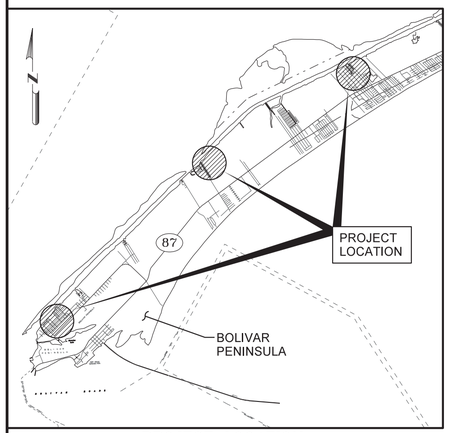
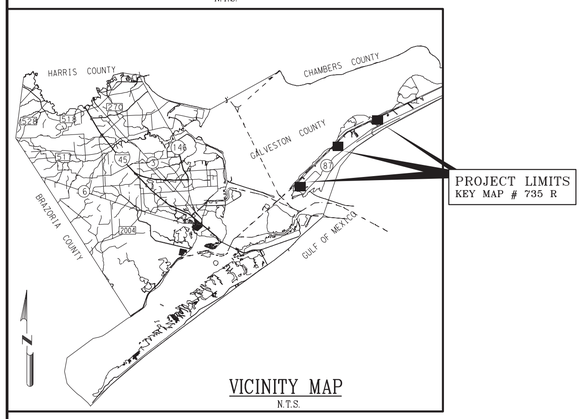
GALVESTON COUNTY

BOLIVAR
CULVERT OUTFALLS



PROJECT LOCATION
N.T.S.



VICINITY MAP
N.T.S.

DARRELL APFFEL
COMMISSIONER — PRECINCT 1

JOE GIUSTI
COMMISSIONER — PRECINCT 2

MARK A. HENRY
COUNTY JUDGE

STEPHEN D. HOLMES
COMMISSIONER — PRECINCT 3

KEN CLARK
COMMISSIONER — PRECINCT 4

MICHAEL SHANNON, P.E., CFM
COUNTY ENGINEER

THE STATE OF TEXAS
COUNTY OF GALVESTON

JULY, 2019
PRECINCT 1

STATE OF TEXAS
DARRELL L. KADERKA
79298
REGISTERED
PROFESSIONAL ENGINEER
05/06/2019

CivilTech Engineering, Inc.
11821 Telge Road
Cypress, Texas 77429
(281) 304-0200 Fax (281) 304-0210
Firm Registration No. F-382

7/9/2019 41:34:14 PM
Q:\2013\330005\Drawings\Sheets\00-BOL*cover.dgn

INDEX OF SHEETS:

TRAFFIC CONTROL NOTES;

TRAFFIC CONTROL WILL CONSIST OF COMPLETE ROADWAY CLOSURES FOR PIPE INSTALLATION ACROSS ROADS AND DRIVEWAYS. UTILIZE APPROVED TYPE III BARRICADES AS SHOWN IN THE PLANS.
ALL TRENCHES ACROSS ROADS AND DRIVEWAYS WILL BE COMPLETED IN A SINGLE WORKING DAY. TRENCES LEFT OPEN FOR MORE THAN 12 HOURS MUST BE PLATED OVER USING APPROVED STEEL PLATES.
FLEX BASE MAY BE USED FOR TEMPORARY PAVING AT ASPHALT PAVEMENTS FOR NO LONGER THAN 28 CALENDAR DAYS.

7/3/2019 10:34:10 AM
Q:\2013\330005\Drawings\Sheets\02-BOL*INDEX.dgn

NO.	REVISIONS	DATE	NAME

GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

STATE OF TEXAS
DARRELL L. KADERKA
79298
REGISTERED PROFESSIONAL ENGINEER
06/30/2019

PROJECT TITLE: BOLIVAR CULVERT OUTFALLS		
DRAWN BY: DA	SHEET DESCRIPTION: INDEX OF SHEETS	JOB NO: 330005.00
CK'D BY: DLK		FILE NAME:
SCALE:		FILE NO:
DATE: 7/3/2019	APPROVED BY:	SHT NO: 2 / 27

GENERAL

1. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS BEFORE BEGINNING CONSTRUCTION.
2. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SECURITY TO PROTECT THE PROJECT SITE, CONTRACTOR PROPERTY, EQUIPMENT, AND WORK.
3. THE CONTRACTOR IS RESPONSIBLE FOR CLEANING STREETS OF CONSTRUCTION DIRT AND DEBRIS AT CLOSE OF EACH WORK DAY.
4. THE CONDITION OF ADJACENT EXISTING ROADWAYS AND/OR RIGHT-OF-WAY, UPON COMPLETION OF THE JOB SHALL BE AS GOOD AS OR BETTER THAN PRIOR TO STARTING WORK.
5. THE CONTRACTOR STAGING AREA SHALL BE DETERMINED BY THE CONTRACTOR WITH CONCURRENCE BY THE ENGINEER PRIOR TO CONSTRUCTION.
6. THE CONTRACTOR SHALL NOTIFY ALL PROPERTY OWNERS A MINIMUM OF 24 HOURS PRIOR TO BLOCKING DRIVEWAYS OR ENTERING UTILITY EASEMENTS.
7. INGRESS AND EGRESS SHALL BE PROVIDED FOR TRAFFIC DURING CONSTRUCTION. ACCESS TO ALL ADJACENT STRUCTURES SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION DURATION.
8. THE CONTRACTOR SHALL REMOVE AND REPLACE OR RECONSTRUCT EXISTING FENCES, POSTS, PLANTERS, TRASH CONTAINERS, CULVERTS, ETC. AS NECESSARY TO COMPLETE CONSTRUCTION. ANY ITEMS DAMAGED DURING CONSTRUCTION BY THE CONTRACTOR SHALL BE REPLACED WITH EQUAL OR BETTER AT NO EXTRA PAY. TREES, BUSHES, AND SHRUBBERY THAT ARE DESIGNATED TO REMAIN, BUT DAMAGED BY CONTRACTOR'S OPERATIONS, SHALL BE REPLACED AND WATERED THOROUGHLY WITHIN 72 HOURS OF REMOVAL. NO SEPARATE PAY.
9. ANY MAIL BOXES REQUIRING REMOVAL SHALL BE RELOCATED SO THAT MAIL SERVICE IS NOT INTERRUPTED.
10. PAVED SURFACES, PAVEMENT MARKERS AND MARKINGS SHALL BE PROTECTED FROM DAMAGE BY CONSTRUCTION EQUIPMENT.
11. IRON RODS DISTURBED DURING CONSTRUCTION ARE TO BE REPLACED BY A REGISTERED PUBLIC LAND SURVEYOR FOR THE ORIGINAL PROPERTY OWNER AT NO SEPARATE PAY.
12. CONSTRUCTION STAKING WILL BE PROVIDED BY THE CONTRACTOR.
13. THE COUNTY OR THE COUNTY'S SURVEYOR SHALL PROVIDE A BENCHMARK OR TEMPORARY BENCHMARK AND SURVEY CONTROLS.
14. THE CONTRACTOR SHALL MAINTAIN UPDATED REDLINED RECORD DRAWINGS ON SITE FOR INSPECTION BY THE ENGINEER.
15. THE REMOVAL OF ANY ABANDONED UTILITIES REQUIRED TO COMPLETE THE WORK SHALL BE INCIDENTAL AND NO SEPARATE PAYMENT SHALL BE MADE.
16. IT IS THE CONTRACTORS'S RESPONSIBILITY TO STOCKPILE NECESSARY MATERIAL ON-SITE OR SECURED OFF-SITE AT NO ADDITIONAL EXPENSE TO GALVESTON COUNTY. ALL STORM SEWER, ROADWAY, AND CHANNEL EXCAVATION, IF SUITABLE, SHALL BE USED BEFORE BORROW IS BROUGHT ON-SITE. OFF-SITE BORROW IS NOT ANTICIPATED.
17. MANHOLES, JUNCTION BOXES, INLETS, AND RISERS ARE TO BE PRE-CAST ONLY UNLESS OTHERWISE SPECIFIED. SUBMIT SHOP DRAWINGS FOR APPROVAL.
18. EXCESS MATERIAL EXCAVATED TO CONSTRUCT THE PROPOSED PARKING LOTS, DRIVES, STORM SEWERS, ETC. SHALL BE PLACED ONSITE AS GENERALLY SHOWN ON THE GRADING PLANS WITHIN FILL AREAS 1 & 2. FILL MATERIAL DEPOSITED WITHIN THESE AREAS SHALL GENERALLY CONFORM TO THE PROPOSED GRADES IN ORDER TO MAINTAIN POSITIVE DRAINAGE. ALL FILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH ARTICLE 132.3.D.1 - ORDINARY COMPACTION AND IS CONSIDERED SUBSIDIARY TO EXCAVATION.
19. ALL TOP SOIL SHALL BE STOCKPILED ON SITE AT AN APPROVED LOCATION WITH FILTER FABRIC FENCING PLACED AROUND THE PERIMETER AT THE TOE OF THE STOCKPILE.
20. OMITTED
21. STRUCTURAL EXCAVATION SHALL BE CONSIDERED SUBSIDIARY TO STRUCTURES BEING CONSTRUCTED. NO ADDITIONAL PAY WILL BE ALLOWED FOR EXCAVATION OF UTILITIES, STORM SEWERS, INLETS, MANHOLES, OR OTHER STRUCTURES.

UTILITY

1. REMOVAL OF ALL ABANDONED UTILITIES WILL BE INCIDENTAL TO THE CONSTRUCTION REQUIRING THE REMOVAL OF THOSE UTILITIES.
2. EXISTING UTILITIES ARE SHOWN IN AN APPROXIMATE MANNER ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETELY FIELD LOCATING AND VERIFYING ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THE DRAWINGS. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES OCCURRING DUE TO HIS FAILURE TO EXACTLY LOCATE ALL EXISTING UTILITIES.
3. ANY CONFLICT WITH EXISTING UTILITIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN A TIMELY MANNER SUCH THAT THE CONFLICT CAN BE RESOLVED BEFORE CONTINUING CONSTRUCTION ACTIVITIES.

STORM SEWER

1. NO JETING OF BEDDING OR BACKFILL WILL BE ALLOWED.
2. CONTRACTOR IS TO COMPLY WITH THE LATEST O.S.H.A. REGULATIONS AND STATE OF TEXAS LAW CONCERNING EXCAVATION, TRENCH AND SHORING, (AS SPECIFIED IN PART 1926, SUBPART P "EXCAVATING, TRENCHING AND SHORING".)
3. ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION. ANY EXISTING DRAINAGE STRUCTURE OR FACILITY DAMAGED DURING CONSTRUCTION SHALL BE RESTORED TO THE ORIGINAL CONDITION AT NO ADDITIONAL COSTS.
4. ALL REINFORCED CONCRETE PIPE INDICATED FOR USE IN STORM DRAINS WILL NOT BE SUBSTITUTED WITH HDPE PIPE.

TRAFFIC CONTROL

1. SIGNIFICANT TRAFFIC CONTROL IS NOT ANTICIPATED ON THIS PROJECT. THE CONTRACTOR'S MEANS OF TRAFFIC CONTROL SHALL BE PRESENTED TO THE COUNTY FOR APPROVAL PRIOR TO INSTALLING ANY TRAFFIC CONTROL DEVICES.

TREE PROTECTION

1. TREES SHALL BE PROTECTED FROM ALL CONSTRUCTION ACTIVITIES. FENCING OR ROOT PRUNING MAY BE REQUIRED AT THE DIRECTION OF THE ENGINEER TO PROTECT THESE TREES IF CONSTRUCTION ACTIVITIES EXTEND TO WITHIN THE TREE'S DRIP LINE. COST OF SUCH TREE PROTECTION MEASURES WILL BE CONSIDERED INCIDENTAL TO WORK ITEMS BEING PERFORMED.

NO.	REVISIONS	DATE	NAME

GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

STATE OF TEXAS
DARRELL L. KADERKA
79298
REGISTERED PROFESSIONAL ENGINEER
06/30/2019

PROJECT TITLE: BOLIVAR CULVERT OUTFALLS		
DRAWN BY: DA	SHEET DESCRIPTION: GENERAL NOTES	JOB NO: 330005.00
CK'D BY: DLK		FILE NAME:
SCALE:		FILE NO:
DATE: 7/3/2019	APPROVED BY:	SHT NO: 2 / 27

7/3/2019 10:34:11 AM
Q:\2013\330005\Drawings\Sheets\03-notes01.dgn

STORM WATER QUALITY

THIS PROJECT DISTURBS LESS THAN 1 ACRE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTATION, INSPECTION, AND MAINTENANCE OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. THE COST TO IMPLEMENT INSPECT, AND MAINTAIN THE SWPPP SHALL BE CONSIDERED INCIDENTAL TO THE SWPPP BID ITEMS.

PRIVATE UTILITY

CENTERPOINT ENERGY

CAUTION: UNDERGROUND GAS FACILITIES

LOCATIONS OF CENTERPOINT ENERGY MAIN LINES (TO INCLUDE CENTERPOINT ENERGY, INTRASTATE PIPELINE, LLC. WHERE APPLICABLE) ARE SHOWN IN AN APPROXIMATE LOCATION ONLY. SERVICE LINES ARE USUALLY NOT SHOWN. OUR SIGNATURE ON THESE PLANS ONLY INDICATES THAT OUR FACILITIES ARE SHOWN IN APPROXIMATE LOCATION. IT DOES NOT IMPLY THAT A CONFLICT ANALYSIS HAS BEEN MADE. THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT (713) 223-4567 OR 1-800-669-8344 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

1. WHEN CENTERPOINT ENERGY PIPE LINE MARKINGS ARE NOT VISIBLE, CALL (713) 967-8037 (7:00 AM TO 4:30 P.M.) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.
2. WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF CENTERPOINT ENERGY FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED BY USING NON-MECHANIZED EXCAVATION PROCEDURES.
3. WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STESS ON THE PIPING.

THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES.

WARNING: OVERHEAD ELECTRIC LINES

OVERHEAD LINES MAY EXIST ON THE PROPERTY. THE LOCATION OF OVERHEAD LINES HAS NOT BEEN SHOWN ON THESE DRAWINGS AS THE LINES ARE CLEARLY VISIBLE, BUT YOU SHOULD LOCATE THEM PRIOR TO BEGINNING ANY CONSTRUCTION. TEXAS LAW, SECTION 752, HEALTH & SAFETY CODE, FORBIDS ACTIVITIES THAT OCCUR IN CLOSE PROXIMITY TO HIGH VOLTAGE LINES, SPECIFICALLY:

1. ANY ACTIVITY WHERE PERSON OR THINGS MAY COME WITHIN SIX (6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES; AND
2. OPERATING A CRANE, DERRICK, POWER SHOVEL, DRILLING RIG, PILE DRIVER, HOISTING EQUIPMENT, OR SIMILAR APPARATUS WITHIN 10 FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES.

PARTIES RESPONSIBLE FOR THE WORK, INCLUDING CONTRACTORS, ARE LEGALLY RESPONSIBLE FOR THE SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW. THIS LAW CARRIES BOTH CRIMINAL AND CIVIL LIABILITY. TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED CALL CENTERPOINT ENERGY AT (713) 207-2222.

NO.	REVISIONS	DATE	NAME

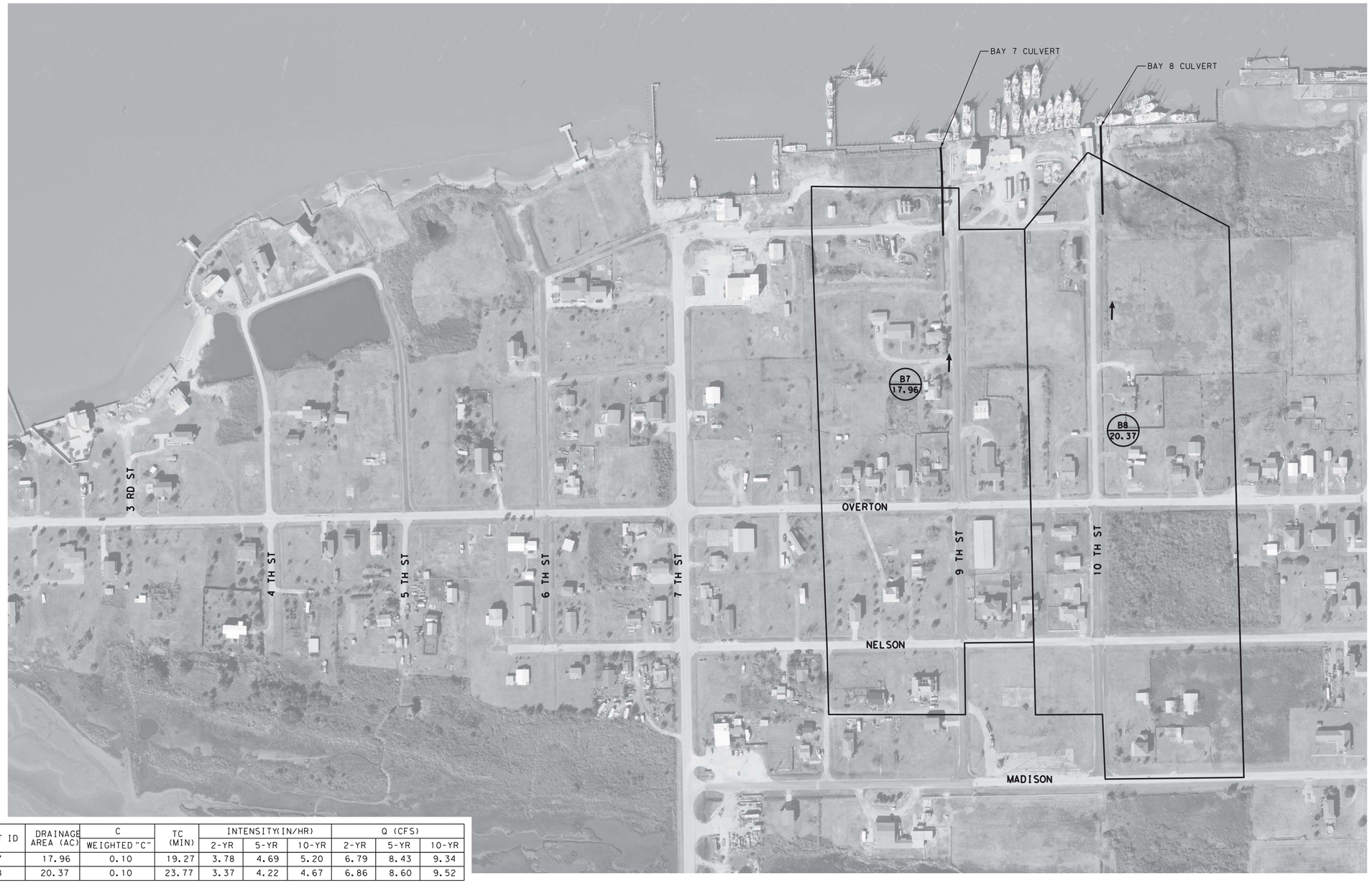
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

DARRELL L. KADERKA 79298 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 06/30/2019

PROJECT TITLE: BOLIVAR CULVERT OUTFALLS		
DRAWN BY: DA	SHEET DESCRIPTION: GENERAL NOTES	JOB NO: 330005.00
CK'D BY: DLK		FILE NAME:
SCALE:		FILE NO:
DATE: 7/3/2019	APPROVED BY:	SHT NO: 4 / 27

7/3/2019 10:34:11 AM
Q:\2013\330005\Drawings\Sheets\04-notes02.dgn



0 75 150 300
SCALE IN FEET

LEGEND

BXX / X.XX — DRAINAGE AREA ID / ACRES

DRAINAGE AREA BOUNDARY

CULVERT ID	DRAINAGE AREA (AC)	C WEIGHTED "C"	TC (MIN)	INTENSITY(IN/HR)			Q (CFS)		
				2-YR	5-YR	10-YR	2-YR	5-YR	10-YR
BAY 7	17.96	0.10	19.27	3.78	4.69	5.20	6.79	8.43	9.34
BAY 8	20.37	0.10	23.77	3.37	4.22	4.67	6.86	8.60	9.52

NO.	REVISIONS	DATE	NAME

GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

DARRELL L. KADERKA 79298 REGISTERED PROFESSIONAL ENGINEER
STATE OF TEXAS
06/30/2019

PROJECT TITLE:	BOLIVAR CULVERT OUTFALLS
DRAWN BY: DA	SHEET DESCRIPTION: DRAINAGE AREA MAP
CK'D BY: DLK	JOB NO: 330005.00
SCALE:	FILE NAME:
DATE: 7/3/2019	APPROVED BY:
	FILE NO:
	SHT NO: 5 / 27

7/3/2019 10:34:32 AM
Q:\2013\330005\Drawings\Sheets\05-B+DA+MAP1.dgn

0 75 150 300

SCALE IN FEET

LEGEND

BXX X.XX — DRAINAGE AREA ID, ACRES

DRAINAGE AREA BOUNDARY

CULVERT ID	DRAINAGE AREA (AC)	C	TC(MIN)	INTENSITY (IN/HR)			Q (CFS)		
		WEIGHTED "C"		2-YR	5-YR	10-YR	2-YR	5-YR	10-YR
BAY 9-1	27.73	0.10	27.50	3.13	3.95	4.36	8.67	10.94	12.10
Bay 9-2 Cross Culvert	13.54	0.10	25.27	3.26	4.10	4.54	4.42	5.55	6.14
BAY 10-1	5.72	0.10	16.25	4.19	5.15	5.72	2.39	2.95	3.27
BAY 11-1 Cross Culvert	3.51	0.15	21.40	3.56	4.44	4.92	1.88	2.34	2.59
BAY 11-2 DW Culvert	4.10	0.10	25.43	3.25	4.09	4.52	1.33	1.68	1.85
BAY 14-1	6.95	0.10	11.42	5.78	7.10	7.88	4.02	4.93	5.48
BAY 14-2 Cross Culvert	3.36	0.10	10.78	6.13	7.52	8.35	2.06	2.53	2.81

NO.	REVISIONS	DATE	NAME

GALVESTON COUNTY

THE STATE OF TEXAS COUNTY OF GALVESTON

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

Darrell L. Kaderka

STATE OF TEXAS — DARRELL L. KADERKA — 79298 — REGISTERED PROFESSIONAL ENGINEER — 06/30/2019

PROJECT TITLE: BOLIVAR CULVERT OUTFALLS

DRAWN BY: DA
CK'D BY: DLK
SCALE:
DATE: 7/3/2019

SHEET DESCRIPTION: DRAINAGE AREA MAP

APPROVED BY:

JOB NO: 330005.00
FILE NAME:
FILE NO:
SHT NO: 6 / 27

7/3/2019 10:36:45 AM
Q:\2013\330005\Drawings\Sheets\06-B+DA+MAP2.dgn

0 75 150 300
SCALE IN FEET

LEGEND

BXX X.XX — DRAINAGE AREA ID, ACRES

DRAINAGE AREA BOUNDARY

CULVERT ID	DRAINAGE AREA (AC)	C	TC (MIN)	INTENSITY(IN/HR)			Q (CFS)		
		WEIGHTED "C"		2-YR	5-YR	10-YR	2-YR	5-YR	10-YR
BAY 30	4.80	0.15	11.34	5.82	7.14	7.94	4.19	5.14	5.71
BAY 32	7.04	0.10	12.97	5.09	6.25	6.94	3.58	4.40	4.89
BAY 33	8.18	0.15	15.70	4.27	5.26	5.84	5.24	6.45	7.16

NO.	REVISIONS	DATE	NAME

GALVESTON COUNTY

THE STATE OF TEXAS · COUNTY OF GALVESTON

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

Darrell L. Kaderka

STATE OF TEXAS · DARRELL L. KADERKA · 79298 · REGISTERED PROFESSIONAL ENGINEER · 06/30/2019

PROJECT TITLE: BOLIVAR CULVERT OUTFALLS			
DRAWN BY: DA	SHEET DESCRIPTION: DRAINAGE AREA MAP		JOB NO: 330005.00
CK'D BY: DLK			FILE NAME:
SCALE:			FILE NO.
DATE: 7/3/2019	APPROVED BY:		SHT NO: 7 / 27

7/3/2019 10:37:58 AM
Q:\2013\330005\Drawings\Sheets\07-B+DA+MAP3.dgn

CULVERT ID	DRAINAGE AREA (AC)	C WEIGHTED "C"	TC (MIN)	INTENSITY(IN/HR)			Q (CFS)		
				2-YR	5-YR	10-YR	2-YR	5-YR	10-YR
BAY 48-1	4.87	0.30	16.02	4.22	5.20	5.77	6.17	7.59	8.43
BAY 48-2	7.33	0.17	17.45	4.01	4.95	5.49	4.89	6.05	6.71
BAY 50	17.72	0.10	39.56	2.52	3.22	3.57	4.46	5.71	6.33
BAY 51	26.84	0.10	45.76	2.31	2.97	3.30	6.20	7.98	8.87

NO.	REVISIONS	DATE	NAME

GALVESTON COUNTY

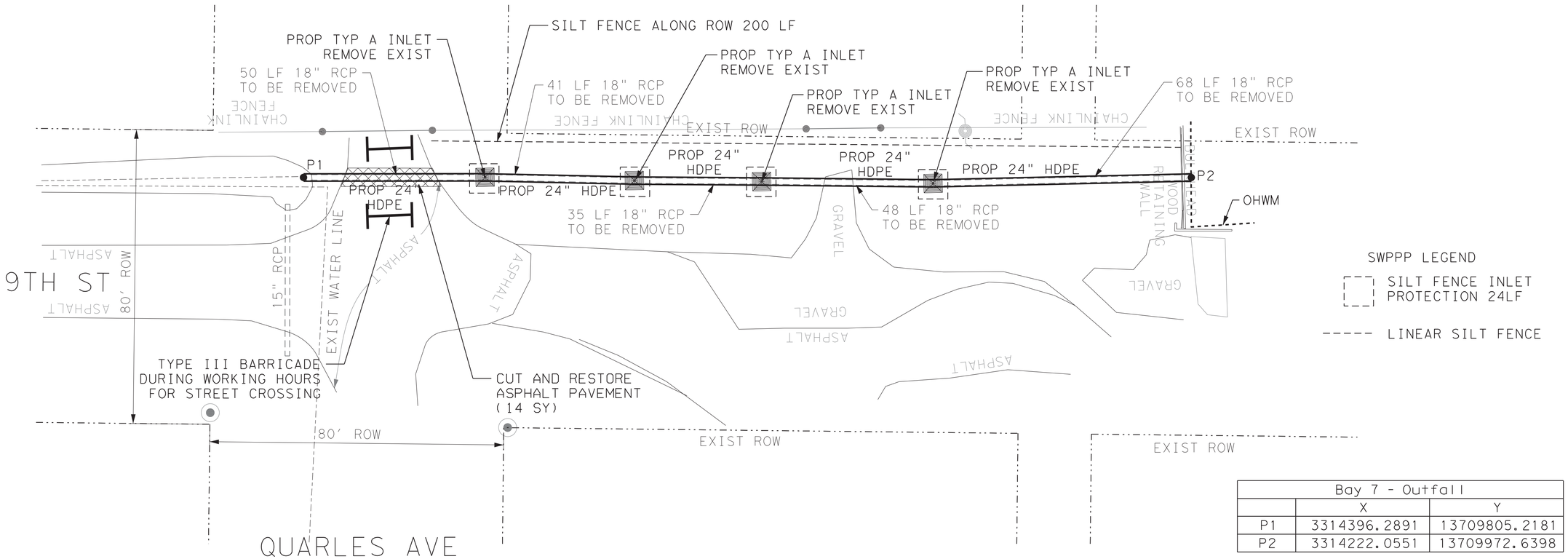
CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

THE STATE OF TEXAS · COUNTY OF GALVESTON

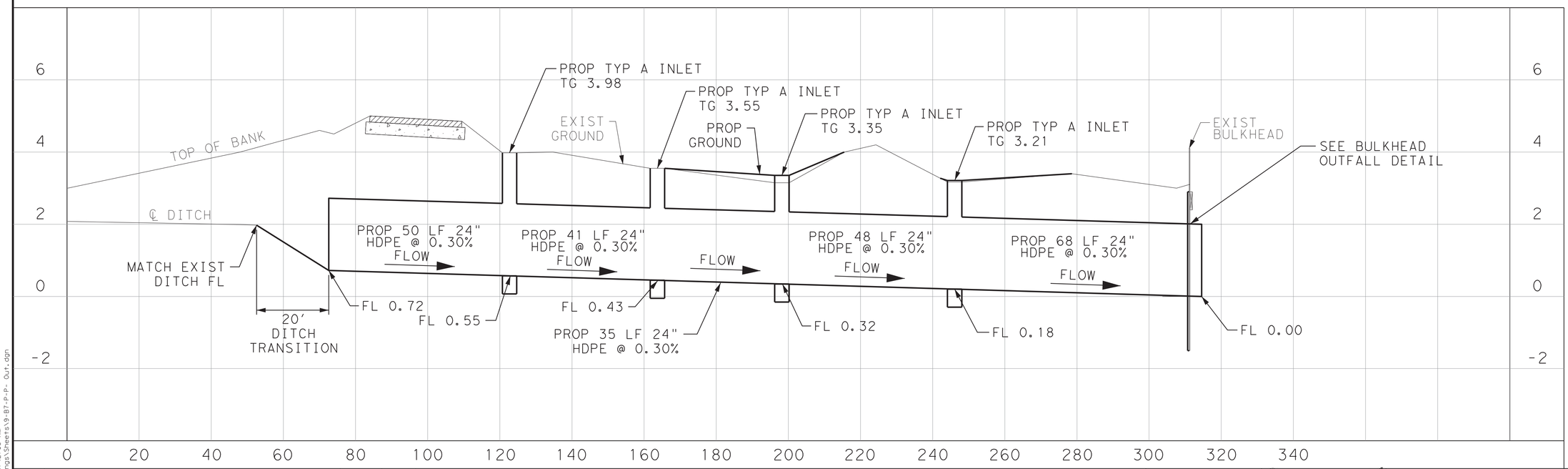
Darrell L. Kaderka
STATE OF TEXAS · DARRELL L. KADERKA · 79298 · REGISTERED PROFESSIONAL ENGINEER
06/30/2019

PROJECT TITLE: BOLIVAR CULVERT OUTFALLS		
DRAWN BY: DA	SHEET DESCRIPTION: DRAINAGE AREA MAP	JOB NO: 330005.00
CK'D BY: DLK		FILE NAME:
SCALE:		FILE NO:
DATE: 7/3/2019	APPROVED BY:	SHT NO: 8 / 27

7/3/2019 10:39:54 AM
O:\2013\330005\Drawings\Sheets\08-BxDA-MAP4.dgn



Bay 7 - Outfall		
	X	Y
P1	3314396.2891	13709805.2181
P2	3314222.0551	13709972.6398



SCALE IN FEET

NO.	REVISIONS	DATE	NAME

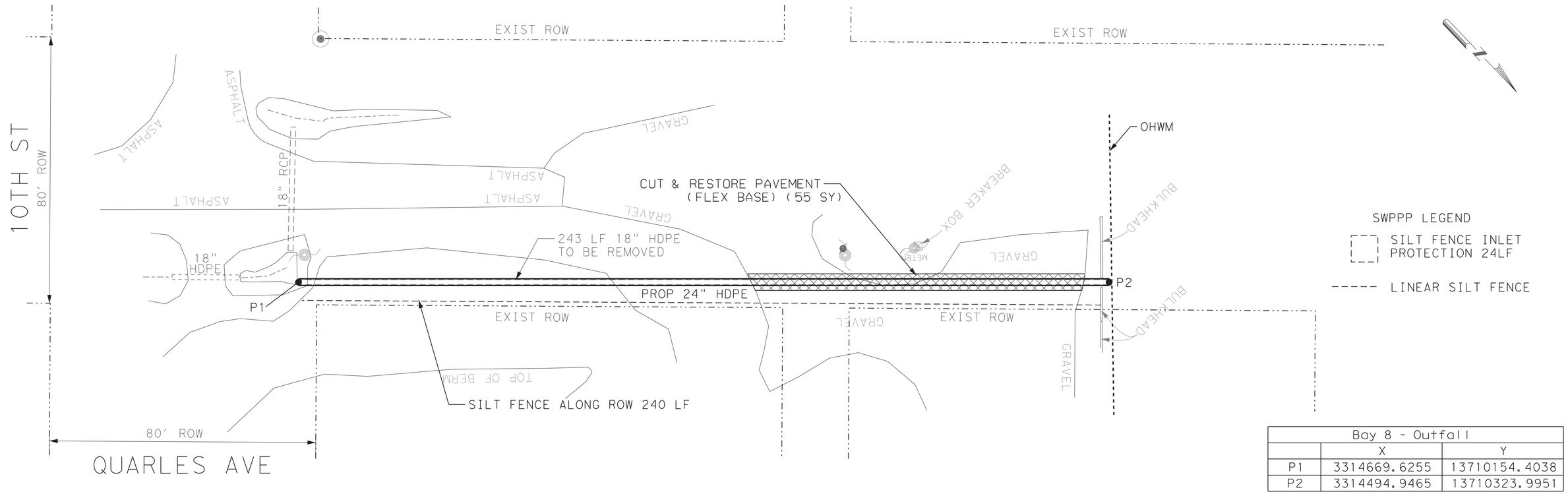
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

