CONSTRUCTION PLANS FOR
EAST DRAINAGE CHANNELS

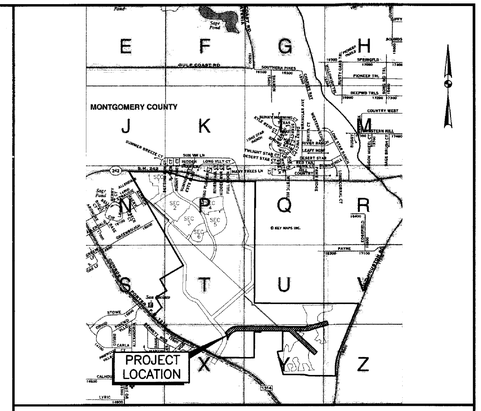
TO SERVE

2,200 ACRE MONTGOMERY COUNTY TRACT

MONTGOMERY COUNTY MUNICIPAL UTILITY DISTRICT NO. 157
CITY OF CONROE ETJ, MONTGOMERY COUNTY, TEXAS

JOB NO. 1968-16003

DATE : DECEMBER 2018



VICINITY MAP
MONTGOMERY KEY MAP 220 X, Y & Z
(NTS)

SHEET INDEX

PLAN & PROFILE

CROSS SECTIONS

DETAILS

DIAL 811
ONE CALL NOTIFICATION SYSTEM
CALL BEFORE YOU DIG
(713) 223-4567 (IN HOUSTON)
(New Statewide Number Outside Houston)
1-800-545-6005

FIRM
Flood Insurance Rate
Panel: 48339C0575G
Map Revised: August 18, 2014
This site is in Unshaded Zone X

MONTGOMERY COUNTY
ENGINEERING DEPARTMENT
Approved: _____ County Engineer
Date: 11/16/18

STATE OF TEXAS
CHRISTOPHER A. LEBLANC
100170
LICENSED
PROFESSIONAL ENGINEER
12/20/18

RECORD DRAWING
I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS
BY _____ DATE _____
PRINTED NAME _____
TITLE _____ INITIAL _____
COMPANY _____

APPROVED FOR CONSTRUCTION
BY _____ DATE _____

OWNER:
MONTGOMERY COUNTY MUNICIPAL UTILITY DISTRICT NO. 157
9 GREENWAY PLAZA, SUITE 1100
HOUSTON, TEXAS 77046

ENGINEER:
LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN-F-1386

4436

SHEET 1 OF 23

EAST DRAINAGE CHANNELS - TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT - JOB NO. 1968-16003

Date\Time : Wed, 19 Dec 2018 - 5:21pm User Name : jpinks
Path\Name : C:\Users\jpinks\Documents\Temp\AcPublish_13\2101-Cover Sheet.dwg

GENERAL CONSTRUCTION NOTES

THE FOLLOWING NOTES ARE STANDARDS TO ALL CONSTRUCTION AND ARE TO BE INCLUDED IN ALL SETS OF CONSTRUCTION DRAWINGS.

1. MATERIALS, CONSTRUCTION AND TESTING TO BE IN ACCORDANCE WITH MONTGOMERY COUNTY ORDINANCES AND SPECIFICATIONS, LATEST PRINTING AND AMENDMENTS THERETO.
2. CONTRACTOR SHALL OBTAIN ALL DEVELOPMENT AND CONSTRUCTION PERMITS REQUIRED BY MONTGOMERY COUNTY AT CONTRACTOR'S EXPENSE PRIOR TO COMMENCEMENT OF WORK.
3. CONTRACTOR SHALL GIVE NOTICE TO ALL AUTHORIZED INSPECTORS, SUPERINTENDENTS OR PERSONS IN CHARGE OF PRIVATE AND PUBLIC UTILITIES OR RAILROADS AFFECTED BY HIS OPERATIONS AND MONTGOMERY COUNTY DEPARTMENT OF ENGINEERING 48 (OR 72) HOURS PRIOR TO COMMENCEMENT OF WORK IN STREET RIGHTS-OF-WAY OR EASEMENTS.
4. ALL EXISTING UNDERGROUND UTILITIES ARE NOT GUARANTEED TO BE COMPLETED OR DEFINITE, BUT WERE OBTAINED FROM THE BEST INFORMATION AVAILABLE. CONTRACTOR HAS SOLE RESPONSIBILITY FOR FIELD VERIFICATION OF ALL EXISTING FACILITIES SHOWN ON DRAWINGS. CONTRACTOR SHALL COORDINATE ALL CONFLICTS WITH THE APPROPRIATE GOVERNING AGENCY.
5. THE LOCATIONS OF AT&T COMPANY, ENTERPRISE PIPELINE, TEXAS EXPRESS PIPELINE, EXPLORER PIPELINE OR KINDER MORGAN PIPELINE AND TXU UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL REQUEST THE EXACT LOCATION OF THESE FACILITIES BY CALLING THE UTILITY COMPANIES, AT LEAST 48 (OR 72) HOURS BEFORE COMMENCING WORK. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE WHICH OCCURS DUE TO FAILURE TO REQUEST THE LOCATION AND PRESERVATION OF THESE UNDERGROUND FACILITIES. ANY DAMAGE TO EXISTING FACILITIES INCURRED AS A RESULT OF CONSTRUCTION OPERATIONS WILL BE REPAIRED BY THE CONTRACTOR AT HIS OWN EXPENSE.
6. TEXAS LAW ARTICLE 1436C, PROHIBITS ALL ACTIVITIES IN WHICH PERSONS OR EQUIPMENT MAY COME WITHIN 6 FEET OF ENERGIZED OVERHEAD POWER LINES, AND FEDERAL REGULATION, TITLE 29, PART 1910.1301) AND PART 1926.440(e)(15) REQUIRE A MINIMUM CLEARANCE OF 10 FEET FROM THESE FACILITIES. THE ABOVE LAWS CARRY BOTH CRIMINAL AND CIVIL LIABILITIES, WITH CONTRACTORS AND OWNERS BEING LEGALLY RESPONSIBLE FOR THE SAFETY OF WORKERS UNDER THESE LAWS. IF YOU OR YOUR COMPANY MUST WORK NEAR ENERGIZED OVERHEAD POWER LINES, CALL THE POWER COMPANY FOR THE LINES TO BE DE-ENERGIZED AND/OR MOVED AT YOUR EXPENSE.
7. CONSTRUCTION SHALL COMPLY WITH THE LATEST REVISIONS OF OSHA REGULATIONS AND STATE OF TEXAS LAW CONCERNING TRENCHING AND SHORING. CONTRACTOR SHALL PROVIDE A TRENCH SAFETY SYSTEM TO MEET, AS A MINIMUM, THE REQUIREMENTS OF OSHA SAFETY AND HEALTH REGULATION, PART 1926, SUB-PART P AS PUBLISHED IN THE FEDERAL REGISTER, VOLUME 54, NO. 209, DATED OCTOBER 31, 1989, AND CITY OF CONROE ORDINANCE NUMBER 1033-87, AND LATEST REVISIONS.
8. DETAILS PREPARED BY MONTGOMERY COUNTY OR THE CONSTRUCTION PLANS DO NOT EXTEND TO OR INCLUDE DESIGNS OR SYSTEMS PERTAINING TO THE SAFETY OF THE CONTRACTOR OF ITS EMPLOYEES AGENTS, OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE CONSTRUCTION CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS, INCLUDING THE PLANS AND SPECIFICATIONS REQUIRED BY CHAPTER 756, SUBCHAPTER "C" OF THE TEXAS HEALTH AND SAFETY CODE.
9. CONTRACTOR SHALL COVER OPEN EXCAVATIONS WITH ANCHORED STEEL PLATES DURING NON-WORKING HOURS, ALONG EXISTING ROADWAYS AND TRAFFIC AREAS.
10. ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION AND ANY DRAINAGE DITCH OR STRUCTURE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO THE SATISFACTION OF MONTGOMERY COUNTY OR THE RESPECTIVE OWNER OF THE FACILITY. ALL CONSTRUCTION RUNOFF SHALL COMPLY WITH STORM WATER MANAGEMENT FOR CONSTRUCTION ACTIVITIES AND THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) REQUIREMENTS.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE FLAGMEN, SIGNING, STRIPING AND WARNING DEVICES, ETC., DURING CONSTRUCTION BOTH DAY AND NIGHT IN ACCORDANCE WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES." CONTRACTOR SHALL MAIN AIN AT LEAST ONE LANE OF TRAFFIC IN EACH DIRECTION DURING WORKING HOURS OR PROVIDE ALL-WEATHER DETOURS AROUND CONSTRUCTION SITE, PROVIDE PUBLIC NOTIFICATION, AND USE UNIFORMED POLICE OFFICERS TO CONTROL TRAFFIC.
12. EXISTING PAVEMENTS, CURBS, SIDEWALKS AND DRIVEWAYS DAMAGED OR REMOVED DURING CONSTRUCTION SHALL BE REPLACED TO MONTGOMERY COUNTY OR APPLICABLE PROVIDED STANDARDS. ALL ASPHALT AND CONCRETE DRIVEWAYS EXCAVATED DURING CONSTRUCTION SHALL BE BACKFILLED WITH STABILIZED MATERIAL AND RETURNED TO EXISTING CONDITIONS. ALL STATE AND COUNTY HIGHWAY PAVEMENT AND RAILROAD RIGHT-OF-WAYS TO BE BORED ACCORDING TO THE RULES, REGULATIONS AND REQUIREMENTS FOR APPROVAL AND ACCEPTANCE BY SAID AGENCIES.
13. EXISTING ROADS AND/OR RIGHT-OF-WAYS DISTURBED DURING CONSTRUCTION SHALL BE AS GOOD OR BETTER THAN THE CONDITION PRIOR TO STARTING THE WORK, UPON COMPLETION OF THE PROJECT.

    AFTER DISTURBED AREAS HAVE BEEN COMPLETED TO THE LINES, GRADES, AND CROSS-SECTIONS SHOWN ON THE PLANS, SEEDING SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS TO ESTABLISH ADEQUATE VEGETATION COVERAGE TO ELIMINATE EROSION. IF NO PROVISION FOR PLANTING GRASS IS INCLUDED IN THE PLANS OR SPECIFICATIONS, THE MINIMUM REQUIREMENT FOR THIS ITEM WILL BE IN ACCORDANCE WITH THE TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR "SODDING OR SEEDING FOR EROSION CONTROL."
14. ALL TRENCHES, INCLUDING TRENCHES FOR LEADS AND STUBS UNDER PAVEMENT AND TO A POINT ONE (1) FOOT BACK OF ALL CURBS SHALL BE BACKFILLED WITH CEMENT STABILIZED SAND AS PER SPECIFICATION TO A POINT IMMEDIATELY BELOW THE SUBGRADE. TRENCHES OTHER THAN UNDER PAVEMENT SHALL BE BACKFILLED WITH SUITABLE EARTH MATERIAL IN 6 INCH LAYERS AND MECHANICALLY COMPACTED TO A DENSITY OF NOT LESS THAN 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR COMPACTION TEST (ATSM DESIGNATION D-698/AASHTO T99), MOISTURE CONTENT OF BACKFILL SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CEMENT STABILIZED SAND SPECIFICATIONS. SEE CITY STANDARD DETAIL SHEETS FOR BEDDING AND OTHER DESIGN REQUIREMENTS.
15. INCLUDE PRICE OF ALL BEDDING AND BACKFILL OF TYPE REQUIRED, IN PLACE BID PER LINEAR FOOT OF PIPE.
16. CONTRACTOR TO REMOVE EXISTING PLUGS AND CONNECT TO EXISTING UTILITY LINES AS INDICATED ON PLANS.
17. UNLESS OTHERWISE NOTED ON PLANS, WHERE MANHOLES ARE LOCATED WITHIN THE UTILITY EASEMENTS, THE CONTRACTOR SHALL RIM ELEVATIONS TWO INCHES ABOVE FINISHED GROUND ELEVATIONS.
18. WHEN TRENCH CONDITION REQUIRES THE USE OF WELL POINTS, THIS IS TO BE REQUESTED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.
19. CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING THE MUD AND/OR DIRT DEPOSITED ON EXISTING PAVEMENT DUE TO HIS CONSTRUCTION ACTIVITY DAILY. ALL EQUIPMENT AND DEBRIS FROM CONSTRUCTION TO BE MOVED AT END OF PROJECT.
20. CONTRACTOR SHALL CONTACT THE FOLLOWING A MINIMUM OF 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.

CHRIS LEBLANC	LJA ENGINEERING, INC.	(713) 953-5043
MONTGOMERY COUNTY DEPARTMENT OF ENGINEERING		(936) 539-7833
TxDOT	ROBERT GREENMYER	(936) 538-3356
ENTERPRISE PIPELINE CO. (72 HOURS NOTICE)	LAND ENCROACHMENT GROUP	(866) 901-8170
GULF STATES UTILITIES	JABARI HARVEY	(281) 362-4063

21. ALL AREAS DISTURBED ALONG SIDE AND BACK-OF-LOT EASEMENTS OR OTHER UNNECESSARY DISTURBANCE AS A RESULT OF CONSTRUCTION WORK SHALL BE SEEDED AND FERTILIZED IN ACCORDANCE WITH SEEDING SPECIFICATIONS (NO SEPARATE PAY).
22. ALL STATIONS ARE CENTERLINE OF STREET RIGHT-OF-WAY UNLESS OTHERWISE NOTED.
23. THE CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION
24. MATERICAL USED FOR COMPACTED FILL SHALL HAVE A PLASTIC INDEX (P.I.) BETWEEN 10 AND 20 OR AS DIRECTED BY THE GEOTECHNICAL REPORT.
25. WHEN THE OWNER DETERMINES THAT THE CONTRACTOR IS WORKING IN OR ADJACENT TO DEVELOPED AREAS, NO CONSTRUCTION SHALL COMMENCE PRIOR TO SUNRISE ON WEEK DAYS AND 7:30 A.M. ON WEEKENDS AND/OR HOLIDAYS, AND SHALL CONCLUDE PRIOR TO SUNDOWN UNLESS ARRANGEMENTS TO THE CONTRARY HAVE BEEN COORDINATED AND APPROVED WITH THE OWNER.
26. IN THE CASE OF ONGOING PROJECTS ADJACENT TO OR NEAR THE PROPOSED PROJECT, THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING CONSTRUCTION WITH OTHER CONTRACTORS.

STORM SEWER CONSTRUCTION NOTES

THE FOLLOWING NOTES ARE SPECIFIC TO STORM SEWER CONSTRUCTION AND ARE TO BE INCLUDED IN ALL SETS OF CONSTRUCTION DRAWINGS CONTAINING ANY STORM SEWER CONSTRUCTION:

1. STORM SEWER AND LEADS SHALL BE REINFORCED CONCRETE PIPE, ATSM C-76, CLASS III, WITH O-RING RUBBER GASKET JOINTS, AND SHALL BE INSTALLED, BEDDED AND BACKFILLED IN ACCORDANCE WITH CITY OF CONROE STANDARD DETAIL DRAWING NUMBER 1202.

NOTE: HDPE PIPE MAY BE USED PROVIDED THAT IT IS BACKFILLED WITH CEMENT STABILIZED SAND (2 SACK CEMENT/TON), OR OTHER BACKFILLED MATERIALS THAT HAVE BEEN APPROVED BY MONTGOMERY COUNTY, SEE NOTES BELOW.

2. ALL PROPOSED PIPE STUB OUTS FROM MANHOLES OR INLETS ARE TO BE PLUGGED WITH 8 INCH BRICK WALLS UNLESS OTHERWISE NOTED.
3. CONTRACTOR SHALL MAINTAIN ADEQUATE DRAINAGE AT ALL TIMES DURING CONSTRUCTION AND SHALL NOT REHSAPE AND REGRADE ANY DITCHES THAT WERE DISTURBED DURING CONSTRUCTION AS TO NOT IMPEDE DRAINAGE.
4. CONTRACTOR SHALL DE-WATER TRENCH BEFORE PLACING BEDDING AND SHALL KEEP TRENCH DRY DURING CONSTRUCTION UNTIL BACKFILL IS 3 FEET ABOVE TOP OF PIPE.
5. ALL R.C.P. STORM SEWER SHALL HAVE RUBBER GASKET JOINTS.
6. ALL C.M.P. STORM SEWER SHALL BE ASPHALT COATED.
7.
   A. ALL BOX CULVERTS INSTALLED SHALL BE PLACED ON A MINIMUM OF 6 INCHES OF CEMENT STABILIZED SAND (CEMENT STABILIZED SAND SHALL 2 SACK CEMENT PER TON).
   B. FOR INSTALLATION OF PRE-CAST CONCRETE BOX CULVERTS IN POOR SOIL CONDITIONS, A 7 INCH REINFORCED CONCRETE SLAB SHALL BE INSTALLED.
   C. FOR INSTALLATION OF MONOLITHIC REINFORCED CONCRETE BOX CULVERTS IN POOR SOIL CONDITIONS A 4 INCH THICK CLASS "C" CONCRETE SEAL SLAB SHALL BE INSTALLED.
8. STORM SEWER MANHOLES SHALL BE STANDARD PRE-CAST, UNLESS OTHERWISE NOTED.
9. ALL INLETS TO BE CITY OF CONROE TYPE "C", "C-1", OR "C 2" UNLESS OTHERWISE STATED ON PLANS. INLETS TO BE STANDARD DEPTH UNLESS OTHERWISE NOTED.
10. ALL STORM SEWER LEADS SHALL BE 18 INCH MINIMUM UNLESS OTHERWISE INDICATED.
11. GRADE DROP ON LEADS BETWEEN INLETS TO BE A MINIMUM IF 0.20 FOOT. GRADE DROP BETWEEN INLET AND MANHOLES TO BE 0.20 FOOT UNLESS OTHERWISE NOTED.
12. WHEN MANHOLE FRAME AND COVER IS REQUIRED, USE EAST JORDAN 24" FRAME AND COVER (OR EQUAL) WITH TEH CITY OF CONROE LOGO EMBEDDED ON IT.
13. FOR ADJUSTMENT OF MANHOLE LIDS USE STANDARD CONCRETE RINGS.
14. CONCRETE USED FOR ALL POURED-IN-PLACE MANHOLES, INLETS, WINGWALLS, HEADWALLS AND OTHER APPURTENANCES TO BE CLASS "A" CONCRETE WITH 3,000 PSI STRENGTH AT 28 DAYS.
15. ALL EXPOSED CORNERS TO BE CHAMFERED ¾"

NOTE: OTHER BACKFILL MATERIALS MAY BE USED BASED ON THE GEOTECHNICAL REPORT, AS PER HDPE SPECIFICATION, SECTION 6.F. BACKFILL MUST BE USED WITH APPROPRIATE COMPACTION.

NOTE: SEE SPECIFICATIONS FOR THE USE OF HIGH DENSITY POLYETHYLENE PIPE FOR STORM AND IN THE STREETS AND DRAINAGE SPECIFICATIONS. DRAINS SPECIFIC TECHNICAL INFORMATION MAY BE FOUND IN THE DESIGN MANUAL.

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 OR 811 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED.

- WHEN CENTERPOINT ENERGY PIPELINE MARKINGS ARE NOT VISIBLE, CALL (713) 945-8036 OR (713) 945-8037 (7:00 A.M. TO 4:30 P.M.) FOR STATUS OF LINE LOCATION REQUEST BEFORE EXCAVATION BEGINS.
- WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF CENTERPOINT ENERGY FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON- MECHANIZED EXCAVATION PROCEDURES.
- WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED, SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE STRESS ON THE PIPING.
- FOR EMERGENCIES REGARDING GAS LINES CALL (713)659-3552 OR(713) 207-4200

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

CAUTION: OVERHEAD ELECTRICAL LINES

OVERHEAD LINES MAY EXIST ON THE PROPERTY. WE HAVE NOT ATTEMPTED TO MARK THOSE LINES SINCE THEY ARE CLEARLY VISIBLE, BUT YOU SHOULD LOCATE THEM PRIOR TO BEGINNING ANY CONSTRUCTION. TEXAS LAW, SECTION 752, HEALTH & SAFETY CODE FORBIDS ALL ACTIVITIES THAT OCCUR IN CLOSE PROXIMITY TO HIGH VOLTAGE LINES, SPECIFICALLY:

- ANY ACTIVITY WHERE PERSONS OR THINGS MAY COME WITHIN SIX (6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES; AND
- 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.

ACTIVITIES ON OR ACROSS CENTERPOINT ENERGY FEE OR EASEMENT PROPERTY
NO APPROVAL TO USE, CROSS OR OCCUPY CENTERPOINT PROPERTY, PLEASE CONTACT OUR SURVEYING & RIGHT OF WAY DIVISION AT (713) 207-6248 OR (713) 207-5769

SPECIAL TRENCH BACKFILL NOTE:

ALL TRENCH BACKFILL FOR UTILITIES SHALL BE COMPACTED TO AT LEAST 95% OF MAXIMUM DENSITY PER ASTM D-698. MOISTURE CONTENT SHALL BE WITHIN + 3% OF OPTIMUM. DENSITIES SHALL BE TAKEN AT APPROXIMATE 100-FOOT INTERVALS FOR EACH LIFT, OR AS RECOMMENDED BY THE TESTING LAB, OR AS OTHERWISE DIRECTED BY THE ENGINEER. THE TESTING LAB SHALL BE PAID BY THE OWNER EXCEPT RETESTS REQUIRED DUE TO THE FAILURE OF THE FIRST TEST SHALL BE PAID BY THE CONTRACTOR. LIFTS SHALL BE 8-INCH MAXIMUM, MEASURED LOOSE. ALL TRENCH BACKFILL SHALL BE CONSIDERED SUBSIDIARY TO THE PIPE.

WATERLINE CONSTRUCTION NOTES:

1. CONTRACTOR SHALL PROVIDE ADEQUATE THRUST BLOCKING TO WITHSTAND TEST PRESSURE AS SPECIFIED IN CITY OF CONROE STANDARD DRAWINGS AND REQUIREMENTS FOR WATER MAIN CONSTRUCTION AND MATERIALS.
2. PRIOR TO INSTALLATION OF WATER METER, WATER METER LEAD OR UNMETERED FIRE SPRINKLER LINE, THE CONTRACTOR SHALL CONTACT THE PERMIT DIVISION.
3. PRIOR TO WATER MAIN CONSTRUCTION, THE CONTRACTOR SHALL CONTACT THE CITY ENGINEER AND COMPLY WITH ALL REQUIREMENTS NECESSARY FOR THE ISSUANCE OF A WORK ORDER FOR THE WATER MAIN CONSTRUCTION.
4. SEPARATION DISTANCES FOR ALL WATER MAIN AND SANITARY SEWER MAIN CONSTRUCTION SHALL BE GOVERNED BY THE "TEXAS COMMISSION ON ENVIRONMENTAL QUALITY RULES AND REGULATIONS FOR DESIGN CRITERIA FOR SEWAGE SYSTEMS", SECTION 217, LATEST PRINTING, REFER TO THE CITY OF CONROE DESIGN MANUAL DIVISION VI, WATER MAIN DESIGN REQUIREMENTS, PART 1.04, K-1, 2, AND 3 FOR CLEARANCE REQUIREMENTS.
5. TWELVE-INCH (12") AND SMALLER MAINS SHALL HAVE A MINIMUM COVER OF FOUR FEET (4') FROM THE TOP OF THE CURB OR FIVE FEET (5') FROM THE MEAN ELEVATION OF THE BOTTOM OF THE NEARBY DITCH AND NEARBY RIGHT-OF-WAY ELEVATION FOR OPEN DITCH SECTIONS.
6. MAINS LARGER THAN TWELVE INCHES (12") SHALL HAVE A MINIMUM COVER OF FIVE FEET (5') FROM THE TOP OF THE CURB OR SIX FEET (6') FROM THE MEAN ELEVATION FOR OPEN DITCH SECTIONS.
7. ALL WATER MAINS SHALL BE HYDROSTATICALLY TESTED BEFORE BACTERIOLOGICAL TESTING IN ACCORDANCE WITH AWWA STANDARD C-600.
8. ALL WATER PIPING SHALL BE DISINFECTED AND BACTERIOLOGICALLY TESTED PRIOR TO USE IN ACCORDANCE WITH AWWA STANDARD C-601.
9. ALL WATER MAINS 4" THROUGH 12" SHALL BE C-900 (SDR-18). ALL WATER MAINS 14" THROUGH 36" SHALL BE C-905 (SDR-18).
10. PRIOR TO BACKFILLING OF ALL UNDERGROUND WATER LINES, INSTALL A CONTINUOUS #14 COPPER TRACER WIRE, LOCATED DIRECTLY OVER BURIED LINES AND ACCESSIBLE AT EACH VALVE STACK.
11. THE INSTALLATION OF ALL WATER LINES SHALL EXTEND ALONG THE ENTIRE LENGTH OF THE PROPERTY TO BE SERVED. WATER LINES THAT DEAD END SHALL EXTEND TO THE PROJECT LIMITS FOR FUTURE EXTENSIONS.

BENCHMARK:

MC LIDAR GROUND CONTROL POINT RM 548: A SURVEY SPIKE SET IN THE PAVEMENT AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CALHOUN ROAD AND EAST DR.
ELEV = 139.49 FEET NAVD88 (GEOID2003)

TBM-A
A ⅝-INCH IRON ROD WITH ORANGE PLASTIC CAP STAMPED "LJA ENG CONTROL" LOCATED AT THE SOUTH SIDE OF F.M.242. THE POINT IS LOCATED +/- 850 FEET WEST OF THE INTERSECTION OF F.M. 242 AND MYSTIC HILL DRIVE AND +/- 10 FEET SOUTH OF THE SOUTHERN EDGE OF PAVEMENT OF F.M. 242.
ELEV = 140.79 FEET NAVD88 (GEOID2003)

FLOODPLAIN:

SITE IS LOCATED IN UNSHADED ZONE X PER FEMA FIRM MAP No. 48339C0575G REVISED AUGUST 18, 2014. THE NEAREST FLOODPLAIN ELEVATION WAS DETERMINED TO BE 134.00 FEET.

NOTES:

MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ COUNTY ENGINEER

DATE: 11/6/19

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 – ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

GENERAL NOTES

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

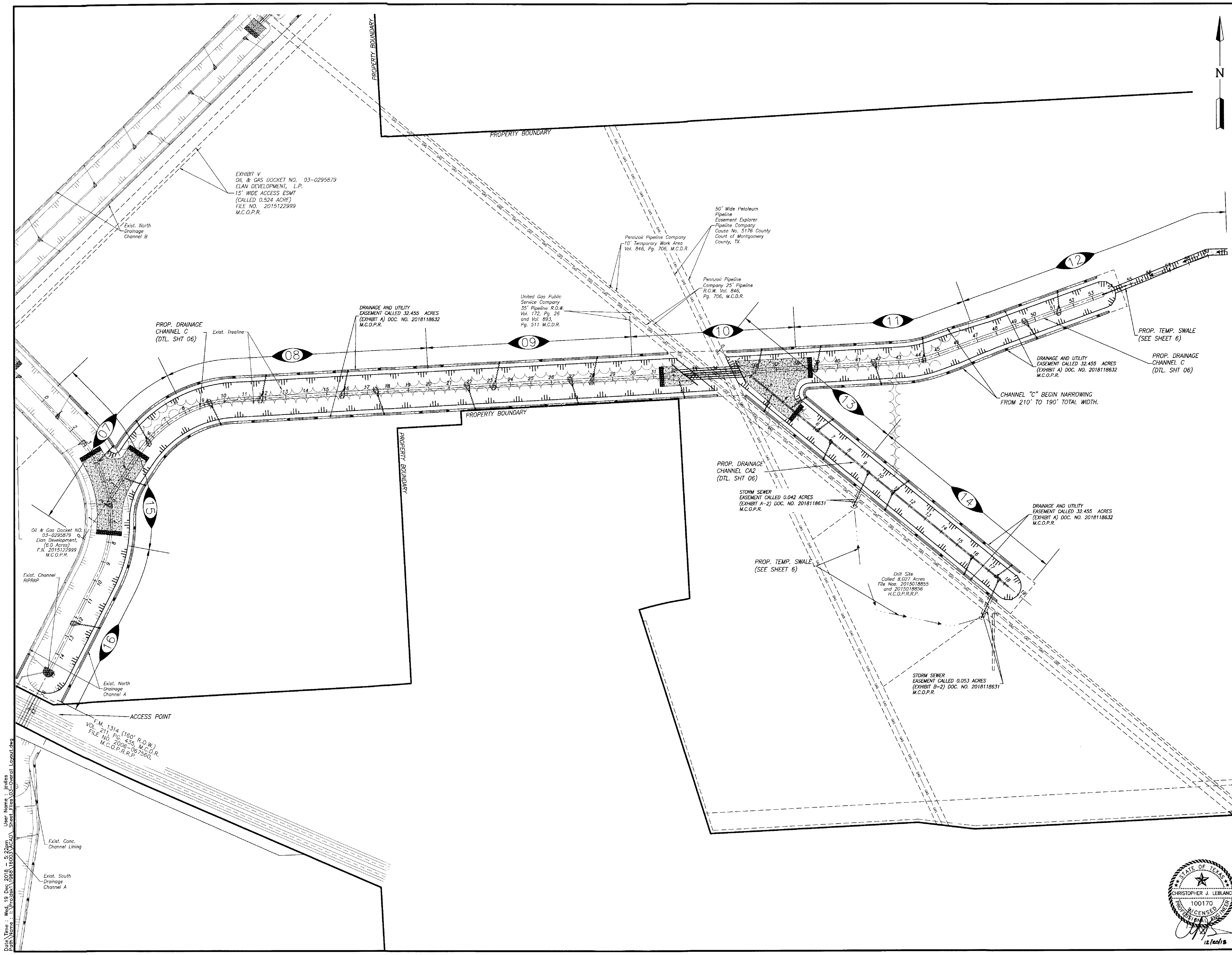
LJA PROJECT NO.: 1968-16003

SUBMITTED:	DESIGNED BY: CL/JM/JCA
SCALE: NONE	DRAWN BY: JCA
DATE: DECEMBER 2018	SHEET NO. 2 OF 23 SHEETS
SURVEYED BY:	
F B NO:	

STATE OF TEXAS
CHRISTOPHER J. LEBLANC
100170
LICENSED PROFESSIONAL ENGINEER
12/20/18

EAST DRAINAGE CHANNELS – TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT – JOB NO. 1968-16003

Date\Time : Wed, 19 Dec 2018 - 8:21am
Path\Name : P:\Projects\1968\16003\Acad\Sheet Files\Notes.dwg
User Name : jcarlos



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MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: [signature] COUNTY ENGINEER

DATE: 1/16/19

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DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 - ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

OVERALL LAYOUT

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

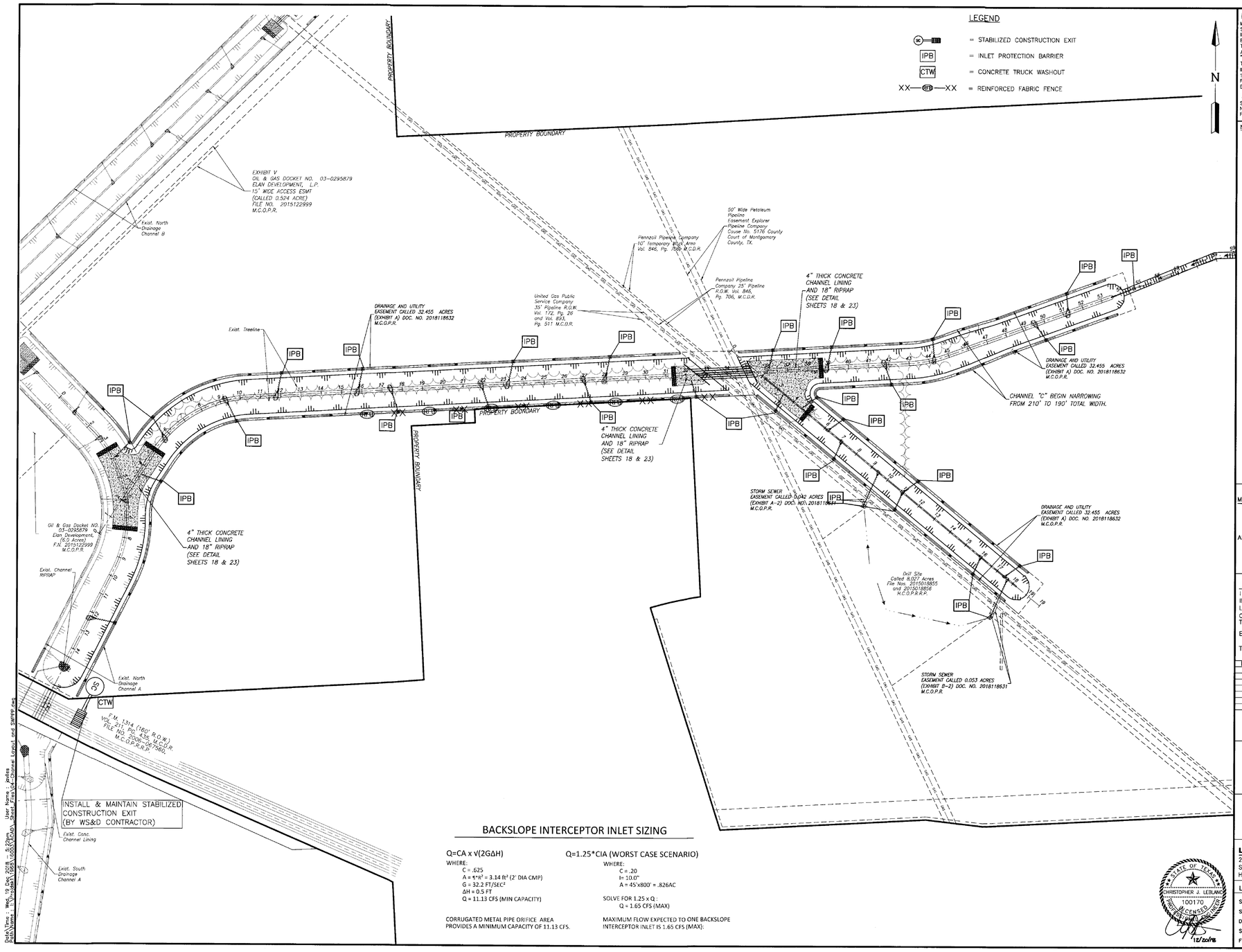
STATE OF TEXAS — CHRISTOPHER J. LEBLANC — 100170 — LICENSED PROFESSIONAL ENGINEER — 12/20/18

LJA PROJECT NO.: 1968-16003

SUBMITTED:
SCALE: 1" = 200'
DATE: DECEMBER 2018
SURVEYED BY:
F B NO:

DESIGNED BY: CL/JM/JCA
DRAWN BY: JCA
SHEET NO. 3 OF 23 SHEETS

EAST DRAINAGE CHANNELS - TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT - JOB NO. 1968-16003



BACKSLOPE INTERCEPTOR INLET SIZING

$Q = CA \times \sqrt{(2G\Delta H)}$

WHERE:
- C = .625
- A = $\pi * R^2$ = 3.14 FT^2 (2' DIA CMP)
- G = 32.2 FT/SEC^2
- ΔH = 0.5 FT
- Q = 11.13 CFS (MIN CAPACITY)

CORRUGATED METAL PIPE ORIFICE AREA PROVIDES A MINIMUM CAPACITY OF 11.13 CFS.

