# TOMBALL INDEPENDENT SCHOOL DISTRICT PLANS FOR DETENTION BASINS, STORM SEWER AND SITE EARTHWORK TO SERVE JUERGEN ROAD EDUCATIONAL CAMPUS

#### **EXHIBIT D**

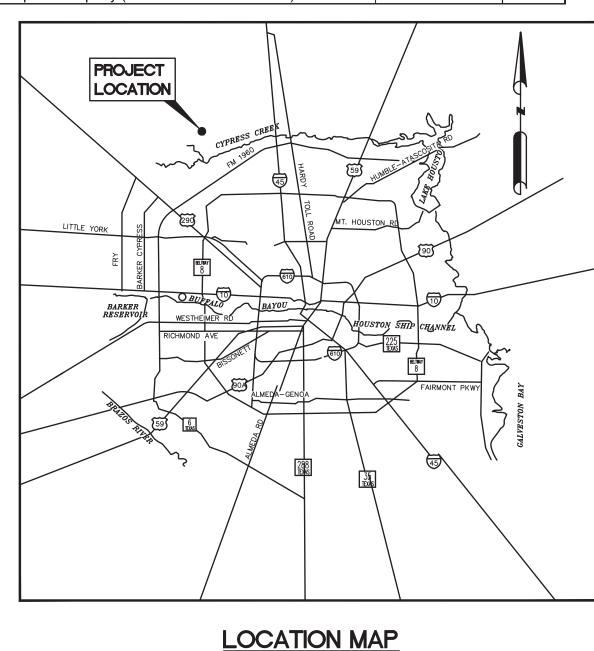
#### **Development Table**

Project #2207070042

TOMBALL ISD PLANS FOR DETENTION BASINS, STORM SEWER AND SITE EARTHWORK CURRENT PRJ #2207070042 TO SERVE JUERGEN ROAD EDUCATIONAL CAMPUS

TOMBALL ISD PLANS FOR DETENTION BASINS, STORM SEWER AND SITE EARTHWORK RELATED PRJ #2207070050 TO SERVE JUERGEN ROAD EDUCATIONAL CAMPUS HCFCD REVIEW

1		Total: Acreage within the tract owned by the Developer within the Little Cypress Creek Service Area	206.2672	acres
2	sment	Subtotal: Acreage developed prior to February 11, 2014 (as shown on plans) and all new ROW dedicated according the Master Thoroughfare Plan	0.7576	acres
3	ses	Subtotal: Acreage developed in a previous phase under the LCCIG	0.0000	
4	As	Subtotal: Acreage Proposed to be Developed in this phase	205.5096	acres
5	ct Fee	Subtotal: Remaining undeveloped acreage owned by Developer within the Little Cypress Creek Watershed after completion of this development (Line1-Line2-Line3-Line4-Line5)	0.0000	acres
6	ba	Little Cypress Creek Impact Fee	\$ 4,000.00	per acre
7	lm	Total Impact Fee Due for Development Acreage (Line 4 times Line 6)	\$ 822,038.57	
8		Subtotal Impact Fees Previously Paid	\$ _	
9		Total TRE to be provided in this development phase (Line 10+Line 11)	182.90	ac-ft
10		Required mitigation detention for this development phase (Line 4 times 0.55 ac-ft/ac)	113.03	ac-ft
11	111	Required Conveyance detention for this development phase (Line 4 times 0.34 ac-ft/ac)	69.87	ac-ft
12	TRE	Remaining developable Property after this development phase without previously provided ⊤R⊏ (Line s	0.00	acres
13	-	TRE Volume for total remaining developable property after this development phase (Line 14+Line 15)	0.00	ac-ft
14		Required mitigation detention for entire developable Property (Line 5 times 0.55 ac-ft/ac)	0.00	ac-ft
15		Required Conveyance detention for entire developable Property (Line 5 times 0.34 ac-ft/ac)	0.00	ac-ft



48 HOUR NOTICE:

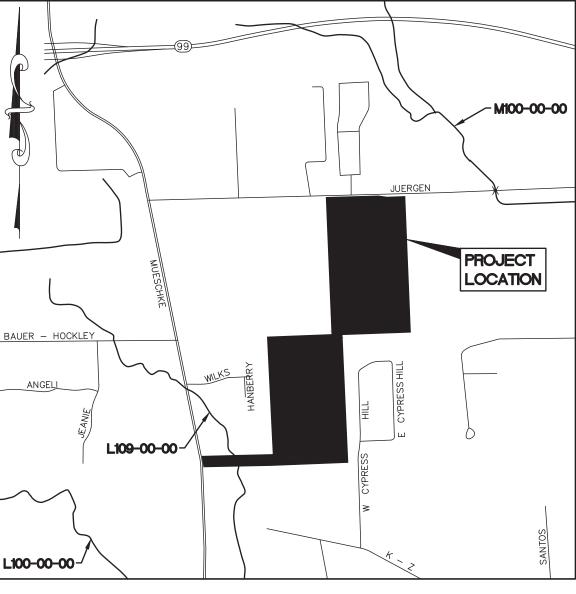
CONTRACTOR SHALL NOTIFY HARRIS COUNTY PRIOR TO COMMENCING CONSTRUCTION AND/OR BACKFILLING ANY UTILITIES. CONTRACTOR(S) TO CONTACT PUBLIC REVIEW DEPARTMENT @ (713-274-3931) OR (public.review@cpid.org).

N.T.S.

\*CONSTRUCTION IN HARRIS COUNTY FLOOD CONTROL DISTRICT RIGHT-OF-WAY REQUIRES: 1.) HCFCD RIGHT-OF-WAY NOTIFICATION (PERMIT) BOTH ARE REQUIRED PRIOR TO ENTERING OR WORKING WITHIN HARRIS COUNTY FLOOD CONTROL DISTRICT RIGHT OF-WAY. THE HCFCD RIGHT-OF-WAY NOTIFICATION AND 48-HOUR NOTICE MUST BE PROVIDED TO HCFCD AT TO APPLY FOR THE HCFCD RIGHT-OF-WAY NOTIFICATION PLEASE GO TO FAILURE TO PROVIDE BOTH ITEMS COULD RESULT IN PROJECT DELAYS.

# OCTOBER 2022

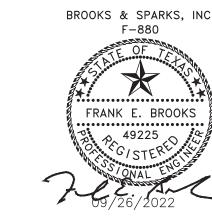
#### VICINITY MAP



KEY MAP 326C, D, G & H ZIP CODE: \* SCALE N.T.S.



TEXAS REGISTERED ENGINEERING FIRM F-880

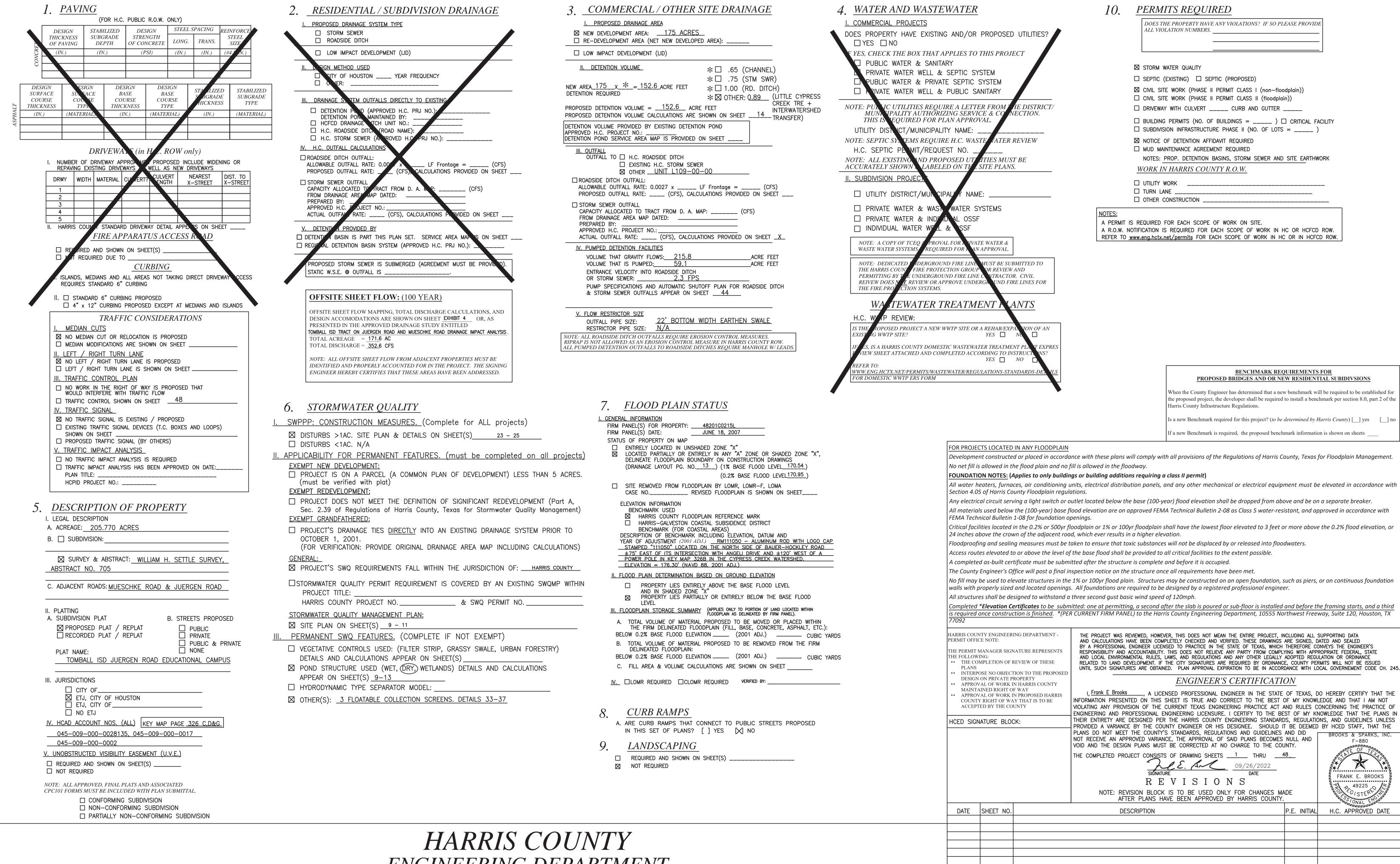


NOTIFICATIONS (PERMIT) ISSUED BY HARRIS COUNTY PUBLIC INFRASTRUCTURE DEPARTMENT - PERMITS OFFICE - IS REQUIRED FOR PROPOSED WORK WITHIN HARRIS COUNTY RIGHT-OF-WAY. THE PROJECT NOTIFICATION MUST BE OBTAINED SEPARATELY FROM SITE DEVELOPMENT PERMIT PACKAGE. FOR ADDITIONAL INFORMATION, PLEASE VISIT <a href="http://hcpid.org/permits/pr\_notification\_of\_construction.html">http://hcpid.org/permits/pr\_notification\_of\_construction.html</a> OR CONTACT PUBLIC REVIEW INSPECTIONS DEPARTMENT @ (713-274-3931 OR public.review@hcpid.org)

# INDEX

SHEET NO.	DESCRIPTION
1.	COVER SHEET
2.	HC REVIEW SHEET
3.	HCFCD REVIEW SHEET
4.	GENERAL NOTES
5.	SERVICE AREA MAP
6.	PROJECT LAYOUT AND GRADING PLAN (SHEET 1 OF 3)
7.	PROJECT LAYOUT AND GRADING PLAN (SHEET 1 OF 3)
8.	PROJECT LAYOUT AND GRADING PLAN (SHEET 1 OF 3)
9.	CONVEYANCE CHANNEL LAYOUT
10.	DETENTION BASIN LAYOUT (SOUTH POND)
11.	DETENTION BASIN LAYOUT (NORTH POND)
12.	EXTREME EVENT OVERFLOW LAYOUT
13.	TYPICAL SECTIONS
14.	DRAINAGE AREA MAP
15.	DRAINAGE CALCULATIONS
16.	50' DRAINAGE EASEMENT PLAN AND PROFILE
17.	50' DRAINAGE EASEMENT PLAN AND PROFILE
18.	50' DRAINAGE EASEMENT PLAN AND PROFILE
19.	BERRY POINT DRIVE PLAN AND PROFILE
20.	BERRY POINT DRIVE PLAN AND PROFILE
21.	BERRY POINT DRIVE PLAN AND PROFILE
22.	BERRY POINT DRIVE PLAN AND PROFILE
23.	STORM WATER POLLUTION PREVENTION PLAN
24.	HARRIS COUNTY STORM WATER POLLUTION PREVENTION DETAILS
25.	HCFCD STORM WATER POLLUTION PREVENTION PLAN DETAILS
26.	HARRIS COUNTY STORM SEWER CONSTRUCTION DETAILS
27.	HARRIS COUNTY PRECAST CONCRETE MANHOLE DETAILS
28.	HARRIS COUNTY PRECAST CONCRETE JUNCTION BOX MANHOLE DETAILS
29.	SINGLE BOX CULVERT PRECAST 4'-0" SPAN SCP-4
30.	SINGLE BOX CULVERT PRECAST 5'-0" SPAN SCP-5
31.	SINGLE BOX CULVERT PRECAST 6'-0" SPAN SCP-6
32.	SINGLE BOX CULVERT PRECAST 7'-0" SPAN SCP-7
33.	HARRIS COUNTY FLOATABLES COLLECTION SCREEN SWQ FEATURE 1
34.	HARRIS COUNTY FLOATABLES COLLECTION SCREEN SWQ FEATURE 2
35. 	HARRIS COUNTY FLOATABLES COLLECTION SCREEN SWQ FEATURE 3
36.	COLLECTION SCREEN DETAIL FOR SWQ FEATURE 1
37. 38.	COLLECTION SCREEN DETAIL FOR SWQ FEATURE 2 & 3 HCFCD INTERCEPTOR STRUCTURE DETAILS
36. 39.	HCFCD CONCRETE CHANNEL LINING DETAILS
40.	HCFCD STORM SEWER RIPRAP DETAILS
41.	CONCRETE WINGWALLS WITH STRAIGHT WINGS FOR O' SKEW BOX CULVERT (SW-0)
42.	CONCRETE WINGWALLS WITH FLARED WINGS FOR SKEWED BOX CULVERT (FW-S)
43.	TEMPORARY STORM WATER PUMP STATION SITE PLAN
44.	TEMPORARY STORM WATER PUMP STATION
45.	TEMPORARY STORM WATER PUMP STATION SPECIFICATIONS
46.	TEMPORARY STORM WATER PUMP STATION ELECTRICAL
47.	FENCE AND GATE DETAILS
48.	TRAFFIC CONTROL PLAN

10.27.2022



SHEET NUMBER 2 of 48

HC PROJECT NO. 2207070042

HCFCD PROJECT NO. 2207070050

HARRIS COUNTY
ENGINEERING DEPARTMENT
REVIEW SHEET

1. PROPERTY DESCRIPTION	2. SITE DETENTION DRAINAGE	3. SWQ DISCHARGE INTO FCD FACILITY	4. FLOOD PLAIN STATUS
I. LOCATION INFORMATION	I. PROPOSED DRAINAGE AREA	I. SWPPP: CONSTRUCTION MEASURES. (Must complete)	I. GENERAL INFORMATION
A. HARRIS COUNTY COMMISSIONER'S PRECINCT:  ☐ 1 ☐ 2 ☑ 3 ☐ 4	⊠I NEW DEVELOPMENT AREA:175             □ RE-DEVELOPMENT AREA (AMOUNT INCREASED IMPERVIOUS AREA):	☐ DISTURBS >1AC. SITE PLAN & DETAILS ON SHEET(S)	FIRM PANEL(S) FOR PROPERTY: <u>48201C0215L</u> FIRM PANEL(S) DATE: <u>JUNE 18, 2007</u>
B. KEY MAP: <u>326 C,D&amp;G</u>	LOW IMPACT DEVELOPMENT (LID)  METHOD/DESCRIPTION		STATUS OF PROPERTY ON MAP ☑ ENTIRELY LOCATED IN UNSHADED ZONE "X"
C. ADDRESS: x	METHODY DESCRIPTION		LOCATED PARTIALLY OR ENTIRELY IN ANY "A" ZONE OR SHADED ZONE "X", DELINEATE FLOODPLAIN BOUNDARY ON CONSTRUCTION DRAWINGS
II. LEGAL DESCRIPTION		*II. APPLICABILITY FOR PERMANENT FEATURES. (Must complete)  EXEMPT NEW DEVELOPMENT:	(DRAINAGE LAYOUT PG. NO) (1% BASE FLOOD LEVEL) (0.2% BASE FLOOD LEVEL)
A. ACREAGE: 205.770 ACRES	II. METHODOLOGY	☐ PROJECT IS ON A PARCEL (A COMMON PLAN OF DEVELOPMENT)	☐ SITE REMOVED FROM FLOODPLAIN BY LOMR, LOMR—F, LOMA CASE NO REVISED FLOODPLAIN IS SHOWN ON SHEET
B.   SUBDIVISION:	HCFCD PCPM DETENTION METHOD USED:	LESS THAN 5 ACRES. (Must be verified with plat) <u>EXEMPT REDEVELOPMENT:</u>	ELEVATION INFORMATION
M SUDVEY & ADSTDACT: WILLIAM II SETTLE SUDVEY	☐ METHOD 1 (LESS THAN 20 ACRES)	☐ PROJECT DOES NOT MEET THE DEFINITION OF SIGNIFICANT	BENCHMARK USED  ☑ HARRIS COUNTY FLOODPLAIN REFERENCE MARK
SURVEY & ABSTRACT: <u>WILLIAM H. SETTLE SURVEY,</u> ABSTRACT NO. 705	<ul><li> ☐ METHOD 2 (20 ACRES TO 640 ACRES)</li><li> ☐ METHOD 3 (GREATER THAN 640 ACRES)</li></ul>	REDEVELOPMENT (Part A,Sec. 2.39 of Regulations of Harris County, Texas for Stormwater Quality Management)	☐ HARRIS-GALVESTON COASTAL SUBSIDENCE DISTRICT  BENCHMARK (FOR COASTAL AREAS)  DESCRIPTION OF BENCHMARK INCLUDING ELEVATION, DATUM AND
C. ADJACENT ROADS: MUESCHKE ROAD & JUERGEN ROAD	☐ METHOD 3 (GREATER THAN 040 ACRES)	EXEMPT GRANDFATHERED:	YEAR OF ADJUSTMENT (2001 ADJ.) RM111050 - ALUMINUM ROD WITH LOGO CAP  STAMPED "111050" LOCATED ON THE NORTH SIDE OF BAUER-HOCKLEY ROAD
C. ADUACLITI NOADS. MOESCHKE KOAD & JUERGEN KOAD		PROJECT'S DRAINAGE TIES <u>DIRECTLY</u> INTO AN EXISTING DRAINAGE SYSTEM PRIOR TO OCTOBER 1, 2001.	±75' EAST OF ITS INTERSECTION WITH ANGELL DRIVE AND ±120' WEST OF A POWER POLE IN KEY MAP 326B IN THE CYPRESS CREEK WATERSHED.
III. PLATTING	III. DETENTION VOLUME & OUTFALL OUTFALL TO:	(FOR VERIFICATION: PROVIDE ORIGINAL DRAINAGE AREA MAP	ELEVATION = 176.30' (NAVD 88, 2001 ADJ.)
A. SUBDIVISION PLAT B. STREETS PROPOSED  ☑ PROPOSED PLAT / REPLAT □ PUBLIC	☐ .65, H.C.F.C.D. CHANNEL, (H.C.F.C.D. UNIT NO.)	INCLUDING CALCULATIONS) <u>GENERAL:</u>	
RECORDED PLAT / REPLAT   PRIVATE   PUBLIC & PRIVATE		PROJECT'S SWQ REQUIREMENTS FALL WITHIN THE JURISDICTION OF:	II ELOOD DLAIN DETEDMINIATION DASED ON COOLIND ELEVATION
PLAT NAME: NONE	.75, EXISTING STORM SEWER (OWNER & OPERATOR)	STORMWATER QUALITY PERMIT REQUIREMENT IS COVERED BY AN	II. FLOOD PLAIN DETERMINATION BASED ON GROUND ELEVATION  PROPERTY LIES ENTIRELY ABOVE THE BASE FLOOD LEVEL
TOMBALL ISD JUERGEN ROAD EDUCATIONAL CAMPUS	1.00, ROADSIDE DITCH, (OWNER & ROAD NAME)	EXISTING SWQMP WITHIN PROJECT TITLE:	□ PROPERTY LIES ENTIRELY ABOVE THE BASE FLOOD LEVEL AND IN SHADED ZONE "X" □ PROPERTY LIES PARTIALLY OR ENTIRELY BELOW THE BASE FLOOD LEVEL
IV. JURISDICTIONS	$\boxtimes$ OTHER (OWNER & OPERATOR) <u>0.89 - L109-00-00 - LITTLE CYPRESS CREEK TRE</u>		
☐ CITY OF	+ INTERWATERSHED TRANSFER	HARRIS COUNTY PROJECT No & SWQ PERMIT No.	III. FLOODPLAIN STORAGE SUMMARY  (APPLIES ONLY TO PORTION OF LAND LOCATED WITHIN FEMA REGULATORY FLOODPLAIN).
□ ETJ, CITY OF HOUSTON     □ ETJ, CITY OF	IV. STORMWATER DETENTION BASIN INFORMATION	STORMWATER QUALITY MANAGEMENT PLAN:  SITE PLAN ON SHEET(S)	A. TOTAL VOLUME OF MATERIAL PROPOSED TO BE MOVED OR PLACED WITHIN
☐ NO ETJ ☐ UTILITY DISTRICT (NAME)	A. HCFCD PCPM SUMMARY TABLE SEE SHEET OF THESE PLANS.		THE FIRM DELINEATED FLOODPLAIN (FILL, BASE, CONCRETE, ASPHALT, ETC.):  BELOW 0.2% BASE FLOOD ELEVATION (2001 ADJ.) CUBIC YARDS
	DETENTION BASIN SERVICE AREA acres	III. PERMANENT SWQ FEATURES. (COMPLETE IF NOT EXEMPT)	B. TOTAL VOLUME OF MATERIAL PROPOSED TO BE REMOVED FROM THE FIRM
V. HCAD ACCOUNT NOS. (ALL) KEY MAP PAGE 326 C,D&G  045-009-000-0028135, 045-009-000-0017	STORM EVENT (2—YEAR) 10% EXCEEDANCE (10—YEAR)  10% EXCEEDANCE (10—YEAR) (100—YEAR)	☐ VEGETATIVE CONTROLS USED: (FILTER STRIP, GRASSY SWALE,  URBAN FORESTRY DETAILS AND CALCULATIONS APPEAR ON  Output  Description:  URBAN FORESTRY DETAILS AND CALCULATIONS APPEAR ON  Output  Description:  Output  Des	DELINEATED FLOODPLAIN:  BELOW 0.2% BASE FLOOD ELEVATION (2001 ADJ.) CUBIC YARDS
045-009-000-0028133, 045-009-000-0017 045-009-000-0002	MAXIMUM ALLOWABLE OUTFLOW (PRE-DEVELOPMENT PEAK FLOW)  MAXIMUM OUTFLOW PROVIDED (PEAK FLOW FROM  141.9  235.8  422.3	SHEET(S)	INCLUDING CALCULATIONS)  C. FILL AREA & VOLUME CALCULATIONS ARE SHOWN ON SHEET
	BASIN)  46.5  BASIN 418.1  LOWEST NATURAL/FINISHED GROUND OR FINISHED FLOOR ELEVATION ESTIMATE	☑ POND STRUCTURE USED (WET, DRY, WETLANDS) DETAILS AND CALCULATIONSAPPEAR ON SHEET(S) 35	C. THE AREA & VOLUME CALCULATIONS ARE SHOWN ON SHEET
	FINISHED FLOOR ELEVATION ESTIMATE  DESIGN WATER SURFACE ELEVATION	☐ HYDRODYNAMIC TYPE SEPARATOR MODEL:	
5. WORK IN HCFCD RIGHT-OF-WAY	MINIMUM STORAGE REQUIRED (ac-ft) ——— 152.6		
I. TYPE OF WORK TO BE PERFORMED IN HCFCD HCFCD ROW	DETENTION STORAGE PROVIDED (ac-ft) ——— 152.6		HCFCD SIGNATURE BLOCK
A. BOND/NOTIFICATION INFORMATION	STORAGE RATE PROVIDED (ac-ft/ac) 0.87		TOMBALL INDEPENDENT SCHOOL DISTRICT PLANS FOR DETENTION BASINS, STORM PROJECT NAME: SEWER AND SITE EARTHWORK TO SERVE JUERGEN ROAD EDUCATIONAL CAMPUS
<ul> <li>         □ HCFCD WATERSHED <u>LITTLE CYPRESS CREEK</u> </li> <li>         □ HCFCD UNIT No. <u>L109-00-00</u> </li> </ul>	OUTFLOW VELOCITY INTO CHANNEL (ft/sec) 0.8 1.5 2.3		ADDRESS:
NUMBER OF OUTFALLS 1	DRAIN TIME - 1% ONLY (hours) 68 HOURS		WAS ACCEPTED BY HARRIS COUNTY FLOOD CONTROL DISTRICT FOR THE PURPOSES LISTED BELOW:
<ul><li>□ UTILITY CROSSING</li><li>□ ROADWAY BRIDGE/CULVERT CROSSING</li></ul>	EMERGENCY OVERFLOW (TYPE, SIZE, ELEVATION, ETC.)	6. REPORTS/AGREEMENTS	HARRIS COUNTY FLOOD CONTROL DISTRICT
☐ FILL ACTIVITY	B. DETENTION BASIN TO BE MAINTAINED BY	I. HCFCD ACCEPTED REPORTS (ALL)	INTERPOSE NO OBJECTION
<ul><li>□ REHABILITATION OF CHANNEL</li><li>□ MAINTENANCE</li></ul>	C. DETENTION SERVICE AREA MAP ON SHEET _5  D. ADDITIONAL CRITERIA FOR PUMPED DETENTION BASINS	STORMWATER DRAINAGE DESIGN REPORT	FOR ITEMS LOCATED OUTSIDE OF HCFCD RIGHT-OF-WAY
☐ TEMPORARY CROSSING ☐ TRAIL (LENGTH)	VOLUME OF PUMPED 1% EXCEEDANCE STORAGE VOLUME = $_{59.1}$ ACFT $_{21.5}$ % OF TOTAL VOLUME MAXIMUM DESIGN OUTFLOW VELOCITY INTO HCFCD CHANNEL = $_{2.3}$ FT/SEC	REPORT TITLE TOMBALL ISD TRACT ON JUERGEN ROAD AND MUESCHKE ROAD  DRAINAGE IMPACT ANALYSIS	APPROVED:
OTHER	DRAIN TIME FOR BASIN = $2.3$ HOURS BASED ONHEAD CONDITIONS	HCFCD PROJECT # 2207110017 ENGINEERING FIRM HDR ENGINEERING, INC	BY FOR ITEMS LOCATED WITHIN EXISTING HCFCD RIGHT-OF-WAY
COST OF WORK IN HCFCD ROW	V. DETENTION PROVIDED IN OTHER PLANS:	ENGINEERING FIRM HDR ENGINEERING, INC REPORT ACCEPTANCE DATE	APPROVED:
II. USACE ENVIRONMENTAL PERMIT  US ARMY CORPS OF ENGINEERS NATIONWIDE	HCFCD PROJECT No DATE SIGNED BY HOUSE	GEOTECHNICAL INVESTIGATION REPORT REPORT TITLE TOMBALL ISD STREETS, UTILITIES, AND DETENTION IMPROVEMENTS	FOR ITEMS LOCATED WITHIN PROPOSED HCFCD RIGHT-OF-WAY
PERMIT NUMBER(S)	PLAN TITLE  DETENTION POND SERVICE AREA WAS LO PROVIDED ON SHE	REPORT TITLE TOMBALL ISD STREETS, UTILITIES, AND DETENTION IMPROVEMENTS	NO REVIEW REQUIRED:
<ul><li>☐ US ARMY CORPS OF ENGINEERS INDIVIDUAL PERMITS</li><li>☐ OTHER</li></ul>	ENGINEERING FIRM	HCFCD PROJECT # ENGINEERING FIRM TERRACON	FINAL PERMITTING BY OTHERS
NO PERMITS REQUIRED     EXPLAIN:		REPORT ACCEPTANCE DATE	ADDITIONAL COMMENTS:
ACCORDING TO THESE OBSERVATIONS, IT IS THE OPINION OF TERRACON THAT STREAM A IS LIKELY NOT CONSIDERED JURISDICTIONAL WOTUS AS DEFINED BY 33 CFR 328.3(B) (3)° AND	VI. FLOW RESTRICTOR SIZE  OUTFALL PIPE SIZE:	HCFCD APPROVED VARIANCE DESCRIPTION OF VARIANCE	
LIKELY DOES NOT REQUIRE SECTION 404 AND LIKELY DOES NOT REQUIRE PERMITTING.	RESTRICTOR PIPE SIZE:		<del></del>
III. REFERENCE / BASIS OF DETERMINATION	VII. DETENTION PROVIDED BY	DOCUMENT ID #  VARIANCE ACCEPTANCE DATE	
	☐ REGIONAL DETENTION BASIN SYSTEM (APPROVED H.C. PRJ NO.):		THE PROJECT WAS REVIEWED, HOWEVER, THIS DOES NOT MEAN THE ENTIRE PROJECT, INCLUDING ALL SUPPORTING DATA AND CALCULATIONS HAVE BEEN COMPLETELY CHECKED AND VERIFIED. THESE DRAWINGS ARE SIGNED, DATED AND SEALED
BY <u>TERRACON</u> REPORT TITLE <u>WATERS OF THE U.S. DELINEATION REPORT</u>		II. AGREEMENT TYPE & No.;	BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF TEXAS, WHICH THEREFORE CONVEYS THE ENGINEER'S RESPONSIBILITY AND ACCOUNTABILITY. THIS DOES NOT RELIEVE ANY PARTY FROM COMPLYING WITH APPROPRIATE FEDERAL, STATE AND LOCAL ENVIRONMENTAL RULES. LAWS. AND REGULATIONS AND ANY OTHER LEGALLY ADOPTED REGULATION OR ORDINANCE
REPORT TITLE WATERS OF THE U.S. DELINEATION REPORT TOMBALL IS GREENFIELD SITE, EAST OF MUESCHKE ROAD, SOUTH OF JUERGEN ROAD, SOUTHEAST OF SH 99 AND NORTH OF BAUER HOCKLEY ROAD, CYPRESS,	FOR PROJECTS LOCATED IN ANY FLOODPLAIN	☐ INTERLOCAL (ILA): ☐ HCFCD MAINTENANCE	AND LOCAL ENVIRONMENTAL RULES, LAWS, AND REGULATIONS AND ANY OTHER LEGALLY ADOPTED REGULATION OR ORDINANCE RELATED TO LAND DEVELOPMENT. IF THE CITY SIGNATURES ARE REQUIRED BY ORDINANCE, COUNTY PERMITS WILL NOT BE ISSUED UNTIL SUCH SIGNATURES ARE OBTAINED. PLAN APPROVAL EXPIRATION TO BE IN ACCORDANCE WITH LOCAL GOVERNEMENT CODE CH
HARRIS COUNTY, TEXAS TERRACON PROJECT NO. 92207783	Development constructed or placed in accordance with these plans will comply with all provisions of the designated Floodplain Administrator.	☐ TURF ESTABLISHMENT	ENGINEER'S CERTIFICATION
REPORT DATE JAN 4, 2021	No net fill is allowed in the flood plain and no fill is allowed in the floodway.		I <u>, Frank E Brooks</u> , A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF TEXAS, DO HEREBY CE
OTHER			THAT THE INFORMATION PRESENTED ON THIS SHEET IS TRUE AND CORRECT TO THE BEST OF MY KNOWLED AND THAT I AM NOT VIOLATING ANY PROVISION OF THE CURRENT TEXAS ENGINEERING PRACTICE ACT AND REPORT OF THE CURRENT TEXAS ENGINE TEXA
NOTES: I. — III. REQUIRED ON PROJECTS WITH WORK IN A HCFCD CHANNEL.	OFFSITE SHEET FLOW: (100 YEAR)		CONCERNING THE PRACTICE OF ENGINEERING AND PROFESSIONAL ENGINEERING LICENSURE.
PLEASE REFERENCE SECTION 17 OF THE FLOOD CONTROL DISTRICT POLICY, CRITERIA, AND PROCEDURE MANUAL FOR MORE INFORMATION.	OFFSITE SHEET FLOW MAPPING, TOTAL DISCHARGE CALCULATIONS, AND		ANY VIOLATIONS WILL BE FORWARDED TO THE HARRIS COUNTY DISTRICT ATTORNEY'S OFFICE FOR PROSECUT  THE COMPLETED PROJECT CONSISTS OF DRAWING SHEETS 1 THRU 48 F-880
IV. HCFCD STANDARD NOTES: SEE SHEET4 OF THESE PLANS.	DESIGN ACCOMODATIONS ARE SHOWN ON SHEET EXHIBIT 4 OR, AS PRESENTED IN THE APPROVED DRAINAGE STUDY ENTITLED TOMBALL ISD. TRACT ON HIEROGEN BOAD, AND MILESCHIE BOAD, DRAINAGE IMPACT, ANALYSIS		F-880  F-880
V. HCFCD STANDARD DETAILS: SEE SHEET 25,35,38,39 OF THESE PLANS.	TOMBALL ISD TRACT ON JUERGEN ROAD AND MUESCHKE ROAD DRAINAGE IMPACT ANALYSIS.  TOTAL DISCHARGE = 352.6 CES		SIGNATURE DATE FRANK E RROOKS
VI. HCFCD ACCESS PLAN: SEE SHEET OF THESE PLANS.	TOTAL DISCHARGE = <u>352.6</u> CFS  NOTE: ALL OFFSITE SHEET FLOW FROM ADJACENT PROPERTIES MUST BE		P F V I S I O N S
VII. REFER TO THE FOLLOWING PLAN SHEETS: 5-11	IDENTIFIED AND PROPERLY ACCOUNTED FOR IN THE PROJECT. THE SIGNING ENGINEER HEREBY CERTIFIES THAT THESE AREAS HAVE BEEN ADDRESSED.		NOTE: REVISION BLOCK IS TO BE USED ONLY FOR CHANGES MADE AFTER PLANS HAVE BEEN APPROVED BY HARRIS COUNTY FLOOD CONTROL.
FOR EXISTING AND PROPOSED RIGHT(S) OF WAY INCLUDING DELINEATION AND RECORDING INFORMATION PER HCFCD POLICY, CRITERIA, & PROCEDURE MANUAL			PLANS HAVE BEEN APPROVED BY HARRIS COUNTY FLOOD CONTROL.  DATE SHEET NO.  DESCRIPTION  P.E. INITIAL H.C.F.C.D APPROVED I
(i.e., DRAINAGE EASEMENT, FEE STRIP, ETC.) AND GRANTEE (e.g. COH, HCFCD, PUBLIC, TXDOT, ETC.)			
	HARRIS COUNTY		
	FLOOD CONTROL DISTRICT		
NON 4.0 COTODED 2040	REVIEW SHEET		SHEET NUMBER 3_ OF
SION 1.0 OCTOBER 2019		HA	RRIS COUNTY FLOOD CONTROL PROJECT NO. 2207070050

VERSION 1.0 OCTOBER 2019

SHEET NUMBER 3 of 48

- 2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ALL WASTE MATERIAL GENERATED DURING CONSTRUCTION. WASTE MATERIAL MUST BE REMOVED FROM THE WORK SITE AND DISPOSED OF IN SUCH A MANNER AS TO NOT DAMAGE THE OWNER OR OTHER PERSONS. (NO SEPARATE PAY FOR THIS ITEM.)
- 3. THE CONTRACTOR SHALL COORDINATE HIS CONSTRUCTION SCHEDULE WITH THE ENGINEER PRIOR TO COMMENCING WORK.
- 4. CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING FINAL GRADES TO ENSURE POSITIVE DRAINAGE.
- 5. THE CONTRACTOR MUST CLEAN MUD, DIRT OR DEBRIS TRACKED ONTO EXISTING STREETS BY HIMSELF OR SUBCONTRACTOR'S VEHICLES AND EQUIPMENT IN A TIMELY MANNER.
- 6. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES IN THE AREA A MINIMUM OF 48 HOURS PRIOR TO COMMENCING WORK IN ANY RIGHT-OF-WAY OR EXISTING EASEMENT.
- 7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING REQUIRED SECURITY TO PROTECT HIS OWN PROPERTY, EQUIPMENT, AND WORK IN PROGRESS.
- 8. VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD BEFORE COMMENCING ANY WORK. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPORT ANY DISCREPANCIES TO THE OWNER IN
- 9. 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 AND SAFETY CODE, FORBIDS ALL ACTIVITIES IN WHICH PERSONS OR THINGS MAY COME WITHIN SIX (6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES. CONTRACTORS ARE LEGALLY RESPONSIBLE FOR SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW. THIS LAW CARRIES BOTH CRIMINAL AND CIVIL LIABILITY. TO ARRANGE FOR LINES TO BE TURNED OFF OR MOVED AT CONTRACTORS EXPENSE CALL CENTER POINT ENERGY AT (713)
- 10. THE CONTRACTOR SHALL COMPLY WITH OSHA REGULATIONS AND STATE OF TEXAS LAW CONCERNING EXCAVATION, TRENCHING AND SHORING.
- 11. ALL TOP SOIL IN AREAS TO BE GRADED SHALL BE STOCKPILED PRIOR TO GRADING AND REPLACED AT THE PROPOSED ELEVATIONS.
- 12. THE DRAWINGS SHOW AS MUCH INFORMATION AS CAN BE REASONABLY OBTAINED FROM AN ON THE GROUND OBSERVATION, SURVEY AND EXISTING CONSTRUCTION DRAWINGS REGARDING THE TOPOGRAPHIC FEATURES, ELEVATIONS AS WELL AS THE LOCATION AND NATURE OF PIPELINES, NATURAL GAS LINES, UNDERGROUND CABLES, UTILITIES, ETC., HOWEVER, THE ACCURACY OF OR COMPLETENESS OF SUCH INFORMATION IS NOT GUARANTEED. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES SUFFICIENTLY IN ADVANCE OF CONSTRUCTION TO PRECLUDE DAMAGE TO EXISTING UTILITIES. IN THE EVENT THAT UNDERGROUND UTILITIES NOT SHOWN ON THE DRAWINGS ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY.
- 13. IN THE EVENT OF DAMAGE TO UNDERGROUND UTILITIES OR FACILITIES, WHETHER SHOWN OR NOT ON THE DRAWINGS, THE CONTRACTOR SHALL MAKE THE NECESSARY REPAIRS TO REPLACE THE UTILITY OR FACILITY BACK IN SERVICE. ALL SUCH REPAIRS SHALL CONFORM TO THE REQUIREMENTS OF THE COMPANY OR AGENCY SERVICING THE FACILITY.
- 14. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR MAINTAINING A SAFE PROJECT SITE 24 HOURS A DAY. AS A MINIMUM, THE GUIDELINES SET FORTH IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" SHALL BE OBSERVED.
- 15. 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 THE GOVERNING AUTHORITY.
- 16. PLACE BACKFILL AS PROMPTLY AND AS PRACTICABLE AFTER COMPLETION OF EACH STRUCTURE OR PORTION OF A STRUCTURE. DO NOT PLACE BACKFILL AGAINST CONCRETE WALLS OR SIMILAR STRUCTURES UNTIL CONCRETE HAS CURED
- 17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL APPLICABLE CITY, COUNTY, STATE, AND FEDERAL PERMITS.

OBTAIN AND COMPLY WITH ALL APPLICABLE CITY, COUNTY, STATE, AND FEDERAL PERMITS

AND APPROVALS, WITH ASSISTANCE FROM ENGINEER, IF NECESSARY, OBTAIN PERMIT

NOTIFY THE HARRIS COUNTY FLOOD CONTROL DISTRICTS DEVELOPMENT COORDINATION AND INSPECTION DEPARTMENT IN WRITING AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.

APPROVED CONSTRUCTION DRAWINGS, AND A COPY OF THE CORPS OF ENGINEERS

APPLICABLE, TO HCFCD, 9900 NORTHWEST FREEWAY, HOUSTON, TEXAS 77092, ATTN:

DEVELOPMENT COORDINATION AND INSPECTION DEPT. BY HAND DELIVERY, BY EMAIL

COUNTY FLOOD CONTROL DISTRICTS DEVELOPMENT COORDINATION AND INSPECTION

INDIVIDUAL SECTION 404 PERMIT OR COMPLIANCE WITH NATIONWIDE PERMIT, IF

SUBMIT THE HCFCD 48 HOUR PRE-CONSTRUCTION NOTIFICATION FORM. A COPY OF THE

ENGINEER SHALL SUBMIT CERTIFICATION LETTER AND RECORD DRAWINGS TO THE HARRIS

CONTROL DISTRICT RIGHT-OF-WAY. PRIOR TO REQUESTING INSPECTION, THE DRAINAGE

SECTION REQUESTING INSPECTION OF ITEMS CONSTRUCTED IN HARRIS COUNTY FLOOD

(CERTIFICATION) FROM HARRIS COUNTY ENGINEER TO ENTER HARRIS COUNTY FLOOD

- 18. NO CONSTRUCTION WHICH BLOCKS TRAFFIC ON ANY STREET, ALLEY, OR DRIVEWAY WILL BE ALLOWED DURING THE HOURS OF 6:30 A.M. - 8:30 A.M. AND 2:30-6:00 P.M.
- 19. INGRESS AND EGRESS SHALL BE PROVIDED AT ALL TIMES FOR THE PROPERTY OWNERS AND BUSINESSES OF THE ABUTTING PROPERTY AND THE CROSS STREETS WHICH ARE AFFECTED BY THE CONSTRUCTION OF THIS PROJECT.
- 20. DURING THE ENTIRE CONSTRUCTION PERIOD, THE CONTRACTOR SHALL MAINTAIN CONSTRUCTION WARNING SIGNS AT EACH END OF THE PROJECT TO WARN MOTORING AND PEDESTRIAN TRAFFIC THAT CONSTRUCTION IS IN PROGRESS AND OF POSSIBLE HAZARDOUS CONDITIONS GENERATED BY
- 21. ALL DIMENSIONS SHOWN ARE APPROXIMATE AND ARE TO BE VERIFIED BY THE CONTRACTOR. CHANGES IN HORIZONTAL OR VERTICAL ALIGNMENT ARE TO BE APPROVED BY THE ENGINEER.
- 22. CONDITION OF THE ROAD AND/OR RIGHT-OF-WAY, UPON COMPLETION OF JOB SHALL BE AS GOOD OR BETTER THAN PRIOR TO STARTING WORK.
- 23. DELINEATORS SHALL BE INSTALLED ALONG THE PAVEMENT EDGE TO WARN TRAFFIC OF ANY ROADSIDE OBJECTS OR HAZARDS AND TO DELINEATE THE ROADWAY EDGE DURING HOURS OF
- 24. THE CONTRACTOR SHALL COORDINATE FINAL GRADING OF LANDSCAPED AREAS WITH THE ENGINEER.
- 25. CONTRACTOR SHALL CONTACT ALL GOVERNING AGENCIES A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION AND COORDINATE ALL WORK WITH THE SAME.
- 26. ALL FILL PLACED ON SITE SHALL BE ENGINEERED FILL PER THE RECOMMENDATION OF THE SOILS REPORT.
- 27. WHERE CONCRETE CURB OR WALK IS INDICATED, ELEVATION SHALL BE 6 INCHES ABOVE TOP OF
- 28. THE WORK AREA SHALL BE BARRICADED AND ILLUMINATED DURING DARKNESS AND PERIODS OF INACTIVITY, WHEN IN AN AREA OF DIRECT PUBLIC ACCESS.

