-01 **INLET SECTION**
3/8"=1'-0"

SOUTH CAROLINA PROFESSIONAL ENGINEER — THOMAS & HUTTON ENGINEERING No. C00285 — CERTIFICATE OF AUTHORIZATION

SOUTH CAROLINA PROFESSIONAL ENGINEER — No. 19293 — REGISTERED — MARK F. YOUNG

NO.	REVISIONS	BY	DATE
1	BID ADDENDUM #3 COMMENTS	MFY	3/23/16

THOMAS & HUTTON
Engineering | Surveying | Planning | GIS | Consulting
682 Johnnie Dodds Boulevard • Suite 100
Mt. Pleasant, SC 29464 • 843.849.0200
www.thomasandhutton.com

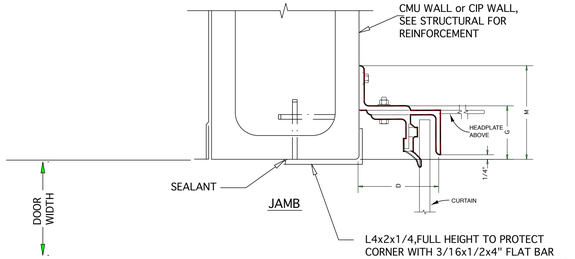
KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

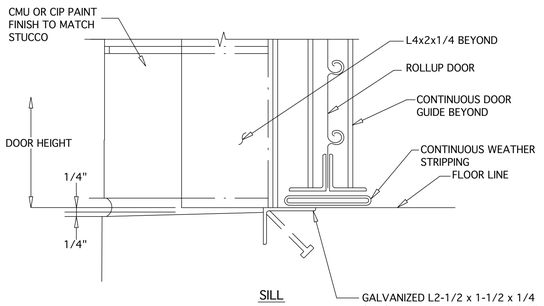
KIAWAH RIVER PLANTATION WWTP

CHLORINE CONTACT CHAMBER - PLAN AND SECTIONS

JOB NO:	J-25328.0000
DATE:	7/31//15
DRAWN:	CDY
DESIGNED:	MFY
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	3/8" = 1'-0"

36-D-01

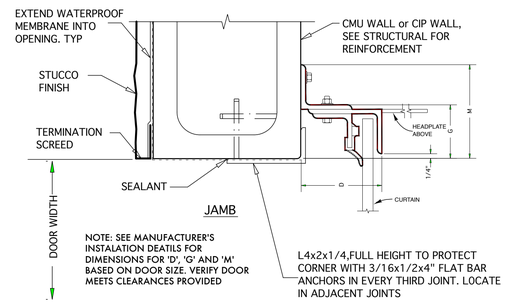


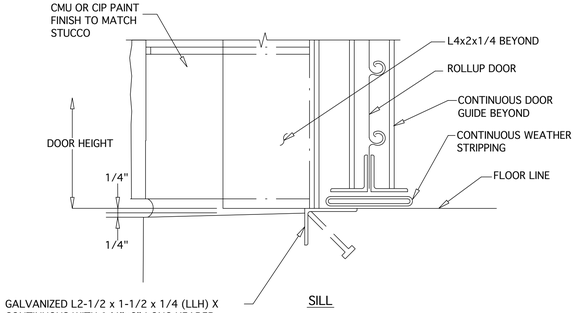


NOTE: DETAILS ILLUSTRATE CMU WALL CONSTRUCTION. DETAILS FOR CIP ARE SIMILAR.

1 Roll Up Door Jamb and Sill - no stucco

Scale: NTS

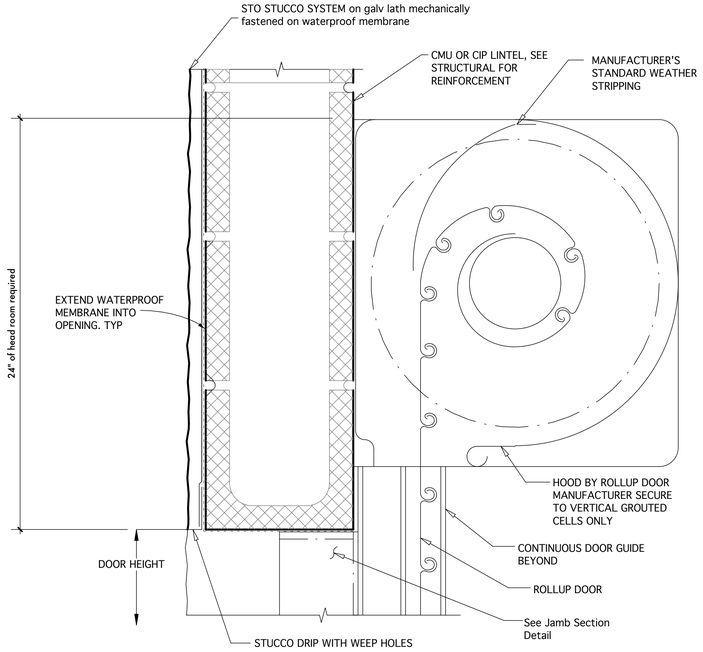




NOTE: DETAILS ILLUSTRATE CMU WALL CONSTRUCTION. DETAILS FOR CIP ARE SIMILAR.

2 Roll Up Door Jamb and Sill

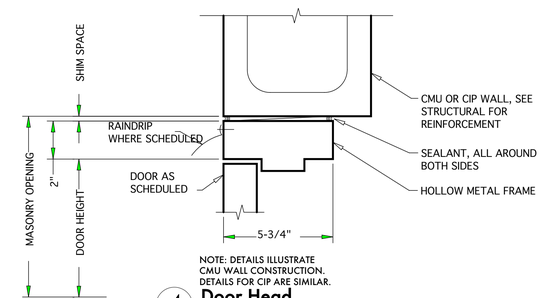
Scale: NTS



NOTE: DETAILS ILLUSTRATE CMU WALL CONSTRUCTION. DETAILS FOR CIP ARE SIMILAR.