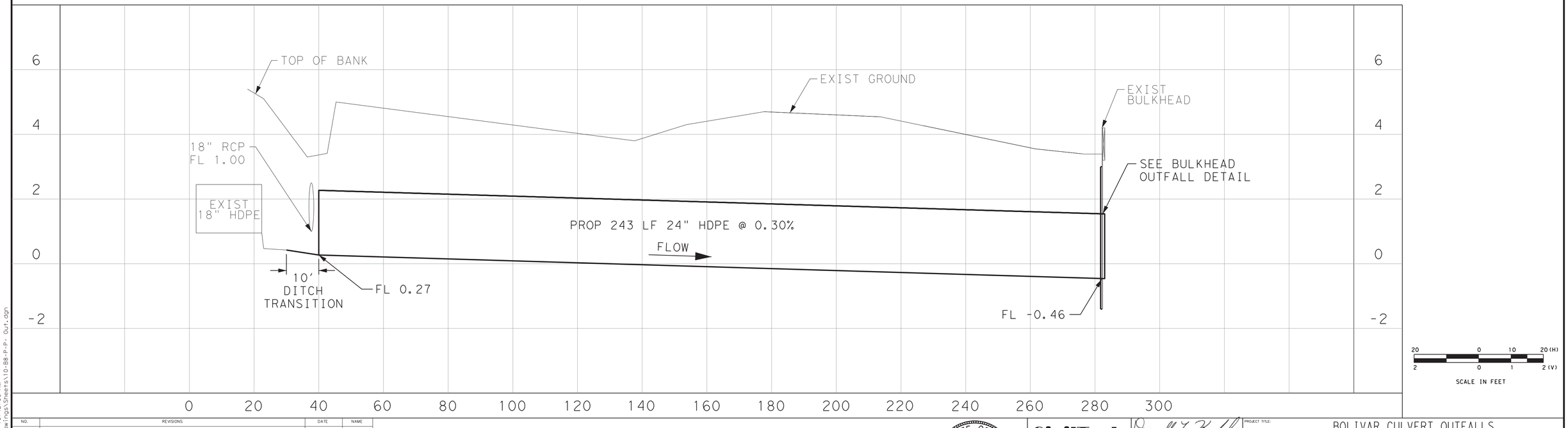
DARRELL L. KADERKA 79298 REGISTERED PROFESSIONAL ENGINEER
06/30/2019

PROJECT TITLE:	BOLIVAR CULVERT OUTFALLS	
DRAWN BY: DA	SHEET DESCRIPTION: BAY 7 OUTFALL PLAN AND PROFILE	JOB NO: 330005.00
CK'D BY: DLK		FILE NAME:
SCALE:		FILE NO:
DATE: 7/3/2019	APPROVED BY:	SHT NO: 9 / 27

7/3/2019 10:42:05 AM
Q:\2013\330005\Drawings\Sheets\9-B7-P-P- Out.dgn



Bay 8 - Outfall		
	X	Y
P1	3314669.6255	13710154.4038
P2	3314494.9465	13710323.9951



NO.	REVISIONS	DATE	NAME

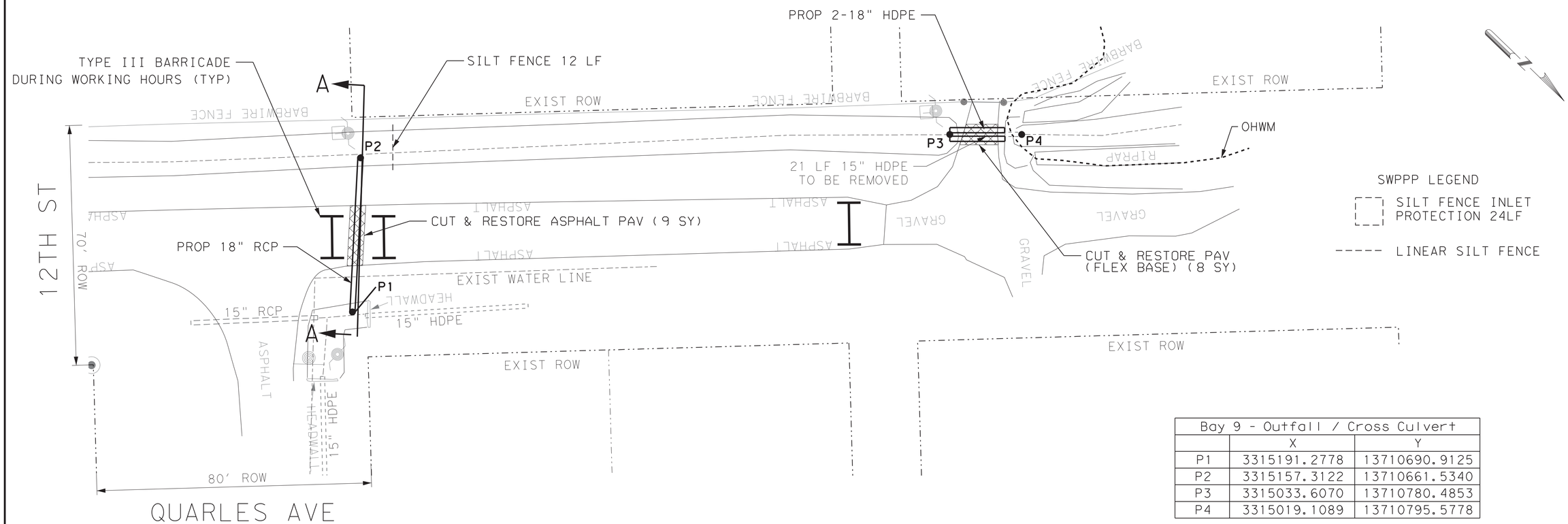
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

DARRELL L. KADERKA 79298 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 06/30/2019

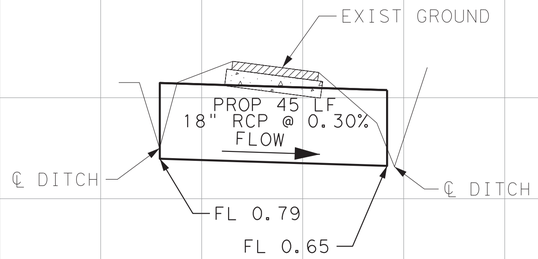
PROJECT TITLE:	BOLIVAR CULVERT OUTFALLS	
DRAWN BY: DA	SHEET DESCRIPTION: BAY 8 OUTFALL PLAN AND PROFILE	JOB NO: 330005.00
CK'D BY: DLK		FILE NAME:
SCALE:		FILE NO:
DATE: 7/3/2019	APPROVED BY:	SHT NO: 10 / 27

7/3/2019 10:42:06 AM
Q:\2013\330005\Drawings\Sheets\10-B8-P-P- Out.dgn

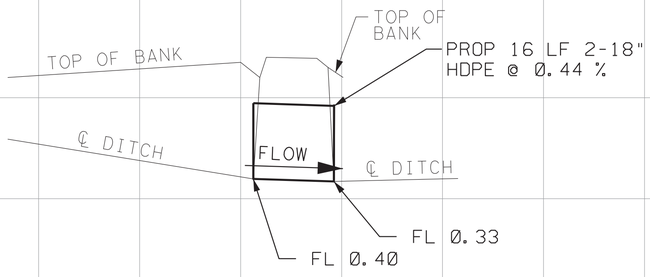


Bay 9 - Outfall / Cross Culvert		
	X	Y
P1	3315191.2778	13710690.9125
P2	3315157.3122	13710661.5340
P3	3315033.6070	13710780.4853
P4	3315019.1089	13710795.5778

CROSS SECTION A-A



OUTFALL



SCALE IN FEET

NO.	REVISIONS	DATE	NAME

GALVESTON COUNTY

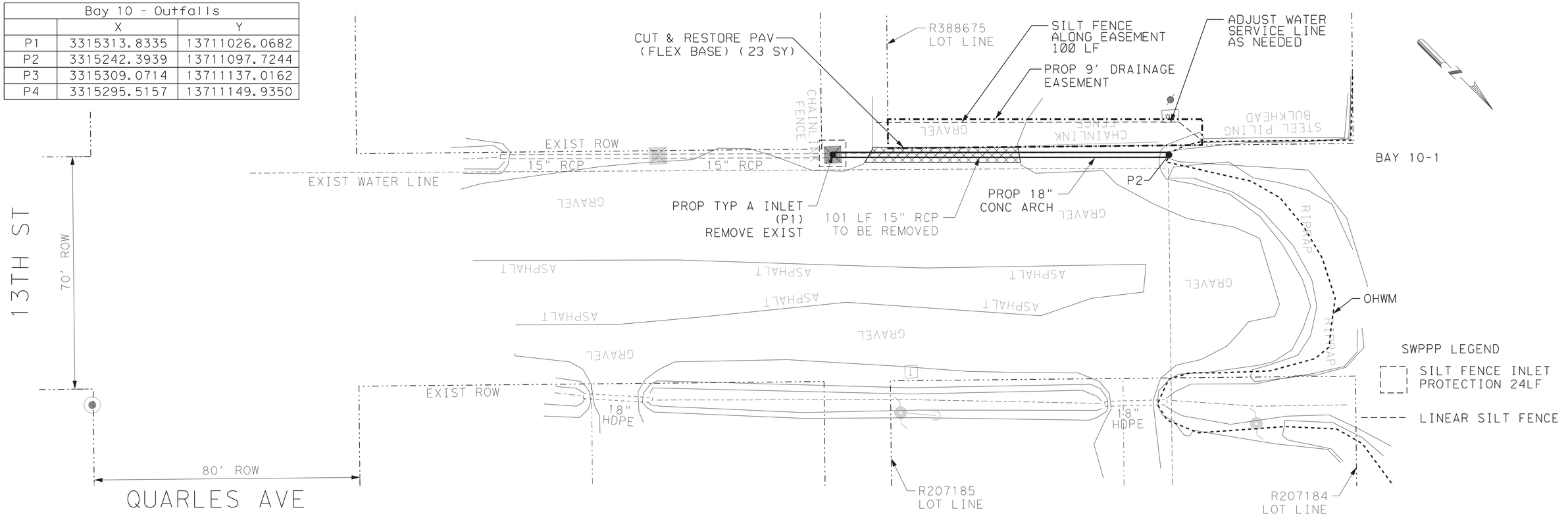
CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

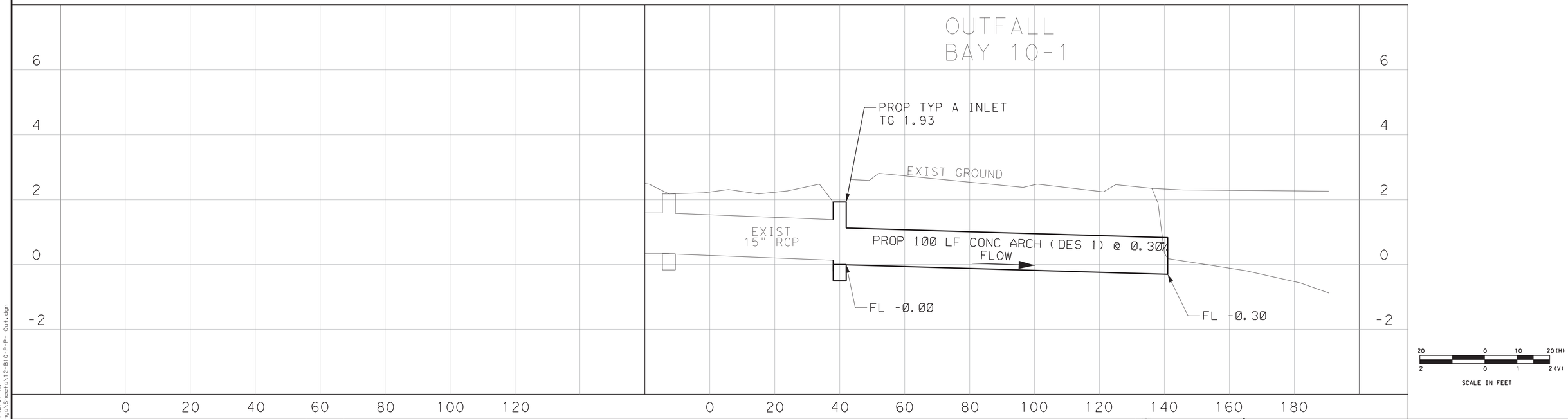
DARRELL L. KADERKA 79298 REGISTERED PROFESSIONAL ENGINEER 06/30/2019

PROJECT TITLE:	BOLIVAR CULVERT OUTFALLS	
DRAWN BY: DA	SHEET DESCRIPTION: BAY 9	JOB NO: 330005.00
CK'D BY: DLK	OUTFALL AND CROSS CULVERT	FILE NAME:
SCALE:	PLAN AND PROFILE	FILE NO:
DATE: 7/3/2019	APPROVED BY:	SHT NO: 11 / 27

7/3/2019 10:42:06 AM
Q:\2013\330005\Drawings\Sheets\11-B9-P-P- Out.dgn

Bay 10 - Outfalls		
	X	Y
P1	3315313.8335	13711026.0682
P2	3315242.3939	13711097.7244
P3	3315309.0714	13711137.0162
P4	3315295.5157	13711149.9350





NO.	REVISIONS	DATE	NAME

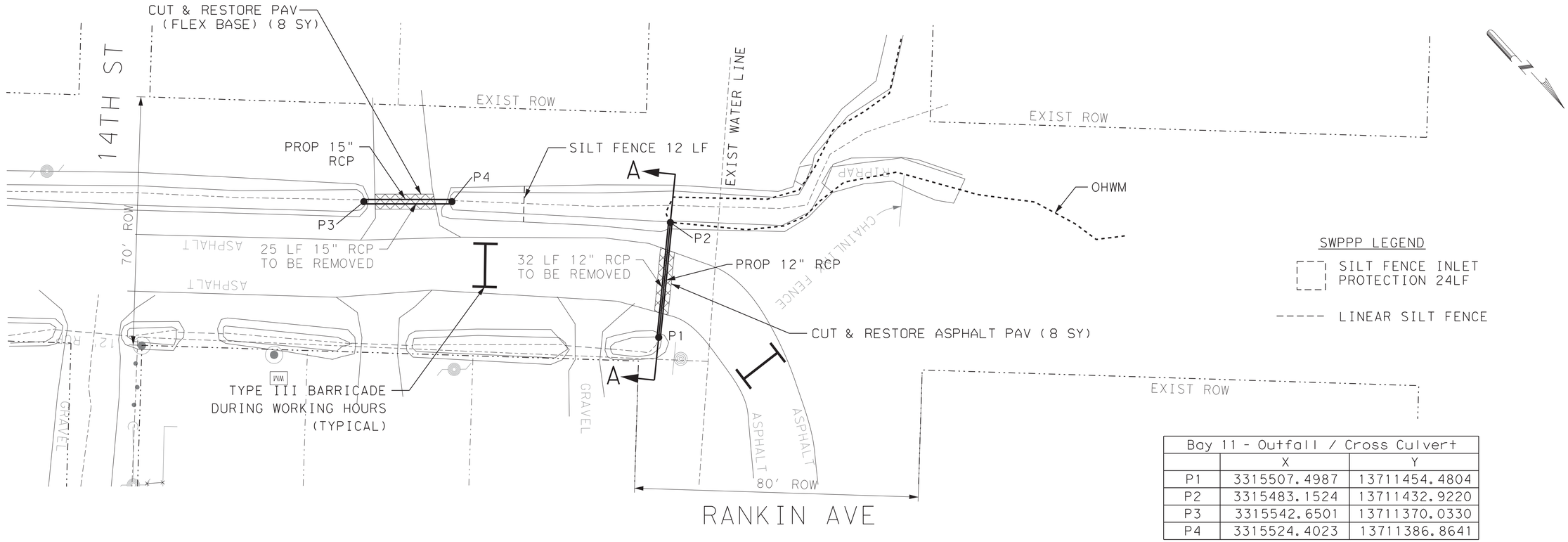
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

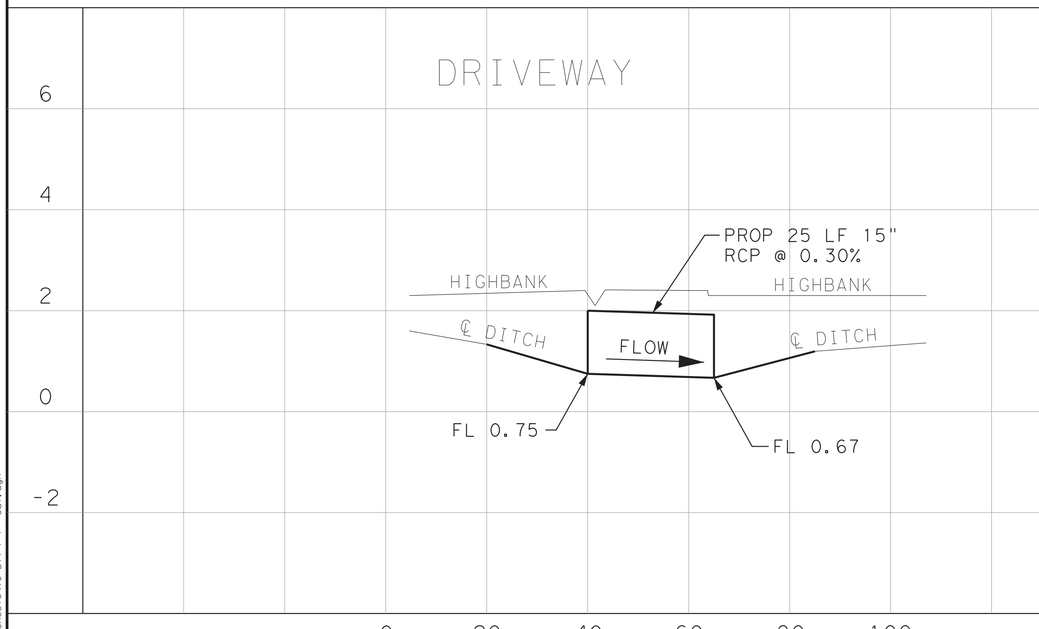
DARRELL L. KADERKA 79298 REGISTERED PROFESSIONAL ENGINEER
06/30/2019

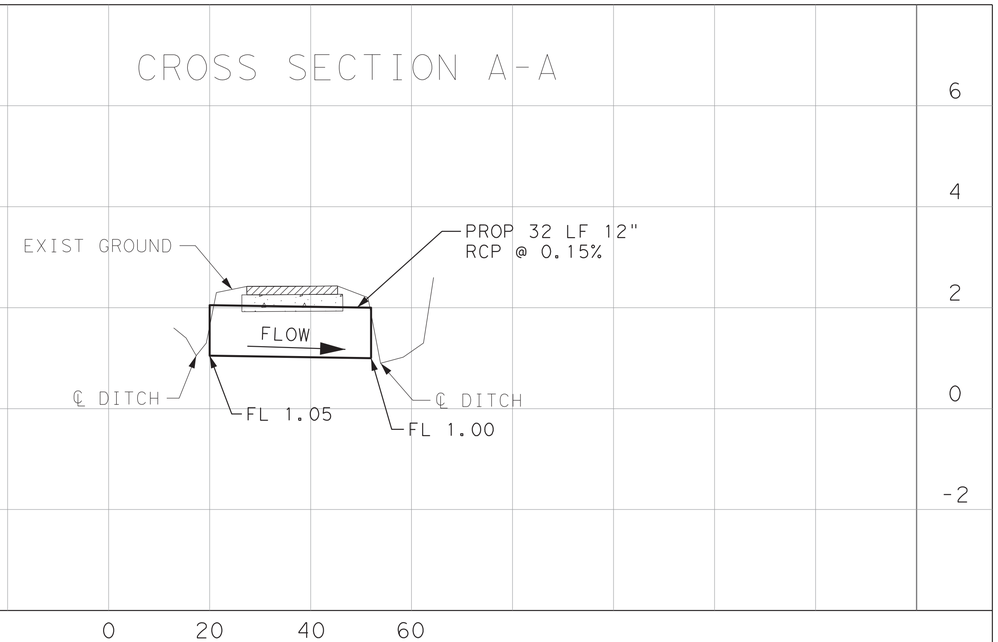
PROJECT TITLE: BOLIVAR CULVERT OUTFALLS		
DRAWN BY: DA	SHEET DESCRIPTION: BAY 10 OUTFALL PLAN AND PROFILE	JOB NO: 330005.00
CK'D BY: DLK		FILE NAME:
SCALE:		FILE NO:
DATE: 7/3/2019	APPROVED BY:	SHT NO: 12 / 27

7/3/2019 10:42:07 AM
Q:\2013\330005\Drawings\Sheets\12-B10-P-P- Out.dgn



Bay 11 - Outfall / Cross Culvert		
	X	Y
P1	3315507.4987	13711454.4804
P2	3315483.1524	13711432.9220
P3	3315542.6501	13711370.0330
P4	3315524.4023	13711386.8641





20 0 10 20 (H)
2 0 1 2 (V)
SCALE IN FEET

NO.	REVISIONS	DATE	NAME

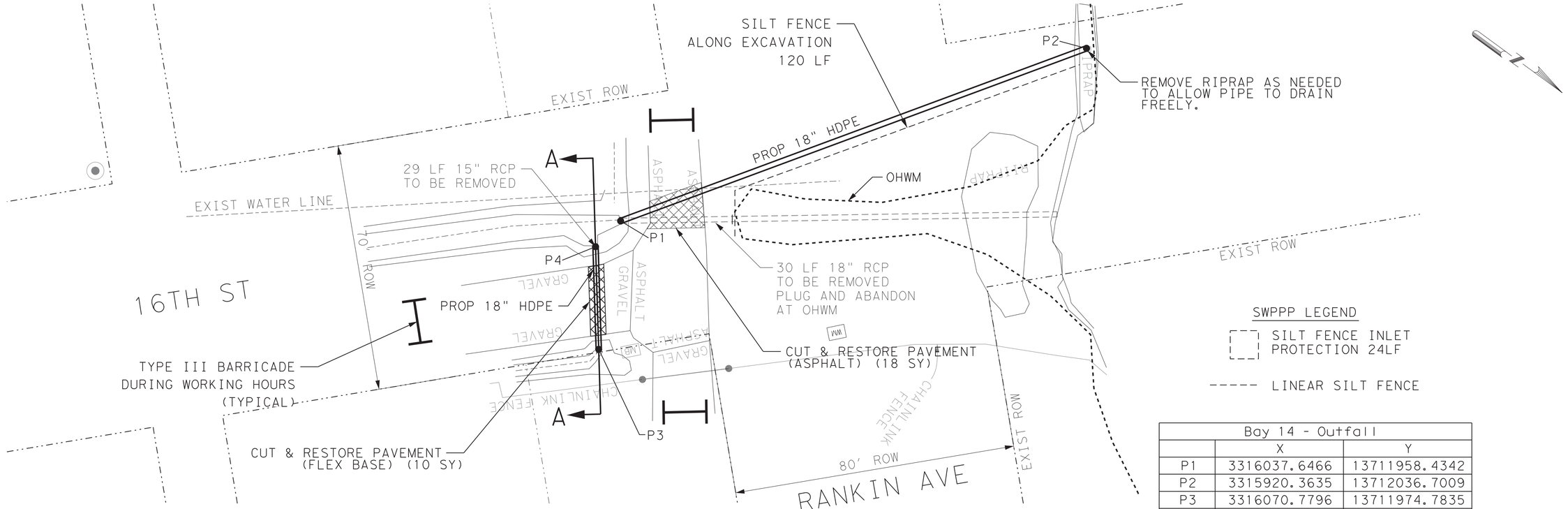
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

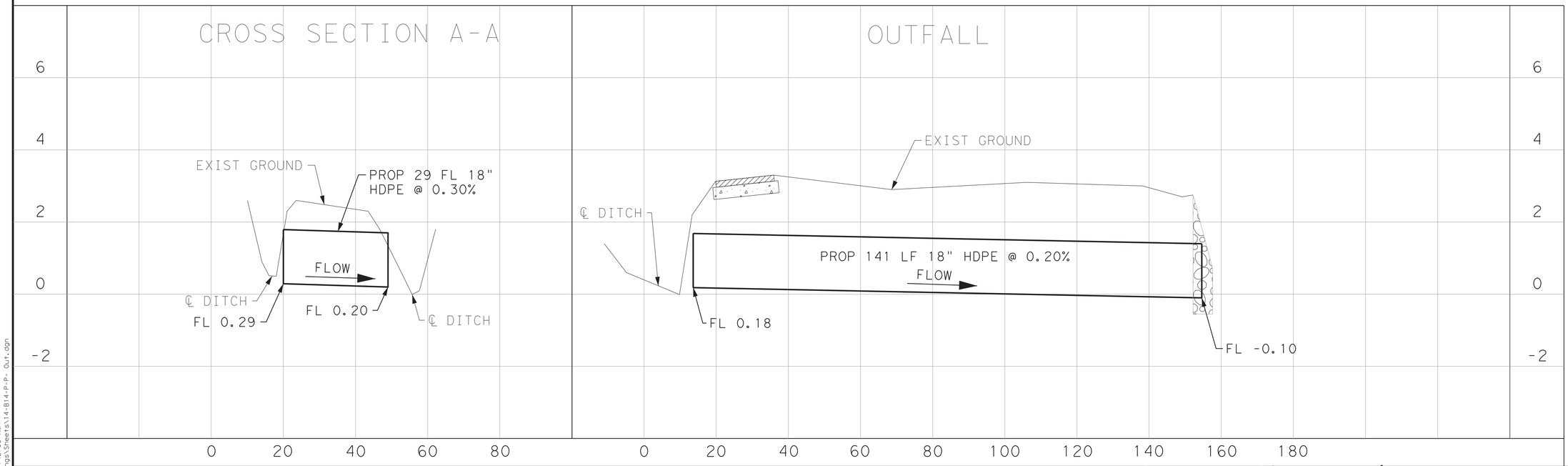
DARRELL L. KADERKA 79298 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 06/30/2019

PROJECT TITLE:	BOLIVAR CULVERT OUTFALLS	
DRAWN BY: DA	SHEET DESCRIPTION: BAY 11	JOB NO: 330005.00
CK'D BY: DLK	DRIVEWAY AND CROSS CULVERT	FILE NAME:
SCALE:	PLAN AND PROFILE	FILE NO:
DATE: 7/3/2019	APPROVED BY:	SHT NO: 13 / 27

7/3/2019 10:42:08 AM
Q:\2013\330005\Drawings\Sheets\13-B11-P-P- Out.dgn



Bay 14 - Outfall		
	X	Y
P1	3316037.6466	13711958.4342
P2	3315920.3635	13712036.7009
P3	3316070.7796	13711974.7835
P4	3316047.7346	13711956.9595



20 0 10 20(H)
2 0 1 2(V)
SCALE IN FEET

NO.	REVISIONS	DATE	NAME

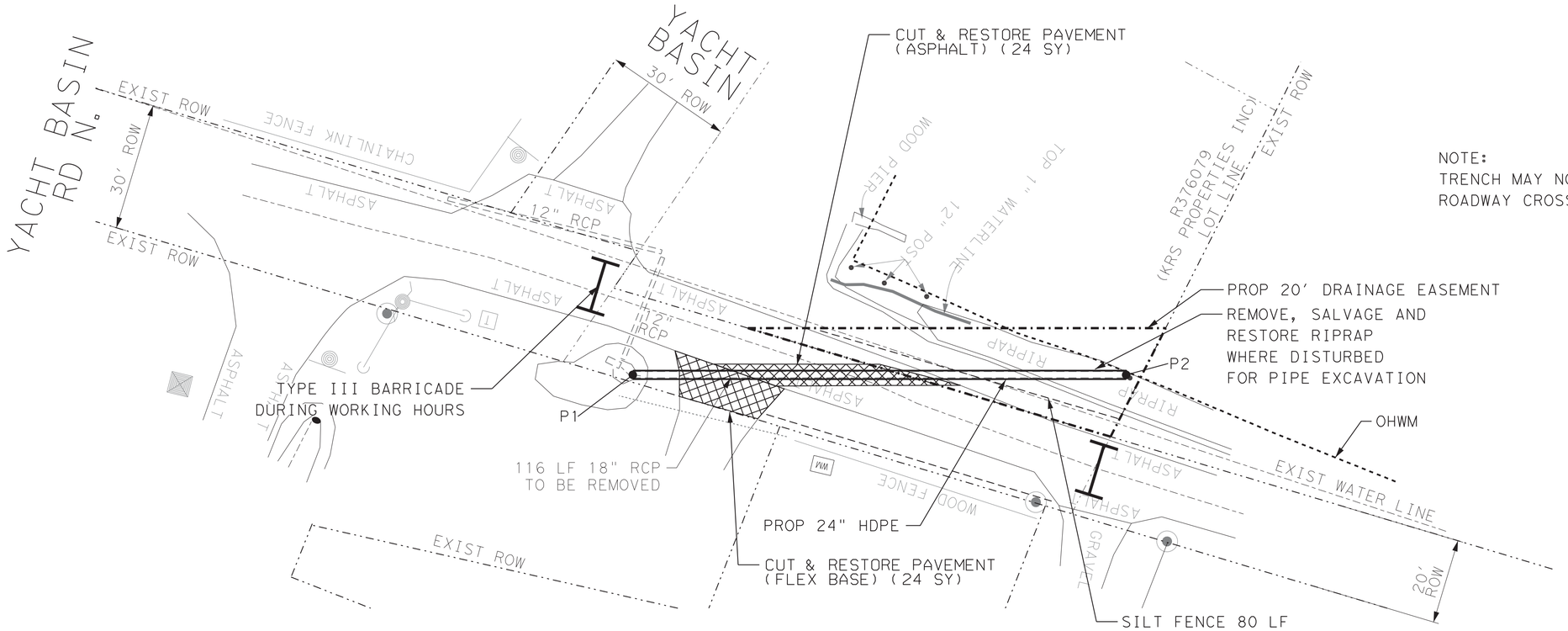
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

STATE OF TEXAS
DARRELL L. KADERKA
79298
REGISTERED PROFESSIONAL ENGINEER
06/30/2019

PROJECT TITLE:	BOLIVAR CULVERT OUTFALLS	
DRAWN BY: DA	SHEET DESCRIPTION: BAY 14	JOB NO: 330005.00
CK'D BY: DLK	OUTFALL AND CROSS CULVERT	FILE NAME:
SCALE:	PLAN AND PROFILE	FILE NO:
DATE: 7/3/2019	APPROVED BY:	SHT NO: 14 / 27

7/3/2019 10:42:08 AM
Q:\2013\330005\Drawings\Sheets\14-B14-P-P- Out.dgn



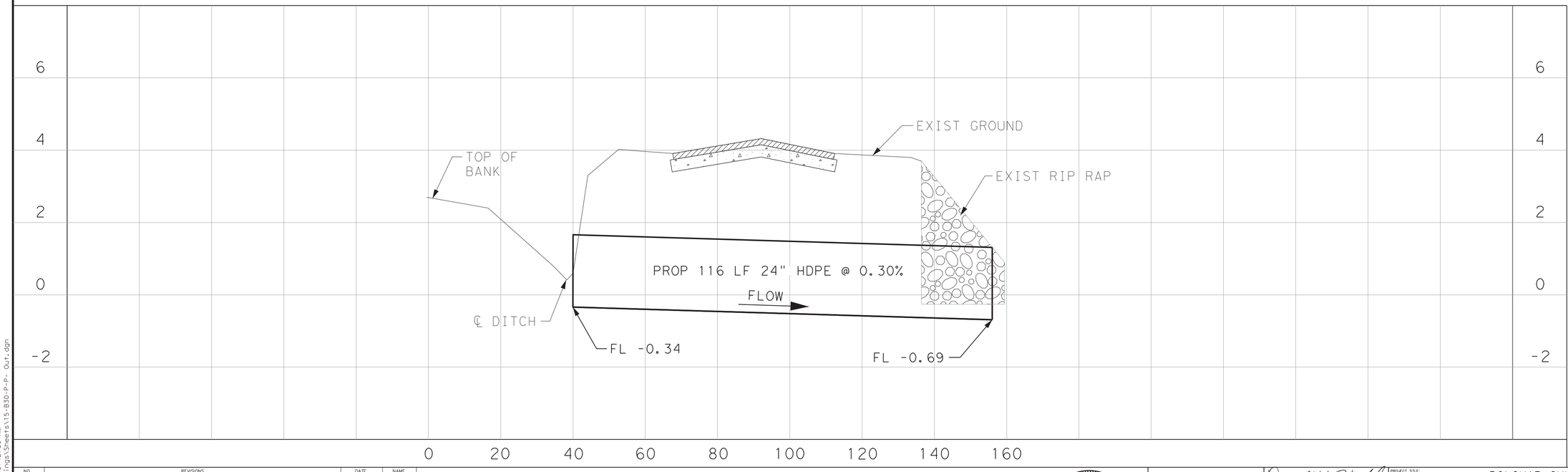
NOTE:
TRENCH MAY NOT BE LEFT OPEN OVERNIGHT.
ROADWAY CROSSING MUST BE COMPLETED IN ONE DAY.