$Q = 1.25 * CIA$ (WORST CASE SCENARIO)

WHERE:
- C = .20
- I= 10.0"
- A = 45'x800' = .826AC

SOLVE FOR 1.25 x Q :
- Q = 1.65 CFS (MAX)

MAXIMUM FLOW EXPECTED TO ONE BACKSLOPE INTERCEPTOR INLET IS 1.65 CFS (MAX).

BENCHMARK:
MC LIDAR GROUND CONTROL POINT RM 548: A SURVEY SPIKE SET IN THE PAVEMENT AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CALHOUN ROAD AND EAST DR.
ELEV = 139.49 FEET NAVD88 (GEOID2003)
TBM-A
A ⅝-INCH IRON ROD WITH ORANGE PLASTIC CAP STAMPED "LJA ENG CONTROL" LOCATED AT THE SOUTH SIDE OF F.M.242. THE POINT IS LOCATED +/- 850 FEET WEST OF THE INTERSECTION OF F.M. 242 AND MYSTIC HILL DRIVE AND +/- 70 FEET SOUTH OF THE SOUTHERN EDGE OF PAVEMENT OF F.M. 242.
ELEV = 140.79 FEET NAVD88 (GEOID2003)

FLOODPLAIN:
SITE IS LOCATED IN UNSHADED ZONE X PER FEMA FIRM MAP No. 48339C0575G REVISED AUGUST 18, 2014. THE NEAREST FLOODPLAIN ELEVATION WAS DETERMINED TO BE 134.00 FEET.

NOTES:

MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ COUNTY ENGINEER

DATE: _____

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 – ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

CHANNEL LAYOUT AND STORM WATER POLLUTION PREVENTION PLAN

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1968-16003

SUBMITTED:	DESIGNED BY: CL/JM/JCA
SCALE: 1" = 200'	DRAWN BY: JCA
DATE: DECEMBER 2018	SHEET NO. 4 OF 23 SHEETS
SURVEYED BY:	
F B NO:	

STATE OF TEXAS
CHRISTOPHER J. LEBLANC
100170
LICENSED PROFESSIONAL ENGINEER
12/20/18

EAST DRAINAGE CHANNELS – TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT – JOB NO. 1968-16003

Date\Time : Wed, 19 Dec 2018 - 5:27pm
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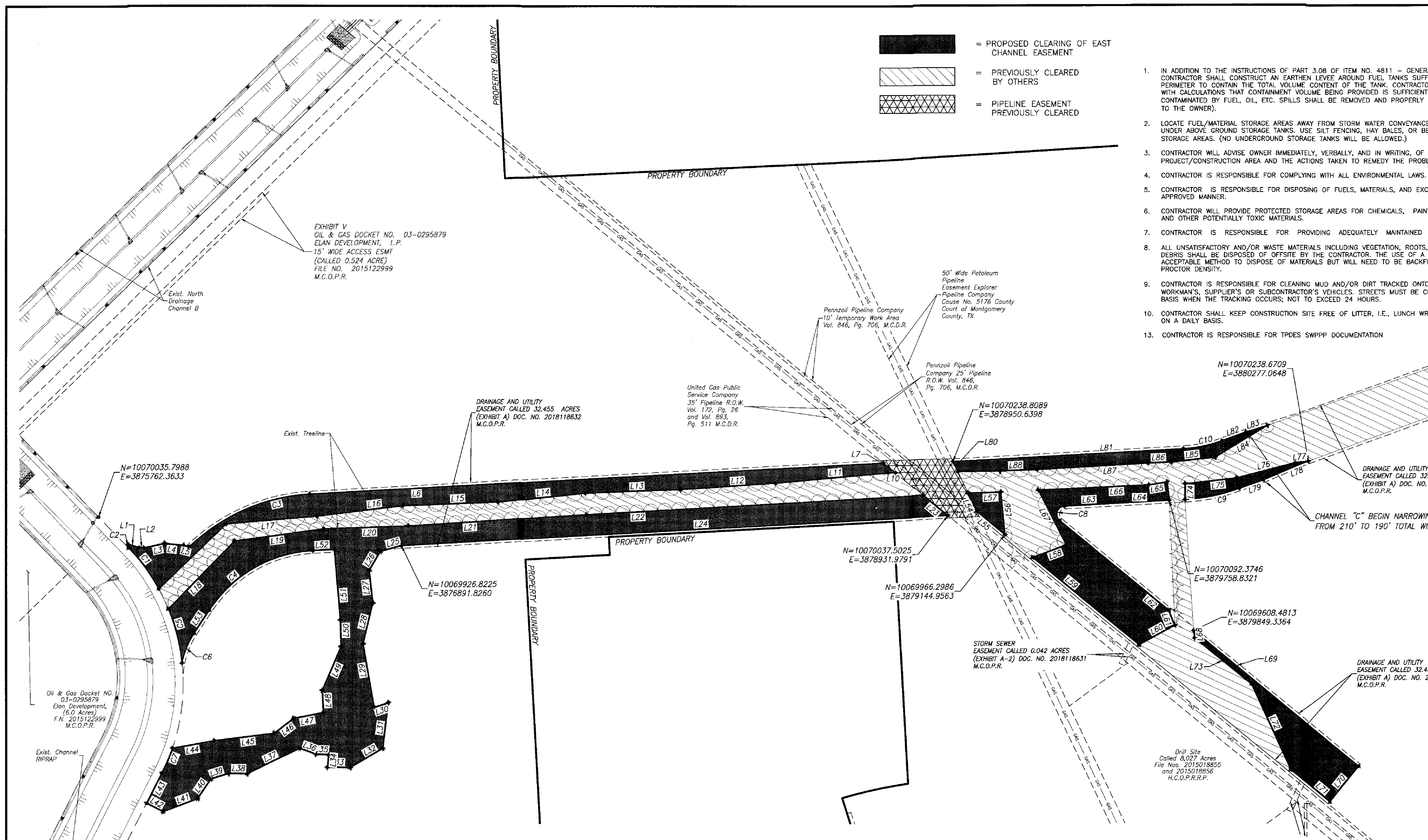
User Name : jedlos
Sheet Files\04-Channel Layout and SWPPP.dwg



1. IN ADDITION TO THE INSTRUCTIONS OF PART 3.08 OF ITEM NO. 4811 – GENERAL SOURCE CONTROLS. THE CONTRACTOR SHALL CONSTRUCT AN EARTHEN LEVEE AROUND FUEL TANKS SUFFICIENT IN HEIGHT AND PERIMETER TO CONTAIN THE TOTAL VOLUME CONTENT OF THE TANK. CONTRACTOR SHALL FURNISH OWNER WITH CALCULATIONS THAT CONTAINMENT VOLUME BEING PROVIDED IS SUFFICIENT. DIRT WHICH IS CONTAMINATED BY FUEL, OIL, ETC. SPILLS SHALL BE REMOVED AND PROPERLY DISPOSED OF (AT NO COST TO THE OWNER).
2. LOCATE FUEL/MATERIAL STORAGE AREAS AWAY FROM STORM WATER CONVEYANCE SYSTEMS. USE A LINER UNDER ABOVE GROUND STORAGE TANKS. USE SILT FENCING, HAY BALES, OR BERMS AROUND FUEL STORAGE AREAS. (NO UNDERGROUND STORAGE TANKS WILL BE ALLOWED.)
3. CONTRACTOR WILL ADVISE OWNER IMMEDIATELY, VERBALLY, AND IN WRITING, OF ANY FUEL SPILLS ONTO THE PROJECT/CONSTRUCTION AREA AND THE ACTIONS TAKEN TO REMEDY THE PROBLEM.
4. CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH ALL ENVIRONMENTAL LAWS.
5. CONTRACTOR IS RESPONSIBLE FOR DISPOSING OF FUELS, MATERIALS, AND EXCAVATIONS IN A LEGALLY APPROVED MANNER.
6. CONTRACTOR WILL PROVIDE PROTECTED STORAGE AREAS FOR CHEMICALS, PAINTS, SOLVENTS, FERTILIZERS, AND OTHER POTENTIALLY TOXIC MATERIALS.
7. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ADEQUATELY MAINTAINED SANITARY FACILITIES.
8. ALL UNSATISFACTORY AND/OR WASTE MATERIALS INCLUDING VEGETATION, ROOTS, CONCRETE AND DEBRIS SHALL BE DISPOSED OF OFFSITE BY THE CONTRACTOR. THE USE OF A BURN PIT WILL BE AN ACCEPTABLE METHOD TO DISPOSE OF MATERIALS BUT WILL NEED TO BE BACKFILLED TO 95% STD. PROCTOR DENSITY.
9. CONTRACTOR IS RESPONSIBLE FOR CLEANING MUD AND/OR DIRT TRACKED ONTO EXISTING STREETS BY HIS WORKMAN'S, SUPPLIER'S OR SUBCONTRACTOR'S VEHICLES. STREETS MUST BE CLEANED ON AN ONGOING BASIS WHEN THE TRACKING OCCURS; NOT TO EXCEED 24 HOURS.
10. CONTRACTOR SHALL KEEP CONSTRUCTION SITE FREE OF LITTER, I.E., LUNCH WRAPPERS, SODA CANS, ETC., ON A DAILY BASIS.
13. CONTRACTOR IS RESPONSIBLE FOR TPDES SWPPP DOCUMENTATION

LINE TABLE

LINE	BEARING	DISTANCE
L1	N 72°55'51" W	43.36'
L2	N 85°25'24" W	17.75'
L3	S 77°42'56" W	78.71'
L4	N 84°05'49" W	71.64'
L5	N 75°18'02" W	22.79'
L6	S 86°53'41" W	2145.08'
L7	N 50°38'39" W	58.42'
L10	N 89°15'37" E	27.82'
L11	N 84°53'33" E	422.03'
L12	N 85°57'01" E	354.96'
L13	N 87°49'04" E	355.64'
L14	N 84°02'54" E	327.96'
L15	N 87°56'58" E	355.99'
L16	N 83°13'29" E	322.91'
L17	N 85°18'31" E	339.93'
L18	S 44°20'48" W	353.22'
L19	S 82°19'45" W	336.62'
L20	S 88°13'18" W	316.23'
L21	S 86°25'32" W	665.71'
L22	S 86°43'42" W	1258.45'

LINE TABLE

LINE	BEARING	DISTANCE
L23	N 50°38'39" W	120.02'
L24	N 86°53'41" E	2043.15'
L25	N 74°29'54" E	80.62'
L26	N 30°37'42" E	81.66'
L27	N 06°20'41" W	121.67'
L28	N 13°36'55" E	156.20'
L29	N 09°51'32" W	239.08'
L30	S 71°54'24" W	55.52'
L31	N 06°47'30" E	172.20'
L32	N 59°53'45" E	140.96'
L33	S 89°06'51" E	85.65'
L34	S 04°46'51" W	46.50'
L35	S 87°28'47" E	46.33'
L36	S 70°23'29" E	64.65'
L37	N 64°26'32" E	217.22'
L38	S 89°22'16" E	69.48'
L39	N 72°42'30" E	68.87'
L40	N 34°16'08" E	87.72'
L41	N 69°29'04" E	138.77'
L42	S 62°52'51" E	69.56'

LINE TABLE

LINE	BEARING	DISTANCE
L43	S 27°07'09" W	125.49'
L44	S 80°08'11" W	158.10'
L45	S 82°55'21" W	226.27'
L46	S 52°31'09" W	90.72'
L47	S 79°20'38" W	112.70'
L48	S 02°37'42" E	82.16'
L49	S 23°22'25" W	175.87'
L50	S 01°16'39" E	99.84'
L51	S 04°45'15" E	263.26'
L52	N 86°53'41" E	80.76'
L53	N 33°28'23" E	103.08'
L54	N 25°29'58" W	74.55'
L55	N 50°38'39" W	136.67'
L56	S 05°21'57" E	159.51'
L57	N 87°44'08" E	122.95'
L58	S 69°17'59" W	133.72'
L59	S 50°38'39" E	514.14'
L60	N 61°33'09" E	151.89'
L61	N 21°48'09" W	60.88'
L62	N 50°38'39" W	526.07'

CURVE TABLE

CURVE	RADIUS	DELTA	ARC	CHORD	CHORD BEARING
C1	716.89'	15°17'08"	191.25'	190.69'	S 36°18'51" E
C2	15.55'	53°54'31"	14.63'	14.10'	S 09°25'32" E
C3	705.00'	40°37'08"	499.80'	489.40'	S 66°35'07" W
C4	495.00'	53°25'18"	461.53'	444.99'	N 60°11'02" E
C5	730.00'	16°20'20"	208.17'	207.47'	S 14°11'12" E
C6	310.00'	22°05'41"	119.54'	118.81'	N 22°25'33" E
C7	730.00'	8°01'51"	102.32'	102.24'	S 23°06'13" W
C8	30.00'	137°32'20"	72.02'	55.93'	N 18°07'31" E
C9	695.00'	16°43'46"	202.93'	202.21'	N 78°31'48" E
C10	505.00'	16°43'46"	147.45'	146.93'	S 78°31'48" W

BENCHMARK:

MC LIDAR GROUND CONTROL POINT RM 548: A SURVEY SPIKE SET IN THE PAVEMENT AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CALHOUN ROAD AND EAST DR.
ELEV = 139.49 FEET NAVD88 (GEOID2003)
TBM–A
A ⅝–INCH IRON ROD WITH ORANGE PLASTIC CAP STAMPED "LJA ENG CONTROL" LOCATED AT THE SOUTH SIDE OF F.M.242 THE POINT IS LOCATED +/– 850 FEET WEST OF THE INTERSECTION OF F.M. 242 AND MYSTIC HILL DRIVE AND +/– 10 FEET SOUTH OF THE SOUTHERN EDGE OF PAVEMENT OF F.M. 242.
ELEV = 140.79 FEET NAVD88 (GEOID2003)

FLOODPLAIN:

SITE IS LOCATED IN UNSHADED ZONE X PER FEMA FIRM MAP No. 48339C0575G REVISED AUGUST 18, 2014. THE NEAREST FLOODPLAIN ELEVATION WAS DETERMINED TO BE 134.00 FEET.

NOTES:

MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: ______ – COUNTY ENGINEER

DATE: 11/6/19

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY ______ DATE ______

TITLE ______

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 – ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

CLEARING & GRUBBING LAYOUT

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

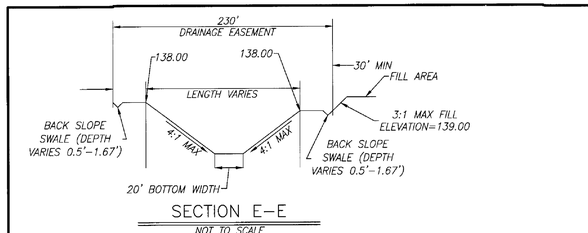
STATE OF TEXAS
CHRISTOPHER J. LEBLANC
100170
LICENSED PROFESSIONAL ENGINEER
12/20/18

LJA PROJECT NO.: 1968–16003

SUBMITTED:
SCALE: 1" = 200'
DATE: DECEMBER 2018
SURVEYED BY:
F B NO:

DESIGNED BY: CL/JM/JCA
DRAWN BY: JCA
SHEET NO. 5 OF 23 SHEETS

EAST DRAINAGE CHANNELS – TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT – JOB NO. 1968–16003



SECTION E–E

NOT TO SCALE

LEGEND

Tw=71.50 — TOP OF RETAINING WALL ELEVATION

— 72 — INDICATES EXISTING NATURAL GROUND CONTOUR

PROPOSED FILL AREA

N

BENCHMARK:

MC LIDAR GROUND CONTROL POINT RM 548: A SURVEY SPIKE SET IN THE PAVEMENT AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CALHOUN ROAD AND EAST DR.
ELEV = 139.49 FEET NAVD88 (GEOID2003)

TBM–A
A ½–INCH IRON ROD WITH ORANGE PLASTIC CAP STAMPED "LJA ENG CONTROL" LOCATED AT THE SOUTH SIDE OF F.M.242. THE POINT IS LOCATED +/– 850 FEET WEST OF THE INTERSECTION OF F.M. 242 AND MYSTIC HILL DRIVE AND +/– 10 FEET SOUTH OF THE SOUTHERN EDGE OF PAVEMENT OF F.M. 242.
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NOTES:

1. 30' MAINTENANCE BERM ENDS AT INTERSECTION WITH ACCESS EASEMENT (FILE NO. 2016017428 M.C.O.P.R.).

OIL & GAS DOCKET NO. 03-0295879
ELAN DEVELOPMENT, L.P.
15' WIDE ACCESS ESMT
(CALLED 0.524 ACRE)
FILE NO. 2015122999
M.C.O.P.R.

Exist. North Drainage Channel B

50' Wide Petroleum Pipeline Easement Explorer Pipeline Company Cause No. 5176 County Court of Montgomery County, TX.

Pennzoil Pipeline Company 10' Temporary Work Area Vol. 846, Pg. 706, M.C.O.R.

Pennzoil Pipeline Company 25' Pipeline R.O.W. Vol. 846, Pg. 706, M.C.O.R.

United Gas Public Service Company 35' Pipeline R.O.W. Vol. 172, Pg. 26 and Vol. 893, Pg. 511 M.C.O.R.

DRAINAGE AND UTILITY EASEMENT CALLED 32.455 ACRES (EXHIBIT A) DOC. NO. 2018118632 M.C.O.P.R.

N:10070069.51
E:3877583.71
E DITCH=118.90

GRADE BREAK
N:10070124.85
E:3878603.70
E DITCH=119.67

Tw=129.78
N:10070133.32
E:3878759.95
E DITCH=119.78

Tw=129.82
N:10070148.12
E:3879032.87
E DITCH=120.02

N:10070166.00
E:3879362.27
E DITCH=120.36

N:10070190.64
E:3879816.41
E DITCH=120.84

N:10070298.16
E:3880189.34
E DITCH=121.26

N:10070518.51
E:3880800.23
E DITCH=121.90

N:10070562.81
E:3880916.07
E SWALE=128.75

PROP. TEMP. SWALE 530LF @0.20% (SEE DETAIL)

N:10070723.66
E:3881311.63
E SWALE=129.60

N:10070727.05
E:3881412.10
E SWALE=129.81

GRADE BREAK
N:10070471.07
E:3880668.71
E DITCH=121.80

DRAINAGE AND UTILITY EASEMENT CALLED 32.455 ACRES (EXHIBIT A) DOC. NO. 2018118632 M.C.O.P.R.

CHANNEL "C" BEGIN NARROWING FROM 210' TO 190' TOTAL WIDTH.

N:10070013.72
E:3876555.21
E DITCH=118.12

Exist. Treeline

N:10069845.65
E:3876170.35
E DITCH=117.79

FILL AREA TO 138.00

PROPERTY BOUNDARY

N:10070130.85
E:3879078.35
E DITCH=120.08

N:10070131.66
E:3878729.36
E DITCH=119.78

N:10069632.10
E:3876012.23
E DITCH=117.55

N:10069531.75
E:3875945.88
E DITCH=117.36

Oil & Gas Docket NO. 03-0295879 Elan Development, L.P. & Agent P.N. 2015122999 M.C.O.P.R.

Exist. Channel Flowline

FILL AREA TO 139.00

Exist. North Drainage Channel A

N:10069552.09
E:3879296.32
E DITCH=120.22

STORM SEWER EASEMENT CALLED 0.042 ACRES (EXHIBIT A-2) DOC. NO. 2018118631 M.C.O.P.R.

N:10069468.16
E:3879588.33
E SWALE=133.73

PROP. TEMP. SWALE 263LF @0.20%(SEE DETAIL)

N:10069206.70
E:3879614.76
E SWALE=134.26

N:10069111.39
E:3879854.48
E SWALE=134.65

N:10069080.56
E:3879938.93
E SWALE=134.36

PROP. TEMP. SWALE 643LF @0.20%(SEE DETAIL)

N:10068903.74
E:3880064.13
E SWALE=133.62

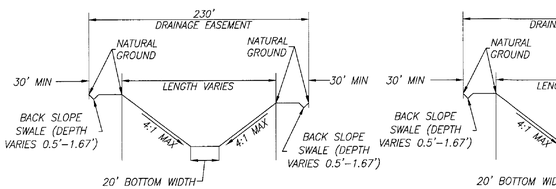
Bath, Site Called 9.927 Acres File Nos. 2015018855 and 2015018856 M.C.O.P.R.P.R.

STORM SEWER EASEMENT CALLED 0.053 ACRES (EXHIBIT B-2) DOC. NO. 2018118631 M.C.O.P.R.

N:10069098.53
E:3880337.09
E DITCH=120.89

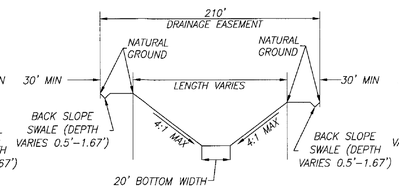
N:10068939.75
E:3880190.27
E SWALE=133.36

DRAINAGE AND UTILITY EASEMENT CALLED 32.455 ACRES (EXHIBIT A) DOC. NO. 2018118632 M.C.O.P.R.



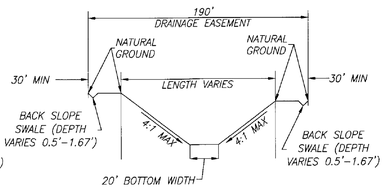
SECTION A–A

NOT TO SCALE



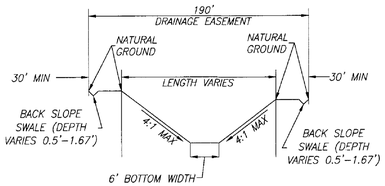
SECTION B–B

NOT TO SCALE



SECTION C–C

NOT TO SCALE



SECTION D–D

NOT TO SCALE

MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ – COUNTY ENGINEER

DATE: _____

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 – ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

GRADING PLAN

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1968–16003

SUBMITTED:
SCALE: 1" = 200'
DATE: DECEMBER 2018
SURVEYED BY:
F B NO:

DESIGNED BY: CL/JM/JCA
DRAWN BY: JCA
SHEET NO. 6 OF 23 SHEETS

STATE OF TEXAS
CHRISTOPHER J. LEBLANC
100170
LICENSED
PROFESSIONAL ENGINEER
12/20/18

EAST DRAINAGE CHANNELS – TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT – JOB NO. 1968–16003

Date/Time: Wed, 19 Dec 2018 - 5:23pm
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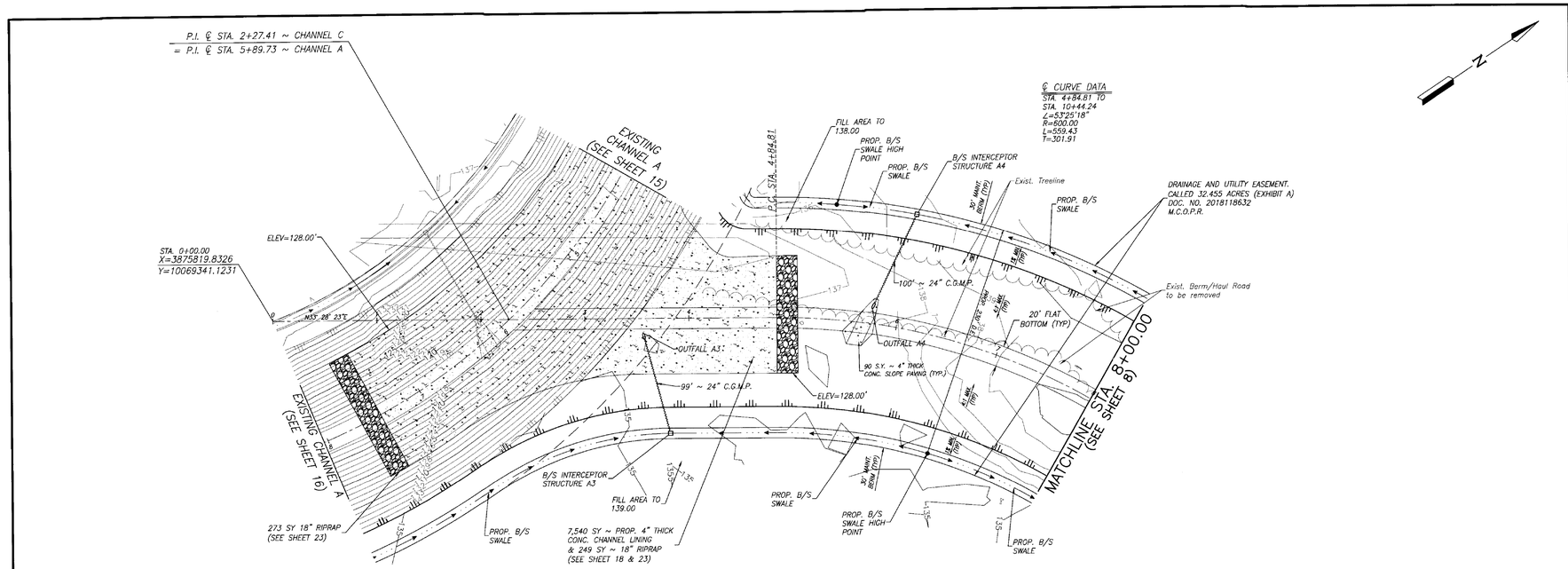
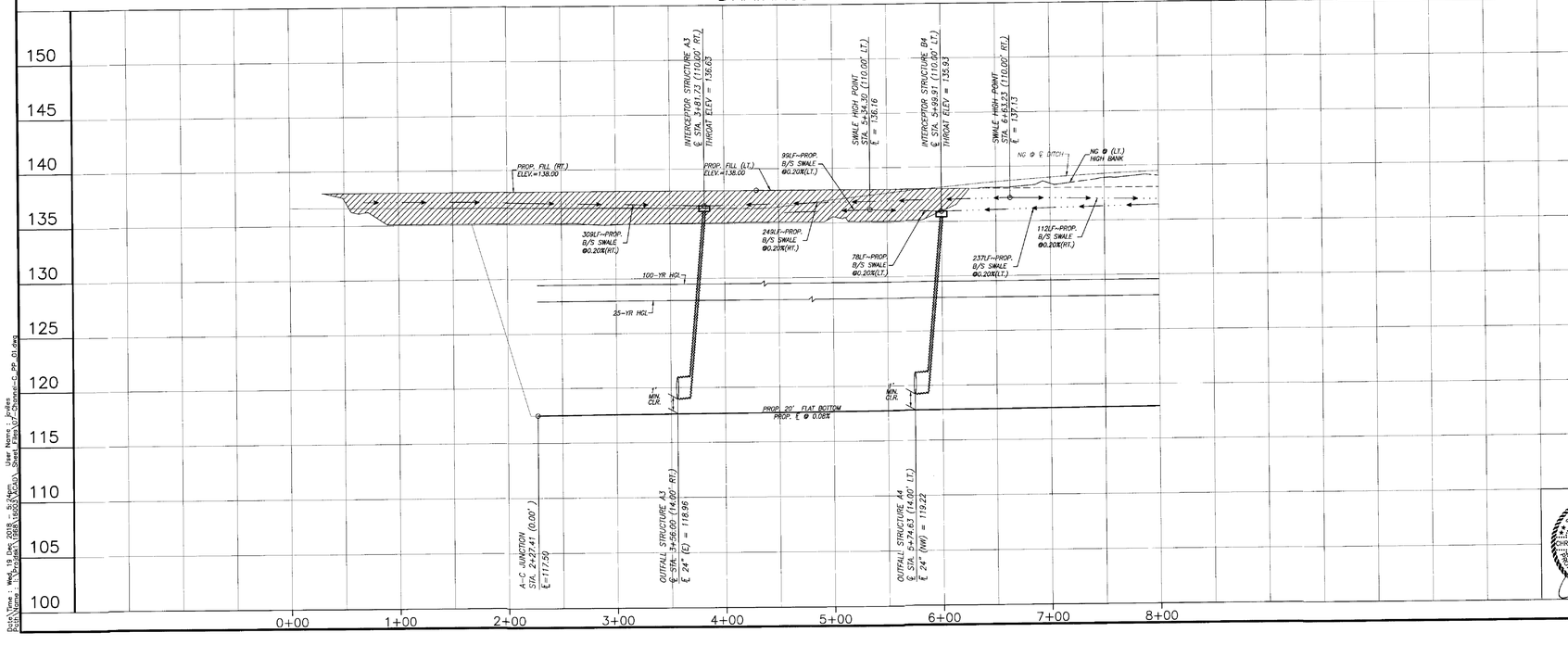


DRAINAGE CHANNEL C



BENCHMARK:

MC LIDAR GROUND CONTROL POINT RM 548: A SURVEY SPIKE SET IN THE PAVEMENT AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CALHOUN ROAD AND EAST DR.
ELEV = 139.49 FEET NAVD88 (GEOID2003)
TBM-A
A ⅝-INCH IRON ROD WITH ORANGE PLASTIC CAP STAMPED "LJA ENG CONTROL" LOCATED AT THE SOUTH SIDE OF F.M.242. THE POINT IS LOCATED +/- 850 FEET WEST OF THE INTERSECTION OF F.M. 242 AND MYSTIC HILL DRIVE AND +/- 10 FEET SOUTH OF THE SOUTHERN EDGE OF PAVEMENT OF F.M. 242.
ELEV = 140.79 FEET NAVD88 (GEOID2003)

FLOODPLAIN:

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NOTES:

MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ COUNTY ENGINEER

DATE: 1/11/19

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 – ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

DRAINAGE CHANNEL C
STA. 0+00.00 TO 8+00.00

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1968-16003

STATE OF TEXAS — CHRISTOPHER J. LEBLANC — 100170 — LICENSED PROFESSIONAL ENGINEER — 12/20/18

SUBMITTED:
SCALE: VERT: 1" = 5' HOR: 1" = 50'
DATE: DECEMBER 2018
SURVEYED BY:
F B NO:

DESIGNED BY: CL/JM/JCA
DRAWN BY: JCA
SHEET NO. 7 OF 23 SHEETS

EAST DRAINAGE CHANNELS – TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT – JOB NO. 1968-16003