PAVEMENT ELEVATION SHOWN.

DRAWINGS OR NOT.

- 29. ALL EXISTING POWER POLES, LIGHT STANDARDS, SIGNS, ETC. WHICH AFFECT THE PROPOSED CONSTRUCTION, SHALL BE REMOVED AND/OR RELOCATED AS REQUIRED WHETHER SHOWN ON
- 30. WHERE PAVEMENT IS BEING REMOVED AND REPLACED FULL DEPTH SAW CUT SHALL BE PERFORMED AT STREET CONNECTION.
- 31. UNOCCUPIED TRENCHES SHALL BE SECURED WITH SAFETY FENCING OR OTHER APPROPRIATE MEANS AT ALL TIMES. TRENCHES WHICH ARE NOT IMMEDIATELY BACK FILLED SHALL BE SECURELY COVERED OVERNIGHT AND BE SURROUNDED BY SAFETY FENCING.
- 32. ALL WORK WITHIN THE PUBLIC RIGHT-OF-WAY SHALL ADHERE TO THE STANDARDS OF THE GOVERNING AUTHORITY.
- 33. ALL DISTURBED AREAS TO BE HYDRO-MULCHED AT LEAST 30 DAYS PRIOR TO SUBSTANTIAL COMPLETION AND TO BE MAINTAINED THROUGH PROJECT CLOSE OUT.
- 34. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING A CLEAN WORKING AREA. TRASH SHALL BE PICKED UP ON A REGULAR BASIS AND MAINTENANCE OF THE GRASSED AREAS WITHIN THE PROJECT LIMITS SHALL BE DONE AS REQUIRED. NO GRASS OVER 6" SHALL BE ALLOWED WITHIN THE PROJECT LIMITS. GRASS EXCEEDING THIS HEIGHT SHALL BE MOWED TO AN ACCEPTABLE HEIGHT. GRASS IN THE PREDOMINANTLY UNDISTURBED AREAS SHALL BE KEPT FREE OF TRASH AND OTHER DEBRIS AND SHALL BE CUT AT LEAST ONCE DURING THE PROJECT. THE ENTIRE SITE SHALL BE MOWED NO MORE THAN 30 DAYS PRIOR TO SUBSTANTIAL COMPLETION.
- 35. MOW STRIPS SHALL BE INSTALLED SO AS NOT TO BLOCK ANY SHEET FLOW PATTERNS AS DESIGNED. ANY MOW STRIPS THAT BLOCK DRAINAGE SHALL BE REMOVED AND REPLACED. IF CONTRACTOR HAS ANY QUESTIONS ON CORRECT ELEVATIONS FOR MOW STRIPS, CONTACT ENGINEER

# APPENDIX D CONSTRUCTION NOTES TO BE ON ALL PROJECTS

- WATER LINES, WASTEWATER COLLECTION SYSTEMS, AND STORM DRAINAGE SYSTEMS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE CITY OF HOUSTON'S, DEPARTMENT OF PUBLIC WORKS AND ENGINEERING "DESIGN MANUAL, STANDARD CONSTRUCTION SPECIFICATIONS, AND DETAILS FOR WASTEWATER COLLECTION SYSTEMS, WATER LINES, STORM DRAINAGE AND STREET
- 2. ALL STORM SEWER WILL BE REINFORCED CONCRETE (C76 CLASS III) AND SHALL BE INSTALLED, BEDDED AND BACKFILLED IN ACCORDANCE WITH THE CITY OF HOUSTON'S DRAWINGS 02317-02. 02317-03, 02317-05, 02317-06 AND 02317-07 AS APPLICABLE.
- 3. ALL STORM SEWER CONSTRUCTED INSIDE LOT EASEMENTS SHALL BE R.C.P., MINIMUM TWENTY (20) FOOT WIDE EASEMENTS SHALL BE PROVIDED.
- 4. AN ALTERNATIVE TO CEMENT STABILIZED SAND MAY BE USED AS BACKFILL FOR PIPES FIFTY-FOUR (54) INCH AND LARGER, FROM 1-FOOT ABOVE THE TOP OF THE PIPE TO THE BOTTOM OF THE SUBGRADE. CONTRACTOR MAY BACKFILL WITH SUITABLE MATERIAL, PROVIDED THE BACKFILL MATERIAL IS PLACED IN EIGHT (8) INCH LIFTS AND MECHANICALLY COMPACTED TO NINETY-FIVE (95)% STANDARD PROCTOR DENSITY. TESTS SHALL BE TAKEN AT ONE HUNDRED (100) FOOT INTERVALS ON EACH LIFT. BEDDING AND BACKFILL TO ONE (1) FOOT ABOVE THE TOP OF THE PIPE SHALL BE CEMENT-STABILIZED SAND.
- 5. ALL PROPOSED PIPE STUB-OUTS FORM MANHOLES OR INLETS ARE TO BE PLUGGED WITH EIGHT (8) INCH BRICK WALLS UNLESS OTHERWISE NOTED.
- 6. THE CONTRACTOR(S) SHALL NOTIFY HARRIS COUNTY ENGINEERING DEPARTMENT PERMIT OFFICE TWENTY-FOUR (24) HOURS IN ADVANCE OF COMMENCING UTILITY AND/OR PAVING CONSTRUCTION AT (713)274-3823 AND WRITTEN NOTIFICATION FORTY-EIGHT (48) HOURS IN ADVANCE OF COMMENCING CONSTRUCTION AT 10555 NORTHWEST FREEWAY, SUITE 144, HOUSTON, TX. 77092.
- 7. PAVING SHALL BE IN ACCORDANCE WITH THE "REGULATIONS OF HARRIS COUNTY, TEXAS FOR THE APPROVAL AND ACCEPTANCE OF INFRASTRUCTURE" AND/OR AMENDMENTS OF THE SAME.
- 8. GUIDELINES SET FORTH IN THE LATEST EDITION OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, TMUCD WITH REVISIONS" SHALL BE OBSERVED.
- 9. OWNER OR OWNER'S AGENT TO OBTAIN ALL PERMITS REQUIRED BY THE "REGULATIONS OF HARRIS COUNTY, TEXAS FOR FLOODPLAIN MANAGEMENT" PRIOR TO STARTING CONSTRUCTION.
- 10. OWNER OR OWNER'S AGENT TO OBTAIN ALL NOTIFICATIONS REQUIRED BY HARRIS COUNTY, TEXAS PRIOR TO STARING CONSTRUCTION OF UTILITIES AND/OR CULVERTS WITHIN HARRIS COUNTY AND HARRIS COUNTY FLOOD CONTROL DISTRICT RIGHTS-OF-WAY.

#### AT&T TEXAS / SWBT FACILITIES

- WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL PRESERVE THESE UNDERGROUND UTILITIES.
- CONSTRUCTION TO HAVE UNDERGROUND LINES FIELD LOCATED.
- AT&T TEXAS/SWBT FACILITIES, ALL EXCAVATIONS MUST BE ACCOMPLISHED USING EXPOSE THE AT&T TEXAS/SWBT FACILITIES.
- WHEN AT&T TEXAS/SWBT FACILITIES ARE EXPOSED, THE CONTRACTOR WILL PROVIDE SUPPORT TO PREVENT DAMAGE TO THE CONDUIT DUCTS OR CABLES. WHEN
- THE PRESENCE OR ABSENCE OF AT&T TEXAS/SWBT UNDERGROUND CONDUIT FACILITIES OR BURIED CABLE FACILITIES SHOWN ON THESE PLANS DOES NOT MEAN THAT THERE ARE NO DIRECT BURIED CABLES OR OTHER CABLES IN THE AREA. FOLLOW THE DIRECT BURIED CABLE PROCEDURES TO LOCATE THE AT&T TEXAS/SWBT DIRECT BURIED CABLES AS INDICATED IN THE AT&T TEXAS RESEARCH AND SIGNATURE PROCESS FOR AT&T TEXAS/SWBT FACILITIES.
- LEE JR. AT (713)567-4552 OR EMAIL HIM AT RL7259@ATT.COM. IF THERE ARE QUESTIONS ABOUT BORING OR EXCAVATION NEAR OUR AT&T TEXAS/SWBT FACILITIES.

#### CAUTION: UNDERGROUND GAS FACILITIES

- AT 1-800-545-6005 OR 811 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE MAIN AND SERVICE LINES FIELD LOCATED. .. WHEN CENTERPOINT ENERGY PIPE LINE MARKINGS ARE NOT VISIBLE.
- CALL (713) 207-5463 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
- .. WHEN CENTERPOINT ENERGY FACILITIES ARE EXPOSED. SUFFICIENT SUPPORT MUST BE PROVIDED TO THE FACILITIES TO PREVENT EXCESSIVE
- FOR EMERGENCIES REGARDING GAS LINES CALL (713) 659-3552 OR (713) 207-4200.
- HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES.

LINES, SPECIFICALLY:

- OF LIVE OVERHEAD HIGH VOLTAGE LINES; AND
- 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 ENERGY AT (713) 207-2222.
- PROPERTY
- EASEMENT PROPERTY IS GIVEN. IF YOU NEED TO USE CENTERPOINT PROPERTY, PLEASE CONTACT OUR SURVEYING & RIGHT OF WAY DIVISION AT (713) 207-6348 OR (713) 207-5769

# STORM SEWER CONSTRUCTION NOTES

- ON SITE STORM SEWERS 12-INCH DIAMETER AND LARGER SHALL BE CORRUGATED HIGH DENSITY POLYETHYLENE (PER AASHTO M-294, TYPE S, HANCOR SURE-LOK F477 PIPE, OR APPROVED EQUAL,) UNLESS OTHERWISE SHOWN ON PLANS. PRODUCT MUST HAVE GASKET JOINTS.
- 2. ON SITE STORM SEWERS 10-INCH DIAMETER AND LESS SHALL BE PVC (POLY-VINYL CHLORIDE) PIPE MEETING A.S.T.M. SPECIFICATIONS, ASTM D3034 AND HAVING A S.D.R. OF 26, UNLESS OTHERWISE SHOWN ON PLANS.
- ANY CONCRETE PIPE USED ON THIS PROJECT SHALL BE REINFORCED CONCRETE MEETING ASTM C-76 CLASS III, AND HAVE BELL AND SPIGOT JOINTS WITH RUBBER GASKETS. CONCRETE PIPE IS ONLY TO BE USED WHERE REQUIRED IN PUBLIC RIGHT-OF-WAY AND/OR AT TIES TO PUBLIC STORM SEWER SYSTEMS. BEDDING BACKFILLING AND INSTALLATION OF PIPE AND CONSTRUCTION OF APPURTENANCES SHALL BE IN ACCORDANCE WITH THE CIVIL DETAIL SHEETS.
- 4. THE CONTRACTOR SHALL USE PRECAST 4000 PSI REINFORCED CONCRETE STORM SEWER MANHOLES AND INLETS. INVERT SHALL BE INSTALLED WITH NON-SHRINK GROUT AND SLOPED TO ENSURE POSITIVE DRAINAGE FROM INLET TO STORM SEWER LINE. WITH SMOOTH FINISH AND NO STANDING WATER IN INLET. BRICK MANHOLES AND/OR INLETS MAY BE USED AS APPROVED BY THE ENGINEER WHEN SETTING STRUCTURES ON EXISTING UTILITY LINE. BRICK STRUCTURES MUST BE MORTARED INSIDE AND OUT. COORDINATE EACH INCIDENT WITH ENGINEER.
- ALL INLETS, MANHOLES, CLEANOUTS, AND HEADWALLS SHALL BE BACKFILLED WITH CEMENT STABILIZED SAND. CEMENT STABILIZED SAND FILL SHALL BE AT LEAST 12" ON BOTTOM OF STRUCTURE AND 12" AROUND OUTSIDE OF STRUCTURE.
- NO CORNER CONNECTIONS WILL BE ALLOWED TO ANY INLETS, JUNCTION BOXES OR BOX
- CONTRACTOR SHALL CUT OFF PIPE FLUSH WITH INSIDE FACE OF INLETS AND MANHOLES. ALL PIPE PENETRATIONS SHALL BE GROUTED INSIDE AND OUT WITH NON-SHRINK GROUT.
- CONCRETE FOR DRAINAGE STRUCTURES SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF
- 4,500 PSI AT 28 DAYS. 9. CULVERT CROSSINGS LOCATED WITHIN 30 FEET OF THE RIGHT-OF-WAY SHALL HAVE MINIMUM

6:1 SLOPING ENDS KNOWN AS SAFETY END TREATMENTS (SETS). THE CULVERT SHALL HAVE

- SUFFICIENT LENGTH TO ALLOW THE 6:1 SLOPE TO BE ACHIEVED FROM THE EDGE OF PAVEMENT TO THE FLOWLINE AT THE END OF THE SET. 10. CULVERTS LARGER THAN SINGLE 30-INCH DIAMETER (OR LARGER THAN MULTIPLE 24- INCH
- DIAMETER CULVERTS) SHALL REQUIRE SAFETY PIPE RUNNERS.

11. CONTRACTOR SHALL FLUSH AND CLEAN ALL STORM SEWER LINES AND STRUCTURES PRIOR TO

- ACCEPTANCE. 12. UTILITIES ARE TO BE TAKEN TO WITHIN FIVE (5) FEET OF BUILDING. SEE PLUMBING SHEETS
- FOR CONTINUATION OF SERVICE CONNECTIONS INTO BUILDING. 13. TIE-INS TO EXISTING MANHOLES SHALL BE MADE SUCH THAT THE FINAL CONDITIONS UPON

COMPLETION OF THE JOB SHALL BE AS GOOD OR BETTER THAN PRIOR TO STARTING WORK.

- 14. THE CONTRACTOR IS TO INSTALL WATER-TIGHT ADAPTORS OF A TYPE COMPATIBLE WITH THE MATERIALS BEING JOINED AT THE POINT OF CONNECTION OF THE SERVICE LINE TO THE
- BUILDING PLUMBING. NO CEMENT GROUT MATERIALS ARE PERMITTED. 15. THE CONTRACTOR IS TO INSTALL EACH CLEANOUT SO THAT IT OPENS IN A DIRECTION OPPOSITE TO THE FLOW OF THE WASTE AND, EXCEPT IN THE CASE OF A "WYE" BRANCH AND
- END-OF-THE-LINE CLEANOUTS, CLEANOUTS WILL BE INSTALLED VERTICALLY ABOVE THE FLOW LINE OF THE PIPE. CLEANOUTS WILL BE MADE WITH AIR-TIGHT MECHANICAL PLUG. 16. ALL STORM SEWER MANHOLES LOCATED OUTSIDE OF PAVED AREAS SHALL BE SET AT FINISH
- 17. ALL INLETS AND JUNCTION BOXES LOCATED OUTSIDE OF PAVED AREAS SHALL HAVE A PRE-CAST TOP WITH CAST-IN FRAME.

GRADE WITH CONCRETE COLLAR UNLESS OTHERWISE NOTED ON PLANS.

- 18. CONTRACTOR SHALL GROUT ALL JOINTS INSIDE OF ALL INLETS, JUNCTION BOXES, AND
- MANHOLES WITH NON-SHRINK GROUT. 19. ALL TYPE "A" GRATE INLETS SHALL HAVE SLOTTED GRATE TOPS (MODEL V-4880-3).
- 20. CEMENT-SAND BACKFILL SHALL CONSIST OF NOT LESS THAN 1-1/2 SACKS OF CEMENT PER TON OF SAND WITH SUFFICIENT WATER TO HYDRATE THE CEMENT. THE MATERIAL SHALL BE PLACED IN LIFTS EIGHT (8) INCHES THICK MAXIMUM AND COMPACTED TO 95% STANDARD PROCTOR DENSITY.
- 21. CONTRACTOR IS RESPONSIBLE FOR PUMPING OUT STORM WATER QUALITY UNITS AND PROVIDING THE ENGINEER WITH A MANIFEST STATING THAT THE SILT AND DEBRIS WAS DISPOSED OF IN A LEGAL MANNER. MANIFEST AND TIME STAMPED PICTURES OF THE CLEAN UNITS MUST BE PROVIDED PRIOR TO ENGINEER SUBMITTING THE STORM WATER QUALITY AS-BUILT CERTIFICATE. CONTRACTOR TO NOTIFY ENGINEER WHEN PUMP OUT WILL TAKE PLACE.

# HARRIS COUNTY PERMIT NOTES

- 1. PAVING SHALL BE IN ACCORDANCE WITH THE "REGULATIONS OF HARRIS COUNTY, TEXAS FOR THE APPROVAL AND ACCEPTANCE OF INFRASTRUCTURE" AND/OR AMENDMENTS OF SAME.
- 2. GUIDELINES SET FORTH IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" SHALL BE OBSERVED.
- COUNTY, TEXAS FOR FLOOD PLAIN MANAGEMENT" PRIOR TO STARTING CONSTRUCTION
- 4. OWNER TO OBTAIN ALL PERMITS REQUIRED BY HARRIS COUNTY, TEXAS PRIOR TO STARTING CONSTRUCTION OF UTILITIES AND/OR CULVERTS WITHIN HARRIS COUNTY'S ROAD RIGHTS-OF-WAY.
- 5. NOTIFICATIONS ISSUED BY HARRIS COUNTY ENGINEERING DEPARTMENT -PERMITS OFFICE - IS REQUIRED FOR PROPOSED WORK WITHIN HARRIS COUNTY RIGHT-OF-WAY THE PROJECT MUST BE APPROVED PRIOR TO OBTAINING THE REQUIRED NOTIFICATION. BE ADVISED THAT A NOTIFICATION MUST BE OBTAINED SEPARATELY FROM SITE 5. CONTRACTOR TO INSPECT AND MAINTAIN THE AREAS LISTED BELOW AT LEAST ONCE EVERY DEVELOPMENT PERMIT PACKAGE. FOR ADDITIONAL INFORMATION, PLEASE VISIT HTTP: //HCPID.ORG/PERMITS/PR\_NOTIFICATION\_OF\_CONSTRUCTION.HTML OR CONTACT PUBLIC REVIEW INSPECTIONS DEPARTMENT @ (713-274-3931)
  - 6. "AS PER FIRM PANEL NO. 48201CO 215L , DATED JUNE 18, 2007 , THIS TRACT (IS NOT, IS, IS PARTIALLY) WITHIN THE 100-YEAR FLOOD PLAIN, AND THE NEAREST APPLICABLE 100-YEAR FLOOD PLAIN ELEVATION IS XXX.XX (NAVD 88, 2001 ADJ)."

#### TEXAS REGISTERED ENGINEERING FIRM F-880 21020 PARK ROW

PHONE: (281) 578-9595 FAX: (281) 578-9686

#### **FLOODPLAIN INFORMATION:**

KATY, TX 77449

(COMMUNITY-PANEL NO. 4802870215L), MAP REVISED DATE: JUNE 18, 2007. THE SUBJECT PROPERTY LIES WITHIN THE AREAS DESIGNATED A ZONE "X" UNSHADED. DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD. ZONE X SHADED. AREAS OF 0.2% ANNUAL CHANCE FLOOD AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD. ZONE AE. BASE FLOOD ELEVATIONS DETERMINED. AND FLOODWAY. THE FLOODWAY IS THE CHANNEL OF A STREAM PLUS ANY ADJACENT FLOODPLAIN AREAS THAT MUST BI KEPT FREE OF ENCROACHMENT SO THAT THE 1% ANNUAL CHANCE FLOOD CAN BE CARRIED WITHOUT SUBSTANTIAL INCREASES IN FLOOD HEIGHTS.

■■ BROOKS & SPARKS, INC.

ACCORDING TO F.I.R.M. MAP NO. 48201C0215L

#### REFERENCE BENCHMARK:

RM111050 - ALUMINUM ROD WITH LOGO CAP STAMPED "111050" LOCATED ON THE NORTH SIDE OF BAUER-HOCKLEY ROAD ±75' EAST OF ITS INTERSECTION WITH ANGELI DRIVE AND ±120' WEST OF A POWER POLE IN KEY MAP 326B IN THE CYPRESS CREEK WATERSHED. ELEVATION = 176.30' (NAVD 88, 2001 ADJ.)

#### TEMPORARY BENCHMARKS:

TBM "A" - BOX CUT ON "BB" INLET LOCATED ON THE EAST SIDE OF MUESCHKE ROAD ±50' SOUTH OF THE MOST NORTHERLY SOUTHWEST CORNER OF THE SUBJECT TRACT. ELEVATION = 169.64

NOTE: THE LOCATIONS OF THE PRIVATE UTILITY LINES ARE SHOWN IN AN APPROXIMATE WAY ONLY.THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. HE ALSO ACCEPTS FULL RESPONSIBILITY FOR ANY AND ALL DAMAGES INCURRED E HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UTILITIES.

TO ARRANGE FOR LINES TO BE TURNED OFF OR MOVED, CALL CENTERPOINT ENERGY AT 713-207-223 FOR YOUR SAFETY, YOU ARE REQUIRED BY TEXAS LAW TO CALL 811 AT LEAST 48 HOURS BEFORE YOU DIG SO THAT UNDERGROUND LINES CAN BE MARKED. THIS VERIFICATION DOES NOT FULFILL YOU

#### VERIFICATION OF PRIVATE UTILITY LINES

erPoint Energy/Natural Gas Facilities Verification ONLY. (This Signature verifies that you have shown CNP Natural Gas lines correctly. Not to be used for conflict verification.) (Gas service lines are not shown

enterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY. (This Signature verifies that existing derground facilities. Not to be used for conflict verification.) Signature Valid for six month

APPROVED FOR AT&T TEXAS/SWBT UNDERGROUND CONDUIT FACILITIES ONLY



FOMBALL INDEPENDENT SCHOOL DISTRICT PLANS FOR DETENTION BASINS, STORM SEWER AND SITE EARTHWORK TO SERVE JUERGEN ROAD EDUCATIONAL CAMPUS

GENERAL NOTES

NO. DATE

DRAWN BY: RV CHECKED BY: CSM, JAE DESIGNED BY: CSM APPROVED BY: FEB DATE: 09/26/2022 PROJECT NO. 866-0018 SHEET 4 OF 48 SCALE: N/A

REVISIONS

#### BACKSLOPE SWALE AND INTERCEPTOR STRUCTURE ELEVATIONS AND LOCATIONS SHOWN ON PLANS ARE APPROXIMATE. FINAL ELEVATIONS AND LOCATIONS SHALL BE FIELD VERIFIED BY THE ENGINEER PRIOR TO INSTALLATION. ESTABLISH TURF GRASS ON ALL DISTURBED AREAS WITHIN THE CHANNEL OR DETENTION RIGHT-OF-WAY, EXCEPT THE CHANNEL BOTTOM AND WHERE STRUCTURAL EROSION MEASURES ARE USED. MINIMUM ACCEPTANCE CRITERIA ARE 75% COVERAGE OF LIVE BERMUDA GRASS AND NO EROSION OR RILLS DEEPER THAN 4.

DCID@HCFCD.ORG, OR FAX TO 713-684-4129 (FAX NUMBER).

RIGHT-OF-WAY AND/OR EASEMENTS SHALL BE STAKED AND FLAGGED.

PROTECT, MAINTAIN, AND RESTORE EXISTING BACKSLOPE DRAINAGE SYSTEMS.

HCFCD NOTES

CONTROL DISTRICT RIGHT-OF-WAY.

- PERFORM ALL ACTIVITIES WITHIN HARRIS COUNTY FLOOD CONTROL DISTRICT RIGHT-OF-WAY IN ACCORDANCE WITH THE MOST RECENT HARRIS COUNTY FLOOD CONTROL DISTRICT STANDARD SPECIFICATIONS BOOK.
- EXCAVATE CHANNEL FLOWLINE TO DESIGN ELEVATION AS SHOWN ON PLANS AND DOWNSTREAM, AS NECESSARY, TO ENSURE NO WATER REMAINS IN THE FACILITY (STORM SEWER, LATERAL CHANNEL, OR DRY BOTTOM DETENTION BASIN) DURING NORMAL WATER SURFACE CONDITIONS IN THE CHANNEL, SO THE FACILITY WILL FUNCTION AS INTENDED. FOR WET BOTTOM DETENTION BASINS, ENSURE NO WATER IS ABOVE THE DESIGN LEVEL IN THE WET BOTTOM DURING NORMAL WATER SURFACE CONDITIONS IN THE CHANNEL.
- MAINTAIN FLOW IN CHANNEL DURING CONSTRUCTION AND RESTORE CHANNEL TO ORIGINAL CONDITION.
- 10. REMOVE ALL EXCAVATED MATERIAL FROM THE HARRIS COUNTY FLOOD CONTROL DISTRICT OR DRAINAGE RIGHT-OF-WAY. NO FILL IS TO BE PLACED WITHIN A DESIGNATED FLOOD PLAIN AREA WITHOUT FIRST OBTAINING A FILL PERMIT FROM THE APPROPRIATE JURISDICTIONAL AUTHORITY.

# PRIVATE UTILITY NOTES

- 1. THE LOCATIONS OF AT&T TEXAS/SWBT FACILITIES ARE SHOWN IN AN APPROXIMATE DAMAGES WHICH MIGHT BE OCCASIONED BY THIS FAILURE TO EXACTLY LOCATE AND
- THE CONTRACTOR SHALL CALL 1-800-344-8377 A MINIMUM OF 48 HOURS PRIOR TO
- 3. WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF NON-MECHANIZED EXCAVATION PROCEDURES. WHEN BORING, THE CONTRACTOR SHALL
- EXCAVATING NEAR TELEPHONE POLES THE CONTRACTOR SHALL BRACE THE POLE FOR SUPPORT.
- 6. PLEASE CONTACT THE AT&T TEXAS DAMAGE PREVENTION MANAGER MR. ROOSEVELT
- THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE
- LOCATION OF CENTERPOINT ENERGY FACILITIES, ALL EXCAVATION MUST BE ACCOMPLISHED USING NON-MECHANIZEDEXCAVATION PROCEDURES.
- STRESS ON THE PIPING.
- THE CONTRACTOR IS FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY

#### WARNING: OVERHEAD ELECTRICAL LINES

- OVERHEAD LINES MAY EXIST ON THE PROPERTY. THE LOCATION OF OVERHEAD LINES HAS NOT BEEN SHOWN ON THESE DRAWINGS AS THE LINES ARE CLEARLY VISIBLE, BUT YOU SHOULD LOCATE THEM PRIOR TO BEGINNING ANY CONSTRUCTION. TEXAS LAW, SECTION 752, HEALTH & SAFETY CODE FORBIDS ACTIVITIES THAT OCCUR IN CLOSE PROXIMITY TO HIGH VOLTAGE
- · ANY ACTIVITY WHERE PERSON OR THINGS MAY COME WITHIN SIX(6) FEET
- OPERATING A CRANE, DERRICK, POWER SHOVEL, DRILLING RIG, PILE DRIVER,
- THIS LAW. THIS LAW CARRIES BOTH CRIMINAL AND CIVIL LIABILITY. TO ARRANGE FOR LINES TO BE TURNED OFF OR REMOVED CALL CENTERPOINT
- ACTIVITIES ON/OR ACROSS CENTERPOINT ENERGY FEE OR EASEMENT
- NO APPROVAL TO USE, CROSS OR OCCUPY CENTERPOINT FEE OR

# SWPPP CONSTRUCTION NOTES

POLLUTING THE RECEIVING STORM.

STRUCTURAL CONTROL MEASURES.

- CONTRACTOR SHALL IMPLEMENT INLET PROTECTION DEVICES AND REINFORCED FILTER FABRIC BARRIER ALONG ROAD AND SIDE DITCHES AT LOCATIONS SHOWN ON THE TYPICAL STORM WATER POLLUTION PREVENTION (SWPP) PLANS TO KEEP SILT AND OR EXCAVATED MATERIALS FROM ENTERING INTO THE STORM WATER INLETS AND DITCHES EVENTUALLY
- 2. DURING THE EXCAVATION PHASE OF THE PROJECT, CONTRACTOR SHALL SCHEDULE THE WORK IN SHORT SEGMENTS SO THAT EXCAVATION MATERIAL CAN BE QUICKLY HAULED AWAY FROM THE SITE AND TO PREVENT IT FROM STAYING UNCOLLECTED ON THE EXISTING PAVEMENT. ANY LOOSE EXCAVATED MATERIAL WHICH FALLS ON PAVEMENTS OR DRIVEWAYS

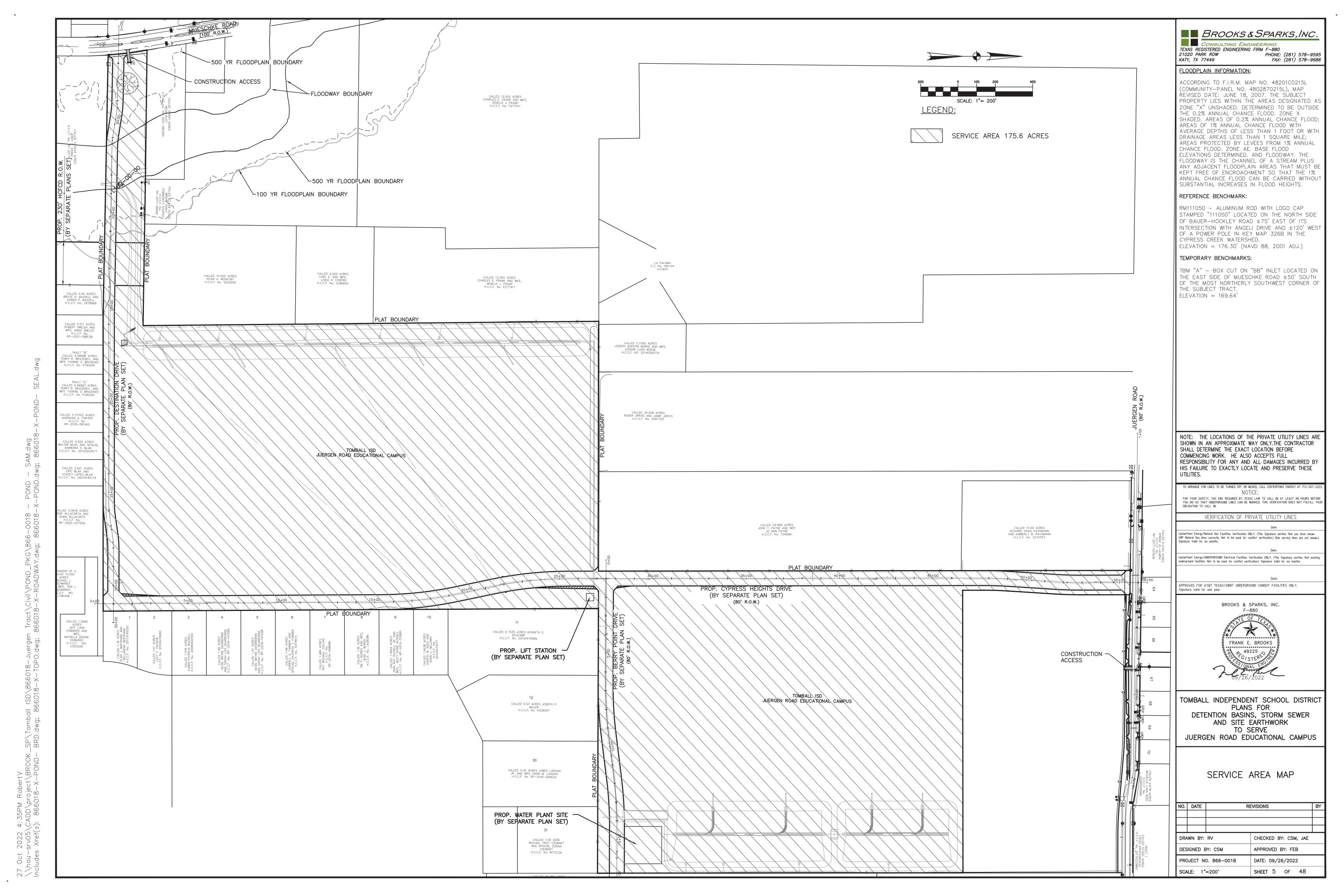
  3. CONTRACTOR TO OBTAIN ALL PERMITS REQUIRED BY THE "REGULATIONS OF HARRIS SHALL BE SWEPT BACK INTO THE EXCAVATED AREA.
- CONTRACTOR SHALL CLEAN UP THE EXISTING STREET INTERSECTIONS AND DRIVEWAYS DAILY, AS NECESSARY, TO REMOVE ANY EXCESS MUD, SILT OR ROCK TRACKED FORM THE EXCAVATED AREA.
- 4. CONTRACTOR SHALL FOLLOW GOOD HOUSEKEEPING PRACTICES DURING THE CONSTRUCTION OF THE PROJECT, ALWAYS CLEANING UP DIRT AND LOOSE MATERIAL AS CONSTRUCTION
- FOURTEEN(14) CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM EVENT OF 0.5 INCHES OR GREATER. DISTURBED AREAS OF THE CONSTRUCTION SITE THAT HAVE NOT BEEN FINALLY

SLOPES 4:1 OR STEEPER SHALL BE REPLACED BY BLOCK SODDING.

LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE. 6. CONTRACTOR TO BE RESPONSIBLE TO MAINTAIN EXISTING DITCHES AND OR CULVERTS FOR UNOBSTRUCTED DRAINAGE AT ALL TIMES. WHERE SODDING IS DISTURBED BY EXCAVATION

ON BACKFILLING OPERATIONS, SUCH AREAS SHALL BE REPLACED BY SEEDING OR SODDING.

AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION.





SCALE: 1"= 100'





BROOKS & SPARKS, INC.

CONSULTING ENGINEERING

TEXAS REGISTERED ENGINEERING FIRM F-880
21020 PARK ROW PHONE: (281) 578-9595
KATY, TX 77449 FAX: (281) 578-9686

#### FLOODPLAIN INFORMATION:

ACCORDING TO F.I.R.M. MAP NO. 48201C0215L (COMMUNITY-PANEL NO. 4802870215L), MAP REVISED DATE: JUNE 18, 2007. THE SUBJECT PROPERTY LIES WITHIN THE AREAS DESIGNATED AS ZONE "X" UNSHADED. DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD. ZONE X SHADED. AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD. ZONE AE. BASE FLOOD ELEVATIONS DETERMINED. AND FLOODWAY. THE FLOODWAY IS THE CHANNEL OF A STREAM PLUS ANY ADJACENT FLOODPLAIN AREAS THAT MUST BE KEPT FREE OF ENCROACHMENT SO THAT THE 1% ANNUAL CHANCE FLOOD CAN BE CARRIED WITHOUT SUBSTANTIAL INCREASES IN FLOOD HEIGHTS.

#### REFERENCE BENCHMARK:

RM111050 — ALUMINUM ROD WITH LOGO CAP STAMPED "111050" LOCATED ON THE NORTH SIDE OF BAUER—HOCKLEY ROAD ±75' EAST OF ITS INTERSECTION WITH ANGELI DRIVE AND ±120' WEST OF A POWER POLE IN KEY MAP 326B IN THE CYPRESS CREEK WATERSHED.

ELEVATION = 176.30' (NAVD 88, 2001 ADJ.)

#### TEMPORARY BENCHMARKS:

TBM "A" - BOX CUT ON "BB" INLET LOCATED ON THE EAST SIDE OF MUESCHKE ROAD  $\pm 50$ ' SOUTH OF THE MOST NORTHERLY SOUTHWEST CORNER OF THE SUBJECT TRACT.

ELEVATION = 169.64'

NOTE: THE LOCATIONS OF THE PRIVATE UTILITY LINES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. HE ALSO ACCEPTS FULL RESPONSIBILITY FOR ANY AND ALL DAMAGES INCURRED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UTILITIES.

#### ARRANGE FOR LINES TO BE TURNED OFF OR MOVED, CALL CENTERPOINT ENERGY AT 713–207–2222. NOTICE:

FOR YOUR SAFETY, YOU ARE REQUIRED BY TEXAS LAW TO CALL BII AT LEAST 48 HOURS BEFORE YOU DIG SO THAT UNDERGROUND LINES CAN BE MARKED. THIS VERIFICATION DOES NOT FULFILL YOUR OBLIGATION TO CALL BII.

VERIFICATION OF PRIVATE UTILITY LINES

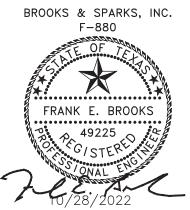
CenterPoint Energy/Natural Gas Facilities Verification ONLY. (This Signature verifies that you have shown CNP Natural Gas lines correctly. Not to be used for conflict verification.) (Gas service lines are not shown.) Signature Valid for six months.

CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY. (This Signature verifies that existing underground facilities. Not to be used for conflict verification.) Signature Valid for six months.

Date:

APPROVED FOR ATAT TEXAS/SWRT UNDERGROUND CONDUIT FACILITIES ONLY

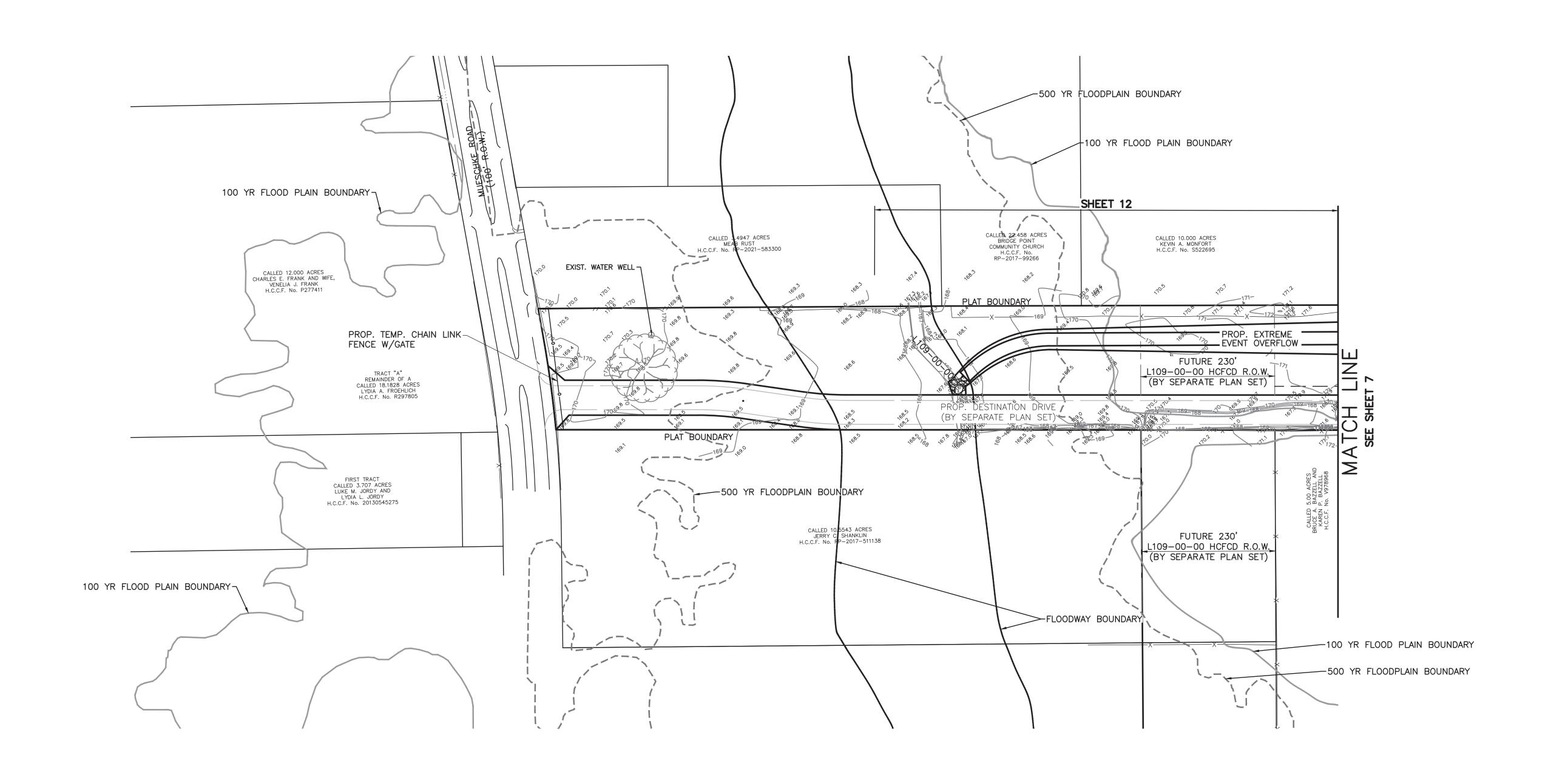
APPROVED FOR AT&T TEXAS/SWBT UNDERGROUND CONDUIT FACILITIES ONLY, Signature valid for one year.

