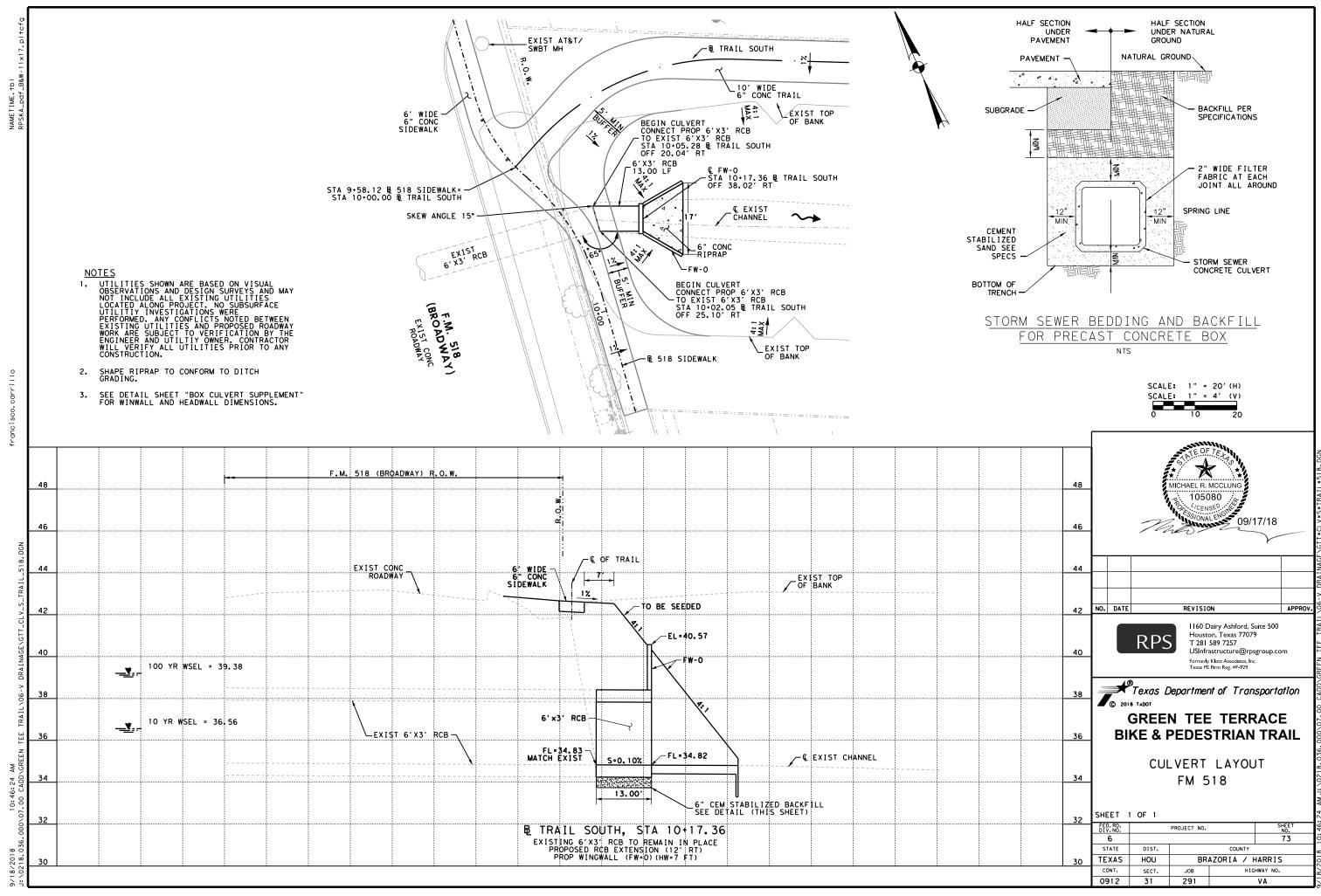
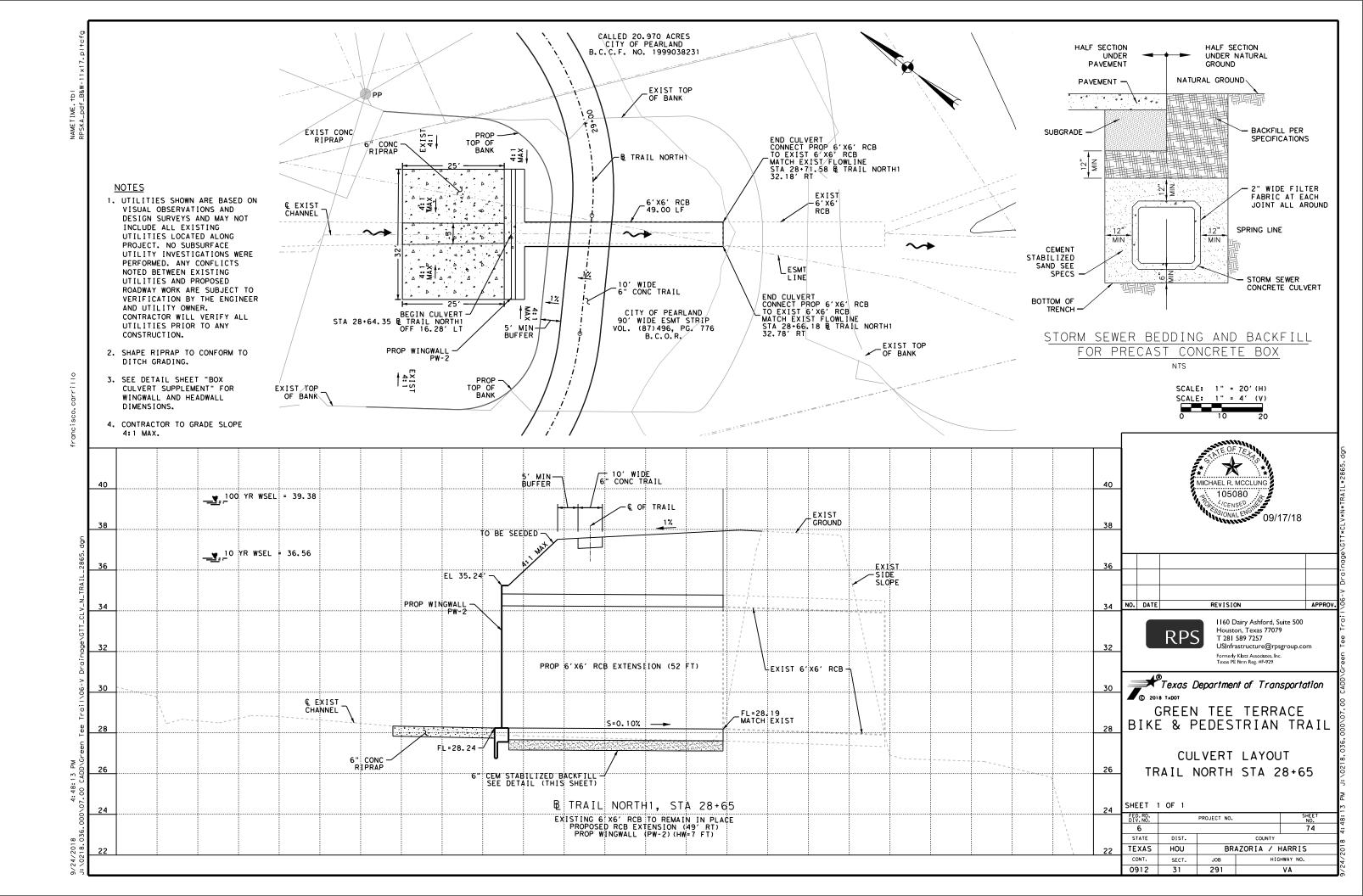
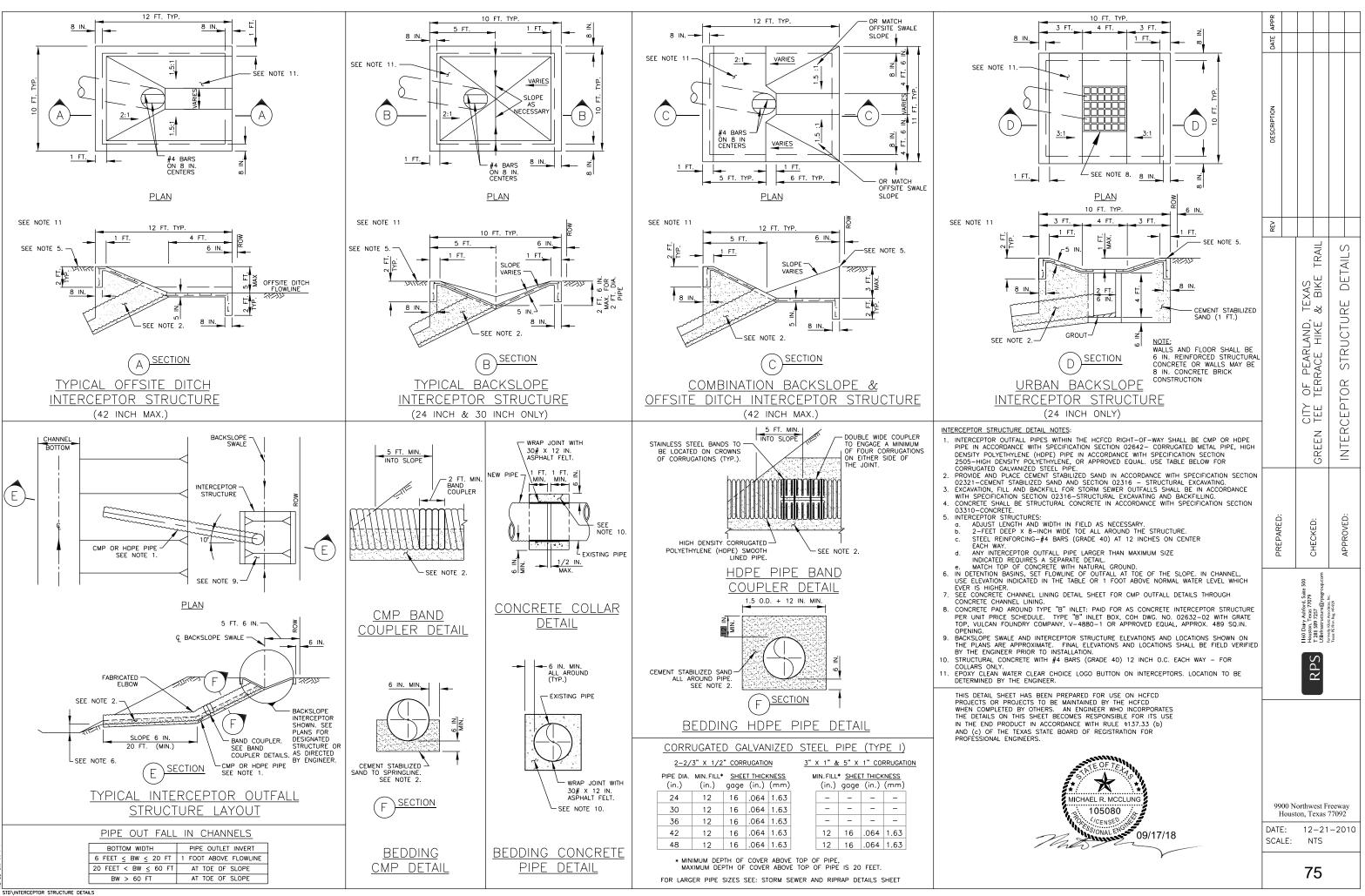
DESCRIPTION OF PROPERTY 1. PAVING RESIDENTIAL / SUBDIVISION DRAINAGE COMMERCIAL / OTHER SITE DRAINAGE WATER AND WASTEWATER (FOR H.C. PUBLIC R.O.W. ONLY I. LEGAL DESCRIPTIO COMMERCIAL PROJECTS I. PROPOSED DRAINAGE AREA PROPOSED DRAINAGE SYSTEM TYPE A ACREAGE STARILIZED DESIGN STEEL SPACING STORM SEWER NEW DEVELOPMENT AREA: DOES PROPERTY HAVE EXISTING AND/OR PROPOSED UTILITIES SUBGRADE DEPTH STRENGTI B. SUBDIVISION -DEVELOPMENT AREA (AMOUNT INCREASED IMPERVIOUS AREA): ONG TRANS. ROADSIDE DITCH CONCRET □NES □NO LOW IMPACT DEVELOPMENT (LID) LOW IMPACT DEVELOPMENT (LID) IF YES, WHECK THE BOX THAT APPLIES TO THIS PROJECT (IN.) (PSI)(IN.) X SURVEY & ABSTRACT: PUBLIC WATER & SANITARY II. DESIGN METHOD USED II. DETENTION VOLUME C.L. DAVIS & CO. LAND SURVEYING * .55 (CHANNEL) PRIVATE WATER WELL & SEPTIC SYSTEM CITY OF HOUSTON ____ YEAR FREQUENCY *□ .65 (STM SWR) D PUBLIC WATER & PRIVATE SEPTIC SYSTEM C. ADJACENT ROADS: FM 518 (BROADWAY), PEARLAND PKW NEW AREA DRIVEWAYS (in H.C. ROW only) ACRE FEET * 1.00 (RD. DITCH) PRIVATE WATER WELL & PUBLIC SANITARY PROVINCE VILLAGE DR. NUMBER OF DRIVEWAY APPROACHES PROPOSED INCLUDE REPAVING EXISTING DRIVEWAYS AS WELL AS NEW DRIVEW III. DRAINAGE SYSTEM OUTFALLS DIRECTLY TO EXISTING NOTE: PUBLIC UTVLITIES REQUIRE A LETTER FR MUNICIPALITY AUTHORIZING SERVICE & PROPOSED DETENTION ACRE FEFT OM THE DISTRICT DETENTION POND (APPROVED H.C. PRJ NO.): DETENTION POND MAINTAINED BY: ______
HCFCD DRAINAGE DITCH UNIT NO.: ______ IL PLATTING PROPOSED DETENTION VOLUME = _____ ACRE FEET PROPOSED DETENTION VOLUME CALCULATIONS ARE SHOWN ON SHEET DRWY WIDTH WATERIAL CULVERT? CULVERT NEAPEST DIST. TO X-STREET A. SUBDIVISION PLAT B. STREETS PROPO THIS IS REOURED FOR PLAN APPROVA DETENTION VOLUME PROVIDED BY EXISTING DETENTION POL PUBLIC
PRIVATE
PUBLIC &
NONE PROPOSED PLAT / REPLAT □ H.C. ROADSIDE DIACH (ROAD NAME): ____ □ H.C. STORM SEWER (APPROVED H.C. PRJ UTILITY DISTRICT/MUNICIPALITY NAME: PPROVED H.C. PROJECT NO.: APPROVED H.C. PROVIDED ON RECORDED PLAT / REPLAT NOTE: SEPTIC SYSTEMS REQUIRE H.C. WASTE WATER REVIEW IV. H.C. OUTFALL CALCULATIONS H.C. SEPTIC PERMIT/REQUEST NO PLAT NAME: UTFALL TO I H.C. ROADSIDE DITCH CROADSIDE DITCH OUTFALL: ALLOWABLE OUTFALL RATE: 0.0027 x _____ LF Frontoge = _____ (CFS) PROPOSED OUTFALL RATE: _____ (CFS), CALCULATIONS PROVIDED ON SHEET HARRIS COUNTY STANDARD DRIVEWAY DETAIL PPEARS ON SHEE EXISTING H.C.