3 Roll Up Door Head

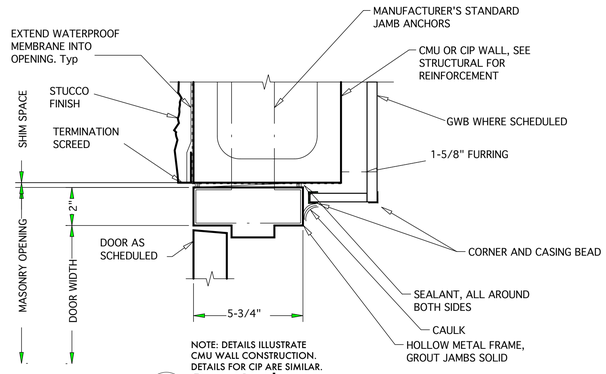
Scale: NTS



NOTE: DETAILS ILLUSTRATE CMU WALL CONSTRUCTION. DETAILS FOR CIP ARE SIMILAR.

4 Door Head

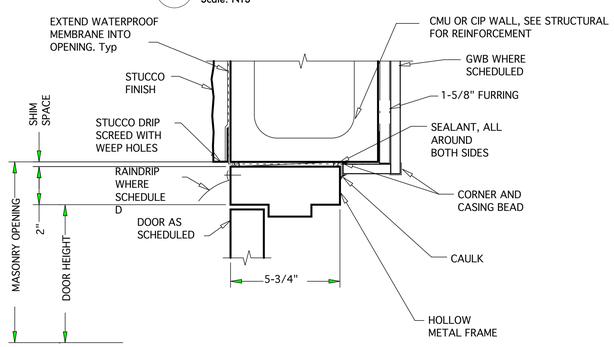
Scale: NTS



NOTE: DETAILS ILLUSTRATE CMU WALL CONSTRUCTION. DETAILS FOR CIP ARE SIMILAR.

5 Door Jamb

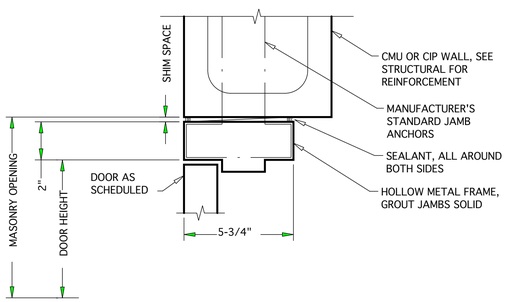
Scale: NTS



NOTE: DETAILS ILLUSTRATE CMU WALL CONSTRUCTION. DETAILS FOR CIP ARE SIMILAR.

8 Door Head

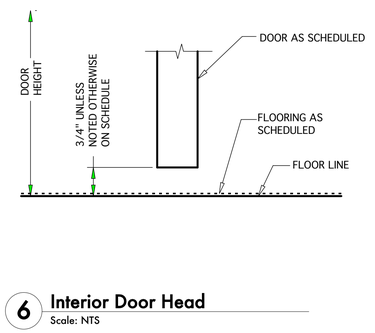
Scale: NTS



NOTE: DETAILS ILLUSTRATE CMU WALL CONSTRUCTION. DETAILS FOR CIP ARE SIMILAR.

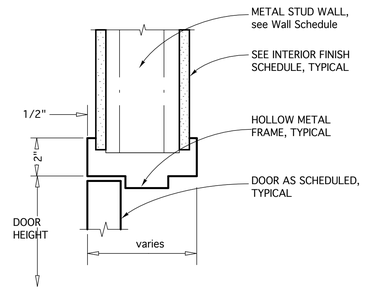
9 Door Jamb

Scale: NTS



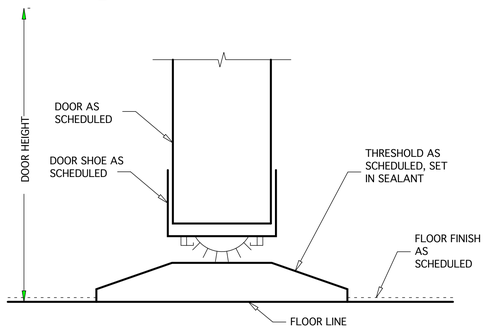
6 Interior Door Head

Scale: NTS



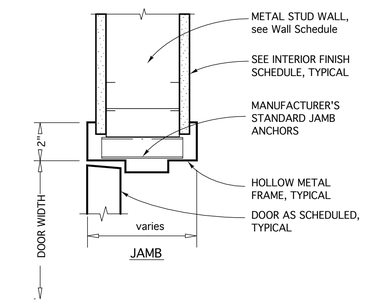
7 Interior Door Head

Scale: NTS



10 Door Sill with Threshold

Scale: NTS



11 Door Jamb

Scale: NTS

No.	Issued For	Date
1	Issued For Bid	Jan. 29, 2016
2	Issued For Addendum 3	March 21, 2016
3		

Stamps

STATE OF SOUTH CAROLINA
SWALLOWTAIL ARCHITECTURE LLC
Summerville, SC
No. 100760
REGISTERED ARCHITECTS

STATE OF SOUTH CAROLINA
RACHEL BEVERLEY BURTON
Summerville, SC
No. 8440
REGISTERED ARCHITECT

January 29 2016

SWALLOWTAIL ARCHITECTURE, LLC
ARCHITECTURE AND INTERIOR DESIGN
843.885.9400 • Swallowtailarchitecture.com
814 N Cedar Street, Summerville, SC 29483

KIAWAH RIVER PLANTATION
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP

WASTE WATER TREATMENT FACILITY DETAILS

Plot Date 3/21/16

Checked RB

Drawn RB

Drawing Title
Waste Water Treatment Facility Details

Drawing No.
35-A-18

SECTION 08 16 13

FIBERGLASS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Fiberglass doors and frames.