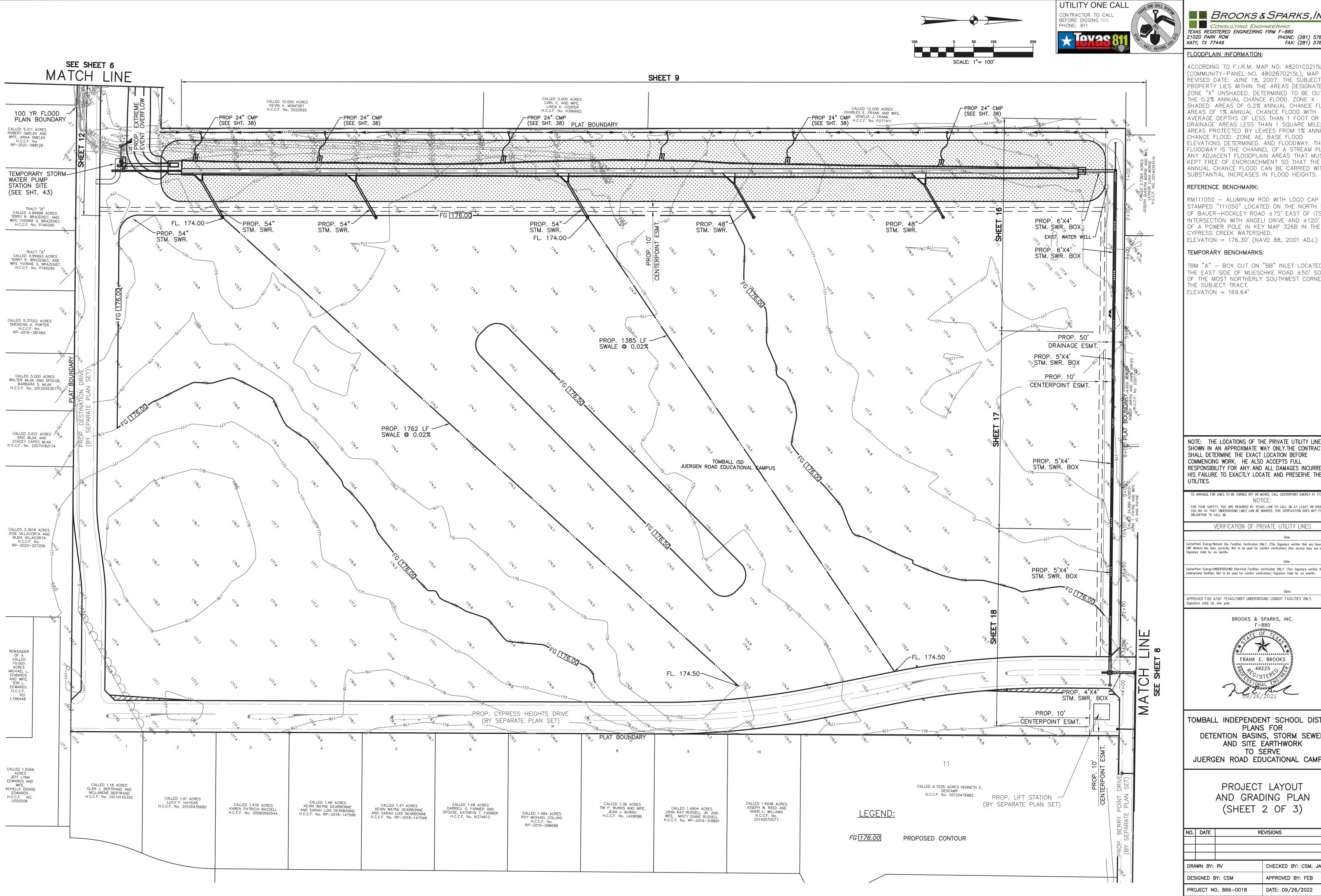


TOMBALL INDEPENDENT SCHOOL DISTRICT
PLANS FOR
DETENTION BASINS, STORM SEWER
AND SITE EARTHWORK
TO SERVE
JUERGEN ROAD EDUCATIONAL CAMPUS

PROJECT LAYOUT AND GRADING PLAN (SHEET 1 OF 3)

NO.	DATE	RE	EVISIONS	BY
DRA	WN BY:	RV	CHECKED BY: CSM, JAE	
DES	SIGNED E	BY: CSM	APPROVED BY: FEB	
PRO	DJECT N	0. 866-0018	DATE: 10/28/2022	
SCA	NLE: 1"	=100'	SHEET 6 OF 48	





■■ BROOKS & SPARKS, INC. CONSULTING ENGINEERING TEXAS REGISTERED ENGINEERING FIRM F-880 PHONE: (281) 578-9595 FAX: (281) 578-9686 21020 PARK ROW

FLOODPLAIN INFORMATION:

ACCORDING TO F.I.R.M. MAP NO. 48201C0215L (COMMUNITY-PANEL NO. 4802870215L), MAP REVISED DATE: JUNE 18, 2007. THE SUBJECT PROPERTY LIES WITHIN THE AREAS DESIGNATED AS ZONE "X" UNSHADED. DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD. ZONE X SHADED. AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD. ZONE AE. BASE FLOOD ELEVATIONS DETERMINED. AND FLOODWAY. THE FLOODWAY IS THE CHANNEL OF A STREAM PLUS ANY ADJACENT FLOODPLAIN AREAS THAT MUST BE KEPT FREE OF ENCROACHMENT SO THAT THE 1% ANNUAL CHANCE FLOOD CAN BE CARRIED WITHOUT

#### REFERENCE BENCHMARK:

RM111050 - ALUMINUM ROD WITH LOGO CAP STAMPED "111050" LOCATED ON THE NORTH SIDE OF BAUER-HOCKLEY ROAD ±75' EAST OF ITS INTERSECTION WITH ANGELI DRIVE AND ±120' WEST OF A POWER POLE IN KEY MAP 326B IN THE CYPRESS CREEK WATERSHED.

#### TEMPORARY BENCHMARKS:

TBM "A" - BOX CUT ON "BB" INLET LOCATED ON THE EAST SIDE OF MUESCHKE ROAD ±50' SOUTH OF THE MOST NORTHERLY SOUTHWEST CORNER OF THE SUBJECT TRACT. ELEVATION = 169.64

NOTE: THE LOCATIONS OF THE PRIVATE UTILITY LINES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. HE ALSO ACCEPTS FULL RESPONSIBILITY FOR ANY AND ALL DAMAGES INCURRED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE

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VERIFICATION OF PRIVATE UTILITY LINES

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enterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY. (This Signature verifies that existing

APPROVED FOR AT&T TEXAS/SWBT UNDERGROUND CONDUIT FACILITIES ONLY,

ignature valid for one year.



TOMBALL INDEPENDENT SCHOOL DISTRICT PLANS FOR DETENTION BASINS, STORM SEWER AND SITE EARTHWORK TO SERVE JUERGEN ROAD EDUCATIONAL CAMPUS

> PROJECT LAYOUT AND GRADING PLAN (SHEET 2 OF 3)

0.	DATE	RE	EVISIONS	BY
RA	WN BY:	RV	CHECKED BY: CSM, JAE	
ES	SIGNED E	BY: CSM	APPROVED BY: FEB	
RC	DJECT NO	0. 866-0018	DATE: 09/26/2022	
CA	NLE: 1"	=100'	SHEET 7 OF 48	
			<u> </u>	

■■ BROOKS & SPARKS, INC. CONSULTING ENGINEERING TEXAS REGISTERED ENGINEERING FIRM F-880 PHONE: (281) 578-9595 FAX: (281) 578-9686 21020 PARK ROW

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RM111050 - ALUMINUM ROD WITH LOGO CAP STAMPED "111050" LOCATED ON THE NORTH SIDE OF BAUER-HOCKLEY ROAD ±75' EAST OF ITS INTERSECTION WITH ANGELI DRIVE AND ±120' WES OF A POWER POLE IN KEY MAP 326B IN THE CYPRESS CREEK WATERSHED. ELEVATION = 176.30' (NAVD 88, 2001 ADJ.)

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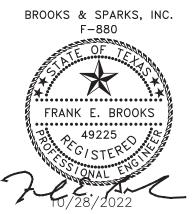
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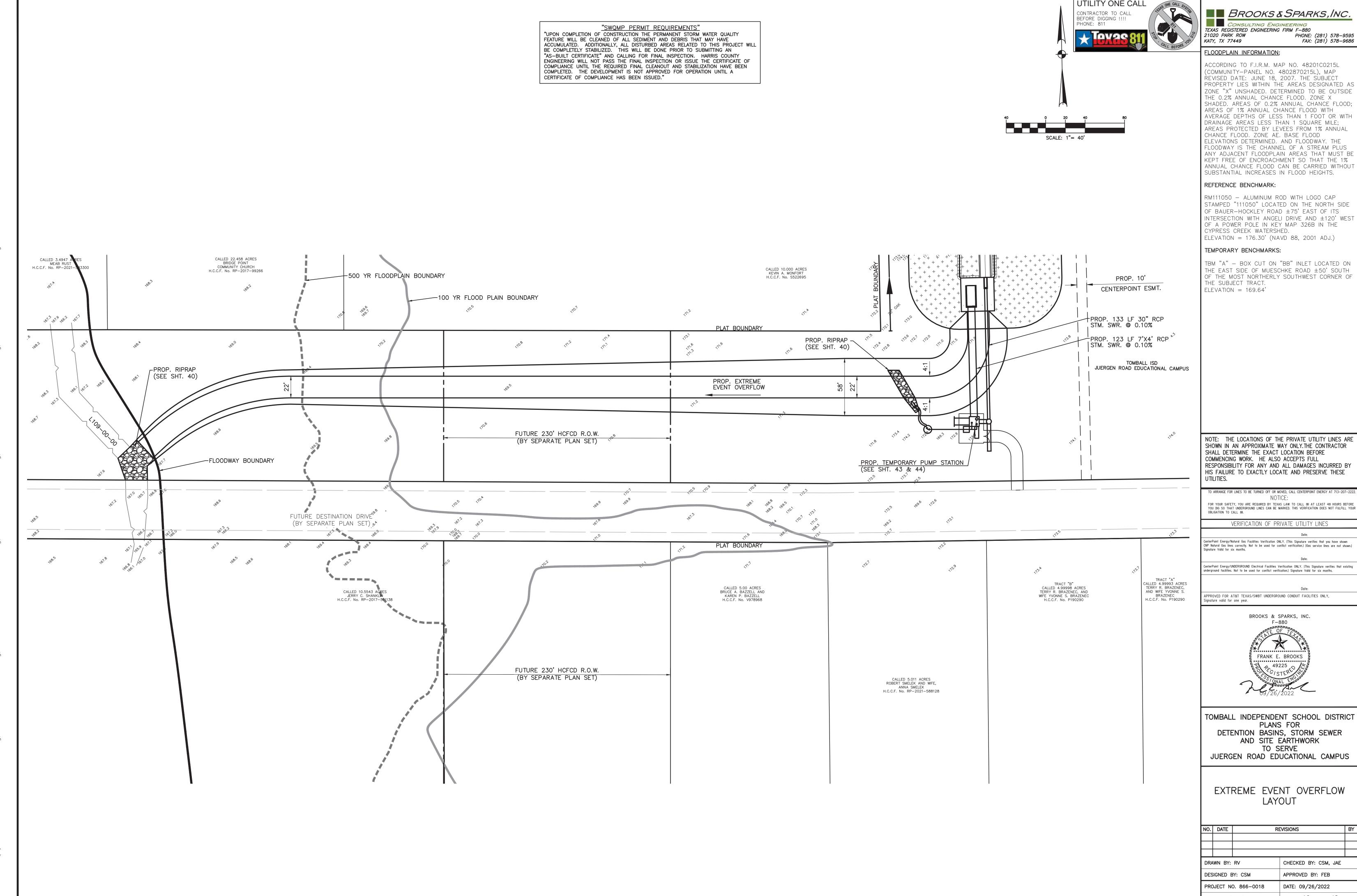
PPROVED FOR AT&T TEXAS/SWBT UNDERGROUND CONDUIT FACILITIES ONLY,



TOMBALL INDEPENDENT SCHOOL DISTRICT PLANS FOR DETENTION BASINS, STORM SEWER AND SITE EARTHWORK TO SERVE JUERGEN ROAD EDUCATIONAL CAMPUS

### CONVEYANCE CHANNEL LAYOUT

NO.	DATE	RE	EVISIONS	BY				
DRA	WN BY:	RV	CHECKED BY: CSM, JAE					
DES	SIGNED E	BY: CSM	APPROVED BY: FEB					
PRO	DJECT N	O. 866-0018	DATE: 10/28/2022					
SCA	LE: 1"	=60"	SHEET 9 OF 48					



■■ BROOKS & SPARKS, INC. CONSULTING ENGINEERING TEXAS REGISTERED ENGINEERING FIRM F-880 PHONE: (281) 578-9595 FAX: (281) 578-9686

(COMMUNITY-PANEL NO. 4802870215L), MAP REVISED DATE: JUNE 18, 2007. THE SUBJECT PROPERTY LIES WITHIN THE AREAS DESIGNATED AS ZONE "X" UNSHADED. DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD. ZONE X SHADED. AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD. ZONE AE. BASE FLOOD ELEVATIONS DETERMINED. AND FLOODWAY. THE FLOODWAY IS THE CHANNEL OF A STREAM PLUS ANY ADJACENT FLOODPLAIN AREAS THAT MUST BE KEPT FREE OF ENCROACHMENT SO THAT THE 1% ANNUAL CHANCE FLOOD CAN BE CARRIED WITHOUT SUBSTANTIAL INCREASES IN FLOOD HEIGHTS.

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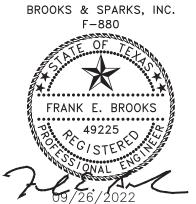
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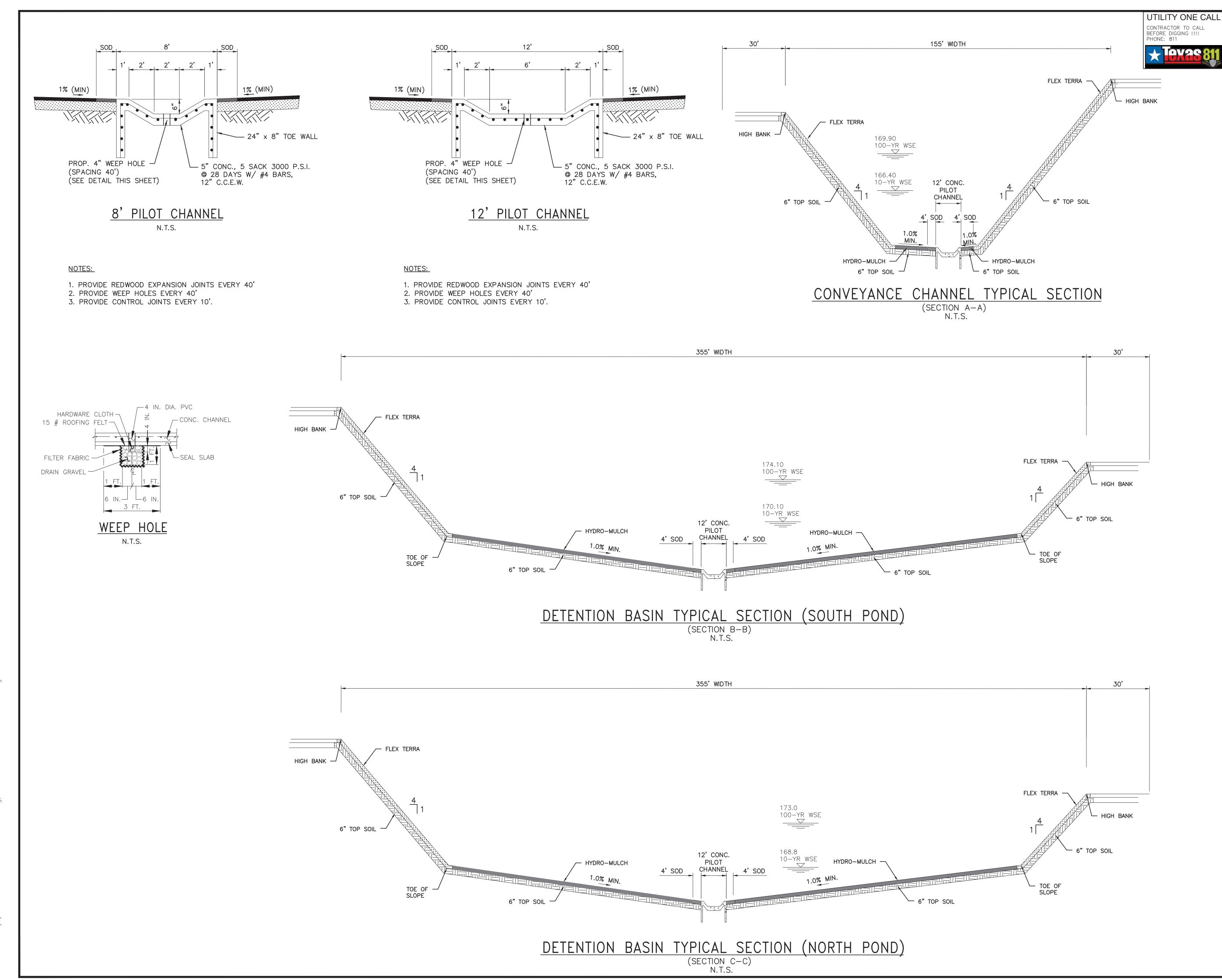
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TOMBALL INDEPENDENT SCHOOL DISTRICT PLANS FOR DETENTION BASINS, STORM SEWER AND SITE EARTHWORK TO SERVE JUERGEN ROAD EDUCATIONAL CAMPUS

# EXTREME EVENT OVERFLOW

NO.	DATE	Р	EVISIONS	BY				
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			1					
DRA	WN BY:	RV	CHECKED BY: CSM, JAE					
DES	SIGNED E	BY: CSM	APPROVED BY: FEB					
PRO	DJECT N	0. 866-0018	DATE: 09/26/2022					
SCA	LE: 1"	=40"	SHEET 12 OF 48					



■■ BROOKS & SPARKS, INC. CONSULTING ENGINEERING TEXAS REGISTERED ENGINEERING FIRM F-880 21020 PARK ROW PHONE: PHONE: (281) 578-9595 FAX: (281) 578-9686

KATY, TX 77449

FLOODPLAIN INFORMATION:

ACCORDING TO F.I.R.M. MAP NO. 48201C0215L (COMMUNITY-PANEL NO. 4802870215L), MAP REVISED DATE: JUNE 18, 2007. THE SUBJECT PROPERTY LIES WITHIN THE AREAS DESIGNATED AS ZONE "X" UNSHADED. DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD. ZONE X SHADED. AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD. ZONE AE. BASE FLOOD ELEVATIONS DETERMINED. AND FLOODWAY. THE FLOODWAY IS THE CHANNEL OF A STREAM PLUS ANY ADJACENT FLOODPLAIN AREAS THAT MUST BE KEPT FREE OF ENCROACHMENT SO THAT THE 1% ANNUAL CHANCE FLOOD CAN BE CARRIED WITHOUT SUBSTANTIAL INCREASES IN FLOOD HEIGHTS.

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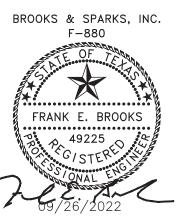
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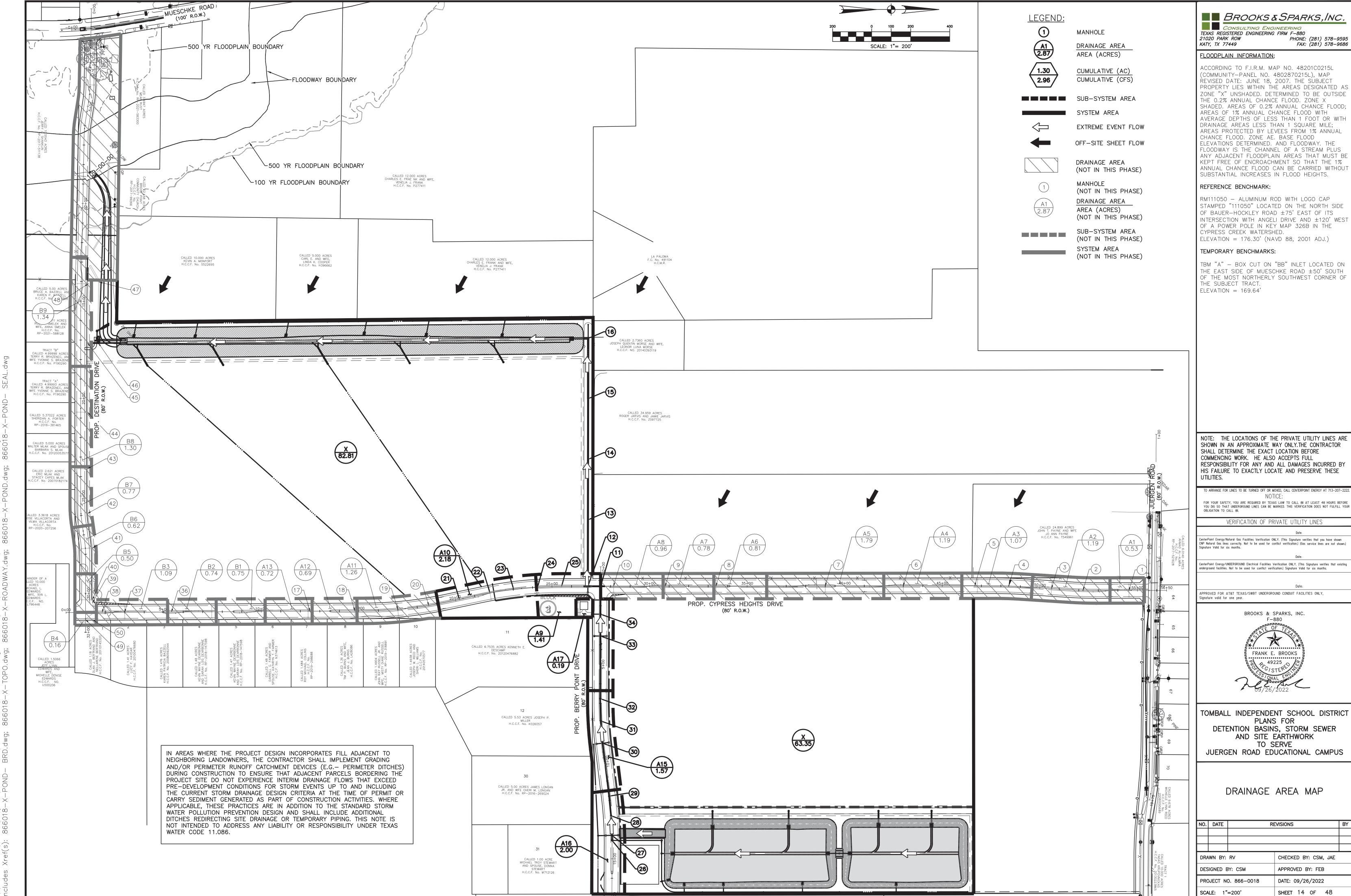
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TOMBALL INDEPENDENT SCHOOL DISTRICT
PLANS FOR
DETENTION BASINS, STORM SEWER
AND SITE EARTHWORK TO SERVE JUERGEN ROAD EDUCATIONAL CAMPUS

TYPICAL SECTIONS

NO.	DATE		REVISIONS BY
DRA	WN BY:	RV	CHECKED BY: CSM, JAE
DES	SIGNED E	BY: CSM	APPROVED BY: FEB
PRO	DJECT N	0. 866-0018	DATE: 09/26/2022
SCA	JF: AS S	SHOWN	SHFET 13 OF 48

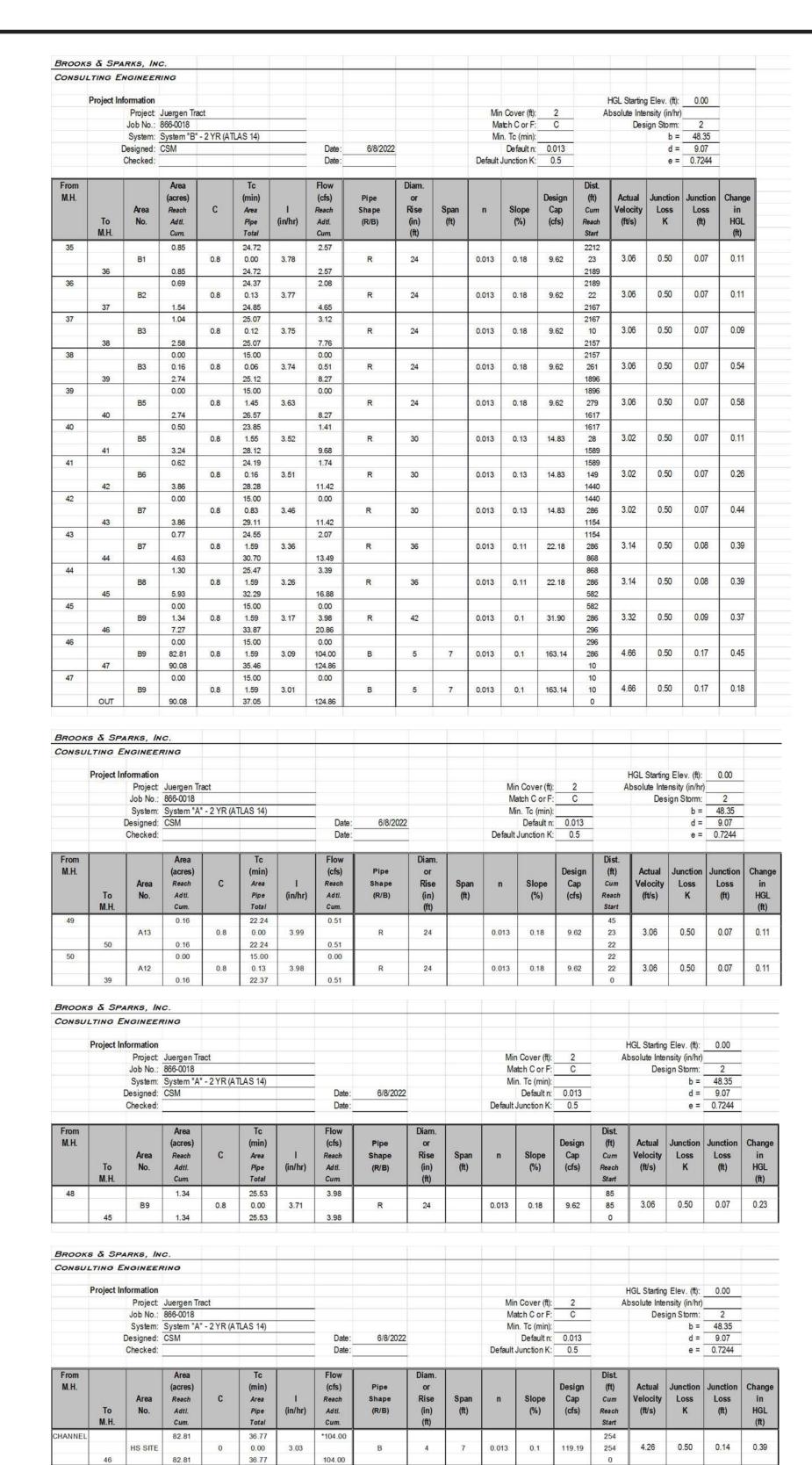


	NO.	DATE	RE	EVISIONS	BY
	DRA	WN BY:	RV	CHECKED BY: CSM, JAE	
	DES	SIGNED E	BY: CSM	APPROVED BY: FEB	
1					

	Project In	nformation													HGL Startin			
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From M.H.	То	Area No.	Area (acres) Reach Adtl.	С	Tc (min) Area Pipe	l (in/hr)	Flow (cfs) Reach Adtl.	Pipe Shape (R/B)	Diam. or Rise (in)	Span (ft)	n	Slope (%)	Design Cap (cfs)	Dist. (ft) Cum Reach	Actual Velocity (ft/s)	Junction Loss K	Junction Loss (ft)	Chang in HGL
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6		A4	1.19	0.8	25.31 1.55	3.51	3,34	R	30		0.013	0.13	14.83	1617 28	3.02	0.50	0.07	0.11
7	7	A5	3.98 1.79	0.8	28.37 26.08 0.16	3.49	11.61 5.00	R	36		0.013	0.11	22.18	1589 1589 149	3.14	0.50	0.08	0.24
8	8		5.77 0.81	20 81623	28.52 24.64	OSSOCIAL DE	16.61 2.23	500	le Steaton		Naviano e	***************************************	Page 17 Sec	1440 1440	3.14	0.50	0.08	0.39
9	9	A6	6.58 0.78	0.8	0.83 29.35 24.57	3.44	18.84 2.08	R	36		0.013	0.11	22.18	286 1154 1154			0.00	
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	11	A8	8.32	0.8	1.59 32.53	3.25	23.42	R	42		0.013	0.1	31.90	286 582	3.32	0.50	0.09	0.37
11	12	A5	0.00 68.46 76.78	0.8	15.00 1.59 34.12	3.16	0.00 20.93 44.35	В	4	4	0.013	0.1	57.99	582 286 296	3.62	0.50	0.10	0.39
12		A5	1.41 4.85	0.8	25.62 1.59	3.08	3.47 14.13	В	4	5	0.013	0.1	77.76	296 286	3.89	0.50	0.12	0.40
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14	14	A5	83.04 0.00	0.8	37.29 15.00 0.06	3.00	61.95 0.00	В	4	5	0.013	0.1	77.76	0 10 10	3.89	0.50	0.12	0.13
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16	16	A5	83.04	8,0	0.06 37.41 15.00	3.00	61.95 0.00	В	4	6	0.013	0.1	98.23	10 0 10	4.09	0.50	0.13	0.14
	OUT	A5	83.04	0.8	0.06 37.46	2.99	61.95	В	4	6	0.013	0.1	98.23	10 0	4.09	0.50	0.13	0.14
BROOK	s & Sp	arks, in	c.															
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	Project In	formation	Juergen Tra									Α	2		GL Starting solute Inten		0.00	
		Job No.:		CL							Min		7.00.1	AL		gn Storm:	2	
											Mat	Cover (ft): _ ch C or F: _	С		Desig		40 25	
		System: Designed:	System "A"	- 2 YR (AT	LAS 14)		Date:	6/8/2022			Mat Min	ch C or F: . Tc (min): Default n:	0.013		Desig	b = d =	48.35 9.07	
		System:	System "A" CSM	-2 YR (AT			Date:	6/8/2022			Mat Min	ch C or F: . Tc (min):			Desig			
From M.H.	То	System: Designed:	System "A" CSM  Area (acres) Reach Adtl.	-2 YR (AT	Tc (min) Area Pipe	l (in/hr)	Flow (cfs) Reach Adtl.	6/8/2022 Pipe Shape (R/B)	Diam. or Rise (in)	Span (ft)	Mat Min	ch C or F: . Tc (min): Default n: unction K:	0.013	Dist. (ft) Cum Reach Start		d = e =	9.07 0.7244	Change in HGL (ff)
	To M.H.	System: Designed: Checked:	System "A" CSM  Area (acres) Reach Adtl. Cum 0.72		Tc (min) Area Pipe Total 24.44 0.00	(in/hr)	Flow (cfs) Reach Adtl. Cum 2.19	Pipe Shape	or Rise	50	Mat Min Default J	ch C or F: . Tc (min): Default n: unction K:	0.013 0.5 Design Cap	(ft) Cum Reach Start 1344 23	Actual Velocity	d = e = Junction Loss	9.07 0.7244 Junction Loss	in
M.H.	То	System: Designed: Checked:  Area No.	System "A" CSM  Area (acres) Reach Adtl. Cum	С	Tc (min) Area Pipe Total 24.44	Total Control	Flow (cfs) Reach Adtl. Cum	Pipe Shape (R/B)	or Rise (in) (ft)	50	Mat Min Default J	ch C or F: . To (min): Default n: unction K: Slope (%)	0.013 0.5 Design Cap (cfs)	(ft) Cum Reach Start	Actual Velocity (ft/s)	d = e = Junction Loss K	9.07 0.7244 Junction Loss (ft)	in HGL (ft)
M.H. 17	To M.H.	System: Designed: Checked:  Area No.  A13	System "A" CSM  Area (acres) Reach Adtl. Cum 0.72	C 0.8	Tc (min) Area Pipe Total 24.44 0.00 24.44 24.37 0.13 24.57 25.42	3.80	Flow (cfs) Reach Adtl. Cum 2.19	Pipe Shape (R/B)	or Rise (in) (ft)	50	Mat Min Default J	ch C or F: . To (min): Default n: unction K: Slope (%)  0.18	0.013 0.5 Design Cap (cfs)	(ft) Cum Reach Start  1344 23 1321 1321 22 1299 1299	Actual Velocity (ft/s)	d = e =  Junction Loss K  0.50	9.07 0.7244 Junction Loss (ft)	in HGL (ft)
M.H. 17	To M.H.	System: Designed: Checked:  Area No.  A13  A12	System "A" CSM  Area (acres) Reach Adtl. Cum 0.72 0.72 0.69	0.8 0.8	Tc (min) Area Pipe Total 24.44 0.00 24.44 24.37 0.13 24.57 25.42 0.12 25.42 15.00	3.80	Date:  Flow (cfs) Reach Adtl. Cum 2.19 2.19 4.28	Pipe Shape (R/B)	or Rise (in) (ft) 24 24	50	Mat Min Default J n 0.013 0.013	ch C or F: . To (min): Default n: unction K: Slope (%)  0.18	0.013 0.5 Design Cap (cfs) 9.62	(ft) Cum Reach Start  1344 23 1321 1321 22 1299 1299 10 1289 1289	Actual Velocity (ft/s) 3.06 3.06	d = e =  Junction Loss K  0.50  0.50	9.07 0.7244 Junction Loss (ft) 0.07	in HGL (ft) 0.11 0.11
M.H. 17 18	To M.H. 18	System: Designed: Checked:  Area No.  A13	System "A"  CSM  Area (acres) Reach Adtl. Cum  0.72  0.72  0.69  1.41  1.26  2.67	C 0.8	Tc (min) Area Pipe Total 24.44 0.00 24.44 24.37 0.13 24.57 25.42 0.12 25.42	3.80	Date:  Flow (cfs) Reach Adtl. Cum 2.19 2.19 2.09 4.28 3.75	Pipe Shape (R/B)	or Rise (in) (ft)	50	Mat Min Default J	ch C or F: . To (min): Default n: unction K: Slope (%)  0.18	0.013 0.5 Design Cap (cfs)	(ft) Cum Reach Start  1344 23 1321 1321 22 1299 1299 10 1289	Actual Velocity (ft/s)  3.06  3.06  3.02	d = e =  Junction Loss K  0.50  0.50  0.50	9.07 0.7244  Junction Loss (ft)  0.07  0.07	in HGL (ft) 0.11 0.11 0.08
M.H.  17  18  19  20  21	To M.H.  18  19	System: Designed: Checked:  Area No.  A13  A12	System "A" CSM  Area (acres) Reach Adtl. Cum 0.72 0.69 1.41 1.26 2.67 0.00 2.67	0.8 0.8	Tc (min) Area Pipe Total 24.44 0.00 24.44 24.37 0.13 24.57 25.42 0.12 25.42 15.00 0.06 25.47 15.00 1.45 26.92	3.80	Plow (cfs) Reach Adtl. Cum 2.19 2.09 4.28 3.75 8.03 0.00 8.03 0.00 8.03	Pipe Shape (R/B)	or Rise (in) (ft) 24 24	50	Mat Min Default J n 0.013 0.013	ch C or F: . To (min): Default n: unction K: Slope (%)  0.18	0.013 0.5 Design Cap (cfs) 9.62	(ft) Cum Reach Start  1344 23 1321 1321 22 1299 10 1289 1289 261 1028 1028 279 749	Actual Velocity (ft/s) 3.06 3.06	d = e =  Junction Loss K  0.50  0.50	9.07 0.7244 Junction Loss (ft) 0.07	in HGL (ft) 0.11 0.11
M.H.  17  18  19  20  21	To M.H.  18  19  20	System: Designed: Checked:  Area No.  A13  A12  A11	System "A" CSM  Area (acres) Reach Adtl. Cum 0.72 0.69 1.41 1.26 2.67 0.00 2.67 0.00 2.67 2.18 4.85	0.8 0.8 0.8	Tc (min) Area Pipe Total 24.44 0.00 24.44 24.37 0.13 24.57 25.42 0.12 25.42 15.00 0.06 25.47 15.00 1.45 26.92 26.47 1.55 28.47	3.80 3.79 3.72	Plow (cfs) Reach Adtl. Cum 2.19 2.09 4.28 3.75 8.03 0.00 8.03 6.10 14.13	Pipe Shape (R/B)	or Rise (in) (ft) 24 24	50	Mat Min Default J n 0.013 0.013 0.013	ch C or F: . To (min): Default n: unction K: Slope (%)  0.18  0.13	0.013 0.5 Design Cap (cfs) 9.62 14.83	(ft) Cum Reach Start  1344 23 1321 1321 22 1299 10 1289 1289 261 1028 279 749 749 28 721	Actual Velocity (ft/s)  3.06  3.06  3.02	d = e =  Junction Loss K  0.50  0.50  0.50	9.07 0.7244  Junction Loss (ft)  0.07  0.07	in HGL (ft) 0.11 0.11 0.08
M.H.  17  18  19  20  21	To M.H.  18  19  20  21	System: Designed: Checked:  Area No.  A13  A12  A11  A11	System "A" CSM  Area (acres) Reach Adtl. Cum 0.72 0.69 1.41 1.26 2.67 0.00 2.67 0.00 2.67	0.8 0.8 0.8	Tc (min) Area Pipe Total 24.44 0.00 24.44 24.37 0.13 24.57 25.42 0.12 25.42 15.00 0.06 25.47 15.00 1.45 26.92 26.47 1.55	3.80 3.79 3.72 3.72	Plow (cfs) Reach Adtl. Cum 2.19 2.09 4.28 3.75 8.03 0.00 8.03 0.00 8.03 6.10	Pipe Shape (R/B)	or Rise (in) (ft) 24 24 30 30	50	Mat Min Default J n 0.013 0.013 0.013 0.013	ch C or F: . To (min): Default n: unction K: Slope (%)  0.18  0.13  0.13	0.013 0.5 Design Cap (cfs) 9.62 14.83	(ft) Cum Reach Start  1344 23 1321 1321 22 1299 10 1289 1289 261 1028 1028 279 749 749 28	Actual Velocity (ft/s)  3.06  3.06  3.02  3.02	d = e =  Junction Loss K  0.50  0.50  0.50  0.50	9.07 0.7244  Junction Loss (ft)  0.07  0.07  0.07	in HGL (ft) 0.11 0.11 0.08 0.41
M.H.  17  18  19  20  21	To M.H.  18  19  20  21  22  23	System: Designed: Checked:  Area No.  A13  A12  A11  A10  A10	System "A" CSM  Area (acres) Reach Adtl. Cum 0.72 0.69 1.41 1.26 2.67 0.00 2.67 0.00 2.67 2.18 4.85 0.00 4.85 0.00	0.8 0.8 0.8 0.8	Tc (min) Area Pipe Total  24.44 0.00 24.44 24.37 0.13 24.57 25.42 0.12 25.42 15.00 0.06 25.47 15.00 1.45 26.92 26.47 1.55 28.47 15.00 0.16 28.63 15.00 0.83	3.80 3.79 3.72 3.61 3.50	Date:  Flow (cfs) Reach Adtl. Cum 2.19 2.19 2.09 4.28 3.75 8.03 0.00 8.03 6.10 14.13 0.00 14.13 0.00	Pipe Shape (R/B)	or Rise (in) (ft) 24 24 30 30 30 36	50	Mat Min Default J n 0.013 0.013 0.013 0.013	ch C or F: . To (min): Default n: unction K:  Slope (%)  0.18  0.13  0.13	0.013 0.5 Design Cap (cfs) 9.62 14.83 14.83	(ft) Cum Reach Start  1344 23 1321 1321 22 1299 10 1289 1289 261 1028 279 749 749 28 721 721 149 572 286	Actual Velocity (ft/s)  3.06  3.06  3.02  3.02  3.02	d = e =  Junction Loss K  0.50  0.50  0.50  0.50  0.50	9.07 0.7244  Junction Loss (ft)  0.07  0.07  0.07  0.07	in HGL (ft) 0.11 0.11 0.08 0.41 0.43
M.H.  17  18  19  20  21  22  23	To M.H.  18  19  20  21  22  23	System: Designed: Checked:  Area No.  A13  A12  A11  A10  A10	System "A"  CSM  Area (acres) Reach Adtl. Cum  0.72  0.69  1.41  1.26  2.67  0.00  2.67  0.00  2.67  2.18  4.85  0.00  4.85	0.8 0.8 0.8 0.8	Tc (min) Area Pipe Total  24.44 0.00 24.44 24.37 0.13 24.57 25.42 0.12 25.42 15.00 0.06 25.47 15.00 1.45 26.92 26.47 1.55 28.47 15.00 0.16 28.63 15.00	3.80 3.79 3.72 3.61 3.50	Plow (cfs) Reach Adtl. Cum 2.19 2.09 4.28 3.75 8.03 0.00 8.03 6.10 14.13 0.00 14.13	Pipe Shape (R/B)	or Rise (in) (ft) 24 24 30 30 36 36	50	Mat Min Default J  n 0.013 0.013 0.013 0.013 0.013	ch C or F: . To (min): Default n: unction K: Slope (%)  0.18  0.13  0.13  0.11	0.013 0.5 Design Cap (cfs) 9.62 9.62 14.83 14.83 22.18	(ft) Cum Reach Start  1344 23 1321 1321 22 1299 10 1289 1289 261 1028 279 749 749 28 721 721 149 572 572	Actual Velocity (ft/s)  3.06  3.06  3.02  3.02  3.14  3.14	d = e =  Junction Loss K  0.50  0.50  0.50  0.50  0.50  0.50  0.50	9.07 0.7244  Junction Loss (ft)  0.07  0.07  0.07  0.07  0.08	in HGL (ft) 0.11 0.11 0.08 0.41 0.43