 OTHER _____ H.C. WASTE WATER REVEWR A ROVAL FIRE APPARATUS ACCESS ROAD NAME & DATE: __ STORM SEWER OUTFALL CAPACITY ALLOCATED TO TRACT FROM FROM DRAINAGE AREA MAP DATED: PREPARED BY: APPROVED H.C. PROJECT NO.: III. JURISDICTIONS ROADSIDE DITCH OUTFALL REQUIRED AND SHOWN ON SHEET(S) **REVIEWER COMMENTS:** ALLOWABLE OUTFALL RATE: 0.0027 _ LF Frontage = ____ (CFS) LCULATIONS PROVIDED ON SHEET A. MAP: ___ X CITY OF PEARLAND NOT REQUIRED DUE TO PROPOSED OUTFALL RATE: ETJ, CITY OF HOUSTON TIRRIK STORM SEWER OUTFALL FROM D. A. _ (CFS) I. ISLANDS AND MEDIANS REQUIRE STANDARD 6" CURBING ACTUAL OUTFALL RATE: CAS), CALCULATIONS PROVIDED ON SHEET __ FROM DRAINAGE AREA MAP DA II.
STANDARD 6" CURBING PROPOSED
4" x 12" CURBING PROPOSED EXCEPT AT MEDIANS AND ISLANDS IV. HCAD ACCOUNT NOS. (ALL) KEY MAP PAGE 615M. R PREPARED BY: _____ NOTE: ALL EXISTING AND PROPOSED UTILITIES MUST BE ACCURATELY SHOWN & LABELED ON THE SITE PLANS. V. DETENTION PROVIDED BY DETENTION BASIN IS PART 1 PLAN SET. SERVICE AREA MAP IS ON SHEET ACTUAL OUTFALL RATE: (CFS), CALCULATIONS PROVIDED ON SHEET **ADERATIONS** TRAFFIC CL REGIONAL DETENTION BASIN SYSTEM (APPROVED C. PRJ NO.): _____ IV. PUMPED DETENTION FACILITIES II. SUBDIVISION PROJECTS MEDIAN CUTS VOLUME THAT GRAVITY FLOWS:______ VOLUME THAT US PUMPED: ACRE FFFT V. UNOBSTRUCTED VISIBILITY EASEMENT (U.V.E.) PROPOSED STORM SEVER IS SUBMERGED (AGREEMENT MUST BE PROVIDED). UTILITY DISTRICT/MUNICIPALITY NAME: □ NO MEDIAN CUT OR RE CATION IS ACRE FEFT ROPOSED VOLUME INAL POWIEU: ACRE FEET MEDIAN MODIFICATIONS ARE SHOWN O NASHEET. STATIC W.S.E. @ OUTFALL IS . REQUIRED AND SHOWN ON SHEET(S) ______ D PRIVATE WATER & WASTE WATER SYSTEMS ☐ NOT REQUIRED I. LEFT / RIGHT TURN LANE PRIVATE WATER & INDIVIDUAL OSSF IN LANE IS PROPOSE NOTE: ALL APPROVED, FINAL PLATS AND ASSOCIATED CPC101 FORMS MUST BE INCLUDED WITH PLAN SUBMITTAL. OFFSITE SHEET FLOW: (100 YEAR) INDIVIDUAL WATER WELL & OSSF LEFT / RIGHT TURE LANE IS SHOWN ON S I FLOW MAPPING, TOTAL DISCHARGE CAL COPY OF TCEQ APPROVAL FOR PRIVATE WATER & ATER SYSTEMS IS REQUIRED FOR PLAN APPROVAL. V. FLOW RESTRICTOR SIZE CONFORMING SUBDIVISION II. TRAFFIC CONTROL PLAN COMODATIONS ARE SHOWN ON SHEET _____OR, AS PROVED DRAINAGE STUDY ENTITLED ESENTE