SWPPP LEGEND

SILT FENCE INLET PROTECTION 24LF

----- LINEAR SILT FENCE

Bay 30 - Outfall		
	X	Y
P1	3334145.9144	13729371.4549
P2	3334070.2086	13729459.6376



20 0 10 20 (H)
2 0 1 2 (V)
SCALE IN FEET

NO.	REVISIONS	DATE	NAME

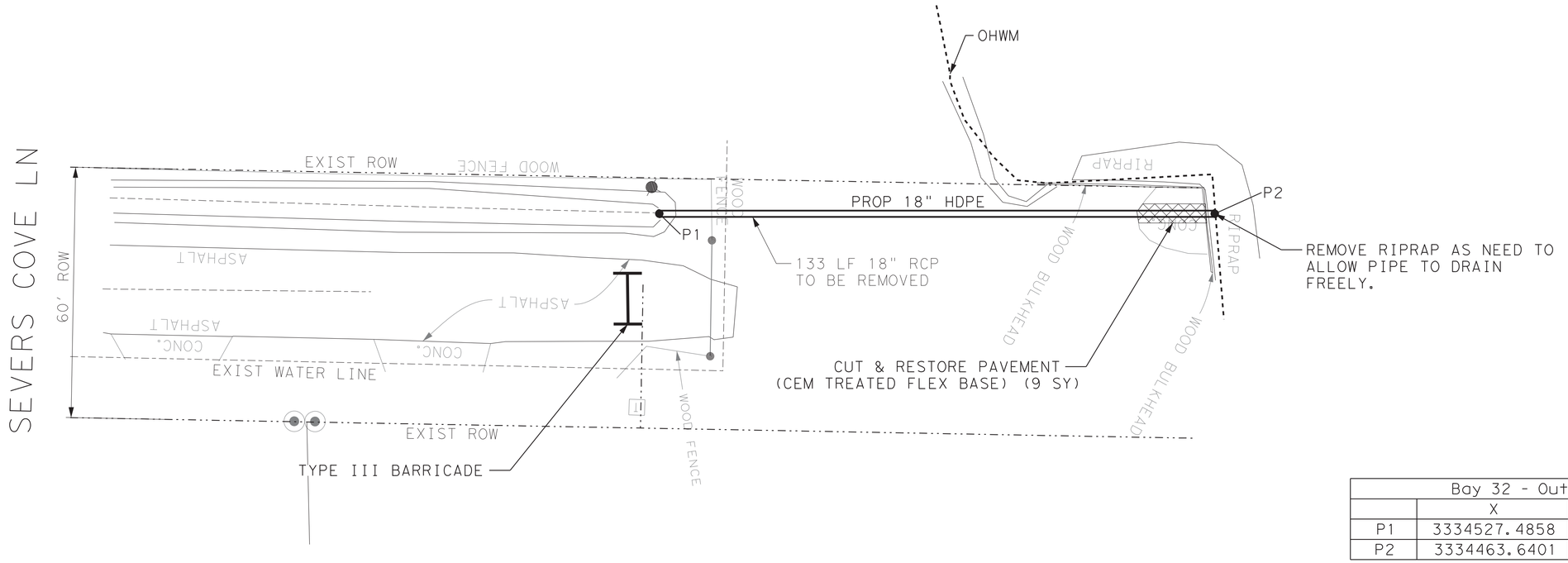
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

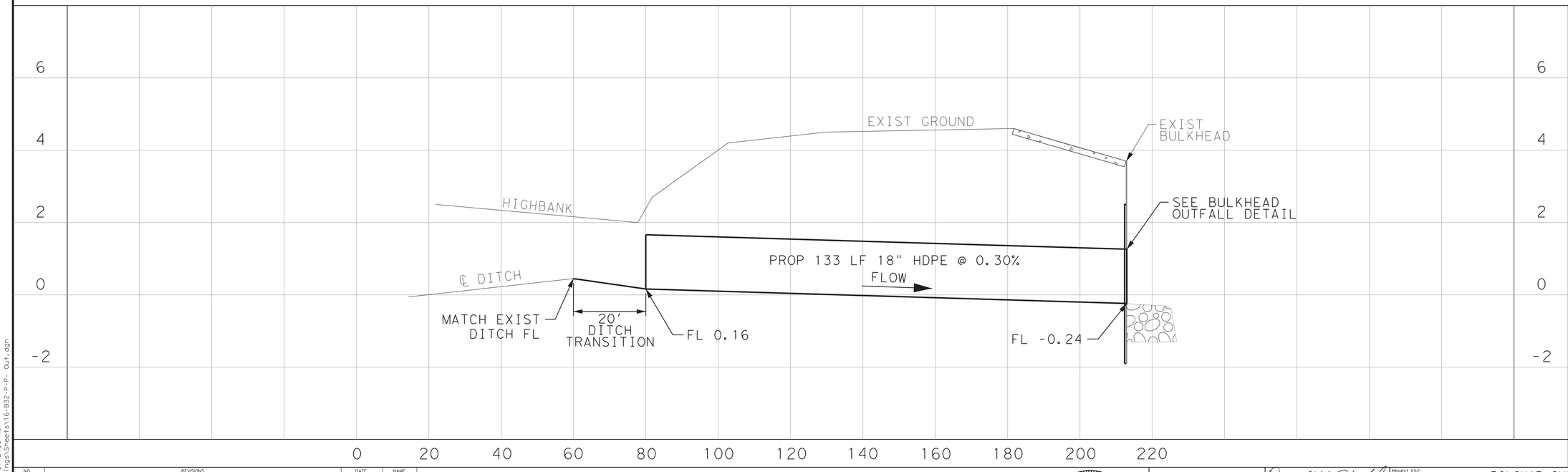
DARRELL L. KADERKA 79298 REGISTERED PROFESSIONAL ENGINEER STATE OF TEXAS 06/30/2019

PROJECT TITLE:	BOLIVAR CULVERT OUTFALLS	
DRAWN BY: DA	SHEET DESCRIPTION: BAY 30 OUTFALL PLAN AND PROFILE	JOB NO: 330005.00
CK'D BY: DLK		FILE NAME:
SCALE:		FILE NO:
DATE: 7/3/2019	APPROVED BY:	SHT NO: 15 / 27

7/3/2019 10:42:09 AM
Q:\2013\330005\Drawings\Sheets\15-B30-P-P- Out.dgn



Bay 32 - Outfall		
	X	Y
P1	3334527.4858	13730053.8263
P2	3334463.6401	13730170.5960



20 0 10 20 (H)
2 0 1 2 (V)
SCALE IN FEET

NO.	REVISIONS	DATE	NAME

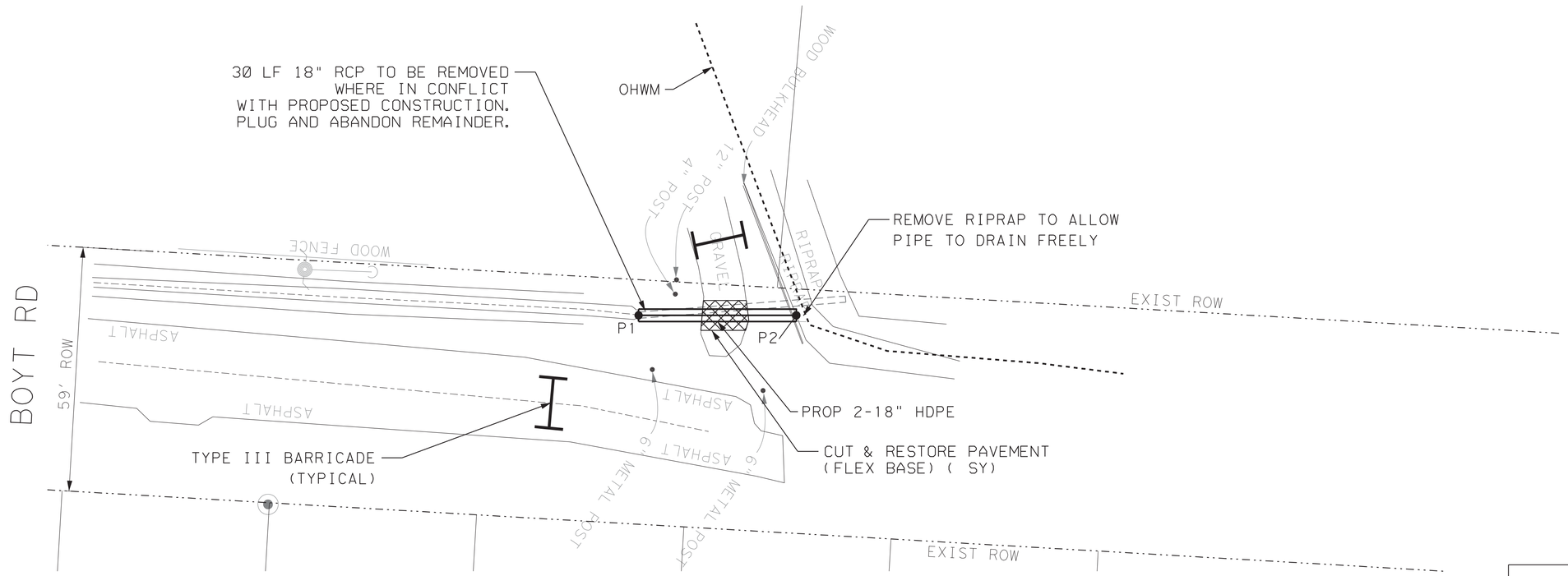
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

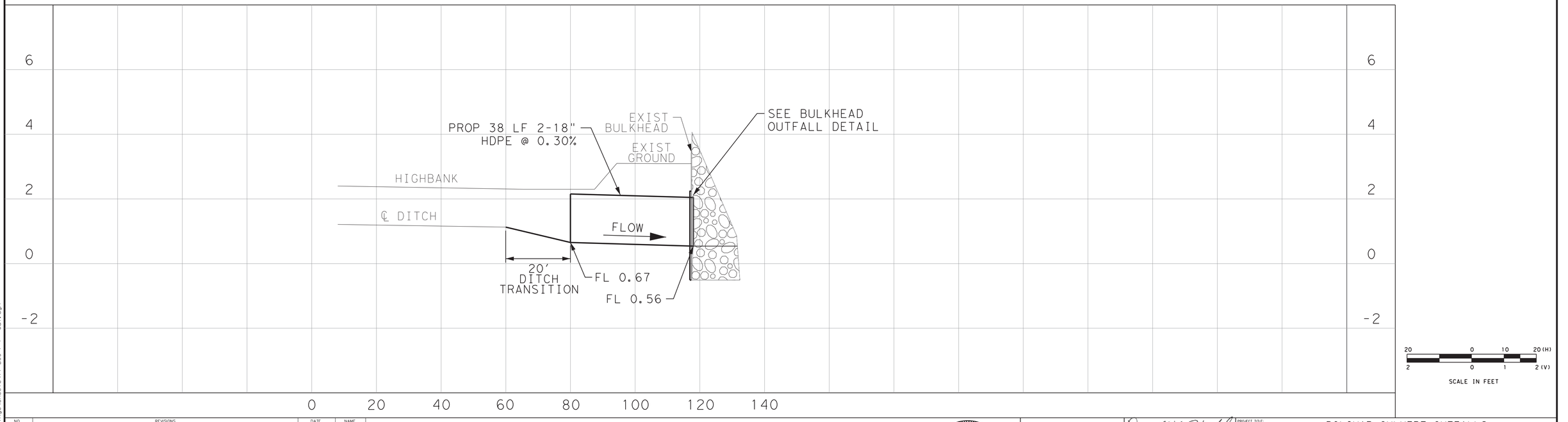
STATE OF TEXAS
DARRELL L. KADERKA
79298
REGISTERED PROFESSIONAL ENGINEER
06/30/2019

PROJECT TITLE: BOLIVAR CULVERT OUTFALLS		
DRAWN BY: DA	SHEET DESCRIPTION: BAY 32 OUTFALL PLAN AND PROFILE	JOB NO: 330005.00
CK'D BY: DLK		FILE NAME:
SCALE:		FILE NO:
DATE: 7/3/2019	APPROVED BY:	SHT NO: 16 / 27

7/3/2019 10:42:09 AM
Q:\2013\330005\Drawings\Sheets\16-B32-P-P- Out.dgn



Bay 33 - Outfall		
	X	Y
P1	3334804.6770	13730469.8506
P2	3334782.9018	13730500.9862



NO.	REVISIONS	DATE	NAME

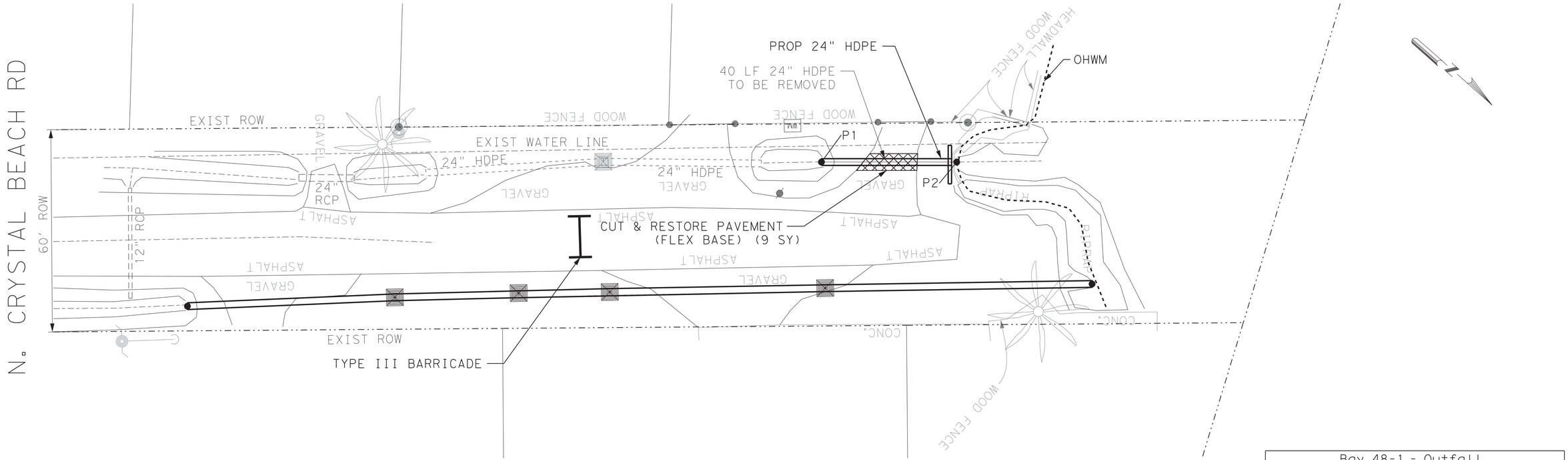
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

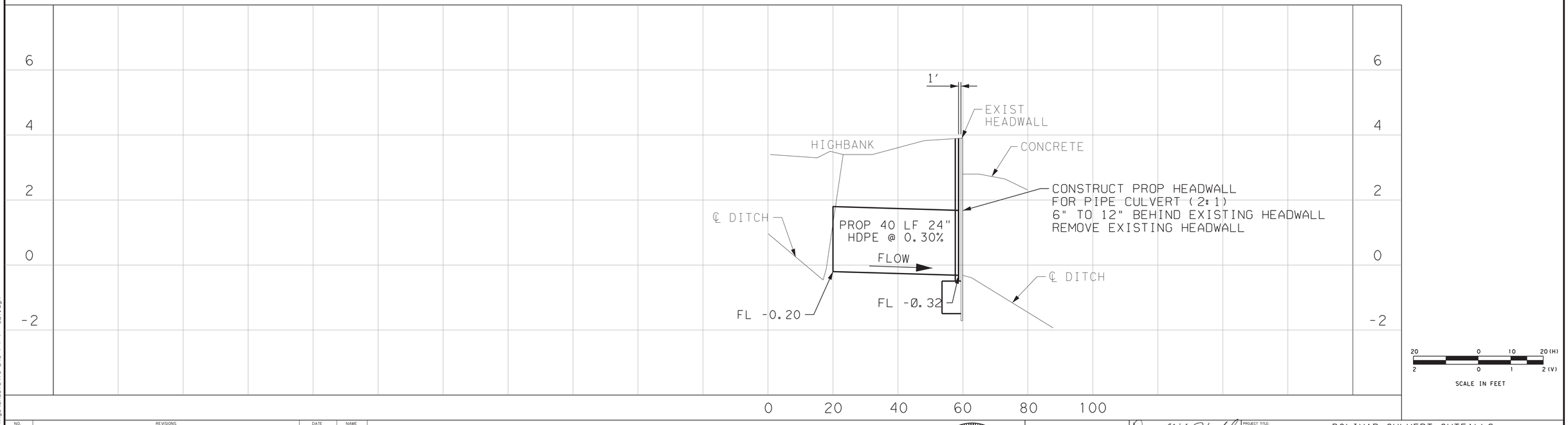
DARRELL L. KADERKA 79298 REGISTERED PROFESSIONAL ENGINEER 06/30/2019

PROJECT TITLE:	BOLIVAR CULVERT OUTFALLS	
DRAWN BY: DA	SHEET DESCRIPTION: BAY 33 OUTFALL PLAN AND PROFILE	JOB NO: 330005.00
CK'D BY: DLK		FILE NAME:
SCALE:		FILE NO:
DATE: 7/3/2019	APPROVED BY:	SHT NO: 17 / 27

7/3/2019 10:42:10 AM
Q:\2013\330005\Drawings\Sheets\17-B33-P-P- Out.dgn



Bay 48-1 - Outfall		
	X	Y
P1	3352965.5002	13742676.8349
P2	3352938.7978	13742706.8466



20 0 10 20 (H)
2 0 1 2 (V)
SCALE IN FEET

NO.	REVISIONS	DATE	NAME

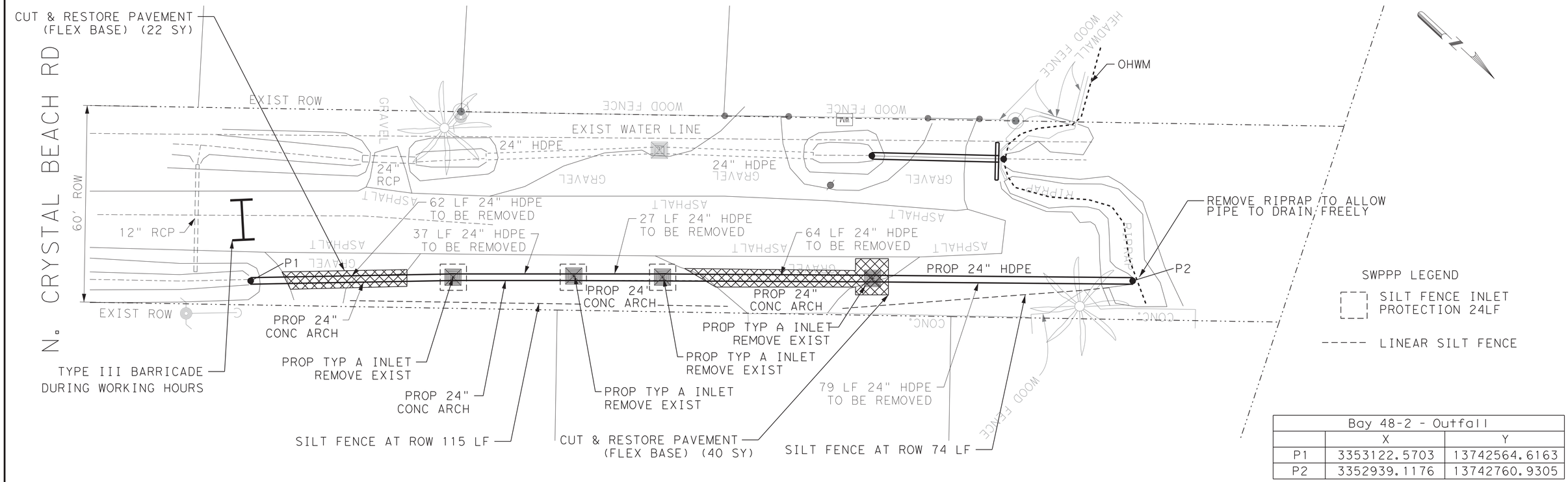
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

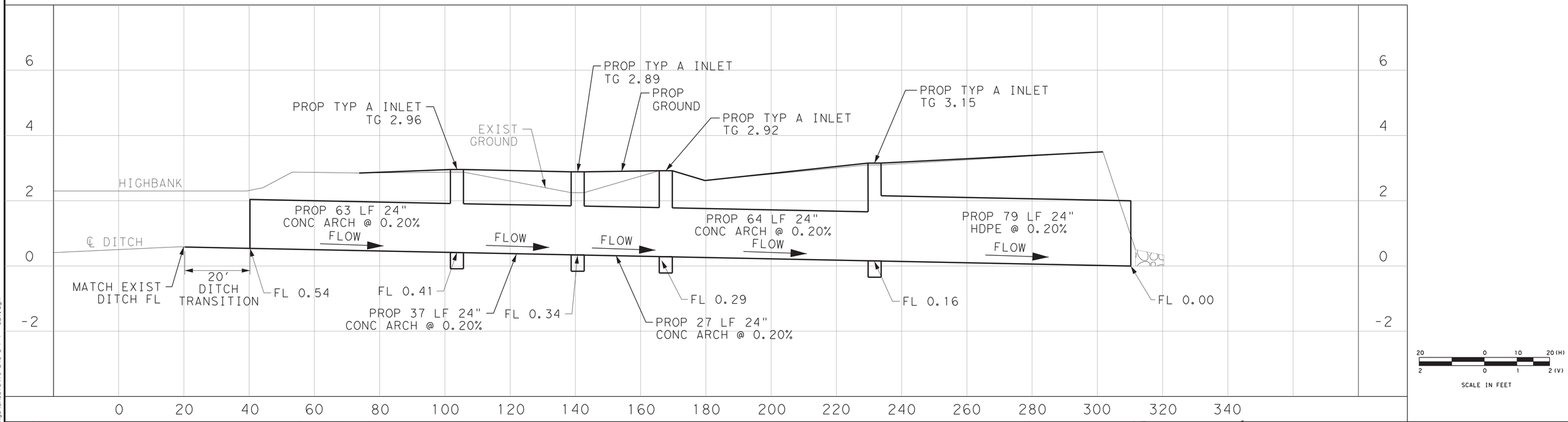
DARRELL L. KADERKA 79298 REGISTERED PROFESSIONAL ENGINEER
STATE OF TEXAS
06/30/2019

PROJECT TITLE:	BOLIVAR CULVERT OUTFALLS	
DRAWN BY: DA	SHEET DESCRIPTION: BAY 48-1 OUTFALL PLAN AND PROFILE	JOB NO: 330005.00
CK'D BY: DLK		FILE NAME:
SCALE:		FILE NO:
DATE: 7/3/2019	APPROVED BY:	SHT NO: 18 / 27

7/3/2019 10:42:10 AM
Q:\2013\330005\Drawings\Sheets\18-B48-1-P-P- Out.dgn



Bay 48-2 - Outfall		
	X	Y
P1	3353122.5703	13742564.6163
P2	3352939.1176	13742760.9305



NO.	REVISIONS	DATE	NAME

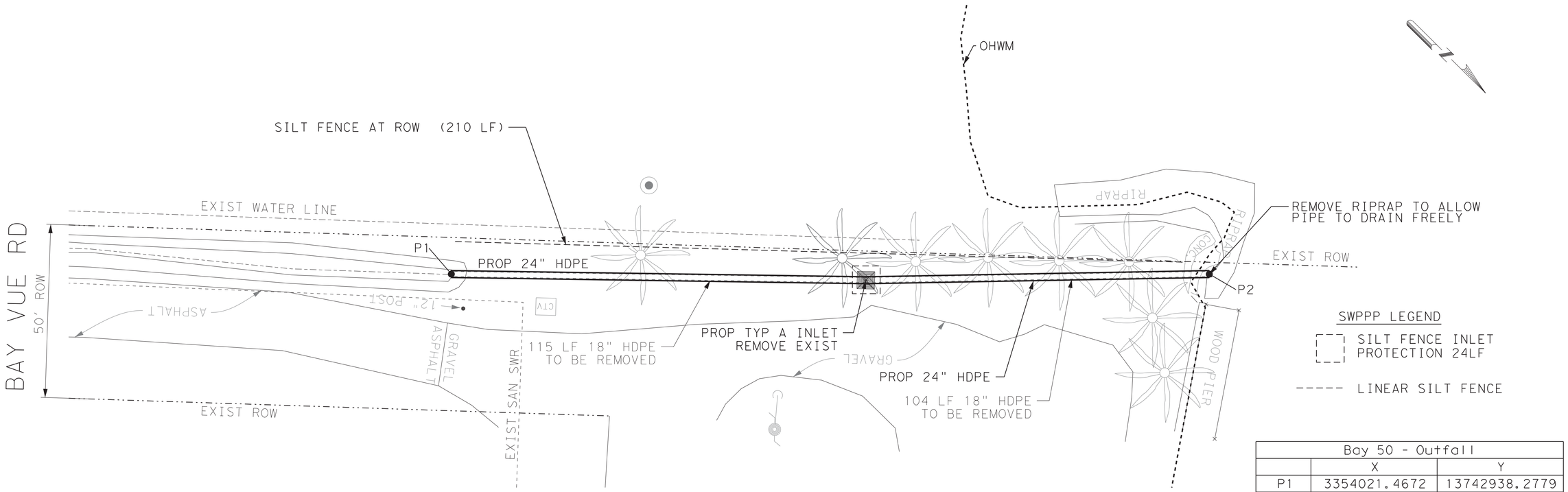
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

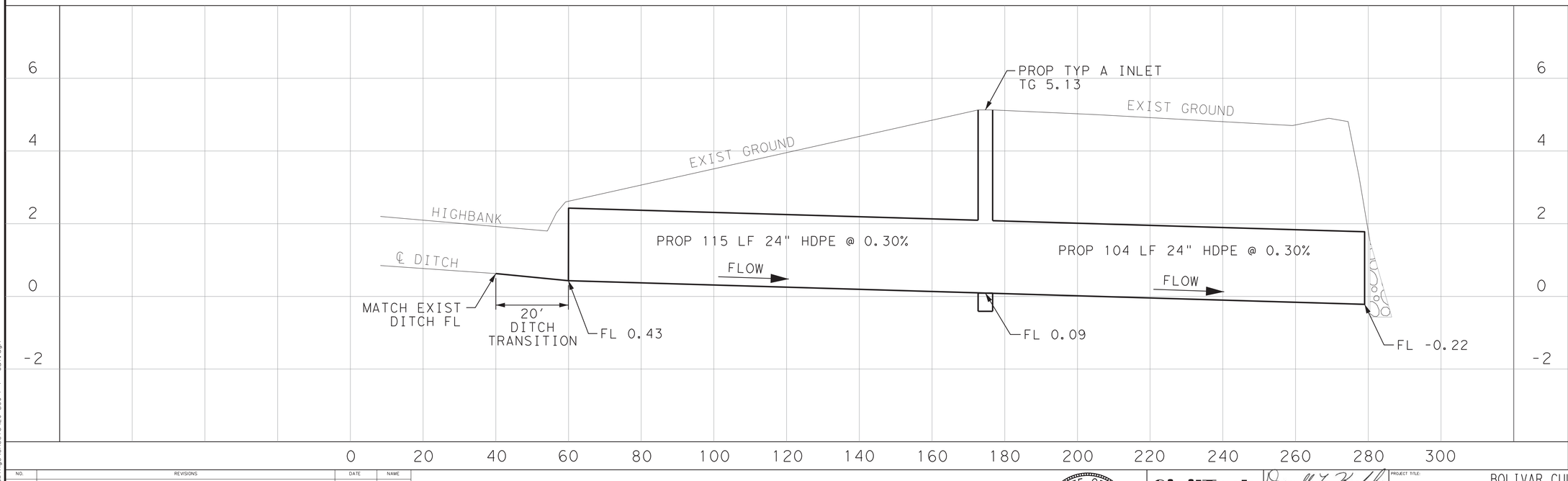
STATE OF TEXAS
DARRELL L. KADERKA
79298
REGISTERED PROFESSIONAL ENGINEER
06/30/2019

PROJECT TITLE: BOLIVAR CULVERT OUTFALLS		
DRAWN BY: DA	SHEET DESCRIPTION: BAY 48-2 OUTFALL PLAN AND PROFILE	JOB NO: 330005.00
CK'D BY: DLK		FILE NAME:
SCALE:		FILE NO:
DATE: 7/3/2019	APPROVED BY:	SHT NO: 19 / 27

7/3/2019 10:42:11 AM
Q:\2013\330005\Drawings\Sheets\19-B48-2-P-P- Out.dgn



Bay 50 - Outfall		
	X	Y
P1	3354021.4672	13742938.2779
P2	3353868.5164	13743094.6597



20 0 10 20 (H)
2 0 1 2 (V)
SCALE IN FEET

NO.	REVISIONS	DATE	NAME

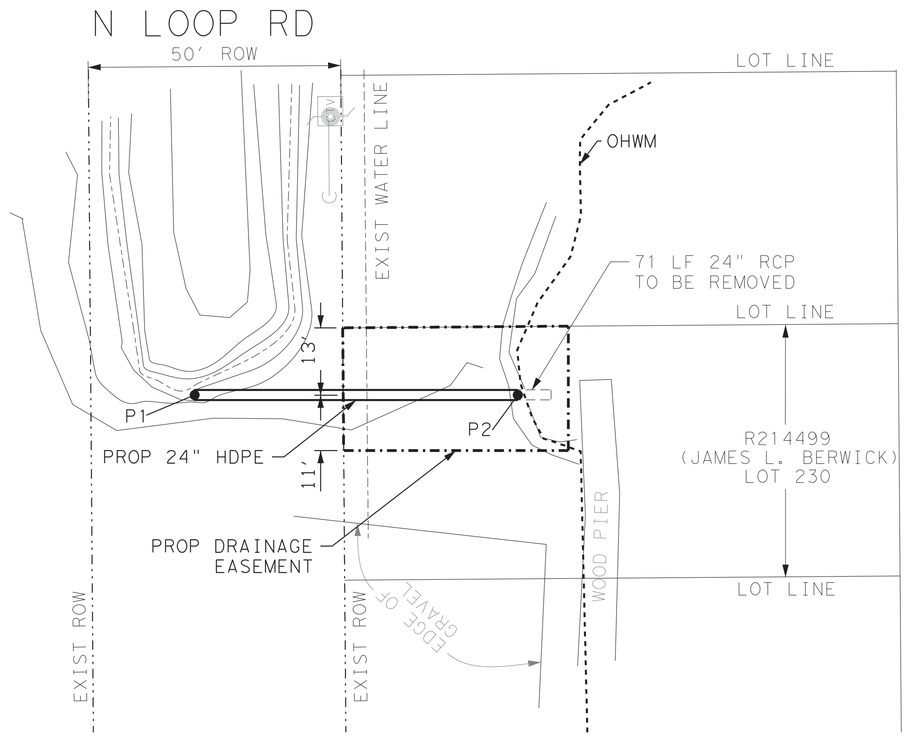
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

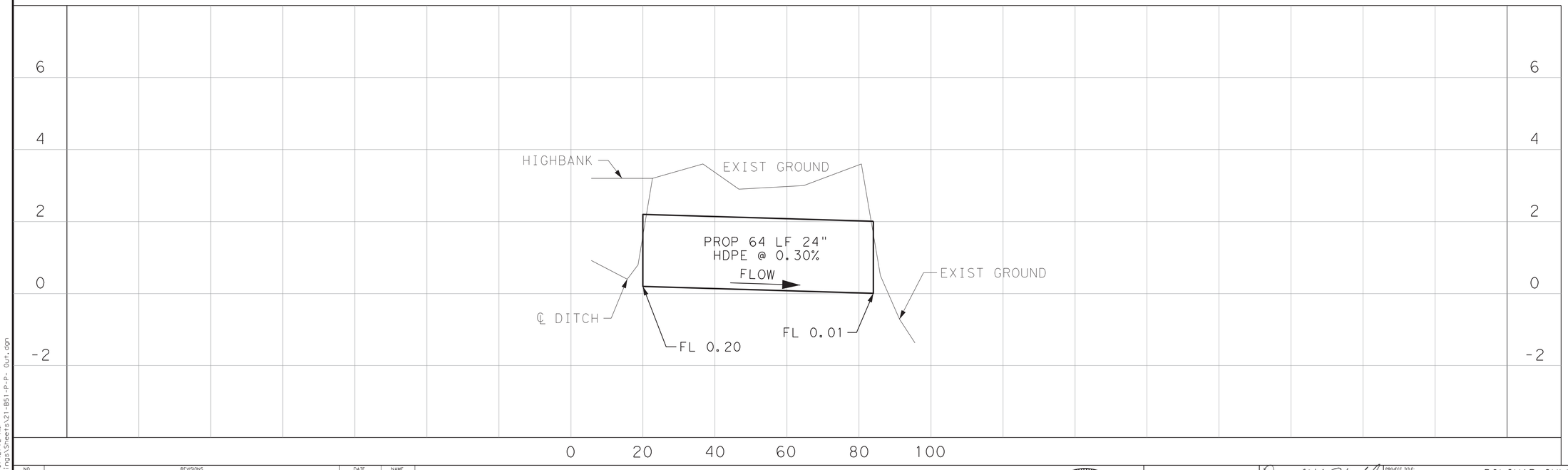
STATE OF TEXAS
DARRELL L. KADERKA
79298
REGISTERED PROFESSIONAL ENGINEER
06/30/2019

PROJECT TITLE:	BOLIVAR CULVERT OUTFALLS	
DRAWN BY: DA	SHEET DESCRIPTION: BAY 50 OUTFALL PLAN AND PROFILE	JOB NO: 330005.00
CK'D BY: DLK		FILE NAME:
SCALE:		FILE NO:
DATE: 7/3/2019	APPROVED BY:	SHT NO: 20 / 27

7/3/2019 10:42:11 AM
Q:\2013\330005\Drawings\Sheets\20-B50-P-P- Out.dgn



Bay 51 - Outfall		
	X	Y
P1	3354523.8207	13743125.3485
P2	3354476.2979	13743082.4797