	- I III L	NGINEE	C.															
		NGINEE	ING															
	Project In	formation													HGL Starting	g Elev. (ft):	0.00	
			Juergen Tra	act								Cover (ft):	2	Д	Absolute Inte			
			866-0018	0.1/0 //	TI A O 44)							atch C or F:	С		Des	ign Storm:	2	
		Designed:	System "A"	-2 TK (A	TLAS 14)		Date:	6/8/2022			IVII	n. Tc (min): Default n:	0.013			b = d =	48.35 9.07	-
		Checked:	OOW				Date:	0/0/2022			Default	Junction K:	0.5			e =	12 - 22 - 2 - 2	
From			Area		Tc		Flow		Diam.		100 h			Dist.				
M.H.	To M.H.	Area No.	(acres) Reach Adtl. Cum	С	(min) Area Pipe Total	l (in/hr)	(cfs) Reach Adtl. Cum	Pipe Shape (R/B)	or Rise (in) (ft)	Span (ft)	n	Slope (%)	Design Cap (cfs)	(ft) Cum Reach Start	Actual Velocity (ft/s)	Junction Loss K	Junction Loss (ft)	Chai in HG (ft
26			0.00		15.00		0.00							1344				
		A 16	63.35	0.8	0.00	4.83	6.40	R	36		0.013	0.1	21.15	23	2.99	0.50	0.07	0.0
07	27	-	63.35		15.00		6.40			<u> </u>				1321	1	-		-
27		A 16	2.00	0.8	26.30	3.65	5.84	R	36	-	0.013	0.1	21.15	1321	2.99	0.50	0.07	0.0
	28	AID	65.35	0.0	26.30	3.63	12.24	- IX	30		0.013	0.1	21.15	1299	2.00	0.50	0.07	0.0
28	- 20		0.00		15.00		0.00							1299				
177.00		A16	10000	0.8	0.12	3.64		R	36		0.013	0.1	21.15	10	2.99	0.50	0.07	0.0
	29		65.35		26.42		12.24							1289				
29			0.00		15.00		0.00							1289				
		A 16		0.8	0.06	3.64		R	36		0.013	0.1	21.15	261	2.99	0.50	0.07	0.3
120	30		65.35		26.48		12.24			-	9		ă.	1028	-			-
30		10000000	1.57	12/2	25.83	1000	4.44	0122	10222		100000	104112	1200020	1028	1	0.50	0.07	0.0
	24	A 15		0.8	1.45	3.54	40.00	R	36		0.013	0.1	21.15	279	2.99	0.50	0.07	0.3
31	31	1	66.92 0.00		27.93 15.00		16.68			1				749 749	1			$\vdash$
31		A 15	0.00	0.8	1.55	3.43	0.00	R	36		0.013	0.1	21.15	28	2.99	0.50	0.07	0.1
	32	,,,,,	66.92	0.0	29.48	0.30	16.68	5.53			0.010	0.1	21.10	721		0.00	3,5,1	(33.4
32			0.00		15.00		0.00							721				
		A 15	111020	0.8	0.16	3.42		R	36		0.013	0.1	21.15	149	2.99	0.50	0.07	0.2
	33		66.92		29.63		16.68					i ii	Į.	572				
33			1.35		25.54		3.64							572				
		A14		0.8	0.83	3.37		R	36		0.013	0.1	21.15	286	2.99	0.50	0.07	0.3
220	34		68.27		30.46		20.32							286	-	2		-
34			0.00		15.00		0.00				0.040			286	2.99	0.50	0.07	0.3
	11	A14	0.19 68.46	0.8	1.59 32.05	3.27	0.60 20.93	R	36	-	0.013	0.1	21.15	286	2.99	0.50	0.07	0.3
	Project In	Job No.:	Juergen Tra 866-0018 System "A"		TLAS 14)		Date:	6/8/2022			Ma Mir	Cover (ft): tch C or F: n. Tc (min): Default n: Junction K:	2 C		HGL Starting bsolute Inte Desi	and the same of th	0.00 2 48.35 9.07 0.7244	
F		Oncored.	A		Тс				Diam.		Delaare	, arroad i K.	0.0	Dist			0.7241	
From M.H.		Area	Area (acres)	С	(min) Area Pipe	l (in/hr)	(cfs) Reach Adti. Cum.	Pipe Shape (R/B)	or Rise (in)	Span (ft)	n	Slope (%)	Design Cap (cfs)	(ft) Cum Reach Start	Actual Velocity (ft/s)	Junction Loss K	Junction Loss (ft)	Changin HGI (ft)
W.T.	To M.H.	No.	Adti. Cum.		Total		200000000000000000000000000000000000000		(ft)									
M.n.		No.	Adtl.		<b>Total</b> 22.46		0.60		(11)					85				
		No.	Adti. Cum.	0.8	E 10/00/2	3.97		R	24		0.013	0.18	9.62	85 85	3.06	0.50	0.07	0.23
			Adti. Cum.	0.8	22.46	3.97		R			0.013	0.18	9.62		3.06	0.50	0.07	0.23
A17	M.H. 34	A17	Adtl. Cum. 0.19 0.19	0.8	22.46 0.00	3.97	0.60	R			0.013	0.18	9.62	85	3.06	0.50	0.07	0.23
A17	M.H. 34		Adti. Cum. 0.19 0.19	0.8	22.46 0.00	3.97	0.60	R			0.013	0.18	9.62	85	3.06	0.50	0.07	0.23
A17	M.H. 34	A17	Adti. Cum. 0.19 0.19	0.8	22.46 0.00	3.97	0.60	R			0.013	0.18	9.62	85	3.06	0.50	0.07	0.23
A17 BROOKS	M.H.  34  S & SPA	A17	Adti. Cum. 0.19 0.19	0.8	22.46 0.00	3.97	0.60	R			0.013	0.18	9.62	85	3.06		0.07	0.23
A17 BROOKS	M.H.  34  S & SPA	ARKS, INCOMPLET	Adti. Cum. 0.19 0.19 0.19 U.C. RING		22.46 0.00	3.97	0.60	R			Mir	n Cover (ft):	2	85	HGL Starting	g Elev. (ft): nsity (in/hr)	0.00	0.23
A17 BROOKS	M.H.  34  S & SPA	ARKS, INCOMPENSATION Project Job No.:	Adti. Cum. 0.19 0.19 0.19 Juergen Tra 866-0018	act	22.46 0.00 22.46	3.97	0.60	R			Mir Ma	n Cover (ft):		85	HGL Starting	g Elev. (ft): ensity (in/hr) ign Storm:	0.00	0.23
A17 BROOKS	M.H.  34  S & SPA	ATT  ARKS, IN  ROGINEEL  Iformation  Project  Job No.:  System:	Adti. Cum.  0.19  0.19  0.19  Juergen Tra 866-0018 System "A"	act	22.46 0.00 22.46	3.97	0.60				Mir Ma	n Cover (ft): atch C or F: n. Tc (min):	2 C	85	HGL Starting	g Elev. (ft): nsity (in/hr) ign Storm: b =	0.00 2 48.35	0.23
A17 BROOKS	M.H.  34  S & SPA	ATT  ARKS, IN  A	Adti. Cum.  0.19  0.19  0.19  Juergen Tra 866-0018 System "A"	act	22.46 0.00 22.46	3.97	0.60 0.60	R 6/8/2022			Mir Ma Mi	n Cover (ft): atch C or F: n. Tc (min): Default n:	2 C	85	HGL Starting	g Elev. (ft): nsity (in/hr) ign Storm: b = d =	0.00 2 48.35 9.07	0.23
A17 BROOKS	M.H.  34  S & SPA	ATT  ARKS, IN  ROGINEEL  Iformation  Project  Job No.:  System:	Adti. Cum.  0.19  0.19  0.19  Juergen Tra 866-0018 System "A"	act	22.46 0.00 22.46	3.97	0.60				Mir Ma Mi	n Cover (ft): atch C or F: n. Tc (min):	2 C	85	HGL Starting	g Elev. (ft): nsity (in/hr) ign Storm: b =	0.00 2 48.35	0.2
A17 BROOKS	M.H.  34  S & SPJ.  LTING E  Project In	ATT  ARKS, IN  A	Adti. Cum. 0.19 0.19 0.19  UC. System "A" CSM  Area (acres) Reach Adti.	act	22.46 0.00 22.46 TLAS 14) Tc (min) Area Pipe	3.97	Date: Date: Flow (cfs) Reach Adtl.		Diam. or Rise (in)	Span (ft)	Mir Ma Mi	n Cover (ft): atch C or F: n. Tc (min): Default n:	2 C	85 0 Dist. (ft) Cum Reach	HGL Starting	g Elev. (ft): nsity (in/hr) ign Storm: b = d =	0.00 2 48.35 9.07	Char in HG
BROOKS CONSUL From M.H.	M.H.  34  S & SP/ LTING E  Project In	ATRKS, INCOMPLETED STATE OF THE PROJECT OF THE PROJ	Adti. Cum.  0.19  0.19  0.19  U.C.  Juergen Tra 866-0018 System "A" CSM  Area (acres) Reach Adti. Cum.	act - 2 YR (A	22.46 0.00 22.46 TLAS 14)	1	Date: Date: Flow (cfs) Reach Adtl. Cum.	6/8/2022 Pipe Shape	Diam. or Rise	100	Mir Ma Mi Default	n Cover (ft): atch C or F: n. Tc (min): Default n: Junction K:	2 C 0.013 0.5	Dist. (ft) Cum Reach Start	HGL Starting bsolute Inte Des  Actual Velocity	g Elev. (ft): ensity (in/hr) ign Storm: b = d = e =  Junction Loss	0.00 2 48.35 9.07 0.7244 Junction Loss	Char in HG
A17  BROOKE	M.H.  34  S & SPJ.  LTING E  Project In	ATRKS, INCOMPLETED STATE OF THE PROJECT OF THE PROJ	Adti. Cum. 0.19 0.19 0.19  UC. System "A" CSM  Area (acres) Reach Adti.	act - 2 YR (A	22.46 0.00 22.46 TLAS 14) Tc (min) Area Pipe	1	Date: Date: Flow (cfs) Reach Adtl.	6/8/2022 Pipe Shape	Diam. or Rise (in)	100	Mir Ma Mi Default	n Cover (ft): atch C or F: n. Tc (min): Default n: Junction K:	2 C 0.013 0.5	85 0 Dist. (ft) Cum Reach	HGL Starting bsolute Inte Des  Actual Velocity	g Elev. (ft): ensity (in/hr) ign Storm: b = d = e =  Junction Loss	0.00 2 48.35 9.07 0.7244 Junction Loss	Charin HG (ft)

\*(Q) flow from ponds provided by HDR, inc., report titled "Tomball ISD Tract on Juergen Road and Mueschke Road Drainage Impact Analysis"



\* (Q) flow from ponds provided by HDR,Inc., report titled "Tomball ISD Tract on Juergen Road and Mueschke Road Drainage Impact Analysis"



#### **FLOODPLAIN INFORMATION:**

ACCORDING TO F.I.R.M. MAP NO. 48201C0215L (COMMUNITY-PANEL NO. 4802870215L), MAP REVISED DATE: JUNE 18, 2007. THE SUBJECT PROPERTY LIES WITHIN THE AREAS DESIGNATED AS ZONE "X" UNSHADED. DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD. ZONE X SHADED. AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD. ZONE AE. BASE FLOOD ELEVATIONS DETERMINED. AND FLOODWAY. THE FLOODWAY IS THE CHANNEL OF A STREAM PLUS ANY ADJACENT FLOODPLAIN AREAS THAT MUST BE KEPT FREE OF ENCROACHMENT SO THAT THE 1% ANNUAL CHANCE FLOOD CAN BE CARRIED WITHOUT SUBSTANTIAL INCREASES IN FLOOD HEIGHTS.

#### REFERENCE BENCHMARK:

RM111050 - ALUMINUM ROD WITH LOGO CAP STAMPED "111050" LOCATED ON THE NORTH SIDE OF BAUER-HOCKLEY ROAD ±75' EAST OF ITS INTERSECTION WITH ANGELI DRIVE AND ±120' WEST OF A POWER POLE IN KEY MAP 326B IN THE CYPRESS CREEK WATERSHED. ELEVATION = 176.30' (NAVD 88, 2001 ADJ.)

#### TEMPORARY BENCHMARKS:

TBM "A" - BOX CUT ON "BB" INLET LOCATED ON THE EAST SIDE OF MUESCHKE ROAD ±50' SOUTH OF THE MOST NORTHERLY SOUTHWEST CORNER OF THE SUBJECT TRACT. ELEVATION = 169.64

NOTE: THE LOCATIONS OF THE PRIVATE UTILITY LINES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. HE ALSO ACCEPTS FULL RESPONSIBILITY FOR ANY AND ALL DAMAGES INCURRED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UTILITIES.

NOTICE: FOR YOUR SAFETY, YOU ARE REQUIRED BY TEXAS LAW TO CALL 811 AT LEAST 48 HOURS BEFORE

VERIFICATION OF PRIVATE UTILITY LINES

OBLIGATION TO CALL 811.

enterPoint Energy/Natural Gas Facilities Verification ONLY. (This Signature verifies that you have shown CNP Natural Gas lines correctly. Not to be used for conflict verification.] (Gas service lines are not shown. Signature Valid for six months.

nderground facilities. Not to be used for conflict verification.) Signature Valid for six months.

APPROVED FOR AT&T TEXAS/SWBT UNDERGROUND CONDUIT FACILITIES ONLY, ignature valid for one year.



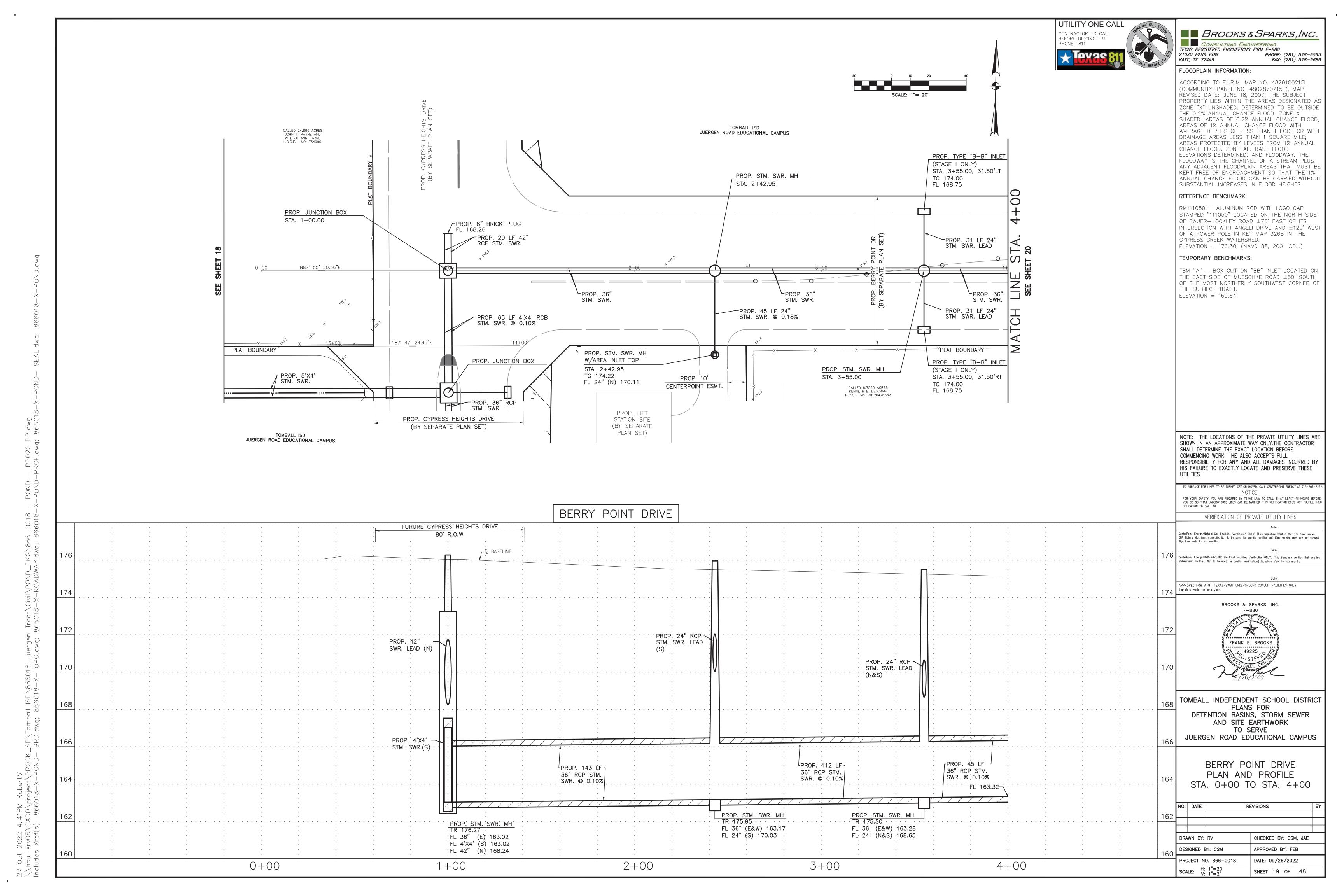
TOMBALL INDEPENDENT SCHOOL DISTRICT PLANS FOR DETENTION BASINS, STORM SEWER AND SITE EARTHWORK TO SERVE JUERGEN ROAD EDUCATIONAL CAMPUS

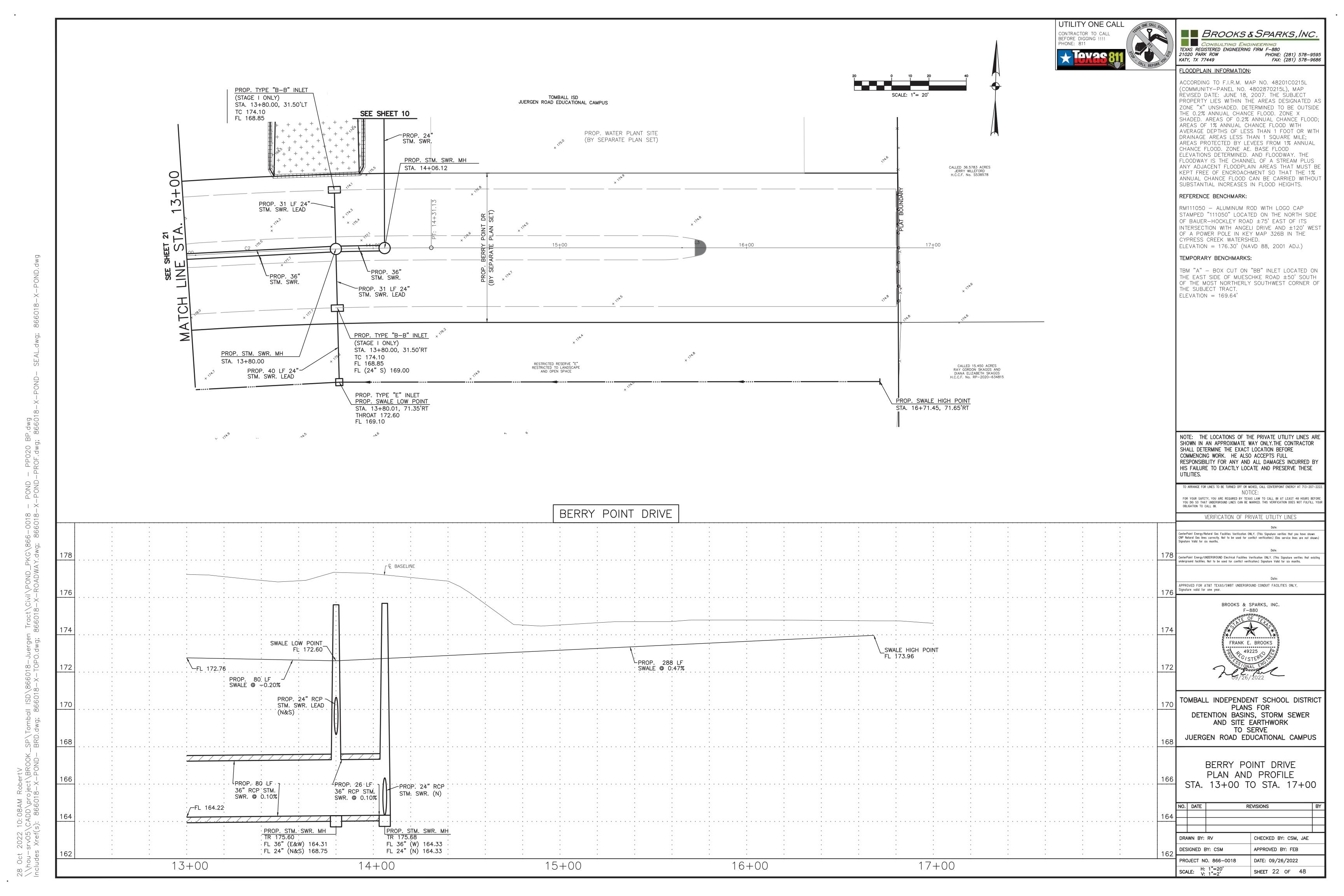
### DRAINAGE CALCULATIONS

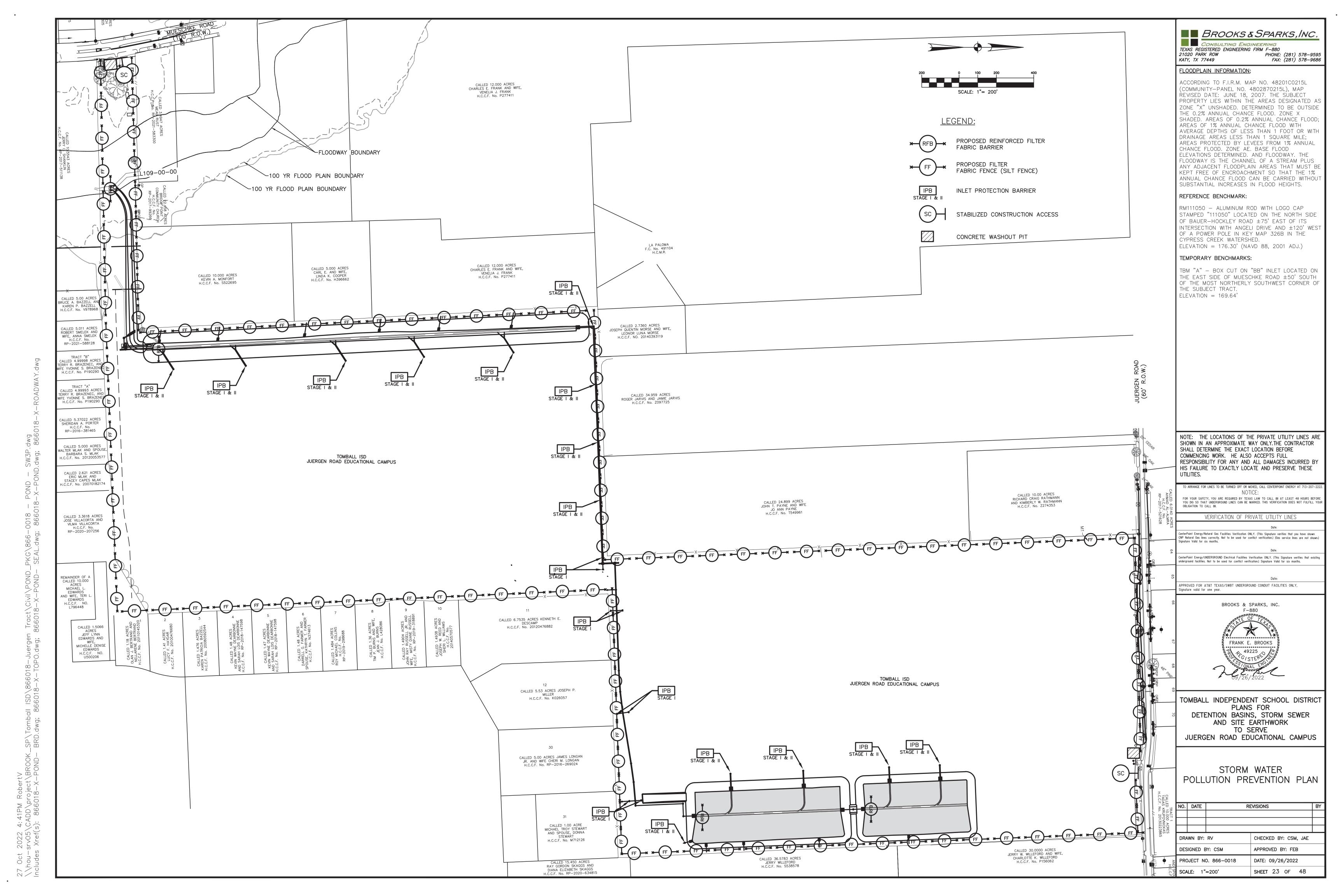
NO.	DATE	REVISIONS							
DRA	WN BY:	RV	CHECKED BY: CSM, JAE						
DESIGNED BY: CSM PROJECT NO. 866-0018			APPROVED BY: FEB  DATE: 09/26/2022						

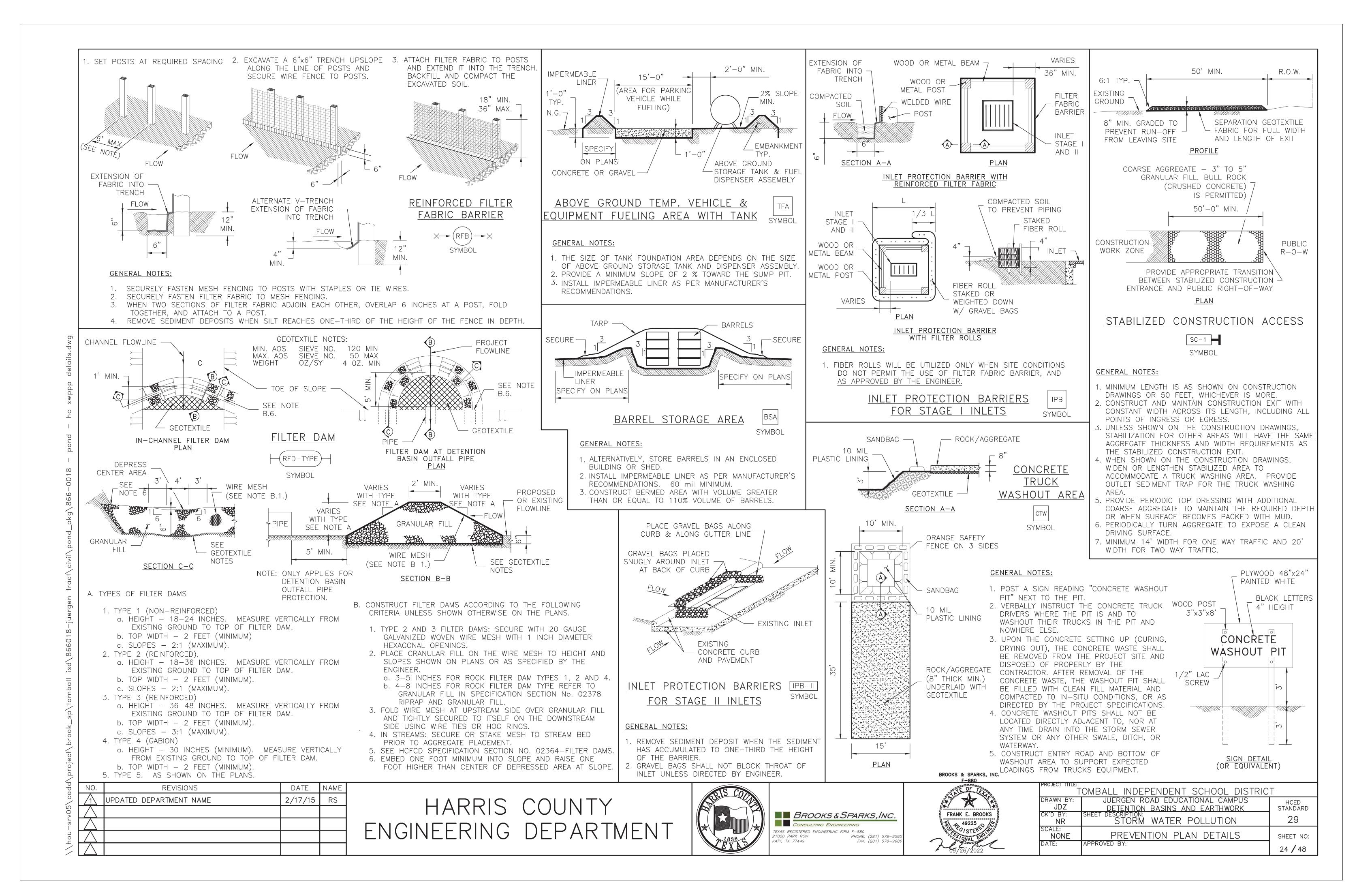
SHEET 15 OF 48

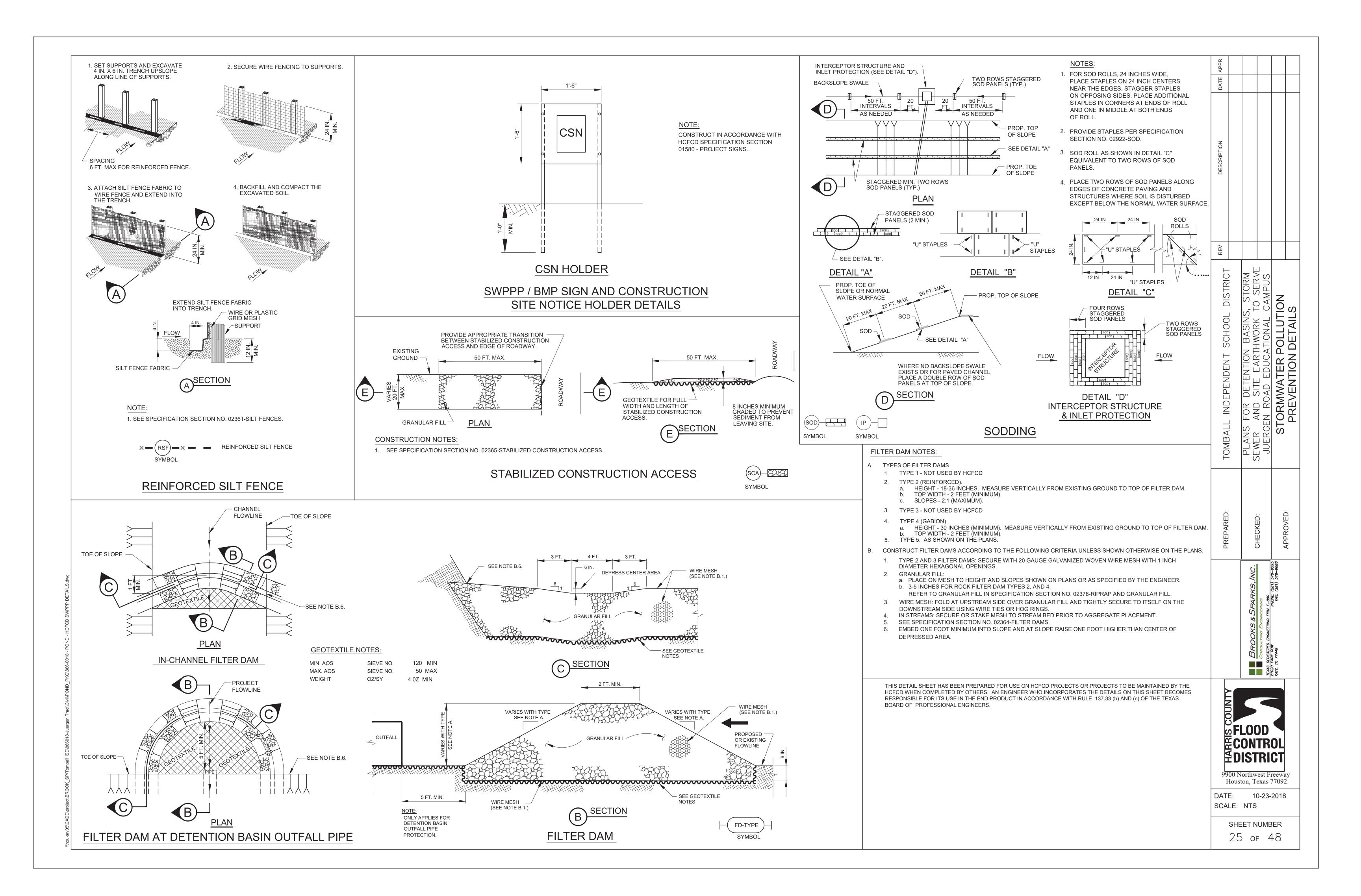
SCALE: 1"=200'

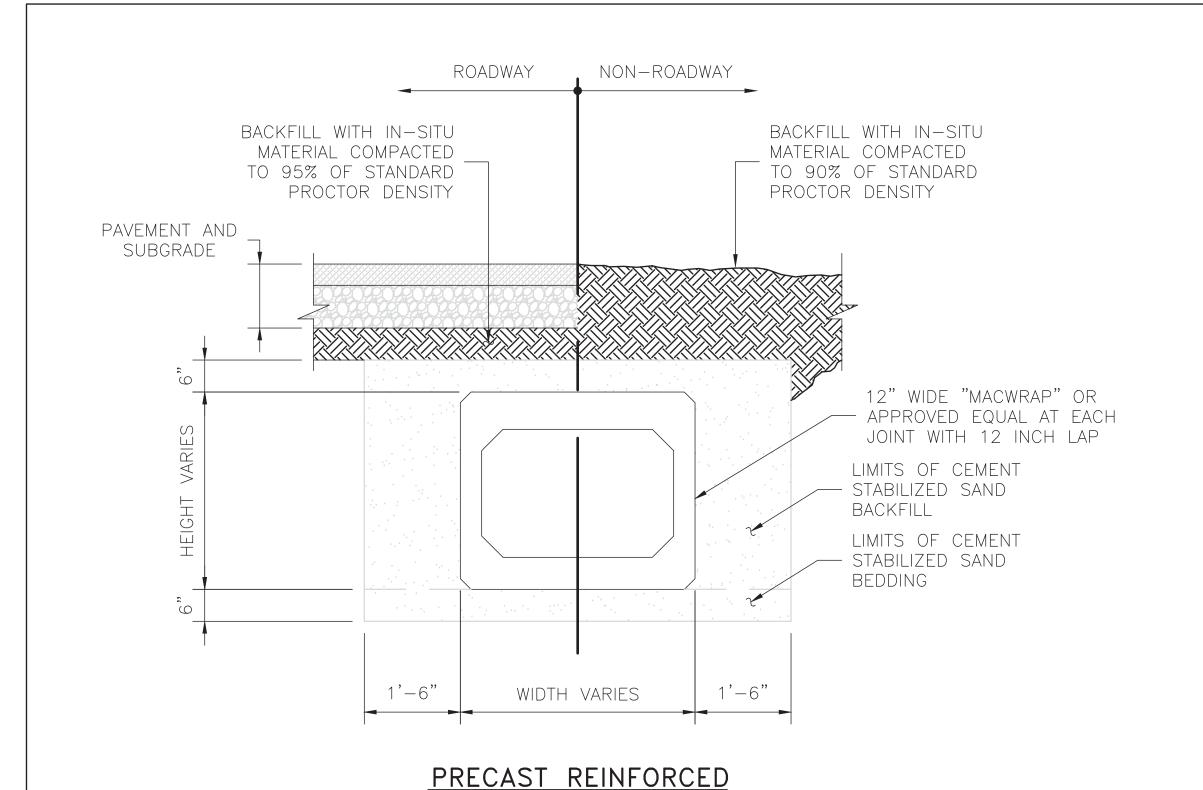




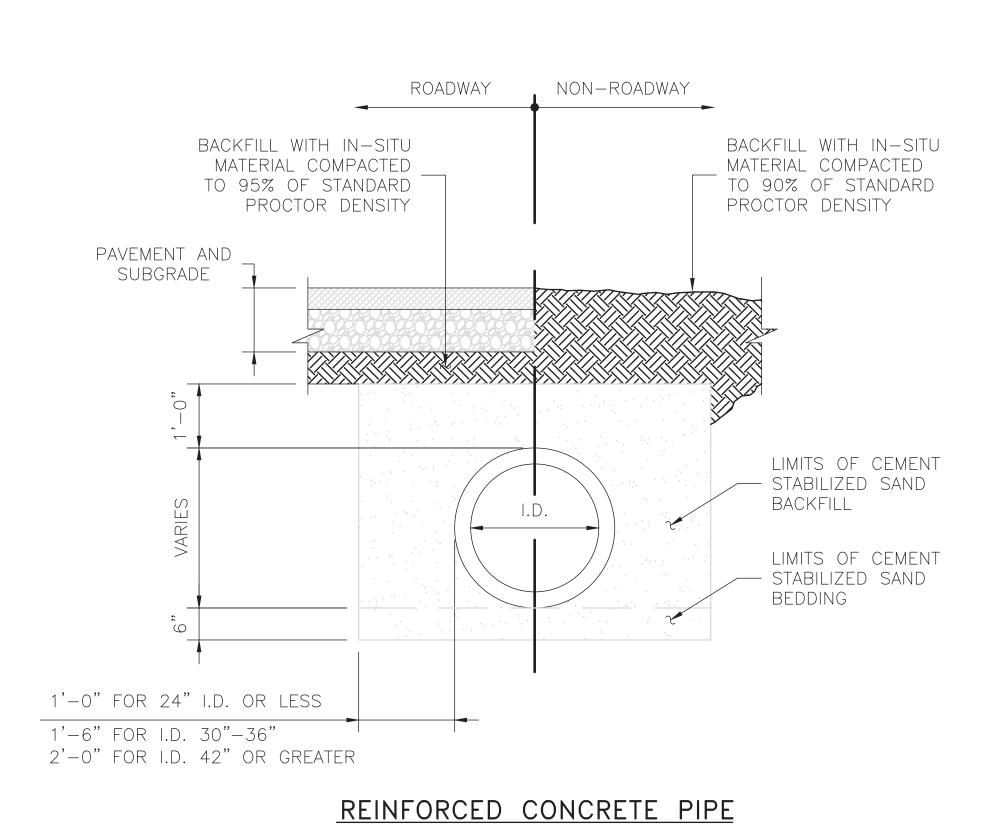


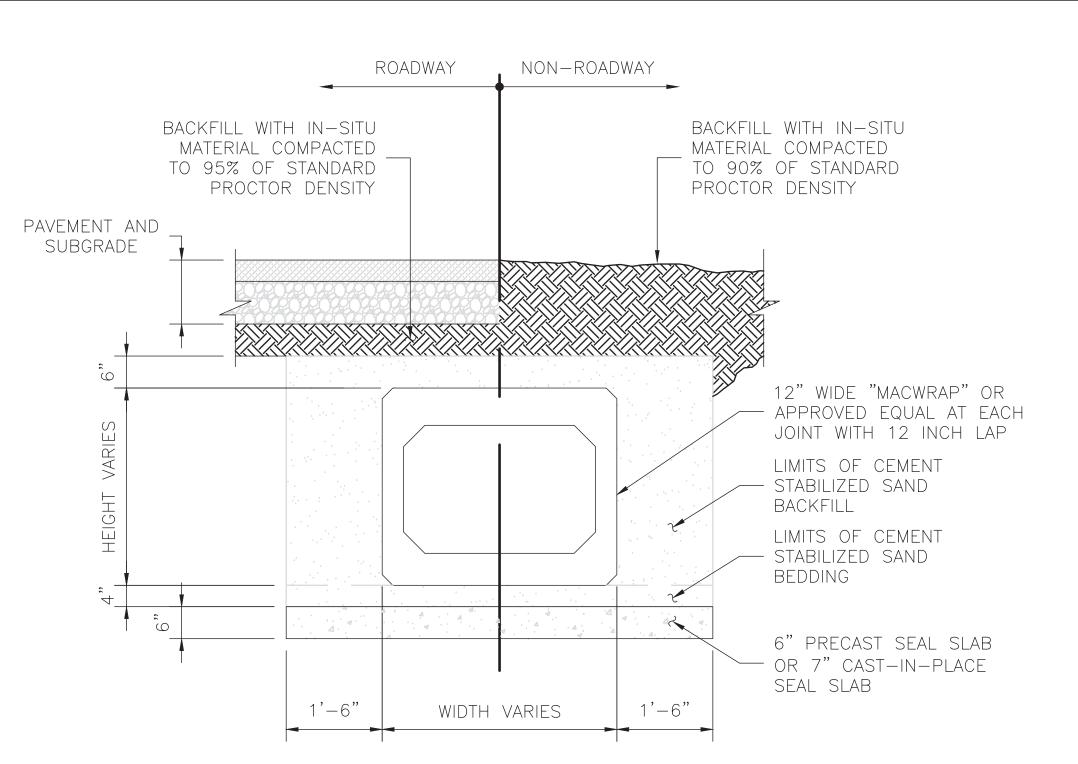




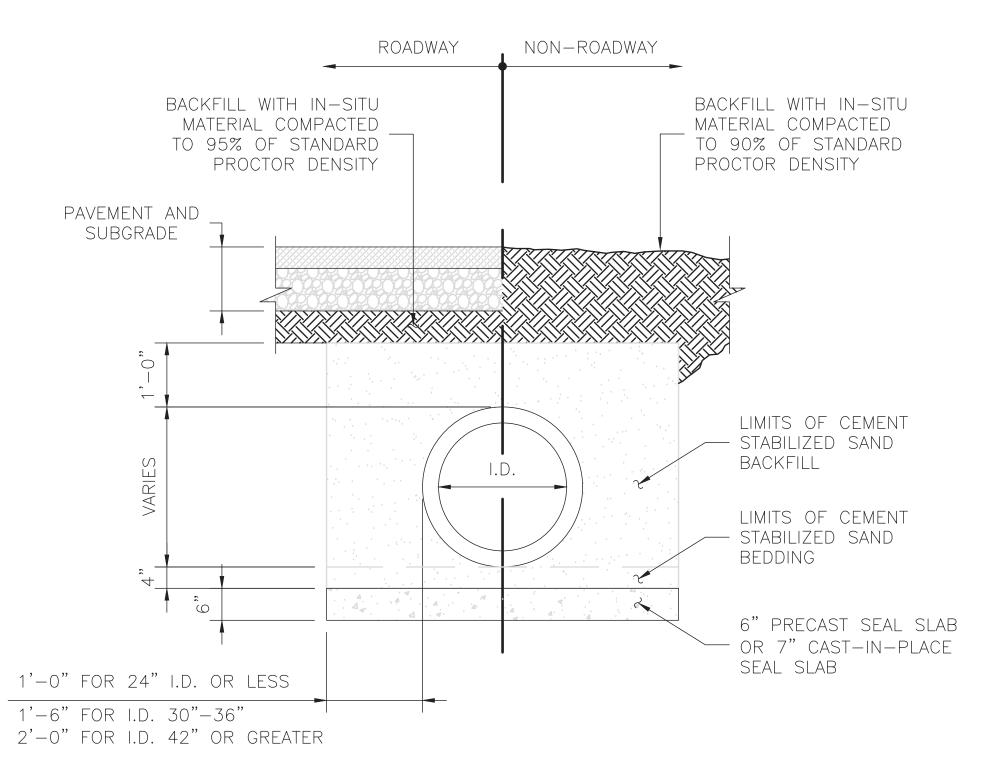


**CONCRETE BOX** 

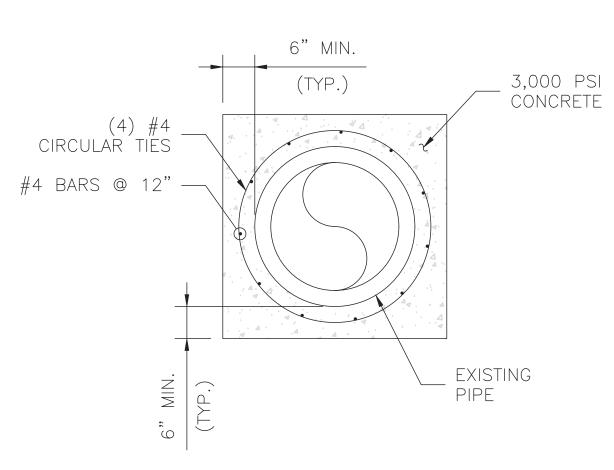




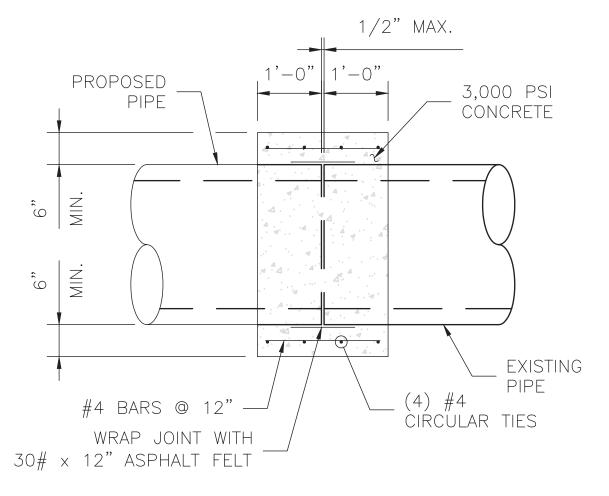
# PRECAST REINFORCED CONCRETE BOX WITH SEAL SLAB