OUTFALL PIPE SIZE: RESTRICTOR PIPE SIZE: □ NON-CONFORMING SUBDIVISION ESIG I THI NO WORK IN THE RIGHT OF WAY IS PROPOSE WOULD INTERFERE WITH TRAFFIC FLOW PARTIALLY NON-CONFORMING SUBDIVISION E: DEDICATED UNDERGROUND FIRE LINES MUST BE SUBMITI CREAGE L ROADSIDE DITCH OUTFALLS REQUIRE EROSION CONTROL MEASURES. S NOT ALLOWED AS AN EROSION CONTROL MEASURE IN HARRIS COUNTY ROI PED DETENTION OUTFALLS TO COADSIDE DITCHES REQUIRE MANHOLE W.U. TRAFFIC CONTROL SHOWN ON SHEET ARRIS COUNTY FIRE PROTECTION GROUP FOR REVIEW AND DISCHARGE = IV. TRAFFIC SIGNAL OTE: ALL OFFSITE SHEET FLOW FROM ADJACENT PROPERTIES MUST BE DENTIFIED AND PROPERLY ACCOUNTED FOR IN THE PROJECT. THE SIGN NGINEER HEREBY CERTIFIES THAT THESE AREAS HAVE BEEN ADDRESSEL □ NO TRAFIC SIGNAL IS EXISTING / PROPOSED EXISTING TRAFFIC SIGNAL DEVICES (T.C. BOXES AND LOOPS SHOWN ON SHEE PROPOSED TRAFFIC SIGNAL (BY OTHERS) TRAFFIC IMPACT ANALYSIS □ TO TRAFFIC IMPACT ANALYSIS IS REQUIRED □ TRAFFIC IMPACT ANALYSIS HAS BEEN APPROVED ON DATE:_ 9. WORK IN HCFCD RIGHT-OF-WAY 8. FLOOD PLAIN STATUS PERMITS REQUIRED PLAN TITLE: 10. HCPID PROJECT NO .: ____ I. GENERAL INFORMATION RRM PANEL(S) FOR PROPERTY: 480.39000351, 48201010351, 480.39000451, 48201010451, L.T RRM PANEL(S) DATE: SEPTEEMER 22, 1999, JUNE 18, 2007, SEPTEMBER 22, 1999, JUNE 18, 2007, DOES THE PROPERTY HAVE ANY VIOLATIONS? IF SO PLEASE PROVIDI I. TYPE OF WORK TO BE PERFORMED IN CHANNED ALL VIOLATION NUMBERS OUTFALL
UTILITY CROSSING
ROADWAY BRIDGE STATUS OF PROPERTY ON MAP U UILUTY CROSSING ROADWAY BRIDGE / CULVERT CROSSING IR CRADAWAY BRIDGE / CULVERT CROSSING RELABLITATION OF CHANNEL MAINTENANCE TEMPORARY CROSSING OTHER IS OF PROPERTY ON MAP ENTIRELY LOCATED IN UNSHADED ZONE "X" LOCATED PARTIALLY OR ENTIRELY IN ANY "A" ZONE OR SHADED ZONE "X", DELINEATE FLOODFLAIN BOUNDARY ON CONSTRUCTION DRAWINGS (DRAINAGE LAYOUT PG. NO.____) (BASE FLOOD LEVEL_____) FLOOD CONTROL DISTRICT CRITERIA TO BE FILLED OUT BY HARRIS COUNTY L DETENTION SUM STORM WATER QUALITY □ SEPTIC (EXISTING) □ SEPTIC (PROPOSED) VATER DETENTION BASIN ROUTING TABL SITE REMOVED FROM FLOODPLAIN BY LOMR, LOMR-F, LOMA CASE NO._____ REVISED FLOODPLAIN IS SHOWN ON SHEET____ ANX BASIN DRAIN TIME (100-YE-PERTIT) = _____ HOURS VELOPED