1.2 REFERENCES

A. American Architectural Manufacturer Association (AAMA)

1. AAMA 1304; Voluntary Specification for Forced Entry Resistance of Side-Hinged Door Systems.

B. ASTM International

1. ASTM E283; Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
2. ASTM E330; Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Pressure Difference
3. ASTM E331; Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
4. ASTM E547; Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference
5. ASTM E 1886; Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials
6. ASTM E 1996; Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes

1.3 DESIGN REQUIREMENTS

A. Structural Requirements – Provide doors and frames capable of complying with requirements indicated:

1. Design pressure: As indicated on drawings

B. Impact (Windborne-Debris) Resistance

1. Doors and frames capable of resisting impact from windborne debris, when tested in accordance with ASTM E1886 and ASTM E1996.

1.4 SUBMITTALS

A. Product Data: Submit door manufacturer current product literature, including installation instruction.

B. Samples: Provide finish samples for all products.

C. Quality Assurance Submittals

1. Design Data: Provide manufacturer test report numbers indicating product compliance with indicated requirements.
2. Manufacturer Instructions: Provide manufacturer's written installation instructions.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver doors, frames, materials and components in manufacturer's original, unopened, undamaged containers with identification labels intact.

B. Store doors and frames as recommended by manufacturer.

1.6 WARRANTY

A. Manufacturer standard warranty indicating that doors and frames will be free from material and workmanship defects from the date of substantial completion for the time periods indicated below:

1. Fiberglass Doors and Frames: 3 Years.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or Architect approved comparable manufacturer:

1. Tiger Door, FRP Extreme Duty - Hurricane
2. Chem-Pruf, Hurricane / FBC Certified Door
3. Special Lite, SL-20 or SL-17

B. Door Style: Smooth, flush fiberglass doors.

2.2 MATERIALS

A. Stiles and Rails: Engineered wood (laminated veneer lumber), composite capped.

2.3 FIBERGLASS DOORS

A. Thickness: 1-3/4 inch.

B. Door Style: Solid.

C. Door Shape: Squared Top.

D. Finish: Field painted.

E. Hardware: As provided by Section 08 71 00.

2.4 FIBERGLASS FRAMES

A. Non-Rated Construction: One-piece pultruded fiberglass reinforced plastic, minimum 1/4 inch wall thickness, jamb-to-head joints mitered and reinforced with FRP clips and stainless steel fasteners; conforming to SDI requirements for performance equivalent to 16 gage steel frames or Stainless Steel hollow metal frames.

B. Frame Profile and Size: As indicated on Drawings.

C. Hardware Preparation: Mortise for lock strike, and recess for strike plate in lock jamb. Reinforce for hinges and other indicated hardware.

2.5 CONSTRUCTION ACCESSORIES

A. Sealants

1. Refer to Section 07 92 00 Joint Sealants.
2. Provide manufacturer recommended sealants maintain watertight conditions.

2.6 FABRICATION

A. Skins are adhered to engineered wood frames with core materials and bonding agents that permanently lock skin to frame.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify openings are ready to receive work and opening dimensions and clearances are as indicated on approved shop drawings. Do not begin installation until openings have been properly prepared.

B. If opening preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Acclimate doors and frames to site conditions for a minimum of 24 hours before installation.

3.2 INSTALLATION

A. Install door opening assemblies in accordance with approved shop drawings, SDI 100, and manufacturer's printed installation instructions, using installation methods and materials specified in installation instructions.

B. Site Tolerances: Maintain plumb and level tolerances specified in manufacturer's printed installation instructions.

C. Hardware: For installation, see Division 08 Section "Door Hardware."

3.3 ADJUSTING

A. Adjust doors in accordance with door manufacturer's maintenance instructions to swing open and shut without binding, and to remain in place at any angle without being moved by gravitational influence.

B. Adjust door hardware to operate correctly in accordance with hardware manufacturer's maintenance instructions.

C. Operation: Rehang or replace doors that do not swing or operate freely.

3.4 PROTECTION

A. Protect installed doors from damage.

END OF SECTION 08 16 13

SECTION 087100

DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Commercial door hardware.
2. Cylinders for doors specified in other Sections.

B. Related Sections include the following:

1. Division 08 Section "Hollow Metal Doors and Frames."

1.3 SUBMITTALS

A. Product Data: Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Maintenance Data: For each type of door hardware to include in maintenance manuals. Include final hardware and keying schedule.

C. Warranty: Special warranty specified in this Section.

D. Other Action Submittals:

1. Door Hardware Sets: Prepared by or under the supervision of Architectural Hardware Consultant, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final door hardware sets with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

a. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule." Double space entries, and number and date each page.
b. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
c. Content: Include the following information:

1) Identification number, location, hand, fire rating, and material of each door and frame.
2) Type, style, function, size, quantity, and finish of each door hardware item.
3) Complete designations of every item required for each door or opening including name and manufacturer.
4) Fastenings and other pertinent information.
5) Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
6) Explanation of abbreviations, symbols, and codes contained in schedule.
7) Mounting locations for door hardware.
8) Door and frame sizes and materials.

d. Submittal Sequence: Submit the final door hardware sets at earliest possible date, particularly where approval of the door hardware sets must precede fabrication of other work that is critical in Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the door hardware sets.

e. Submittal Sequence: Submit initial draft of final schedule along with essential Product Data to facilitate the fabrication of other work that is critical in Project construction schedule. Submit the final door hardware sets after Samples, Product Data, coordination with Shop Drawings of other work, delivery schedules, and similar information has been completed and accepted.

2. Keying Schedule: Prepared by or under the supervision of Architectural Hardware Consultant, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations.

1.4 QUALITY ASSURANCE

A. Architectural Hardware Consultant Qualifications: A person who is currently certified by DHI as an Architectural Hardware Consultant and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.

B. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.

C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UBC Standard 7-2.