REINFORCED CONCRETE PIPE WITH SEAL SLAB



SECTION VIEW



**ELEVATION VIEW** 

TYPICAL CONCRETE COLLAR FOR 36" & SMALLER RCP

# **GENERAL NOTES:**

1. FOR RCP LARGER THAN 36" DIAMETER, CONCRETE COLLARS MUST BE DESIGNED BY THE ENGINEER OF RECORD.

NO.	REVISIONS	DATE	NAME
$\triangle$	UPDATED DEPARTMENT NAME	03/25/15	RS

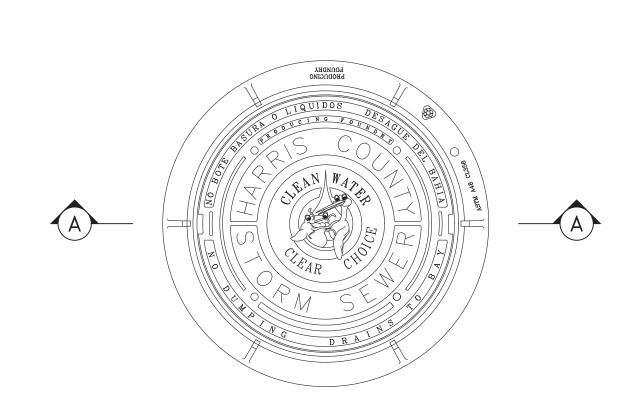
HARRIS COUNTY ENGINEERING DEPARTMENT



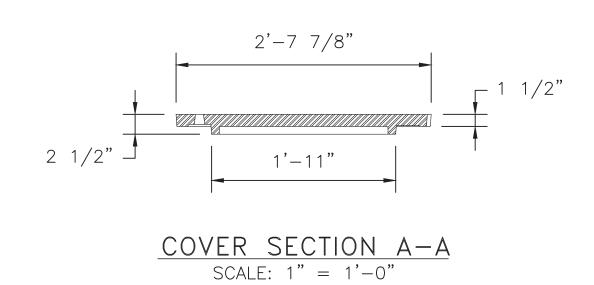


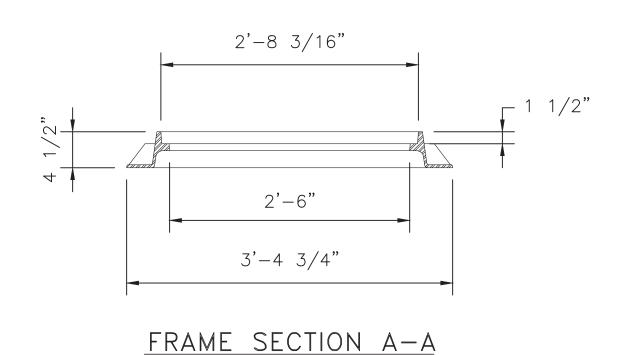
BROOKS & SPARKS, INC.
F-880
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<del>69/26/2022</del>
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PROJECT TITL	<sup>E:</sup> TOMBALL INDEPENDENT SCHOOL DISTF	RICT
DRAWN BY: JDZ	DETENTION BASINS, STORM SEWER AND SITE EARTHWORK TO SERVE JUERGEN ROAD EDUCATIONAL CAMPUS	HCPID, A&E STANDARD
CK'D BY: PDG	SHEET DESCRIPTION: STORM SEWER CONSTRUCTION	11
SCALE: 1"=1'-6"	DETAILS	SHEET NO:
DATE: <b>5/21/13</b>	APPROVED BY:	26 /48

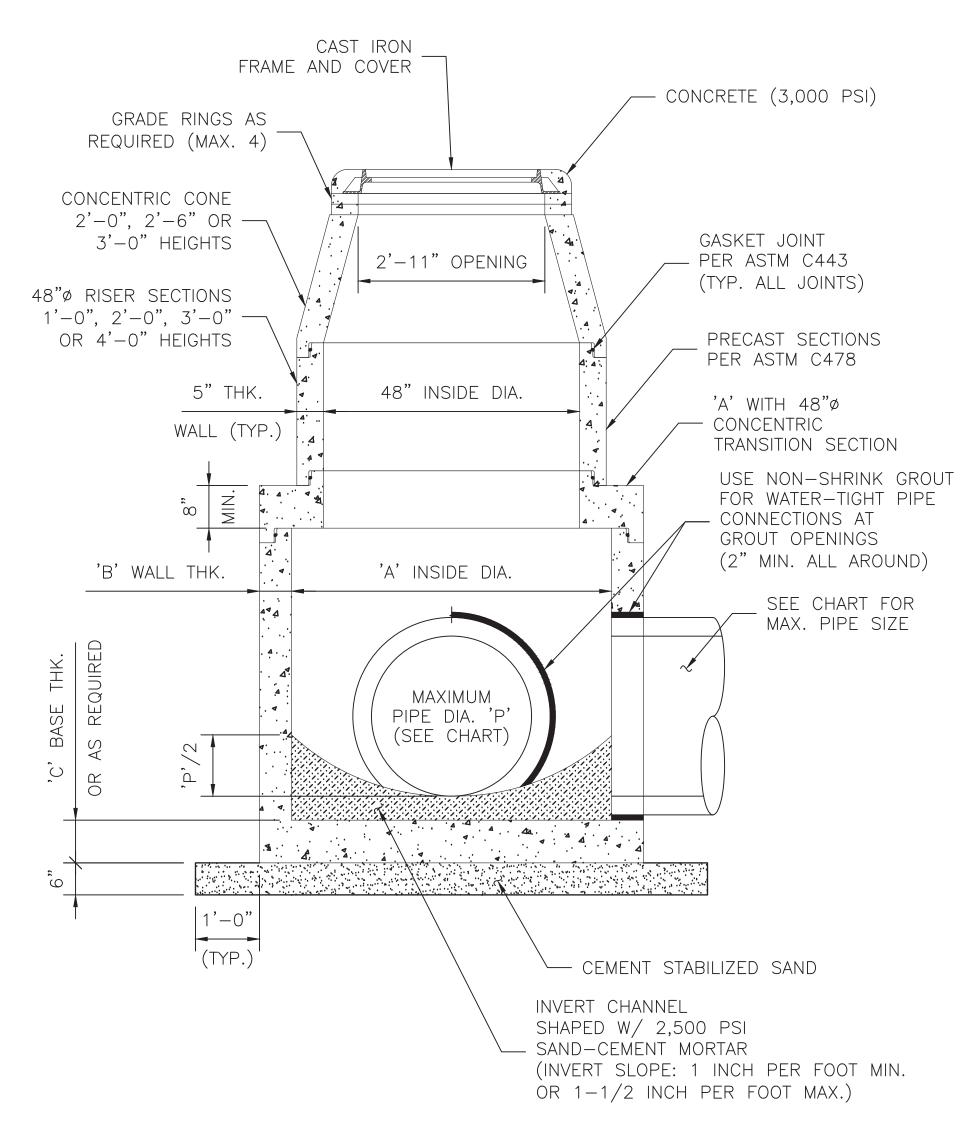


PLAN VIEW FRAME AND COVER SCALE: 1" = 1'-0"



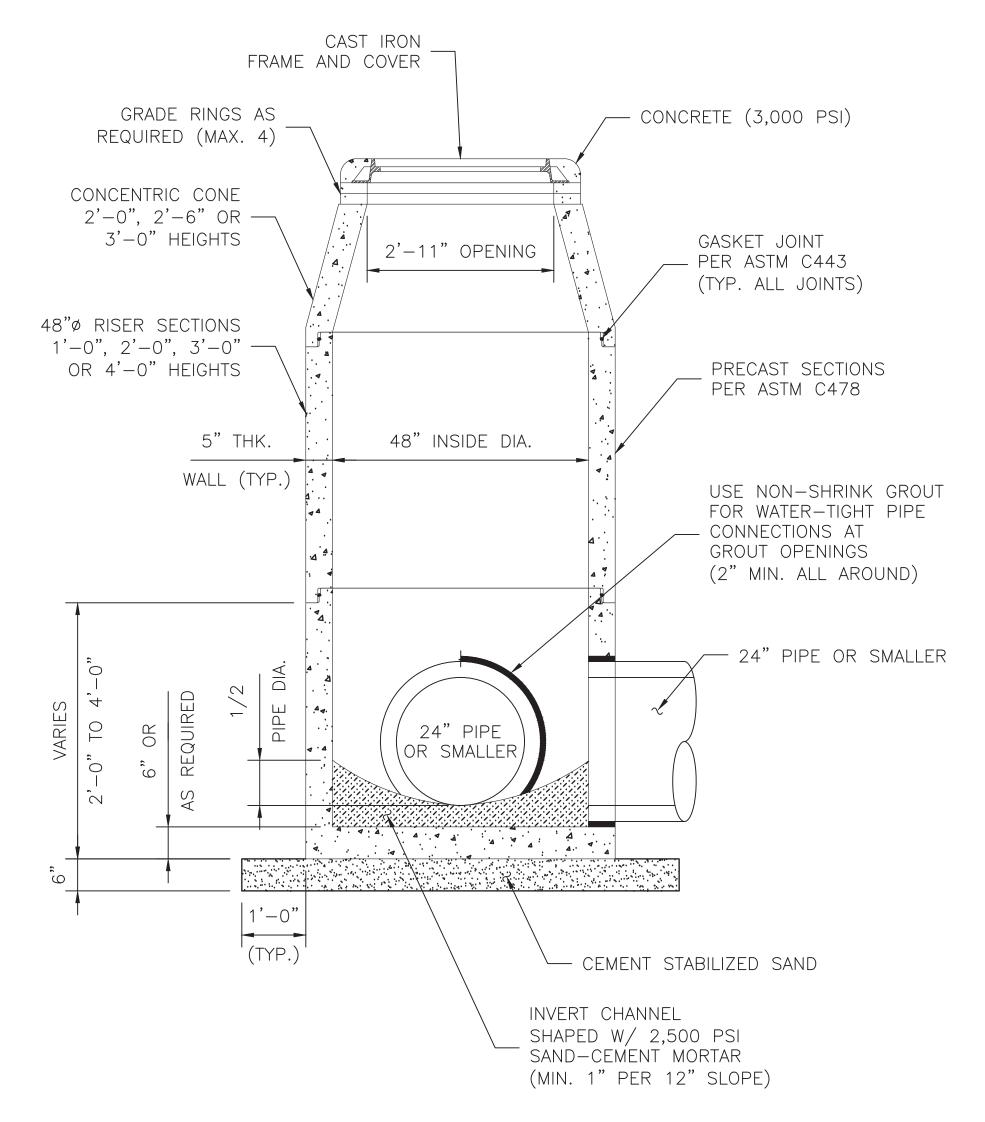


SCALE: 1" = 1'-0"



PRECAST CONCENTRIC MANHOLE FOR PIPE SIZES GREATER THAN 24" SCALE: 1" = 1'-6"

MAXIMUM PIPE DIA. 'P'	INSIDE DIA. 'A'	MIN. WALL THICKNESS 'B'	MIN. BASE THICKNESS 'C'
30"	60"	6"	8"
42"	72"	7"	8"
54"	84"	8"	10"
60"	96"	9"	10"



48"Ø PRECAST CONCENTRIC MANHOLE FOR PIPE SIZES 24" OR SMALLER SCALE: 1" = 1'-6"

# **GENERAL NOTES:**

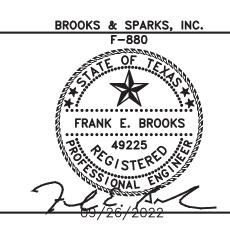
- 1. CONSTRUCTION AND MATERIALS SHALL MEET REQUIREMENTS OF ITEM 471 "PRECAST CONCRETE MANHOLES".
- 2. CONCRETE FOR MANHOLE: MINIMUM 4,000 PSI IN 28 DAYS 3. HL-93 LOADING; MANHOLE DESIGN SHALL MEET OR EXCEED
- - ASTM C478 REQUIREMENTS.
- 4. GASKET JOINT: PER ASTM C443
- 5. FRAME AND COVER SHALL BE EAST JORDAN IRON WORKS
- MODEL V-1420 OR APPROVED EQUAL. 6. SHOP DRAWINGS WITH MANUFACTURER'S CERTIFICATION SHALL BE SUBMITTED FOR ENGINEER'S APPROVAL.

A D L	NO.	REVISIONS	DATE	NAME	
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# HARRIS COUNTY ENGINEERING DEPARTMENT

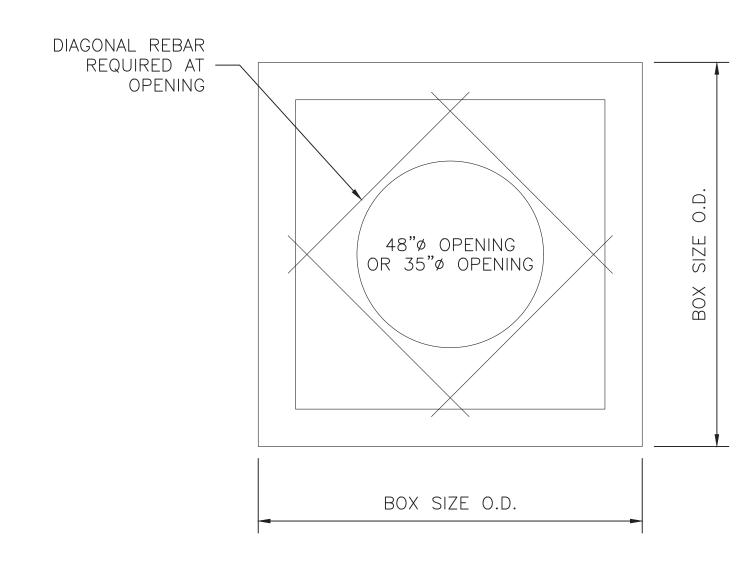




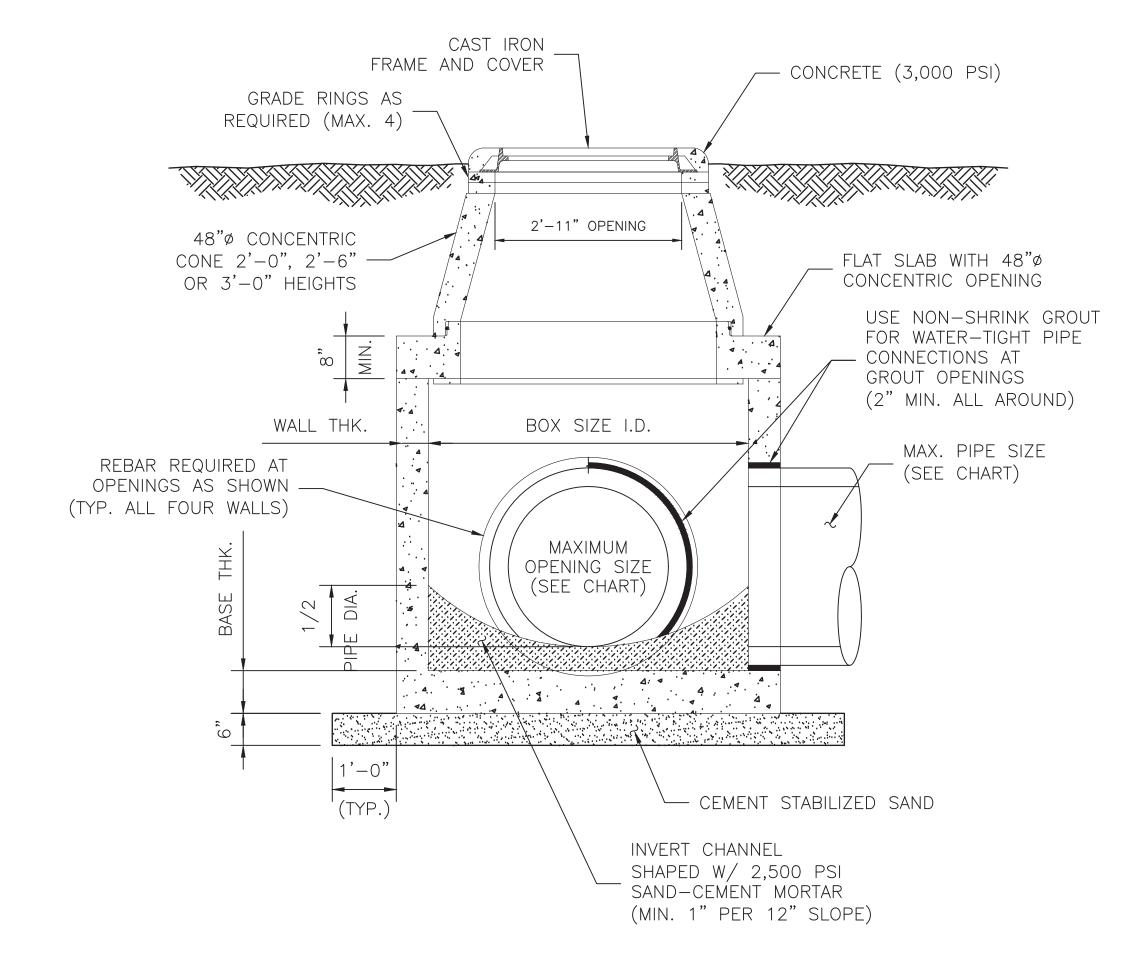


PROJECT TITLE: TOMBALL INDEPENDENT SCHOOL DISTRICT												
	DETENTION BASINS, STORM SEWER AND SITE EARTHWORK TO SERVE JUERGEN ROAD EDUCATIONAL CAMPUS	CIVIL STANDARD										
0	RECAST CONCRETE STORM SEWER	РМН										
DRAWN BY: JDZ	MANHOLE DETAILS	DATE: <b>8/15/17</b>										
CK'D BY: PDG	SCALE: AS NOTED	SHEET NO: 27 /48										

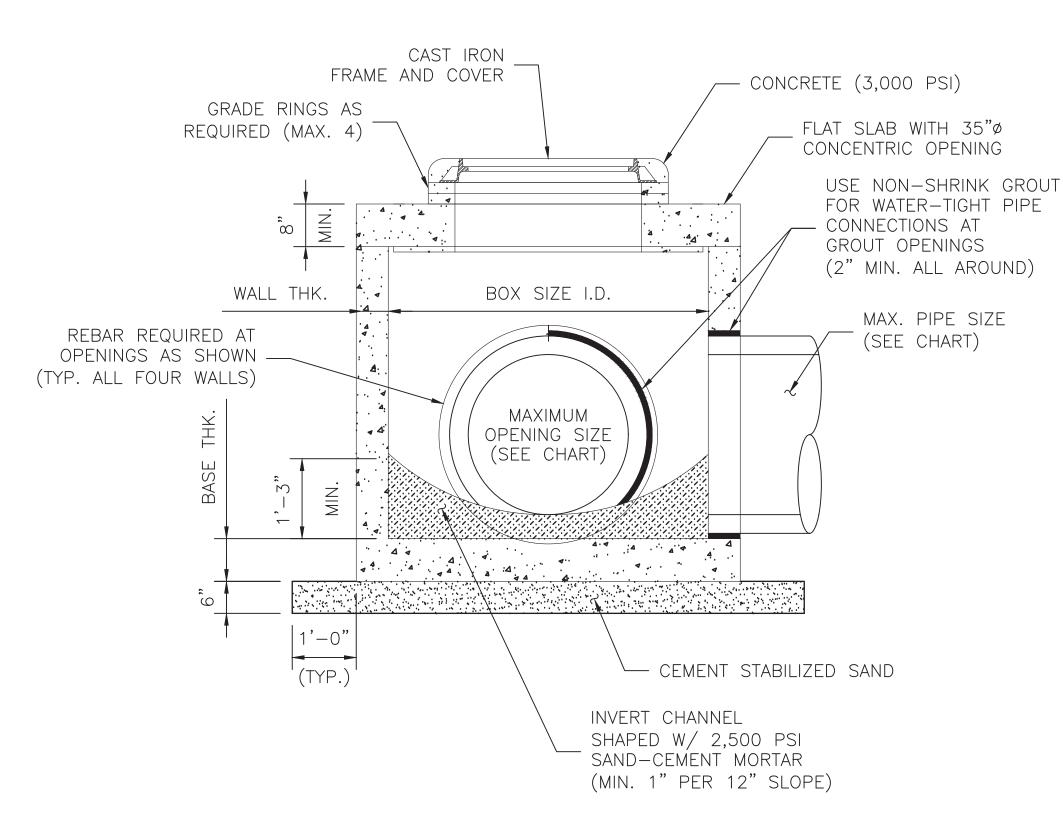




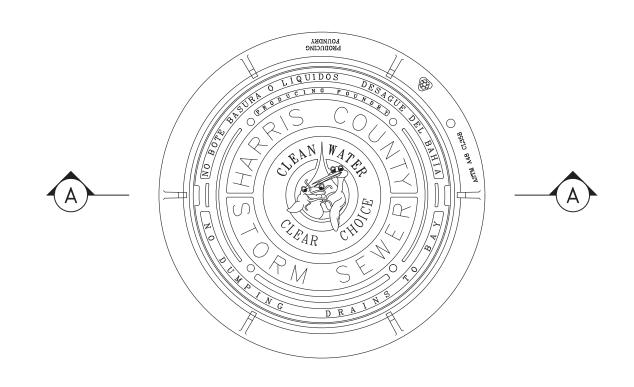
PLAN VIEW FLAT SLAB WITH OPENING SCALE: 1"=1'-6"



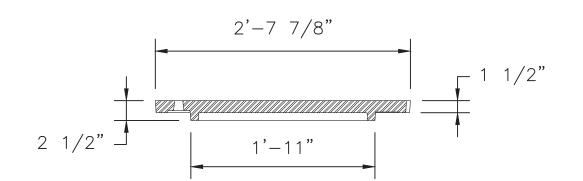
JUNCTION BOX/MANHOLE WITH CONCENTRIC CONE SCALE: 1"=1'-6"



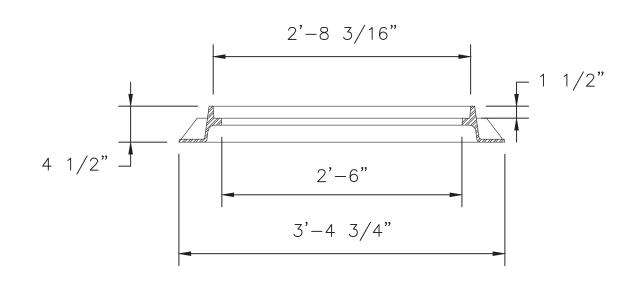
JUNCTION BOX/MANHOLE WITH FLAT SLAB
SCALE: 1"=1'-6"



PLAN VIEW FRAME AND COVER SCALE: 1"=1'-0"



COVER SECTION A-A SCALE: 1"=1'-0"



FRAME SECTION A-A

SCALE: 1"=1'-0"

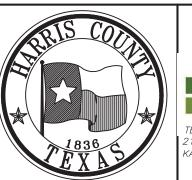
# **GENERAL NOTES:**

- 1. CONSTRUCTION AND MATERIALS SHALL MEET REQUIREMENTS OF ITEM 471 "PRECAST CONCRETE MANHOLES AND JUNCTION BOXES".
- 2. CONCRETE FOR JUNCTION BOX: MINIMUM 4,000 PSI IN 28 DAYS 3. HL-93 LOADING; MANHOLE DESIGN SHALL MEET OR EXCEED
- ASTM C478 AND ASTM C913 REQUIREMENTS.

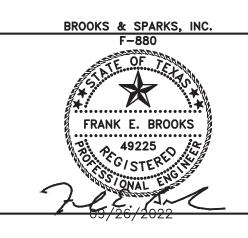
  4. JOINT SEALANT: RAM—NEK GASKET MATERIAL
- 5. FRAME AND COVER SHALL BE EAST JORDAN IRON WORKS
- MODEL V-1420 OR APPROVED EQUAL.
  6. SHOP DRAWINGS WITH MANUFACTURER'S CERTIFICATION SHALL BE SUBMITTED FOR ENGINEER'S APPROVAL.

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ADE	NO.	REVISIONS	DATE	NAME	
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HARRIS COUNTY ENGINEERING DEPARTMENT

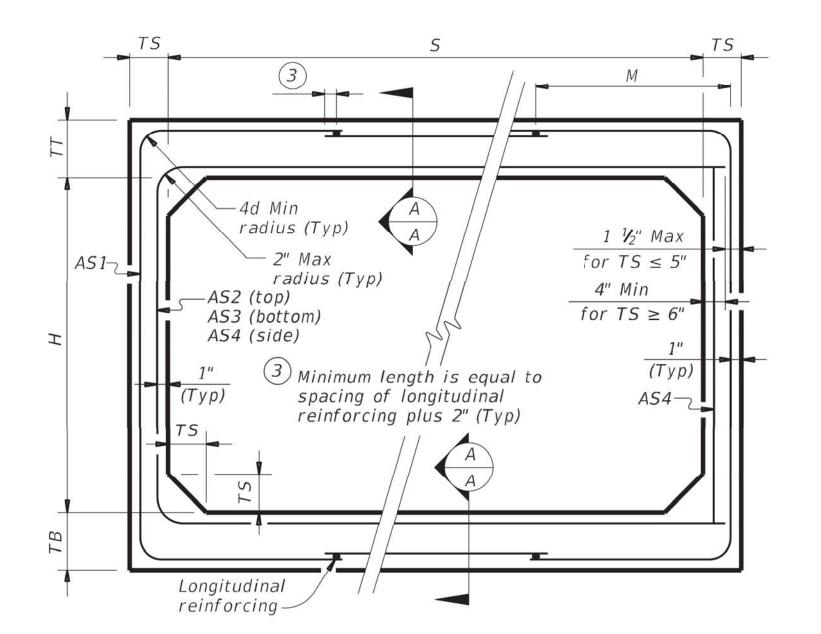






PROJECT TITE	ETOMBALL INDEPENDENT SCHOOL DISTR	RICT
	DETENTION BASINS, STORM SEWER AND SITE EARTHWORK TO SERVE JUERGEN ROAD EDUCATIONAL CAMPUS	CIVIL STANDARD
	ECAST CONCRETE JUNCTION BOX	PJBM
DRAWN BY: JDZ	MANHOLE DETAILS	DATE: <b>8/14/17</b>
CK'D BY: PDG	SCALE: AS NOTED	SHEET NO: 28 /48

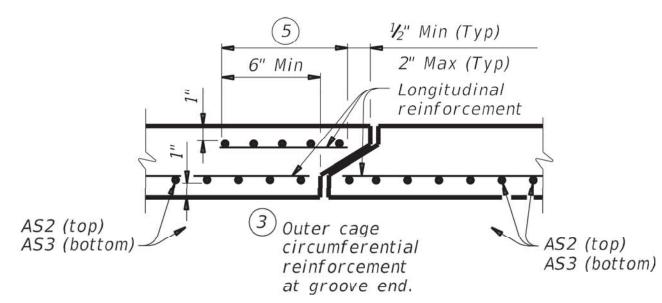
		ï						В0	X DA	TA						
			SECT10	N DIME	NSIONS				REINFORCING (sq. in. / ft.)							
4 2 5 5 5 5 3 -5 38 0.18 0.19 0.17 0.12 3.6 4 2 5 5 5 5 5 10 38 0.13 0.13 0.13 0.12 3.6 4 2 5 5 5 5 5 10 38 0.14 0.16 0.16 0.12 3.6 4 2 5 5 5 5 5 20 38 0.18 0.20 0.21 0.12 3.6 4 2 5 5 5 5 5 30 38 0.23 0.25 0.25 0.12 3.6 4 2 5 5 5 5 5 30 38 0.28 0.30 0.30 0.12 3.6 4 2 5 5 5 5 5 20 38 0.23 0.25 0.25 0.12 4.1 4 3 5 5 5 5 10 38 0.12 0.18 0.10 0.12 4.1 4 3 5 5 5 5 20 38 0.12 0.16 0.16 0.12 4.1 4 3 5 5 5 5 20 38 0.12 0.16 0.16 0.12 4.1 4 3 5 5 5 5 20 38 0.12 0.16 0.16 0.16 0.12 4.1 4 3 5 5 5 5 20 38 0.12 0.14 0.14 0.12 4.1 4 3 5 5 5 5 20 38 0.12 0.18 0.18 0.12 4.1 4 3 5 5 5 5 10 38 0.12 0.18 0.18 0.12 4.1 4 3 5 5 5 5 10 38 0.12 0.18 0.18 0.12 4.1 4 3 5 5 5 5 20 38 0.12 0.18 0.18 0.12 4.1 4 3 5 5 5 5 10 38 0.12 0.18 0.18 0.12 4.1 4 3 5 5 5 5 20 38 0.12 0.14 0.14 0.12 4.1 4 3 5 5 5 5 20 38 0.12 0.18 0.18 0.12 4.1 4 3 5 5 5 5 20 38 0.12 0.18 0.18 0.12 4.1 4 4 5 5 5 5 5 20 38 0.12 0.18 0.18 0.12 4.6 4 4 5 5 5 5 5 30 38 0.12 0.18 0.18 0.12 4.6 4 4 5 5 5 5 5 10 38 0.12 0.19 0.20 0.12 4.6 4 4 5 5 5 5 5 20 38 0.12 0.19 0.20 0.12 4.6 4 4 5 5 5 5 5 20 38 0.12 0.19 0.20 0.12 4.6 4 4 5 5 5 5 5 20 38 0.12 0.19 0.20 0.12 4.6 4 4 5 5 5 5 5 20 38 0.12 0.19 0.20 0.12 4.6 4 4 5 5 5 5 5 20 38 0.12 0.19 0.20 0.12 4.6 4 4 5 5 5 5 5 20 38 0.12 0.19 0.20 0.12 4.6 4 4 5 5 5 5 5 20 38 0.12 0.19 0.20 0.12 4.6 4 4 5 5 5 5 5 20 38 0.12 0.19 0.20 0.12 4.6 4 4 5 5 5 5 5 20 38 0.12 0.19 0.20 0.12 4.6 4 4 5 5 5 5 5 20 38 0.12 0.19 0.20 0.12 4.6 4 4 5 5 5 5 5 20 38 0.12 0.19 0.20 0.12 4.6 4 4 5 5 5 5 5 20 38 0.12 0.19 0.20 0.12 4.6 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5			100000	50 (2)	Section 20	A MANAGE THE	5000 - 50		AS1	AS2	AS3	A54	AS5	AS7	AS8	Weight (tons)
98 97 189 189 189 189 189 189 189 189 189 189		4	2	7.5	6	5	< 2	10	0.18	0.27	0.15	0.12	0.18	0.18	0.14	4.5
4		4	2	5	5	5	2 < 3	38	0.18	0.19	0.17	0.12	=	=	-	3.6
98 1		4	2	5	5	5	3 - 5	38	0.13	0.13	0.13	0.12	-	=	-	3.6
4		4	2	5	5	5	10	38	0.12	0.12	0.12	0.12	=	-	=:	3.6
4       2       5       5       5       25       38       0.23       0.25       0.25       0.12       -       -       -       3.6         4       2       5       5       5       5       30       38       0.28       0.30       0.30       0.12       -       -       -       3.6         4       3       7.5       6       5       <2		4	2	5	5	5	15	38	0.14	0.16	0.16	0.12	_	-	-	3.6
89 5 1	ı	4	2	5	5	5	20	38	0.18	0.20	0.21	0.12		_	7-1	3.6
TO STORY A STATE OF THE PARTY O		4	2	5	5	5	25	38	0.23	0.25	0.25	0.12	-	-	1	3.6
TO STORY A STATE OF THE PARTY O	se.	4	2	5	5	5	30	38	0.28	0.30	0.30	0.12	1	-		3.6
TO STORY A STATE OF THE PARTY O	ts u			re d												
20 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	i m	4	3	7.5	6	5	< 2	:: <b>-</b> :	0.18	0.31	0.18	0.12	0.18	0.18	0.14	5.0
4       3       5       5       5       20       38       0.14       0.23       0.24       0.12       -       -       -       4.1         4       3       5       5       5       5       25       38       0.17       0.29       0.29       0.12       -       -       -       4.1         4       3       5       5       5       5       30       38       0.21       0.35       0.35       0.12       -       -       -       4.1         4       4       7.5       6       5       <2		4	3	5	5	5	2 < 3	38	0.15	0.23	0.20	0.12	-	-	-	4.1
4       3       5       5       5       20       38       0.14       0.23       0.24       0.12       -       -       -       4.1         4       3       5       5       5       5       25       38       0.17       0.29       0.29       0.12       -       -       -       4.1         4       3       5       5       5       5       30       38       0.21       0.35       0.35       0.12       -       -       -       4.1         4       4       7.5       6       5       <2	ting	4	3	5	5	5	3 - 5	38	0.12	0.16	0.16	0.12	1	-	-	4.1
1       3       5       5       5       20       38       0.14       0.23       0.24       0.12       -       -       -       4.1         4       3       5       5       5       5       25       38       0.17       0.29       0.29       0.12       -       -       -       4.1         4       3       5       5       5       5       30       38       0.21       0.35       0.35       0.12       -       -       -       4.1         4       4       7.5       6       5       <2	insa	4	3	5	5	5	10	38	0.12	0.14	0.14	0.12	-	-	-	4.1
1	10	4	3	5	5	5	15	38	0.12	0.18	0.18	0.12		-	-	4.1
1	nage	4	3	5	5	5	20	38	0.14	0.23	0.24	0.12	1	2	_	4.1
1	dan	4	3	5	5	5	25	38	0.17	0.29	0.29	0.12	=	15 <u>—</u> 11	( <u>—</u> )	4.1
4     4     5     5     5     2     3     38     0.12     0.26     0.23     0.12     -     -     -     -     4.66       4     4     5     5     5     5     38     0.12     0.18     0.18     0.12     -     -     -     -     4.66       4     4     5     5     5     10     38     0.12     0.15     0.15     0.12     -     -     -     -     4.66       4     4     5     5     5     15     38     0.12     0.19     0.20     0.12     -     -     -     -     4.66       4     4     5     5     5     20     38     0.12     0.25     0.25     0.12     -     -     -     -     4.66       4     4     5     5     5     25     38     0.14     0.31     0.31     0.12     -     -     -     -     4.66       4     4     5     5     5     30     38     0.17     0.37     0.37     0.12     -     -     -     -     -     -     -     -     -     -     -     -     -     -	or	4	3	5	5	5	30	38	0.21	0.35	0.35	0.12	1	<u> </u>	: <b>-</b> :	4.1
4     4     5     5     5     2     3     38     0.12     0.26     0.23     0.12     -     -     -     -     4.66       4     4     5     5     5     5     38     0.12     0.18     0.18     0.12     -     -     -     -     4.66       4     4     5     5     5     10     38     0.12     0.15     0.15     0.12     -     -     -     -     4.66       4     4     5     5     5     15     38     0.12     0.19     0.20     0.12     -     -     -     -     4.66       4     4     5     5     5     20     38     0.12     0.25     0.25     0.12     -     -     -     -     4.66       4     4     5     5     5     25     38     0.14     0.31     0.31     0.12     -     -     -     -     4.66       4     4     5     5     5     30     38     0.17     0.37     0.37     0.12     -     -     -     -     -     -     -     -     -     -     -     -     -     -	ults		9													
4     4     5     5     5     2     3     38     0.12     0.26     0.23     0.12     -     -     -     -     4.6       4     4     5     5     5     5     38     0.12     0.18     0.18     0.12     -     -     -     -     4.6       4     4     5     5     5     10     38     0.12     0.15     0.15     0.12     -     -     -     -     4.6       4     4     5     5     5     15     38     0.12     0.19     0.20     0.12     -     -     -     -     4.6       4     4     5     5     5     20     38     0.12     0.25     0.25     0.12     -     -     -     -     4.6       4     4     5     5     5     25     38     0.14     0.31     0.31     0.12     -     -     -     -     4.6       4     4     5     5     5     30     38     0.17     0.37     0.37     0.12     -     -     -     -     -     4.6	res	4	4	7.5	6	5	< 2	n—a	0.18	0.33	0.20	0.12	0.18	0.18	0.14	5.5
A     A     B <td></td> <td>4</td> <td>4</td> <td>5</td> <td>5</td> <td>5</td> <td>2 &lt; 3</td> <td>38</td> <td>0.12</td> <td>0.26</td> <td>0.23</td> <td>0.12</td> <td>-</td> <td>-</td> <td>-</td> <td>4.6</td>		4	4	5	5	5	2 < 3	38	0.12	0.26	0.23	0.12	-	-	-	4.6
A     A     B <td>COLL</td> <td>4</td> <td>4</td> <td>5</td> <td>5</td> <td>5</td> <td>3 - 5</td> <td>38</td> <td>0.12</td> <td>0.18</td> <td>0.18</td> <td>0.12</td> <td>1</td> <td>-</td> <td>8<b>—</b>7</td> <td>4.6</td>	COLL	4	4	5	5	5	3 - 5	38	0.12	0.18	0.18	0.12	1	-	8 <b>—</b> 7	4.6
4     4     5     5     5     20     38     0.12     0.25     0.25     0.12     -     -     -     4.6       4     4     5     5     5     25     38     0.14     0.31     0.31     0.12     -     -     -     4.6       4     4     5     5     5     30     38     0.17     0.37     0.37     0.12     -     -     -     4.6	r in	4	4	5	5	5	10	38	0.12	0.15	0.15	0.12	<del></del> .	B <del></del>	-	4.6
4     4     5     5     5     25     38     0.14     0.31     0.31     0.12     -     -     -     4.6       4     4     5     5     5     30     38     0.17     0.37     0.37     0.12     -     -     -     -     4.6		4	4	5	5	5	15	38	0.12	0.19	0.20	0.12	in-	-	-	4.6
		4	4	5	5	5	20	38	0.12	0.25	0.25	0.12				4.6
	mat	4	4	5	5	5	25	38	0.14	0.31	0.31	0.12	=	-	=	4.6
ther		4	4	5	5	5	30	38	0.17	0.37	0.37	0.12	E	=	=	4.6
	her															



CORNER OPTION "A"

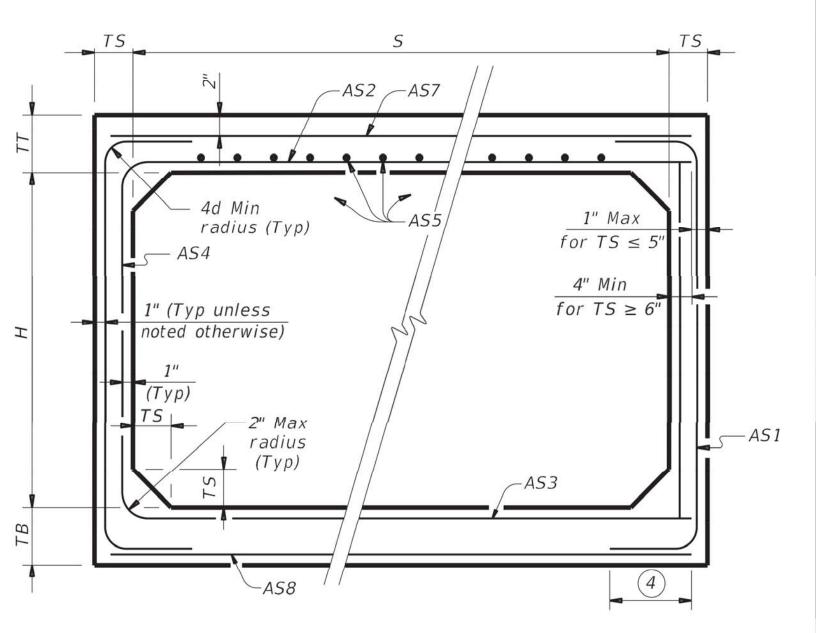
CORNER OPTION "B"

# FILL HEIGHT 2 FT AND GREATER



# SECTION A-A

(Showing top and bottom slab joint reinforcement.)



CORNER OPTION "A"

CORNER OPTION "B"

# FILL HEIGHT LESS THAN 2 FT

4 Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ)

## MATERIAL NOTES:

Provide 0.03 sq. in./ft. minimum longitudinal reinforcement at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.

Provide Class H concrete (f'c = 5,000 psi).

### GENERAL NOTES:

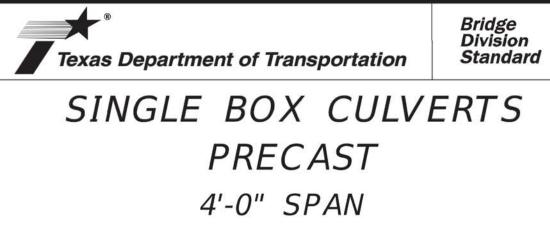
BROOKS & SPARKS, INC.

Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.

See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.

In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)".