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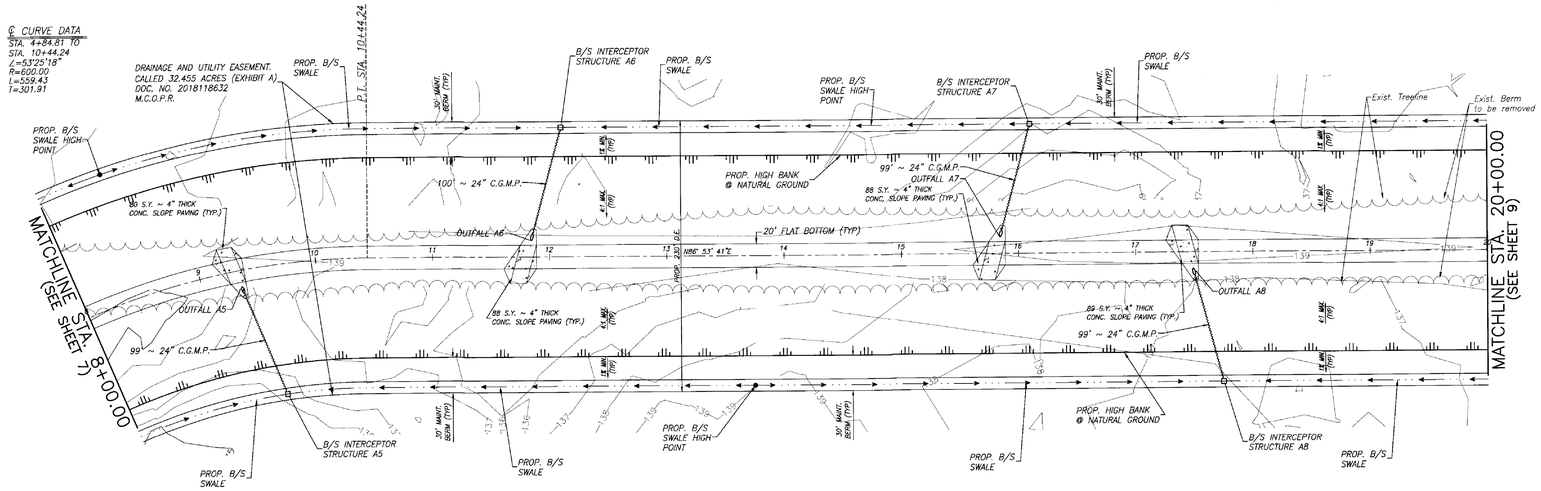
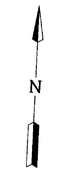
User Name : jjolles





BENCHMARK:

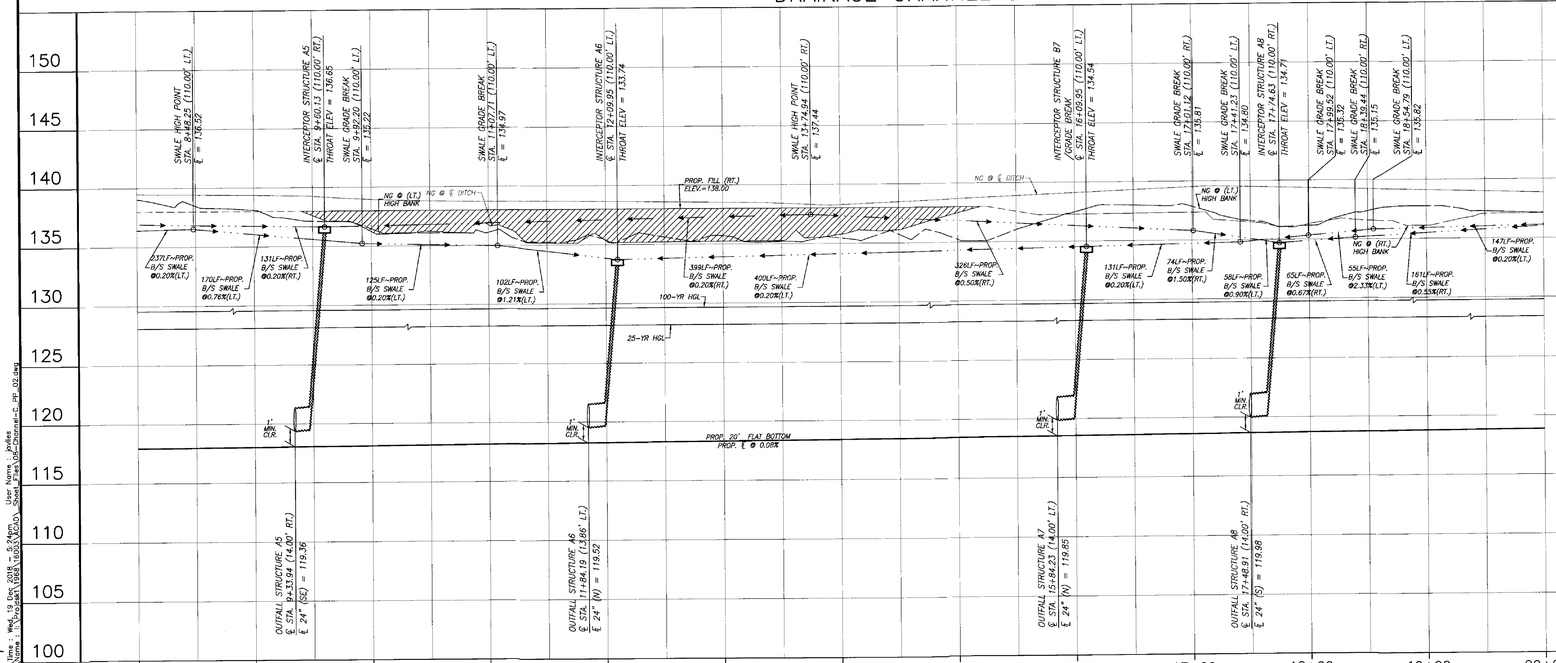
MC LIDAR GROUND CONTROL POINT RM 548: A SURVEY SPIKE SET IN THE PAVEMENT AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CALHOUN ROAD AND EAST DR.
ELEV = 139.49 FEET NAVD88 (GEOID2003)
TBM-A
A ½-INCH IRON ROD WITH ORANGE PLASTIC CAP STAMPED "LJA ENG CONTROL" LOCATED AT THE SOUTH SIDE OF F.M.242. THE POINT IS LOCATED +/- 850 FEET WEST OF THE INTERSECTION OF F.M. 242 AND MYSTIC HILL DRIVE AND +/- 10 FEET SOUTH OF THE SOUTHERN EDGE OF PAVEMENT OF F.M. 242.
ELEV = 140.79 FEET NAVD88 (GEOID2003)

FLOODPLAIN:

SITE IS LOCATED IN UNSHADED ZONE X PER FEMA FIRM MAP No. 48339C0575G REVISED AUGUST 18, 2014. THE NEAREST FLOODPLAIN ELEVATION WAS DETERMINED TO BE 134.00 FEET.

NOTES:

DRAINAGE CHANNEL C



MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ COUNTY ENGINEER

DATE: 11/14/19

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 – ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

DRAINAGE CHANNEL C
STA. 8+00.00 TO 20+00.00

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1968-16003

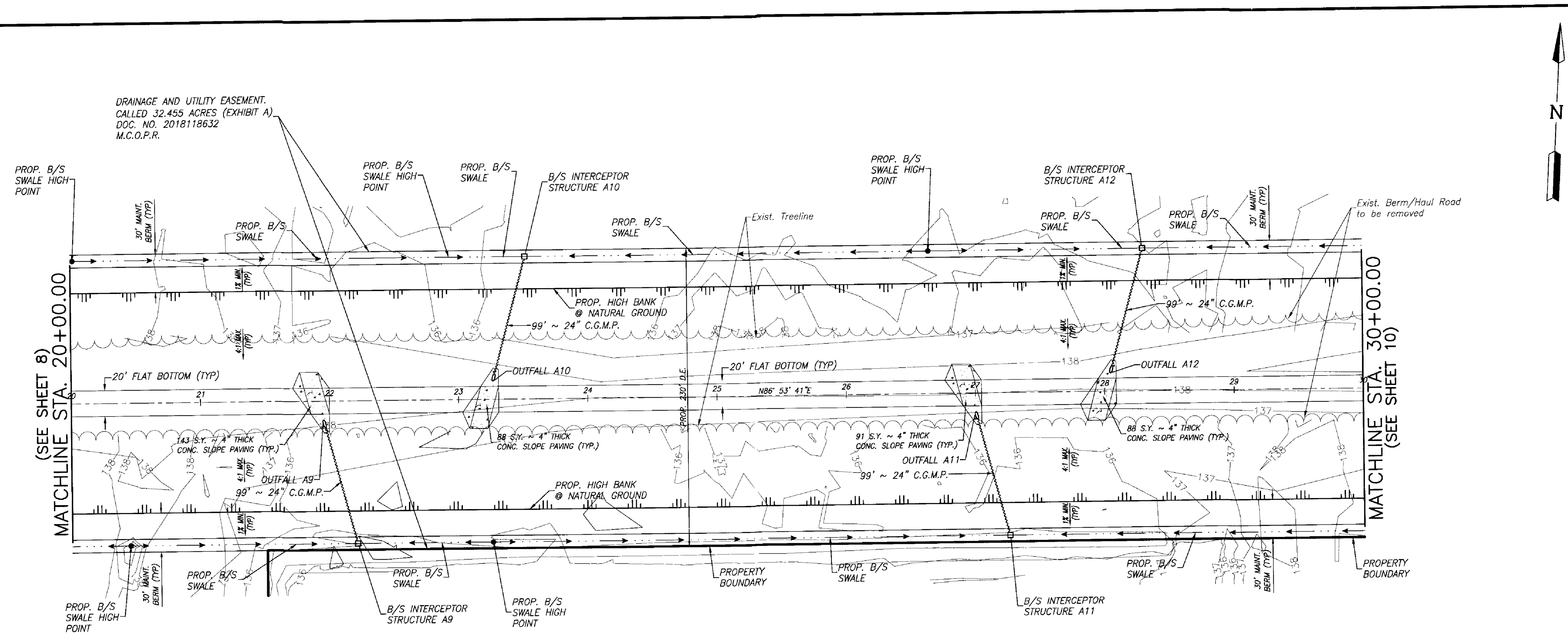
SUBMITTED:
SCALE: VERT: 1" = 5'
HOR: 1" = 50'
DATE: DECEMBER 2018
SURVEYED BY:
F B NO:

DESIGNED BY: CL/JM/JCA
DRAWN BY: JCA
SHEET NO. 8 OF 23 SHEETS

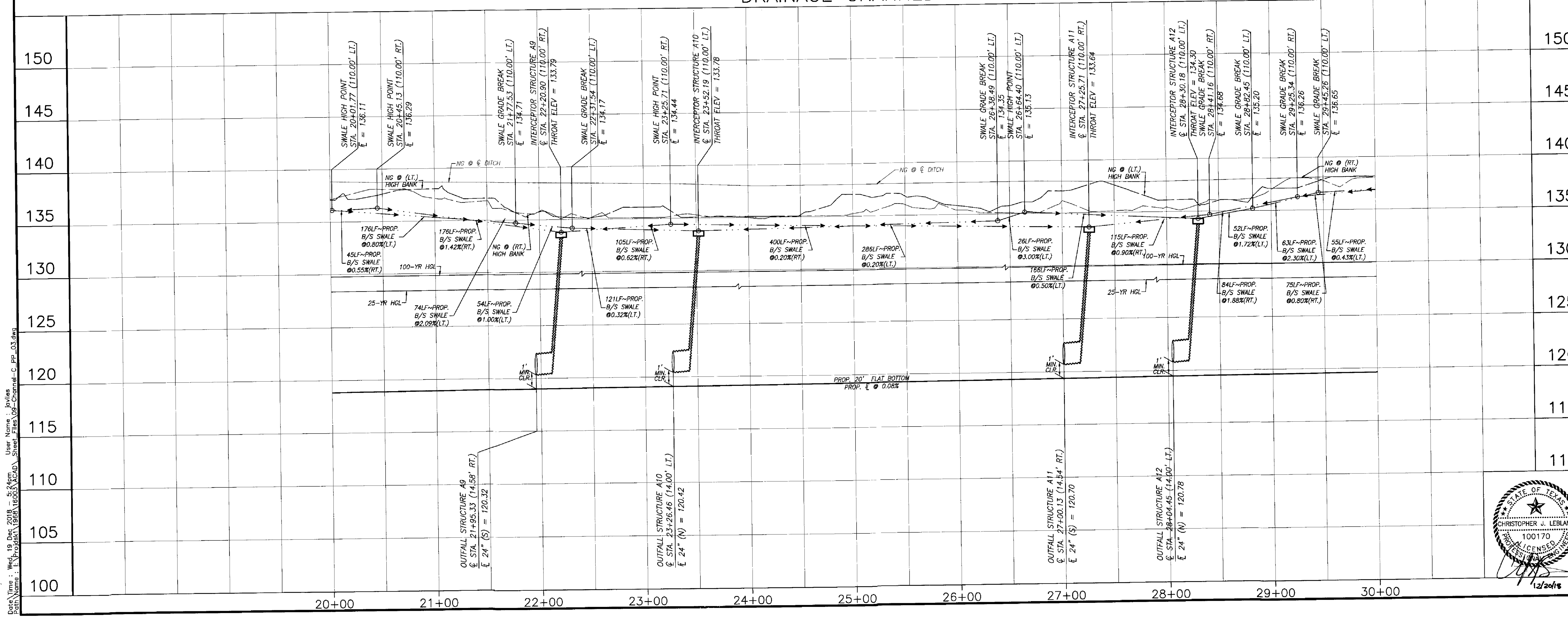
STATE OF TEXAS
CHRISTOPHER J. LEBLANC
100170
LICENSED PROFESSIONAL ENGINEER
12/20/18

EAST DRAINAGE CHANNELS – TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT – JOB NO. 1968-16003

Date & Time: Wed, 19 Dec 2018 - 5:24pm
Path Name: N:\Projects\1968-16003\CAD\Sheets Files\08-Channel-C_sht_02.dwg
User Name: jjaffas



DRAINAGE CHANNEL C



MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: COUNTY ENGINEER

DATE: 1/16/19

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY ______ DATE ______

TITLE ______

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 - ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

DRAINAGE CHANNEL C
STA. 20+00.00 TO 30+00.00

STATE OF TEXAS
CHRISTOPHER J. LEBLANC
100170
LICENSED PROFESSIONAL ENGINEER
12/20/18

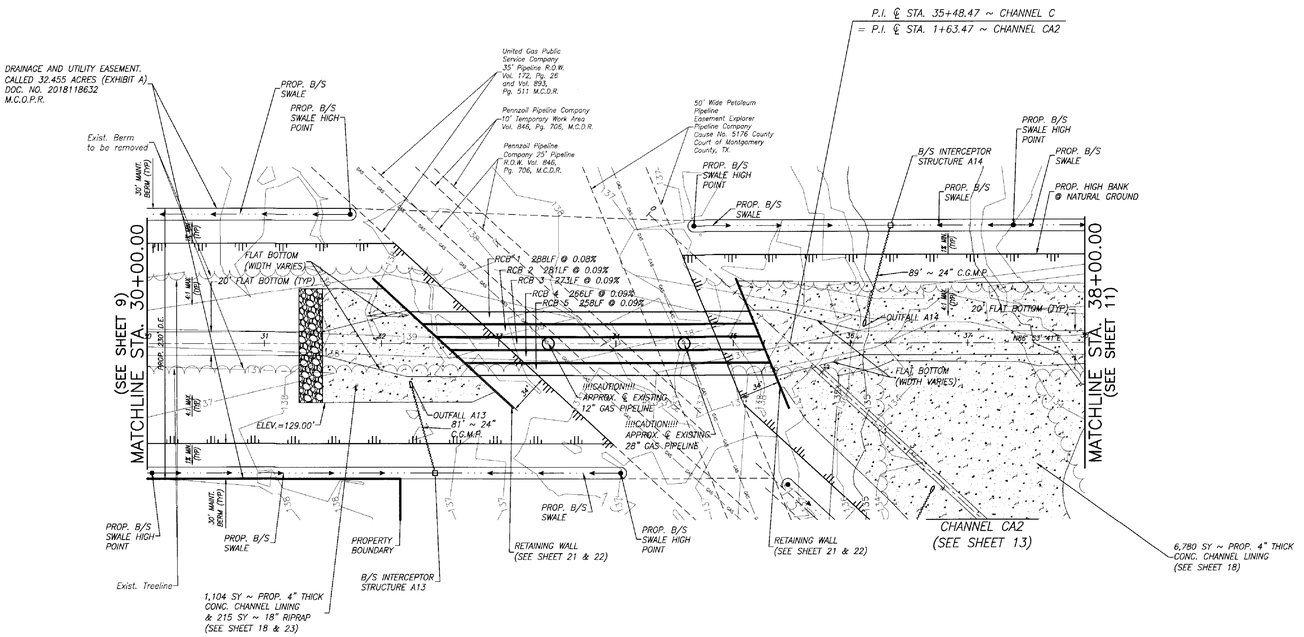
LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1968-16003

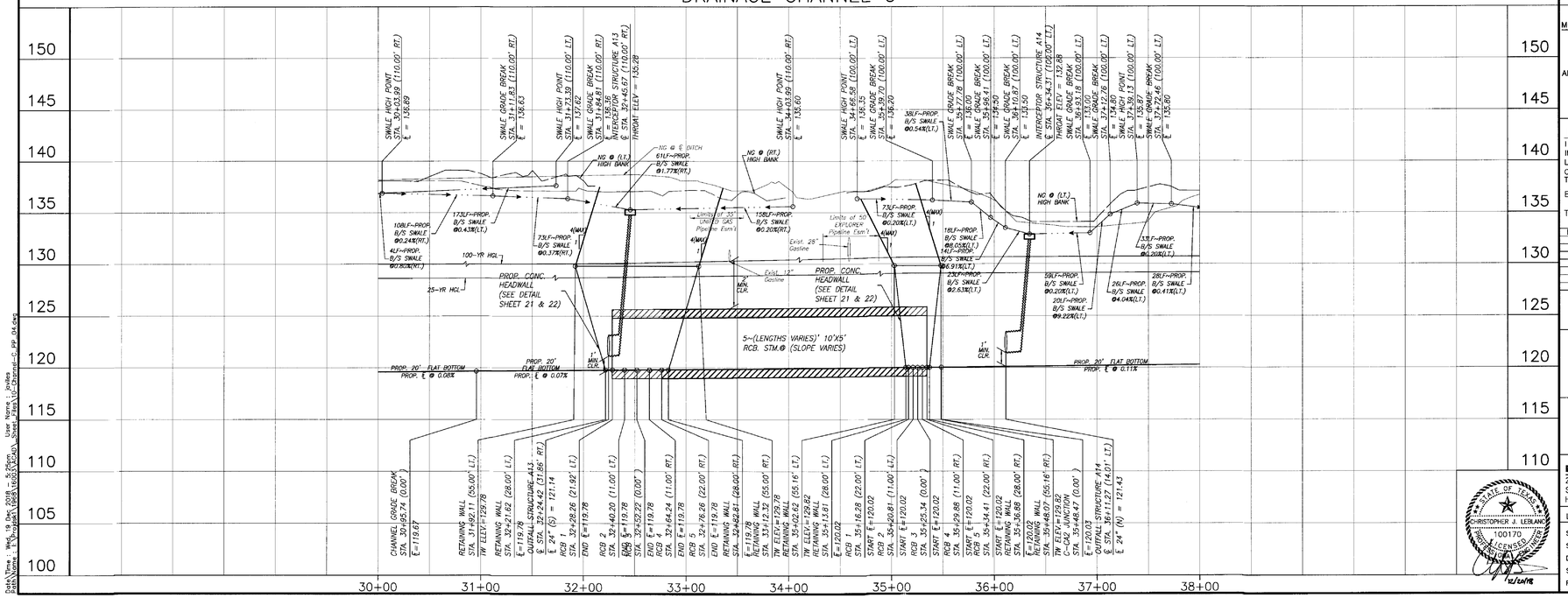
SUBMITTED:
SCALE: VERT: 1" = 5' HOR: 1" = 50'
DATE: DECEMBER 2018
SURVEYED BY:
F B NO:

DESIGNED BY: CL/JM/JCA
DRAWN BY: JCA
SHEET NO. 9 OF 23 SHEETS

EAST DRAINAGE CHANNELS - TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT - JOB NO. 1968-16003



DRAINAGE CHANNEL C



BENCHMARK:

MC LDAR GROUND CONTROL POINT RM 548: A SURVEY SPIKE SET IN THE PAVEMENT AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CALHOUN ROAD AND EAST DR.
ELEV = 139.49 FEET NAVD88 (GEOID2003)
TBM-A
A ⅝-INCH IRON ROD WITH ORANGE PLASTIC CAP STAMPED "LJA ENG CONTROL" LOCATED AT THE SOUTH SIDE OF F.M.242 THE POINT IS LOCATED +/- 850 FEET WEST OF THE INTERSECTION OF F.M. 242 AND MYSTIC HILL DRIVE AND +/- 10 FEET SOUTH OF THE SOUTHERN EDGE OF PAVEMENT OF F.M. 242.
ELEV = 140.79 FEET NAVD88 (GEOID2003)

FLOODPLAIN:

SITE IS LOCATED IN UNSHADED ZONE X PER FEMA FIRM MAP No. 48339C0075G REVISED AUGUST 18, 2014. THE NEAREST FLOODPLAIN ELEVATION WAS DETERMINED TO BE 134.00 FEET.

NOTES:

MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ COUNTY ENGINEER

DATE: 11/6/19

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 – ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

DRAINAGE CHANNEL C
STA. 30+00.00 TO 38+00.00

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1968-16003

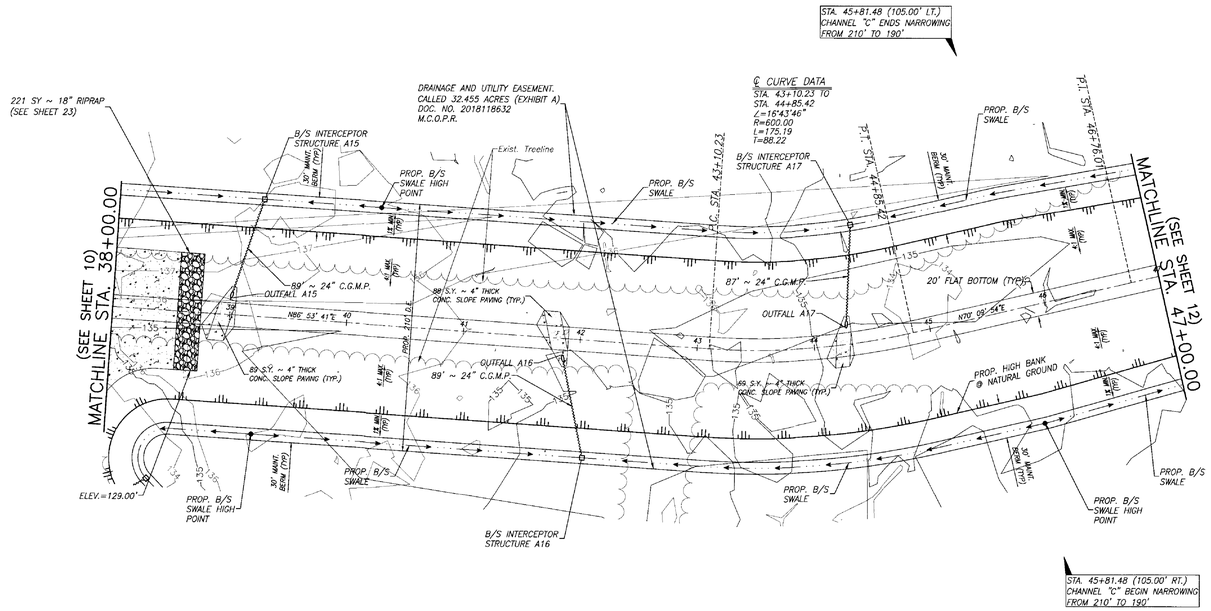
STATE OF TEXAS
CHRISTOPHER J. LEBLANC
100170
LICENSED PROFESSIONAL ENGINEER
12/20/18

SUBMITTED:
SCALE: VERT: 1" = 5' HOR: 1" = 50'
DATE: DECEMBER 2018
SURVEYED BY:
F B NO:

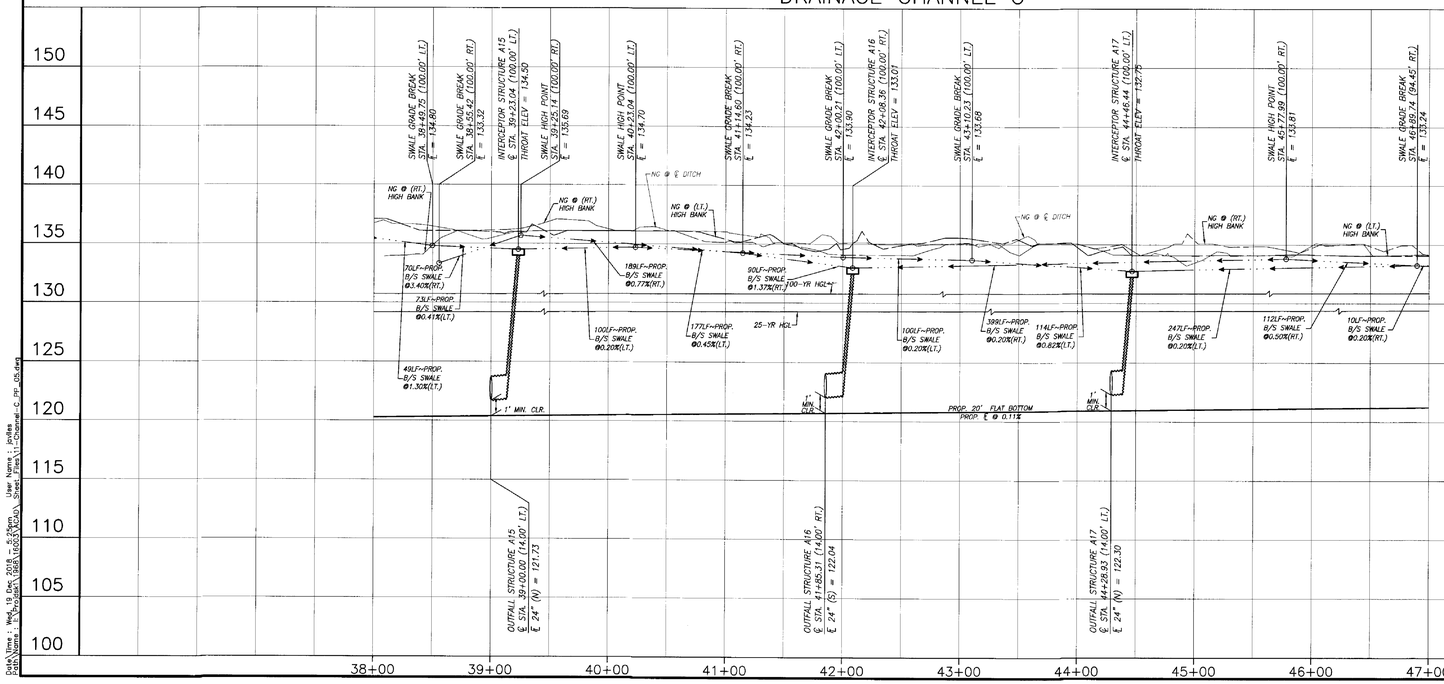
DESIGNED BY: CL/JM/JCA
DRAWN BY: JCA
SHEET NO. 10 OF 23 SHEETS

EAST DRAINAGE CHANNELS – TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT – JOB NO. 1968-16003

Date/Time = Wed, 19 Dec 2018 - 5:25pm User Name = jjones
Path/Name = I:\Projects\1968\16003\CAD\Sheet Files\10-Channel-C.dgn 04.dwg



DRAINAGE CHANNEL C



BENCHMARK:

MC LIDAR GROUND CONTROL POINT RM 548: A SURVEY SPIKE SET IN THE PAVEMENT AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CALHOUN ROAD AND EAST DR.
ELEV = 139.49 FEET NAVD88 (GEOID2003)
TBM-A
A ⅝-INCH IRON ROD WITH ORANGE PLASTIC CAP STAMPED "LJA ENG CONTROL" LOCATED AT THE SOUTH SIDE OF F.M.242. THE POINT IS LOCATED +/- 850 FEET WEST OF THE INTERSECTION OF F.M. 242 AND MYSTIC HILL DRIVE AND +/- 10 FEET SOUTH OF THE SOUTHERN EDGE OF PAVEMENT OF F.M. 242.
ELEV = 140.79 FEET NAVD88 (GEOID2003)

FLOODPLAIN:

SITE IS LOCATED IN UNSHADED ZONE X PER FEMA FIRM MAP No. 48339C0575G REVISED AUGUST 18, 2014. THE NEAREST FLOODPLAIN ELEVATION WAS DETERMINED TO BE 134.00 FEET.

NOTES:

MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ COUNTY ENGINEER

DATE: 11/6/19

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 – ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

DRAINAGE CHANNEL C
STA. 38+00.00 TO 47+00.00

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1968-16003

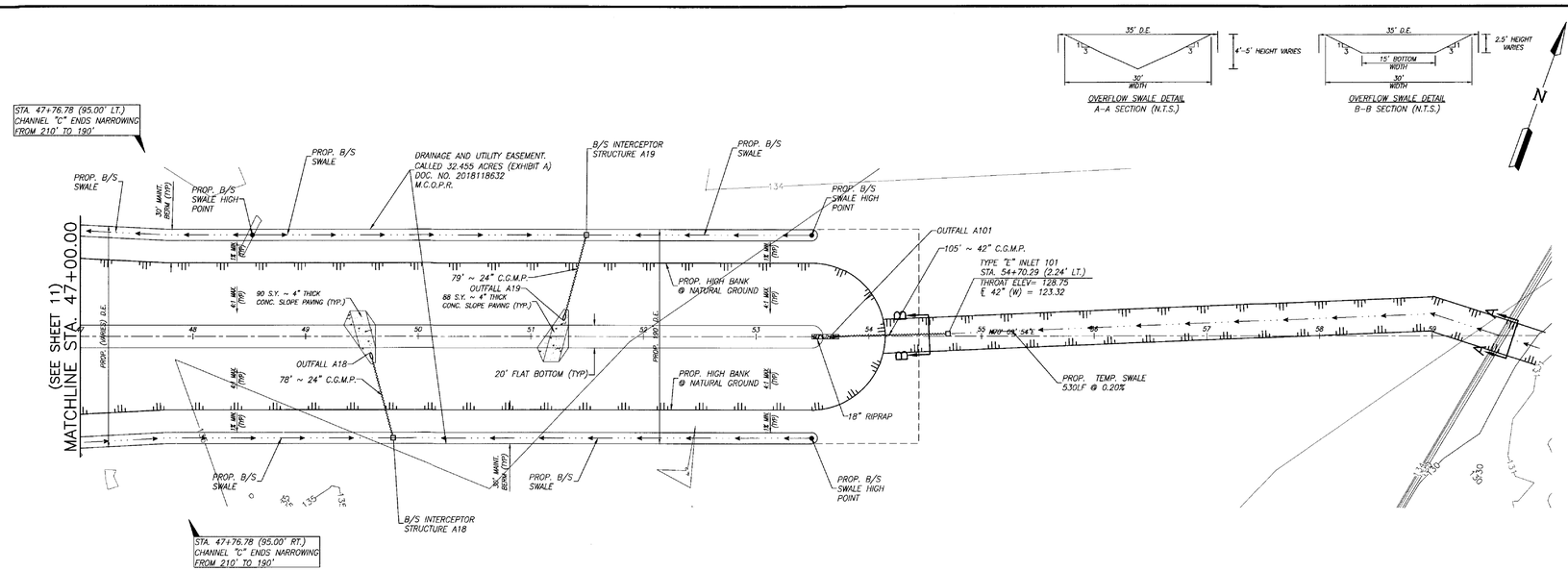
STATE OF TEXAS
CHRISTOPHER J. LEBLANC
100170
LICENSED PROFESSIONAL ENGINEER
12/20/18

SUBMITTED:
SCALE: VERT: 1" = 5'
HOR: 1" = 50'
DATE: DECEMBER 2018
SURVEYED BY:
F B NO:

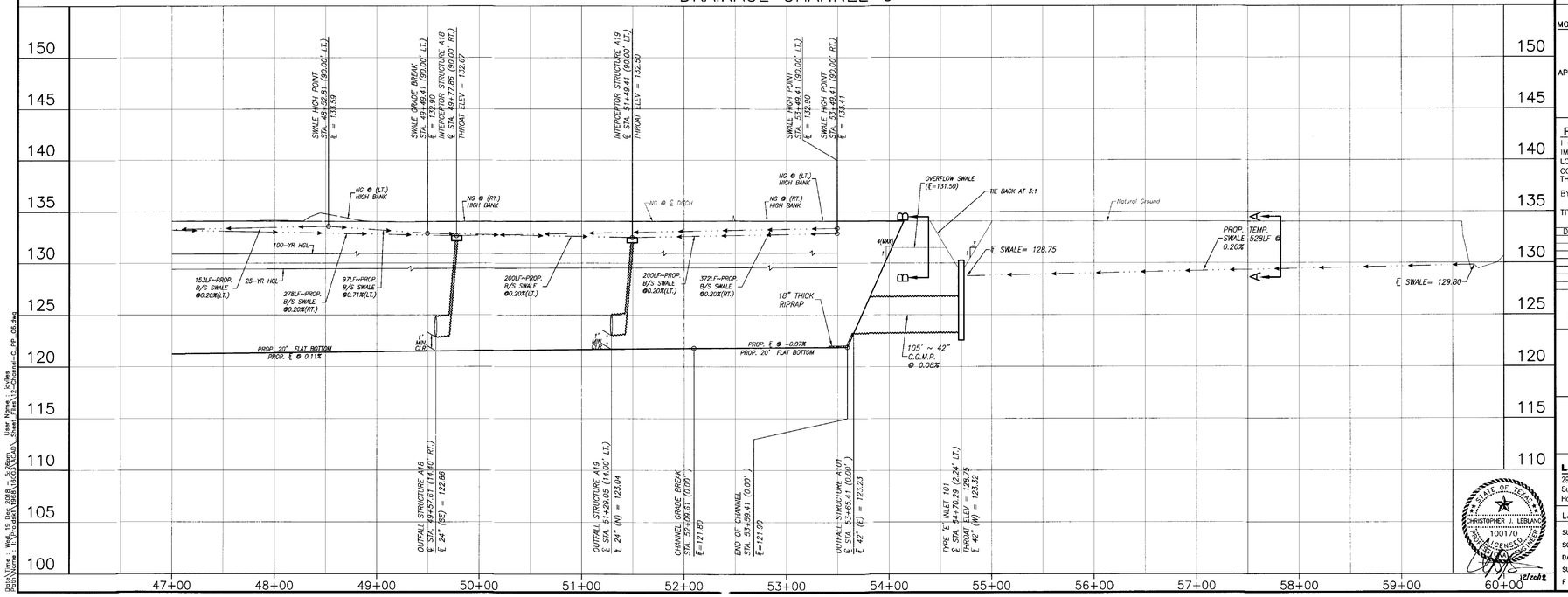
DESIGNED BY: CL/JM/JCA
DRAWN BY: JCA
SHEET NO. 11 OF 23 SHEETS

EAST DRAINAGE CHANNELS – TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT – JOB NO. 1968-16003

Date\Time : Wed, 19 Dec 2018 - 5:24pm User Name : jpitre
Path Name : N:\Projects\1968\16003\JCA\Civil Sheet Files\11-Channel_C_RP_05.dwg



DRAINAGE CHANNEL C



BENCHMARK:

MC LIDAR GROUND CONTROL POINT RM 548: A SURVEY SPIKE SET IN THE PAVEMENT AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CALHOUN ROAD AND EAST DR.
ELEV = 139.49 FEET NAVD88 (GEOID2003)
TBM-A
A ⅝"-INCH IRON ROD WITH ORANGE PLASTIC CAP STAMPED "LJA ENG CONTROL" LOCATED AT THE SOUTH SIDE OF F.M.242. THE POINT IS LOCATED +/- 850 FEET WEST OF THE INTERSECTION OF F.M. 242 AND MYSTIC HILL DRIVE AND +/- 10 FEET SOUTH OF THE SOUTHERN EDGE OF PAVEMENT OF F.M. 242.
ELEV = 140.79 FEET NAVD88 (GEOID2003)

FLOODPLAIN:

SITE IS LOCATED IN UNSHADED ZONE X PER FEMA FIRM MAP No. 48339C0075G REVISED AUGUST 18, 2014. THE NEAREST FLOODPLAIN ELEVATION WAS DETERMINED TO BE 134.00 FEET.