20 0 10 20 (H)
2 0 1 2 (V)
SCALE IN FEET

NO.	REVISIONS	DATE	NAME

GALVESTON COUNTY

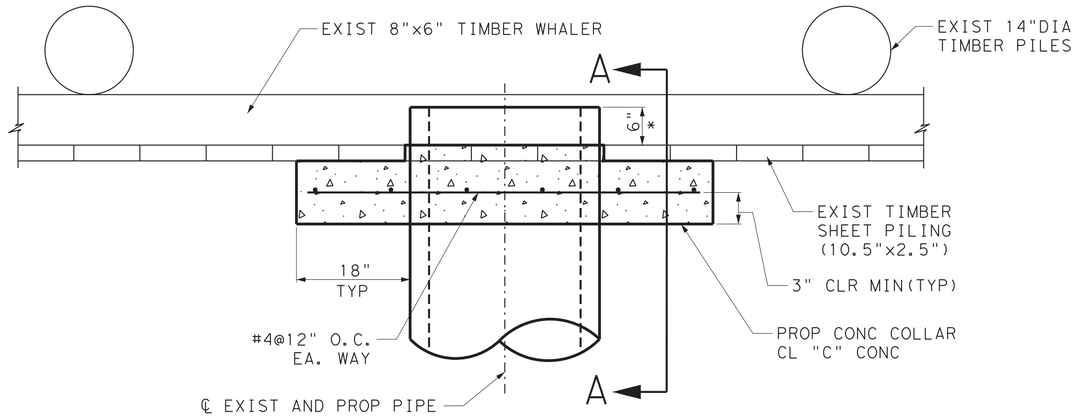
CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

THE STATE OF TEXAS · COUNTY OF GALVESTON

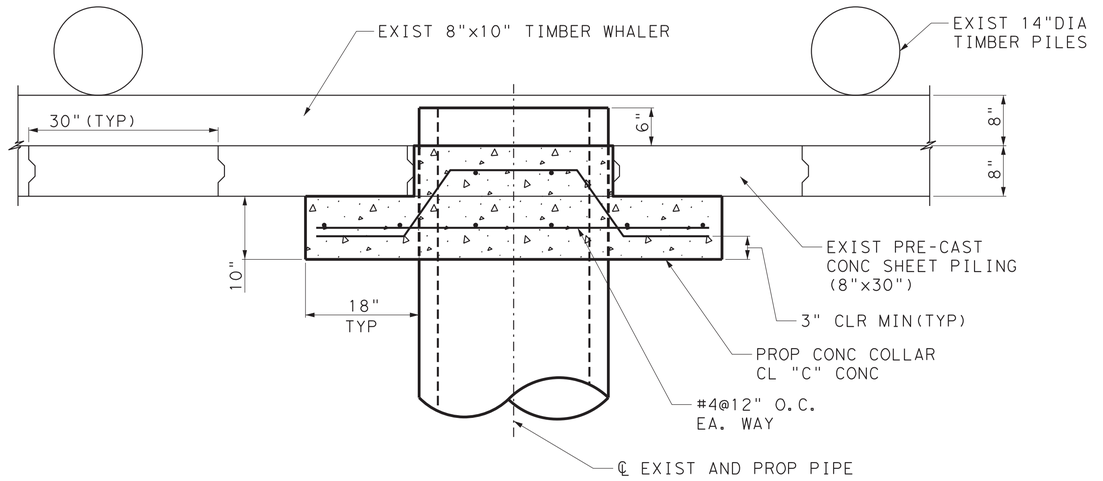
STATE OF TEXAS · DARRELL L. KADERKA · 79298 · REGISTERED PROFESSIONAL ENGINEER · 06/30/2019

PROJECT TITLE:	BOLIVAR CULVERT OUTFALLS
DRAWN BY: DA	SHEET DESCRIPTION: BAY 51 CROSS CULVERT PLAN AND PROFILE
CK'D BY: DLK	JOB NO: 330005.00
SCALE:	FILE NAME:
DATE: 7/3/2019	FILE NO:
APPROVED BY:	SHT NO: 21 / 27

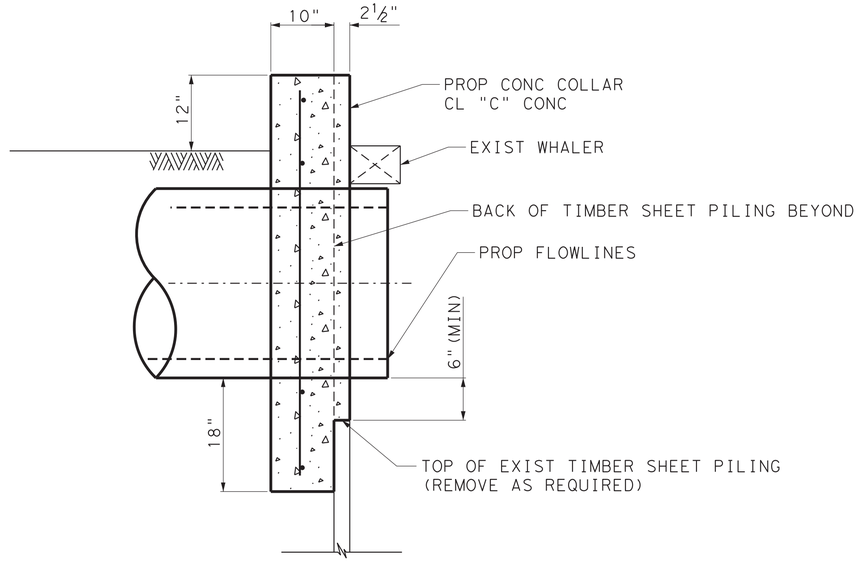
7/3/2019 10:42:12 AM
Q:\2013\330005\Drawings\Sheets\21-B51-P-P- Out.dgn



BULKHEAD OUTFALL DETAIL BAY 7, BAY 32, BAY 33
SCALE: ½"=1'-0"



BULKHEAD OUTFALL DETAIL BAY 8
SCALE: ½"=1'-0"



ELEVATION
SCALE: ½"=1'-0"

NOTES:
PROVIDE SINGLE LAYER OF 15 16 ROOFING FELT BETWEEN PROPOSED CONCRETE COLLAR AND ALL EXISTING BULKHEAD SURFACES.
PLACE PROPOSED CONCRETE COLLAR DIRECTLY AGAINST STORM SEWER WITHOUT THE USE OF ROOFING FELT.
"*" EXTEND PIPE TO LIMITS OF EXISTING ROCK RIP RAP WHERE RIP RAP IS PRESENT BEYOND BULKHEAD.

NO.	REVISIONS	DATE	NAME

GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

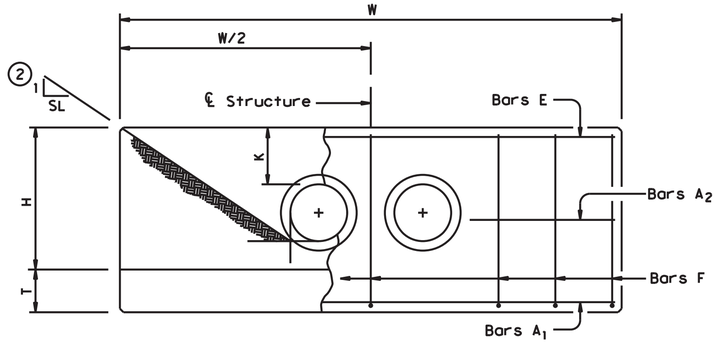
STATE OF TEXAS
DARRELL L. KADERKA
79298
REGISTERED PROFESSIONAL ENGINEER
06/30/2019

PROJECT TITLE: BOLIVAR CULVERT OUTFALLS		
DRAWN BY: DA	SHEET DESCRIPTION: BULKHEAD OUTFALL DETAIL	JOB NO: 330005.00
CK'D BY: DLK		FILE NAME:
SCALE:		FILE NO.
DATE: 7/3/2019	APPROVED BY:	SHT NO: 22 / 27

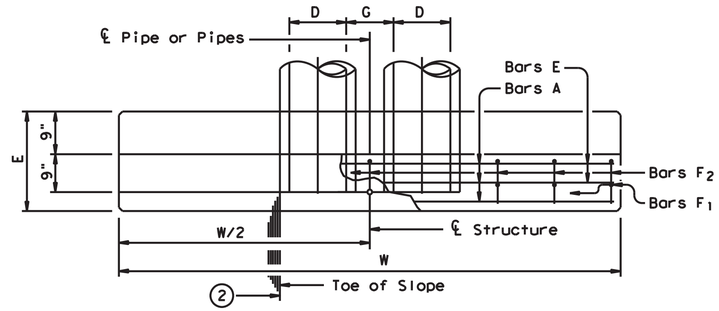
7/3/2019 10:42:12 AM
G:\2013\330005\Drawings\Sheets\22 BOL-BULKHEAD DETAILS.dgn

TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (4)

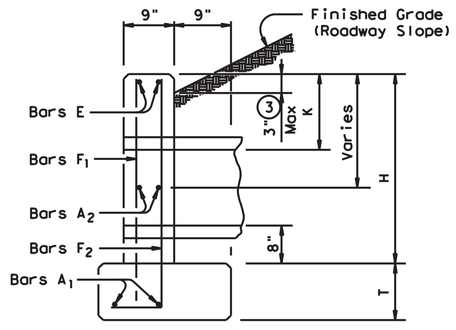
SLOPE	DIA OF PIPE, D	Values for one Pipe
		W
2:1	24"	14'- 0"



ELEVATION



PLAN OF NON-SKEWED PIPES



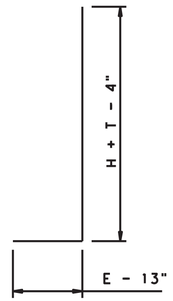
℄ SECTION

TABLE OF CONSTANT DIMENSIONS

DIA OF PIPE, D	G	K	H	T	E
24"	1'- 7"	2'- 0"	4'- 8"	9"	2'- 0"

TABLE OF REINFORCING STEEL (4)

Bar	Size	Spa	No.
A1	# 5	~	2
A2	# 5	1'-6"	~
E	# 5	~	2
F	# 5	1'-0"	~



BARS F_2

GENERAL NOTES:
Designed according to AASHTO LRFD Specifications.
Reinforcing steel shall be placed with the center of the outside layer of bars 2" from the surface of the concrete.
All reinforcing steel shall be Grade 60.
All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.
No bridge rails of any type may be mounted directly to these culvert headwalls.

(1) *OMITTED*

(2) Indicated slope is perpendicular to centerline Pipe or Pipes.

(3) For vehicle safety, curbs shall project no more than 3" above finished grade. Curb heights shall be reduced, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

(4) Quantities shown are for one structure end only (one headwall).

7/3/2019 10:42:13 AM
FILE: 330005\Drawings\Sheets\23-BOL+HEADWALL DET.dgn

NO.	REVISIONS	DATE	NAME

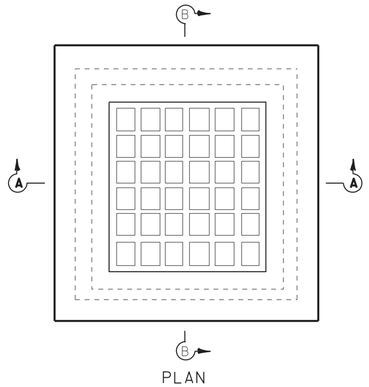
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

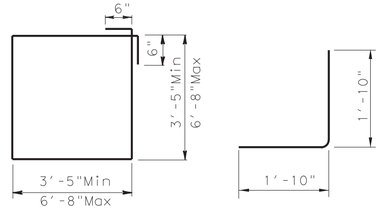
THE STATE OF TEXAS — COUNTY OF GALVESTON

STATE OF TEXAS — DARRELL L. KADERKA — 79298 — REGISTERED PROFESSIONAL ENGINEER — 06/30/2019

PROJECT TITLE: BOLIVAR CULVERT OUTFALLS		
DRAWN BY: DA	SHEET DESCRIPTION: HEADWALL DETAIL	JOB NO: 330005.00
CK'D BY: DLK		FILE NAME:
SCALE:		FILE NO.
DATE: 7/3/2019	APPROVED BY:	SHT NO: 23 / 27

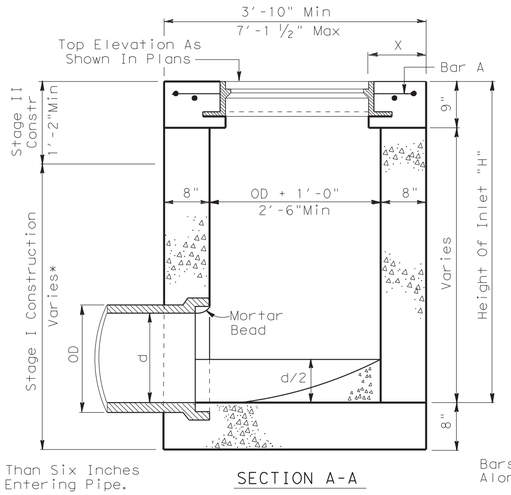


PLAN



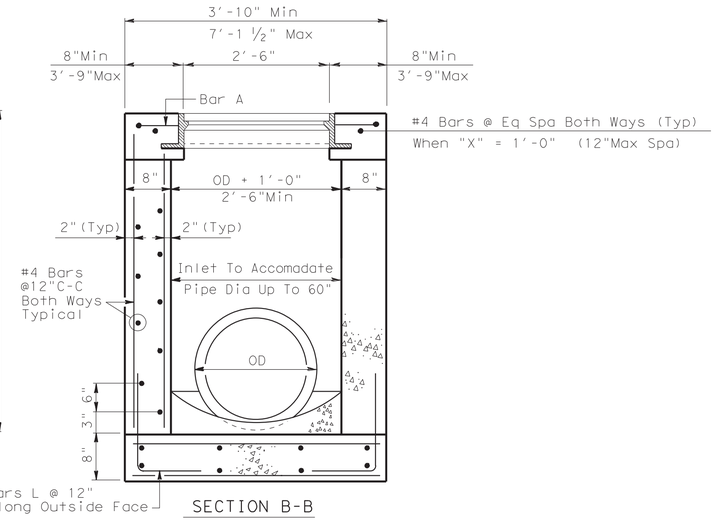
BAR A (#4)

BAR L (#4)



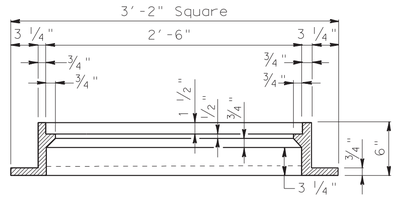
* But Not Less Than Six Inches
Over Highest Entering Pipe.

SECTION A-A

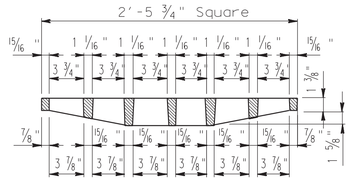


SECTION B-B

TYPE A INLET



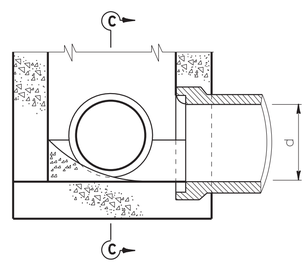
SECTION THRU FRAME



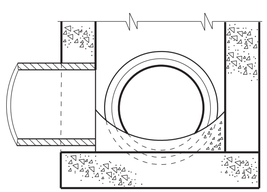
SECTION THRU GRATE

FRAME AND GRATE

Neenah No. R3418-A
EJIW No. V-4880-1

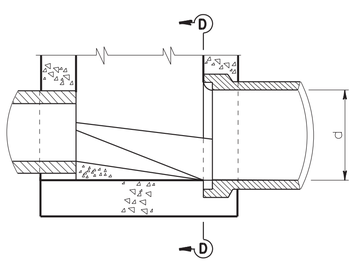


PART SECTION AT INVERT

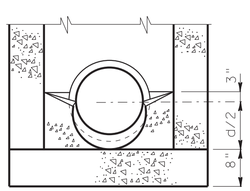


SECTION C-C

Showing Shaping Of Invert, Pipe Entering From Adjacent Sides



PART SECTION AT INVERT



SECTION D-D

Showing Shaping Of Invert, Pipe Entering From Opposite Sides

d = Diameter

GENERAL NOTES:

Where Size Of Pipes Passing Thru Inlet Exceeds 30" Increase Inside Width To Outside Diameter Of Pipe Plus 1'-0" (OD + 1'-0").

Cast Iron Manhole Steps (See Manhole Details) Spaced At 16" Centers And Located On Wall Specified By The Engineer Shall Be Provided And Installed Where "D" Exceeds 5'-0".

See Standard or Detail Sheet For Excavation and Backfill Diagrams.

Inlets Shall Be Built To Stage I And Finished After All Grading Operations Are Substantially Completed.

Frames And Grates May Be Gray Cast Iron.

Shop Drawings Will Be Required For Precast Construction Of Inlets.

NOT FOR TRAFFIC LOADS

STATE OF TEXAS
DARRELL L. KADERKA
79298
REGISTERED PROFESSIONAL ENGINEER
06/30/2019

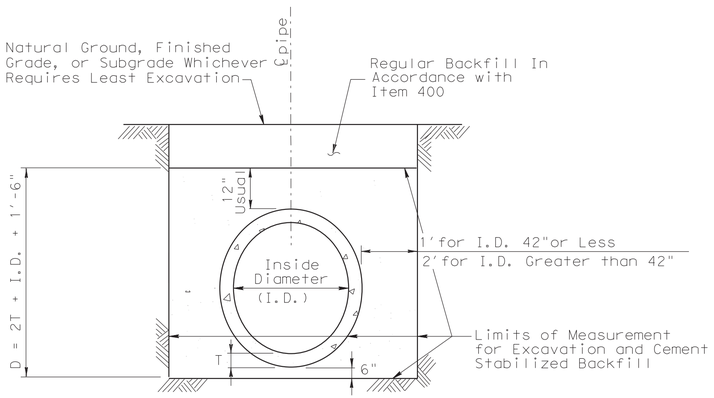
Texas Department of Transportation
Houston District

INLET TYPE A

HIL-A

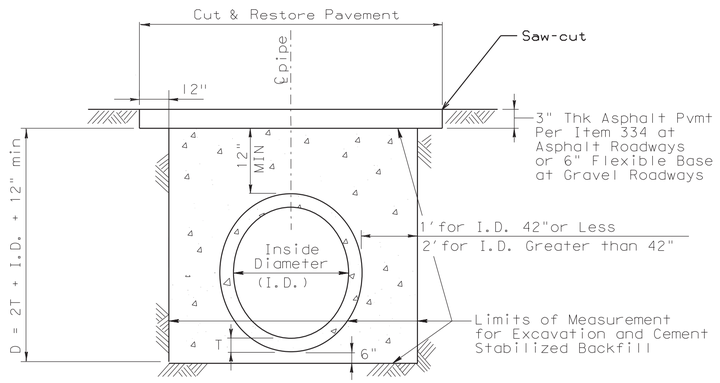
FILE: STDD4.DGN	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	STD:	
© TxDOT 2014	DIST	FED REG	PROJECT NO.			SHEET
REVISIONS	HOUS	6				24
	COUNTY		CONTROL	SECT	JOB	HIGHWAY

STDD4.DGN



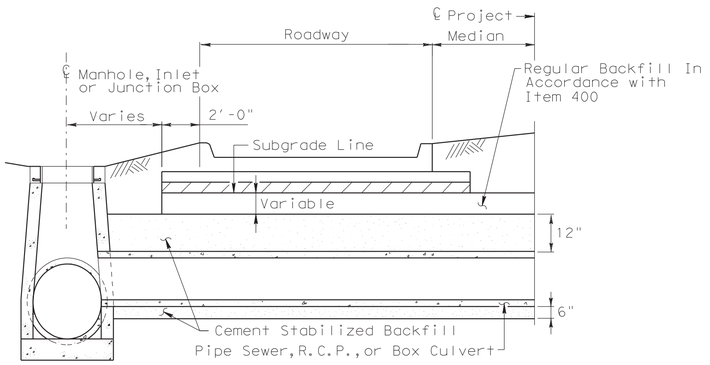
EXCAVATION & BACKFILL DETAIL

REINFORCED CONCRETE PIPE
IN AN UNPAVED AREA INCLUDING DETOURS



EXCAVATION & BACKFILL DETAIL

REINFORCED CONCRETE PIPE
IN A PAVED AREA INCLUDING DETOURS



BACKFILL DETAIL

AT MANHOLE, INLET OR JUNCTION BOX

REINFORCED CONCRETE PIPE

EXCAVATION AND BACKFILL QUANTITIES

PIPE DIA. IN.	T FT.	CULVERT OR SEWER EXCAVATION IN A PAVED OR GRADED AREA C.Y. PER L.F. PER FT. OF DEPTH	CEMENT STABILIZED BACKFILL IN A PAVED OR GRADED AREA C.Y. PER L.F. OF PIPE
12, 18	0.19	0.144	0.383
24	0.23	0.165	0.478
30	0.29	0.188	0.586
36	0.33	0.210	0.692
42	0.38	0.231	0.808
48	0.42	0.327	1.394
54	0.46	0.349	1.560
60	0.50	0.370	1.731
66	0.54	0.392	1.907
72	0.58	0.414	2.088
78	0.62	0.435	2.275
84	0.67	0.457	2.474

NOTE:

In accordance with TxDOT Item 400, a permeable layer of rock may be used as bedding material in trenches where where high water or saturated and weak soils are present.

Rubber gaskets shall be required for all joints on proposed cross drainage, pipe culverts and proposed storm sewer systems, unless otherwise shown in the plans.

D = Depth
H = Height
T = Thickness
R = Radius
Dia = Diameter

* Backfill with cement stabilized material will be required for all structures under detours unless noted otherwise in the General Notes.

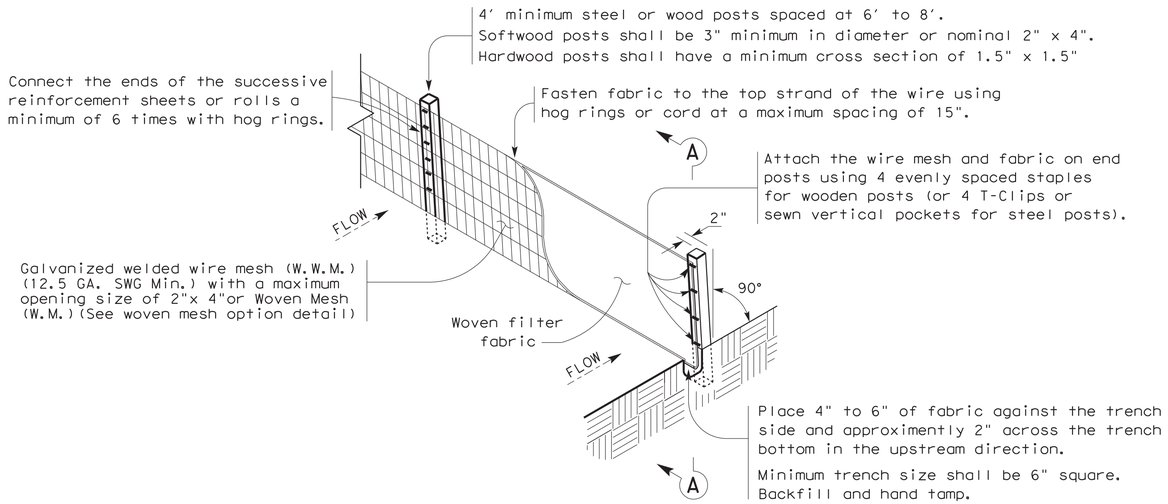
Darrell L. Kaderka
STATE OF TEXAS
DARRELL L. KADERKA
79298
REGISTERED PROFESSIONAL ENGINEER
06/30/2019

Texas Department of Transportation
Houston District

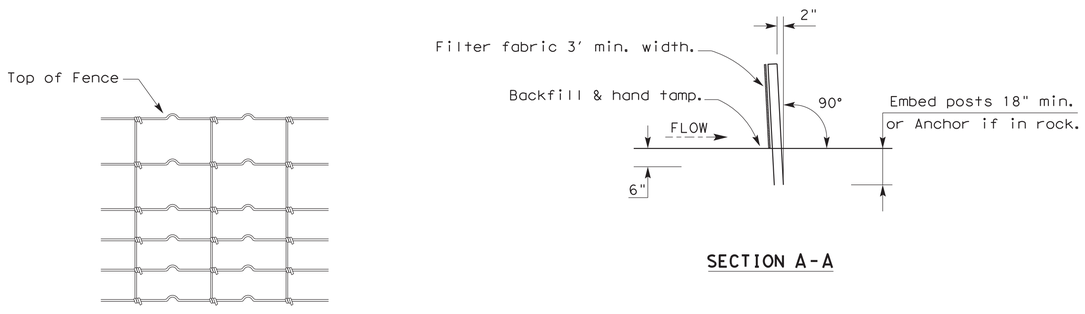
EXCAVATION AND BACKFILL DIAGRAMS

E&BD

FILE: STDE1.DGN	DN: TxDot	CK: TxDot	DW: TxDot	CK: TxDot
© TxDOT FEB 2010	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS REVISED 11/05 REVISED 2/2010 Added note to Table 1, Sht 2 of 2. REVISED 6/12	HOUSTON	6		25
	COUNTY	CONTROL	SECT	JOB	HIGHWAY



TEMPORARY SEDIMENT CONTROL FENCE



SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

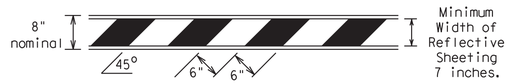
A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

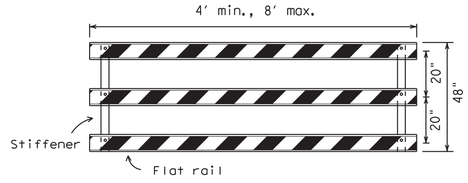
TYPE 3 BARRICADES

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

NO.	REVISIONS	DATE	NAME

GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

DARRELL L. KADERKA 79298 REGISTERED PROFESSIONAL ENGINEER 06/30/2019

PROJECT TITLE: BOLIVAR CULVERT OUTFALLS		
DRAWN BY: DA	SHEET DESCRIPTION: MISCELLANEOUS DETAILS	JOB NO: 330005.00
CK'D BY: DLK		FILE NAME:
SCALE:		FILE NO.
DATE: 7/3/2019	APPROVED BY:	SHT NO: 26 / 27

7/3/2019 10:42:15 AM
FILE: I:\2019\330005\Drawings\Sheets\26-BOLMISC DET.dgn

A PROJECT OF GALVESTON COUNTY

COUNTY JUDGE
HONORABLE MARK A. HENRY

COUNTY COMMISSIONERS

PRECINCT 1 HON. DARRELL APFFEL
PRECINCT 2 HON. JOE GIUSTI
PRECINCT 3 HON. STEPHEN D. HOLMES
PRECINCT 4 HON. KEN CLARK

PROJECT NAME:
BOLIVAR PENINSULA CULVERT AND DRAINAGE IMPROVEMENTS

PROJECT ENGINEER:
CIVILTECH ENGINEERING, INC.

GENERAL LAND OFFICE PROJECT ID:

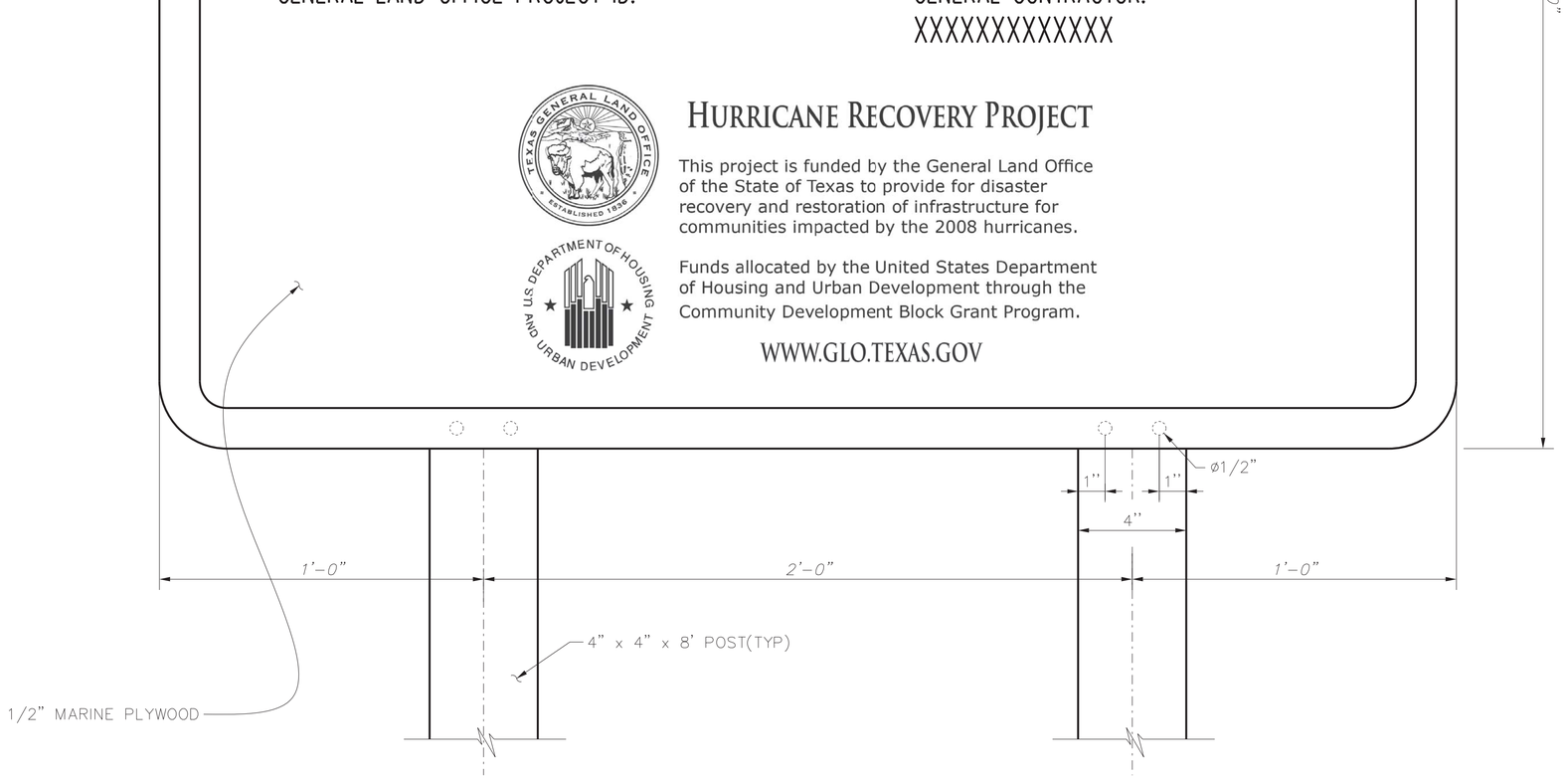
GENERAL CONTRACTOR:
XXXXXXXXXXXXX

HURRICANE RECOVERY PROJECT

This project is funded by the General Land Office of the State of Texas to provide for disaster recovery and restoration of infrastructure for communities impacted by the 2008 hurricanes.

Funds allocated by the United States Department of Housing and Urban Development through the Community Development Block Grant Program.

WWW.GLO.TEXAS.GOV



SCALE IN FEET

NO.	REVISIONS	DATE	NAME

GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

DARRELL L. KADERKA 79298 REGISTERED PROFESSIONAL ENGINEER 06/30/2019

PROJECT TITLE: BOLIVAR CULVERT OUTFALLS		
DRAWN BY: DA	SHEET DESCRIPTION:	JOB NO: 330005.00
CK'D BY: DLK		FILE NAME:
SCALE:		FILE NO.
DATE: 7/3/2019	APPROVED BY:	SHT NO: 27 / 27

7/3/2019 10:42:16 AM
G:\2013\330005\Drawings\Sheets\27-BOL*prj sign.dgn

THE COUNTY OF GALVESTON

RUFUS G. CROWDER, CPPO, CPPB
PURCHASING AGENT

GWEN MCLAREN, CPPB
ASST. PURCHASING AGENT

COUNTY COURTHOUSE
722 Moody (21st Street)
Fifth (5th) Floor
GALVESTON, TEXAS 77550
(409) 770-5371

August 14, 2019

PROJECT NAME: Bolivar Culvert Outfalls

BID NO: B191055

RE: ADDENDUM #1

To All Prospective Bidders:

The following information is being provided to aid in preparation of your bid submittal(s)

AMENDED OPENING DATE:
Bid #B191055, Bolivar Culvert Outfalls, originally scheduled to be opened on Thursday, August 22, 2019, at 2:00 P.M., has been re-scheduled. The new deadline for submitting a bid is as follows:

Date: Thursday, August 29, 2019
Time: 2:15 P.M.

As a reminder, all questions regarding this bid must be submitted in writing to:

Rufus G. Crowder, CPPO CPPB
Galveston County Purchasing Agent
722 Moody, Fifth (5th) Floor
Galveston, Texas 77550
E-mail: purchasing.bids@co.galveston.tx.us

If you have any further questions regarding this bid, please address them to Rufus Crowder, CPPO CPPB, Purchasing Agent, via e-mail at purchasing.bids@co.galveston.tx.us, or contact the Purchasing Department at (409) 770-5371.

Please excuse us for any inconvenience that this may have caused.

Sincerely,

Rufus Crowder

Rufus G. Crowder, CPPO CPPB
Purchasing Agent
Galveston County

THE COUNTY OF GALVESTON

RUFUS G. CROWDER, CPPO, CPPB
PURCHASING AGENT

GWEN MCLAREN, CPPB
ASST. PURCHASING AGENT

COUNTY COURTHOUSE
722 Moody (21st Street)
Fifth (5th) Floor
GALVESTON, TEXAS 77550
(409) 770-5371

August 22, 2019

PROJECT NAME: Bolivar Culvert Outfalls

SOLICITATION NO: ITB #B191055

RE: ADDENDUM #2

To All Prospective Bidders:

The following information is being provided to aid in preparation of your bid submittal(s)

Revised Documents:
The following revisions have been made to remove Bay 7, Bay 8 and Bay 10-1 from the scope of Bid #B191055, Bolivar Culvert Outfalls:

- Bid Form pages 87-88 – the quantities have been adjusted;
- Contract Award - page 91– calendar days have been reduced to 180;
- ***Drawing sheets pages 1-27 in the original bid packet have been removed in their entirety and replaced with the revised set of Drawing Sheets 1-27 which are attached.*** Revisions were made to sheets 2, 5, 6, 9, 10, and 12.