1. Test Pressure: After 5 minutes into the test, neutral pressure level in furnace shall be established at 40 inches or less above the sill.

D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

B. Tag each item or package separately with identification related to the final door hardware sets, and include basic installation instructions, templates, and necessary fasteners with each item or package.

C. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

D. Deliver keys to Owner in person, by registered mail or overnight package service.

1. Keys can be turned over to the Contractor under written direction from the owner only.

1.6 COORDINATION

A. Templates: Distribute door hardware templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including excessive deflection, cracking, or breakage.
b. Faulty operation of operators and door hardware.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: One years from date of Substantial Completion, except as follows:

a. Manual Closers: 10 years from date of Substantial Completion.

1.8 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 HINGES, GENERAL

A. Quantity: Provide the following, unless otherwise indicated:

1. Two Hinges: For doors with heights up to 60 inches.
2. Three Hinges: For doors with heights 61 to 90 inches.
3. Four Hinges: For doors with heights 91 to 120 inches.
4. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

B. Template Requirements: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

C. Hinge Base Metal: Unless otherwise indicated, provide the following:

1. Interior Hinges: Steel, with steel pin.
2. Hinges for Fire-Rated Assemblies: Steel, with steel pin.

D. Hinge Options: Where indicated in door hardware sets or on Drawings:

1. Nonremovable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for outswinging exterior doors.

E. Fasteners: Comply with the following:

1. Machine Screws: For metal doors and frames. Install into drilled and tapped holes.
2. Wood Screws: For wood doors and frames.
3. Threaded-to-the-Head Wood Screws: For fire-rated wood doors.
4. Screws: Phillips flat-head; Finish screw heads to match surface of hinges.

2.2 LOCKS AND LATCHES, GENERAL

A. Accessibility Requirements: Comply with ANSI A117.1.

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.

B. Latches and Locks for Means of Egress Doors: Comply with NFPA 101. Latches shall not require more than 15 lbf to release the latch. Locks shall not require use of a key, tool, or special knowledge for operation.

C. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:

1. Bored Locks: Minimum 1/2-inch latchbolt throw.
2. Deadbolts: Minimum 1-inch bolt throw.

D. Backset: 2-3/4 inches, unless otherwise indicated.

E. Strikes: Manufacturer's standard strike with strike box for each latchbolt or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, and as follows:

1. Strikes for Bored Locks and Latches: BHMA A156.2.
2. Strikes for Auxiliary Deadlocks: BHMA A156.5.
3. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.

2.3 MECHANICAL LOCKS AND LATCHES

A. Lock Functions: Function numbers and descriptions indicated in door hardware sets comply with the following:

1. Bored Locks: BHMA A156.2.

B. Bored Locks: BHMA A156.2 Grade 1; Series 4000.

2.4 AUXILIARY LOCKS AND LATCHES

1. Auxiliary Locks: BHMA A156.5 Grade 1 unless Grade 2 is indicated.

2.5 DOOR BOLTS

A. Bolt Throw: Comply with testing requirements for length of bolts required for labeled fire doors.

1. Flush Bolt Heads: Minimum of 1/2-inch- diameter rods of brass, bronze, or stainless steel with minimum 12-inch- long rod for doors up to 84 inches in height. Provide longer rods as necessary for doors exceeding 84 inches.

B. Manual Flush Bolts: BHMA A156.16 Grade 1 designed for mortising into door edge.

C. Automatic and Self-Latching Flush Bolts: BHMA A156.3 Grade 1; designed for mortising into door edge.

2.6 LOCK CYLINDERS

A. Standard Lock Cylinders: BHMA A156.5, Grade 1 unless Grade 2 is indicated.

B. Cylinders: Manufacturer's standard tumbler type, constructed from brass or bronze, stainless steel, or nickel silver, and complying with the following:

1. Number of Pins: Six.
2. Mortise Type: Threaded cylinders with rings and straight- or clover-type cam.
3. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
4. Bored-Lock Type: Cylinders with tailpieces to suit locks.

5. All cylinders to match existing keyway.

C. Construction Keying: Comply with the following:

1. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.

2.7 KEYING

A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, Appendix A. Incorporate decisions made in keying conference, and as follows:

1. Master Key System: Cylinders are operated by a change key and a master key.
2. Grand Master Key System: Cylinders are operated by a change key, a master key, and a grand master key.

B. Keys: Nickel silver.

1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:

a. Notation: "DO NOT DUPLICATE" and Keyset number.

2. Quantity: In addition to one extra key blank for each lock, provide the following:

a. Cylinder Change Keys: Three.
b. Master Keys: Five.
c. Grand Master Keys: Five.

2.8 CLOSERS

A. Accessibility Requirements: Where handles, pulls, latches, locks, and other operating devices are indicated to comply with accessibility requirements, comply with ANSI A117.1.

1. Comply with the following maximum opening-force requirements:

a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.
b. Sliding or Folding Doors: 5 lbf applied parallel to door at latch.
c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.

B. Door Closers for Means of Egress Doors: Comply with NFPA 101. Door closers shall not require more than 30 lbf to set door in motion and not more than 15 lbf to open door to minimum required width.

C. Power-Assist Closers: As specified in Division 08 Section "Automatic Door Operators" for access doors for people with disabilities or where listed in the door hardware sets.

D. Size of Units: Unless otherwise indicated, comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to

weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

E. Surface Closers: BHMA A156.4 Grade 1 Provide type of arm required for closer to be located on non-public side of door, unless otherwise indicated.

F. Coordinators: BHMA A156.3.

2.9 PROTECTIVE TRIM UNITS

A. Size: 1-1/2 inches less than door width on push side and 1/2 inch less than door width on pull side, by height specified in door hardware sets.

B. Fasteners: Manufacturer's standard machine or self-tapping screws.

C. Metal Protective Trim Units: BHMA A156.6; beveled top and 2 sides; fabricated from material indicated in door hardware sets.