NOTES:

MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ – COUNTY ENGINEER

DATE: 1/16/19

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 – ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

DRAINAGE CHANNEL C
STA. 47+00.00 TO END

LJA Engineering, Inc.
2929 Briarpark Drive, Suite 600, Houston, Texas 77042
Phone 713.953.5200 Fax 713.953.5026 FRN - F-1386

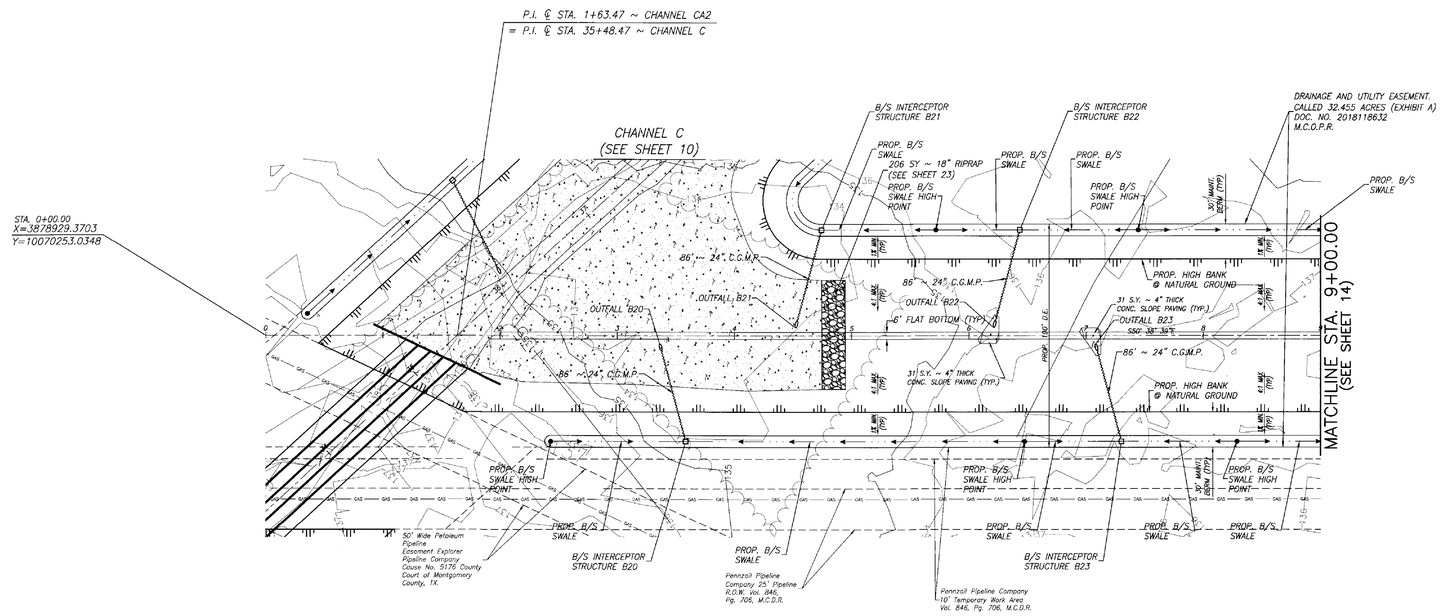
LJA PROJECT NO.: 1968-16003

STATE OF TEXAS – CHRISTOPHER J. LEBLANC – 100170 – LICENSED PROFESSIONAL ENGINEER – 12/2018

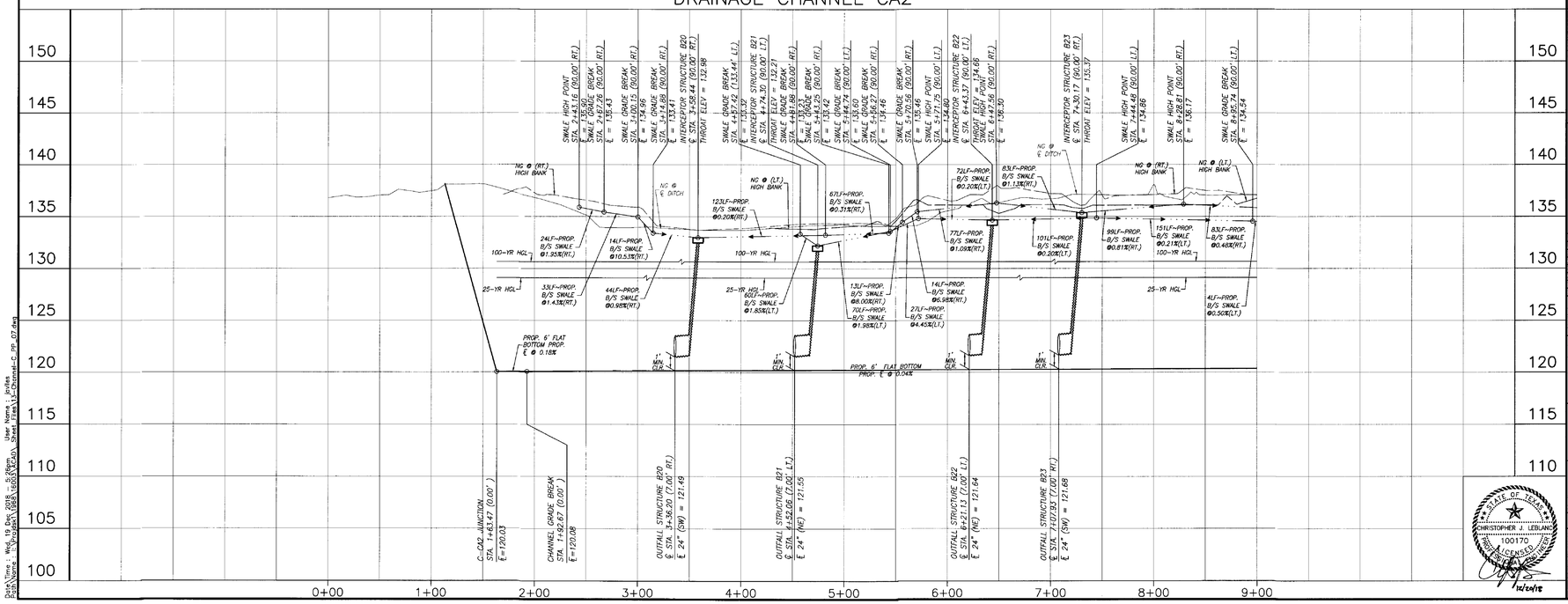
SUBMITTED:
SCALE: VERT: 1" = 5' HOR: 1" = 50'
DATE: DECEMBER 2018
SURVEYED BY:
F B NO:

DESIGNED BY: CL/JM/JCA
DRAWN BY: JCA
SHEET NO. 12 OF 23 SHEETS

EAST DRAINAGE CHANNELS – TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT – JOB NO. 1968-16003



DRAINAGE CHANNEL CA2



BENCHMARK:

MC LIDAR GROUND CONTROL POINT RM 548: A SURVEY SPIKE SET IN THE PAVEMENT AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CALHOUN ROAD AND EAST DR.
ELEV = 139.49 FEET NAVD88 (GEOID2003)
TBM-A
A ⅝-INCH IRON ROD WITH ORANGE PLASTIC CAP STAMPED "LJA ENG CONTROL" LOCATED AT THE SOUTH SIDE OF F.M.242 THE POINT IS LOCATED +/- 850 FEET WEST OF THE INTERSECTION OF F.M. 242 AND MYSTIC HILL DRIVE AND +/- 10 FEET SOUTH OF THE SOUTHERN EDGE OF PAVEMENT OF F.M. 242.
ELEV = 140.79 FEET NAVD88 (GEOID2003)

FLOODPLAIN:

SITE IS LOCATED IN UNSHADED ZONE X PER FEMA FIRM MAP No. 48339C0575G REVISED AUGUST 18, 2014. THE NEAREST FLOODPLAIN ELEVATION WAS DETERMINED TO BE 134.00 FEET.

NOTES:

MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ COUNTY ENGINEER

DATE: 1/16/19

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 – ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

DRAINAGE CHANNEL CA2
STA. 0+00.00 TO 9+00.00

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1968-16003

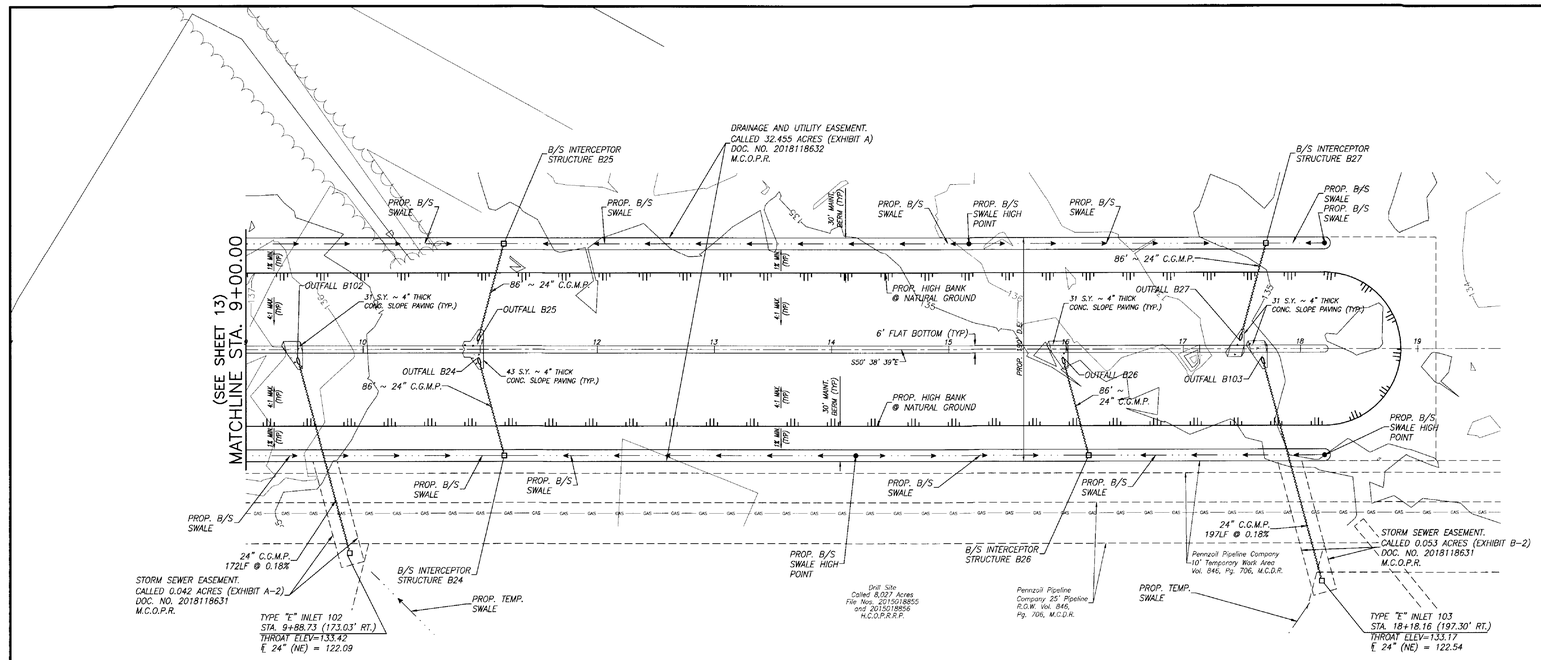
STATE OF TEXAS
CHRISTOPHER J. LEBLANC
100170
LICENSED PROFESSIONAL ENGINEER
12/24/18

SUBMITTED:
SCALE: VERT: 1" = 5'
HOR: 1" = 50'
DATE: DECEMBER 2018
SURVEYED BY:
F B NO:

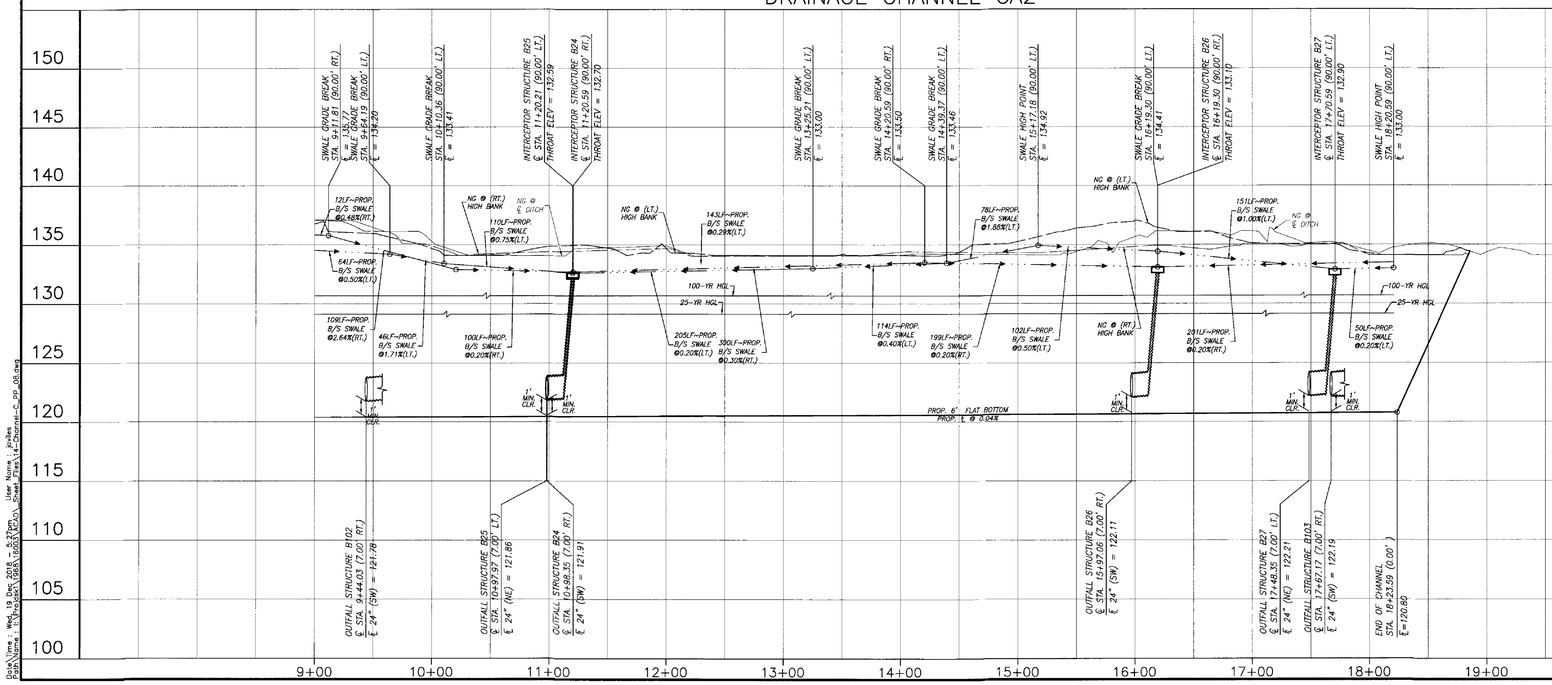
DESIGNED BY: CL/JM/JCA
DRAWN BY: JCA
SHEET NO. 13 OF 23 SHEETS

EAST DRAINAGE CHANNELS – TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT – JOB NO. 1968-16003

Date/Time: Wed, 19 Dec 2018 - 5:26pm User Name: Rolles
Path/Name: I:\Projects\1968\16003\CAD\Sheet Files\13-Channel-C_PP_07.dwg



DRAINAGE CHANNEL CA2



BENCHMARK:
MC LIDAR GROUND CONTROL POINT RM 548: A SURVEY SPIKE SET IN THE PAVEMENT AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CALHOUN ROAD AND EAST DR.
ELEV = 139.49 FEET NAVD88 (GEOID2003)
TBM-A
A ⅝-INCH IRON ROD WITH ORANGE PLASTIC CAP STAMPED "LJA ENG CONTROL" LOCATED AT THE SOUTH SIDE OF F.M.242. THE POINT IS LOCATED +/- 850 FEET WEST OF THE INTERSECTION OF F.M. 242 AND MYSTIC HILL DRIVE AND +/- 10 FEET SOUTH OF THE SOUTHERN EDGE OF PAVEMENT OF F.M. 242.
ELEV = 140.79 FEET NAVD88 (GEOID2003)

FLOODPLAIN:
SITE IS LOCATED IN UNSHADED ZONE X PER FEMA FIRM MAP No. 48339C0575G REVISED AUGUST 18, 2014. THE NEAREST FLOODPLAIN ELEVATION WAS DETERMINED TO BE 134.00 FEET.

NOTES:

MONTGOMERY COUNTY ENGINEERING DEPARTMENT
APPROVED: _____ COUNTY ENGINEER
DATE: 1/16/19

RECORD DRAWING
I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS
BY: _____ DATE: _____
TITLE: _____

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 – ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

DRAINAGE CHANNEL CA2
STA. 9+00.00 TO END

LJA Engineering, Inc.
2929 Briarpark Drive, Suite 600, Houston, Texas 77042
Phone 713.953.5200 Fax 713.953.5026 FRN - F-1386

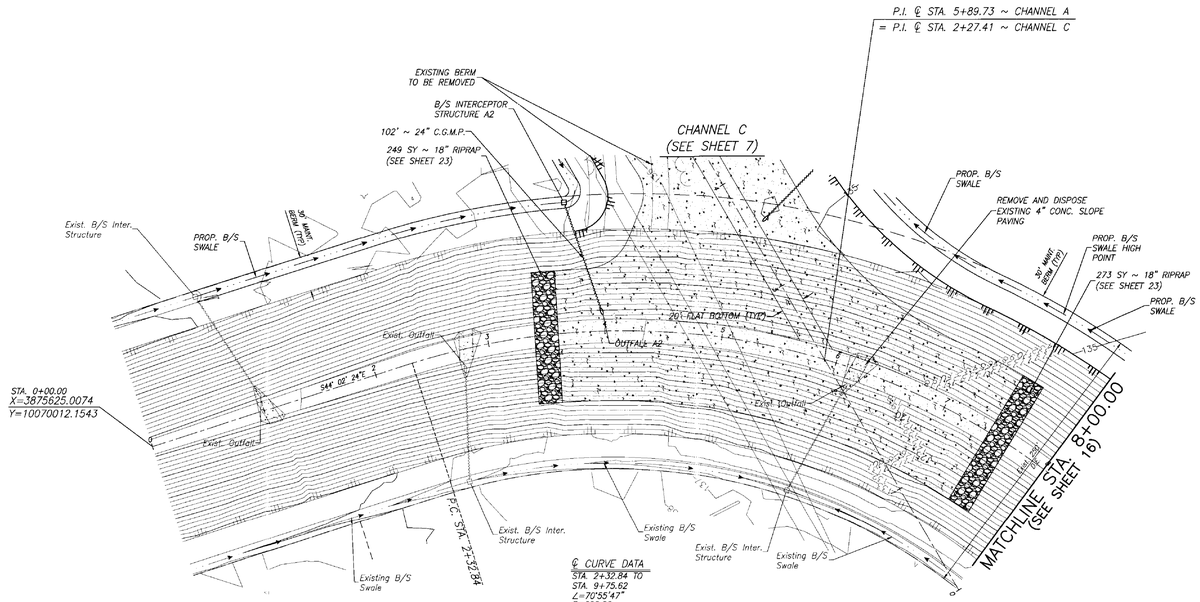
LJA PROJECT NO.: 1968-16003

SUBMITTED:
SCALE: VERT: 1" = 5' HOR: 1" = 50'
DATE: DECEMBER 2018
SURVEYED BY:
F B NO:

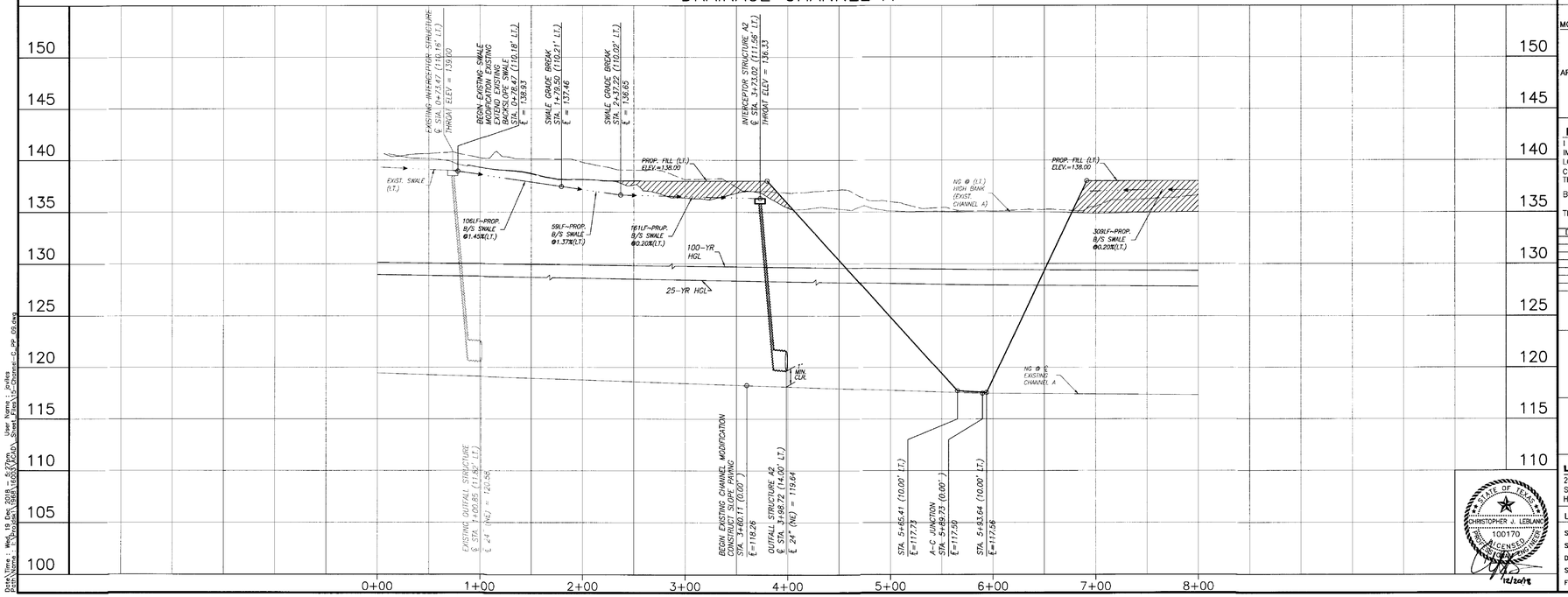
DESIGNED BY: CL/JM/JCA
DRAWN BY: JCA
SHEET NO. 14 OF 23 SHEETS

STATE OF TEXAS — CHRISTOPHER J. LEBLANC — 100170 — LICENSED PROFESSIONAL ENGINEER — 12/20/18

EAST DRAINAGE CHANNELS – TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT – JOB NO. 1968-16003



DRAINAGE CHANNEL A



BENCHMARK:

MC LIDAR GROUND CONTROL POINT RM 548: A SURVEY SPIKE SET IN THE PAVEMENT AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CALHOUN ROAD AND EAST DR.
ELEV = 139.49 FEET NAVD88 (GEOID2003)
TBM~A
A ⅜~INCH IRON ROD WITH ORANGE PLASTIC CAP STAMPED "LJA ENG CONTROL" LOCATED AT THE SOUTH SIDE OF F.M.242. THE POINT IS LOCATED +/~ 850 FEET WEST OF THE INTERSECTION OF F.M. 242 AND MYSTIC HILL DRIVE AND +/~ 10 FEET SOUTH OF THE SOUTHERN EDGE OF PAVEMENT OF F.M. 242.
ELEV = 140.79 FEET NAVD88 (GEOID2003)

FLOODPLAIN:

SITE IS LOCATED IN UNSHADED ZONE X PER FEMA FIRM MAP No. 48339C0575G REVISED AUGUST 18, 2014. THE NEAREST FLOODPLAIN ELEVATION WAS DETERMINED TO BE 134.00 FEET.

NOTES:

MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ ~ COUNTY ENGINEER

DATE: 1/16/19

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 ~ ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

DRAINAGE CHANNEL A
STA. 0+00.00 TO 8+00.00

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN ~ F~1386

LJA PROJECT NO.: 1968~16003

STATE OF TEXAS
CHRISTOPHER J. LESLIANO
100170
LICENSED
PROFESSIONAL ENGINEER
12/20/18

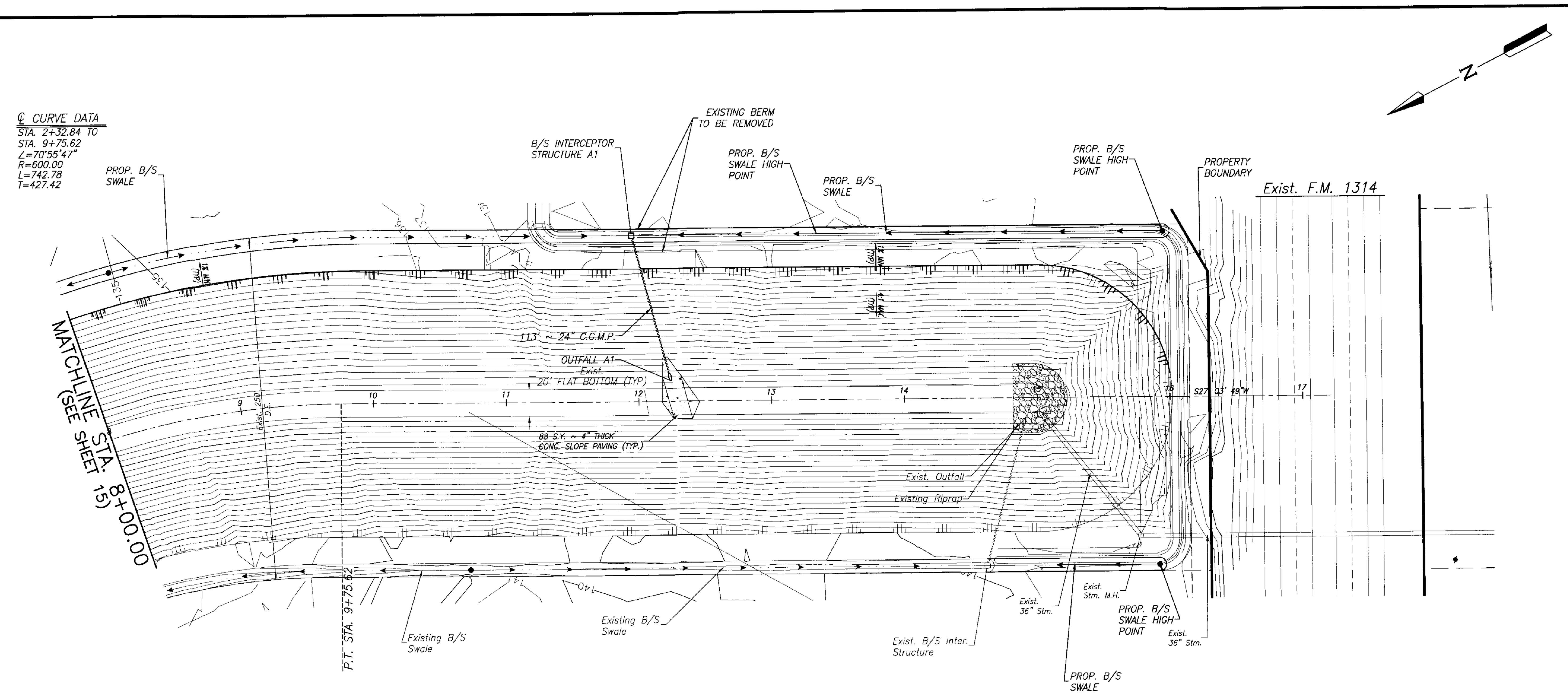
SUBMITTED:
SCALE: VERT: 1" = 5'
HOR: 1" = 50'
DATE: DECEMBER 2018
SURVEYED BY:
F B NO:

DESIGNED BY: CL/JM/JCA
DRAWN BY: JCA
SHEET NO. 15 OF 23 SHEETS

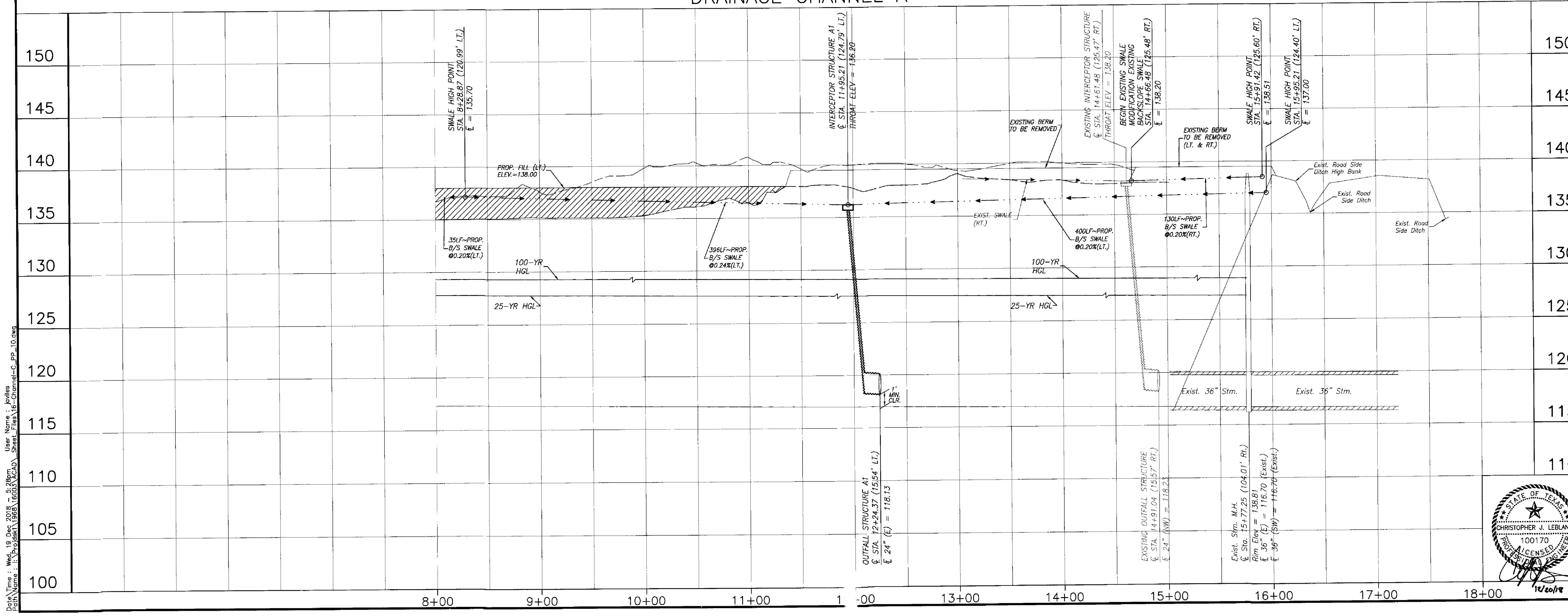
EAST DRAINAGE CHANNELS ~ TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT ~ JOB NO. 1968~16003

Date\Time : Wed, 19 Dec 2018 ~ 6:27pm
Drawing : L:\Projects\1968-16003\Acad\Sheet Files\15-Channel-C_P_05.dwg
User Name : jcalka

15



DRAINAGE CHANNEL A



BENCHMARK:

MC LIDAR GROUND CONTROL POINT RM 548: A SURVEY SPIKE SET IN THE PAVEMENT AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CALHOUN ROAD AND EAST DR.
ELEV = 139.49 FEET NAVD88 (GEOID2003)
TBM-A
A ⅝-INCH IRON ROD WITH ORANGE PLASTIC CAP STAMPED "LJA ENG CONTROL" LOCATED AT THE SOUTH SIDE OF F.M.242 THE POINT IS LOCATED +/- 850 FEET WEST OF THE INTERSECTION OF F.M. 242 AND MYSTIC HILL DRIVE AND +/- 10 FEET SOUTH OF THE SOUTHERN EDGE OF PAVEMENT OF F.M. 242.
ELEV = 140.79 FEET NAVD88 (GEOID2003)

FLOODPLAIN:

SITE IS LOCATED IN UNSHADED ZONE X PER FEMA FIRM MAP No. 48339C0575G REVISED AUGUST 18, 2014. THE NEAREST FLOODPLAIN ELEVATION WAS DETERMINED TO BE 134.00 FEET.