Opening Date:
As a reminder the opening date is Thursday, August 29, 2019 at 2:15 p.m.

Question #1: ***What is the estimated cost?***

Response: The Engineer's estimated construction cost is $350,000.00.

Question #2: ***Line items call for 18" & 24" hdpe smooth lined pipe, is that the corrugated standard hdpe, can't find specs?***

Response: HDPE Smooth Lined Pipe (18") and HDPE Smooth Lined Pipe (24") should conform to SP 2505, High Density Polyethylene Pipe. SP 2505 is attached.

Question #3: ***Where, if any, will the addendums be posted, the Galveston County website doesn't show any jobs posted?***

Response: All addendums will be placed on the Galveston County website under the Purchasing tab.

Question #4: ***What is the spec on the HDPE culverts for this project? Are they ADS HP Storm, ADS N12 ASTM, ADS N12 AASHTO or something else?***

Response: HDPE is covered under ASTM and AASHTO Specs. SP2505 is attached.

As a reminder, all questions regarding this bid must be submitted in writing to:

Rufus G. Crowder, CPPO CPPB
Galveston County Purchasing Agent
722 Moody, Fifth (5th) Floor
Galveston, Texas 77550
E-mail: purchasing.bids@co.galveston.tx.us

If you have any further questions regarding this bid, please address them to Rufus Crowder, CPPO CPPB, Purchasing Agent, via e-mail at purchasing.bids@co.galveston.tx.us, or contact the Purchasing Department at (409) 770-5371.

Please excuse us for any inconvenience that this may have caused.

Sincerely,

Rufus G. Crowder, CPPO CPPB
Purchasing Agent
Galveston County

Item No.	TxDOT 2014	Item Description[2]	Unit	Unit Quantity	Unit Price[1]	Total
GENERAL						
1.	500	Mobilization including all permit fees.	LS	1	$_____	$_____
2.	502	Barricades Signs and Traffic Handling	LS	1	$_____	$_____
PAVING						
3.	400	Cut & Restore Asphalt Pavement	SY	50	$_____	$_____
4.	400	Cut & Restore Pavement (Flex Base)	SY	121	$_____	$_____
DRAINAGE						
5.	400	Cement stabilized Backfill	CY	579	$_____	$_____
6.	420	Class C Concrete (Collar / Bulkhead / Headwall)	EA	5	$_____	$_____
7.	464	Reinforced Concrete Pipe (Class III) (12 inch)	LF	32	$_____	$_____
8.	464	Reinforced Concrete Pipe (Class III) (15 inch)	LF	25	$_____	$_____

Item No.	TxDOT 2014	Item Description[2]	Unit	Unit Quantity	Unit Price[1]	Total
9.	464	Reinforced Concrete Pipe (Class III) (18 inch)	LF	45	$_____	$_____
10.	464	Reinforced Concrete Pipe (Arch) (CL III)(Design 1)	LF	0	$ 0.00	$ 0.00
11.	464	Reinforced Concrete Pipe (Arch) (CL III)(Design 3)	LF	191	$_____	$_____
12.	465	Inlet Complete (Type E) (Modified)	EA	1	$_____	$_____
13.	465	Inlet Complete (Type A)	EA	5	$_____	$_____
14.	496	Remove Structure (Inlet)	EA	5	$_____	$_____
15.	496	Remove Structure (Pipe)	LF	1035	$_____	$_____
16.	496	Remove Structure (Headwall, Wingwall, Bulkhead)	EA	7	$_____	$_____
17.	SP 2505	HDPE Smooth Lined Pipe (18")	LF	519	$_____	$_____
18.	SP 2505	HDPE Smooth Lined Pipe (24")	LF	518	$_____	$_____
		TOTAL BASE BID			$_____	

Contract Award (continued)

Invitation to Bid, General Provisions, Special Provisions for Construction, Bid Forms, Vendor Qualification Packet, Non-Collusion Affidavit, Bid Proposal, Affidavit and Surety Forms, Lobbying Certification, Labor Standards/Prevailing Wage Requirements, Contractor's Local Opportunity Plan, Statement of Bidder's Qualifications, Contractor Certifications, Section 504 Certification "Policy of Nondiscrimination on the Basis of Disability", Bid Bond, Payment Bond, Performance Bond and Attorney Certification, Disaster Recovery Projects, Texas General Land Office Forms, Specifications and Plans attached to this Contract Award are all made a part of this Contract and collectively evidence and constitute the entire contract. Contractor shall furnish all materials, perform all of the work required to be done and do everything else required by these documents.

Time of Completion: The Contractor shall complete the work within 180 Calendar Days of the issuance of the notice to proceed. The time set forth for completion of the work is an essential element of the Contract.

The Contract Sum: The County shall pay the Contractor for performance of the Contract, the sum of ____ _____Dollars and No/100 ($_____), payments to be made as described herein.

Performance Bond required: (x) yes ( ) no
Payment Bond required: (x) yes ( ) no

This Contract is issued pursuant to award made by Commissioners' Court on _____, 20___.

EXECUTED this _____ day of _____, 20___.

COUNTY OF GALVESTON, TEXAS

BY: _____
MARK HENRY, County Judge

ATTEST:

_____
DWIGHT SULLIVAN, County Clerk

CONTRACTOR

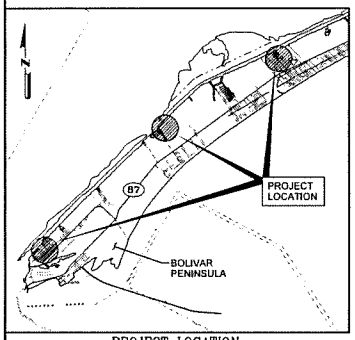
_____

BY: _____
Signature

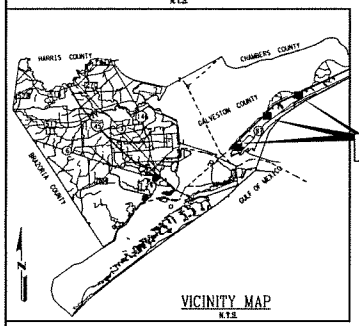
_____
Printed Name - Title

GALVESTON COUNTY

BOLIVAR
CULVERT OUTFALLS



PROJECT LOCATION
N.T.S.



VICINITY MAP
N.T.S.

DARRELL APFFEL
COMMISSIONER — PRECINCT 1

JOE GIUSTI
COMMISSIONER — PRECINCT 2

MARK A. HENRY
COUNTY JUDGE

STEPHEN D. HOLMES
COMMISSIONER — PRECINCT 3

KEN CLARK
COMMISSIONER — PRECINCT 4

MICHAEL SHANNON, P.E., CFM
COUNTY ENGINEER

THE STATE OF TEXAS
COUNTY OF GALVESTON

JULY, 2019
PRECINCT 1

STATE OF TEXAS
DARRELL L. KADERKA
79298
REGISTERED PROFESSIONAL ENGINEER
05/06/2019

CivilTech Engineering, Inc.
11821 Telge Road
Cypress, Texas 77429
(281) 304-0200 Fax (281) 304-0210
Firm Registration No. F-382

8/21/2019 4:38:44 PM
D:\2019\32005\Drawings\Sheets\00-BOL cover.dgn

INDEX OF SHEETS:

TRAFFIC CONTROL NOTES;

TRAFFIC CONTROL WILL CONSIST OF COMPLETE ROADWAY CLOSURES FOR PIPE INSTALLATION ACROSS ROADS AND DRIVEWAYS. UTILIZE APPROVED TYPE III BARRICADES AS SHOWN IN THE PLANS.
ALL TRENCHES ACROSS ROADS AND DRIVEWAYS WILL BE COMPLETED IN A SINGLE WORKING DAY. TRENCES LEFT OPEN FOR MORE THAN 12 HOURS MUST BE PLATED OVER USING APPROVED STEEL PLATES.
FLEX BASE MAY BE USED FOR TEMPORARY PAVING AT ASPHALT PAVEMENTS FOR NO LONGER THAN 28 CALENDAR DAYS.

8/21/2019 4:38:44 PM
G:\2013\330005\Drwngs\Sheets\02-BOL-INDEX.dgn

NO.	REVISIONS	DATE	NAME
1	ADDENDUM #2 - REVISED INDEX	8/21/19	DLK

GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

DARRELL L. RADEMAKER 79298 REGISTERED PROFESSIONAL ENGINEER 06/30/2019

PROJECT TITLE: BOLIVAR CULVERT OUTFALLS
DESIGN BY: DA
DRN BY: DLK
CHK'D:
DATE: 8/21/2019
SHEET DESCRIPTION: INDEX OF SHEETS
APPROVED BY:
JOB NO: 330005.00
FILE NAME:
FILE NO:
SHT NO: 2 / 27

GENERAL

1. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS BEFORE BEGINNING CONSTRUCTION.
2. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SECURITY TO PROTECT THE PROJECT SITE, CONTRACTOR PROPERTY, EQUIPMENT, AND WORK.
3. THE CONTRACTOR IS RESPONSIBLE FOR CLEANING STREETS OF CONSTRUCTION DIRT AND DEBRIS AT CLOSE OF EACH WORK DAY.
4. THE CONDITION OF ADJACENT EXISTING ROADWAYS AND/OR RIGHT-OF-WAY, UPON COMPLETION OF THE JOB SHALL BE AS GOOD AS OR BETTER THAN PRIOR TO STARTING WORK.
5. THE CONTRACTOR STAGING AREA SHALL BE DETERMINED BY THE CONTRACTOR WITH CONCURRENCE BY THE ENGINEER PRIOR TO CONSTRUCTION.
6. THE CONTRACTOR SHALL NOTIFY ALL PROPERTY OWNERS A MINIMUM OF 24 HOURS PRIOR TO BLOCKING DRIVEWAYS OR ENTERING UTILITY EASEMENTS.
7. INGRESS AND EGRESS SHALL BE PROVIDED FOR TRAFFIC DURING CONSTRUCTION. ACCESS TO ALL ADJACENT STRUCTURES SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION DURATION.
8. THE CONTRACTOR SHALL REMOVE AND REPLACE OR RECONSTRUCT EXISTING FENCES, POSTS, PLANTERS, TRASH CONTAINERS, CULVERTS, ETC. AS NECESSARY TO COMPLETE CONSTRUCTION. ANY ITEMS DAMAGED DURING CONSTRUCTION BY THE CONTRACTOR SHALL BE REPLACED WITH EQUAL OR BETTER AT NO EXTRA PAY. TREES, BUSHES, AND SHRUBBERY THAT ARE DESIGNATED TO REMAIN, BUT DAMAGED BY CONTRACTOR'S OPERATIONS, SHALL BE REPLACED AND WATERED THOROUGHLY WITHIN 72 HOURS OF REMOVAL. NO SEPARATE PAY.
9. ANY MAIL BOXES REQUIRING REMOVAL SHALL BE RELOCATED SO THAT MAIL SERVICE IS NOT INTERRUPTED.
10. PAVED SURFACES, PAVEMENT MARKERS AND MARKINGS SHALL BE PROTECTED FROM DAMAGE BY CONSTRUCTION EQUIPMENT.
11. IRON RODS DISTURBED DURING CONSTRUCTION ARE TO BE REPLACED BY A REGISTERED PUBLIC LAND SURVEYOR FOR THE ORIGINAL PROPERTY OWNER AT NO SEPARATE PAY.
12. CONSTRUCTION STAKING WILL BE PROVIDED BY THE CONTRACTOR.
13. THE COUNTY OR THE COUNTY'S SURVEYOR SHALL PROVIDE A BENCHMARK OR TEMPORARY BENCHMARK AND SURVEY CONTROLS.
14. THE CONTRACTOR SHALL MAINTAIN UPDATED REDLINED RECORD DRAWINGS ON SITE FOR INSPECTION BY THE ENGINEER.
15. THE REMOVAL OF ANY ABANDONED UTILITIES REQUIRED TO COMPLETE THE WORK SHALL BE INCIDENTAL AND NO SEPARATE PAYMENT SHALL BE MADE.
16. IT IS THE CONTRACTORS'S RESPONSIBILITY TO STOCKPILE NECESSARY MATERIAL ON-SITE OR SECURED OFF-SITE AT NO ADDITIONAL EXPENSE TO GALVESTON COUNTY. ALL STORM SEWER, ROADWAY, AND CHANNEL EXCAVATION, IF SUITABLE, SHALL BE USED BEFORE BORROW IS BROUGHT ON-SITE. OFF-SITE BORROW IS NOT ANTICIPATED.
17. MANHOLES, JUNCTION BOXES, INLETS, AND RISERS ARE TO BE PRE-CAST ONLY UNLESS OTHERWISE SPECIFIED. SUBMIT SHOP DRAWINGS FOR APPROVAL.
18. EXCESS MATERIAL EXCAVATED TO CONSTRUCT THE PROPOSED PARKING LOTS, DRIVES, STORM SEWERS, ETC. SHALL BE PLACED ONSITE AS GENERALLY SHOWN ON THE GRADING PLANS WITHIN FILL AREAS 1 & 2. FILL MATERIAL DEPOSITED WITHIN THESE AREAS SHALL GENERALLY CONFORM TO THE PROPOSED GRADES IN ORDER TO MAINTAIN POSITIVE DRAINAGE. ALL FILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH ARTICLE 132.3.D.1 - ORDINARY COMPACTION AND IS CONSIDERED SUBSIDIARY TO EXCAVATION.
19. ALL TOP SOIL SHALL BE STOCKPILED ON SITE AT AN APPROVED LOCATION WITH FILTER FABRIC FENCING PLACED AROUND THE PERIMETER AT THE TOE OF THE STOCKPILE.
20. OMITTED
21. STRUCTURAL EXCAVATION SHALL BE CONSIDERED SUBSIDIARY TO STRUCTURES BEING CONSTRUCTED. NO ADDITIONAL PAY WILL BE ALLOWED FOR EXCAVATION OF UTILITIES, STORM SEWERS, INLETS, MANHOLES, OR OTHER STRUCTURES.

UTILITY

1. REMOVAL OF ALL ABANDONED UTILITIES WILL BE INCIDENTAL TO THE CONSTRUCTION REQUIRING THE REMOVAL OF THOSE UTILITIES.
2. EXISTING UTILITIES ARE SHOWN IN AN APPROXIMATE MANNER ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETELY FIELD LOCATING AND VERIFYING ALL EXISTING UTILITIES, SHOWN OR NOT SHOWN ON THE DRAWINGS. CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES OCCURRING DUE TO HIS FAILURE TO EXACTLY LOCATE ALL EXISTING UTILITIES.
3. ANY CONFLICT WITH EXISTING UTILITIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN A TIMELY MANNER SUCH THAT THE CONFLICT CAN BE RESOLVED BEFORE CONTINUING CONSTRUCTION ACTIVITIES.

STORM SEWER

1. NO JETING OF BEDDING OR BACKFILL WILL BE ALLOWED.
2. CONTRACTOR IS TO COMPLY WITH THE LATEST O.S.H.A. REGULATIONS AND STATE OF TEXAS LAW CONCERNING EXCAVATION, TRENCH AND SHORING, (AS SPECIFIED IN PART 1926, SUBPART P "EXCAVATING, TRENCHING AND SHORING".)
3. ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION. ANY EXISTING DRAINAGE STRUCTURE OR FACILITY DAMAGED DURING CONSTRUCTION SHALL BE RESTORED TO THE ORIGINAL CONDITION AT NO ADDITIONAL COSTS.
4. ALL REINFORCED CONCRETE PIPE INDICATED FOR USE IN STORM DRAINS WILL NOT BE SUBSTITUTED WITH HDPE PIPE.

TRAFFIC CONTROL

1. SIGNIFICANT TRAFFIC CONTROL IS NOT ANTICIPATED ON THIS PROJECT. THE CONTRACTOR'S MEANS OF TRAFFIC CONTROL SHALL BE PRESENTED TO THE COUNTY FOR APPROVAL PRIOR TO INSTALLING ANY TRAFFIC CONTROL DEVICES.

TREE PROTECTION

1. TREES SHALL BE PROTECTED FROM ALL CONSTRUCTION ACTIVITIES. FENCING OR ROOT PRUNING MAY BE REQUIRED AT THE DIRECTION OF THE ENGINEER TO PROTECT THESE TREES IF CONSTRUCTION ACTIVITIES EXTEND TO WITHIN THE TREE'S DRIP LINE. COST OF SUCH TREE PROTECTION MEASURES WILL BE CONSIDERED INCIDENTAL TO WORK ITEMS BEING PERFORMED.

8/21/2019 4:36:45 PM
G:\2013\330005\Grnd\Rpts\Sheets\03-notes01.dgn

NO.	REVISIONS	DATE	NAME

GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0300
FX: (281) 304-0210
REGISTRATION NO. F-382

STATE OF TEXAS
DARRELL L. SADLER
79298
REGISTERED PROFESSIONAL ENGINEER
08/30/2019

PROJECT TITLE: BOLIVAR CULVERT OUTFALLS

DESIGN BY: DA	SHEET DESCRIPTION: GENERAL NOTES	JOB NO. 330005.00
DFT. BY: DLK		FILE NAME:
CHKD.		PLT. NO.
DATE: 8/21/2019	APPROVED BY:	SHT. NO. 2 / 27

STORM WATER QUALITY

THIS PROJECT DISTURBS LESS THAN 1 ACRE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTATION, INSPECTION, AND MAINTENANCE OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. THE COST TO IMPLEMENT INSPECT, AND MAINTAIN THE SWPPP SHALL BE CONSIDERED INCIDENTAL TO THE SWPPP BID ITEMS.

PRIVATE UTILITY

CENTERPOINT ENERGY

CAUTION: UNDERGROUND GAS FACILITIES

LOCATIONS OF CENTERPOINT ENERGY MAIN LINES (TO INCLUDE CENTERPOINT ENERGY, INTRASTATE PIPELINE, LLC. WHERE APPLICABLE) ARE SHOWN IN AN APPROXIMATE LOCATION ONLY. SERVICE LINES ARE USUALLY NOT SHOWN. OUR SIGNATURE ON THESE PLANS ONLY INDICATES THAT OUR FACILITIES ARE SHOWN IN APPROXIMATE LOCATION. IT DOES NOT IMPLY THAT A CONFLICT ANALYSIS HAS BEEN MADE. THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT (713) 223-4567 OR 1-800-669-8344 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

1. WHEN CENTERPOINT ENERGY PIPE LINE MARKINGS ARE NOT VISIBLE, CALL (713) 967-8037 (7:00 AM TO 4:30 P.M.) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.
2. WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF CENTERPOINT ENERGY FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED BY USING NON-MECHANIZED EXCAVATION PROCEDURES.
3. WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STESS ON THE PIPING.

THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES.

WARNING: OVERHEAD ELECTRIC LINES

OVERHEAD LINES MAY EXIST ON THE PROPERTY. THE LOCATION OF OVERHEAD LINES HAS NOT BEEN SHOWN ON THESE DRAWINGS AS THE LINES ARE CLEARLY VISIBLE, BUT YOU SHOULD LOCATE THEM PRIOR TO BEGINNING ANY CONSTRUCTION. TEXAS LAW, SECTION 752, HEALTH & SAFETY CODE, FORBIDS ACTIVITIES THAT OCCUR IN CLOSE PROXIMITY TO HIGH VOLTAGE LINES, SPECIFICALLY:

1. ANY ACTIVITY WHERE PERSON OR THINGS MAY COME WITHIN SIX (6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES; AND
2. OPERATING A CRANE, DERRICK, POWER SHOVEL, DRILLING RIG, PILE DRIVER, HOISTING EQUIPMENT, OR SIMILAR APPARATUS WITHIN 10 FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES.

PARTIES RESPONSIBLE FOR THE WORK, INCLUDING CONTRACTORS, ARE LEGALLY RESPONSIBLE FOR THE SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW. THIS LAW CARRIES BOTH CRIMINAL AND CIVIL LIABILITY. TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED CALL CENTERPOINT ENERGY AT (713) 207-2222.

8/21/2019 4:36:45 PM
G:\2013\330005\Drawings\Sheets\04-notes02.dgn

NO.	REVISIONS	DATE	NAME

GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

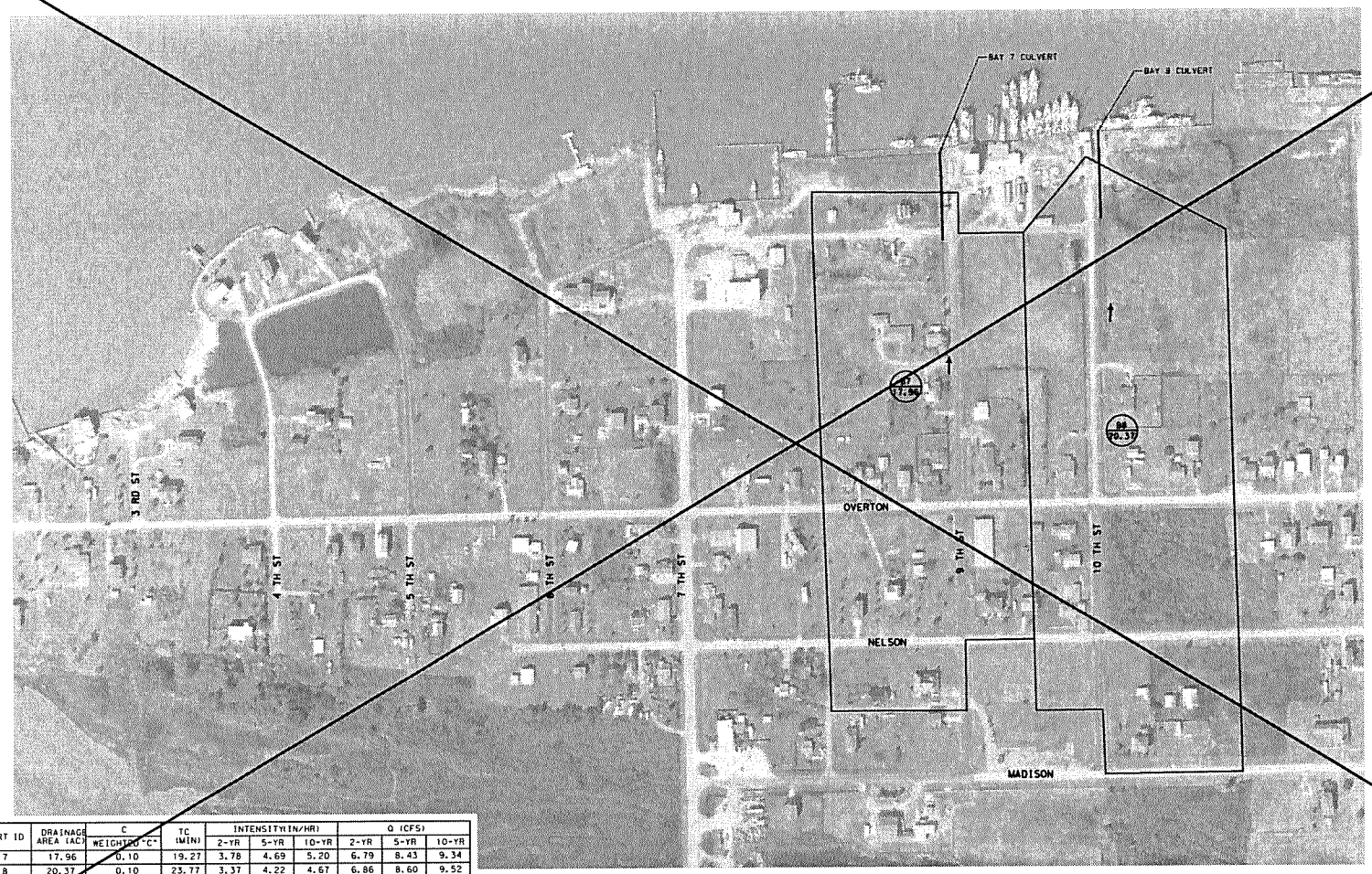
STATE OF TEXAS — DARRELL L. RADELIFF — 79298 — REGISTERED PROFESSIONAL ENGINEER — 06/30/2019

8/21/2019

BOLIVAR CULVERT OUTFALLS

GENERAL NOTES

330005.00



0 75 150 300
SCALE IN FEET

LEGEND

- DRAINAGE AREA ID / ACRES
- DRAINAGE AREA BOUNDARY

CULVERT ID	DRAINAGE AREA (AC)	C WEIGHTED "C"	TC (MIN)	INTENSITY(IN/HR) 2-YR	5-YR	10-YR	Q (CFS) 2-YR	5-YR	10-YR
BAY 7	17.96	0.10	19.27	3.78	4.69	5.20	6.79	8.43	9.34
BAY 8	20.37	0.10	23.77	3.37	4.22	4.67	6.86	8.60	9.52

NO.	REVISIONS	DATE	NAME
1	ADDENDUM #2 - SHEET REMOVED	8/21/19	DLK

GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

DARRELL L. KADENA 79298 REGISTERED PROFESSIONAL ENGINEER 06/30/2019

PROJECT NO.: BOLIVAR CULVERT OUTFALLS
DRAWN BY: DA
DATE BY: DLK
CHKD:
DATE: 8/21/2019
SHEET DESCRIPTION: DRAINAGE AREA MAP
JOB NO.: 330005.00
FILE NAME:
PLT NO.:
SHT NO.: 5 / 27

8/21/2019 4:38:50 PM
G:\2013\330005\Drawings\Sheets\05-BOLMAP1.dgn

0 75 150 300
SCALE IN FEET

LEGEND

BAY X.XX — DRAINAGE AREA ID
ACRES

DRAINAGE AREA BOUNDARY

CULVERT ID	DRAINAGE AREA (AC)	C WEIGHTED "C"	TC(MIN	INTENSITY (IN/HR) 2-YR	5-YR	10-YR	Q (CFS) 2-YR	5-YR	10-YR
BAY 9-1	27.73	0.10	27.50	3.13	3.95	4.36	8.67	10.94	12.10
Bay 9-2 Cross Culvert	13.54	0.10	25.27	3.26	4.10	4.54	4.42	5.55	6.14
~~BAY 10-1~~	~~5.72~~	~~0.10~~	~~16.25~~	~~4.10~~	~~5.15~~	~~5.72~~	~~2.39~~	~~2.95~~	~~3.27~~
BAY 11-1 Cross Culvert	3.51	0.15	21.40	3.56	4.44	4.92	1.88	2.34	2.59
BAY 11-2 DW Culvert	4.10	0.10	25.43	3.25	4.09	4.52	1.33	1.68	1.85
BAY 14-1	6.95	0.10	11.42	5.78	7.10	7.88	4.02	4.93	5.48
BAY 14-2 Cross Culvert	3.36	0.10	10.78	6.13	7.52	8.35	2.06	2.53	2.81

NO	REVISIONS	DATE	NAME
1	ADDENDUM #2 - REMOVED BAY 10-1	8/21/19	DLK

GALVESTON COUNTY

THE STATE OF TEXAS COUNTY OF GALVESTON

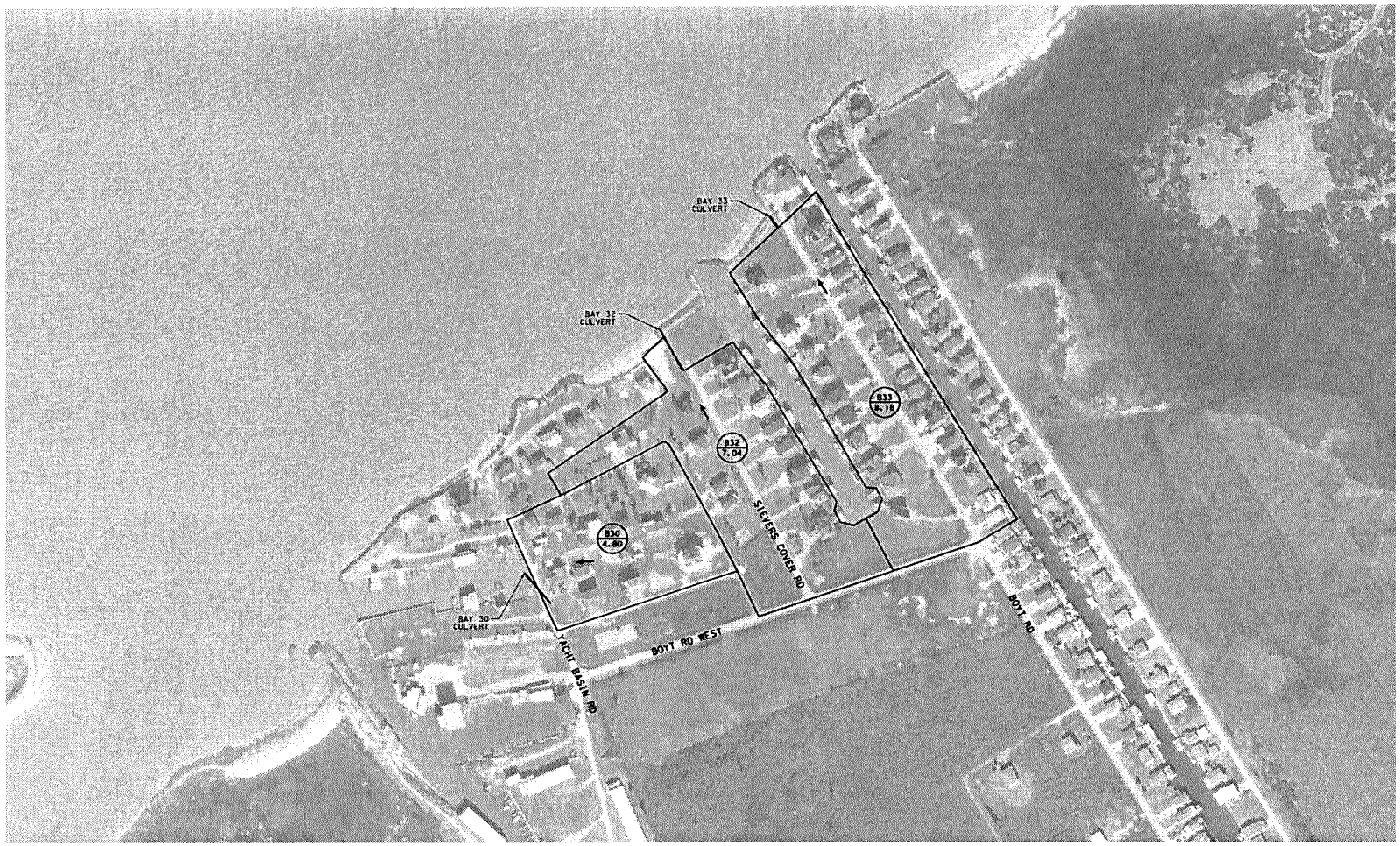
CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

DARRELL L. RADEMAKER 79298 REGISTERED PROFESSIONAL ENGINEER 06/30/2019

PROJECT TITLE: BOLIVAR CULVERT OUTFALLS

DESIGN BY: DA
DATE BY: DLK
DRAWN: DLK
DATE: 8/21/2019
SHEET DESCRIPTION: DRAINAGE AREA MAP
APPROVED BY:
JOB NO. 330005.00
FILE NAME:
FILE NO.
SHT NO. 6 / 27

8/21/2019 5:05:43 PM
D:\2019\330005\Drainage\Sheets\06-BHDAMAP2.dgn



N

0 75 150 300
SCALE IN FEET

LEGEND

B#X — DRAINAGE AREA ID
AC — ACRES

DRAINAGE AREA BOUNDARY

CULVERT ID	DRAINAGE AREA (AC)	C	TC (MIN)	INTENSITY(IN/HR)			Q (CFS)		
		WEIGHTED "C"		2-YR	5-YR	10-YR	2-YR	5-YR	10-YR
BAY 30	4.80	0.15	11.34	5.82	7.14	7.94	4.19	5.14	5.71
BAY 32	7.04	0.10	12.97	5.09	6.25	6.94	3.58	4.40	4.89
BAY 33	8.18	0.15	15.70	4.27	5.26	5.84	5.24	6.45	7.16