# HL93 LOADING



SCP-4

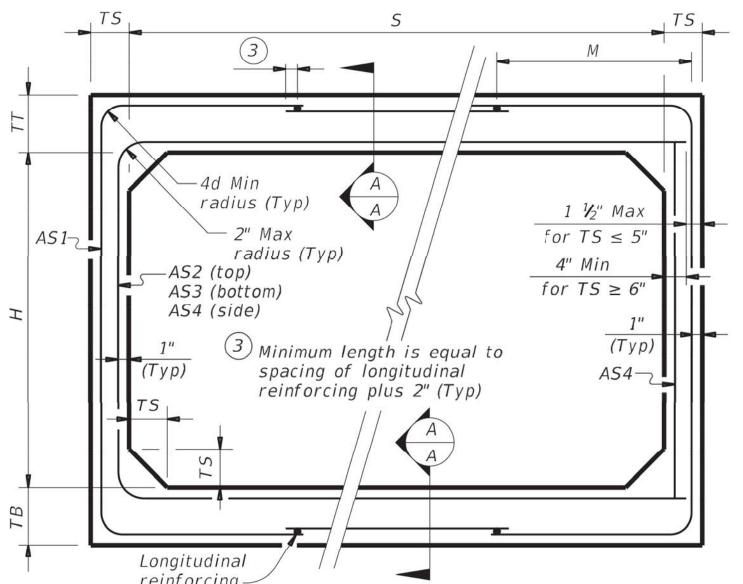
FILE: scp04sts-20.dgn		DN: TxD	ОТ	ск: TxD0T	DW: T)	(D0T		ск: Т	xD0T
©TxD0T	February 2020	CONT	SECT	JOB			HIGHWAY		
	REVISIONS								
		DIST		COUNT	Υ			SHEET	NO.
			iii				29	OF	48

1) For box length = 8'-0''

2) AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS5 is minimum required area of reinforcement per linear foot of box width.

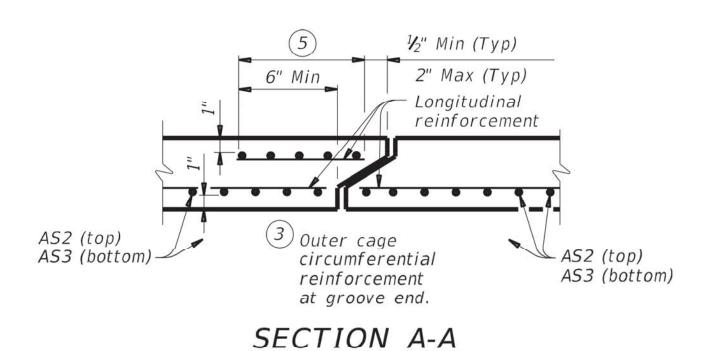
DATE: FILE:

:-		BOX DATA													
-		SECTIO	N DIME	NSIONS		Fill	М	_	RE	INFORCI	NG (sq.	in. / ft.	)(2)		1) Lift
	5 (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)	Height (ft.)	(Min) (in.)	AS1	AS2	AS3	AS4	AS5	AS7	AS8	Weight (tons)
	5	2	8	7	6	< 2	-	0.19	0.27	0.18	0.14	0.19	0.19	0.17	6.0
	5	2	6	6	6	2 < 3	44	0.22	0.20	0.16	0.14	-	= )	-	5.1
	5	2	6	6	6	3 - 5	44	0.16	0.14	0.14	0.14	-	-	=	5.1
	5	2	6	6	6	10	36	0.15	0.14	0.14	0.14	=	<b>1</b> =	(=)	5.1
sion	5	2	6	6	6	15	36	0.20	0.18	0.18	0.14		n=:	·—·	5.1
any	5	2	6	6	6	20	36	0.26	0.23	0.24	0.14		-	7 <b>—</b> 7	5.1
con	5	2	6	6	6	25	36	0.33	0.29	0.29	0.14	-	7-1	1-1	5.1
ant) the se.	5	2	6	6	6	30	36	0.39	0.34	0.35	0.14	-	1 - 1		5.1
varr for ts u												2			
No v Vity Sm i	5	3	8	7	6	< 2	::	0.19	0.31	0.21	0.14	0.19	0.19	0.17	6.6
sibil	5	3	6	6	6	2 < 3	45	0.18	0.24	0.19	0.14	-	-	-	5.7
Act pon.	5	3	6	6	6	3 - 5	36	0.14	0.17	0.16	0.14	-	-	-	5.7
tice res esul	5	3	6	6	6	10	36	0.14	0.16	0.17	0.14	=	=	=	5.7
Prac no	5	3	6	6	6	15	35	0.16	0.21	0.22	0.14	_	_	<del>122</del> 4	5.7
ng l	5	3	6	6	6	20	35	0.21	0.27	0.28	0.14	-		-	5.7
eeri assu dar	5	3	6	6	6	25	35	0.26	0.34	0.34	0.14	<u>100</u>	12	-	5.7
ngin OT 3	5	3	6	6	6	30	35	0.31	0.41	0.41	0.14	-	\—-		5.7
s E TxD sults															
exa r.	5	4	8	7	6	< 2	31-05	0.19	0.33	0.24	0.14	0.19	0.19	0.17	7.2
e "T peve rect	5	4	6	6	6	2 < 3	45	0.16	0.27	0.22	0.14	-	-	-	6.3
y th atso	5	4	6	6	6	3 - 5	45	0.14	0.19	0.18	0.14	-	1-1	s. <del>-</del> -s	6.3
ed be wh	5	4	6	6	6	10	36	0.14	0.18	0.18	0.14	-	16 <del>-1</del> 71		6.3
erne oose r fo	5	4	6	6	6	15	35	0.14	0.23	0.24	0.14	-	-	=	6.3
gov puri ts o	5	4	6	6	6	20	35	0.17	0.30	0.31	0.14	<u> </u>	<u> </u>	=	6.3
d is any rma	5	4	6	6	6	25	35	0.21	0.37	0.38	0.14	=	-	=	6.3
dare or	5	4	6	6	6	30	35	0.25	0.44	0.45	0.14	ä	=	=	6.3
use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion standard to other formats or for incorrect results or damages resulting from its use.						10 <b>2</b>		0.10	0.25	0.00	0.11	0.10	0.10	0.47	7.0
rxDi to c	5	5	8	7	6	< 2	-	0.19	0.35	0.26	0.14	0.19	0.19	0.17	7.8
by is	5	5	6	6	6	2 < 3	45	0.14	0.29	0.24	0.14	- s		-	6.9
se c ade and	5	5	6	6	6	3 - 5	45	0.14	0.21	0.20	0.14	-	-	-	6.9
s mis s st	5	5	6	6	6	10	45	0.14	0.19	0.20	0.14	-	7-2	(-)	6.9
The kind is of this	5	5	6	6	6	15	36	0.14	0.24	0.25	0.14		); <del></del> 1	2 <b>—</b> 2	6.9
kii of	5	5	6	6	6	20	35	0.15	0.31	0.32	0.14	-	( <del>-</del> )	:-:	6.9
	5	5	6	6	6	25	35	0.18	0.38	0.39	0.14	-	-	-	6.9
	5	5	6	6	6	30	35	0.21	0.46	0.47	0.14	<del></del>	, <del>-</del>	-	6.9



CORNER OPTION "B"

# FILL HEIGHT 2 FT AND GREATER



# (Showing top and bottom slab joint reinforcement.)

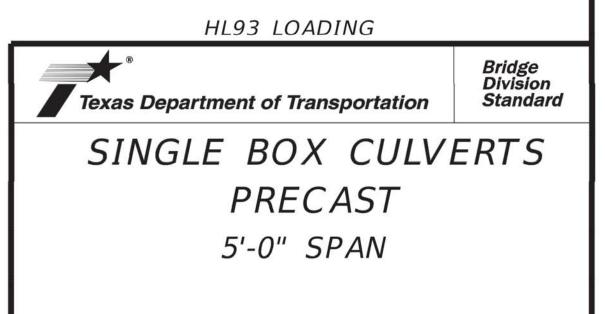
may be met by the transverse wires when wire mesh reinforcement is used.

Provide Class H concrete (f'c = 5,000 psi).

See Box Culverts Precast Miscellaneous Details (SCP-MD)

In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)".

REVISIONS

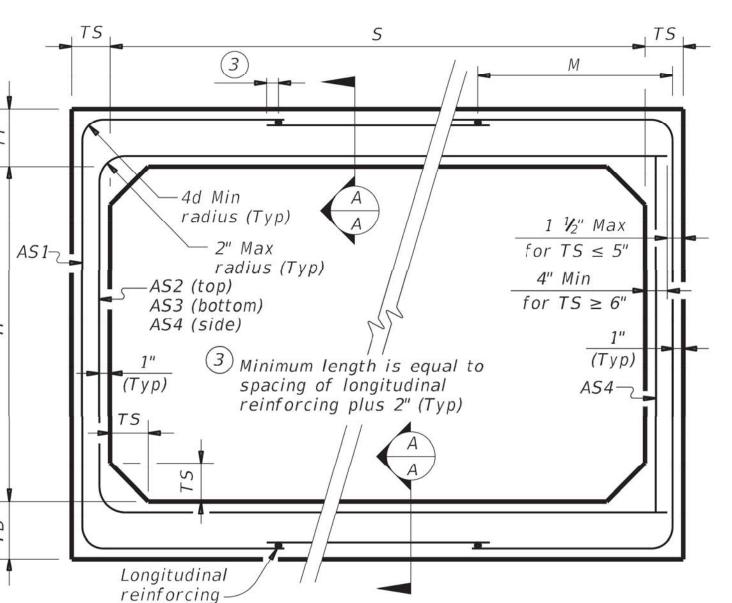


SCP-5 DN: TXDOT CK: TXDOT DW: TXDOT scp05sts-20.dgn ck: TxDOT (C)TxDOT February 2020 CONT SECT JOB HIGHWAY SHEET NO. COUNTY

30 OF 48

1) For box length = 8'-0''

2) AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS5 is minimum required area of reinforcement per linear foot of box width.



CORNER OPTION "A"

CORNER OPTION "A"

radius (Typ)

2" Max

radius (Typ)

\_\_\_ AS4

1" (Typ unless noted otherwise)

4 Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ)

FILL HEIGHT LESS THAN 2 FT

for  $TS \leq 5$ "

4" Min

CORNER OPTION "B"

for TS ≥ 6"

AS1

#### MATERIAL NOTES:

Provide 0.03 sq. in./ft. minimum longitudinal reinforcement at each face in slabs and walls. This minimum requirement

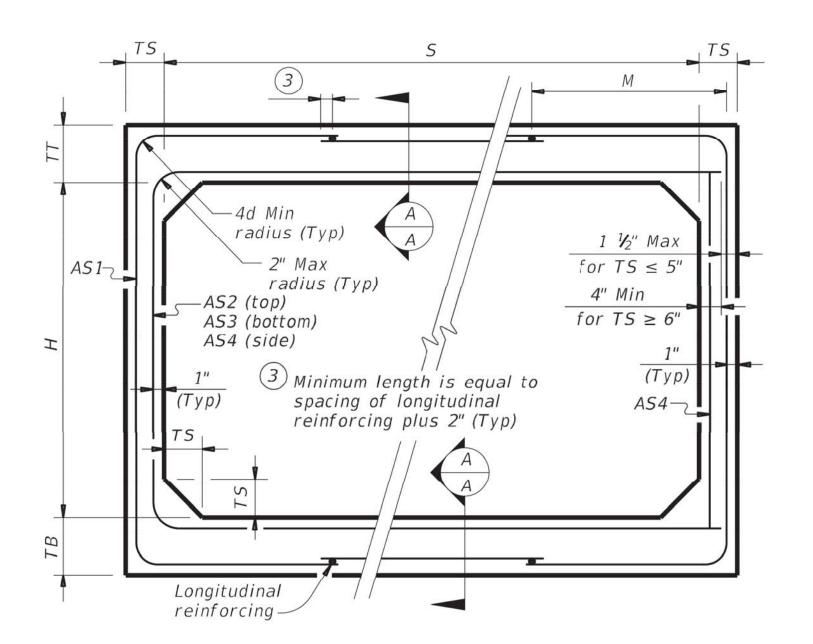
#### GENERAL NOTES:

Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.

standard sheet for details and notes not shown.

BROOKS & SPARKS, INC.

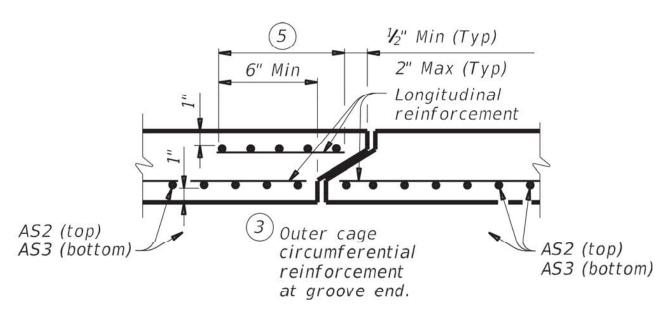
	ē.						В0	X DA	TA						
		SECTIO	N DIME	NSIONS		Fill	М		RE	INFORCI	NG (sq.	in. / ft.	)(2)		1) Lift
	5 (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)	Height (ft.)	(Min) (in.)	AS 1	A52	A53	A54	AS5	AS7	A58	Weight (tons)
	6	2	8	7	7	< 2	8 <del>-1</del> 9	0.23	0.27	0.19	0.17	0.19	0.19	0.17	7.2
	6	2	7	7	7	2 < 3	43	0.25	0.21	0.17	0.17	-	= ;	=	6.8
	6	2	7	7	7	3 - 5	43	0.20	0.17	0.17	0.17	-	-	=	6.8
_	6	2	7	7	7	10	39	0.20	0.17	0.17	0.17	-	-	(=)	6.8
conversion	6	2	7	7	7	15	39	0.26	0.20	0.20	0.17	_	7-1	1-1	6.8
nvei	6	2	7	7	7	20	39	0.34	0.26	0.26	0.17	-	32—33		6.8
0 0	6	2	7	7	7	25	39	0.43	0.32	0.32	0.17	-	2:	1-1	6.8
warranty for the c its use.	6	2	7	7	7	30	39	0.52	0.38	0.39	0.17	-	-	( <b>-</b> )	6.8
for for	6	2	0	7	7	- 2		0.20	0.21	0.22	0.17	0.10	0.10	0.17	7.0
neering Fractice Act. No assumes no responsibility r damages resulting from	6 6	<i>3</i>	8 7	7	7	< 2 2 < 3	43	0.20 0.21	0.31 0.24	0.22	0.17 0.17	0.19	0.19	0.17	7.9 7.5
cr nsik ng f	6	3	7	7	7	3 - 5	39	0.21	0.24	0.19	0.17	-			7.5
se A	6	3	7	7	7	10	39	0.17	0.18	0.17	0.17	-	-	-	7.5
action of the services	6	3	7	7	7	15	38	0.17	0.18	0.19	0.17	_	_	_	7.5
es n ges	6	3	7	7	7	20	38	0.22	0.24	0.24	0.17				7.5
ring sume	6	3	7	7	7	25	38	0.35	0.38	0.39	0.17	420			7.5
ginee T ass	6	3	7	7	7	30	38	0.42	0.46	0.46	0.17	_	\ <u>-</u>	_	7.5
	U	, ,	,	,	,	30	30	0.42	0.40	0.40	0.17		,		7.5
exas En . TxDO results	6	4	8	7	7	< 2	y	0.19	0.34	0.25	0.17	0.19	0.19	0.17	8.6
"1e) /er. ct r	6	4	7	7	7	2 < 3	43	0.19	0.27	0.21	0.17	-	-	-	8.2
rhe soel rre	6	4	7	7	7	3 - 5	39	0.17	0.21	0.19	0.17	_	-	_	8.2
by vhat inco	6	4	7	7	7	10	39	0.17	0.20	0.21	0.17	_	11-1		8.2
ned se v for	6	4	7	7	7	15	38	0.18	0.27	0.27	0.17	<del></del>	_	_	8.2
or or	6	4	7	7	7	20	38	0.24	0.34	0.35	0.17	S 550 S	. = ,		8.2
ard is governed by the "Ley r any purpose whatsoever. formats or for incorrect r	6	4	7	7	7	25	38	0.29	0.43	0.42	0.17	_	=	=	8.2
an	6	4	7	7	7	30	38	0.35	0.51	0.52	0.17	-	_	=	8.2
for															
DOT Ooth	6	5	8	7	7	< 2	:=:	0.19	0.37	0.28	0.17	0.19	0.19	0.17	9.3
Tx Tx d tc	6	5	7	7	7	2 < 3	43	0.17	0.30	0.24	0.17	-		-	8.9
use or this standard is made by TxDOT for any standard to other forma	6	5	7	7	7	3 - 5	43	0.17	0.23	0.21	0.17	-	-	-	8.9
use mad stai	6	5	7	7	7	10	39	0.17	0.22	0.23	0.17	-	) <u>-</u>	-	8.9
i he i is this	6	5	7	7	7	15	38	0.17	0.28	0.29	0.17	-	X <del></del> 4	-	8.9
ine kind is of this	6	5	7	7	7	20	38	0.20	0.37	0.38	0.17	-	(-)	7-1	8.9
	6	5	7	7	7	25	38	0.25	0.45	0.46	0.17	-	=	-	8.9
	6	5	7	7	7	30	38	0.30	0.54	0.55	0.17	=	, <del>-</del>	( <b>-</b> )	8.9
	6	6	8	7	7	< 2	4	0.19	0.38	0.30	0.17	0.19	0.19	0.17	10
ĺ	6	6	7	7	7	2 < 3	52	0.17	0.32	0.26	0.17	-	=	=	9.6
	6	6	7	7	7	3 - 5	52	0.17	0.24	0.22	0.17	_	-	-	9.6
	6	6	7	7	7	10	43	0.17	0.23	0.24	0.17	-	-	-	9.6
	6	6	7	7	7	15	39	0.17	0.29	0.31	0.17	_	1 -1	n-1	9.6
	6	6	7	7	7	20	39	0.18	0.38	0.39	0.17	-	::	:=::	9.6
	6	6	7	7	7	25	38	0.23	0.46	0.48	0.17	-	-	1-1	9.6
	6	6	7	7	7	30	38	0.27	0.55	0.57	0.17		:=:	-	9.6



CORNER OPTION "A"

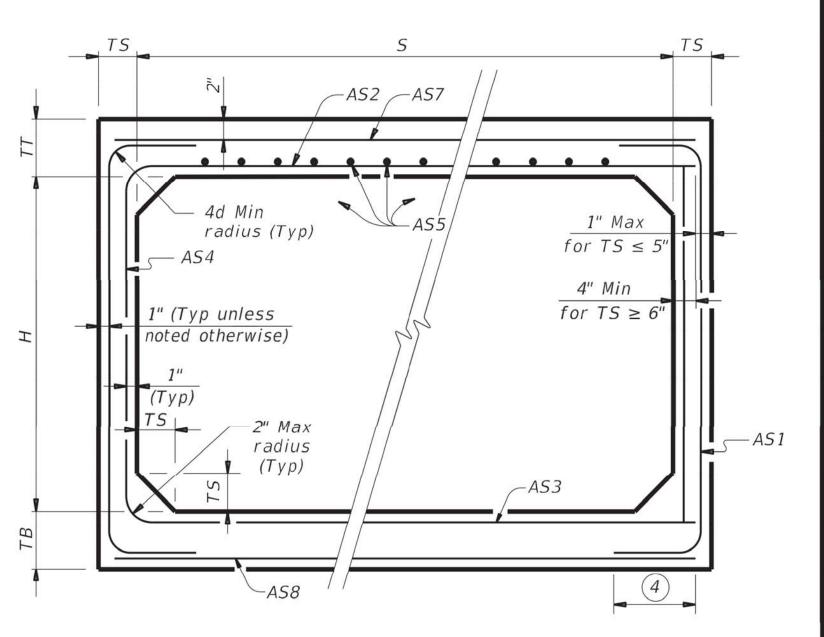
CORNER OPTION "B"

# FILL HEIGHT 2 FT AND GREATER



# SECTION A-A

(Showing top and bottom slab joint reinforcement.)



CORNER OPTION "A"

CORNER OPTION "B"

# FILL HEIGHT LESS THAN 2 FT

4 Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ)

#### MATERIAL NOTES:

Provide 0.03 sq. in./ft. minimum longitudinal reinforcement at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.

Provide Class H concrete (f`c = 5,000 psi).

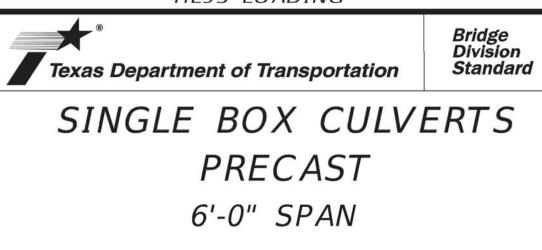
# GENERAL NOTES:

Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.

See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.

In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)".

### HL93 LOADING

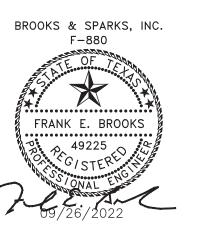


SCP-6

.E:	scp06sts-20.dgn	DN: TxD	ОТ	ск: TxD0T	DW: TXDOT	ск: TxD0T	
TxD0T	February 2020	CONT	SECT	JOB		HIGHWAY	
	REVISIONS						
		DIST		COUNT	Υ	SHEET NO.	
			i ii			31 OF 48	

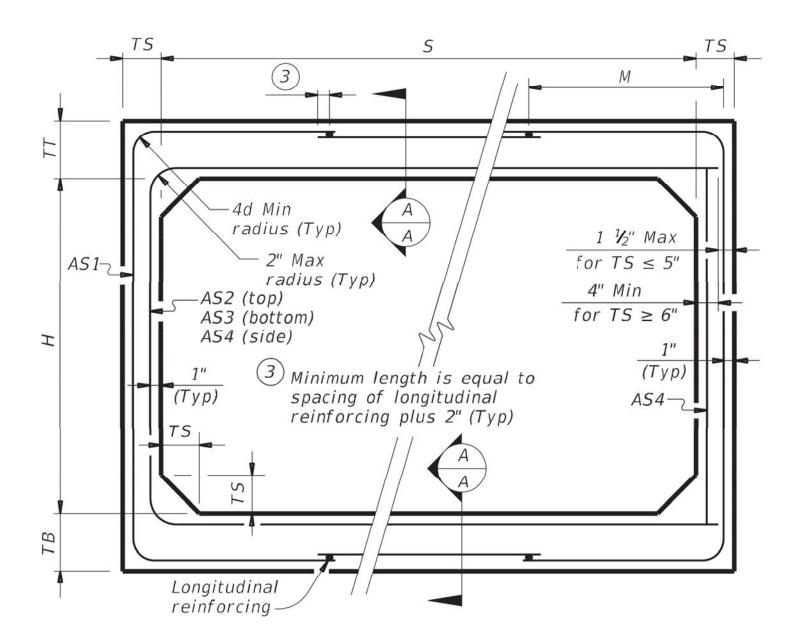
1) For box length = 8'-0''

2) AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS5 is minimum required area of reinforcement per linear foot of box width.



DATE: FILE:

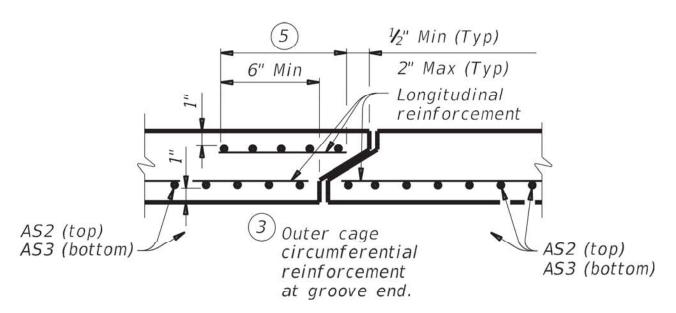
						В0	X DA	TA						
SECTION DIMENSIONS					Fill	М	REINFORCING (sq. in. / ft.)							1) Lift
5 (ft.)	Н (ft.)	TT (in.)	TB (in.)	TS (in.)	Height (ft.)	(Min) (in.)	AS 1	A52	AS3	A54	AS5	AS7	A58	We (to
7	3	8	8	8	< 2	(111.)	0.23	0.31	0.22	0.19	0.19	0.19	0.19	9
7	3	8	8	8	2 < 3	47	0.27	0.25	0.24	0.19	-	-	-	9
7	3	8	8	8	3 - 5	43	0.19	0.19	0.19	0.19	_	_	==	-
7	3	8	8	8	10	43	0.21	0.20	0.21	0.19	_	-		-
7	3	8	8	8	15	43	0.28	0.26	0.27	0.19	_	-		
7	3	8	8	8	20	43	0.36	0.34	0.35	0.19	_	14-1	1-1	
7	3	8	8	8	25	43	0.45	0.42	0.43	0.19	_	7-1	_	
7	3	8	8	8	30	43	0.54	0.50	0.51	0.19	_	1-1	_	
					30	13	0.54	0.50	0.51	0.13				
7	4	8	8	8	< 2	29 <b>—</b> 3	0.21	0.34	0.25	0.19	0.19	0.19	0.19	1
7	4	8	8	8	2 < 3	43	0.23	0.28	0.28	0.19	-	-	=	1
7	4	8	8	8	3 - 5	43	0.19	0.22	0.19	0.19	-	-	_	1
7	4	8	8	8	10	43	0.19	0.23	0.23	0.19	=	=	=	1
7	4	8	8	8	15	41	0.24	0.30	0.30	0.19	-	-	-	1
7	4	8	8	8	20	41	0.31	0.38	0.39	0.19	-		-	1
7	4	8	8	8	25	41	0.38	0.47	0.48	0.19	420	r <u>—</u> ii	-	1
7	4	8	8	8	30	41	0.46	0.57	0.57	0.19	_	-		1
	-	0	0				0.10	0.26	0.27	0.10	0.10	0.10	0.10	<u> </u>
7	5	8	8	8	< 2	-	0.19	0.36	0.27	0.19	0.19	0.19	0.19	1
7	5	8	8	8	2 < 3	47	0.21	0.31	0.31	0.19	-	_	-	1
7	5	8	8	8	3 - 5	43	0.19	0.24	0.21	0.19	-	1-1	1,-1	1
7	5	8	8	8	10	43	0.19	0.25	0.26	0.19		1.76	-	1
7	5	8	8	8	15	41	0.21	0.32	0.33	0.19	-	_	-	1
7	5	8	8	8	20	41	0.27	0.41	0.42	0.19				1
7	5 5	8	8	8	25 30	41	0.33	0.51	0.52 0.62	0.19	-		=	1
	3	0	0	0	30	41	0.40	0.61	0.02	0.19	-	-	=	
7	6	8	8	8	< 2	-	0.19	0.38	0.30	0.19	0.19	0.19	0.19	1
7	6	8	8	8	2 < 3	59	0.19	0.33	0.34	0.19	-	-	-	
7	6	8	8	8	3 - 5	47	0.19	0.25	0.23	0.19	_	_	_	
7	6	8	8	8	10	43	0.19	0.25	0.23	0.19	_		_	1
7	6	8	8	8	15	41	0.19	0.34	0.35	0.19	_	_		1
7	6	8	8	8	20	41	0.13	0.43	0.45	0.19	_		_	1
7	6	8	8	8	25	41	0.29	0.53	0.55	0.19	_		_	
7	6	8	8	8	30	41	0.35	0.64	0.65	0.19	=		-	
					n e				B 6 2					
7	7	8	8	8	< 2	_	0.19	0.40	0.33	0.19	0.19	0.19	0.19	1
7	7	8	8	8	2 < 3	59	0.19	0.36	0.37	0.19	-	=	=	1
7	7	8	8	8	3 - 5	59	0.19	0.27	0.25	0.19	-	-	-	1
7	7	8	8	8	10	47	0.19	0.27	0.29	0.19	-	-	=	1
7	7	8	8	8	15	43	0.19	0.35	0.37	0.19	-	1-	-	1
7	7	8	8	8	20	43	0.22	0.44	0.46	0.19	-	::	( <del>-</del> )	1
7	7	8	8	8	25	43	0.27	0.54	0.57	0.19	-	1-	i — i	1
_	7	8	8	8	30	41	0.32	0.65	0.67	0.19				1



CORNER OPTION "A"

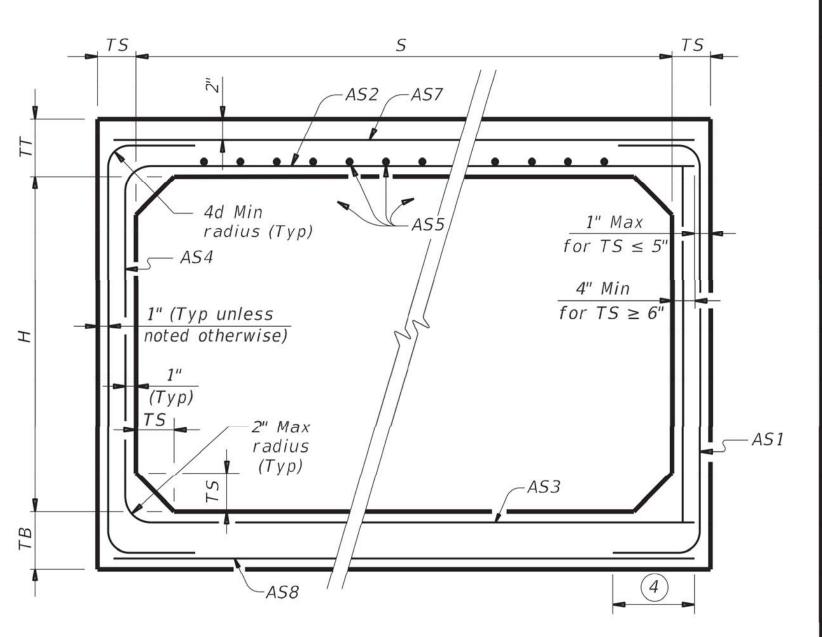
CORNER OPTION "B"

# FILL HEIGHT 2 FT AND GREATER



# SECTION A-A

(Showing top and bottom slab joint reinforcement.)



CORNER OPTION "A"

CORNER OPTION "B"

# FILL HEIGHT LESS THAN 2 FT

4 Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ)

#### MATERIAL NOTES:

Provide 0.03 sq. in./ft. minimum longitudinal reinforcement at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.

Provide Class H concrete (f'c = 5,000 psi).

#### GENERAL NOTES:

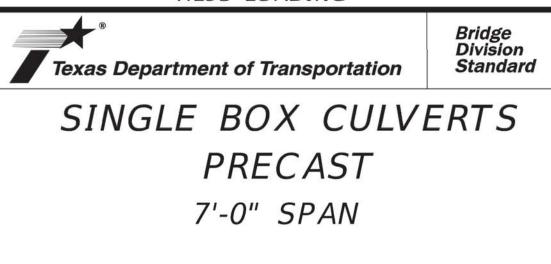
BROOKS & SPARKS, INC.

Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.

See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.

In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)".

### HL93 LOADING



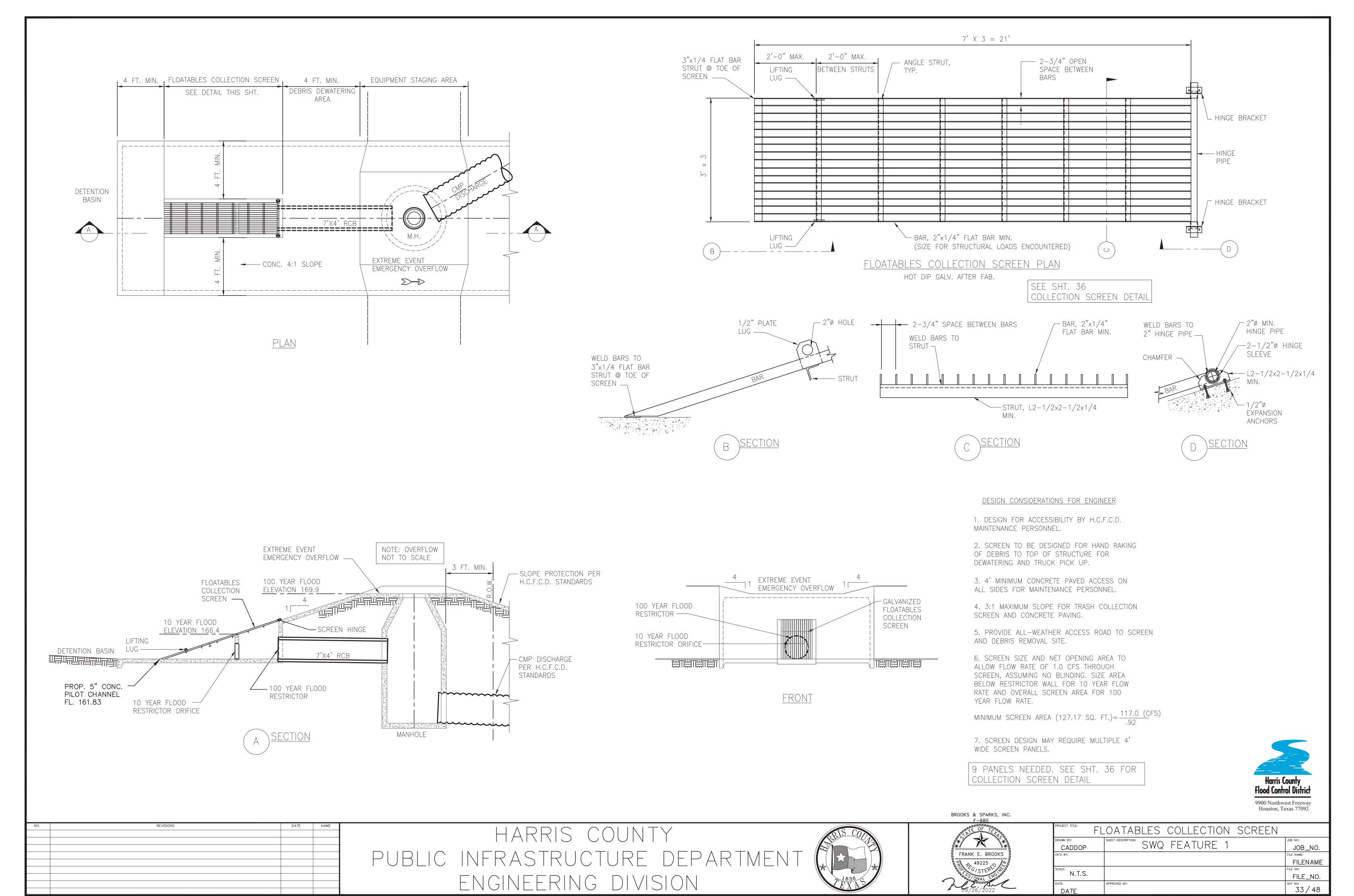
CCD	$\overline{}$
SCP-	• /
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E:	scp07sts-20.dgn	DN: TXD	ОТ	CK:TXDOT	DW: TxD	DOT	ck:TxD0T	
TxD0T	February 2020	CONT	SECT	JOB		HIGHWAY		
	REVISIONS							
		DIST	COUNTY				SHEET NO.	
						32	OF 48	

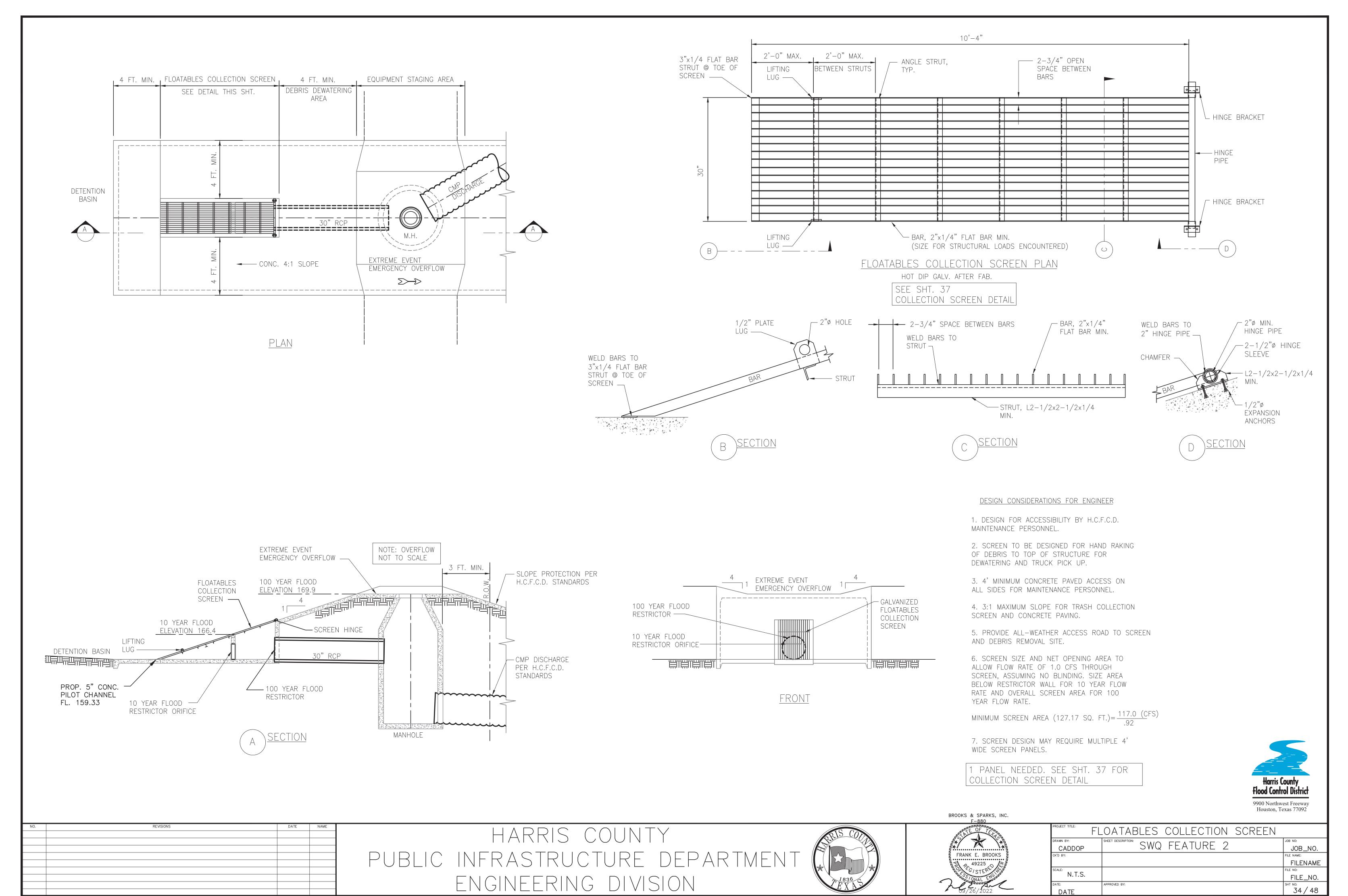
1) For box length = 8'-0''

2) AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS5 is minimum required area of reinforcement per linear foot of box width.

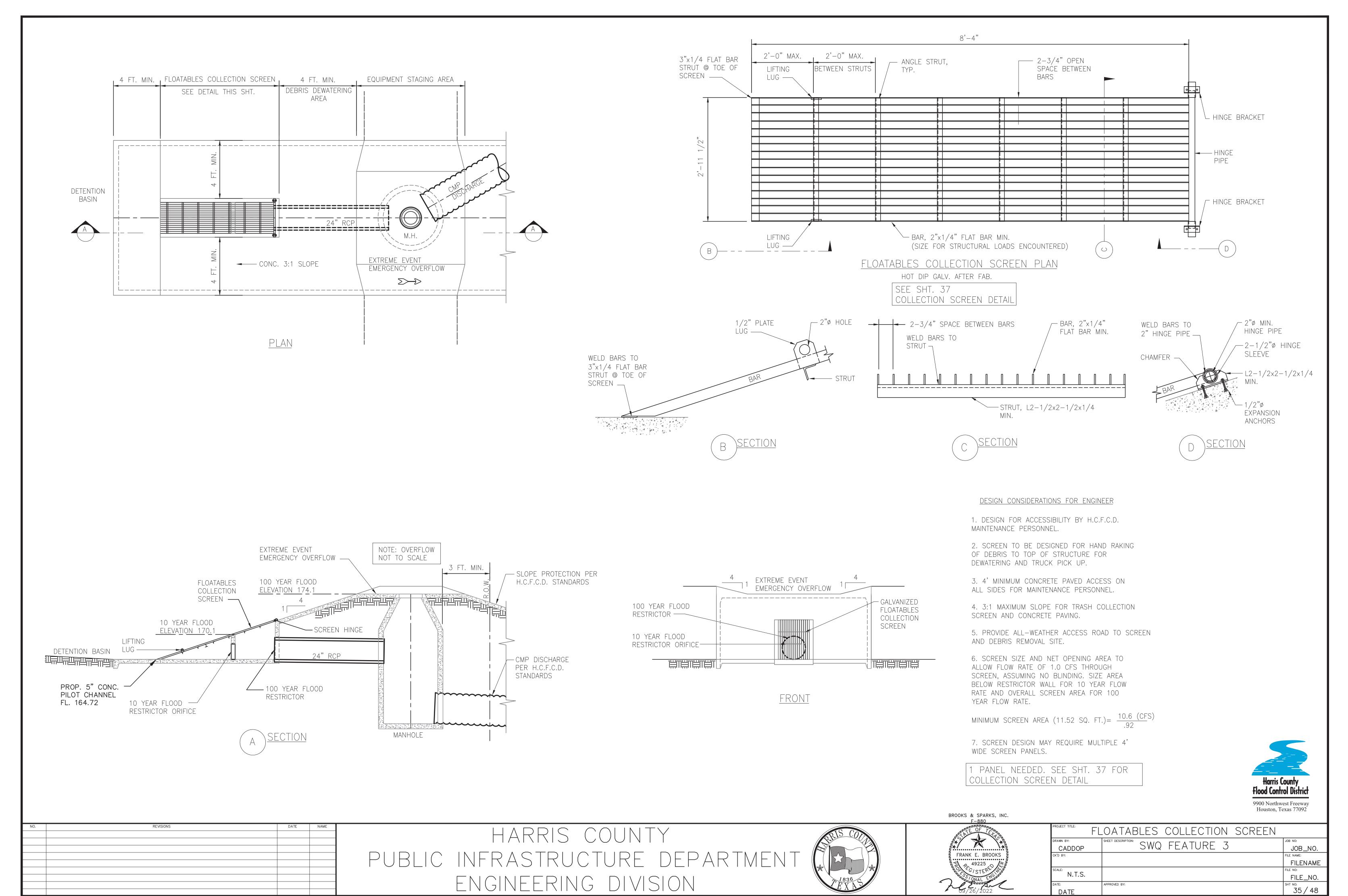
DATE: FILE:



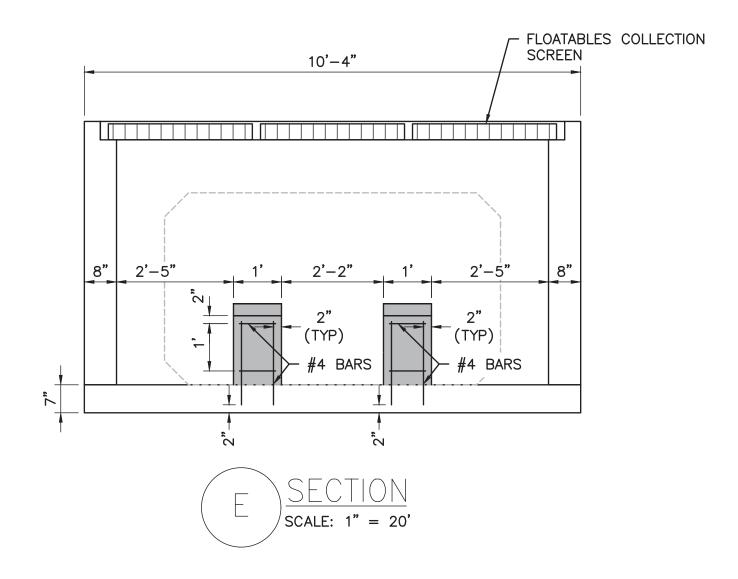
G: \PROJECTS\ACAD10\SPECDWGS\projsign 19980714.1107 REVISION 2; JULY 19, 2004 C.C.