NOTES:

MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: [signature] - COUNTY ENGINEER

DATE: 1/16/19

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY ______ DATE ______

TITLE ______

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 - ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

DRAINAGE CHANNEL A
STA. 8+00.00 TO END

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

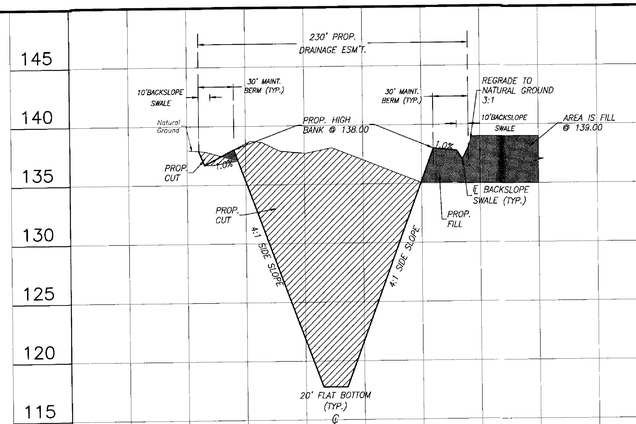
STATE OF TEXAS
CHRISTOPHER J. LEBLANC
100170
LICENSED PROFESSIONAL ENGINEER
12/20/18

LJA PROJECT NO.: 1968-16003

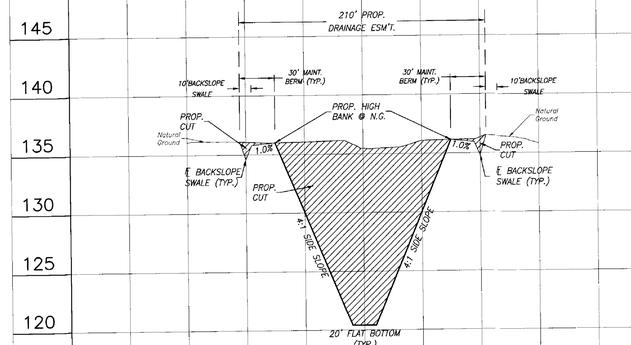
SUBMITTED:
SCALE: VERT: 1" = 5'
HOR: 1" = 50'
DATE: DECEMBER 2018
SURVEYED BY:
F B NO:

DESIGNED BY: CL/JM/JCA
DRAWN BY: JCA
SHEET NO. 16 OF 23 SHEETS

EAST DRAINAGE CHANNELS - TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT - JOB NO. 1968-16003



DRAINAGE CHANNEL "C"
STA= 4+00 – 13+00



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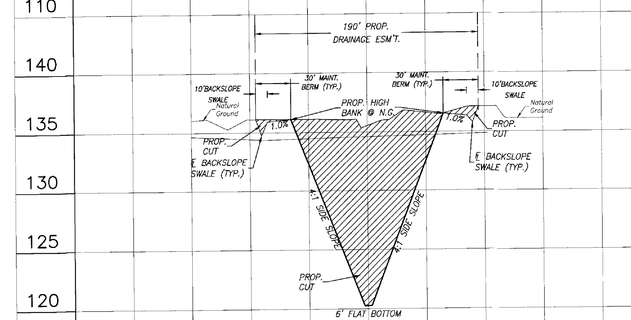

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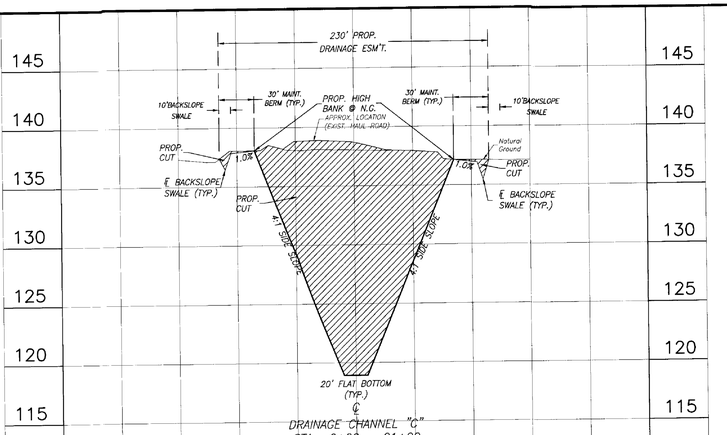

DRAINAGE CHANNEL "C"
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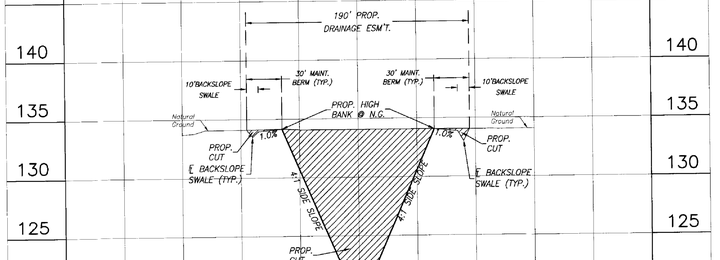

DRAINAGE CHANNEL "C"
STA= 48+00 – END

BENCHMARK:

MC LIDAR GROUND CONTROL POINT RM 548: A SURVEY SPIKE SET IN THE PAVEMENT AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CALHOUN ROAD AND LAST DR.
ELEV = 139.49 FEET NAVD88 (GEOID2003)
TBM-A
A ⅝-INCH IRON ROD WITH ORANGE PLASTIC CAP STAMPED "LJA ENG CONTROL" LOCATED AT THE SOUTH SIDE OF F.M.242. THE POINT IS LOCATED +/- 850 FEET WEST OF THE INTERSECTION OF F.M. 242 AND MYSTIC HILL DRIVE AND +/- 10 FEET SOUTH OF THE SOUTHERN EDGE OF PAVEMENT OF F.M. 242.
ELEV = 140.79 FEET NAVD88 (GEOID2003)

FLOODPLAIN:

SITE IS LOCATED IN UNSHADED ZONE X PER FEMA FIRM MAP No. 48339C0575G REVISED AUGUST 18, 2014. THE NEAREST FLOODPLAIN ELEVATION WAS DETERMINED TO BE 134.00 FEET.

NOTES:

PROPOSED CUT

PROPOSED FILL

MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ COUNTY ENGINEER

DATE: 1/16/19

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 – ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

DRAINAGE CHANNEL
C & CA2
CROSS SECTIONS

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1968-16003

SUBMITTED:
SCALE: VERT: 1" = 5'
HOR: 1" = 50'
DATE: DECEMBER 2018
SURVEYED BY:
F B NO:

DESIGNED BY: CL/JM/JCA
DRAWN BY: JCA
SHEET NO. 17 OF 23 SHEETS

STATE OF TEXAS
CHRISTOPHER J. LEBLANC
100170
LICENSED
ENGINEER
12/20/18

EAST DRAINAGE CHANNELS – TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT – JOB NO. 1968-16003

17

Date\Time : Wed, 19 Dec 2018 – 5:28pm
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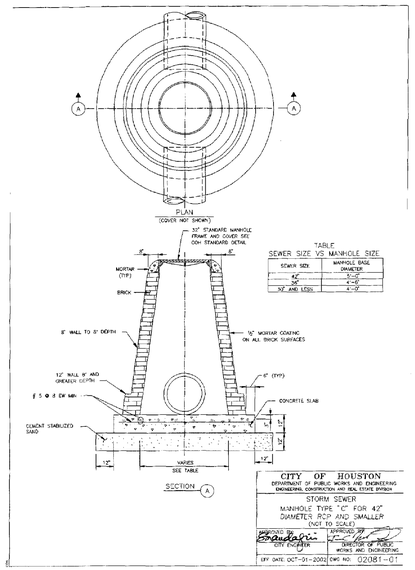
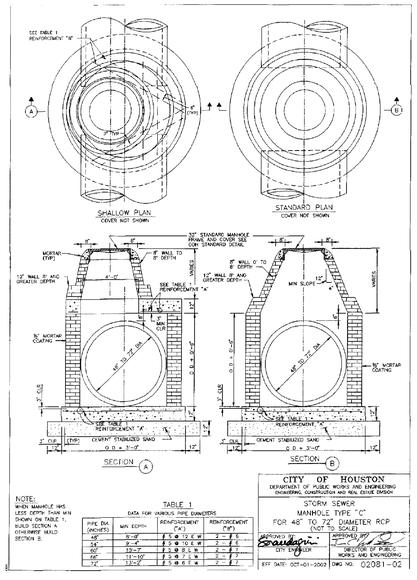
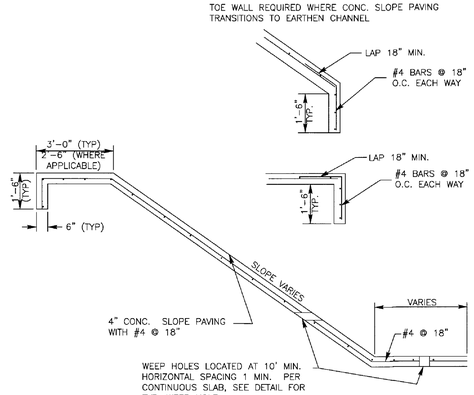
User Name : jpfiles



STORM SEWER MANHOLE TYPE "C" FOR 42" DIAMETER RCP AND SMALLER

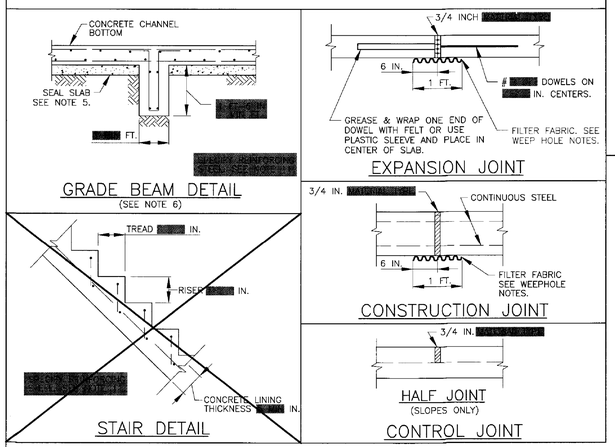


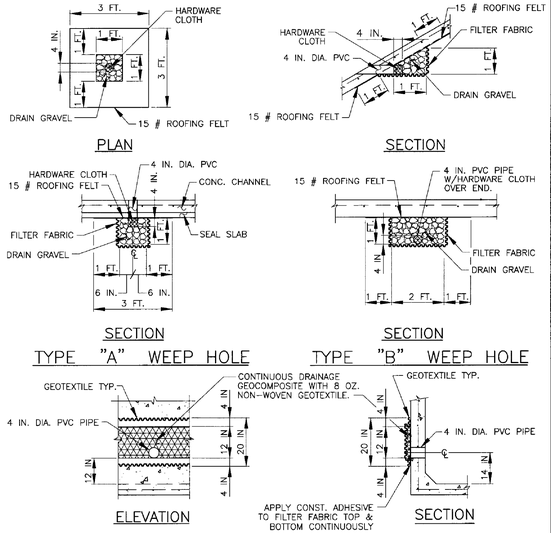
STORM SEWER MANHOLE TYPE "C" FOR 48" TO 72" DIAMETER RCP



1. *EXPANSION JOINTS TO BE PLACED AT A MAXIMUM DISTANCE OF 80 FEET.*
2. *CENTER DOWEL HORIZONTALLY ON JOINT.*
3. *CENTER DOWEL HORIZONTALLY IN CONCRETE BASE. EXTEND THICKENED CONCRETE AS NEEDED TO MAINTAIN 3" MIN COVER.*

TYPICAL CHANNEL LINING DETAIL





WEEP HOLE NOTES:

MATERIALS:

a. PIPE: 4 INCH DIA. SCH. 40 PVC

b. DRAIN GRAVEL:

SIEVE SIZE	% FINER
1 IN	100
3/4 IN	70 – 100
3/8 IN	20 – 90
NO. 4	0 – 60
NO. 8	0

c. HARDWARE CLOTH: MIN. OPEN 1/8 IN, MAX. OPEN 1/4 IN

d. FILTER FABRIC: NON-WOVEN GEOTEXTILE
MIN. AOS SIEVE NO. [redacted]
MAX. AOS SIEVE NO. [redacted]
WEIGHT OZ/SY [redacted]

2. CUT WEEP HOLE PIPE FLUSH WITH CONCRETE SURFACE.
3. TYPE "A" AND "C" WEEP HOLES FOR TYPICAL RECTANGULAR CONCRETE CHANNEL LINING. TO BE STAGGERED.

WEEP HOLE DETAILS

CONCRETE CHANNEL LINING DETAILS NOTES:

1. STRUCTURAL CONCRETE FOR CONCRETE CHANNEL LINING AND NONSTRUCTURAL CONCRETE FOR SEAL SLAB SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 03310–CONCRETE.
2. REINFORCING STEEL SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 03310–CONCRETE.
3. EXCAVATION AND BACKFILL FOR CONCRETE CHANNEL LINING SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 02316–STRUCTURAL EXCAVATING AND BACKFILLING.
4. RIPRAP SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 02378–RIPRAP AND GRANULAR FILL.
5. A NON–REINFORCED [redacted] NONSTRUCTURAL CONCRETE SEAL SLAB WILL BE REQUIRED BENEATH THE BOTTOM OF CONCRETE CHANNELS.
6. STRUCTURAL CONCRETE GRADE BEAMS SHALL BE INSTALLED TRANSVERSLEY AT [redacted] CENTERS ON CONCRETE LINED CHANNELS WITH BOTTOM WIDTHS EQUAL TO OR GREATER THAN 20 FEET.
7. JOINTS:
   A. PLACE [redacted] JOINT IN CONCRETE LOW–FLOW AND TRAPEZOIDAL BOTTOM SECTIONS AT [redacted] SPACING CONTINUOUSLY THROUGH CHANNEL LINING.
   B. PLACE CONTROL JOINT ON SLOPES AT 20 FOOT SPACING.
8. CEMENT STABILIZED SAND SHALL BE PROVIDED AND PLACED IN ACCORDANCE WITH SPECIFICATION SECTION NO. 02321–CEMENT STABILIZED SAND.
9. DELETE 2 FT FLAT EDGE WHEN LINING IS BELOW TOP OF BANK. SEE MID–SLOPE LINING DETAIL.
10. UPSTREAM AND DOWNSTREAM TOE WALL [redacted] AT BOTTOM OF SLOPE AND 8 INCHES THIICK.
11. [redacted] F SLOPE.

BENCHMARK:

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TBM–A
A ½–INCH IRON ROD WITH ORANGE PLASTIC CAP STAMPED "LJA ENG CONTROL" LOCATED AT THE SOUTH SIDE OF F.M.242. THE POINT IS LOCATED +/– 850 FEET WEST OF THE INTERSECTION OF F.M. 242 AND MYSTIC HILL DRIVE AND +/– 10 FEET SOUTH OF THE SOUTHERN EDGE OF PAVEMENT OF F.M. 242.
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FLOODPLAIN:

SITE IS LOCATED IN UNSHADED ZONE X PER FEMA FIRM MAP No. 48339C0575G REVISED AUGUST 18, 2014. THE NEAREST FLOODPLAIN ELEVATION WAS DETERMINED TO BE 134.00 FEET.

NOTES:

MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: _____ – COUNTY ENGINEER

DATE: 11/6/19

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY _____ DATE _____

TITLE _____

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 – ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

CONCRETE CHANNEL LINING DETAILS

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN – F-1386

LJA PROJECT NO.: 1968–16003

SUBMITTED:	DESIGNED BY: CL/JM/JCA
SCALE: NONE	DRAWN BY: JCA
DATE: DECEMBER 2018	SHEET NO. 18 OF 23 SHEETS
SURVEYED BY:	
F B NO:	

STATE OF TEXAS
100170
LICENSED PROFESSIONAL ENGINEER
CHRISTOPHER J. LEBLANC
12/2018

EAST DRAINAGE CHANNELS – TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT – JOB NO. 1968–16003

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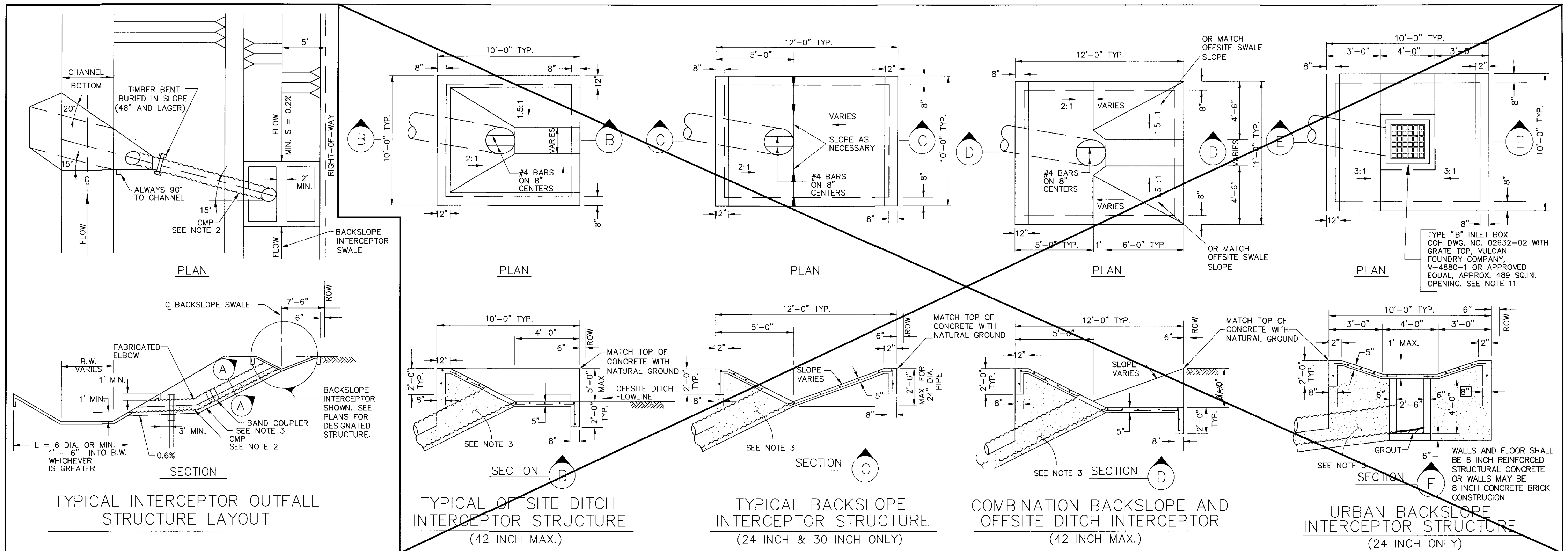
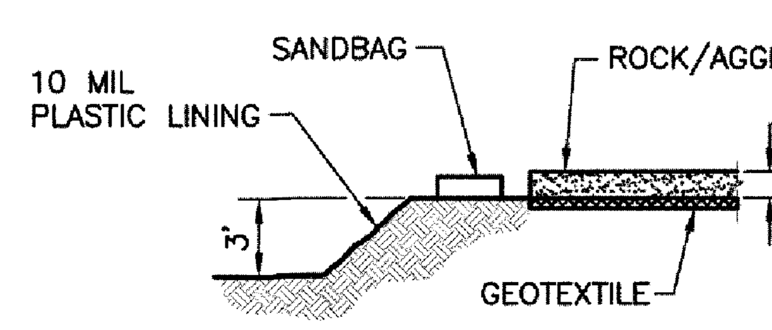
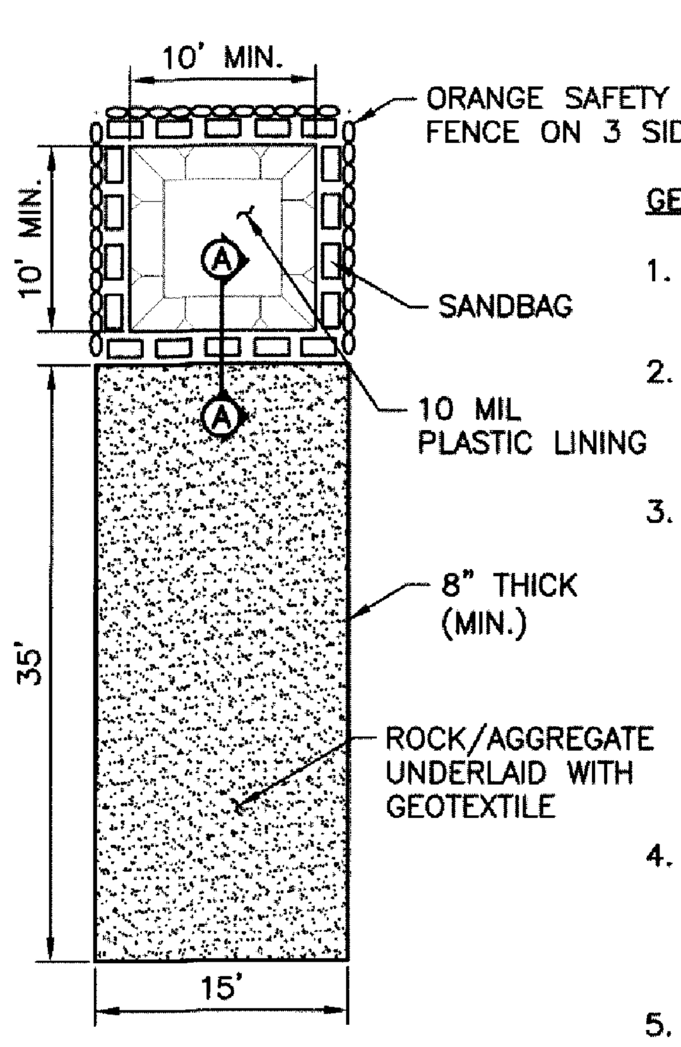


CONCRETE TRUCK WASHOUT AREA

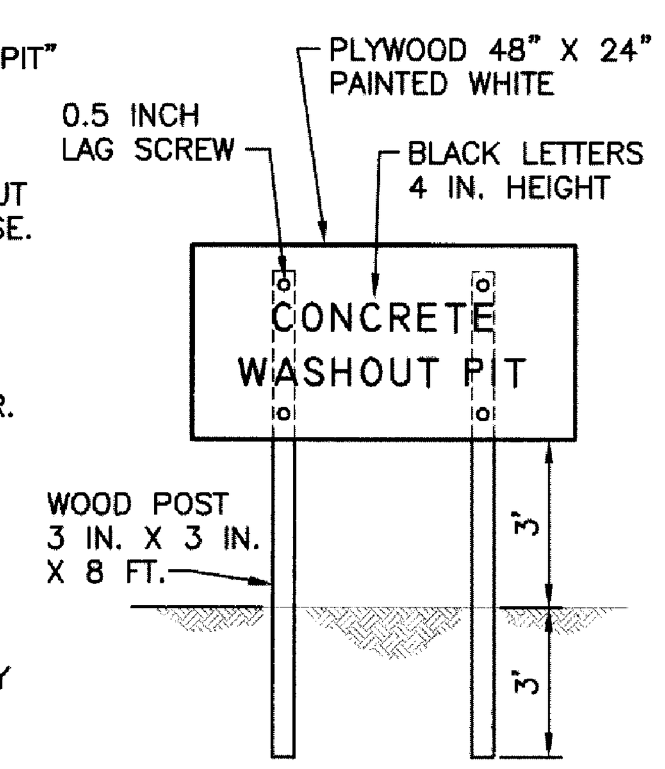


CTW SYMBOL

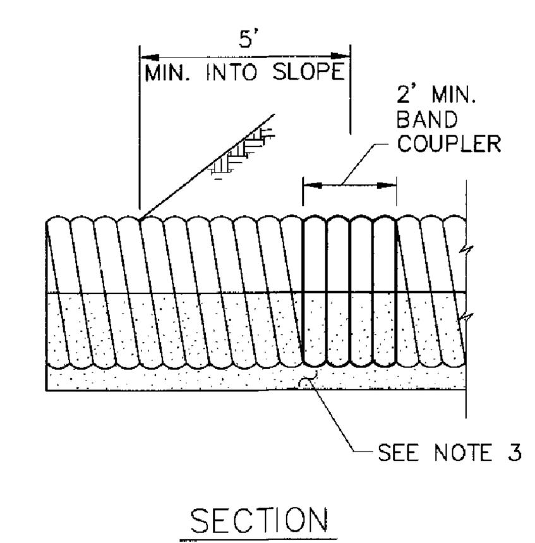


GENERAL NOTES:

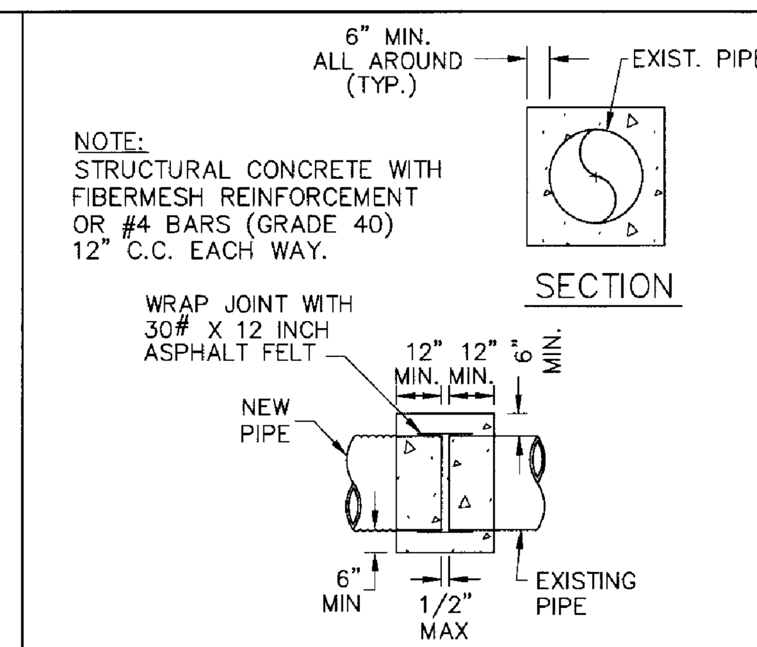
1. POST A SIGN READING "CONCRETE WASHOUT PIT" NEXT TO THE PIT.
2. VERBALLY INSTRUCT THE CONCRETE TRUCK DRIVERS WHERE THE PIT IS AND TO WASH OUT THEIR TRUCKS IN THE PIT AND NOWHERE ELSE.
3. UPON THE CONCRETE SETTING UP (CURING, DRYING OUT), THE CONCRETE WASTE SHALL BE REMOVED FROM THE PROJECT SITE AND DISPOSED OF PROPERLY BY THE CONTRACTOR. AFTER REMOVAL OF THE CONCRETE WASTE, THE WASH OUT PIT SHALL BE FILLED WITH CLEAN FILL MATERIAL AND COMPACTED TO IN-SITU CONDITIONS, OR AS DIRECTED BY THE PROJECT SPECIFICATIONS.
4. CONCRETE WASH OUT PITS SHALL NOT BE LOCATED DIRECTLY ADJACENT TO, NOR AT ANY TIME DRAIN INTO THE STORM SEWER SYSTEM OR ANY OTHER SWALE, DITCH, OR WATERWAY.
5. CONSTRUCT ENTRY ROAD AND BOTTOM OF WASHOUT AREA TO SUPPORT EXPECTED LOADINGS FROM TRUCKS EQUIPMENT.



SIGN DETAIL
(OR EQUIVALENT)



CMP BAND COUPLER DETAIL



TYPICAL CONCRETE COLLAR DETAIL

GENERAL NOTES:

1. INSTALL OUTFALLS 48 INCHES OR LARGER DIAMETER AND TREATMENT PLANT OUTFALLS OF ANY DIAMETER WITH RIPRAP EROSION PROTECTION, DIMENSIONED AS SHOWN IN "TYPICAL STORM SEWER OUTFALL STRUCTURE LAYOUT."
2. STORM SEWER AND INTERCEPTOR OUTFALL PIPES WITHIN THE MONT. COUNTY RIGHT-OF-WAY SHALL BE CORRUGATED METAL PIPE (CMP) IN ACCORDANCE WITH SPECIFICATION SECTION NO. 02642-CORRUGATED METAL PIPE.
3. PROVIDE AND PLACE CEMENT STABILIZED SAND IN ACCORDANCE WITH SPECIFICATION SECTION NO. 02321-CEMENT STABILIZED SAND.
4. TIMBER BENTS SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 02464-TIMBER BENTS.
5. EXCAVATION, FILL AND BACKFILL FOR INTERCEPTOR STRUCTURES SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 02316-STRUCTURAL EXCAVATING AND BACKFILLING.
6. RIPRAP SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 02378-RIPRAP AND GRANULAR FILL.
7. CONCRETE SHALL BE STRUCTURAL CONCRETE IN ACCORDANCE WITH SPECIFICATION SECTION NO. 03310-CONCRETE.
8. INTERCEPTOR STRUCTURES:
   a. ADJUST LENGTH AND WIDTH IN FIELD AS NECESSARY.
   b. 2-FEET DEEP X 8-INCH WIDE TOE ALL AROUND THE STRUCTURE.
   c. STEEL REINFORCING-# 4 BARS (GRADE 40) AT 12 INCHES ON CENTER EACH WAY.
   d. ANY INTERCEPTOR OUTFALL PIPE LARGER THAN MAXIMUM SIZE INDICATED REQUIRES A SEPARATE DETAIL
9. SET FLOWLINE OF OUTFALL PIPES 1 FOOT ABOVE CHANNEL FLOWLINE OR 1 FOOT ABOVE NORMAL WATER SURFACE ELEVATION.
10. SEE CONCRETE CHANNEL LINING DETAIL SHEET FOR CMP OUTFALL DETAILS THROUGH CONCRETE CHANNEL LINING.
11. CONCRETE PAD AROUND TYPE B""INLET: PAID FOR AS CONCRETE INTERCEPTOR STRUCTURE PER UNIT PRICE SCHEDULE.