1. Material: 0.050-inch- thick stainless steel.

2.10 STOPS AND HOLDERS

A. Stops and Bumpers: BHMA A156.16 Grade 1 unless Grade 2 is indicated.

1. Provide floor stops for doors unless wall or other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic. Where floor or wall stops are not appropriate, provide overhead holders.

B. Silencers for Metal Door Frames: BHMA A156.16, Grade 1; neoprene or rubber, minimum diameter 1/2 inch; fabricated for drilled-in application to frame.

2.11 DOOR GASKETING

A. Standard: BHMA A156.22.

B. General: Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

1. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
2. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
3. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

C. Fire-Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UBC Standard 7-2.

1. Test Pressure: After 5 minutes into the test, neutral pressure level in furnace shall be established at 40 inches or less above the sill.

D. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

E. Gasketing Materials: ASTM D 2000 and AAMA 701/702.

2.12 THRESHOLDS

A. Standard: BHMA A156.21.

B. Accessibility Requirements: Where thresholds are indicated to comply with accessibility requirements, comply with ANSI A117.1.

1. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than [1/2 inch high.

C. Thresholds for Means of Egress Doors: Comply with NFPA 101. Maximum 1/2 inch high.

2.13 MISCELLANEOUS DOOR HARDWARE

A. Auxiliary Hardware: BHMA A156.16, Grade 1 unless Grade 2 is indicated.

2.14 FABRICATION

A. Manufacturer's Nameplate: Do not provide manufacturers' products that have manufacturer's name or trade name displayed in a visible location (omit removable nameplates) except in conjunction with required fire-rated labels and as otherwise approved by Architect.

1. Manufacturer's identification will be permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18 for finishes. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.

C. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to commercially recognized industry standards for application intended. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.

1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where

through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.

2. Steel Machine or Wood Screws: For the following fire-rated applications:

   a. Mortise hinges to doors.
   b. Strike plates to frames.
   c. Closers to doors and frames.

3. Steel Through Bolts: For the following fire-rated applications, unless door blocking is provided:

   a. Surface hinges to doors.
   b. Closers to doors and frames.
   c. Surface-mounted exit devices.

4. Spacers or Sex Bolts: For through bolting of hollow metal doors.
5. Fasteners for Wood Doors: Comply with requirements of DHI WDHS.2, "Recommended Fasteners for Wood Doors."

2.15 FINISHES

A. Standard: Comply with BHMA A156.18.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. BHMA Designations: Comply with base material and finish requirements indicated by the following:

1. BHMA 619: Satin nickel plated, clear coated, over brass or bronze base metal.
2. BHMA 626: Satin chromium plated over nickel, over brass or bronze base metal.
3. BHMA 627: Satin aluminum, clear coated, over aluminum base metal.
4. BHMA 628: Satin aluminum, clear anodized, over aluminum base metal.
5. BHMA 630: Satin stainless steel, over stainless-steel base metal.
6. BHMA 652: Satin chromium plated over nickel, over steel base metal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Steel Frames: Comply with DHI A115 series.

3.3 INSTALLATION

A. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."

B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 09 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

C. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."

3.4 FIELD QUALITY CONTROL

A. Independent Architectural Hardware Consultant: Owner will engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.

1. Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
2. Door Closers: Adjust sweep period so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

B. Six-Month Adjustment: Approximately six months after date of Substantial Completion, Installer shall perform the following:

1. Examine and readjust each item of door hardware as necessary to ensure function of doors and door hardware.
2. Consult with and instruct Owner's personnel on recommended maintenance procedures.
3. Replace door hardware items that have deteriorated or failed due to faulty design, materials, or installation of door hardware units.

3.6 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.7 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

END OF SECTION 08 71 00

Attachment: Finish Hardware Schedule

Finish Hardware Schedule

for

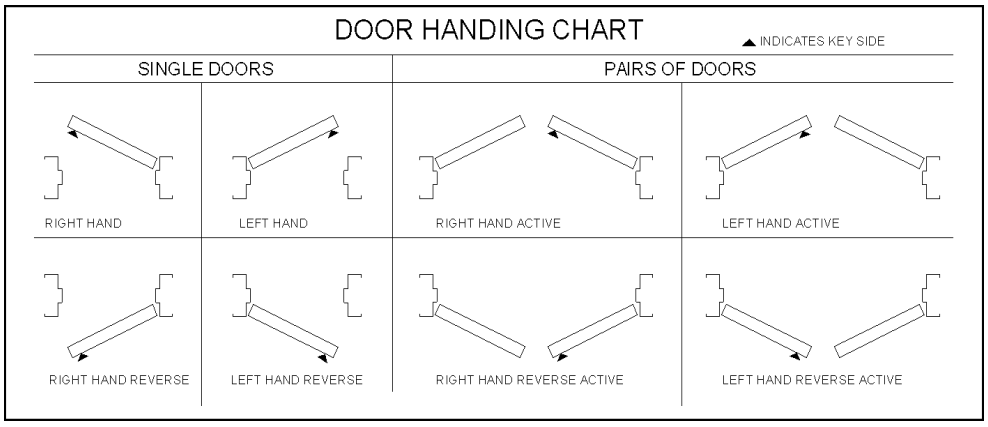
Kiawah River Plantation WWTP

Architect:	Swallowtail Architecture, LLC 814 N. Cedar St. Summerville, SC 29483 (843)885-9400
Contractor:	
Supplier:	Lowcountry Doors & Hardware, Inc. 500-A La Mesa Road Mt. Pleasant, SC 29464 (843)884-8927 Fax# (843)216-6541
Prepared by:	Martin W. Montjoy, AHC
Job Number:	KRWWTP
Date:	March 21, 2016

Finish Hardware Schedule

Kiawah River Plantation WWTP

Job Number: KRWWTP



Finish Hardware Schedule

Kiawah River Plantation WWTP

Based on:

Hinge	IVES (IVES)
Lockset	Schlage Lock Company (SCH)
Privacy Set	Schlage Lock Company (SCH)
Door Closer	LCN Closers (LCN)
Wall Bumper	IVES (IVES)
Weatherstripping	Pemko (PEM)
Sweep Strip	Pemko (PEM)
Threshold	Pemko (PEM)
Drip Cap	Pemko (PEM)
Misc	Lowcountry D&H (LDH)
Silencer	IVES (IVES)

Finish Hardware Schedule

Kiawah River Plantation WWTP

Hardware Finishes:

Finish	Finish Description
626	Satin chromium plated over nickel
630	Satin stainless steel
A	Aluminum
AL	Aluminum
C	
GRY	
US32D	Satin stainless steel

Finish Hardware Schedule

Kiawah River Plantation WWTP

Door List

Door#	Hardware Set#
C-D102	2
C-D103	2
D101	1
D102	1
D103	3
D104	2
D105	3
D106	2
D201	2
D202	2
D203	2
D204	5
D205	4

Finish Hardware Schedule

Kiawah River Plantation WWTP

Hardware Set#: 1

Key Set	Qty	Units	Door#	Door Location	Hand	Label	Deg
	1	Single	D101		N/A		
	1	Single	D102		N/A		
	2	Single	Size:	X X 1 3/4			

Qty	UOM	Manf	Item Type	Item Series/Description	Finish
2	EA	LDH	Misc	All Hardware by Door Supplier	

Hardware Set#: 2

Key Set	Qty	Units	Door#	Door Location	Hand	Label	Deg
	1	Single	C-D102		N/A		
	1	Single	C-D103		N/A		
	1	Single	D104		N/A		
	1	Single	D106		N/A		
	1	Single	D201		N/A		
	1	Single	D202		N/A		
	1	Single	D203		N/A		
	7	Single	Size:	X X 1 3/4			

Qty	UOM	Manf	Item Type	Item Series/Description	Finish
21	EA	IVES	Hinge	5BB1 x 4.5 X 4.5 x NRP	630
7	EA	SCH	Lockset	ND80PD x SPA x 13-047 x 10-025 ND80PD - Storeroom	626
7	EA	LCN	Door Closer	4040XP x SCUSH x TBWMS	AL
7	EA	PEM	Weatherstripping	303AS x 42" x 84"	A
7	EA	PEM	Sweep Strip	315CN x 42"w [Gray Insert]	C
7	EA	PEM	Threshold	2005AV x 42"w	A
7	EA	PEM	Drip Cap	346C x 46"w	C

Finish Hardware Schedule

Kiawah River Plantation WWTP

Hardware Set#: 3

Key Set	Qty	Units	Door#	Door Location	Hand	Label	Deg
	1	Single	D103		N/A		
	1	Single	D105		N/A		
	2	Single	Size: X X 1 3/4				

Qty	UOM	Manf	Item Type	Item Series/Description	Finish
6	EA	IVES	Hinge	5BB1 x 4.5 X 4.5 x NRP	630
2	EA	SCH	Lockset	ND80PD x SPA x 13-047 x 10-025 ND80PD - Storeroom	626
2	EA	LCN	Door Closer	4040XP x REG x TBWMS	AL
2	EA	PEM	Weatherstripping	303AS x 36" x 84"	A
2	EA	PEM	Sweep Strip	315CN x 36"w [Gray Insert]	C
2	EA	PEM	Threshold	2005AV x 36"w	A
2	EA	PEM	Drip Cap	346C x 40"w	C

Hardware Set#: 4

Key Set	Qty	Units	Door#	Door Location	Hand	Label	Deg
	1	Single	D205		N/A		
	1	Single	Size: X X 1 3/4				

Qty	UOM	Manf	Item Type	Item Series/Description	Finish
3	EA	IVES	Hinge	5BB1 x 4.5 X 4.5 x NRP	630
1	EA	SCH	Lockset	ND80PD x SPA x 13-047 x 10-025 ND80PD - Storeroom	626
1	EA	LCN	Door Closer	4040XP x REG x TBWMS	AL
1	EA	PEM	Weatherstripping	303AS x 42" x 84"	A
1	EA	PEM	Sweep Strip	315CN x 42"w [Gray Insert]	C
1	EA	PEM	Threshold	2005AV x 42"w	A

Finish Hardware Schedule

Kiawah River Plantation WWTP

Job Number: KRWWTP

Hardware Set#: 5

Key Set	Qty	Units	Door#	Door Location	Hand	Label	Deg
	1	Single	D204		N/A		
	---	---	---	---	---	---	---
	1	Single	Size:	X X 1 3/4			

Qty	UOM	Manf	Item Type	Item Series/Description	Finish
3	EA	IVES	Hinge	5BB1 x 4.5 X 4.5	630
1	EA	SCH	Privacy Set	ND40S x SPA x 13-048 x 10-025	626
1	EA	IVES	Wall Bumper	WS407-CCV	US32D
3	EA	IVES	Silencer	SR64	GRY

INDEX TO

SECTION 43 21 22 – SELF PRIMING WAS PUMPS

END OF SECTION

SECTION 43 21 22

SELF PRIMING WAS PUMPS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Division 1 specification Sections, apply to this Section.

B. Additional requirements related to work specified in this Section include, but are not limited to, the following:

1. Section 45 50 00 – Membrane Bioreactor.

1.2 SCOPE

A. Furnish all labor, materials, tools and equipment necessary for complete installation of self-priming pump(s) described in this Specification.

B. Pump(s) shall be designed for continuous duty operation, to provide the transfer of fluid volumes.

1.3 QUALITY ASSURANCE

A. The pump and accessories specified herein shall be the design and fabrication of a single manufacturer which shall have the sole source responsibility for the pump(s) and associated accessories.