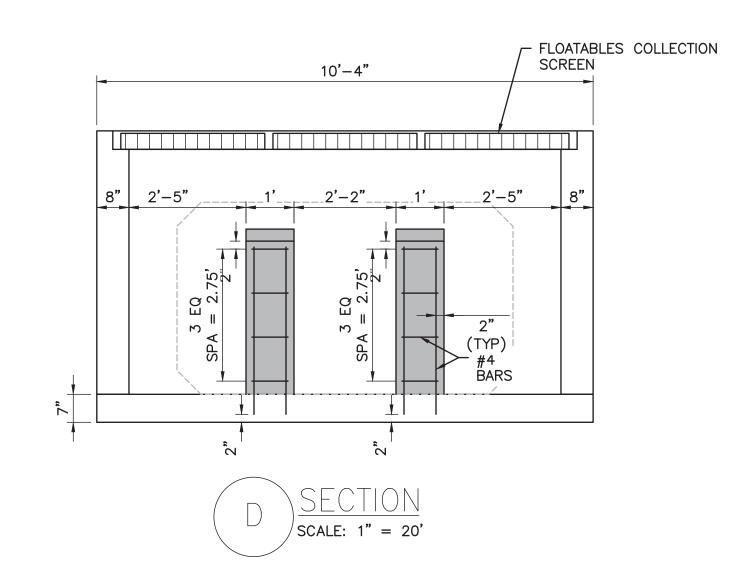


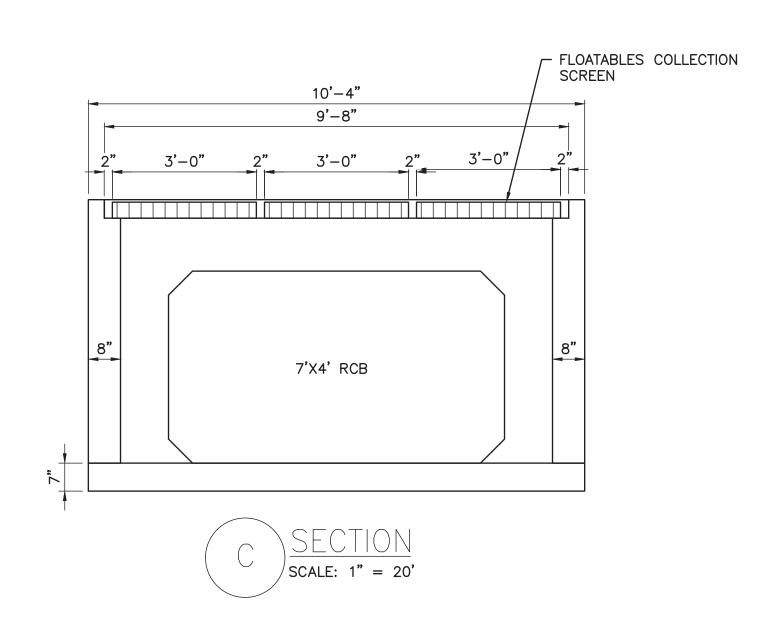
G: \PROJECTS\ACAD10\SPECDWGS\projsign 19980714.1107 REVISION 2; JULY 19, 2004 C.C.



G: \PROJECTS\ACAD10\SPECDWGS\projsign 19980714.1107 REVISION 2; JULY 19, 2004 C.C.







BROOKS & SPARKS, INC.

TEXAS REGISTERED ENGINEERING FIRM F-880
21020 PARK ROW PHONE: (281) 578-9595
KATY, TX 77449 FAX: (281) 578-9686

#### FLOODPLAIN INFORMATION:

ACCORDING TO F.I.R.M. MAP NO. 48201C0215L (COMMUNITY-PANEL NO. 4802870215L), MAP REVISED DATE: JUNE 18, 2007. THE SUBJECT PROPERTY LIES WITHIN THE AREAS DESIGNATED AS ZONE "X" UNSHADED. DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD. ZONE X SHADED. AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD. ZONE AE. BASE FLOOD ELEVATIONS DETERMINED. AND FLOODWAY. THE FLOODWAY IS THE CHANNEL OF A STREAM PLUS ANY ADJACENT FLOODPLAIN AREAS THAT MUST BE KEPT FREE OF ENCROACHMENT SO THAT THE 1% ANNUAL CHANCE FLOOD CAN BE CARRIED WITHOUT SUBSTANTIAL INCREASES IN FLOOD HEIGHTS.

#### REFERENCE BENCHMARK:

RM111050 — ALUMINUM ROD WITH LOGO CAP STAMPED "111050" LOCATED ON THE NORTH SIDE OF BAUER-HOCKLEY ROAD ±75' EAST OF ITS INTERSECTION WITH ANGELI DRIVE AND ±120' WEST OF A POWER POLE IN KEY MAP 326B IN THE CYPRESS CREEK WATERSHED.

ELEVATION = 176.30' (NAVD 88, 2001 ADJ.)

#### TEMPORARY BENCHMARKS:

TBM "A" — BOX CUT ON "BB" INLET LOCATED ON THE EAST SIDE OF MUESCHKE ROAD ±50' SOUTH OF THE MOST NORTHERLY SOUTHWEST CORNER OF THE SUBJECT TRACT.

ELEVATION = 169.64'

NOTE: THE LOCATIONS OF THE PRIVATE UTILITY LINES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. HE ALSO ACCEPTS FULL RESPONSIBILITY FOR ANY AND ALL DAMAGES INCURRED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE

TO ARRANGE FOR LINES TO BE TURNED OFF OR MOVED, CALL CENTERPOINT ENERGY AT 713–207–2

FOR YOUR SAFETY, YOU ARE REQUIRED BY TEXAS LAW TO CALL 811 AT LEAST 48 HOURS BEFORE YOU DIG SO THAT UNDERGROUND LINES CAN BE MARKED. THIS VERIFICATION DOES NOT FULFILL YOUR OBLIGATION TO CALL 811.

VERIFICATION OF PRIVATE UTILITY LINES

CenterPoint Energy/Natural Gas Facilities Verification ONLY. (This Signature verifies that you have shown CNP Natural Gas lines correctly. Not to be used for conflict verification.) (Gas service lines are not shown.) Signature Valid for six months.

CenterPoint Energy/UNDERGROUND Electrical Facilities Verification ONLY. (This Signature verifies that existing underground facilities. Not to be used for conflict verification.) Signature Valid for six months.

Date:

APPROVED FOR AT8T TEXAS/SWBT UNDERGROUND CONDUIT FACILITIES ONLY,



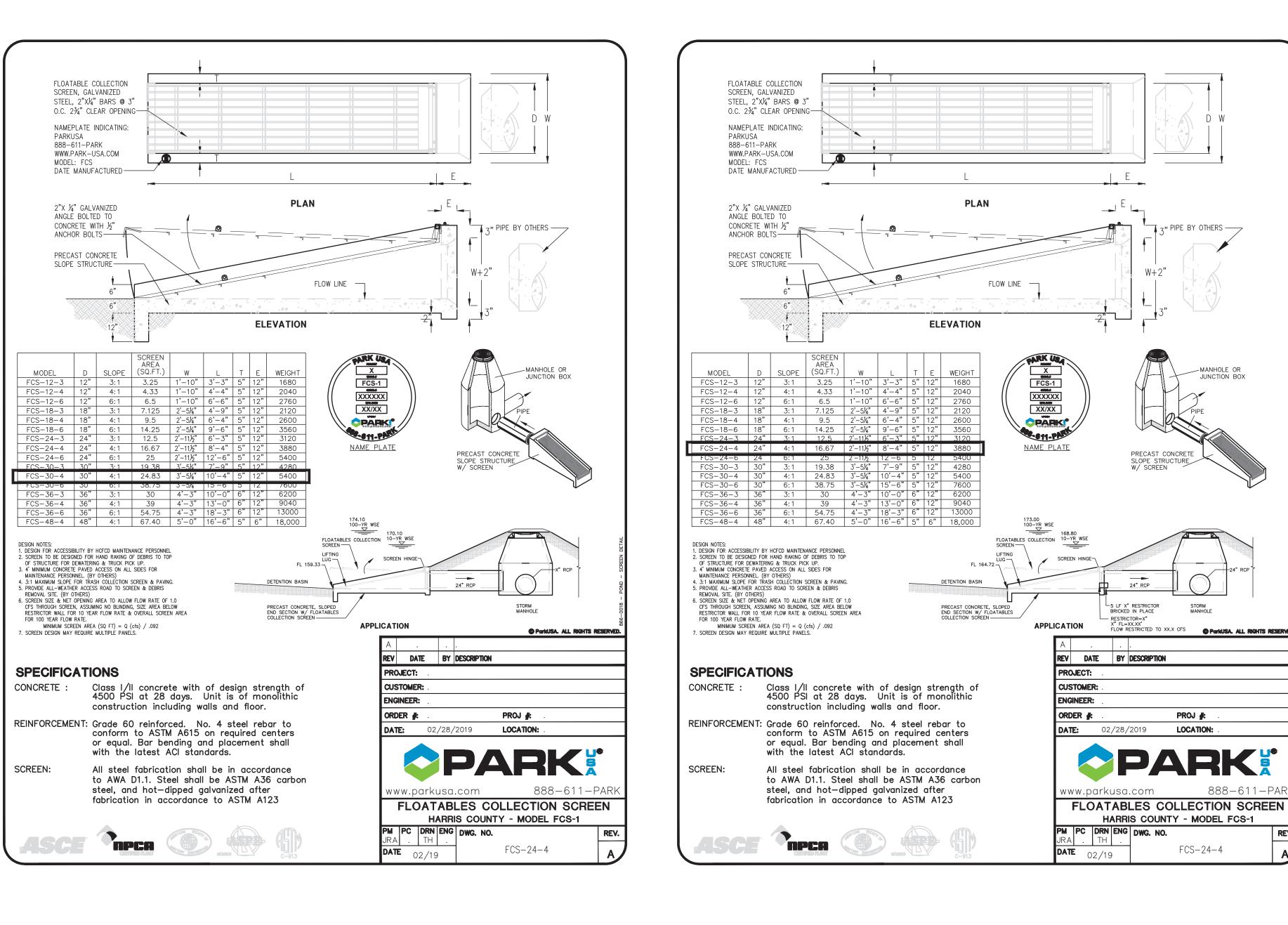
TOMBALL INDEPENDENT SCHOOL DISTRICT
PLANS FOR
DETENTION BASINS, STORM SEWER
AND SITE EARTHWORK
TO SERVE
JUERGEN ROAD EDUCATIONAL CAMPUS

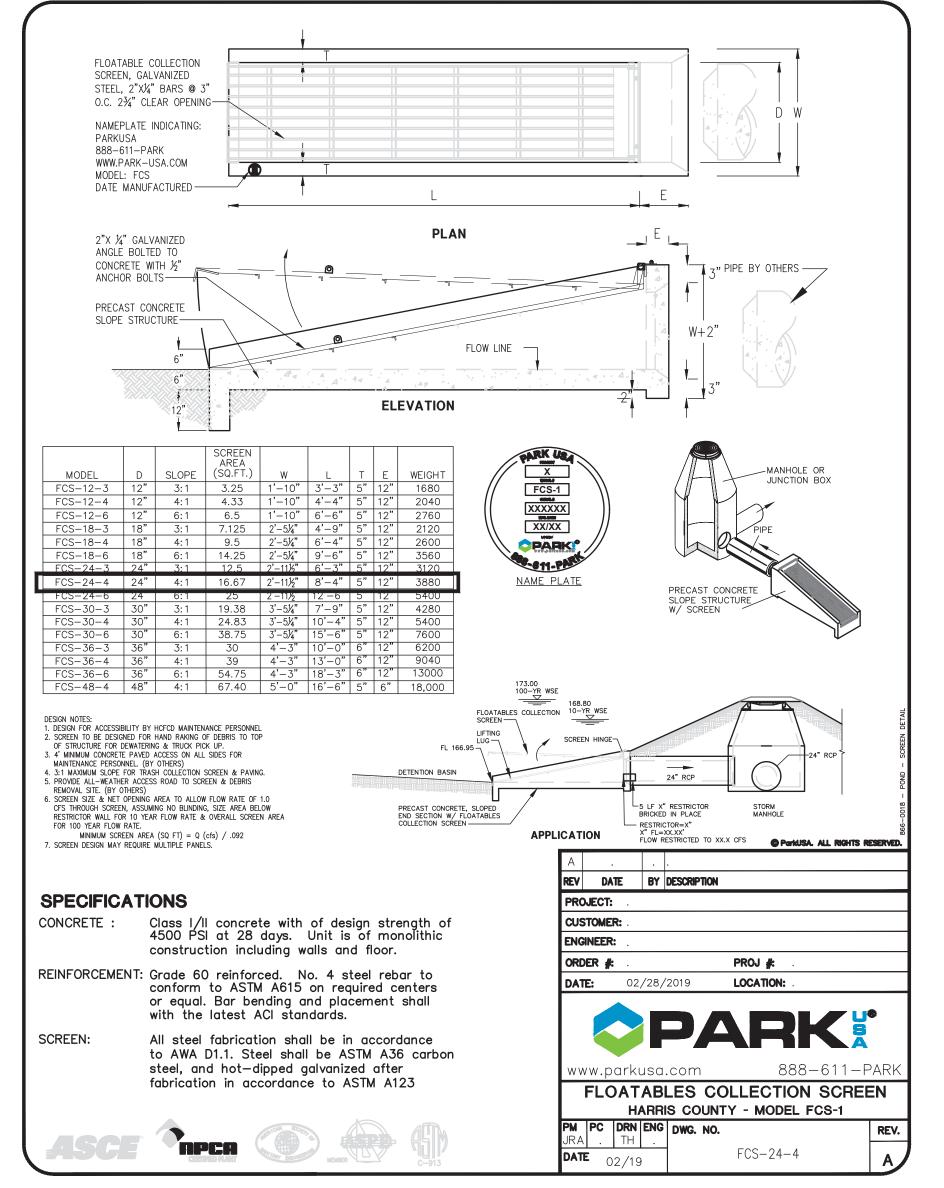
COLLECTION SCREEN DETAIL FOR SWQ FEATURE 1

NO.	DATE		REVISIONS	BY
DRA	WN BY:	RV	CHECKED BY: CSM, JAE	
DES	SIGNED E	BY: CSM	APPROVED BY: FEB	
PROJECT NO. 866-0018			DATE: 09/26/2022	
SCA	LE: 1"=	20'	SHEET 36 OF 48	

# SWQ FEATURE 3 FOR SOUTH POND

# TRASH RACK ONLY FOR NORTH POND





BROOKS & SPARKS, INC.

CONSULTING ENGINEERING
TEXAS REGISTERED ENGINEERING FIRM F-880

21020 PARK ROW PHONE: (281) 578-9595 KATY, TX 77449 FAX: (281) 578-9686

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TO ARRANGE FOR LINES TO BE TURNED OFF OR MOVED, CALL CENTERPOINT ENERGY AT 713-207-2222.

NOTICE:

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Date:

APPROVED FOR AT&T TEXAS/SWBT UNDERGROUND CONDUIT FACILITIES ONLY,

Signature valid for one year.

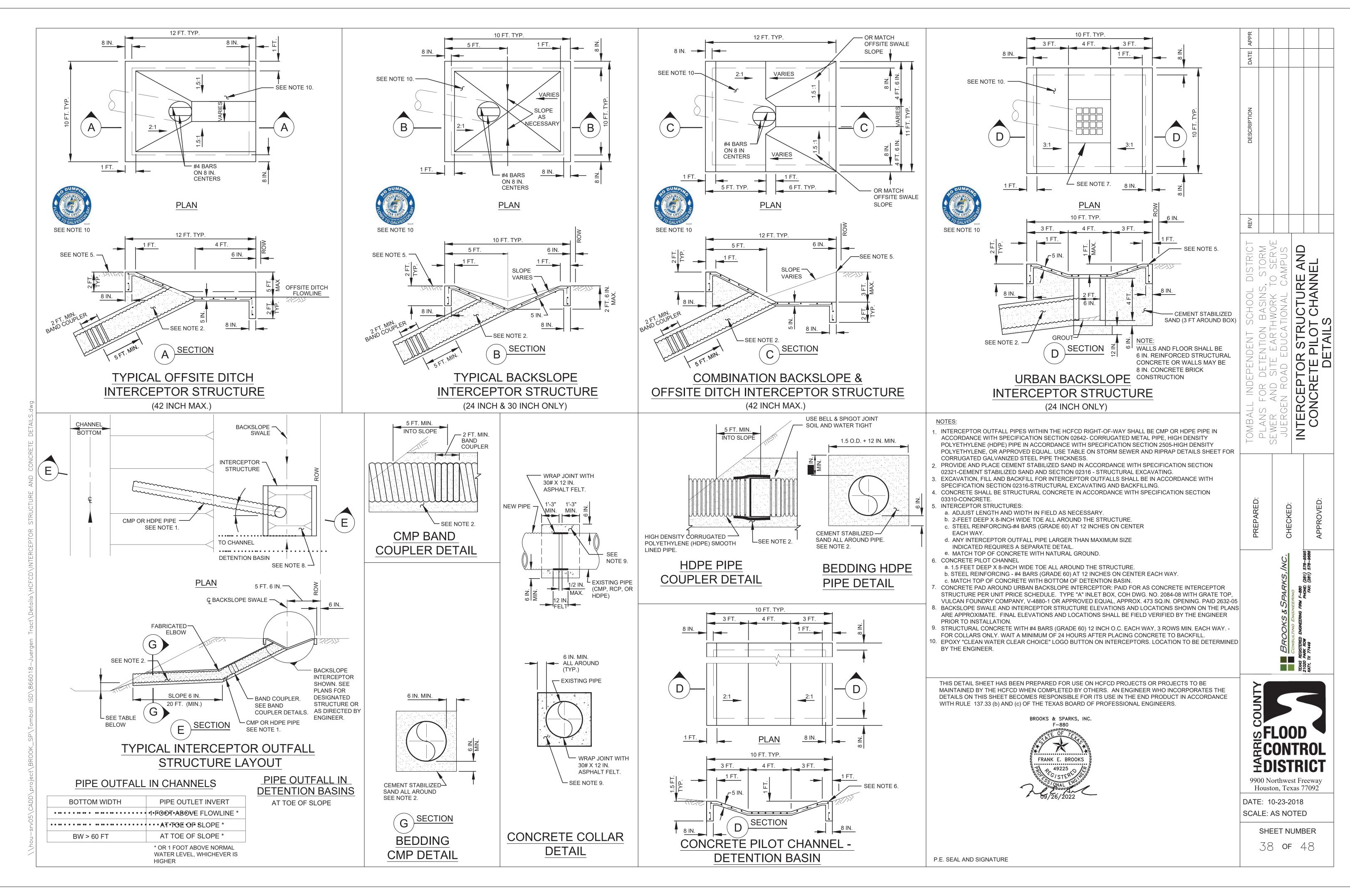


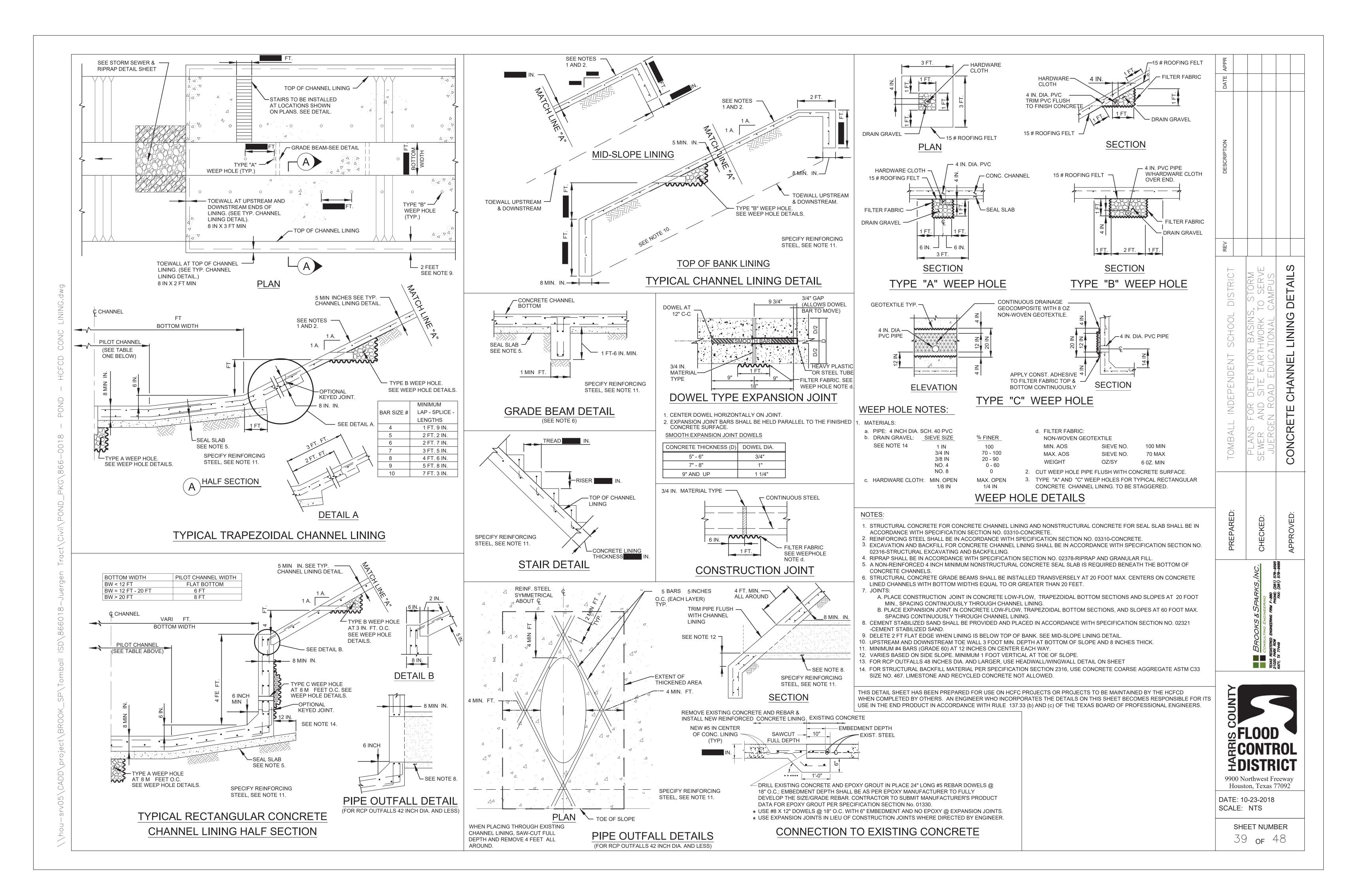
TOMBALL INDEPENDENT SCHOOL DISTRICT
PLANS FOR
DETENTION BASINS, STORM SEWER
AND SITE EARTHWORK

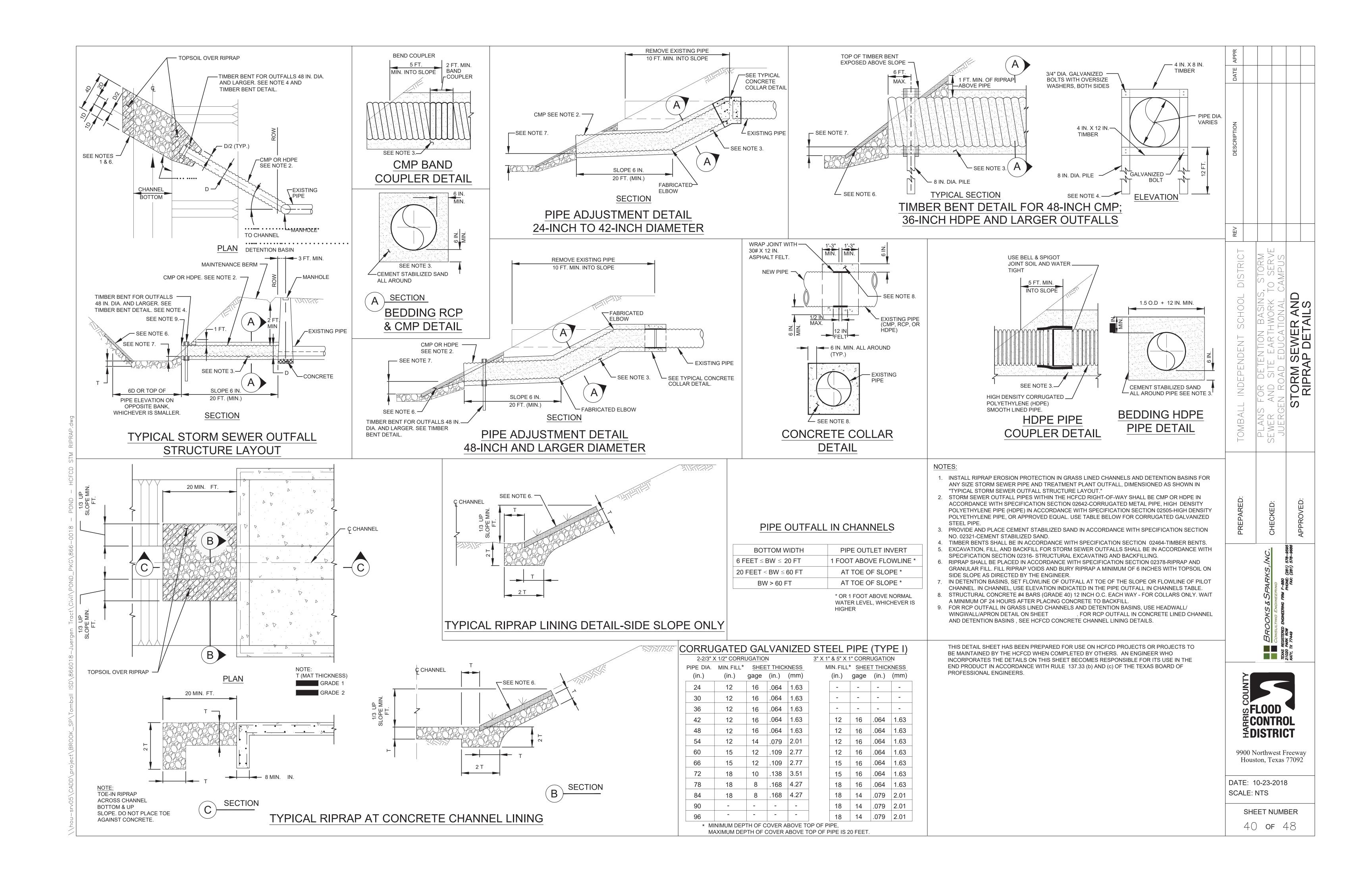
TO SERVE
JUERGEN ROAD EDUCATIONAL CAMPUS

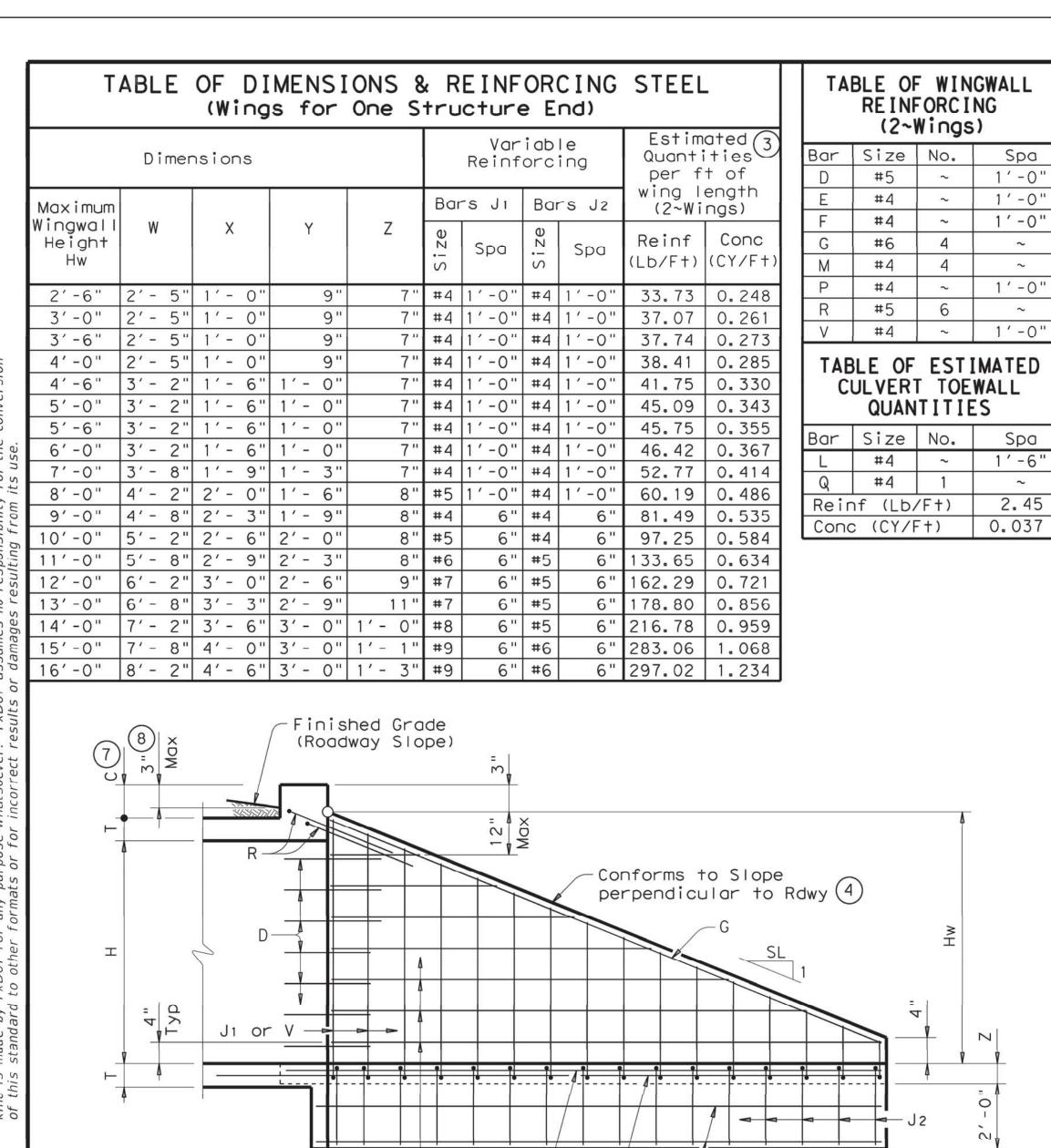
COLLECTION SCREEN DETAIL FOR SWQ FEATURE 2 & 3

).	DATE	REVISIONS					
RAWN BY: RV			CHECKED BY: CSM, JAE				
ESIGNED BY: CSM			APPROVED BY: FEB				
ROJECT NO. 866-0018			DATE: 09/26/2022				
CA	\LE: 1"	=20'	SHEET 37 OF 48				
			<u> </u>				









### TABLE OF WINGWALL REINFORCING (2~Wings) Bar Size No. Spa #5 ~ 1'-0" #4 ~ 1'-0" #4 ~ 1'-0" #6 4 ~ #4 4 #4 ~ | 1'-0" #5 6 ~ | 1'-0" #4 TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES Bar Size No. Spa #4 | ~ | 1'-6"

#4 | 1 |

0.037

Conc (CY/Ft)

# WING DIMENSION CALCULATIONS: Formulas: (All values are in Feet) Hw = H + T + C - 0.250'Lw = (Hw - 0.333') (SL)

For Cast-in-place culverts: L+w = (N) (S) + (N+1) (U)

For Precast culverts:

L+w = (N) (2U + S) + (N-1) (0.5')Total Wingwall Area (Two Wings ~ S.F.) = (Hw + 0.333') (Lw)

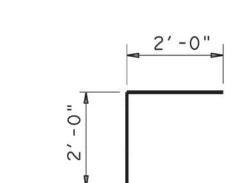
Hw = Height of Wingwall

SL:1 = Side Slope Ratio (Horizontal:1 Vertical)

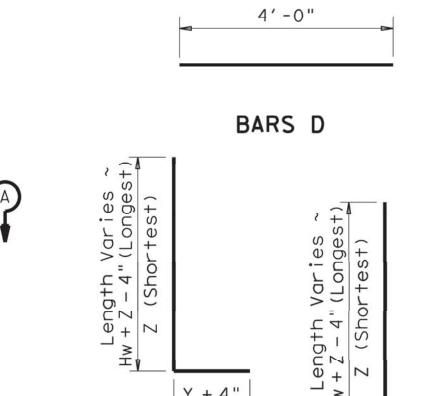
Lw = Length of Wingwall Ltw = Culvert Toewall Length

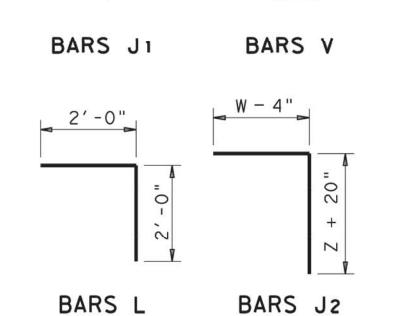
N = Number of Culvert Spans

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



BARS R





BARS L

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications. All reinforcing steel shall be Grade 60. Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted

1) Extend Bars P 3'-0" minimum into bottom slab of

cover and 4" minimum between bars.

SECTION B-B will not be required.

other than T6, refer to RAC standard.

from that shown as necessary.

will be allowed for this work.

(2) Adjust to fit as necessary to maintain 1 1/4" clear

(3) Quantities shown are based on an average wing height

for two wings (one structure end). To determine total

quantities for two wings multiply the tabulated values

riprap shall be constructed. Payment for riprap shall

be as required by Item 432, "Riprap". Unless otherwise

typical riprap reinforcing into the toewall; construction

joints or grooved joints, oriented in the direction of

(4) Recommended values of Slope are: 2:1, 3:1, 4:1, & 6:1.

(5) When shown elsewhere on the plans, a 5" deep concrete

shown on the plans or directed by the Engineer, the

riprap shall have a 6" wide by 1'-6" deep reinforced

concrete toewall along all edges adjacent to natural

flow, shall extend across the full distance of the

riprap is provided, the culvert toewall shown in

(6) At Contractor's option, Culvert Toewall may be ended flush with Wingwall Toewall. Adjust reinforcing

(7) 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,

shall be reduced, if necessary, to provide a maximum

3" projection above finished grade. No changes will be made in quantities and no additional compensation

(8) For vehicle safety, curb heights and wall heights

riprap, at intervals of approximately 20'. When such

ground; the toewall shall be reinforced by extending

Box Culvert.

by Lw.

All concrete shall be Class "C" and shall have a

minimum compressive strength of 3600 psi. All reinforcing bars shall be adjusted to provide a minimum of  $1 \frac{1}{4}$ " clear cover.

When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer. See BCS sheet for additional dimensions and

information. The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

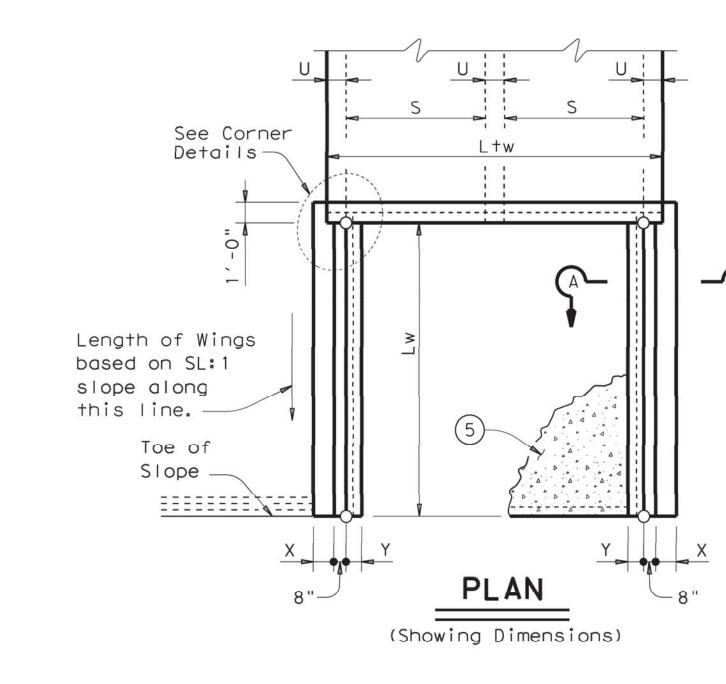


Bridge Division

CONCRETE WINGWALLS WITH STRAIGHT WINGS FOR 0° SKEW BOX CULVERTS

SW-O

LANCER POST OF LIST AND							41 OF	48
I-10: Add note for Inthetic fibers.	DIST	COUNTY			SHEET NO.			
REVISIONS								
TxDOT February 2010	CONT	SECT		JOB			HIGHWAY	1
sw-Ostde.dgn	DN: GAF	=	CK:	CAT	DW:	TxD0T	CK:	GAF



FOOTING AND TOEWALL

CORNER DETAILS

SECTION B-B (5)

-Culvert Bottom Slab Reinforcing Culvert Toewall

Const Jt Wingwall Toewall

(Typ)

BROOKS & SPARKS, INC.

DISCLAIMER: The use o kind is made of this stand

INSIDE ELEVATION

(Showing reinforcing. Culvert and Culvert

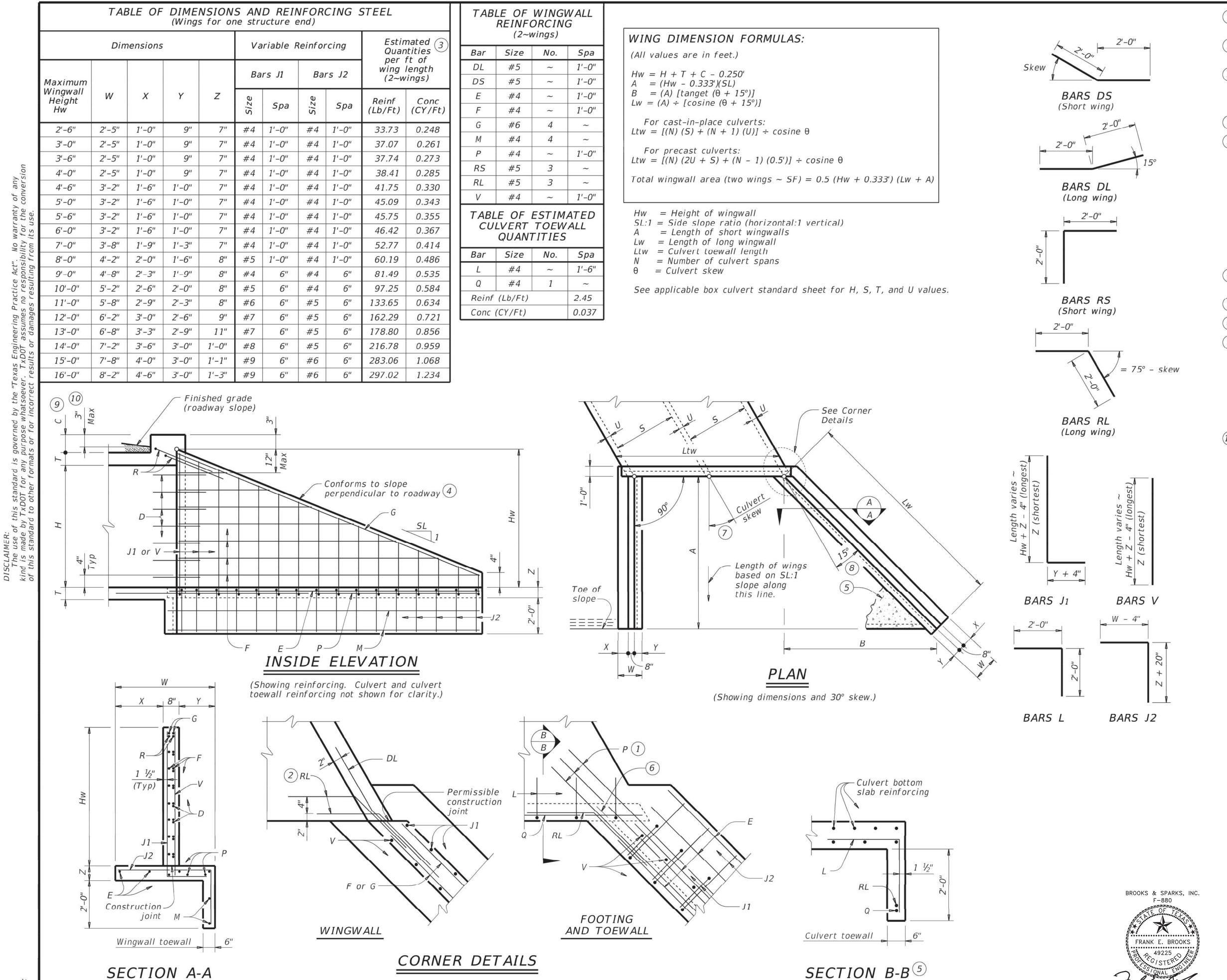
Toewall reinforcing not shown for clarity.)

Permiss

Const Jt

F or G

WINGWALL



(Culvert and culvert toewall reinforcing not shown for clarity.)