BENCHMARK:

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NOTES:

MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: [signature] - COUNTY ENGINEER

DATE: 1/16/19

RECORD DRAWING

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BY ______ DATE ______

TITLE ______

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 - ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

OUTFALL AND INTERCEPTOR STRUCTURE DETAILS

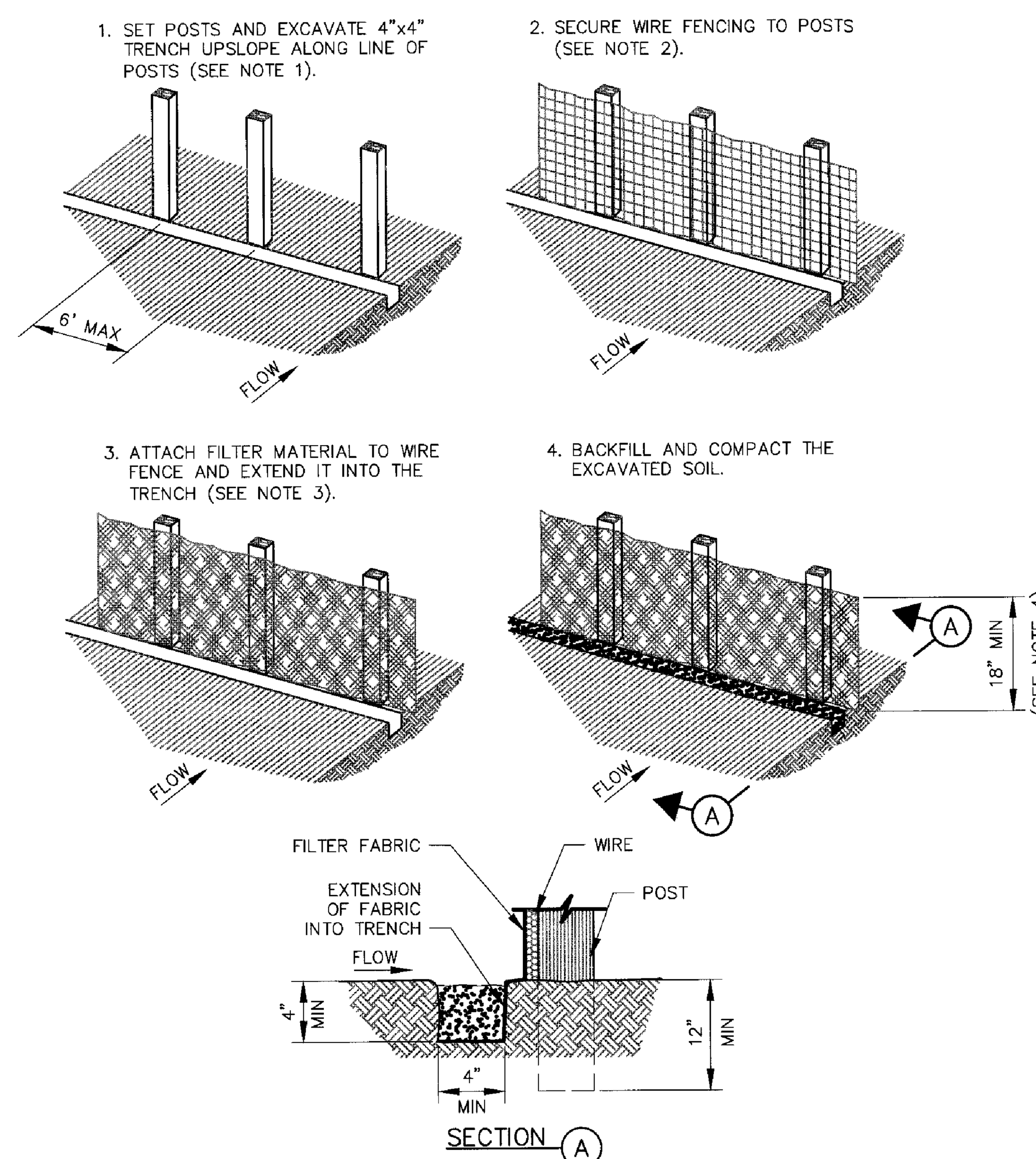
LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1968-16003

SUBMITTED:
SCALE: NONE
DATE: DECEMBER 2018
SURVEYED BY:
F B NO:
DESIGNED BY: CL/JM/JCA
DRAWN BY: JCA
SHEET NO. 19 OF 23 SHEETS

STATE OF TEXAS CHRISTOPHER J. LEBLANC 100170 LICENSED PROFESSIONAL ENGINEER 12/20/18

EAST DRAINAGE CHANNELS - TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT - JOB NO. 1968-16003



SECTION (A)

NOTES

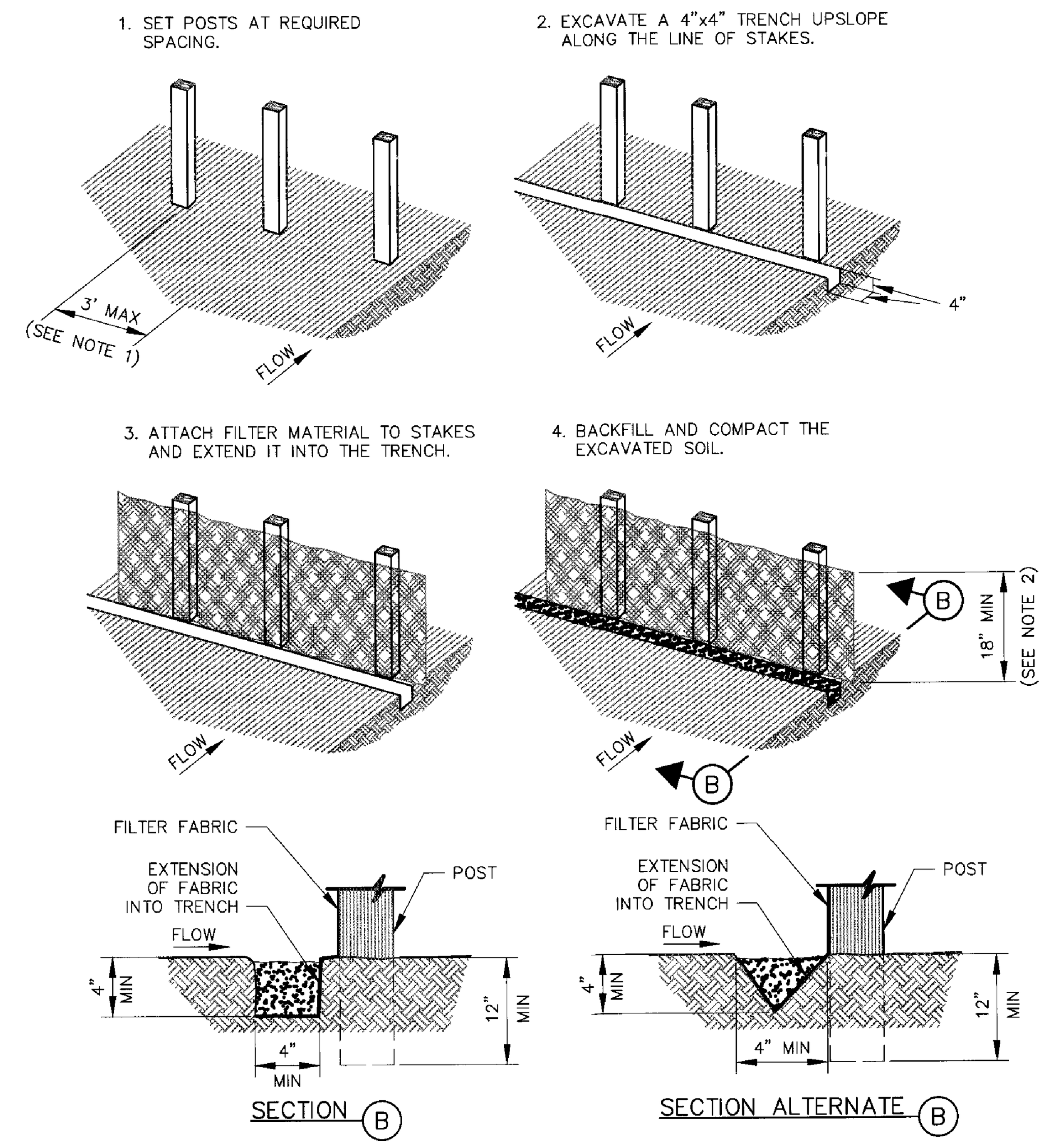
1. SET 2 INCH BY 2 INCH WOODEN STAKES SPACE A MAX OF 6 FEET APART AND EMBEDDED A MIN OF 12 INCHES.
2. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH STAPLES.
3. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE, WITH TIES SPACED EVERY 24 INCHES AT TOP AND MIDSECTION.
4. MINIMUM HEIGHT OF FILTER SHOULD BE 18 INCHES AND A MAXIMUM OF 36 INCHES ABOVE NATURAL GROUND.
5. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH EACH OTHER THEY SHALL BE OVERLAPPED 6 INCHES AT THE POSTS AND FOLDED.

X—(RFB)—X

SYMBOL

REINFORCED FILTER FABRIC BARRIER

NTS



SECTION (B)

SECTION ALTERNATE (B)

NOTES

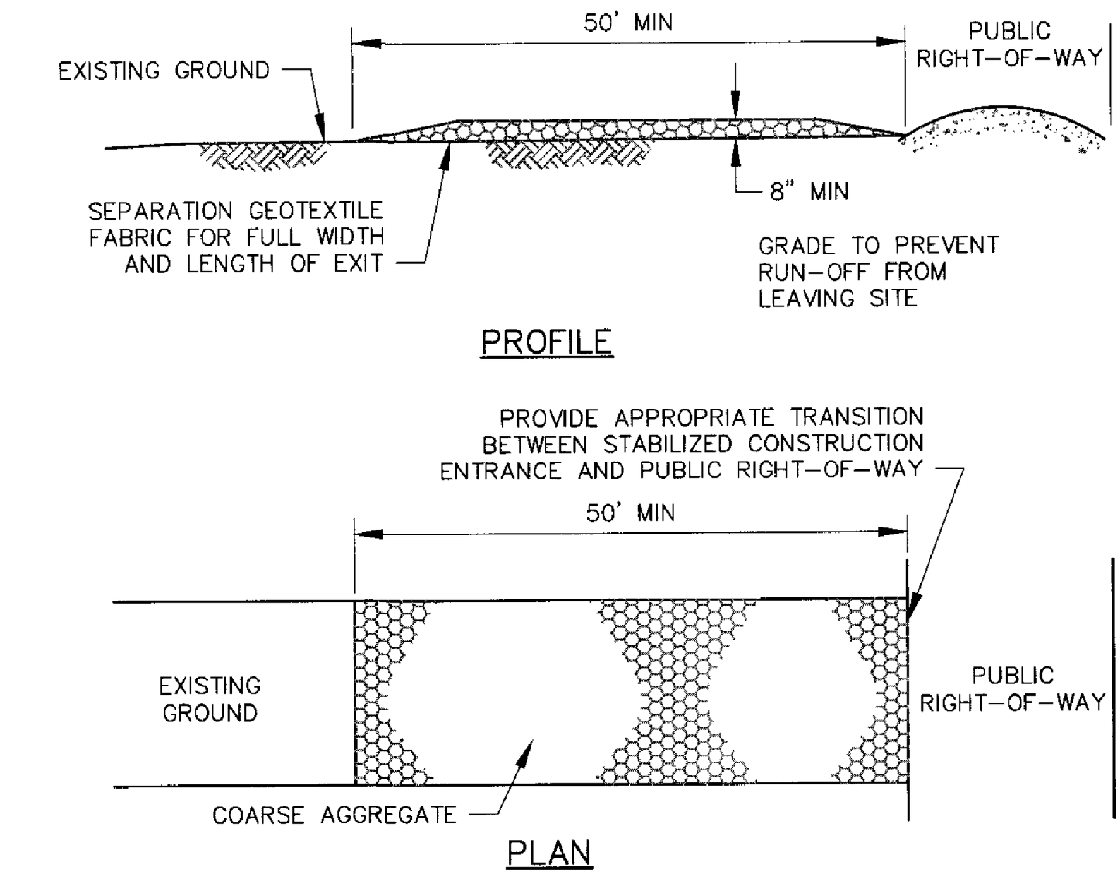
1. 2 INCH THICK BY 2 INCH WOODEN STAKES TO BE SET AT MAX SPACING OF 3 FEET AND EMBEDDED A MIN OF 12 INCHES. IF PRE ASSEMBLED FENCE WITH SUPPORT NETTING IS USED, SPACING OF POST MAY BE INCREASED TO 8 FEET MAX.
2. ATTACH FILTER FABRIC TO WOODED STAKES. FILTER FABRIC FENCE SHALL HAVE A MIN HEIGHT OF 18 INCHES AND MAX HEIGHT OF 36 INCHES ABOVE NATURAL GROUND.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHOULD BE OVERLAPPED 6 INCHES AT THE POSTS AND FOLDED.
4. MINIMUM HEIGHT OF FILTER SHOULD BE 18 INCHES AND A MAXIMUM OF 36 INCHES ABOVE NATURAL GROUND.

X—(FF)—X

SYMBOL

FILTER FABRIC FENCE

NTS



PLAN

NOTES

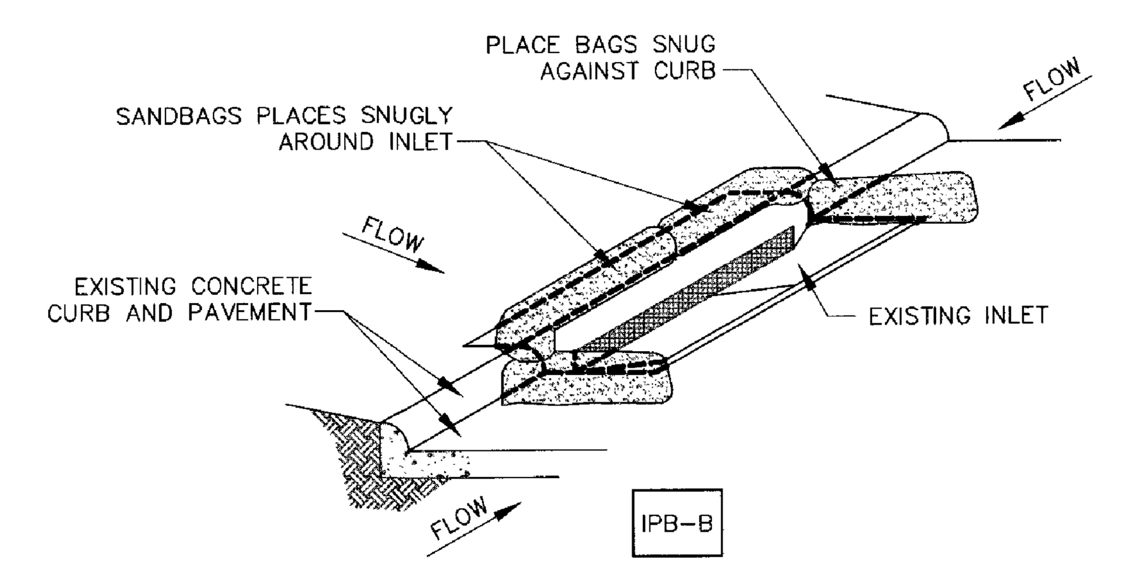
1. LENGTH SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS, BUT NOT LESS THAN 50 FEET.
2. THICKNESS SHALL BE NOT LESS THAN 8 INCHES.
3. WIDTH SHALL BE NOT LESS FULL WIDTH OF ALL POINTS OF INGRESS OR ENGRESS.
4. STABILIZATION FOR OTHER AREAS SHALL HAVE THE SAME AGGREGATE THICKNESS AND WIDTH REQUIREMENTS AS THE STABILIZED CONSTRUCTION EXIT, UNLESS OTHERWISE SHOWN ON THE CONSTRUCTION DRAWINGS.
5. STABILIZED AREA MAY BE WIDENED OR LENGTHENED TO ACCOMMODATE A TRUCK WASHING AREA. AN OUTLET SEDIMENT TRAP MUST BE PROVIDED FOR THE TRUCK WASHING AREA.
6. STABILIZED CONSTRUCTION EXIT SHALL BE MAINTAINED FREE OF SEDIMENT FOR THE DURATION OF THE PROJECT.

(SC)

SYMBOL

STABILIZED CONSTRUCTION EXIT

NTS

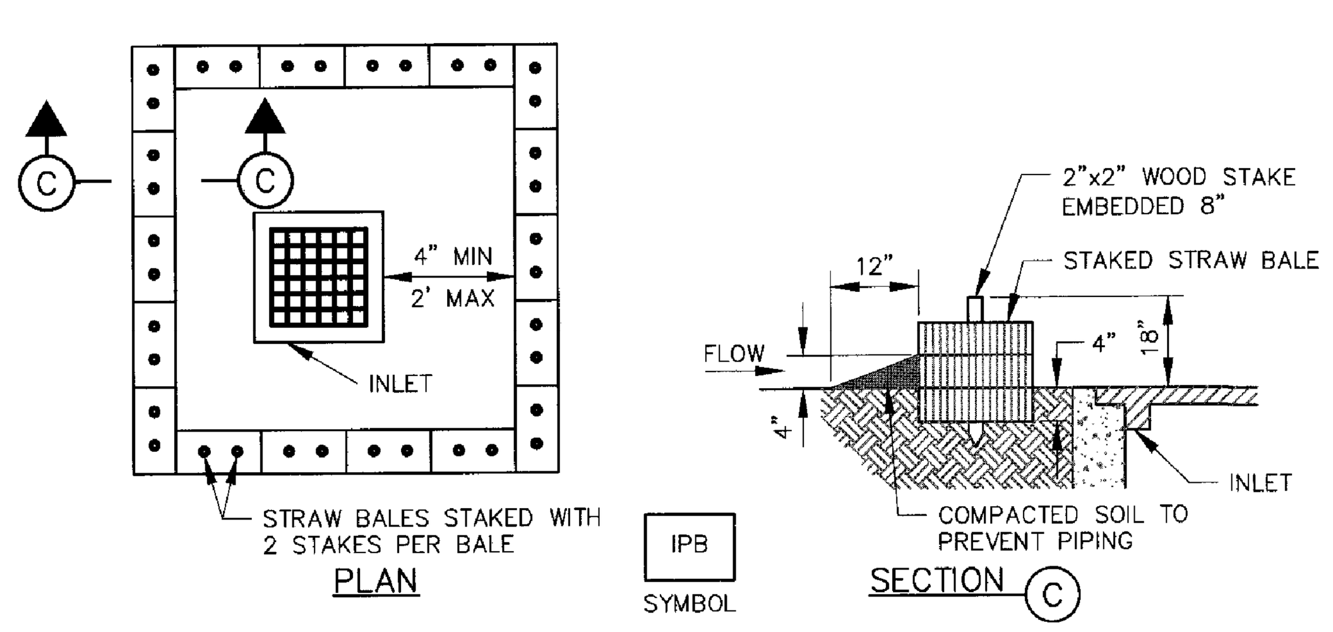


IPB-B

SYMBOL

INLET PROTECTION BARRIER

NTS



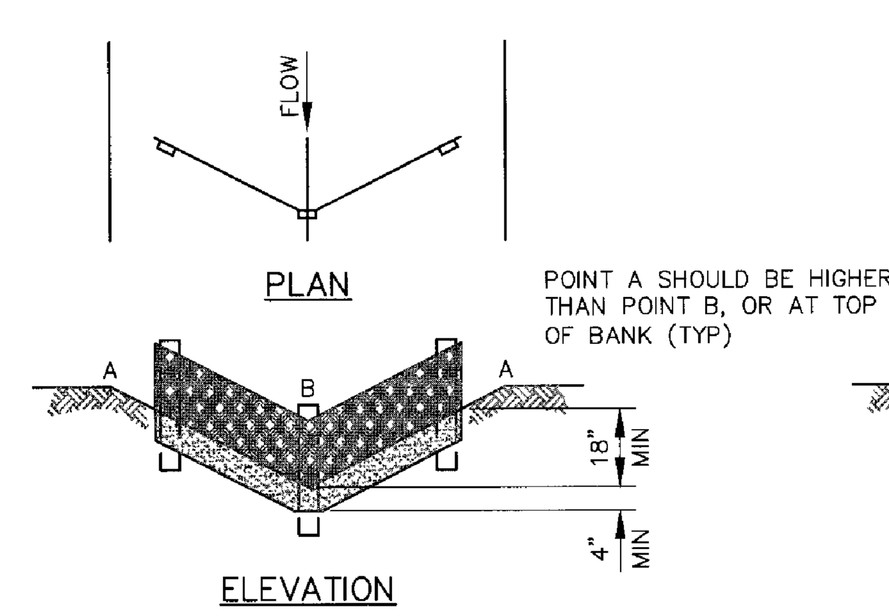
IPB

SYMBOL

SECTION (C)

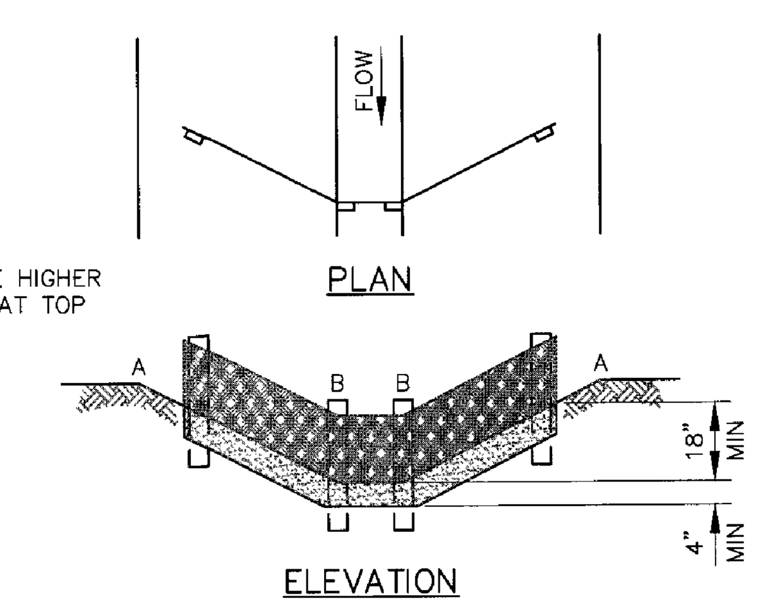
STRAW BALE DROP INLET PROTECTION BARRIER

NTS



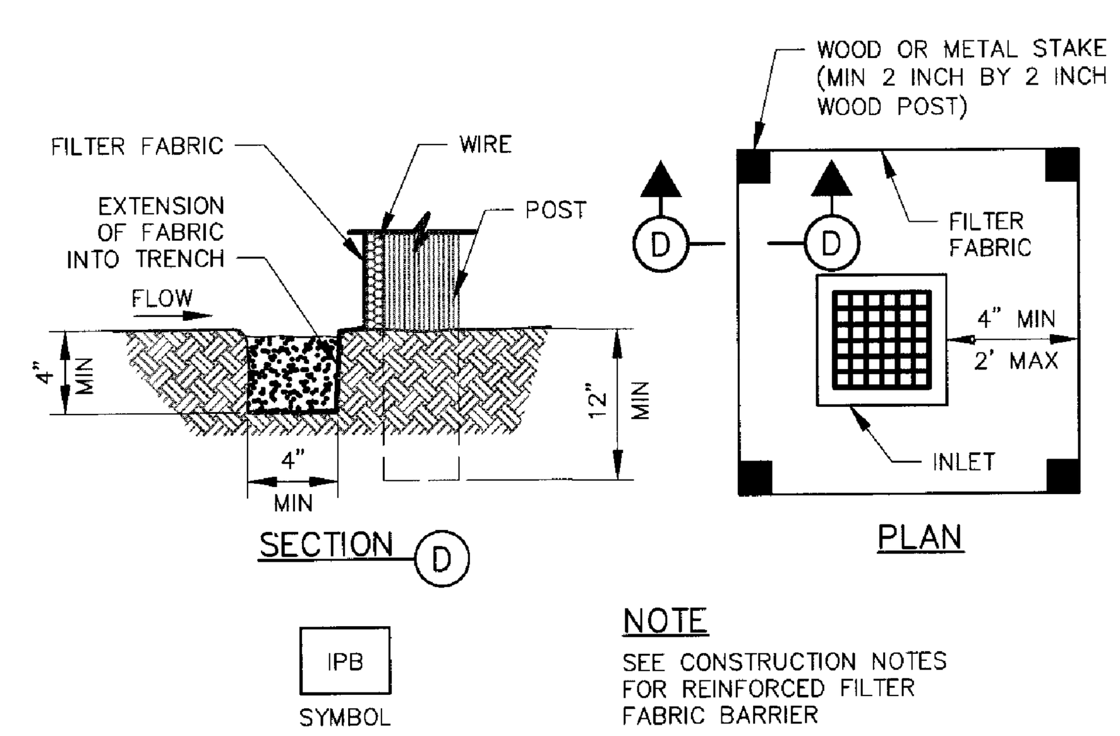
"V-DITCH" SECTION

NTS



TRAPEZOIDAL SECTION

NTS



IPB

SYMBOL

NOTE

SEE CONSTRUCTION NOTES FOR REINFORCED FILTER FABRIC BARRIER

SILT FENCE DROP INLET PROTECTION BARRIER

NTS

BENCHMARK:

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ELEV = 139.49 FEET NAVD88 (GEOID2003)
TBM-A
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ELEV = 140.79 FEET NAVD88 (GEOID2003)

FLOODPLAIN:

SITE IS LOCATED IN UNSHADED ZONE X PER FEMA FIRM MAP No. 48339C0575G REVISED AUGUST 18, 2014. THE NEAREST FLOODPLAIN ELEVATION WAS DETERMINED TO BE 134.00 FEET.

NOTES:

MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: ________ - COUNTY ENGINEER

DATE: 11/6/19

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY ________ DATE ________

TITLE ________

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 - ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

STORM WATER POLLUTION PREVENTION PLAN DETAILS

STATE OF TEXAS
CHRISTOPHER J. LEBLANC
100170
LICENSED PROFESSIONAL ENGINEER
12/20/18

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1968-16003

SUBMITTED:
SCALE: NONE
DATE: DECEMBER 2018
SURVEYED BY:
F B NO:

DESIGNED BY: CL/JM/JCA
DRAWN BY: JCA
SHEET NO. 20 OF 23 SHEETS

EAST DRAINAGE CHANNELS - TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT - JOB NO. 1968-16003

TABLE OF DIMENSIONS & REINFORCING STEEL
(Wings for One Structure End)

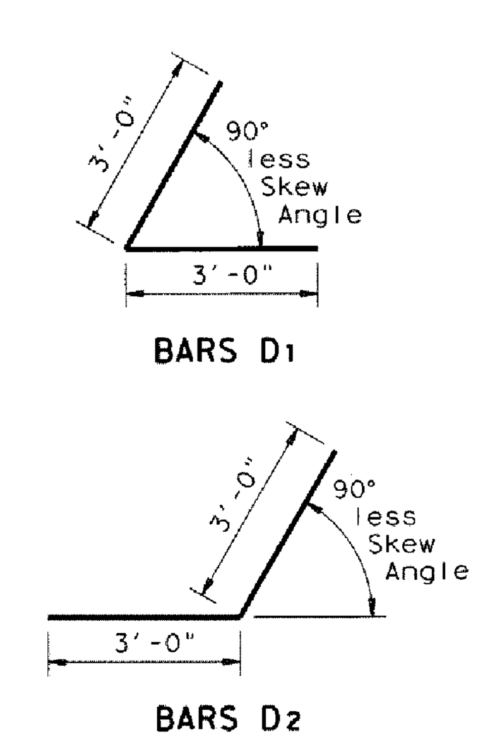
Dimensions					Variable Reinforcing				Estimated Quantities per ft of wing (2~Wings) (4)		Estimated Quantities per ft of Toewall (1~Toewall)	
Maximum Wingwall Height Hw	W	X	Y	Z	Bars J1 Size	Bars J1 Spa	Bars J2 Size	Bars J2 Spa	Reinf (Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	48.64	0.406	6.85	0.071
2'-9"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	49.31	0.424	6.85	0.071
3'-0"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	49.98	0.444	6.85	0.071
3'-3"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	53.32	0.462	6.85	0.071
3'-6"	2'-10"	10"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	53.98	0.480	6.85	0.071
4'-0"	3'- 2"	1'- 2"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	55.77	0.532	6.85	0.071
4'-6"	3'- 2"	1'- 2"	1'- 0"	7"	#4	1'-0"	#4	1'-0"	59.77	0.568	6.85	0.071
5'-0"	3'- 9"	1'- 7"	1'- 2"	7"	#4	1'-0"	#4	1'-0"	63.45	0.632	6.96	0.075
5'-6"	3'- 9"	1'- 7"	1'- 2"	7"	#4	1'-0"	#4	1'-0"	67.46	0.668	6.96	0.075
6'-0"	4'- 4"	2'- 0"	1'- 4"	7"	#5	1'-0"	#5	1'-0"	80.67	0.730	7.07	0.078
6'-6"	4'- 4"	2'- 0"	1'- 4"	7"	#5	1'-0"	#5	1'-0"	85.05	0.768	7.07	0.078
7'-0"	5'- 0"	2'- 3"	1'- 9"	8"	#5	1'-0"	#5	1'-0"	92.15	0.864	8.07	0.093
7'-6"	5'- 0"	2'- 3"	1'- 9"	8"	#5	1'-0"	#5	1'-0"	96.54	0.902	8.07	0.093
8'-0"	5'- 6"	2'- 8"	1'-10"	8"	#5	6"	#5	6"	139.04	0.962	8.13	0.095
8'-6"	5'- 6"	2'- 8"	1'-10"	8"	#5	6"	#5	6"	144.47	1.000	8.13	0.095
9'-6"	6'- 0"	2'-10"	2'- 2"	9"	#5	6"	#5	6"	156.93	1.136	8.41	0.110
10'-6"	6'- 5"	3'- 0"	2'- 5"	9"	#6	6"	#5	6"	196.27	1.234	8.57	0.117
11'-6"	7'- 2"	3'- 6"	2'- 8"	11"	#6	6"	#6	6"	230.13	1.438	9.52	0.140
12'-6"	7'- 8"	3'- 9"	2'-11"	1'- 0"	#7	6"	#6	6"	283.41	1.592	9.74	0.157
13'-6"	8'- 2"	4'- 0"	3'- 2"	1'- 2"	#8	6"	#6	6"	348.72	1.804	10.02	0.186
14'-6"	8'-10"	4'- 5"	3'- 5"	1'- 4"	#9	6"	#6	6"	432.94	2.046	10.30	0.218
15'-6"	9'- 6"	4'-10"	3'- 8"	1'- 6"	#9	6"	#7	6"	489.52	2.302	11.24	0.253
16'-0"	9'-11"	5'- 0"	3'-11"	1'- 7"	#9	6"	#7	6"	505.72	2.448	11.47	0.279

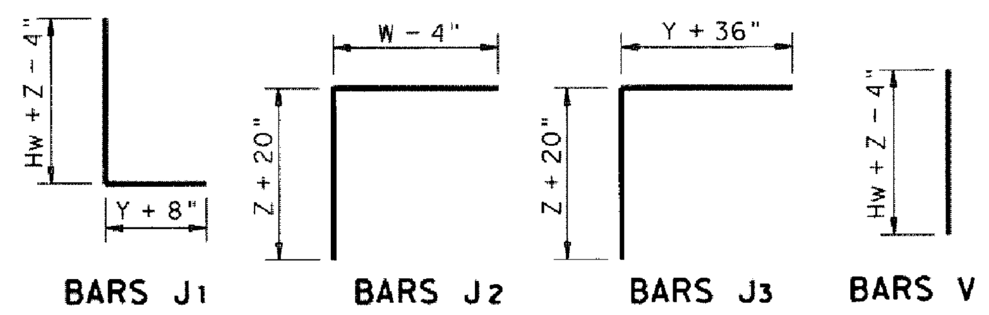
TABLE OF WINGWALL REINFORCING (2~Wings)

Bar	Size	No.	Spa
D1	#6	~	1'-0"
D2	#6	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'-0"
V	#4	~	1'-0"

TABLE OF TOEWALL REINFORCING

Bar	Size	No	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"





WING DIMENSION CALCULATIONS:

Formulas: (All values are in Feet)

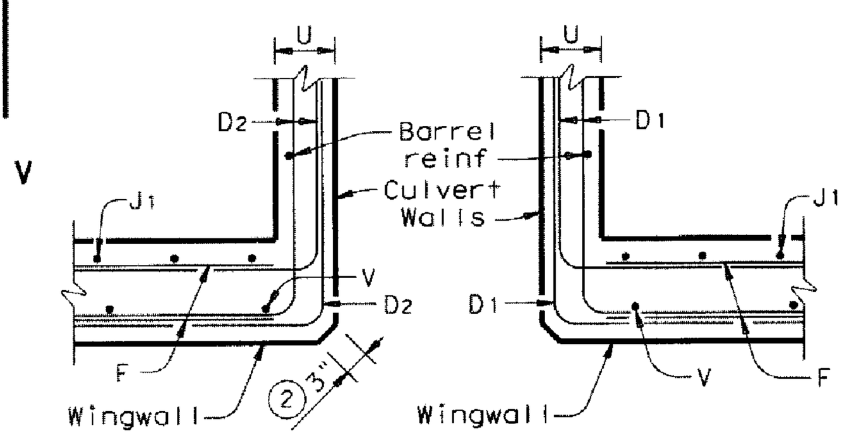
Hw = H + T + C
Lw = (Hw) (SL) ÷ Cosine θ for Ty PW-1
= (Hw - 1') (SL) ÷ Cosine θ for Ty PW-2 and Hw ≥ 4'
= (Hw - 0.5') (SL) ÷ Cosine θ for Ty PW-2 and Hw < 4'

For Cast-in-place culverts:
Ltw = [(N) (S) + (N + 1) (U)] ÷ Cosine θ

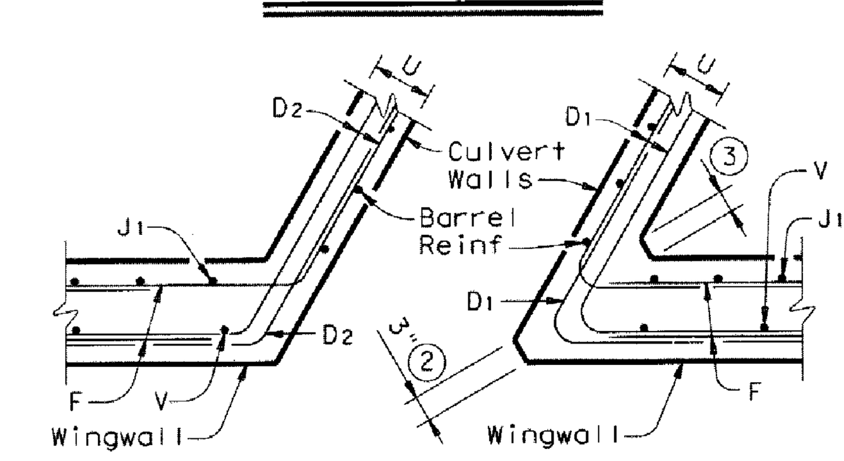
For Precast culverts:
Ltw = [(N) (2 U + S) + (N - 1) (0.5')] ÷ Cosine θ
Total Wingwall Area (Two Wings ~ SF)
= (2)(Hw)(Lw) for Ty PW-1
= (2)(Hw)(Lw) - 6 SF for Ty PW-2 and Hw ≥ 4'
= (2)(Hw)(Lw) - 1.5 SF for Ty PW-2 and Hw < 4'

Hw = Height of Wingwall
Lw = Length of Wingwall
Ltw = Culvert Toewall Length
N = Number of Culvert Spans
SL:1 = Channel Slope ratio. (Horizontal: 1 Vertical, Usual value is 2:1)
θ = Culvert Skew

See applicable box culvert standard for S, H, T and U values.