B. The materials and equipment covered by this specification are intended to be standard materials and equipment of demonstrated successful performance and supplied by a manufactured who has been actively engaged in the supply of similarly sized pumps for a minimum of 5 years. Equipment shall be designed and constructed in accordance with the highest standards of the industry and shall be installed in accordance with the manufacturer's recommendations and the Contract Documents.

1.4 SUBMITTAL INFORMATION

A. Provide a complete sets of submittal information in PDF format. All pertinent information needed to fully describe the pump(s) and accessories shall be included in the submittal. Where multiple options are included within standard literature, project specific part numbers and options shall be highlighted by enclosing the project-specific information (circling, clouding, text boxes) and other information shall be crossed out. Any deviations to these specifications must be listed on a separate page referencing the specification section with a brief description of the deviation and why it is equal to or superior to what is specified. Submittals for each size and type shall include, but not be limited to the following:

1. Name of manufacturer.

2. Type and Model.

3. Rotational speed.

4. Major component materials of construction.

5. Pump specification describing construction details.

6. Outline Dimension Drawing.

7. Installation Drawing.

8. Complete performance data showing capacity and power input.

9. Electrical Data than includes:
   a. Motor rating, hp.
   b. Motor temperature rating.
   c. Motor full load rotational speed.
   d. Motor full load current.
   e. Motor locked rotor current.

10. Motor performance curves showing speed, efficiency, current, power, etc.

1.5 OPERATION & MAINTENANCE MANUALS

A. Furnish a complete Installation, Operation & Maintenance Manual in PDF form. Manuals shall include pump outline dimensions, motor data, nameplate data, safety instructions, transportation and storage information, general design information, mounting & installation information, electrical connection information, commissioning instructions, maintenance information and a trouble shooting guide.

PART 2 – PRODUCTS

2.1 PUMP DESIGN

A. Pumps must be designed to handle raw, screened, industrial waste.

B. Solids Handling Capability – When pumps are used for handling raw wastewater or activated sludge, all internal passages, impeller vanes, and recirculation ports shall pass a 2.0" spherical solid. Smaller internal passages that create a maintenance nuisance or interfere with priming and pump performance shall not be permitted. Upon request from the engineer or owner, manufacturer's certified drawings showing size and location of the recirculation port(s) shall be submitted for approval.

C. Reprime Performance:

1. During unattended operation, the pump shall retain adequate liquid in the casing to insure automatic repriming while operating at its rated

speed in a completely open system. The need for a suction check valve or external priming device shall not be required.

2. Pump must reprime the Maximum Repriming Lift shown in the Pump Schedule at the specified speed and impeller diameter while operating with only one-half of the liquid remaining in the pump casing. (Reprime lift is defined as the static height of the pump suction above the liquid).

3. The pump must reprime and deliver full capacity within five minutes after the pump is energized in the reprime condition.

4. Upon request from the engineer or owner, certified reprime performance test results, prepared by the manufacturer, and certified by a registered professional engineer, shall be submitted for approval prior to shipment.

5. Manufacturer shall certify pump installation configuration provides optimum performance.

D. Pump Schedules Inside Equipment Room (Interior): Pumps shall be provided to meet to following conditions and duty points.

1. Pump Name - WAS Pump

2. Number of Pumps - 2 (1 duty and 1 standby)

3. Fluid to be pumped - Screened, de-gritted, raw waste water and Returned Activated Sludge

4. Fluid Specific Gravity - 1

5. Fluid Viscocity (cp) - 110

6. Hazardous Location - No

7. VFD Controlled - No

8. Solids Concentration (mg/l) - 13,000

9. Primary Duty Point

   a. Capacity (gpm) - 20

   b. Total Dynamic Head 1 (ft) – 20

E. Pump Schedules Outside Basins (Exterior): Pumps shall be provided to meet to following conditions and duty points.

Pump Name	WAS
Number of Pumps	2 (1 duty and 1 standby)
Fluid to be pumped	Screened, de-gritted, raw waste water, Returned Activated Sludge (RAS) and Waste Activated Sludge (WAS)
Fluid Specific Gravity	1
Fluid Viscocity	110
Hazardous Location	No
VFD Controlled	No
Solids Concentration (mg/l)	13,000
Primary Duty Point	
Capacity (gpm)	20
Total Dynamic Head 1 (ft)	20

F. Pumps shall be end suction, single stage, horizontal frame mounted, vertical V-belt type base, self-priming centrifugal type.

G. Materials and Construction Features.

1. Pump casing: Casing shall be cast iron Class 30 with integral volute scroll. Casing shall incorporate following features:

a. Mounting feet sized to prevent tipping or binding when pump is completely disassembled for maintenance.

b. Fill port coverplate, 3 1/2" diameter, shall be opened after loosening a hand nut/clamp bar assembly. In consideration for safety, hand nut threads must provide slow release of pressure, and the clamp bar shall be retained by detente lugs. A Teflon gasket shall prevent adhesion of the fill port cover to the casing.

c. Casing drain plug shall be at least 1 1/4" NPT to insure complete and rapid draining.

2. Rotating Assembly: A rotating assembly will include impeller, shaft, mechanical shaft seal, lip seals, bearings, sealplate and bearing housing. Design shall incorporate following features:

a. Buna-N Seals will be utilized along with Cast Iron Construction.

b. Self-Cleaning and Clog Resistant Impeller.

c. Steel base with dual volute design.

d. Built in flapper check valve.

H. Motor

1. Motors shall be squirrel cage induction type, totally enclosed, fan cooled.

2. Motors shall be 460 volts, 60 Hz, 3 phase.

3. Motors shall have NEMA Class F insulation.

I. Manufacturer's Warranty:

1. The pump manufacturer shall warrant the pump equipment to be of quality construction, free of defects in material and workmanship. A written warranty shall include specific details described below.

2. All equipment, apparatus, and parts furnished shall be warranted for one (1) year, excepting only those items that are normally consumed in service, such as oils, grease, packing, gaskets, O-rings, etc. The pump manufacturer shall be solely responsible for warranty of the pump equipment and all components.