- 1) Extend Bars P 3'-0" minimum into bottom slab of box culvert.
- 2) Adjust as necessary to maintain 1 1#2" clear cover and 4" minimum between bars.
- 3 Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings, multiply the tabulated values by 0.5 x (A + Lw).
- 4 Recommended values of side slope are: 2:1, 3:1, 4:1, and 6:1.
- When shown elsewhere on the plans, construct 5" deep concrete riprap. Payment for riprap is as required by Item 432, "Riprap". Unless otherwise shown on the plans or directed by the Engineer, provide a 6" wide by 1'-6" deep reinforced concrete toewall along all edges of the riprap adjacent to natural ground; reinforce the toewall by extending typical riprap reinforcing into the toewall; and extend construction joints or grooved joints oriented in the direction of flow across the full distance of the riprap at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required.
- 6 At Contractor's option, culvert toewall may be ended flush with wingwall toewall. Adjust reinforcing as needed.
- (7) Applicable values of skew are: 15°, 30°, and 45°.
- 8) Typical wingwall angle for all skews.
- 9 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- 10 For vehicle safety, the following requirements must be met:
  - For structures without bridge rail, construct curbs no more than 3" above finished grade.
  - For structures with bridge rail, construct 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.

# MATERIAL NOTES:

Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.

Provide galvanized reinforcing steel if required elsewhere in the plans.

In riprap concrete, synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

# GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.

See Box Culvert Supplement (BCS) standard sheet

for additional dimensions and information.

The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.



Bridge Division Standard

CONCRETE WINGWALLS
WITH FLARED WINGS FOR
SKEWED BOX CULVERTS

FW-S

ii:	fw-sstde-20.dgn	DN: GAF	=	CK:	CAT	DW:	TxDOT	CK:	TXD0T
TxD0T	February 2020	CONT	SECT		JOB	1		HIGHWAY	
	REVISIONS								
		DIST	COUNTY			SHEET NO.			
								42 OF	48

BROOKS & SPARKS, INC. CONSULTING ENGINEERING
TEXAS REGISTERED ENGINEERING FIRM F-880
21020 PARK ROW PHONE:

PHONE: (281) 578-9595 FAX: (281) 578-9686

FLOODPLAIN INFORMATION:

KATY, TX 77449

ACCORDING TO F.I.R.M. MAP NO. 48201C0215L (COMMUNITY-PANEL NO. 4802870215L), MAP REVISED DATE: JUNE 18, 2007. THE SUBJECT PROPERTY LIES WITHIN THE AREAS DESIGNATED AS ZONE "X" UNSHADED. DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD. ZONE X SHADED. AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE: AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD. ZONE AE. BASE FLOOD ELEVATIONS DETERMINED. AND FLOODWAY. THE FLOODWAY IS THE CHANNEL OF A STREAM PLUS ANY ADJACENT FLOODPLAIN AREAS THAT MUST BE KEPT FREE OF ENCROACHMENT SO THAT THE 1% ANNUAL CHANCE FLOOD CAN BE CARRIED WITHOUT SUBSTANTIAL INCREASES IN FLOOD HEIGHTS.

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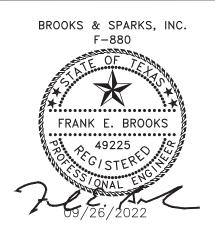
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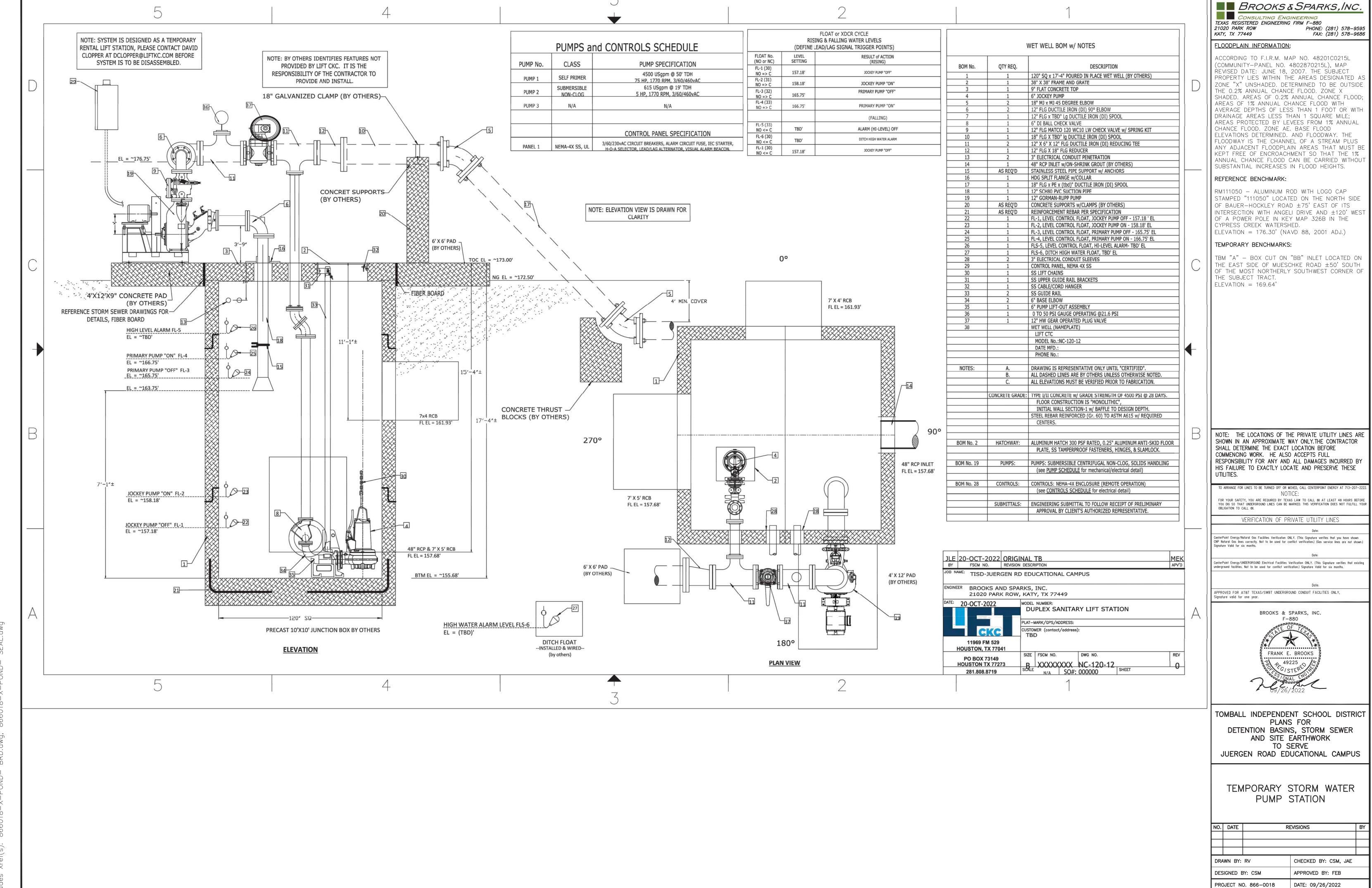


TOMBALL INDEPENDENT SCHOOL DISTRICT PLANS FOR DETENTION BASINS, STORM SEWER AND SITE EARTHWORK TO SERVE

JUERGEN ROAD EDUCATIONAL CAMPUS

TEMPORARY STORM WATER PUMP STATION SITE

NO.	DATE	ATE REVISIONS				
DRAWN BY: RV			CHECKED BY: CSM, JAE			
DESIGNED BY: CSM			APPROVED BY: FEB			
PROJECT NO. 866-0018			DATE: 09/26/2022			
SCA	LE: 1"	=10'	SHEET 43 OF 48			
		<u> </u>	<u> </u>			



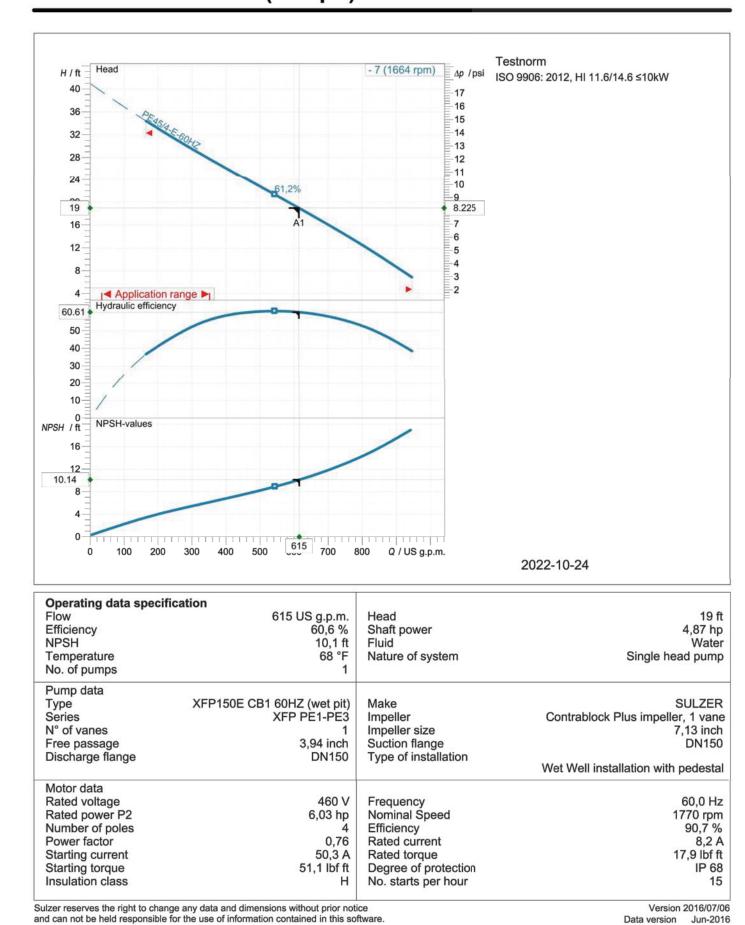
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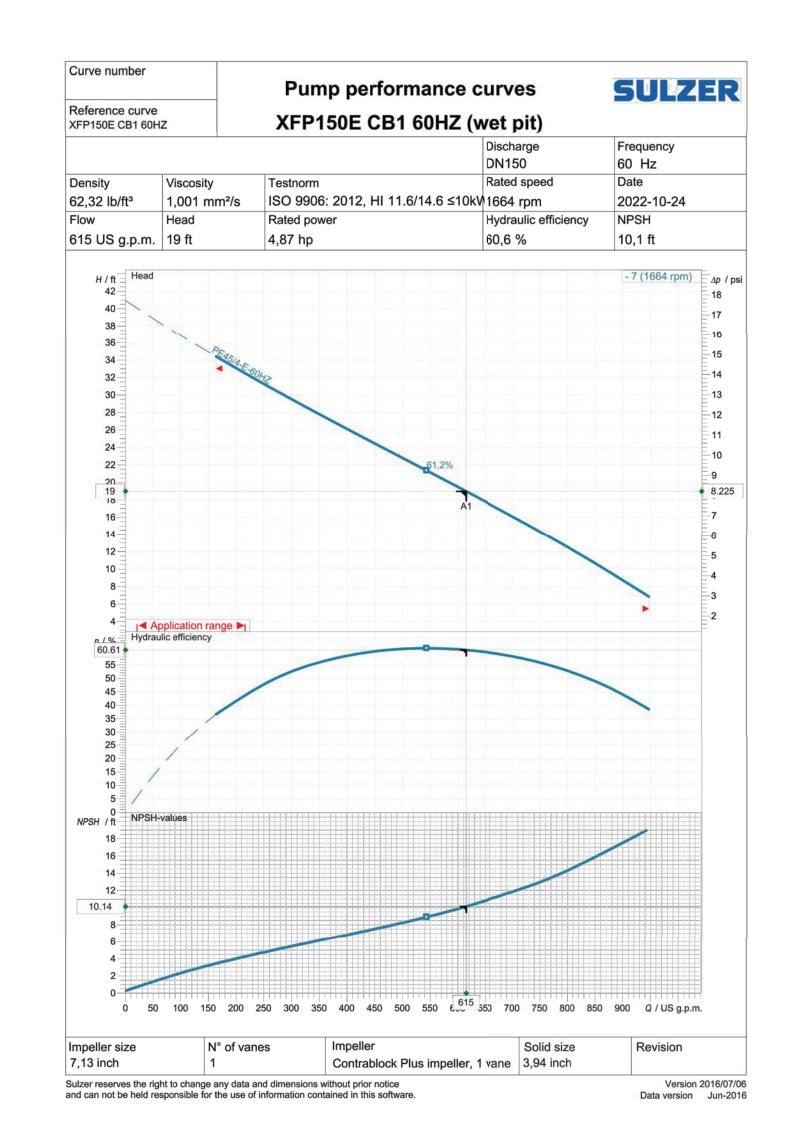
SHEET 44 OF 48

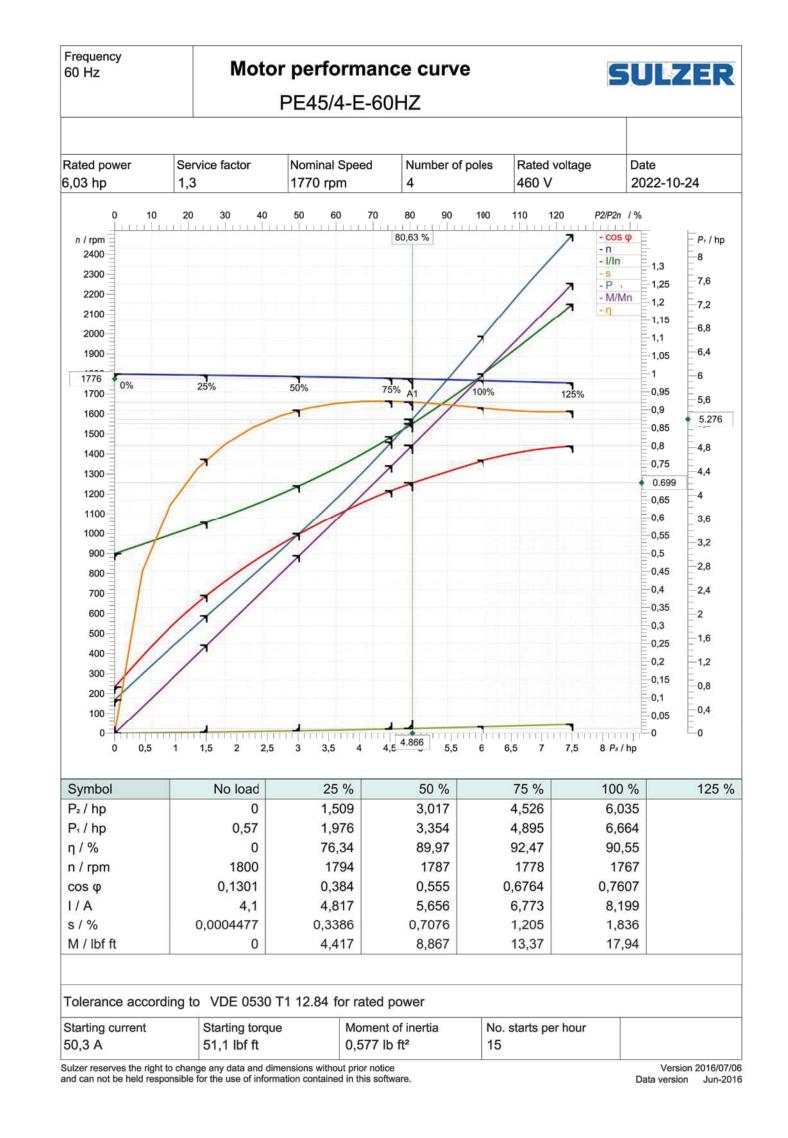
# **SULZER**

# XFP150E CB1 60HZ (wet pit)

27 Oct 2022 4:46PM RobertV \\hou-srv05\CADD\project\BROOK\_SP\Tomb Includes Xref(s): 866018-X-POND- BRD.dwg;









FLOODPLAIN INFORMATION:

KATY, TX 77449

ACCORDING TO F.I.R.M. MAP NO. 48201C0215L (COMMUNITY-PANEL NO. 4802870215L), MAP REVISED DATE: JUNE 18, 2007. THE SUBJECT PROPERTY LIES WITHIN THE AREAS DESIGNATED A ZONE "X" UNSHADED. DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD. ZONE X SHADED. AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD. ZONE AE. BASE FLOOD ELEVATIONS DETERMINED. AND FLOODWAY. THE FLOODWAY IS THE CHANNEL OF A STREAM PLUS ANY ADJACENT FLOODPLAIN AREAS THAT MUST B KEPT FREE OF ENCROACHMENT SO THAT THE 1% ANNUAL CHANCE FLOOD CAN BE CARRIED WITHOUT SUBSTANTIAL INCREASES IN FLOOD HEIGHTS.

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RM111050 - ALUMINUM ROD WITH LOGO CAP STAMPED "111050" LOCATED ON THE NORTH SIDE OF BAUER-HOCKLEY ROAD ±75' EAST OF ITS INTERSECTION WITH ANGELI DRIVE AND ±120' WEST OF A POWER POLE IN KEY MAP 326B IN THE CYPRESS CREEK WATERSHED.

ELEVATION = 176.30' (NAVD 88, 2001 ADJ.)

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TBM "A" - BOX CUT ON "BB" INLET LOCATED ON THE EAST SIDE OF MUESCHKE ROAD ±50' SOUTH OF THE MOST NORTHERLY SOUTHWEST CORNER OF THE SUBJECT TRACT. ELEVATION = 169.64'

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TO ARRANGE FOR LINES TO BE TURNED OFF OR MOVED, CALL CENTERPOINT ENERGY AT 713-207-222 FOR YOUR SAFETY, YOU ARE REQUIRED BY TEXAS LAW TO CALL 811 AT LEAST 48 HOURS BEFORE

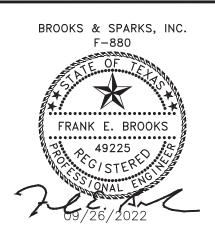
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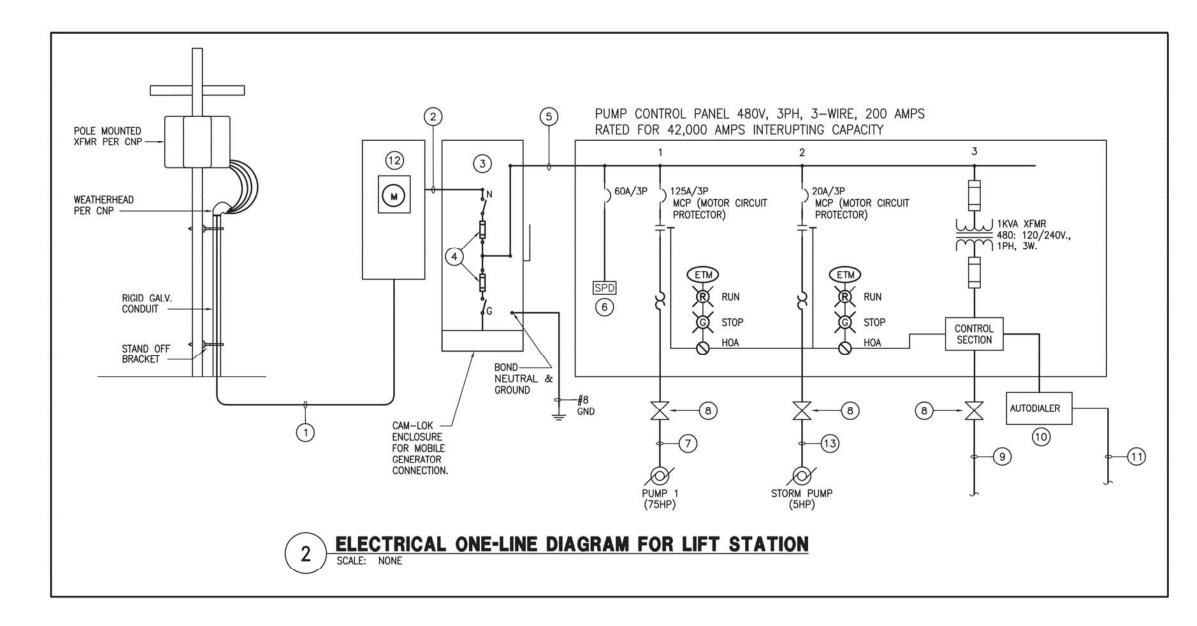


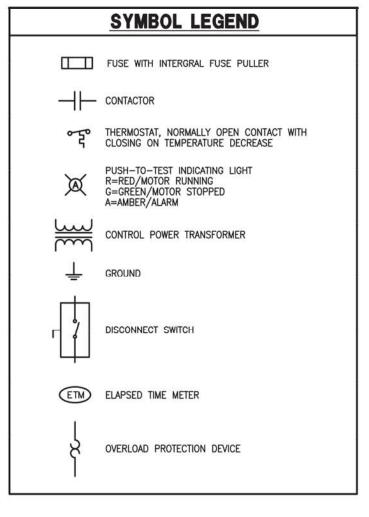
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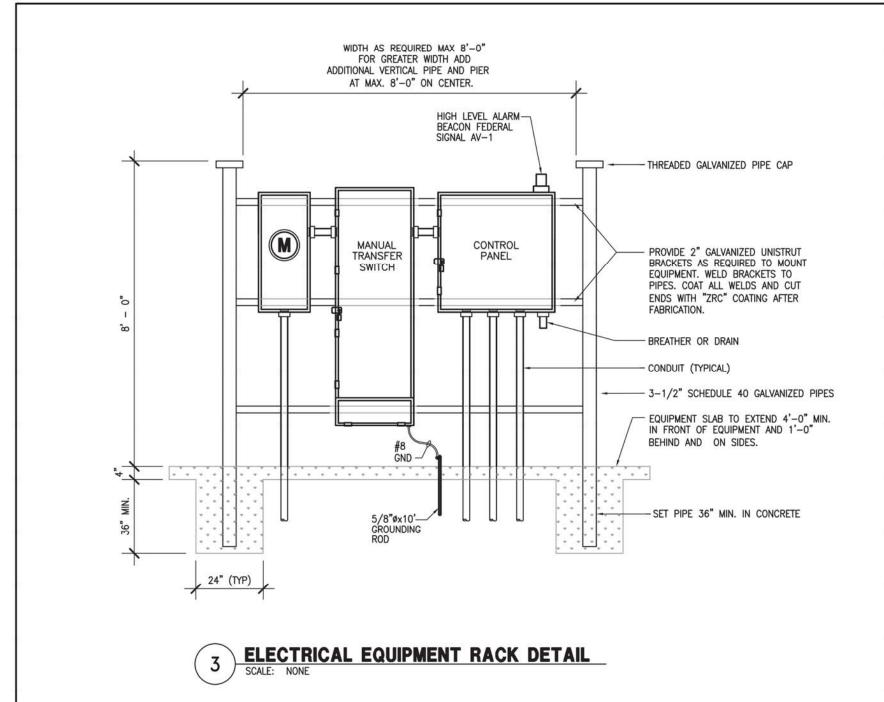
JUERGEN ROAD EDUCATIONAL CAMPUS

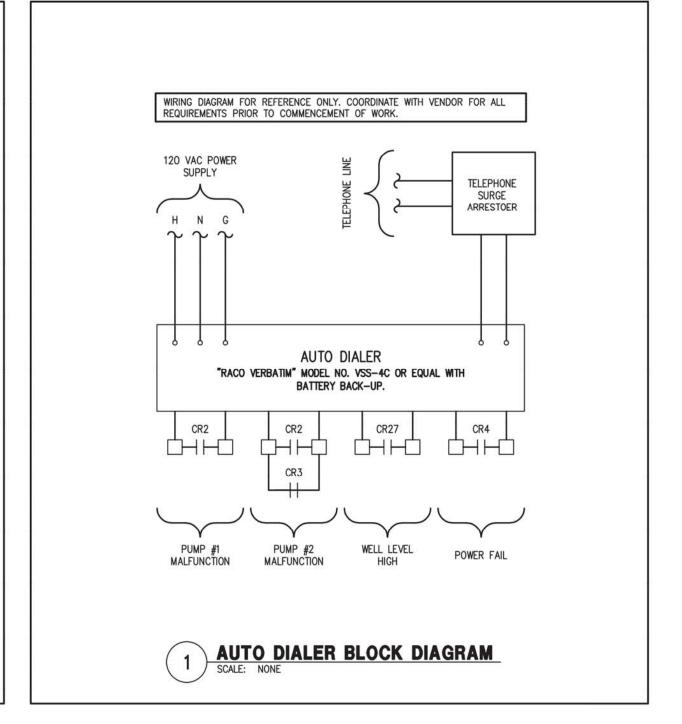
TEMPORARY STORM WATER PUMP STATION **SPECIFICATIONS** 

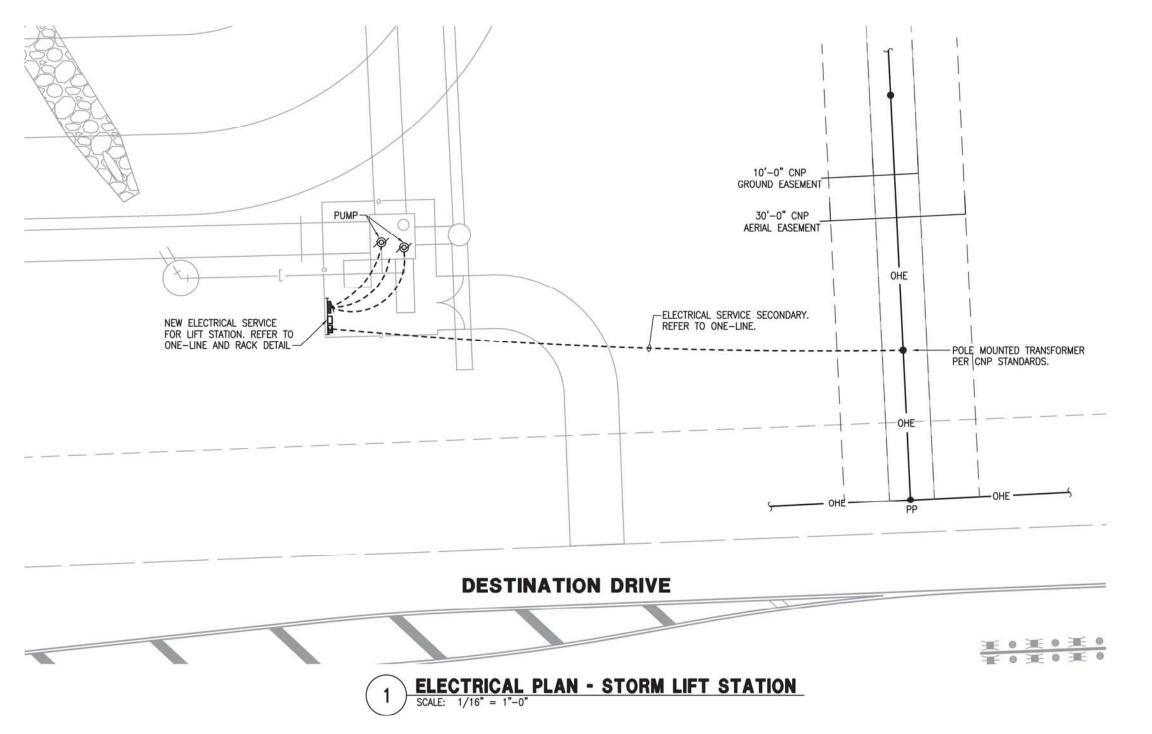
).	DATE	REVISIONS					
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	·						
RAWN BY: RV			CHECKED BY: CSM, JAE	·			
ESIGNED BY: CSM			APPROVED BY: FEB				
ROJECT NO. 866-0018			DATE: 09/26/2022				
CA	LE: 1"	=20'	SHEET 45 OF 48				
		<u> </u>					











# **ELECTRICAL SPECIFICATIONS**

## **SPECIFICATIONS**

\* VERIFY ALL DIMENSIONS AT THE JOB SITE AND FROM THE ARCHITECTURAL

UNLESS OTHERWISE NOTED, CONTRACTOR AND SUBCONTRACTOR SHALL PAY FOR ALL PERMITS AND CHARGES REQUIRED AND SHALL COMPLY WITH ALL GOVERNING CODES AND ORDINANCES.

VISITING THE SITE: EACH BIDDER SHALL VISIT THE SITE OF THE PROPOSED WORK AND SHALL FULLY INFORM HIMSELF REGARDING THE FACILITIES. NO

ADDITIONAL COMPENSATION WILL BE ALLOWED FOR WORK OR MATERIAL

MITTED FROM THE BIDDER'S CONTRACT PROPOSAL DUE TO HIS FAILURE

TO SO INFORM HIMSELF BY SUCH INVESTIGATION. ALL CHANNELING AND PATCHING OF ROOF, FLOOR, CEILING AND WALLS

SHALL BE GENERAL CONTRACTOR.

FURNISH AND INSTALL A COMPLETE ELECTRICAL SYSTEM AS INDICATED ON PLANS. ELECTRICAL CONTRACTOR TO MAKE ALL FINAL CONNECTIONS TO ALL EQUIPMENT. MATERIAL SHALL BE AS FOLLOWS:

ALL ELECTRICAL CONDUCTORS SHALL BE INSTALLED IN CONDUIT COMPLYING WITH THE NATIONAL ELECTRICAL CODE. WHERE INSTALLED SUBJECT TO STRESS FROM COLLISION OR IMPACT, CONDUIT SHALL BE GALVANIZED RIGID STEEL. WHERE RIGID STEEL CONDUIT IS NOT REQUIRED, CONDUCTORS SHALL BE INSTALLED IN ELECTRICAL METALLIC TUBING WITH ELECTRO—GALVANIZING OUT SIDE AND ENAMEL INSIDE. TUBING SHALL BE BY "TRIANGLE" OR AN APPROVED SUBSTITUTION. LIQUID—TIGHT FLEXIBLE METAL CONDUIT SHALL BE USED AT ALL MOTOR CONNECTIONS, OR WHERE MOVEMENT/VIBRATION IS A CONCERN. UNLESS NOTED OTHERWISE FLEXIBLE METAL CONDUIT MAY BE USED ONLY FOR CONNECTION TO LIGHTING FIXTURES, IN LENGTHS NOT TO EXCEED 6 (SIX) FEET. MINIMUM CONDUIT SIZE SHALL BE 1/2 INCH. MINIMUM SIZE FOR FLEXIBLE METAL CONDUIT SHALL BE 1/2 INCH. CONDUIT CONDUCTOR FILL SHALL CONFIRM TO NATIONAL ELECTRICAL CODE, LATEST

\* CARLON PVC TYPE SCH. 40 HEAVY WALL CONDUIT WITH GROUND WIRE MAY BE USED <u>BELOW</u> FLOOR SLAB OR UNDERGROUND IN LIEU OF RIGID, THREADED, GALVANIZED CONDUIT. PVC SCH. 40 CONDUIT SHALL NOT BE RUN IN OR ABOVE FLOOR SLAB, OR IN TILT WALL PANELS. PVC CONDUIT SHALL TERMINATE BELOW FLOOR SLAB WITH RIGID, THREADED METAL CONDUIT ADAPTER. CONDUIT ABOVE SLAB SHALL BE METAL.

\* A GROUND CONDUCTOR SHALL BE SUPPLIED IN NONMETALLIC CONDUIT OR E.M.T. UTILIZING SET SCREW TYPE CONNECTORS. THE GROUND CONDUCTOR SHALL BE BARE, STRANDED, ANNEALED COPPER.

CONDUIT TO BE SUPPORTED FROM JOIST. PROVIDED HANGERS, SUPPORTS AND FASTENINGS AS REQUIRED BY NATIONAL ELECTRICAL CODE DO NOT SUPPORT FROM ROOF DECK.

CONDUIT FITTINGS:

\* ALL CONDUIT FITTINGS SHALL BE STEEL, SET SCREW OR COMPRESSION TYPE INSULATED THROAT, UL LISTED. FITTINGS SHALL BE AS MANUFACTURED BY APPLETON ELECTRIC, OZ GEDNEY CO., ARROW CONDUIT AND FITTINGS CORP.,

ALL CONDUCTORS SHALL BE COPPER. EACH CONDUCTOR SHALL BE CONTINUOUS, WITHOUT WELD, SPLICE, OR JOIST THROUGHOUT ITS LENGTH, AND UNIFORM IN CROSS-SECTION. WIRE #6 AWG AND LARGER SHALL HAVE YPE "THWN" INSULATION. WIRE #8 AWG AND SMALLER SHALL HAVE DUAL-RATED TYPE "THHN/THWN" INSULATION. MINIMUM WIRE SIZE, EXCEPT FOR CONTROL WIRING, SHALL BE #12 AWG. ALL WIRING INSIDE LIGHTING FIXTURES SHALL BE TEMPERATURE RATED PER THE N.E.C. - 90 DEGREES C MINIMUM. BRANCH CIRCUIT WIRING WITHIN 3 INCHES OF FLUORESCENT BALLASTS SHALL BE TEMPERATURE RATED FOR 90 DEGREES C.

## **GENERAL NOTES**

- INSTALLATION SHALL COMPLY WITH LOCAL CODES AND WITH LATEST EDITION OF NEC.
- CONTRACTOR TO PROVIDE CONDUITS FOR MOTOR AND FLOAT CONDUCTORS. PROTECTION DEVICES PROVIDED BY PUMP MANUFACTURER. CONTRACTOR SHALL PROVIDE ALL ADDITIONAL APPURTENANCES, INCLUDING FEEDER WIRING INCLUDING FEEDER WIRING AS NEEDED FOR A COMPLETE INSTALLATION.
- CONTRACTOR SHALL COORDINATE POWER SOURCE WITH OWNER'S REPRESENTATIVE AND PROVIDE ALL NECESSARY PROTECTIVE DEVICES AT POWER SOURCE FOR A COMPLETE SYSTEM. POWER BEING PROVIDED FROM BUILDING UNDER BUILDING UNDER MEP CONTRACT. COORDINATE WITH MEP.
- CONTRACTOR SHALL COORDINATE TELEPHONE LINE WITH MEP. TELEPHONE LINE WILL BE PROVIDED FROM BUILDING UNDER MEP CONTRACT.

# # KEYED NOTES #

- 1) 4#3/0 IN 2"C. ROUTED TO POWER COMPANY POLE MOUNTED TRANSFORMER.
- 2 4#3/0 + 1#6 GND. IN 2"C.
- 3 100A/3P/100AF/N4XSS SERVICE RATED MANUAL TRANSFER SWITCH. BASIS OF DESIGN EATON QUICK CONNECT DOUBLE THROW DISCONNECT SWITCH #DT-4-6-3SN-SN-N4XSS-K-SN-LC. CONTRACTOR TO COORDINATE CAM-LOK CONFIGURATION AND OTHER REQUIREMENTS WITH OWNER PRIOR TO PURCHASE AND
- (4) DUAL ELEMENT, TIME DELAY, CLASS RK5 FUSE, BASIS OF DESIGN BUSSMANN #FRS-R-100.
- (5) 3#3/0 + 1#6 GND IN 2"C.
- 6 480V, 3PH, N4X SURGE PROTECTION DEVICE 80KA PER MODE AND 160KA PER PHASE. BASIS OF DESIGN ACT COMMUNICATIONS ACT SURGE STRYKER #455-277Y-80. SPD SHALL BE PROTECTED WITH 60A CIRCUIT BREAKER USING 5#6.
- (7) 3#1 + 1#6GND IN 1-1/2"C.
- (8) INSTALL "EYS" TYPE SEAL-OFF IN ALL CONDUITS FROM LIFT STATION. USE NON-HARDENING CHICO 'A' TYPE SEALANT.
- (9) PROVIDE 2" CONDUIT WITH PULL WIRE BETWEEN CONTROLLER AND LIFT STATION FOR LOW VOLTAGE WIRING. CONTRACTOR TO COORDINATE WITH VENDOR FOR ALL REQUIREMENTS PRIOR TO COMMENCEMENT OF WORK.
- 10 AUTO-DIALER AS REQUIRED. REFER TO AUTO-DIALER DETAIL FOR MORE INFORMATION.
- (11) PROVIDE (1) 2"CONDUIT WITH PULL STRING FOR PHONE LINE TO AUTO-DIALER. COORDINATE TERMINATION POINTS AND OTHER REQUIREMENTS WITH OWNER/VENDOR PRIOR TO COMMENCEMENT
- (12) PROVIDE UTILITY METER/SUB-METER AS REQUIRED BY OWNER/UTILITY COMPANY.
- (13) 3#12 + 1#12GND IN 3/4"C.

Drawn By:

Checked By:

Revision Dates:

Date: 10-20-2022

CONSULTANTS

10930 W. SAM HOUSTON PKWY N., SUITE 900

Houston, Texas 77064 281.664.1900 | Registration No. F-4111

Project No. 2022-03503-00

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AL ST

SALASO'BRIEN

MEP ENGINEERS

SALAS O'BRIEN

HOUSTON, TX 77064

OFFICE: 281-664-1900

FAX: 281-664-1912

**FLOODPLAIN INFORMATION:** 

21020 PARK ROW

KATY, TX 77449

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■■ BROOKS & SPARKS, INC.

PHONE: (281) 578-9595

FAX: (281) 578-9686

CONSULTING ENGINEERING TEXAS REGISTERED ENGINEERING FIRM F-880

## REFERENCE BENCHMARK:

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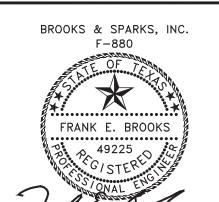
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TOMBALL INDEPENDENT SCHOOL DISTRICT PLANS FOR DETENTION BASINS, STORM SEWER AND SITE EARTHWORK TO SERVE

TEMPORARY STORM WATER PUMP STATION

APPROVED BY: FEB

DATE: 09/26/2022

SHEET 46 OF 48

ELECTRICAL

JUERGEN ROAD EDUCATIONAL CAMPUS

NO. DATE REVISIONS CHECKED BY: CSM, JAE DRAWN BY: RV

DESIGNED BY: CSM

SCALE: 1"=20'

PROJECT NO. 866-0018

**ELECTRICAL STORM** LIFT STATION PLAN

1 7/16" X 1 1/2"

CHAIN LINK AS

14GA RAIL

SPECIFIED

4" MIN POST

HEAVY DUTY FULCRUM LATCH

ROD WITH

GRADE

1. POST SIZE DEPENDS ON FENCE HEIGHT AND WIND

LOADS, POST SIZES PER CHAIN-LINK MANUFACTURER

2. ENSURE PROPER ADA/TAS MOUNTING HEIGHTS FOR

3. REFER TO GATE SCHEDULE FOR GATES TO RECEIVE

CHAIN-LINK GATE

ADJUSTABLE FITTING

TOP PF PAV'G/

3'0" MIN. FOOTING

ALL HARDWARE.

CARD READERS.

3/8" TENSION BRACE



■■ BROOKS & SPARKS, INC. CONSULTING ENGINEERING TEXAS REGISTERED ENGINEERING FIRM F-880 PHONE: (281) 578-9595 FAX: (281) 578-9686 21020 PARK ROW

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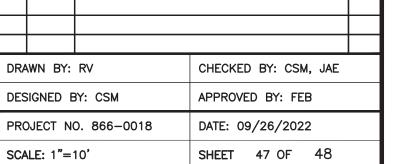
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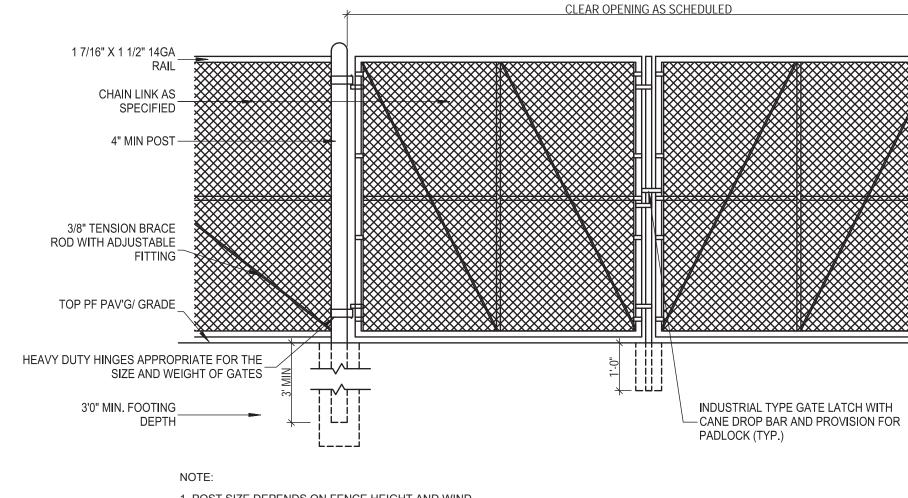
TOMBALL INDEPENDENT SCHOOL DISTRICT PLANS FOR DETENTION BASINS, STORM SEWER AND SITE EARTHWORK TO SERVE JUERGEN ROAD EDUCATIONAL CAMPUS

> FENCE & GATE DETAILS

NO. DATE



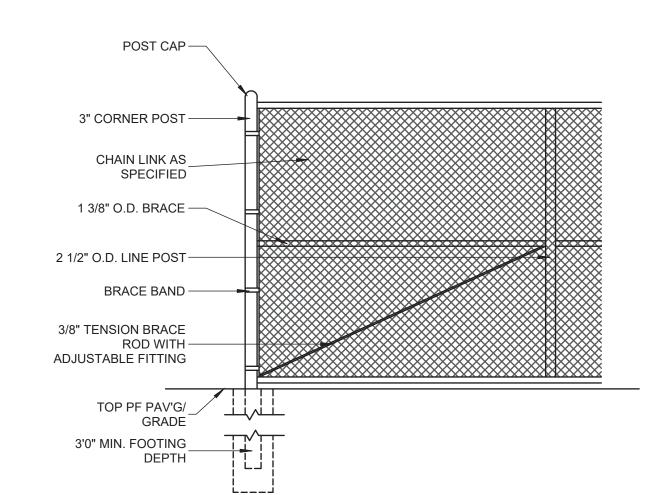
REVISIONS



1. POST SIZE DEPENDS ON FENCE HEIGHT AND WIND LOADS, POST SIZES PER CHAIN-LINK MANUFACTURER 2. ENSURE PROPER ADA/TAS MOUNTING HEIGHTS FOR ALL HARDWARE.

3. REFER TO GATE SCHEDULE FOR GATES TO RECEIVE CARD READERS.

CHAIN-LINK DOUBLE GATE



3. REFER TO GATE SCHEDULE FOR GATES TO RECEIVE CARD READERS.

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NOTE:

ALL HARDWARE.

CHAIN-LINK FENCE









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