SECTION C-C



SECTION C-C

(1) Skew Angle = 0°

(2) At discharge end, chamfer may be ¾".

(3) For 15° Skew ~ 1"
For 30° Skew ~ 2"
For 45° Skew ~ 3"

(4) Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.

(5) Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.

(6) Extend Bars E2 1'-6" minimum into the wingwall footing.

(7) Lap Bars M1 1'-6" minimum with Bars M2.

(8) Bars G equally spaced at 8" maximum, place as shown. Provide at least two pair Bars G per wing.

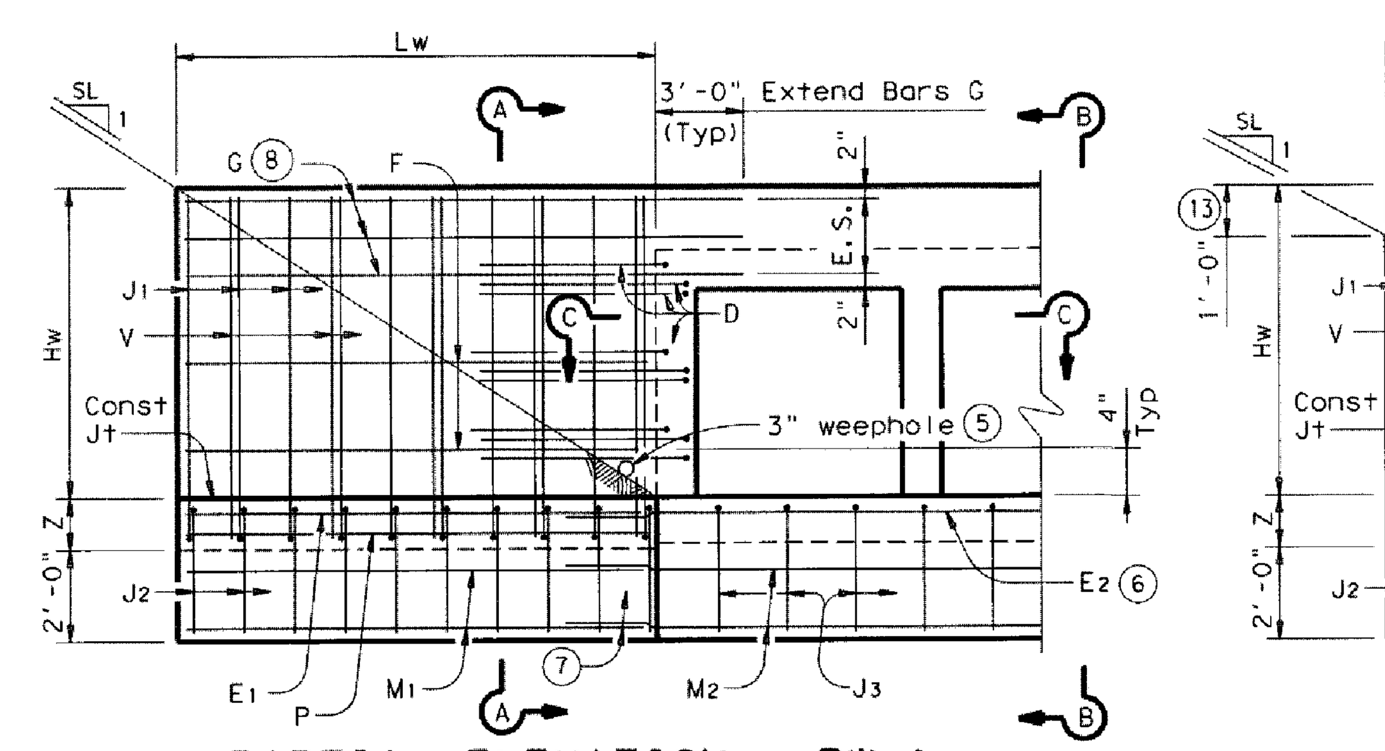
(9) 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.

(10) For vehicle safety, the following requirements must be met:
- For structures without bridge rail, curbs cannot project more than 3" above finished grade.
- For structures with bridge rail, build curbs flush with finished grade.
Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

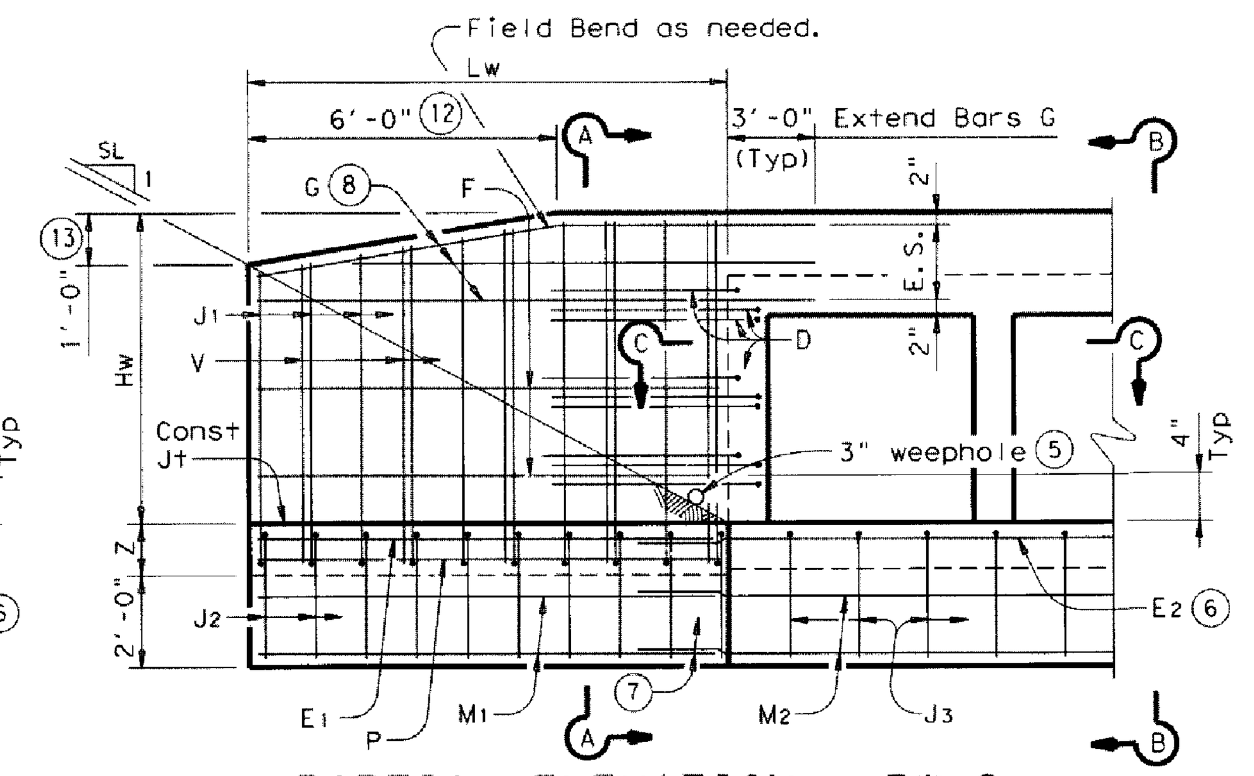
(11) 1'-0" typical. 2'-0" typical when RAC standard is referenced elsewhere in the plans.

(12) 3'-0" for Hw < 4'.

(13) 6" for Hw < 4'.



PARTIAL ELEVATION - PW-1



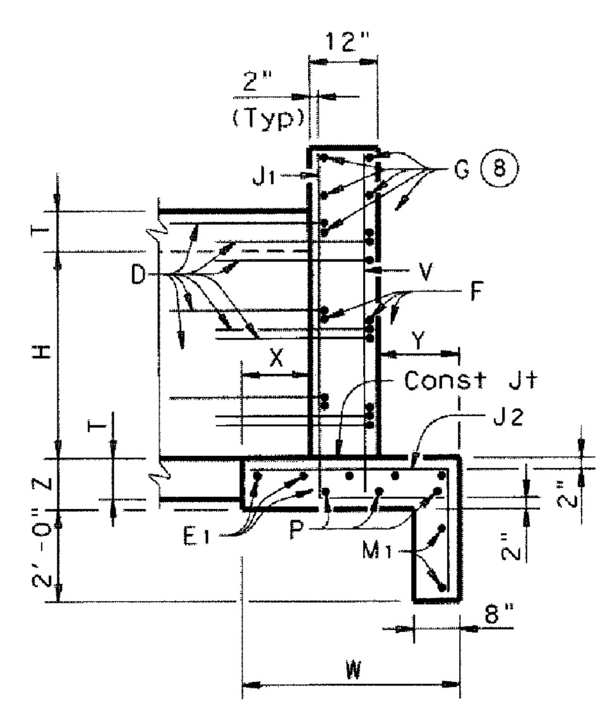
PARTIAL ELEVATION - PW-2

GENERAL NOTES:

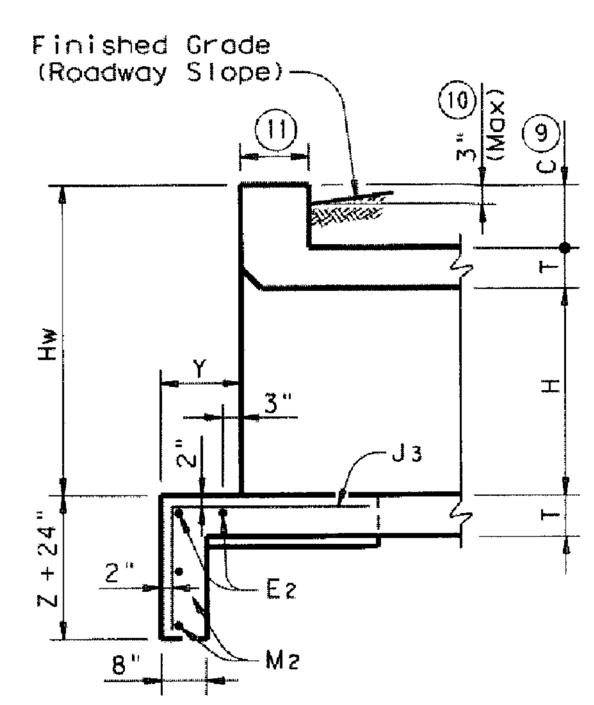
Designed in accordance with AASHTO LRFD Bridge Design Specifications.
Provide Class "C" Concrete (f'c = 3,600 psi Min) and Grade 60 reinforcing steel.
Provide 1 ¼" Min clear cover to reinforcing steel.
Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer.
See BCS sheet for wingwall type and additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

DESIGNER NOTES:

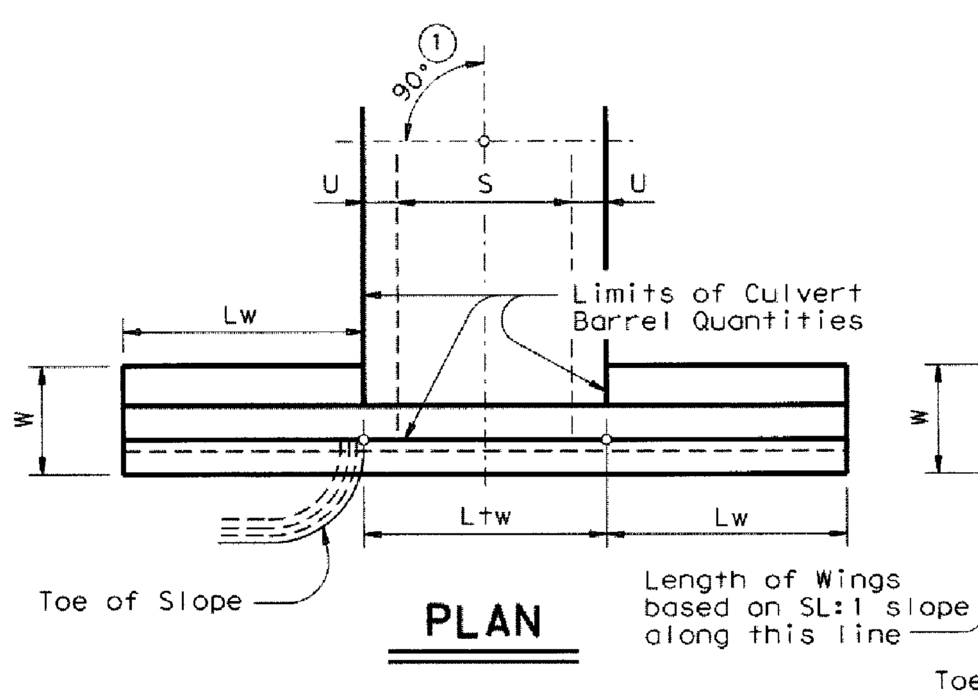
Type PW-1 can be used for all applications and must be used if railing is to be mounted to the wingwall.
Type PW-2 can only be used for applications without a railing mounted to the wingwall.



SECTION A-A
(Showing Wing Reinf)

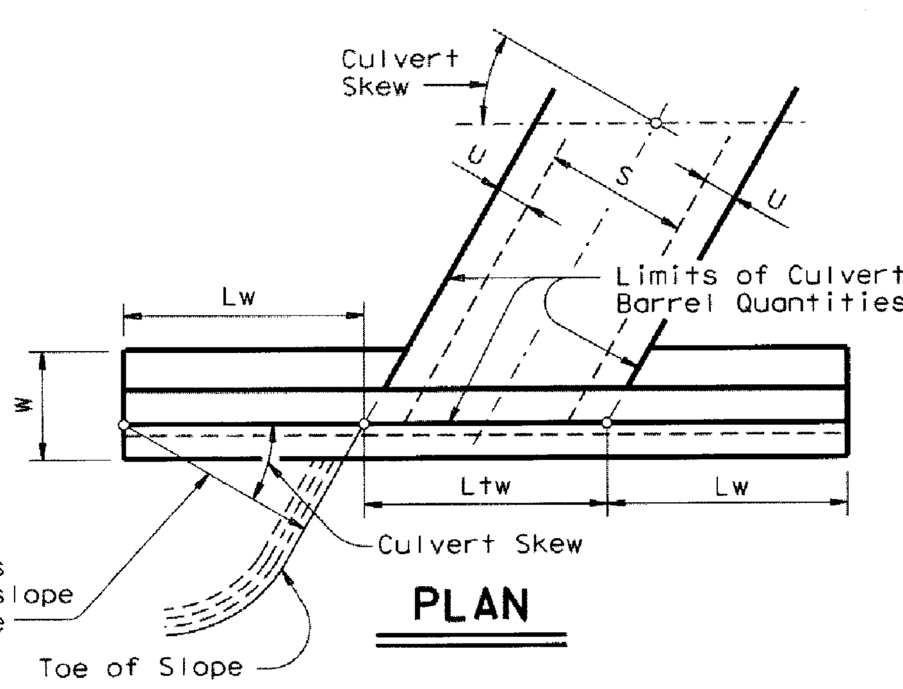


SECTION B-B
(Showing Wing Reinf)



PLAN

DETAILS FOR NON-SKEWED BOX CULVERTS



PLAN

DETAILS FOR SKEWED BOX CULVERTS
(Showing 30° Skew)

Texas Department of Transportation | Bridge Division Standard

CONCRETE WINGWALLS WITH PARALLEL WINGS FOR BOX CULVERTS TYPES PW-1 AND PW-2

PW

FILE: pwstde01.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-10: Reinforcing Quantities. 01-12: PW-1 & PW-2.	DIST	COUNTY		SHEET NO.

BENCHMARK:
MC LIDAR GROUND CONTROL POINT RM 548: A SURVEY SPIKE SET IN THE PAVEMENT AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CALHOUN ROAD AND EAST DR.
ELEV = 139.49 FEET NAVD88 (GEOID2003)
TBM-A
A ⅝-INCH IRON ROD WITH ORANGE PLASTIC CAP STAMPED "LJA ENG CONTROL" LOCATED AT THE SOUTH SIDE OF F.M.242 THE POINT IS LOCATED +/- 850 FEET WEST OF THE INTERSECTION OF F.M. 242 AND MYSTIC HILL DRIVE AND +/- 10 FEET SOUTH OF THE SOUTHERN EDGE OF PAVEMENT OF F.M. 242.
ELEV = 140.79 FEET NAVD88 (GEOID2003)

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NOTES:

MONTGOMERY COUNTY ENGINEERING DEPARTMENT
APPROVED: COUNTY ENGINEER
DATE: 1/16/19

RECORD DRAWING
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BY ______ DATE ______
TITLE ______

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 – ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

CONCRETE WINGWALL DETAILS

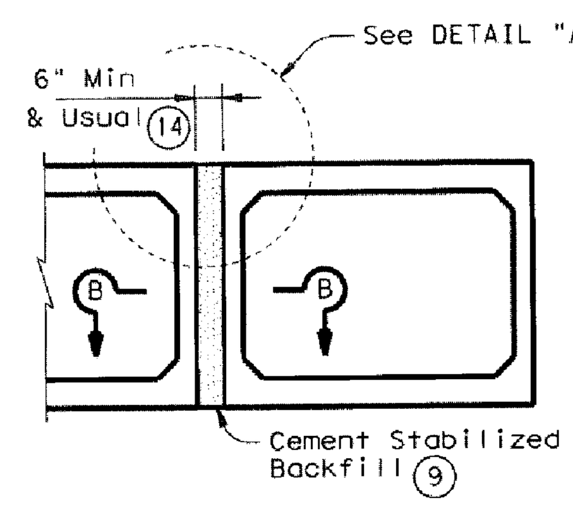
LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

STATE OF TEXAS
CHRISTOPHER J. LEBLANC
100170
LICENSED PROFESSIONAL ENGINEER
12/20/18

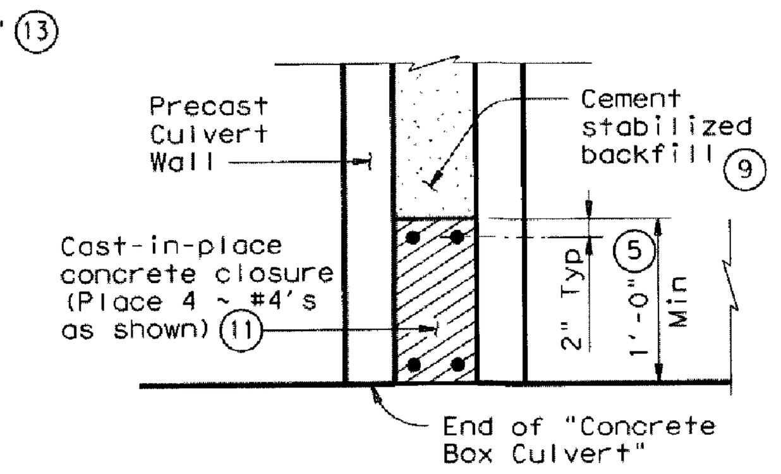
LJA PROJECT NO.: 1968-16003
SUBMITTED:
SCALE: NONE
DATE: DECEMBER 2018
SURVEYED BY:
F B NO:
DESIGNED BY: CL/JM/JCA
DRAWN BY: JCA
SHEET NO. 21 OF 23 SHEETS

EAST DRAINAGE CHANNELS – TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT – JOB NO. 1968-16003

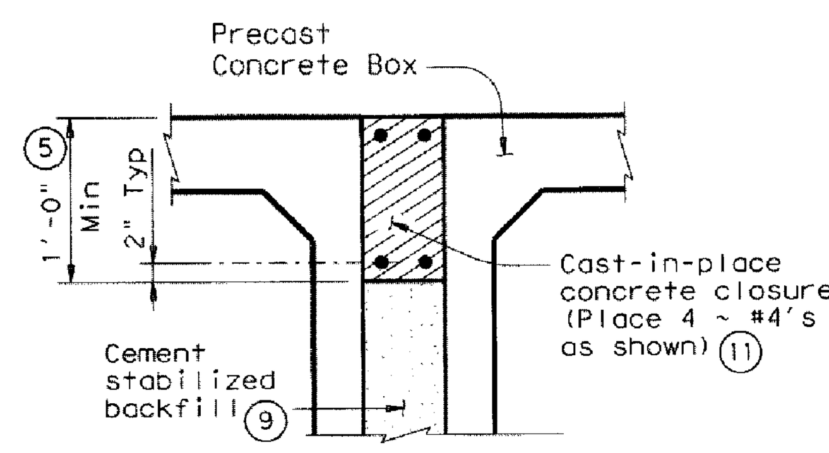
DATE:
FILE:



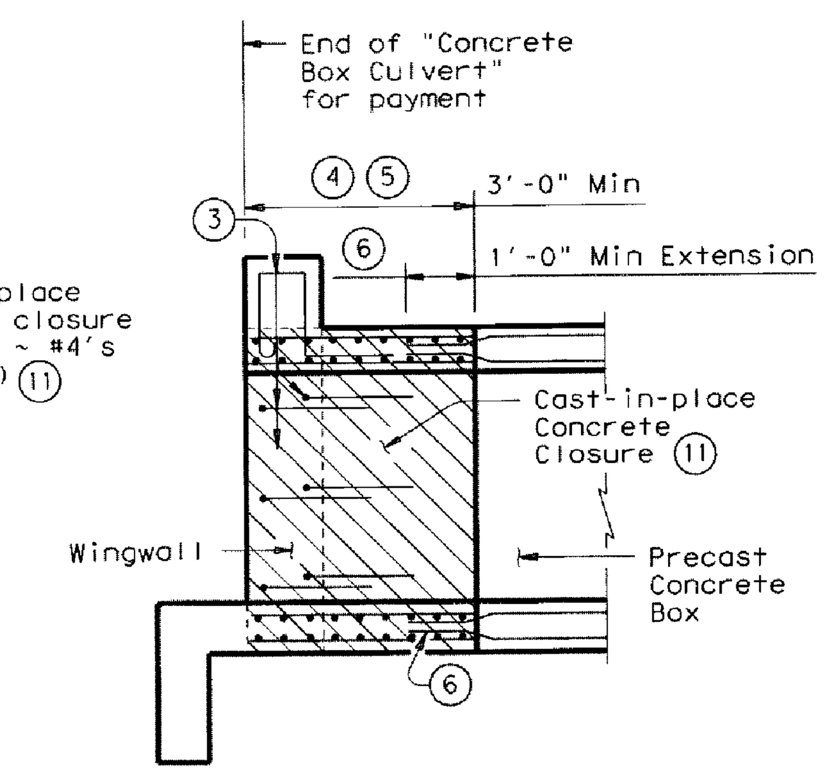
MULTIPLE UNIT PLACEMENT



SECTION B-B

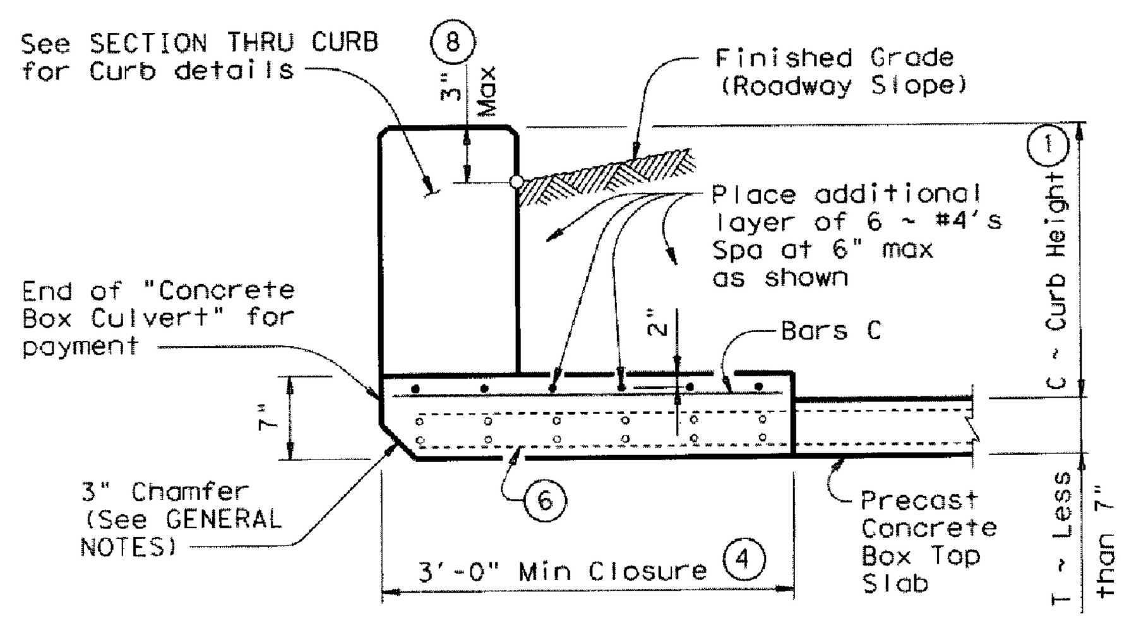


DETAIL "A" (13)

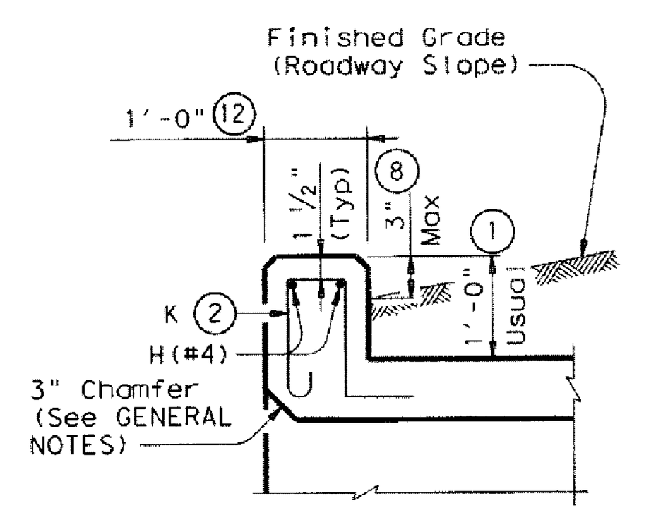


WINGWALL CONNECTION

(Also applies to Safety End Treatment)

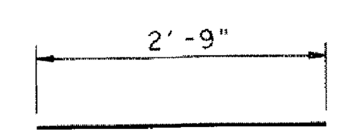


SECTION THRU TOP SLABS LESS THAN 7"

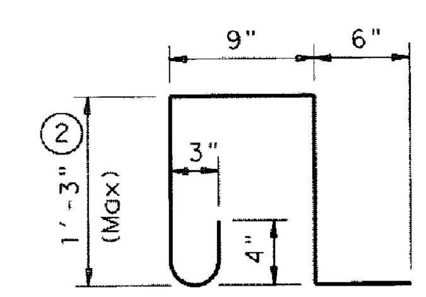


SECTION THRU CURB

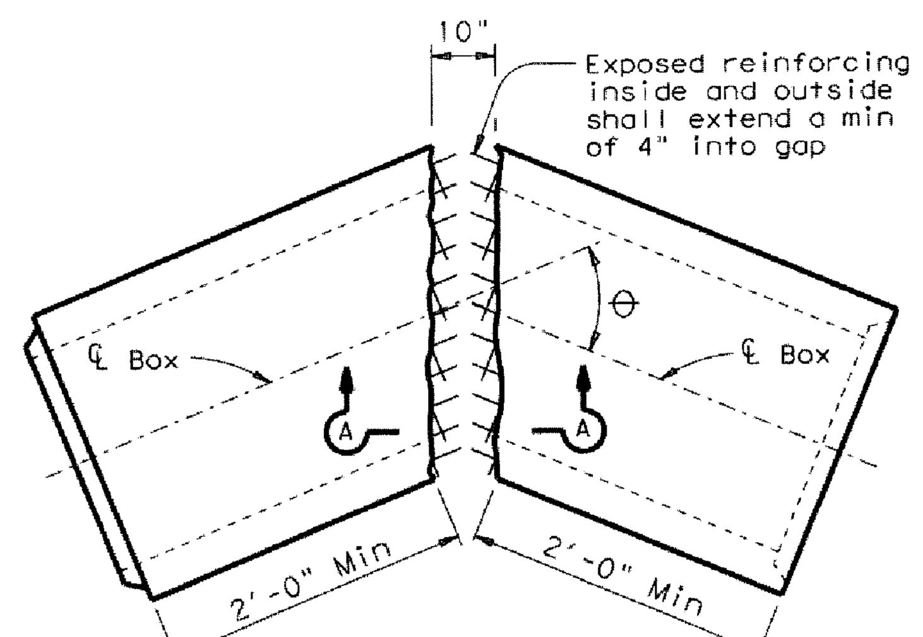
(10) QUANTITIES PER FOOT OF CURB	
Reinforcing Steel	4.18 Lb
Concrete	0.037 CY



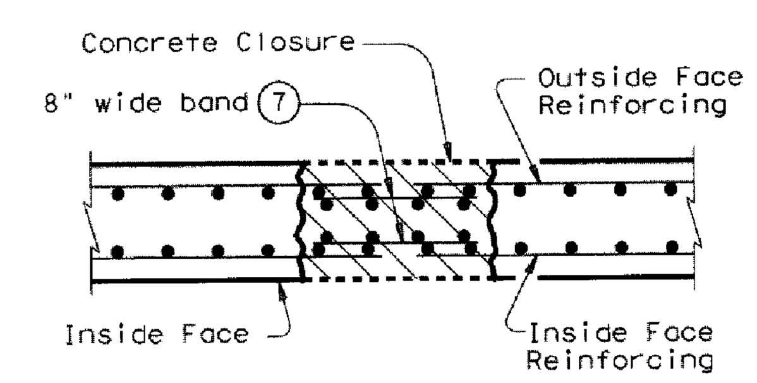
BARS C ~ #4 (Spa = 1'-0" Max)



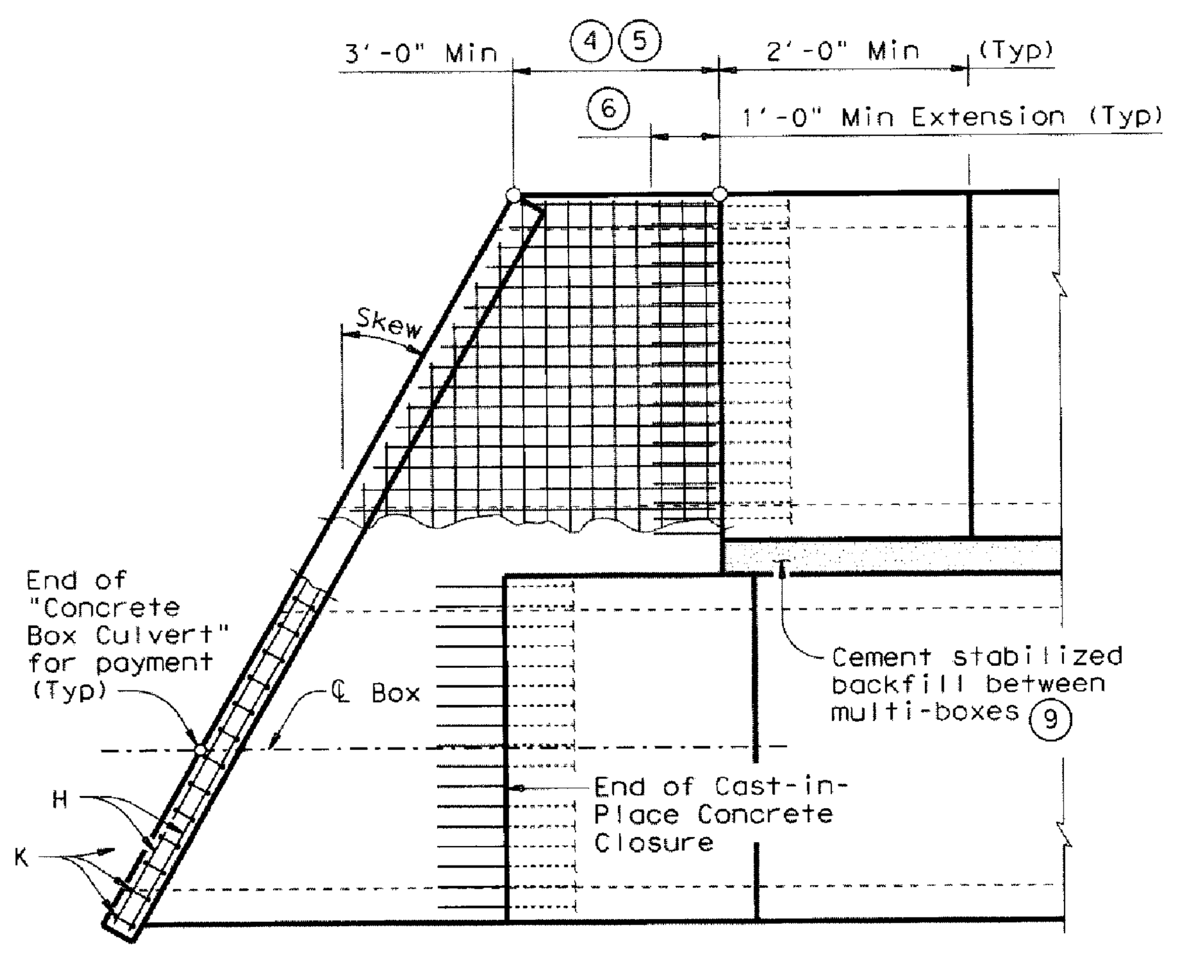
BARS K ~ #4 (Spa = 1'-0" Max) (Length = 4'-3")



ANGLE DETAIL



SECTION A-A



PLAN OF SKEWED ENDS

(Showing multi-box placement)

(1) 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 traffic rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.