3. Components failing to perform as specified by the engineer or owner, or as represented by the manufacturer, or as proven defective in service during the warranty period, shall be replaced, repaired, or satisfactorily modified by the manufacturer without cost of parts or labor to the owner.

4. The warranty shall become effective sixty (60) days after installation, or ninety (90) days after shipment, whichever occurs first.

J. Manufacturers

1. AMT
2. Approved equal
3. OVIVO shall approve WAS pump manufacturer and pump selection.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Contractor shall off-load equipment at installation site using equipment of sufficient size and design to prevent injury or damage. Immediately after off-loading, contractor shall inspect complete pump and appurtenances for shipping damage or missing parts. Any damage or discrepancy shall be noted in written claim with shipper prior to accepting delivery. Validate all pump serial numbers and parts lists with shipping documentation. Notify the manufacturer's representative of any unacceptable conditions noted with shipper.

3.2 INSTALLATION

A. Contractor shall install, level, align, and lubricate pump(s) as indicated on project drawings. Installation must be in accordance with written instructions supplied by the manufacture at time of delivery.

B. Sufficient supports and thrust blocks shall be installed to prevent strain and vibration on pump piping. Install and secure all service lines (level control, air release valve or pump drain lines) as required.

C. After all anchor bolts, piping and control connections are installed, completely fill the grout dam in the pump station base with non-shrink grout.

3.3 FIELD QUALITY CONTROL

A. Contractor is to inspect the installed pump(s) for visual deficiencies.

B. Prior to acceptance by owner, an operational test of all pumps, drives, and control systems shall be conducted to determine if the installed equipment meets the purpose and intent of the specifications. Tests shall demonstrate that all equipment is electrically, mechanically, structurally, and otherwise acceptable; it is safe and in optimum working condition; and conforms to the specified operating characteristics.

3.4 PROTECTION

A. The contractor shall be responsible for provisions to protect the pumps and materials after installation but prior to acceptance by the Owner. Protection of the equipment shall include provisions during installation and testing of nearby piping, valving, or other adjacent equipment. The Contractor shall remove all protective measures installed at completion and acceptance of the project.

END OF SECTION

Yodice, Mark

From: Yodice, Mark
Sent: Friday, March 18, 2016 11:03 AM
To: Yodice, Mark
Subject: FW: Kiawah River Plantation WWTP
Attachments: Kiawah River Plantation WWTP PA.pdf

Mark Yodice
Thomas & Hutton
yodice.m@thomasandhutton.com
(P) 843-725-5236 (F) 843-849-0203
Website | vCard

From: Charles Cobb [mailto:CCobb@chathamengineering.com]
Sent: Friday, March 11, 2016 11:25 AM
To: Yodice, Mark <yodice.m@thomasandhutton.com>; Hayes, Jen <hayes.j@thomasandhutton.com>; Cummins, Lyndell <cummins.l@thomasandhutton.com>
Subject: Kiawah River Plantation WWTP

MARK, JEN & LYNDY,
PLEASE SEE BELOW AND ATTACHED.

CHATHAM ENGINEERING
Charles Cobb, P.E.
Electrical
109 Park of Commerce Dr., Suite 6
Savannah, GA 31405
P 912-238-2400 F 912-238-2412
C 912-713-5312

www.chathamengineering.com

From: Michelle Peavler
Sent: Friday, March 11, 2016 11:08 AM
To: Charles Cobb
Subject: FW: Kiawah River Plantation WWTP

Charles,

We received the attached prior approval information. All the HVAC equipment listed in the document is an approved equal.

Please forward to Thomas & Hutton.

Thanks,

S. Michelle Peavler, PE, LEED AP

CHATHAM ENGINEERING
109 Park of Commerce Dr., Suite 6
Savannah, GA 31405
P: 912-238-2400 F: 912-238-2412
www.chathamengineering.com

From: Taylor Sipes [mailto:taylor.sipes@trs-sesco.com]
Sent: Friday, March 04, 2016 10:43 AM
To: Michelle Peavler
Cc: Greg Ashcroft
Subject: Kiawah River Plantation WWTP

Good morning Michelle,

Please find our prior approval letter attached for your consideration, in reference to the above mentioned project.

If you have any questions, please let us know.

Thanks,

Taylor Sipes
Inside Sales Assistant
Thermal Resource Sales, Inc.
1941 Savage Road, Suite 400-C
Charleston, SC 29407
Phone: 843-556-7272 Fax: 843-556-7487

Thermal Resource Sales, Inc.
1941 Savage Rd, Suite 400-C
Charleston, SC 29407

PH: 843-556-7272
Fax: 843-556-7487
www.trs-sesco.com

PRIOR APPROVAL REQUEST

March 4, 2016

Chatham Engineering
109 Park of Commerce Dr
Savannah, Ga 31405

RE: Kiawah River Plantation WWTP

Dear Michelle Peavler ,

For your consideration, we are requesting prior approval to bid the following mechanical equipment for use on this project. We have many references and installations throughout the construction markets in the Southeast, including the Carolinas.

We are requesting permission to bid these specific manufacturers according to the plans and specifications.

Manufacturer	Product	Spec. Section	Website
Metalaire	Air Distribution	01-M-01	www.metalaire.com
American Coolair (ILG)	Exhaust Fans	01-M-01	www.coolair.com
Fraser-Johnston	SSHP	01-M-01	www.fraserjohnston.com
Indeeco	Electric Heaters	01-M-01	www.indeeco.com
United Enertech	Louver	01-M-01	www.unitedenertech.com

These companies' lines of equipment have each been in manufacturing for many years and are nationally recognized. If you require additional information on these companies or performance data on their products, we would be happy to provide you with that data.

Thank you for your consideration. We look forward to the opportunity to prepare a bid on this project and await your response.

Regards,

Greg Ashcroft
Sales Engineer