NO.	REVISIONS	DATE	NAME

GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-582

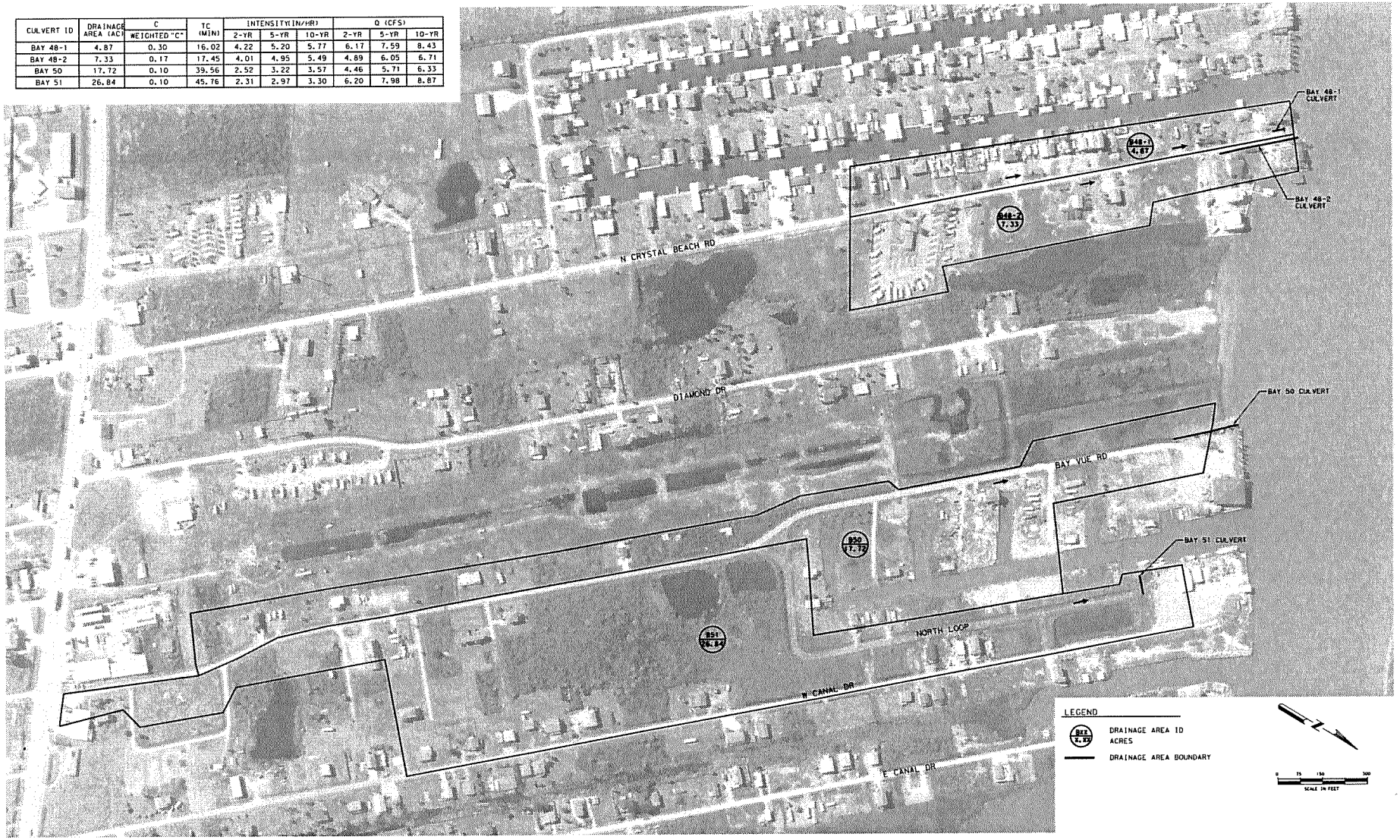
DARRELL L. RADENA
79296
REGISTERED PROFESSIONAL ENGINEER
08/30/2019

PROJECT TITLE: BOLIVAR CULVERT OUTFALLS

DESIGN BY: DA
SHEET DESCRIPTION: DRAINAGE AREA MAP
JOB NO. 330005.00
DATE OF: DLK
PLT SCALE:
SCALE:
PLT VOL:
DATE: 8/21/2019
APPROVED BY:
SHT NO. 7 / 27

8/21/2019 4:41:56 PM
G:\2013\330005\Drawings\Sheets\07-Bay&Main1.dgn

CULVERT ID	DRAINAGE AREA (AC)	C WEIGHTED "C"	TC (MIN)	INTENSITY(IN/HR)			Q (CFS)		
				2-YR	5-YR	10-YR	2-YR	5-YR	10-YR
BAY 48-1	4.87	0.30	16.02	4.22	5.20	5.77	6.17	7.59	8.43
BAY 48-2	7.33	0.17	17.45	4.01	4.95	5.49	4.89	6.05	6.71
BAY 50	17.72	0.10	39.56	2.52	3.22	3.57	4.46	5.71	6.33
BAY 51	26.84	0.10	45.76	2.31	2.97	3.30	6.20	7.98	8.87



NO.	REVISIONS	DATE	NAME

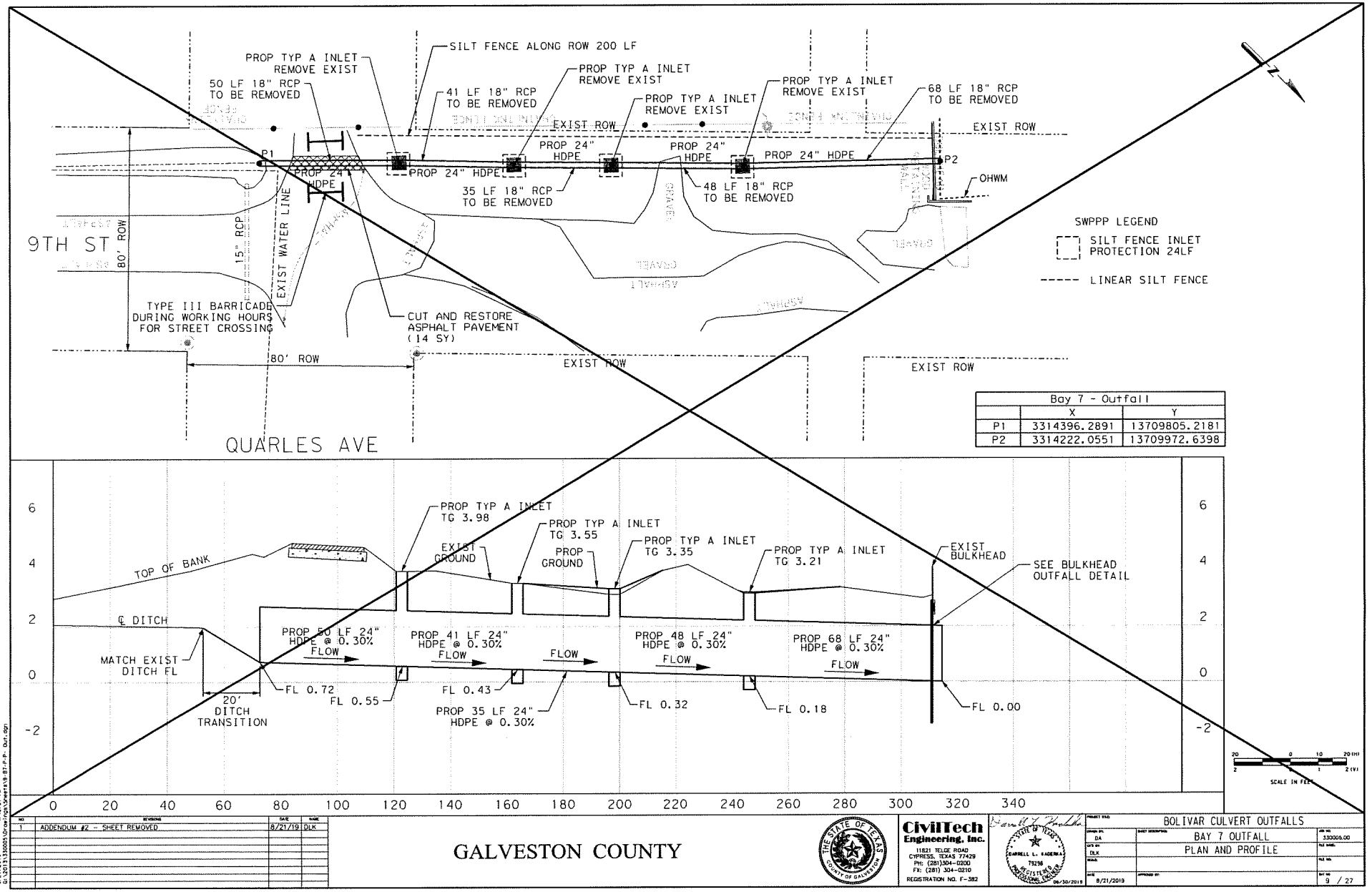
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

DARRELL L. RADEMA 78298 REGISTERED PROFESSIONAL ENGINEER 06/30/2019

PROJECT FILE	BOLIVAR CULVERT OUTFALLS	
DESIGNED DA	SHEET DESCRIPTION DRAINAGE AREA MAP	JOB NO. 330009.00
DRAWN BY DLK		FILE NAME
CHECKED		TASK NO.
DATE 8/21/2019	APPROVED BY	SHT NO. 8 / 27

8/21/2019 4:43:45 PM
D:\2019\330005\Drawings\Sheets\05-BOLIVAR04.dgn



Bay 7 - Outfall		
	X	Y
P1	3314396.2891	13709805.2181
P2	3314222.0551	13709972.6398

NO	REVISIONS	DATE	NAME
1	ADDENDUM #2 - SHEET REMOVED	8/21/19	DLK

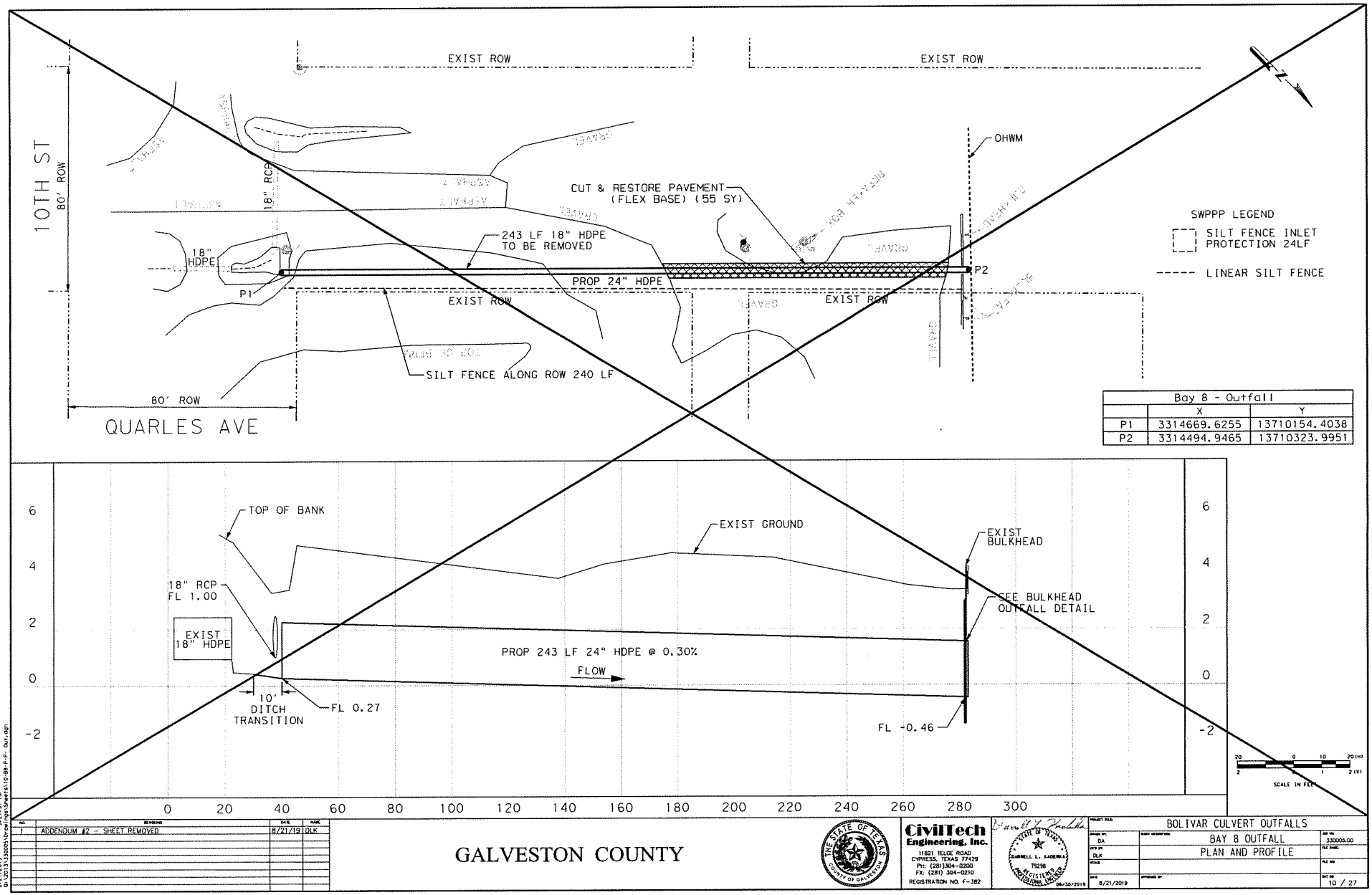
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

BARRELL L. KADERKA
79298
REGISTERED
PROFESSIONAL ENGINEER
08/30/2019

PROJECT TITLE: BOLIVAR CULVERT OUTFALLS
DESIGNED BY: DA
DRAWN BY: DLK
CHECKED BY:
SHEET DESCRIPTION: BAY 7 OUTFALL
PLAN AND PROFILE
JOB NO. 530005.00
FILE NAME:
DATE: 8/21/2019
APPROVED BY:
SHT NO. 9 / 27

8/21/2019
4:45:51 PM
G:\2013\530005\Drawings\Sheets\9-BT-P-P- Out.dgn



Bay 8 - Outfall		
	X	Y
P1	3314669.6255	13710154.4038
P2	3314494.9465	13710323.9951

NO.	REVISIONS	DATE	NAME
1	ADDENDUM #2 - SHEET REMOVED	8/21/19	DLK

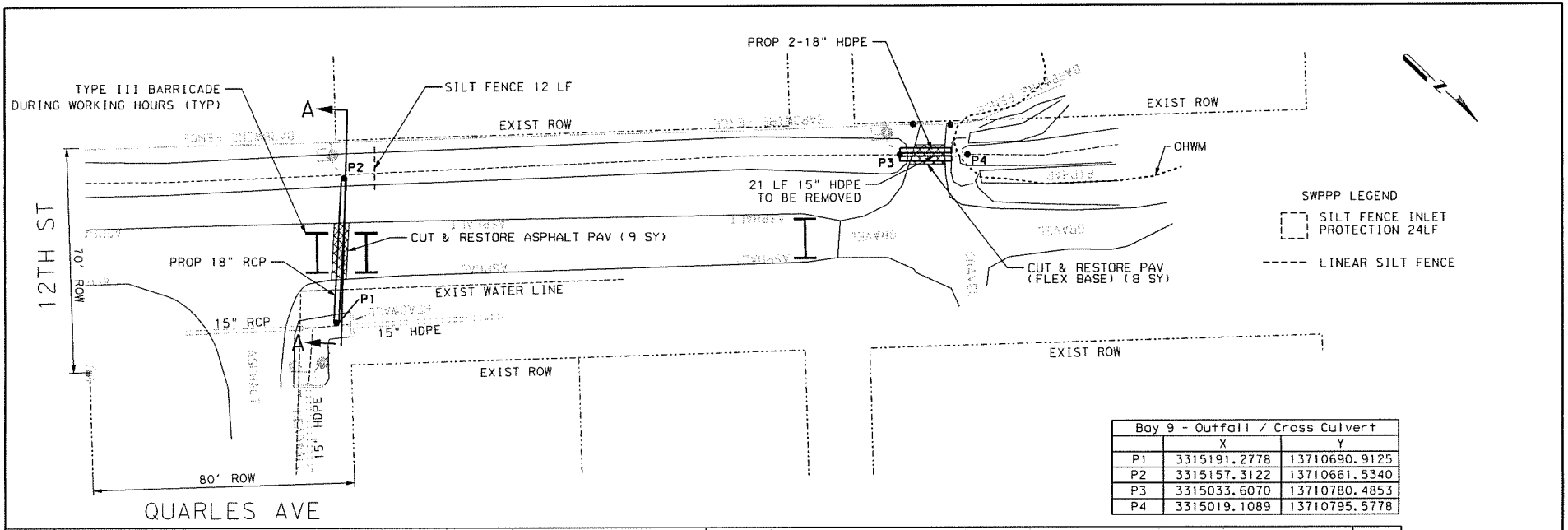
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

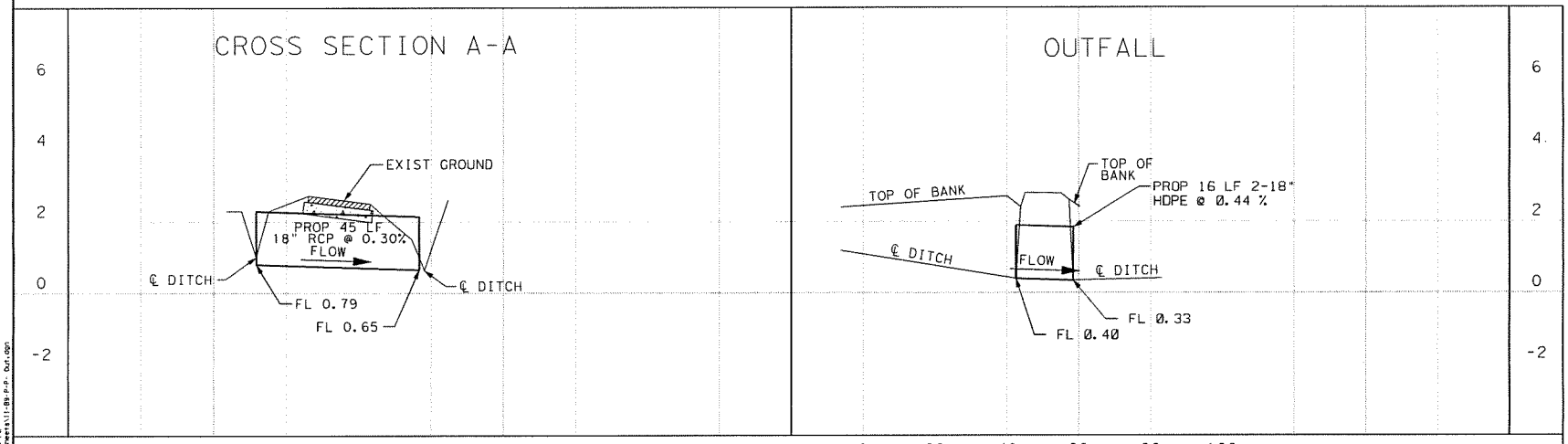
DARRELL L. RADEMA
79296
REGISTERED PROFESSIONAL ENGINEER
06/30/2019

PROJECT NAME	BOLIVAR CULVERT OUTFALLS
DRAWN BY: DA	SHEET DESCRIPTION: BAY 8 OUTFALL PLAN AND PROFILE
CHK'D BY: DLK	JOB NO. 330005.00
SCALE:	FILE SHEET:
DATE: 8/21/2019	APPROVED BY:
	FILE NO.
	SHT NO. 10 / 27

8/21/2019 5:21:31 PM
G:\2013\330005\Drawings\Sheets\10-BB-P-P- Out.dgn



Bay 9 - Outfall / Cross Culvert		
	X	Y
P1	3315191.2778	13710690.9125
P2	3315157.3122	13710661.5340
P3	3315033.6070	13710780.4853
P4	3315019.1089	13710795.5778



NO.	REVISIONS	DATE	NAME

GALVESTON COUNTY

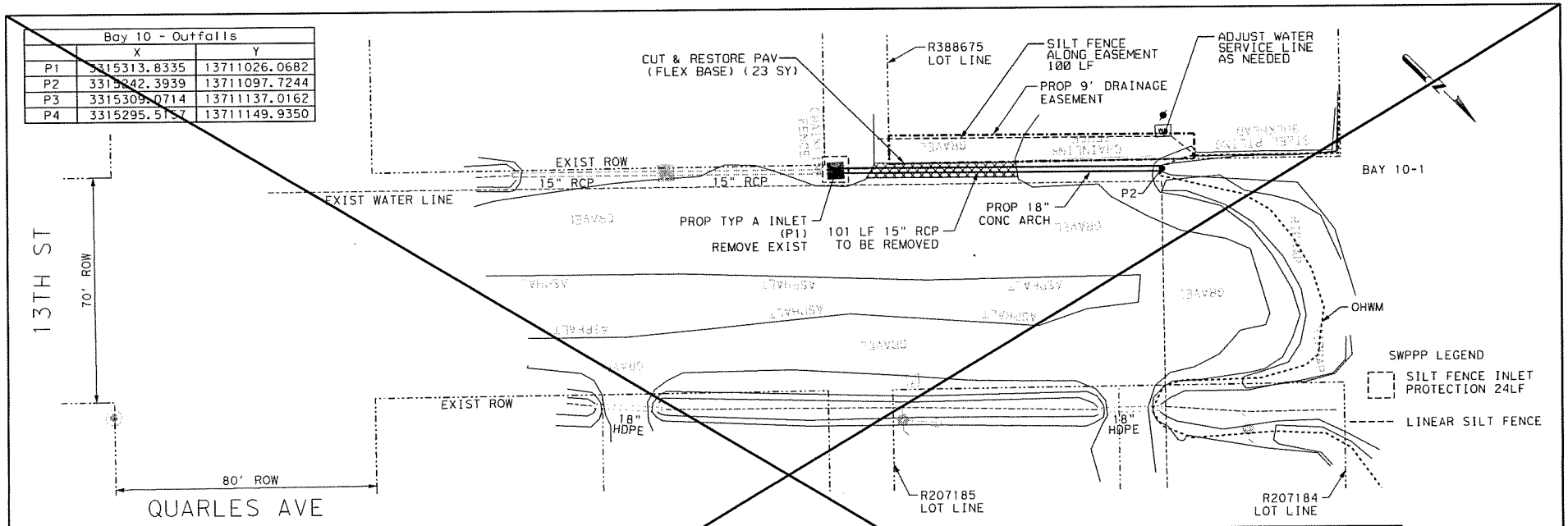
CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0303
FX: (281) 304-0210
REGISTRATION NO. F-382

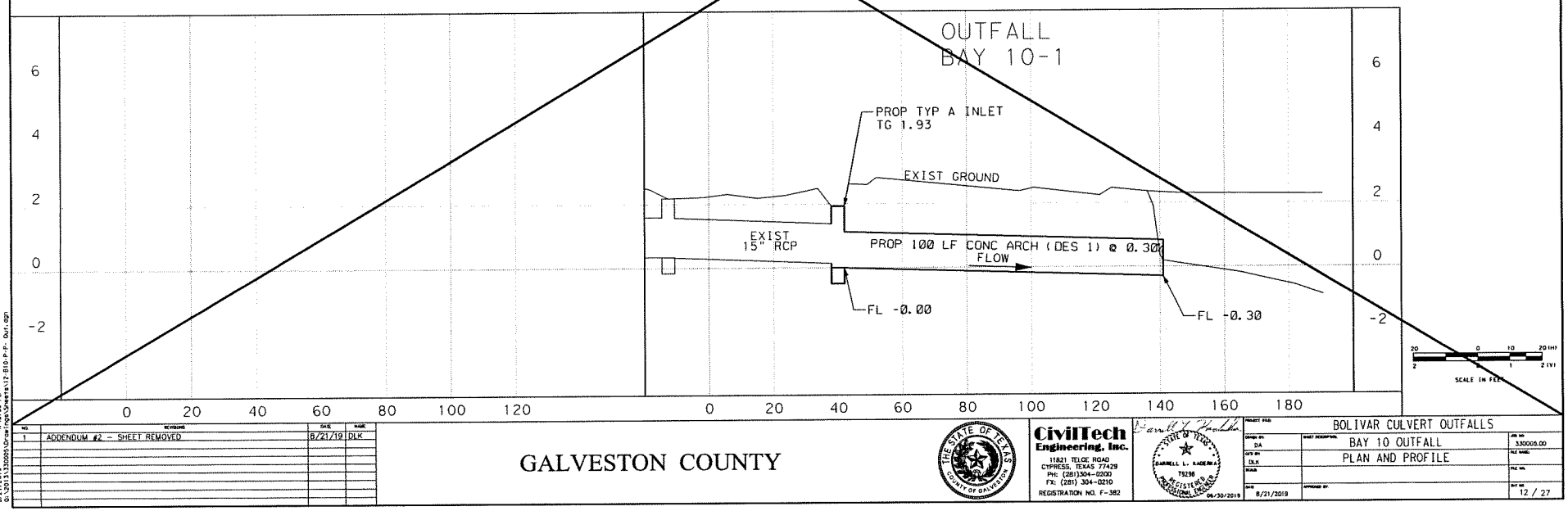
DARRELL L. RADEMA
79296
REGISTERED PROFESSIONAL ENGINEER
06/30/2019

PROJECT TITLE	BOLIVAR CULVERT OUTFALLS
DESIGNED BY: DA	SHEET DESCRIPTION: BAY 9
JOB NO. 330005.00	
DETAILED BY: DLK	OUTFALL AND CROSS CULVERT
FILE NAME:	
CHECKED BY:	PLAN AND PROFILE
FILE NO.	
DATE: 8/21/2019	APPROVED BY:
SHT NO. 11 / 27	

8/21/2019 4:45:53 PM
G:\2013\330005\Drawings\11-Bay-P-P- Out.dgn

Bay 10 - Outfalls		
	X	Y
P1	3315313.8335	13711026.0682
P2	3315242.3939	13711097.7244
P3	3315309.0714	13711137.0162
P4	3315295.5157	13711149.9350





NO.	REVISIONS	DATE	NAME
1	ADDENDUM #2 - SHEET REMOVED	8/21/19	DLK

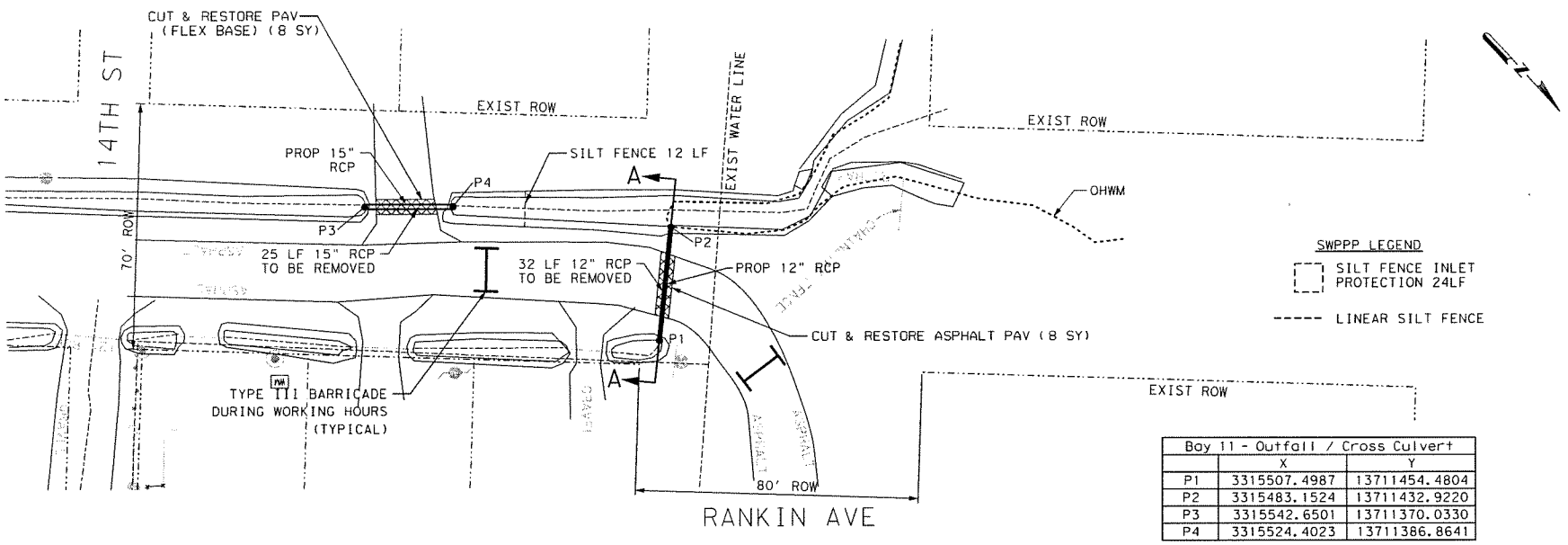
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

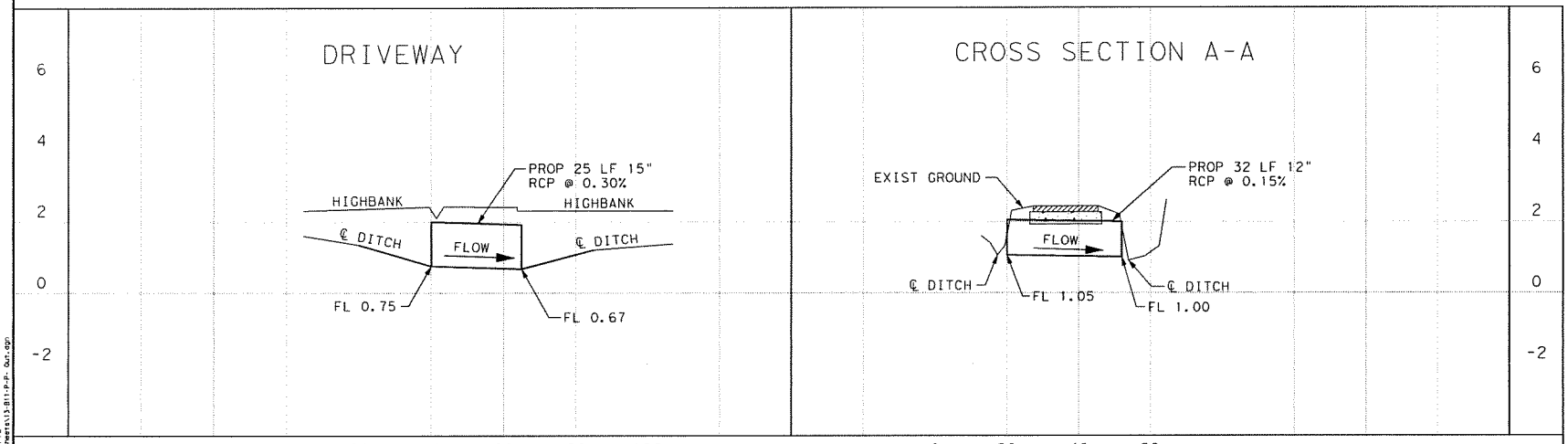
GABRIELL L. KADEMAN 79298 REGISTERED PROFESSIONAL ENGINEER 08/30/2019

BOLIVAR CULVERT OUTFALLS
BAY 10 OUTFALL
PLAN AND PROFILE
DA | DLK | 8/21/2019
330005.00
12 / 27

8/21/2019 4:45:53 PM
G:\2013\330005\Drawings\Sheets\12-B10-P-P- Out.dgn



Bay 11 - Outfall / Cross Culvert		
	X	Y
P1	3315507.4987	13711454.4804
P2	3315483.1524	13711432.9220
P3	3315542.6501	13711370.0330
P4	3315524.4023	13711386.8641



SCALE IN FEET

NO.	REVISIONS	DATE	NAME

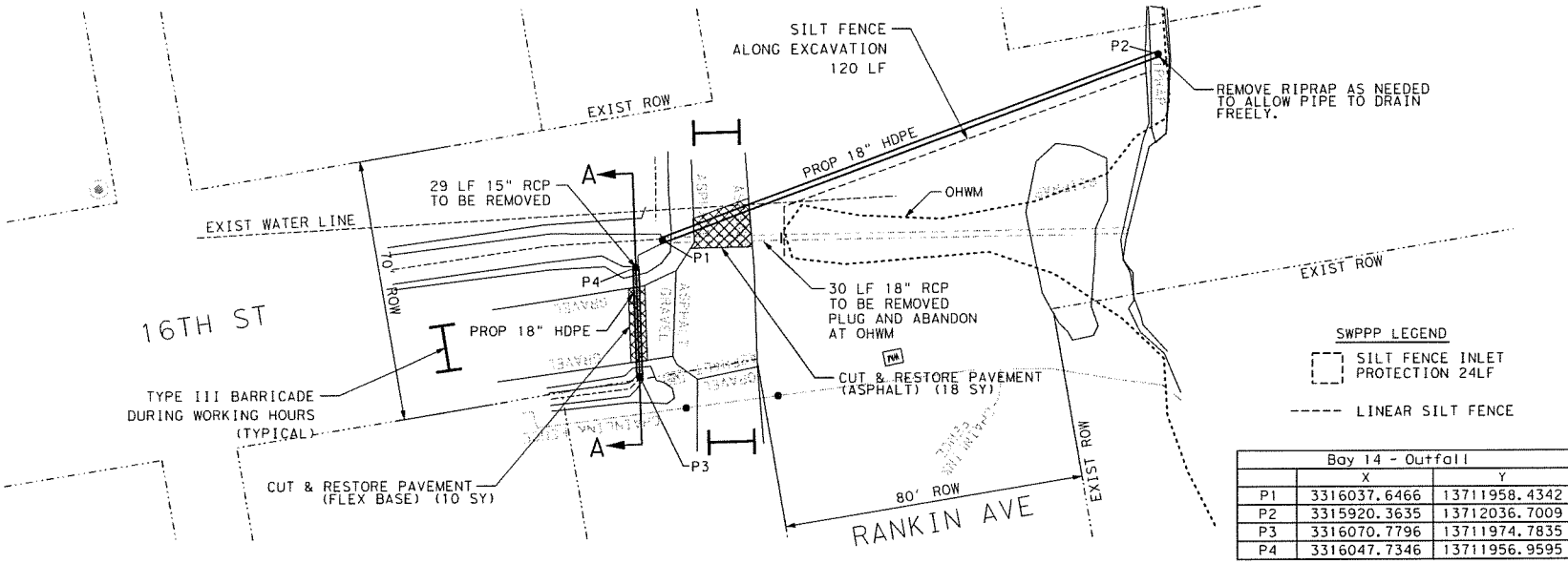
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-362