(2) For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.

(3) Curb, Wingwall or Safety End Treatment reinforcing shall extend into concrete closure. Any reinforcing that does not fit into the closure shall be bent or trimmed as necessary.

(4) Cast-in-place concrete closure shall be 3'-0" min. Boxes shall be cast short or broken back in the field. All reinforcing in the closure shall be the same size and spacing as in the precast box section. Except where shown otherwise, the cast-in-place closure shall be flush with the inside and outside faces of the precast box section.

(5) For multiple unit placements the length of the closure for the interior walls may be adjusted as necessary. The length of the top slab, bottom slab, and exterior wall closure shall not be less than 3'-0". See Section B-B detail when interior walls are cast full length.

(6) Precast box reinforcing shall extend a minimum of 1'-0" into concrete closure (Typ).

(7) Bands of reinforcing matching the inside and outside face reinforcing shall be placed in the gaps of the top and bottom slabs. A band matching the outside face reinforcing of the wall shall be placed in the gaps of the walls (placed in the outside face only). The bands shall be tack welded to the exposed reinforcing at each point of contact.

(8) For vehicle safety, the following requirements must be met:
- For structures without bridge rail, curbs shall project no more than 3" above finished grade.
- For structures with bridge rail, curbs shall be flush with finished grade.

Curb heights shall be reduced, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

(9) Cement Stabilized Backfill between boxes is considered part of the Box Culvert for payment.

(10) All curb concrete and reinforcing is considered part of the Box Culvert for payment.

(11) Any additional concrete and reinforcing required for the closures shall be considered as subsidiary to the Concrete Box Culvert.

(12) 1'-0" typical. 2'-0" when RAC standard is referred to elsewhere in the plans.

(13) For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in DETAIL "A".

(14) This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box". No payment will be made for any additional material in the gap between adjacent boxes.

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

All closure concrete shall be Class "C" with a minimum compressive strength of 3600 psi and shall be placed according to the Item, "Concrete Substructures".

Any additional concrete required for the closures shall be considered as subsidiary to the Concrete Box Culvert.

Refer to the Single Box Culverts Precast standard for details not shown.

The bottom edge of the top slab closure shall be chamfered 3 inches at the entrance.

HL93 LOADING

Texas Department of Transportation — Bridge Division Standard

BOX CULVERTS
PRECAST
MISCELLANEOUS DETAILS

SCP-MD

FILE: scpmdsts.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

DATE:
FILE:

BENCHMARK:

MC LIDAR GROUND CONTROL POINT RM 548: A SURVEY SPIKE SET IN THE PAVEMENT AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CALHOUN ROAD AND EAST DR.
ELEV = 139.49 FEET NAVD88 (GEOID2003)
TBM-A
A 5/8-INCH IRON ROD WITH ORANGE PLASTIC CAP STAMPED "LJA ENG CONTROL" LOCATED AT THE SOUTH SIDE OF F.M.242 THE POINT IS LOCATED +/- 850 FEET WEST OF THE INTERSECTION OF F.M. 242 AND MYSTIC HILL DRIVE AND +/- 10 FEET SOUTH OF THE SOUTHERN EDGE OF PAVEMENT OF F.M. 242.
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FLOODPLAIN:

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NOTES:

MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: ____ - COUNTY ENGINEER

DATE: 1/16/19

RECORD DRAWING

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BY ________ DATE ________

TITLE ________

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 - ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

BOX CULVERT DETAILS

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
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Phone 713.953.5200
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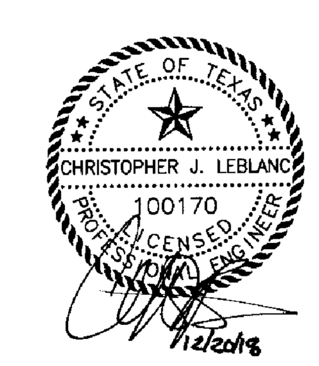
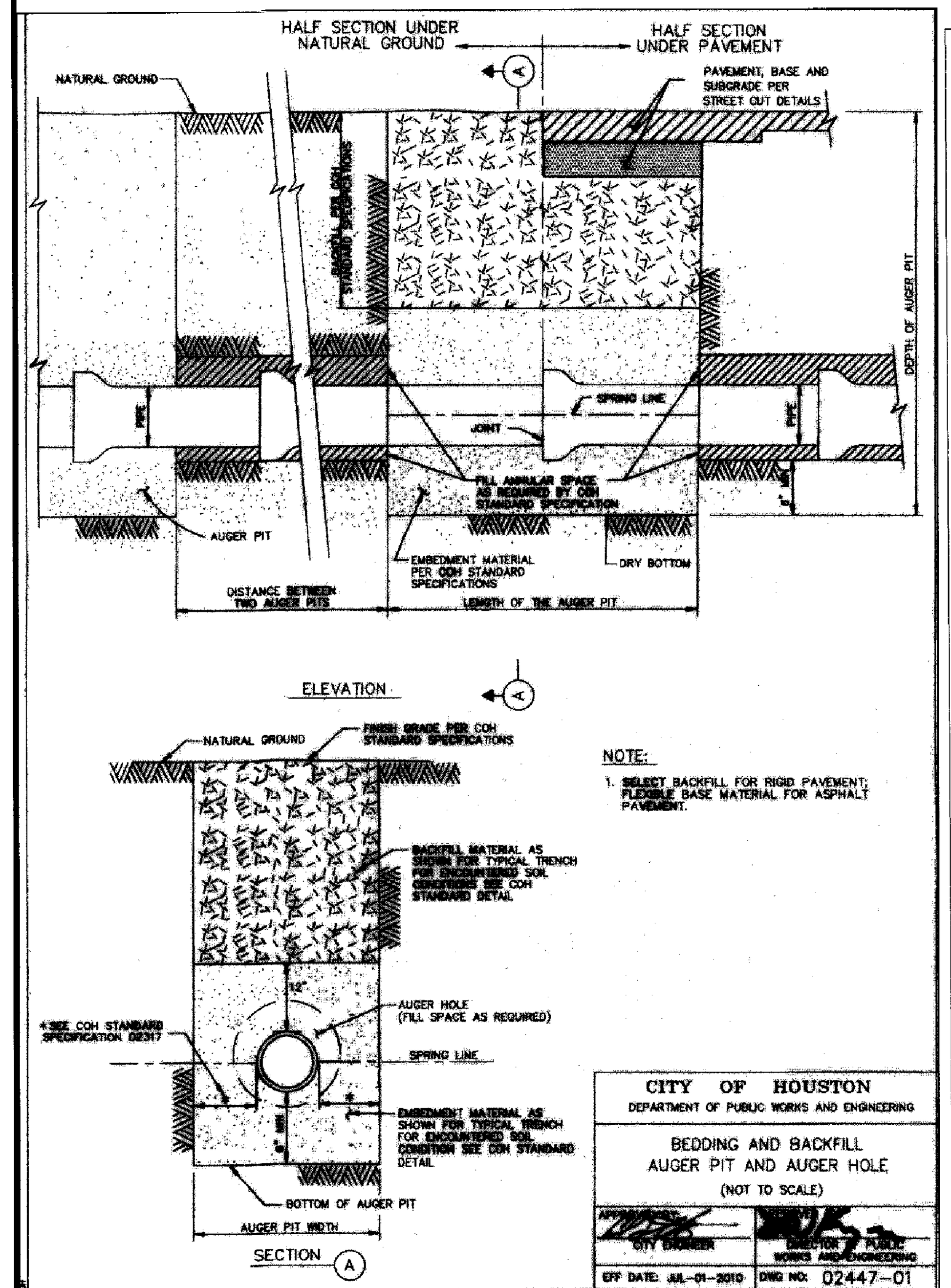
FRN - F-1386



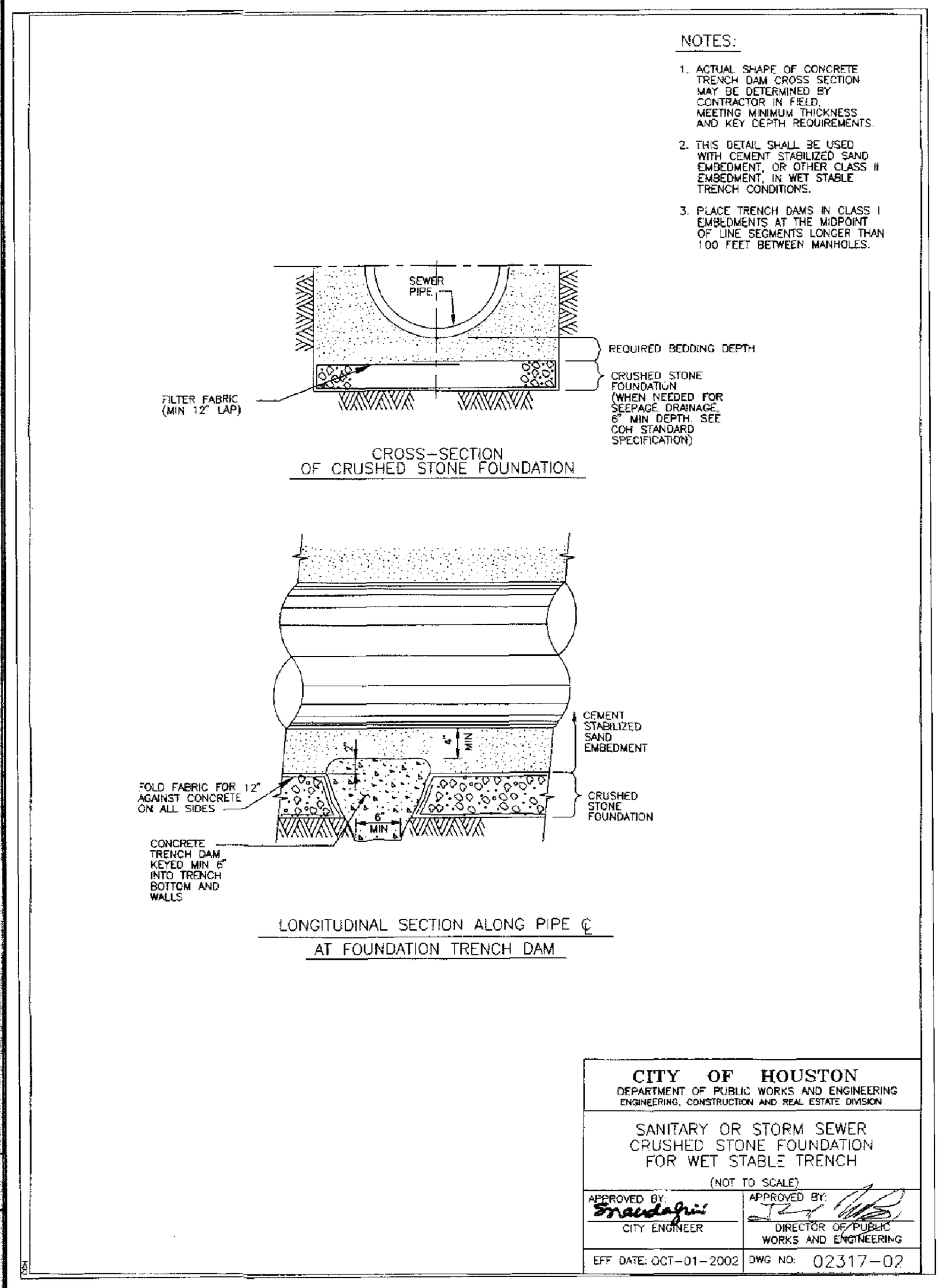
LJA PROJECT NO.: 1968-16003

SUBMITTED:	DESIGNED BY: CL/JM/JCA
SCALE: NONE	DRAWN BY: JCA
DATE: DECEMBER 2018	SHEET NO. 22 OF 23 SHEETS
SURVEYED BY:	
F B NO:	

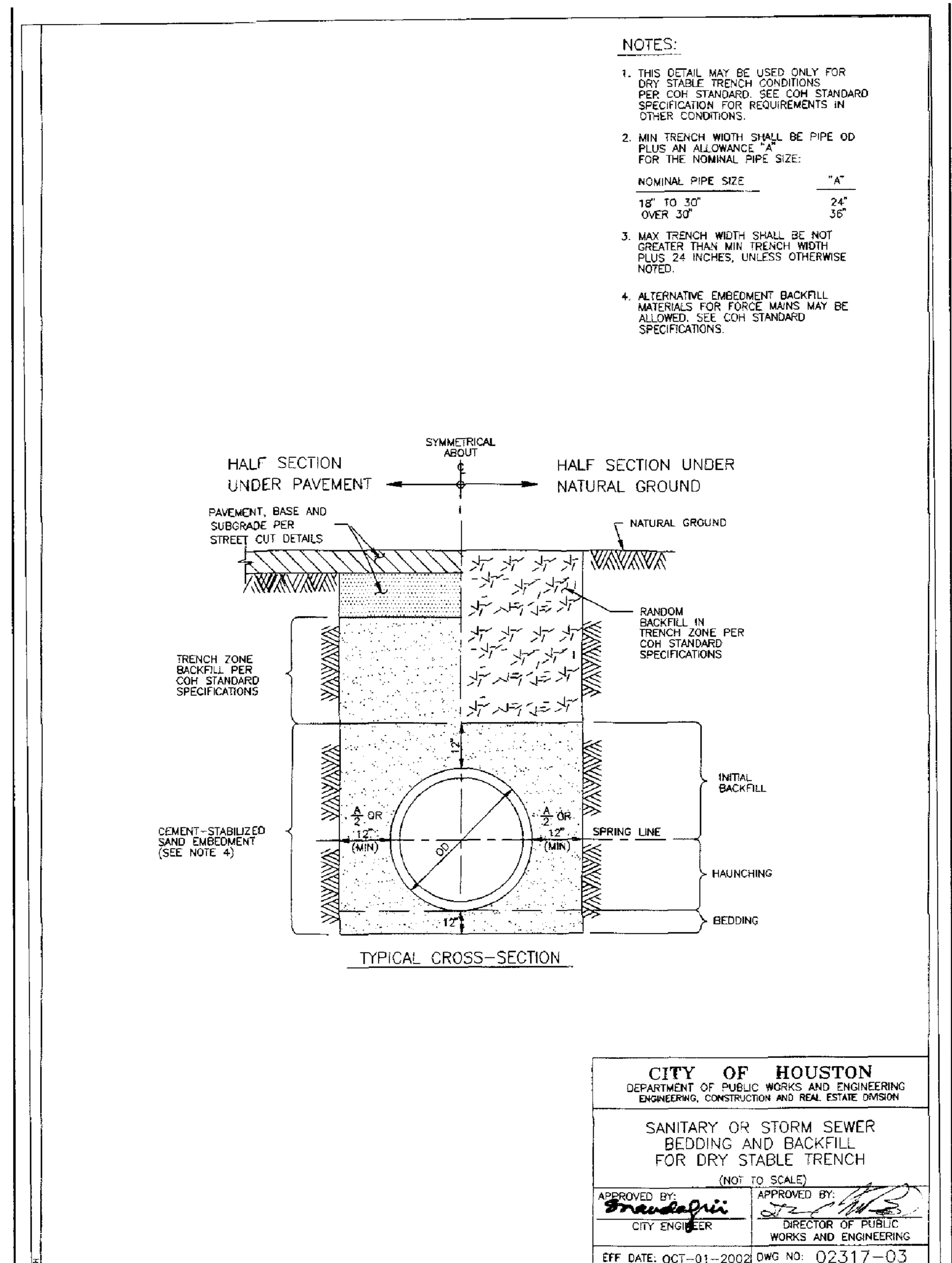
EAST DRAINAGE CHANNELS - TO SERVE 2,200 ACRE MONTGOMERY COUNTY TRACT - JOB NO. 1968-16003



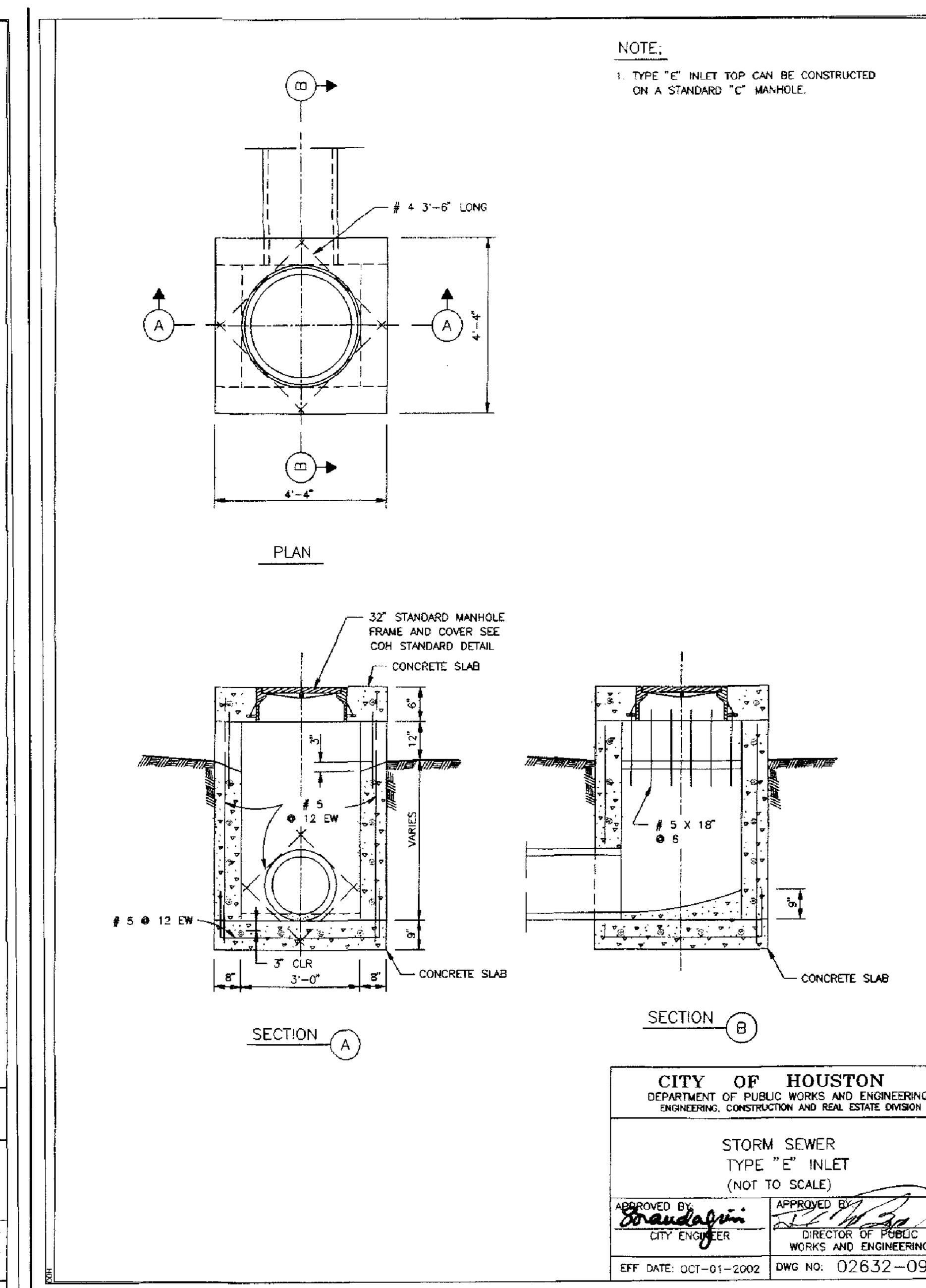
BEDDING AND BACKFILL AUGER PIT AND AUGER HOLE



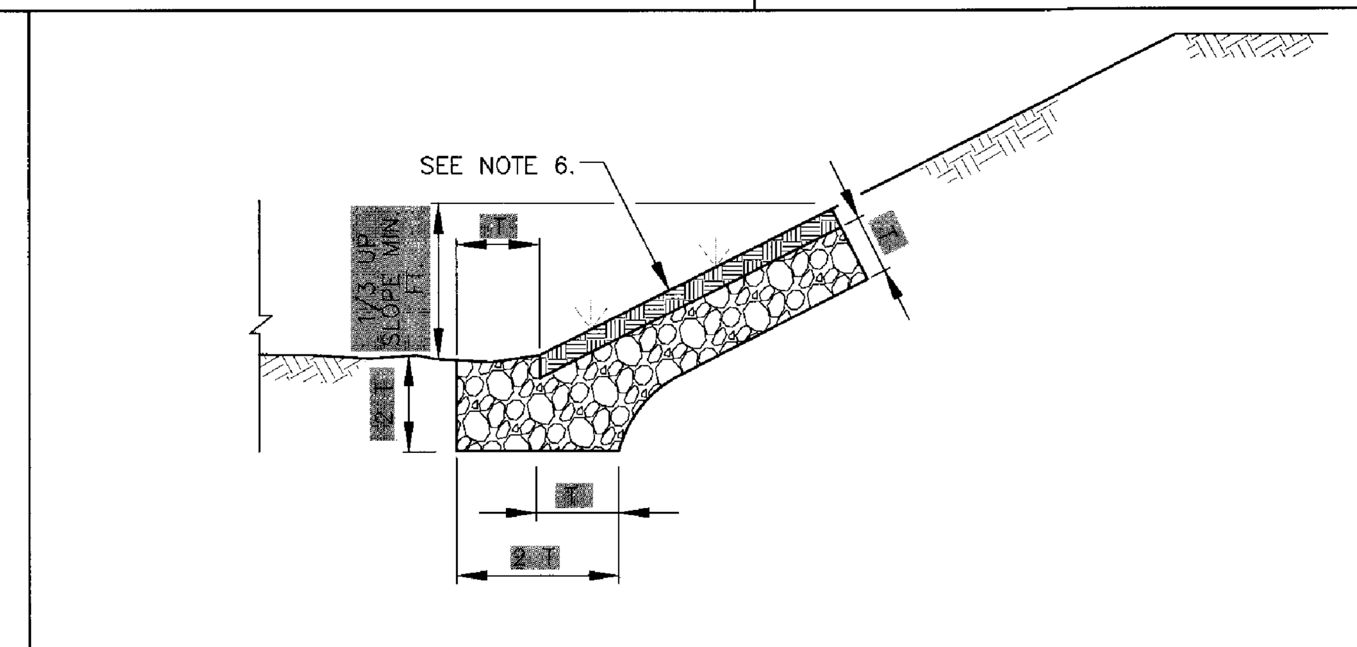
SANITARY OR STORM SEWER CRUSHED STONE FOUNDATION FOR WET STABLE TRENCH



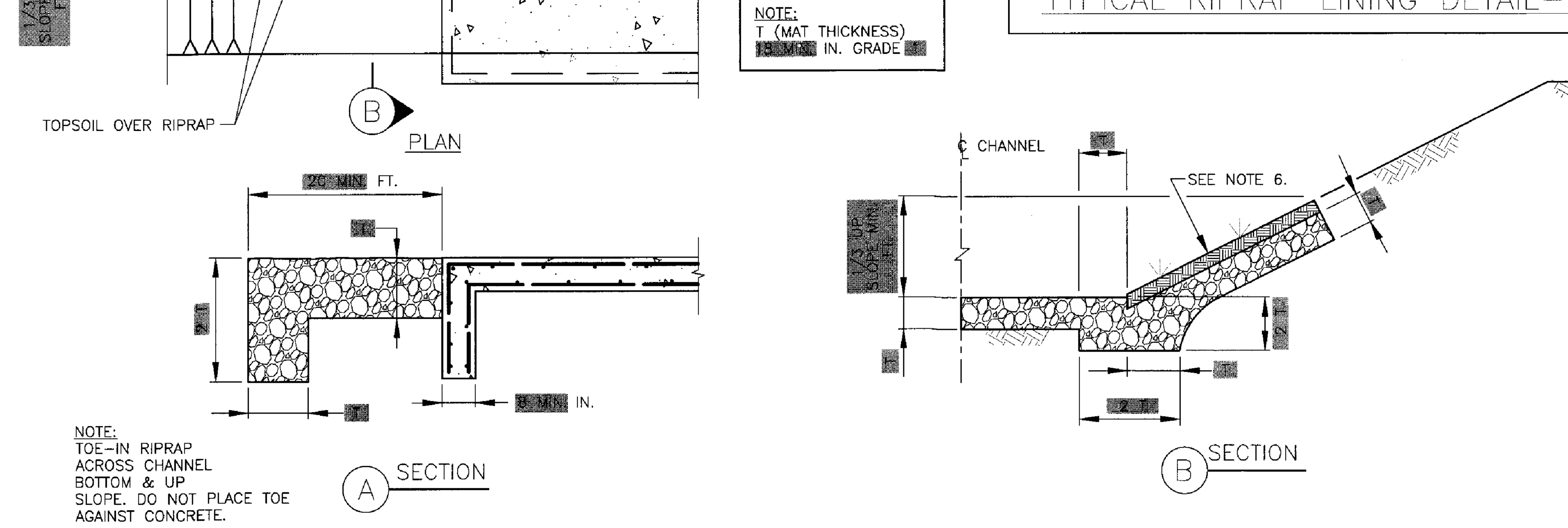
SANITARY OR STORM SEWER BEDDING AND BACKFILL FOR DRY STABLE TRENCH



STORM SEWER TYPE "E" INLET



TYPICAL RIPRAP LINING DETAIL–SIDE SLOPE ONLY



TYPICAL RIPRAP AT CONCRETE CHANNEL LINING

PIPE OUTFALL IN CHANNELS

BOTTOM WIDTH	PIPE OUTLET INVERT
6 FEET ≤ BW ≤ 20 FT	1 FOOT ABOVE FLOWLINE
20 FEET < BW ≤ 60 FT	AT TOE OF SLOPE
BW > 60 FT	AT TOE OF SLOPE

CORRUGATED GALVANIZED STEEL PIPE (TYPE I)

	2-2/3" X 1/2" CORRUGATION				3" X 1" & 5" X 1" CORRUGATION			
PIPE DIA. (in.)	MIN.FILL* (in.)	SHEET THICKNESS gage	(in.)	(mm)	MIN.FILL* (in.)	SHEET THICKNESS gage	(in.)	(mm)
24	12	16	.064	1.63	–	–	–	–
30	12	16	.064	1.63	–	–	–	–
36	12	16	.064	1.63	–	–	–	–
42	12	16	.064	1.63	12	16	.064	1.63
48	12	16	.064	1.63	12	16	.064	1.63
54	12	14	.079	2.01	12	16	.064	1.63
60	15	12	.109	2.77	12	16	.064	1.63
66	15	12	.109	2.77	15	16	.064	1.63
72	18	10	.138	3.51	15	16	.064	1.63
78	18	8	.168	4.27	18	16	.064	1.63
84	18	8	.168	4.27	18	14	.079	2.01
90	–	–	–	–	18	14	.079	2.01
96	–	–	–	–	18	14	.079	2.01

* MINIMUM DEPTH OF COVER ABOVE TOP OF PIPE, MAXIMUM DEPTH OF COVER ABOVE TOP OF PIPE IS 20 FEET.

STORM SEWER OUTFALL NOTES:

1. INSTALL OUTFALLS 48 INCHES OR LARGER AND TREATMENT PLANT OUTFALLS OF ANY DIAMETER, WITH RIPRAP EROSION DIMENSIONED AS SHOWN IN "TYPICAL STORM SEWER OUTFALL STRUCTURE LAYOUT."
2. STORM SEWER OUTFALL PIPES WITHIN THE HCFCD RIGHT–OF–WAY SHALL BE CMP OR HDPE IN ACCORDANCE WITH SPECIFICATION SECTION 02642–CORRUGATED METAL PIPE, HIGH DENSITY POLYETHYLENE PIPE (HDPE) IN ACCORDANCE WITH SPECIFICATION SECTION 02505–HIGH DENSITY POLYETHYLENE PIPE, OR APPROVED EQUAL. USE TABLE BELOW FOR CORRUGATED GALVANIZED STEEL PIPE.
3. PROVIDE AND PLACE CEMENT STABILIZED SAND IN ACCORDANCE WITH SPECIFICATION SECTION NO. 02321–CEMENT STABILIZED SAND.
4. TIMBER BENTS SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02464–TIMBER BENTS.
5. STORM SEWER OUTFALLS SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02316–STRUCTURAL EXCAVATING AND BACKFILLING.
6. RIPRAP SHALL BE PLACED IN ACCORDANCE WITH SPECIFICATION SECTION 02378–RIPRAP AND GRANULAR FILL. FILL RIPRAP VOIDS AND BURY RIPRAP A MINIMUM OF 6 INCHES WITH TOPSOIL ON SIDE SLOPE AS DIRECTED BY THE ENGINEER.
7. IN DETENTION BASIN, SET FLOWLINE OF OUTFALL AT TOE OF THE SLOPE. IN CHANNEL, USE ELEVATION INDICATED IN THE TABLE OR 1 FOOT ABOVE NORMAL WATER LEVEL, WHICH EVER IS HIGHER.
8. SEE CONCRETE CHANNEL LINING DETAIL SHEET FOR CMP OR OUTFALL DETAILS THROUGH CONCRETE CHANNEL LINING.
9. STRUCTURAL CONCRETE #4 BARS (GRADE 40) 12 INCH O.C. EACH WAY – FOR COLLARS ONLY.

BENCHMARK:

MC LIDAR GROUND CONTROL POINT RM 548: A SURVEY SPIKE SET IN THE PAVEMENT AT THE SOUTHEAST CORNER OF THE INTERSECTION OF CALHOUN ROAD AND EAST DR.
ELEV = 139.49 FEET NAVD88 (GEOID2003)
TBM–A
A 5/8–INCH IRON ROD WITH ORANGE PLASTIC CAP STAMPED "LJA ENG CONTROL" LOCATED AT THE SOUTH SIDE OF F.M.242 THE POINT IS LOCATED +/– 850 FEET WEST OF THE INTERSECTION OF F.M. 242 AND MYSTIC HILL DRIVE AND +/– 10 FEET SOUTH OF THE SOUTHERN EDGE OF PAVEMENT OF F.M. 242.
ELEV = 140.79 FEET NAVD88 (GEOID2003)

FLOODPLAIN:

SITE IS LOCATED IN UNSHADED ZONE X PER FEMA FIRM MAP No. 48339C0575G REVISED AUGUST 18, 2014. THE NEAREST FLOODPLAIN ELEVATION WAS DETERMINED TO BE 134.00 FEET.

NOTES:

MONTGOMERY COUNTY ENGINEERING DEPARTMENT

APPROVED: – COUNTY ENGINEER

DATE: 1/16/19

RECORD DRAWING

I CERTIFY THAT THIS DRAWING REFLECTS THE IMPROVEMENTS CONSTRUCTED AS TO SIZE, LOCATION AND GRADE AND THAT THE CONSTRUCTION WAS IN FULL COMPLIANCE WITH THE CONTRACT DOCUMENTS

BY ______ DATE ______

TITLE ______

DATE	REVISION	BY

CITY OF CONROE ETJ
MONTGOMERY COUNTY, TEXAS

2,200 – ACRE MONTGOMERY COUNTY TRACT
EAST DRAINAGE CHANNELS

STORM SEWER & RIPRAP DETAILS

LJA Engineering, Inc.
2929 Briarpark Drive
Suite 600
Houston, Texas 77042
Phone 713.953.5200
Fax 713.953.5026
FRN - F-1386

LJA PROJECT NO.: 1968–16003

SUBMITTED:
SCALE: NONE
DATE: DECEMBER 2018
SURVEYED BY:
F B NO:
DESIGNED BY: CL/JM/JCA
DRAWN BY: JCA
SHEET NO. 23 OF 23 SHEETS