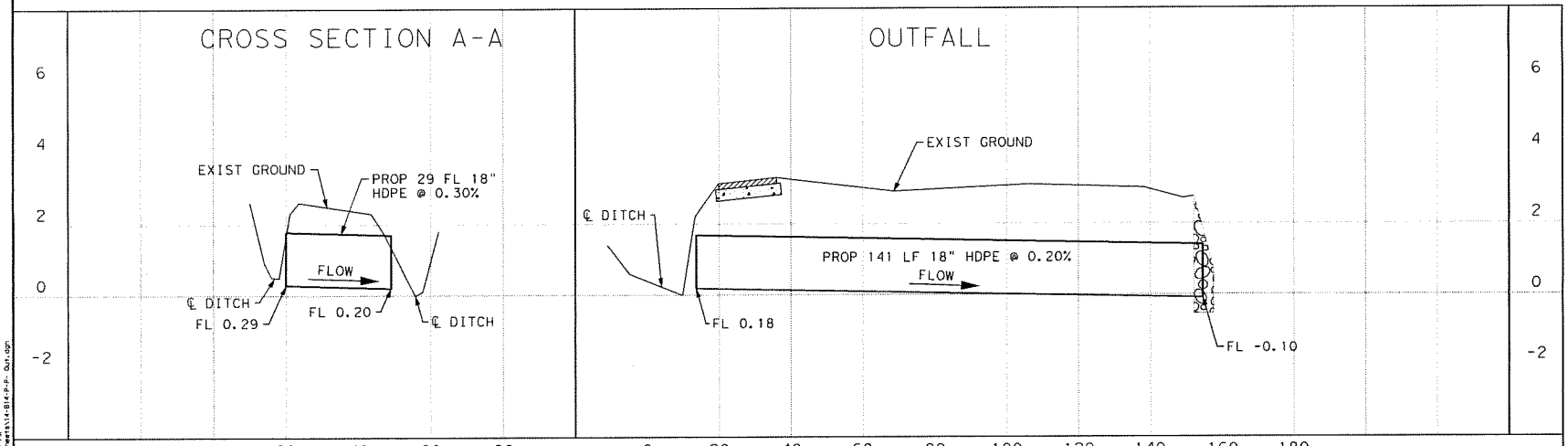
DARRELL L. HAGEMAN 75298 REGISTERED PROFESSIONAL ENGINEER 06/30/2019

PROJECT TITLE	BOLIVAR CULVERT OUTFALLS
DESIGNED BY: DA	SHEET DESCRIPTION: BAY 11
DRAWN BY: DLK	DRIVEWAY AND CROSS CULVERT
SCALE:	PLAN AND PROFILE
DATE: 8/21/2019	APPROVED BY:
JOB NO.	330005.00
FILE NAME	
FILE NO.	
SHT NO.	13 / 27

8/21/2019
41:45:54 PM
G:\2019\330005\Engr\dgn\Sheets\13 BAY11-P-P- Out.dgn



Bay 14 - Outfall		
	X	Y
P1	3316037.6466	13711958.4342
P2	3315920.3635	13712036.7009
P3	3316070.7796	13711974.7835
P4	3316047.7346	13711956.9595



8/21/2019 4:45:54 PM
G:\2013\330005\Drawings\Sheets\14-BAY-P-P-Out.dgn

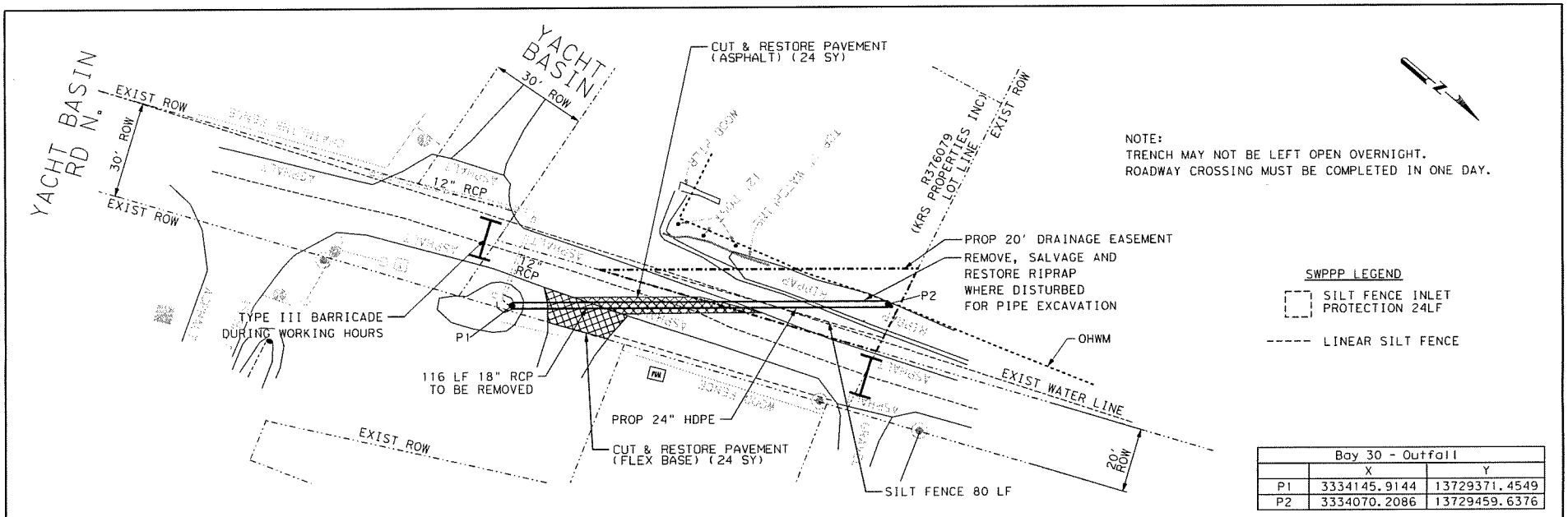
NO.	REVISIONS	DATE	NAME

GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

DARRELL L. RADEMILL
75256
REGISTERED PROFESSIONAL ENGINEER
05/30/2019

PROJECT TITLE	BOLIVAR CULVERT OUTFALLS
DESIGNED BY: DA	SHEET DESCRIPTION: BAY 14
DRAWN BY: DLK	OUTFALL AND CROSS CULVERT
CHECKED BY:	PLAN AND PROFILE
DATE: 8/21/2019	APPROVED BY:
JOB NO.	330005.00
FILE NAME:	
PLS NO.	
SHT NO.	14 / 27



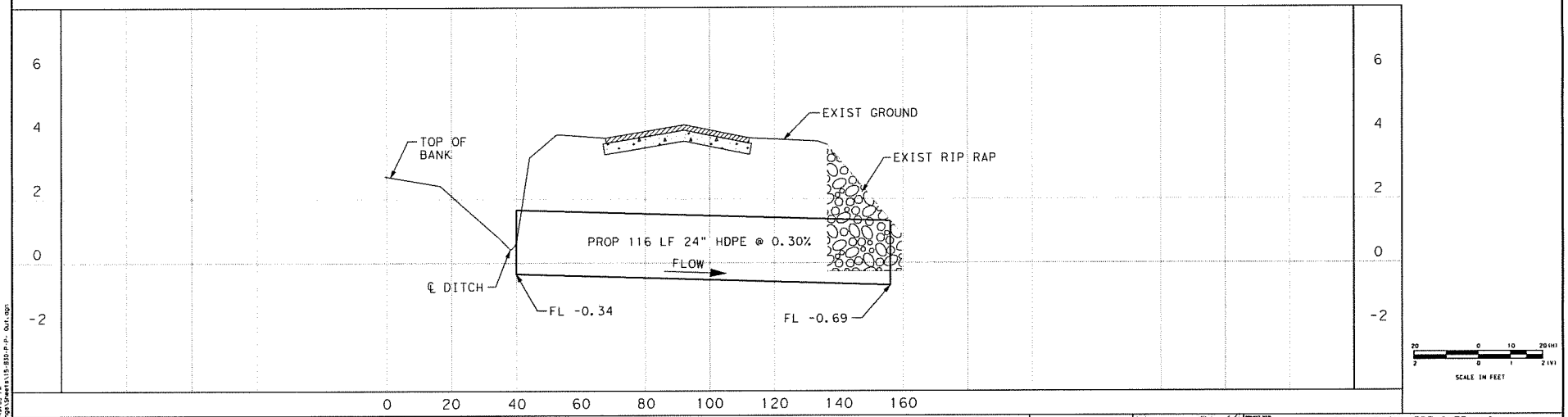
NOTE:
TRENCH MAY NOT BE LEFT OPEN OVERNIGHT.
ROADWAY CROSSING MUST BE COMPLETED IN ONE DAY.

SWPPP LEGEND

SILT FENCE INLET PROTECTION 24LF

----- LINEAR SILT FENCE

Bay 30 - Outfall		
	X	Y
P1	3334145.9144	13729371.4549
P2	3334070.2086	13729459.6376



NO.	REVISIONS	DATE	NAME

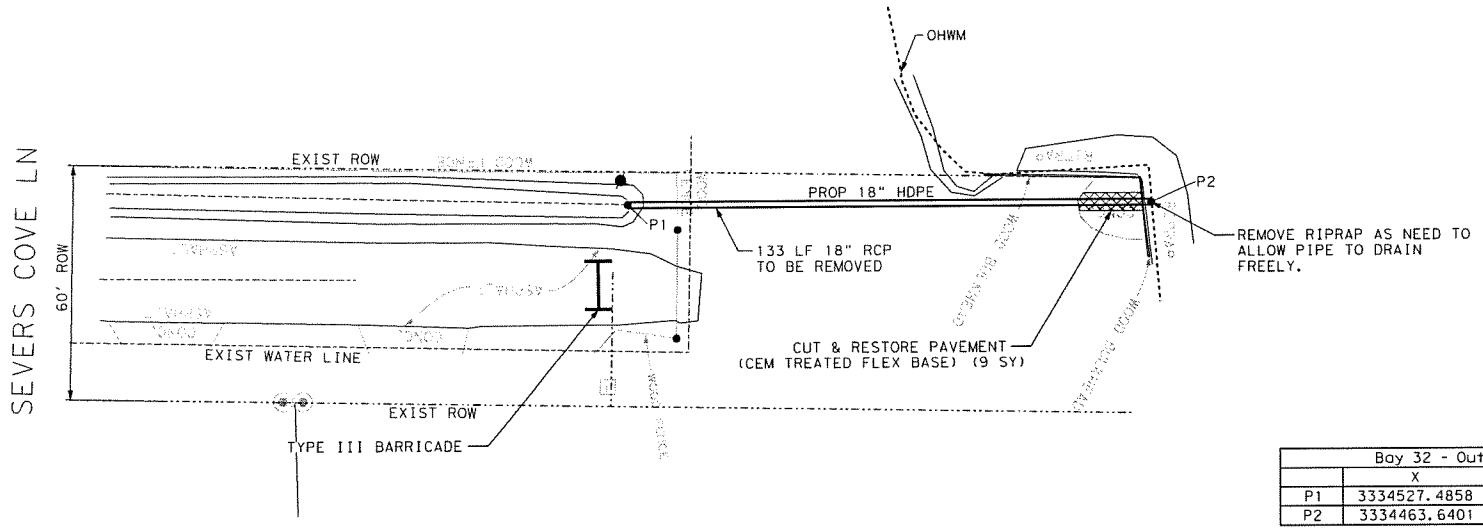
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

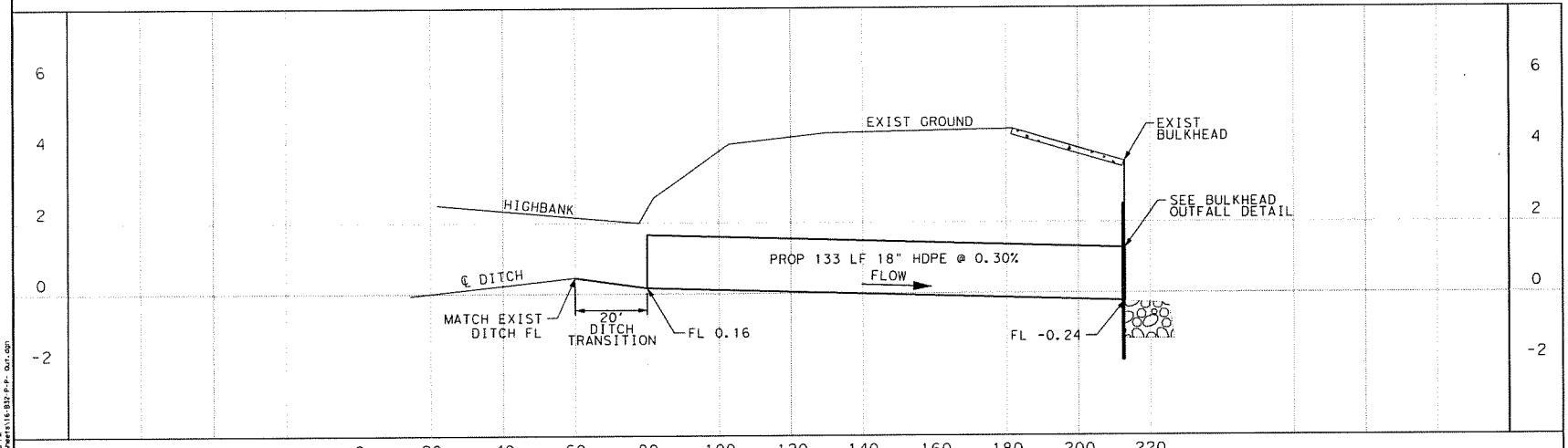
DARRELL L. RADEMA 79298 REGISTERED PROFESSIONAL ENGINEER 06/30/2019

PROJECT TITLE: BOLIVAR CULVERT OUTFALLS
DESIGN BY: DA
DRAWN BY: DLK
CHKD:
DATE: 8/21/2019
SHEET DESCRIPTION: BAY 30 OUTFALL PLAN AND PROFILE
APPROVED BY:
JOB NO: 330005.00
FILE NAME:
FILE NO:
SHT NO: 15 / 27

8/21/2019 11:45:55 PM
G:\2013\330005\Drawings\Sheets\15-BAY-P+P- Out.dgn



Bay 32 - Outfall		
	X	Y
P1	3334527.4858	13730053.8263
P2	3334463.6401	13730170.5960



SCALE IN FEET

8/21/2019 4:45:56 PM
G:\2013\130005\Drawings\Sheets\16-BAY-P-P-Out.dgn

NO.	REVISIONS	DATE	NAME

GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

DARRELL L. RADENA 79258 REGISTERED PROFESSIONAL ENGINEER 06/30/2019

8/21/2019

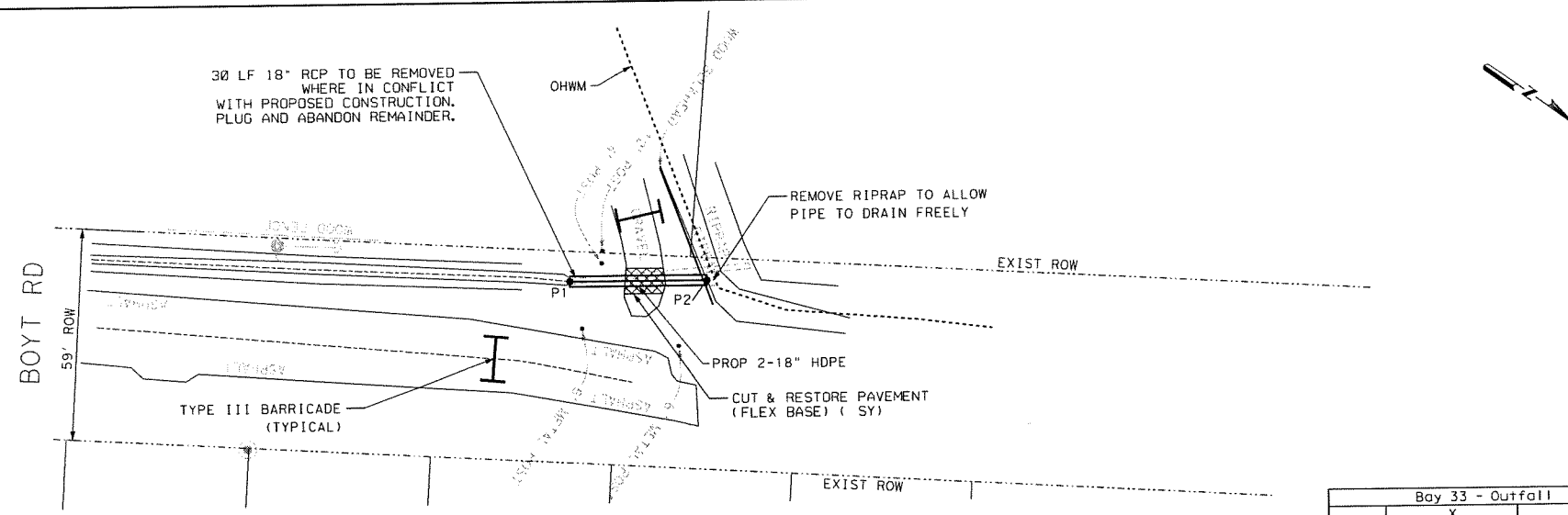
BOLIVAR CULVERT OUTFALLS

BAY 32 OUTFALL

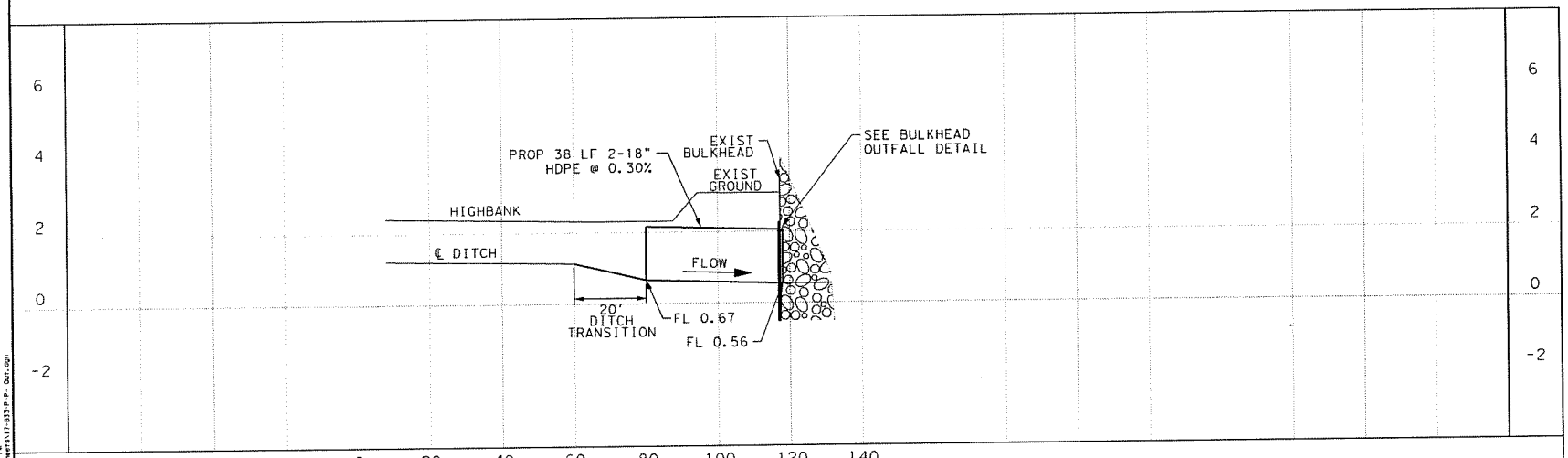
PLAN AND PROFILE

130005.00

16 / 27



Bay 33 - Outfall		
	X	Y
P1	3334804.6770	13730469.8506
P2	3334782.9018	13730500.9862

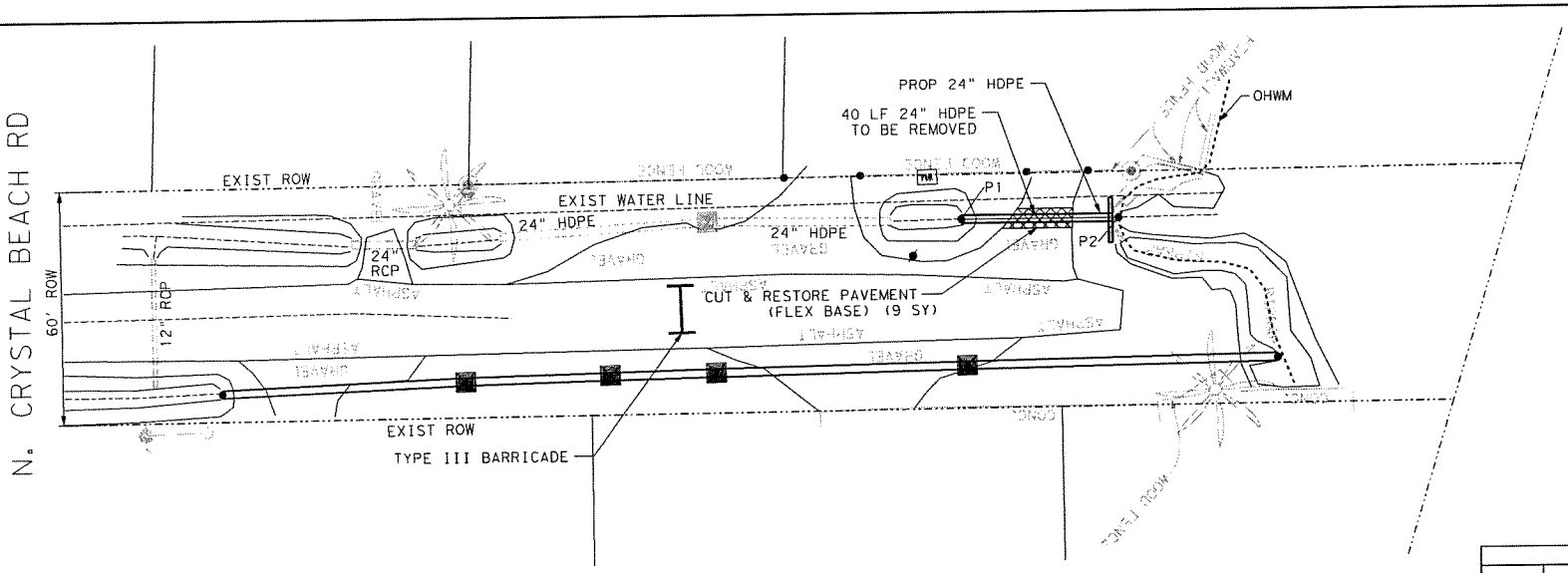


GALVESTON COUNTY

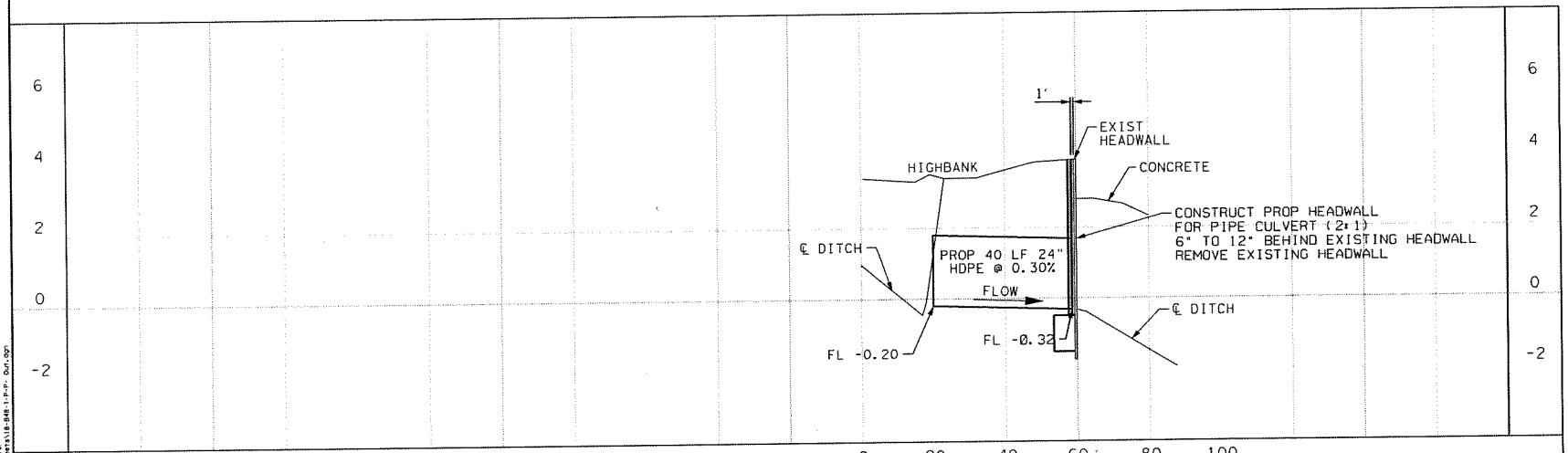
CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0300
FX: (281) 304-0210
REGISTRATION NO. F-382

DARRELL L. SADERA
75298
REGISTERED PROFESSIONAL ENGINEER
06/30/2019

BOLIVAR CULVERT OUTFALLS
BAY 33 OUTFALL
PLAN AND PROFILE
330005.00
8/21/2019
17 / 27



Bay 48-1 - Outfall		
	X	Y
P1	3352965.5002	13742676.8349
P2	3352938.7978	13742706.8466

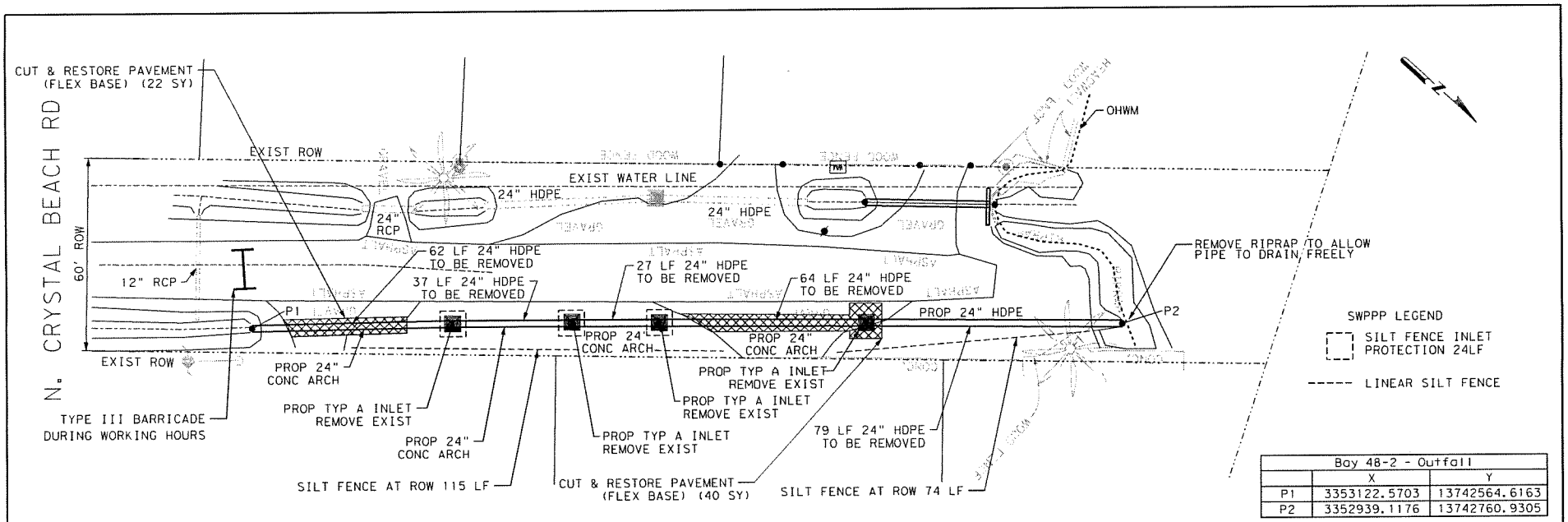


GALVESTON COUNTY

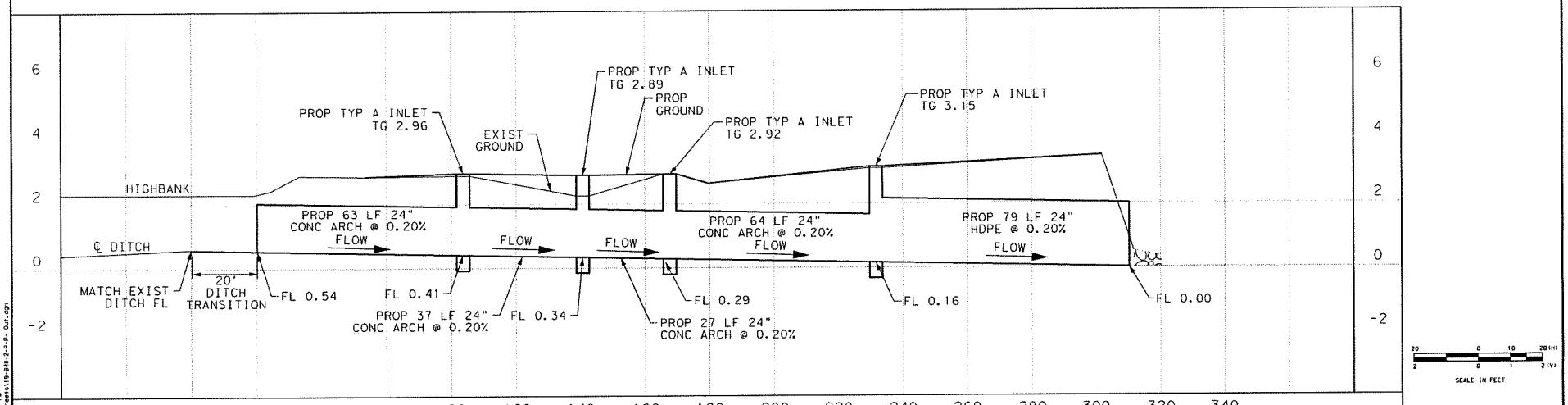
CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0300
FX: (281) 304-0210
REGISTRATION NO. F-382

DARRELL L. RADEMA
79298
REGISTERED PROFESSIONAL ENGINEER
06/30/2019

BOLIVAR CULVERT OUTFALLS
BAY 48-1 OUTFALL
PLAN AND PROFILE
330005.00
18 / 27
8/21/2019



Bay 48-2 - Outfall		
	X	Y
P1	3353122.5703	13742564.6163
P2	3352939.1176	13742760.9305



8/21/2019 4:45:57 PM
G:\2013\330005\Drawings\Sheets\19-BAY 2-1-#- Out.dgn

NO.	REVISIONS	DATE	NAME

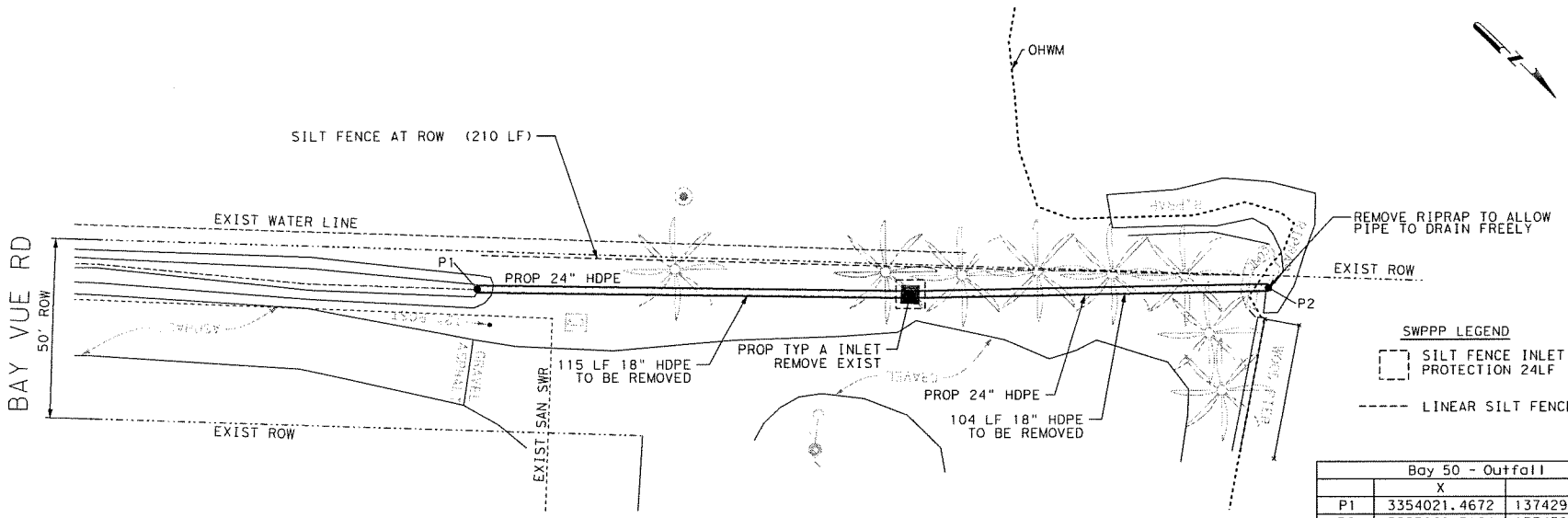
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

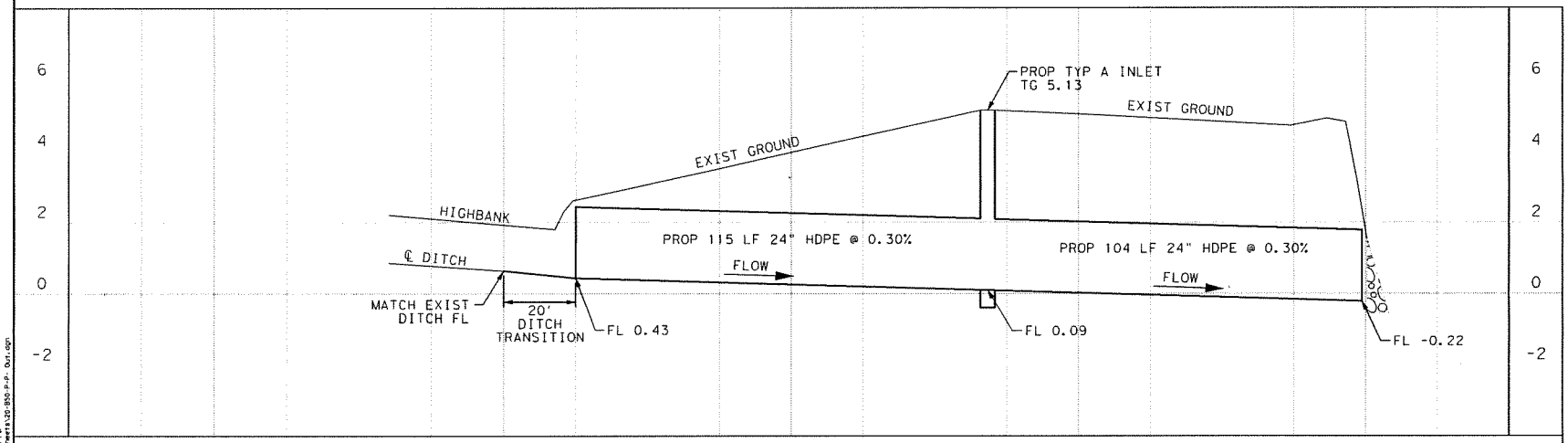
DARRELL L. RADEMA
79256
REGISTERED
PROFESSIONAL ENGINEER
06/30/2019

8/21/2019

PROJECT TASK: BOLIVAR CULVERT OUTFALLS
DESIGN BY: DA
DRAWN BY: DLK
CHECK BY:
SHEET DESCRIPTION: BAY 48-2 OUTFALL
PLAN AND PROFILE
JOB NO. 330005.00
FILE NAME:
DATE: 8/21/2019
APPROVED BY:
SHT NO. 19 / 27



Bay 50 - Outfall		
	X	Y
P1	3354021.4672	13742938.2779
P2	3353868.5164	13743094.6597



NO.	REVISIONS	DATE	NAME

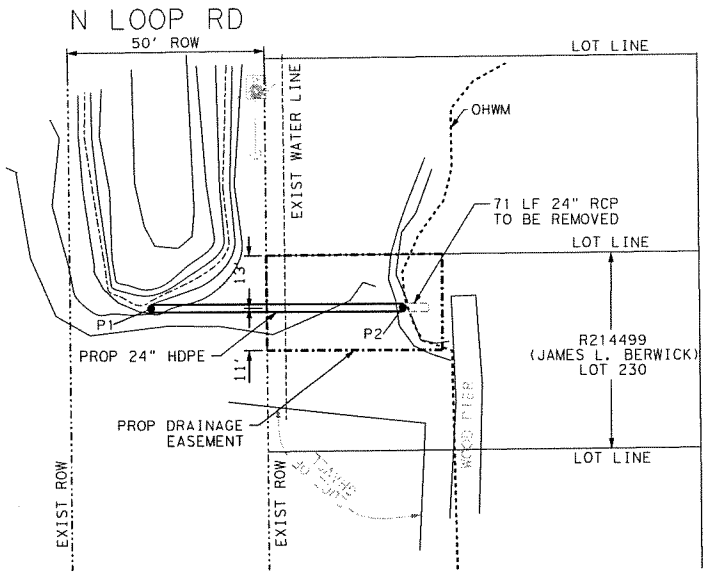
GALVESTON COUNTY

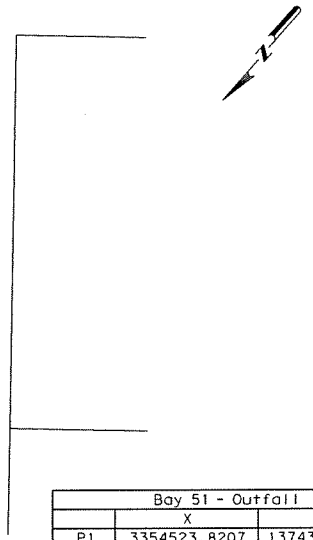
CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0300
FX: (281) 304-0210
REGISTRATION NO. F-382

DARRELL L. RADEMAKER 79298 REGISTERED PROFESSIONAL ENGINEER 06/30/2019

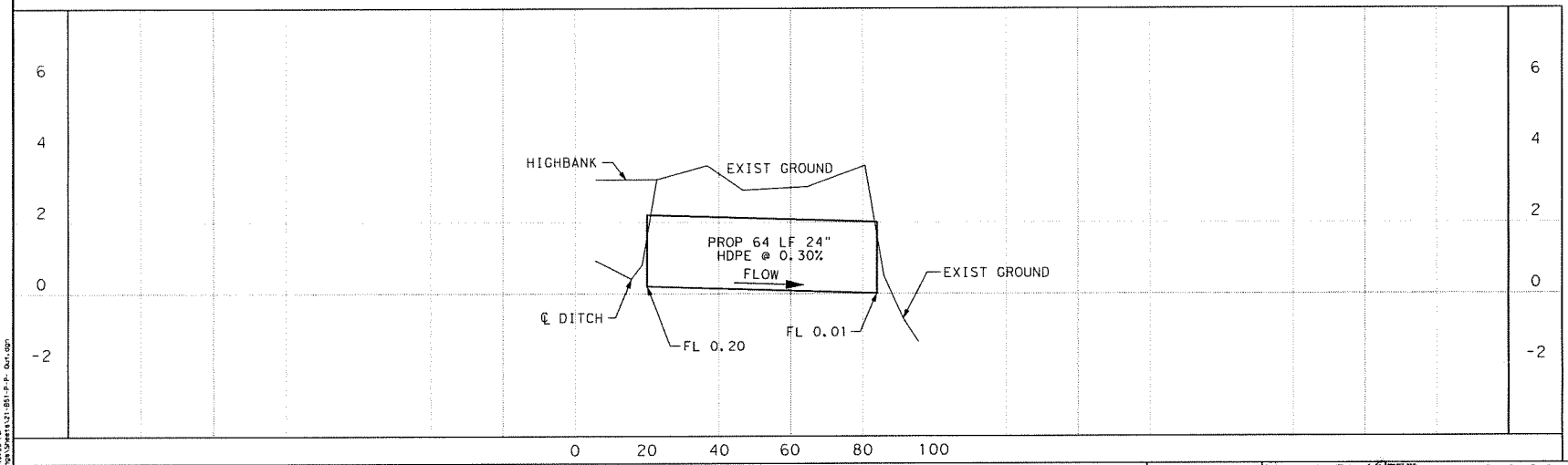
PROJECT TITLE	BOLIVAR CULVERT OUTFALLS	
DESIGN BY: DA	SHEET DESCRIPTION: BAY 50 OUTFALL	JOB NO. 330005.00
DATE BY: DLK	PLAN AND PROFILE	FILE NAME:
SCALE:		FILE NO.
DATE: 8/21/2019	APPROVED BY:	SHT NO. 20 / 27

8/21/2019 4:45:58 PM
D:\2019\330005\Dgn\Sheets\330-B50-P-P- Out.dgn





Bay 51 - Outfall		
	X	Y
P1	3354523.8207	13743125.3485
P2	3354476.2979	13743082.4797



NO.	REVISIONS	DATE	NAME

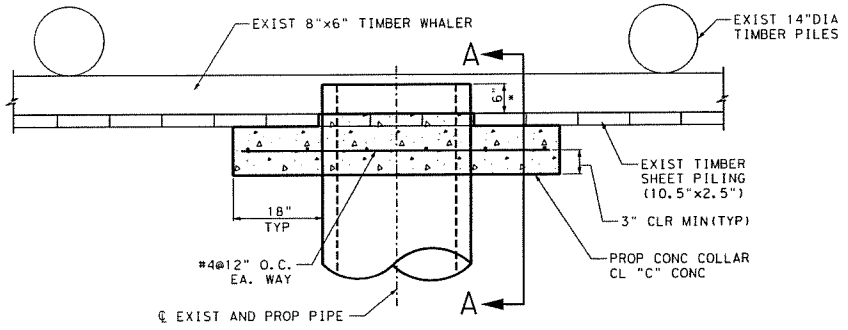
GALVESTON COUNTY

CivilTech Engineering, Inc.
11621 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

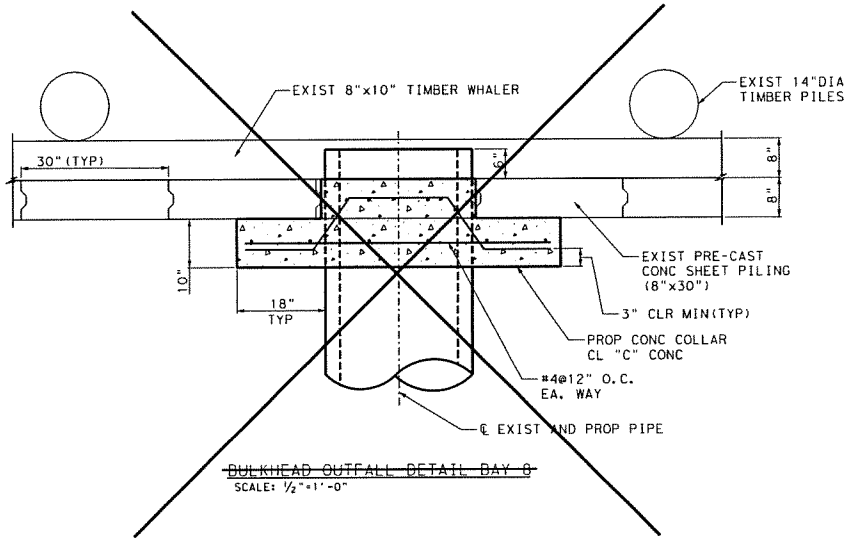
DARRELL L. RADEMA 79298 REGISTERED PROFESSIONAL ENGINEER 08/30/2019

PROJECT TITLE	BOLIVAR CULVERT OUTFALLS
DESIGNED BY: DA	SHEET DESCRIPTION: BAY 51 CROSS CULVERT
DRAWN BY: DLK	PLAN AND PROFILE
CHECKED BY:	
SCALE:	
DATE: 8/21/2019	APPROVED BY:
JOB NO.	330005.00
FILE NAME:	
FILE NO.	
SHT NO.	21 / 27

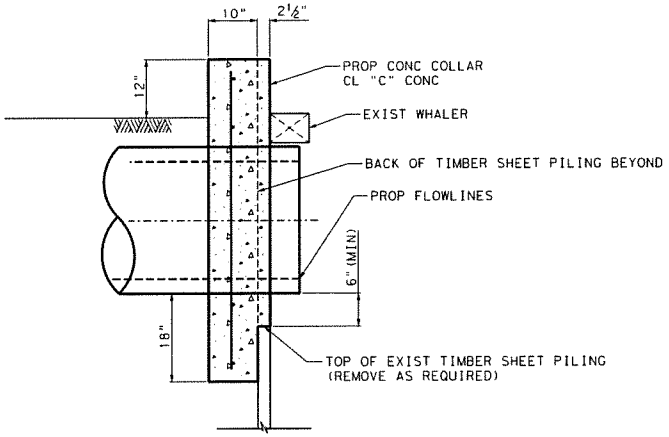
8/21/2019 4:45:58 PM
G:\2021\330005\Drawings\Sheet\21-B51-P-P- Ex1.dgn



BULKHEAD OUTFALL DETAIL ~~BAY 7~~, BAY 32, BAY 33
SCALE: ½"=1'-0"



~~BULKHEAD OUTFALL DETAIL BAY 8~~
SCALE: ½"=1'-0"



ELEVATION
SCALE: ½"=1'-0"

NOTES:
PROVIDE SINGLE LAYER OF 15 16 ROOFING FELT BETWEEN PROPOSED CONCRETE COLLAR AND ALL EXISTING BULKHEAD SURFACES.
PLACE PROPOSED CONCRETE COLLAR DIRECTLY AGAINST STORM SEWER WITHOUT THE USE OF ROOFING FELT.
"×" EXTEND PIPE TO LIMITS OF EXISTING ROCK RIP RAP WHERE RIP RAP IS PRESENT BEYOND BULKHEAD.

NO.	REVISIONS	DATE	NAME
1	ADDENDUM #2 - REMOVED BAY 7 AND BAY 8	8/21/19	DLK

GALVESTON COUNTY

CivilTech Engineering, Inc.
11521 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

DARRELL L. BADEMA 75298 REGISTERED PROFESSIONAL ENGINEER 06/30/2019

PROJECT TITLE	BOLIVAR CULVERT OUTFALLS
DESIGNED BY: DA	SHEET DESCRIPTION: BULKHEAD OUTFALL DETAIL
DATE BY: DLK	JOB NO. 330005.00
CHECKED BY:	FILE NAME:
DATE: 8/21/2019	APPROVED BY:
	FILE NO.
	SHT NO. 22 / 27

8/21/2019 4:45:59 PM
G:\2019\330005\Drawings\22 BOL-BULKHEAD DETAILS.dgn

TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (4)

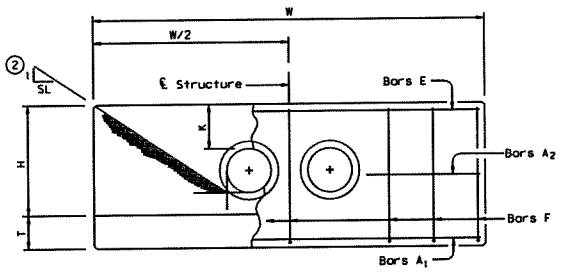
SLOPE	DIA OF PIPE, D	Values for one Pipe
		W
2:1	24"	14'- 0"

TABLE OF CONSTANT DIMENSIONS

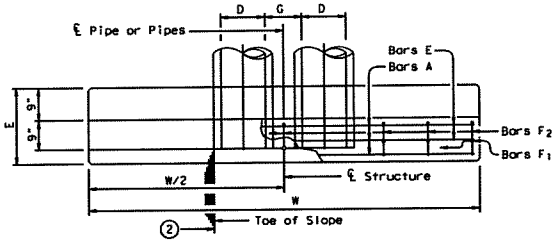
DIA OF PIPE, D	G	K	H	T	E
24"	1'- 7"	2'- 0"	4'- 8"	9"	2'- 0"

TABLE OF REINFORCING STEEL (4)

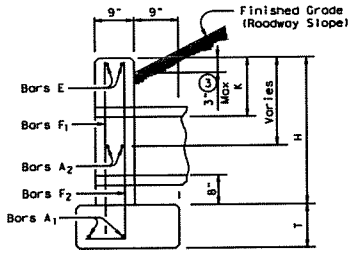
Bar	Size	Spa	No.
A1	# 5	~	2
A2	# 5	1'-6"	~
E	# 5	~	2
F	# 5	1'-0"	~



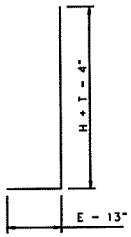
ELEVATION



PLAN OF NON-SKEWED PIPES



℄ SECTION



BARS F2

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

Reinforcing steel shall be placed with the center of the outside layer of bars 2" from the surface of the concrete.

All reinforcing steel shall be Grade 60.

All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.

No bridge rails of any type may be mounted directly to these culvert headwalls.

(1) *OMITTED*

(2) Indicated slope is perpendicular to centerline Pipe or Pipes.

(3) For vehicle safety, curbs shall project no more than 3" above finished grade. Curb heights shall be reduced, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

(4) Quantities shown are for one structure end only (one headwall).

NO.	REVISIONS	DATE	NAME

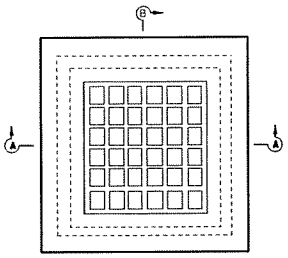
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

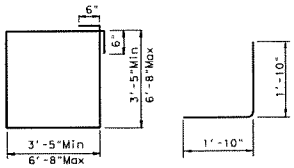
DARRELL L. RADEMA, 79298, REGISTERED PROFESSIONAL ENGINEER, STATE OF TEXAS, 06/30/2019

PROJECT TITLE: BOLIVAR CULVERT OUTFALLS
DRAWN BY: DA
DATE: 8/21/2019
SHEET DESCRIPTION: HEADWALL DETAIL
JOB NO. 330006.00
FILE NAME:
SHT NO. 23 / 27

8/21/2019 4:45:59 PM
J:\2013\330003\Drawings\Sheets\23-BOLIVAR HEADWALL DET.dgn

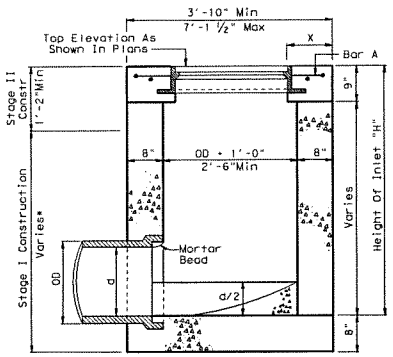


PLAN



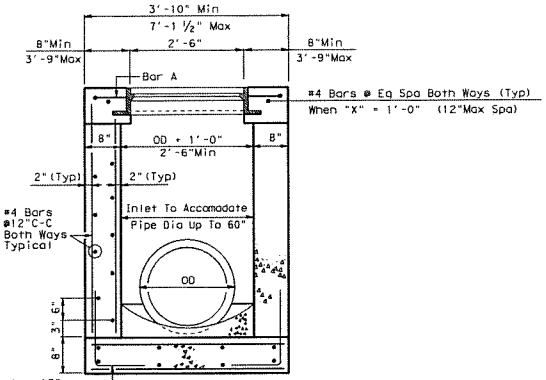
BAR A (#4)

BAR L (#4)



* But Not Less Than Six Inches Over Highest Entering Pipe.

SECTION A-A



SECTION B-B

TYPE A INLET

GENERAL NOTES:

Where Size Of Pipes Passing Thru Inlet Exceeds 30" Increase Inside Width To Outside Diameter Of Pipe Plus 1'-0" (OD + 1'-0").

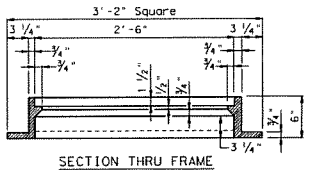
Cast Iron Manhole Steps (See Manhole Details) Spaced At 16" Centers And Located On Wall Specified By The Engineer Shall Be Provided And Installed Where "D" Exceeds 5'-0".

See Standard or Detail Sheet For Excavation and Backfill Diagrams.

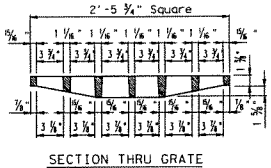
Inlets Shall Be Built To Stage I And Finished After All Grading Operations Are Substantially Completed.

Frames And Grates May Be Gray Cast Iron.

Shop Drawings Will Be Required For Precast Construction Of Inlets.



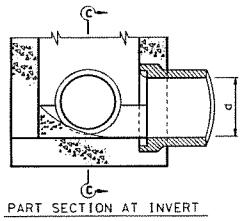
SECTION THRU FRAME



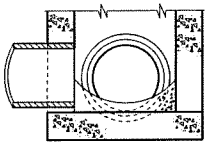
SECTION THRU GRATE

FRAME AND GRATE

Neenah No. R3418-A
EJIW No. V-4880-1

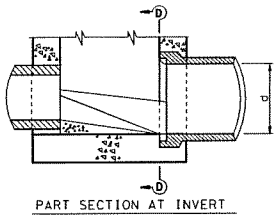


PART SECTION AT INVERT

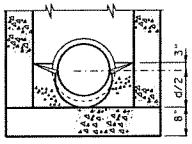


SECTION C-C

Showing Shaping Of Invert, Pipe Entering From Adjacent Sides



PART SECTION AT INVERT



SECTION D-D

Showing Shaping Of Invert, Pipe Entering From Opposite Sides

d = Diameter

NOT FOR TRAFFIC LOADS

Texas Department of Transportation
Houston District

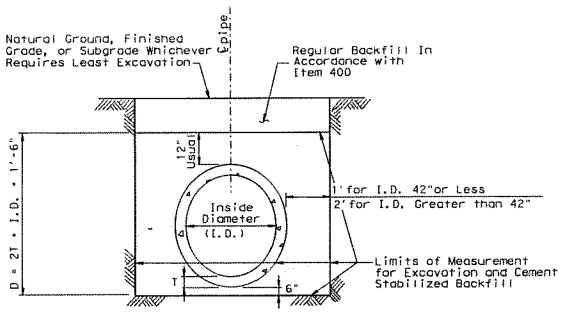
INLET TYPE A

HIL-A

FILE: STDD4.DCN	DW: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	STDI
© TxDOT 2014	DIST	FED REG	PROJECT NO.		SHEET
REVISIONS	HOUS	6			24
	COUNTY		CONTROL	SECT	JOB	HIGHWAY

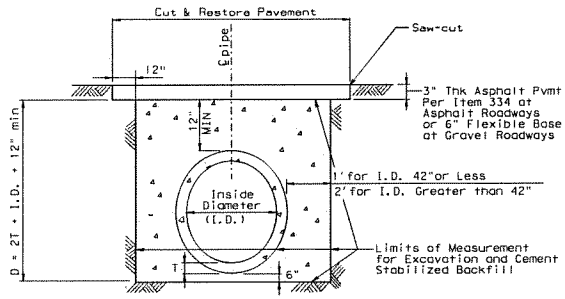
STATE OF TEXAS
DARRELL L. BAGENAS
79298
REGISTERED PROFESSIONAL ENGINEER
06/30/2019

STDD4.DGN



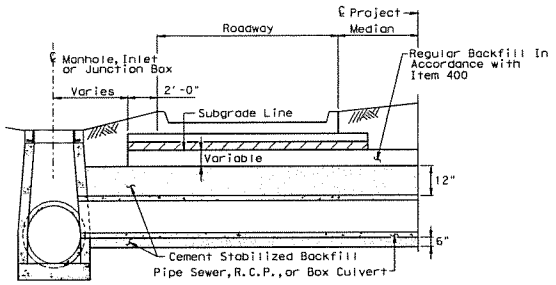
EXCAVATION & BACKFILL DETAIL

REINFORCED CONCRETE PIPE
IN AN UNPAVED AREA INCLUDING DETOURS



EXCAVATION & BACKFILL DETAIL

REINFORCED CONCRETE PIPE
IN A PAVED AREA INCLUDING DETOURS



BACKFILL DETAIL

AT MANHOLE, INLET OR JUNCTION BOX

REINFORCED CONCRETE PIPE

EXCAVATION AND BACKFILL QUANTITIES

PIPE DIA. IN.	T FT.	CULVERT OR SEWER EXCAVATION IN A PAVED OR GRADED AREA C.Y. PER L.F. PER FT. OF DEPTH	CEMENT STABILIZED BACKFILL IN A PAVED OR GRADED AREA C.Y. PER L.F. OF PIPE
12, 18	0.19	0.144	0.383
24	0.23	0.165	0.478
30	0.29	0.188	0.586
36	0.33	0.210	0.692
42	0.38	0.231	0.808
48	0.42	0.327	1.394
54	0.46	0.349	1.560
60	0.50	0.370	1.731
66	0.54	0.392	1.907
72	0.58	0.414	2.088
78	0.62	0.435	2.275
84	0.67	0.457	2.474

NOTE:
In accordance with TxDOT Item 400, a permeable layer of rock may be used as bedding material in trenches where where high water or saturated and weak soils are present.

D = Depth
H = Height
T = Thickness
R = Radius
Dia = Diameter

Rubber gaskets shall be required for all joints on proposed cross drainage, pipe culverts and proposed storm sewer systems, unless otherwise shown in the plans.

* Backfill with cement stabilized material will be required for all structures under detours unless noted otherwise in the General Notes.

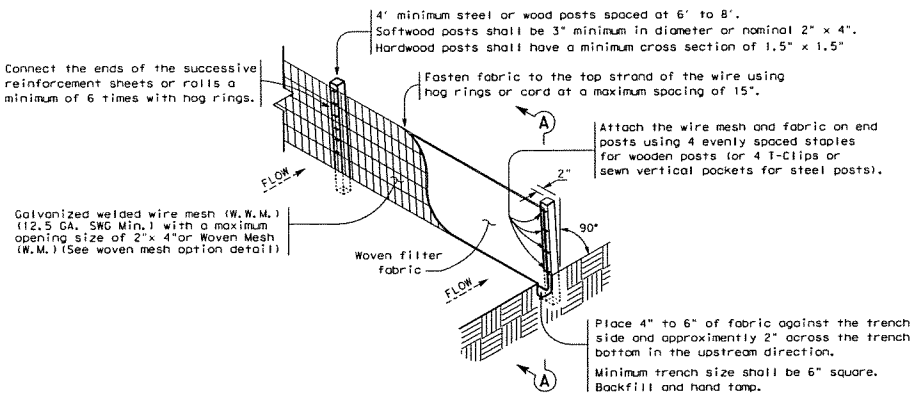
STATE OF TEXAS
DARRELL L. RADEMA
79208
REGISTERED PROFESSIONAL ENGINEER
06/30/2019

Texas Department of Transportation
Houston District

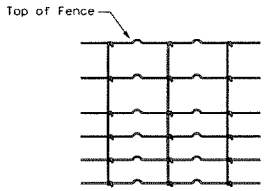
EXCAVATION AND BACKFILL DIAGRAMS

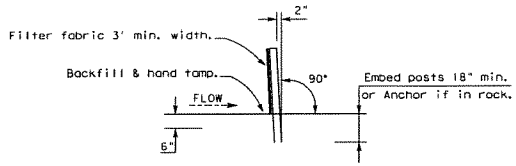
E&BD

FILE: STDE1.DGN	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT FEB 2010	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS REVISED 11/05 REVISED 2/2010 Added note to Table 1, Snt 2 of 2. REVISED 6/12	HOUSTON	6		25
	COUNTY		CONTROL SECT	JOB HIGHWAY



TEMPORARY SEDIMENT CONTROL FENCE





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

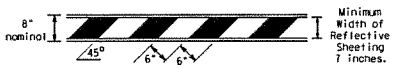
A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

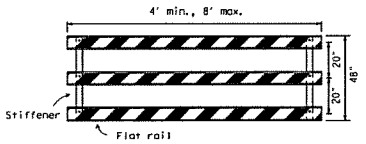
TYPE 3 BARRICADES

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

NO.	REVISIONS	DATE	NAME

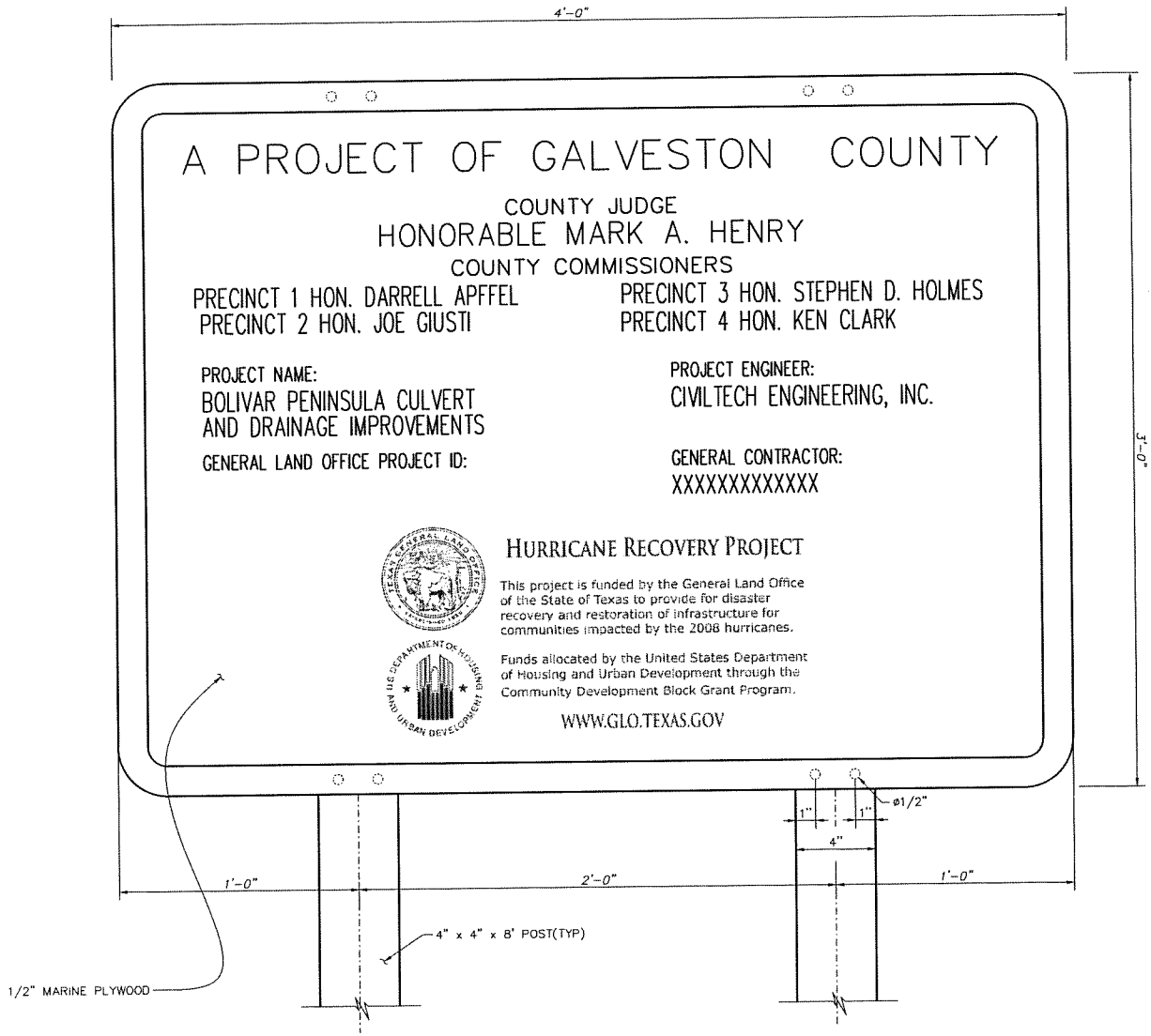
GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0200
FX: (281) 304-0210
REGISTRATION NO. F-382

DARRELL L. RADEMA 79298 REGISTERED PROFESSIONAL ENGINEER 08/30/2019

PROJECT TITLE	BOLIVAR CULVERT OUTFALLS
DESIGN BY	DA
SHEET DESCRIPTION	MISCELLANEOUS DETAILS
JOB NO.	330005.00
DATE BY	DLK
SCALE	
FILE NAME	
DATE	8/21/2019
APPROVED BY	
SHT NO.	26 / 27

8/21/2019 4:48:01 PM
C:\CIVILTECH\330005\Drawings\330005-426-804.441sc.DET.dgn



NO.	REVISIONS	DATE	NAME

GALVESTON COUNTY

CivilTech Engineering, Inc.
11821 TELGE ROAD
CYPRESS, TEXAS 77429
PH: (281)304-0300
FX: (281) 304-0210
REGISTRATION NO. F-582

DARRELL L. RADERA 79298 REGISTERED PROFESSIONAL ENGINEER 06/30/2019

BOLIVAR CULVERT OUTFALLS

DESIGN BY: DA	JOB NO. 330005.00
DETD BY: DLK	FILE NAME:
CHKD:	FILE NO.
DATE: 8/21/2019	APPROVED BY:
	SHT NO. 27 / 27

8/21/2019 4:46:02 PM
G:\2013\330005\Drawings\Sheets\27-BOL.dgn | sign.dgn

SPECIAL ITEM 2505

HIGH DENSITY POLYETHYLENE PIPE

PART 1 – GENERAL

1.1 SUMMARY

Section includes requirements for high density corrugated polyethylene (HDPE) smooth lined (open profile) pipe for gravity sewers and drains, including fittings and appurtenances.

1.2 MEASUREMENT AND PAYMENT

This item will be measured by the foot. Pipe will be measured between the ends of the barrel along the flow line. This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal, unless modified by Article 9.2, "Plans Quantity Measurement". The price paid is full compensation for furnishing, hauling, placing, and joining of pipes; jointing materials; all connections to new or existing structures; cutting pipe ends, on skew or slope; and equipment, labor, tools, and incidentals.

1.3 REFERENCES

ASTM D 3212 – Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
ASTM D 3350 – Polyethylene Plastics Pipe and Fittings Materials.
ASTM D 4976 – Polyethylene Plastics Molding and Extrusion Materials.
ASTM F 477 – Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
AASHTO M294 – Corrugated Polyethylene Pipe, 300- to 1500-mm Diameter.

PART 2 – P R O D U C T S

2.1 PIPE AND FITTINGS

Provide HDPE pipe which conform to the requirements of cell classes 33500C or 335510C per ASTM D 3350 except that carbon black shall not exceed 5% for 12 inch through 60 inch diameters.

Furnish corrugated HDPE smooth lined gravity sewer pipe with integral bell and "o"-ring gasketed spigot (bell-n-spigot). The bell shall overlap a minimum of two corrugations of the spigot end when fully engaged. Join two straight cut pipe (not tapered) ends by either a double "o"-ring gasketed bell-bell coupler or an external double wide coupler with 4 stainless steel bands and tensioning locking mechanisms or approved equal.

Do not use HDPE pipe in applications requiring auguring of sewer pipe.

PART 3 – EXECUTION

3.1 INSTALLATION

Excavate, shape, bed, and backfill in accordance with the manufacturer's recommended installation procedures and Item 400, "Excavation and Backfill for Structures".

END OF SPECIAL ITEM 2505