POWL DETENTION BASIN MAXIMUM WATER PEAK STORACE STORACE RATE VELOPED POWL DETENTION (CFS) SURFACE ELEVATION VOLUME (AC-FT) (AC-FT PER AC) DETENTION BASIN DRAINAGE AREA = RAINFALL EVENT PROBABILITY PRE-DEVELOPED RUNOFF (CFS) CIVIL SITE WORK (PHASE II PERMIT CLASS | (non-floodplgin)) PEAK POST-DEVELOPED RUNOFF (CF ELEVATION INFORMATION BENCHMARK USED III HARRIS COUNTY FLOODPLAIN REFERENCE MARK HARRIS-GALVESTON COASTAL SUBSIDENCE DISTRICT BENCHMARK (FOR COASTAL AREAS) DESCRIPTION OF BENCHMARK INCLUDING ELEVATION, DATUM AND YEAR OF AQUISTMENT (2001 AQU) HIKE AND BIKE TRAIL CIVIL SITE WORK (PHASE II PERMIT CLASS II (floodplain)) DRIVEWAY WITH CULVERT _____ CURB AND GUTTER ____ II. USACE ENVIRONMENTAL PERMIT 10% EXCEEDANCE (10-YEAR) US ARMY CORPS ENGINEERS NATIONWIDE PERMIT NUMBER(S) \Box building permits (no. of buildings = ____) \Box critical facility 1% EXCEEDANCE (100-YEAR) ADDITIONAL CRITERIA EOR PUMPED DETENTION BASINS □ SUBDIVISION INFRASTRUCTURE PHASE II (NO. OF LOTS = _____) US ARMY CORPS OF ENGINEERS INDIVIDUAL PERMITS OF BUMPED 1% EXCEEDANCE STORAGE VOLUME = _____AC-FT ____F TOTAL VOLUME MPDESIGN OUTFLOW VELOCITY INTO HCFCD CHANNEL = _____FT./SEC. THE FOR BASIN = _____HOURS RASED ON OTHER □ NOTICE OF DETENTION AFFIDAVIT REQUIRED RM. NO. 01030 ELEV. 37.33 (NAVD88 2001 ADJ.) HEAD CONDITIONS NO PERMITS REQUIRED EXPLAIN: □ MUD MAINTENANCE AGREEMENT REQUIRED □ HCFCD ROW NOTIFICATION PERMIT REQUIRED FLOOD PLAIN DETERMINATION BASED ON GROUND ELEVATION STORMWATER DRAINAGE DESIGN REPORT PROPERTY LIES ENTIRELY ABOVE THE BASE FLOOD LEVEL AND IN SHADED ZONE "X" PROPERTY LIES PARTIALLY OR ENTIRELY BELOW THE BASE FLOOD NOTES: REPORT TITLE DRAINAGE IMPACT ANALYSIS GREEN TEE TERRACE TRAIL CLEAR CERAK A100-00-00 REPORT DATE JULY 18, 2018 ENGINEERING FIRM RPS WORK IN HARRIS COUNTY R.O.W. III. FLOODPLAN STORAGE SUMMARY (APPLIES ONLY TO PORTION OF LAND LOCATED WIT DATE OF ACCEPTANCE BY HCFCD OR FLOODPLAIN ADMINISTRATOR _______ HCFCD PROJECT # _________ 180802105_____ A. TOTAL VOLUME OF MATERIAL PROPOSED TO BE MOVED OR PLACED WITHIN THE FIRM DELINEATED FLOODFLAIN (FILL, BASE, CONCRETE, ADFHAIT, ETC.): i.e., BELOW NEVATION (ILL, BASE, CONCRETE, ADFHAIT, ETC.): B. TOTAL VOLUME ON MATERIAL PROPOSED TO BE REMOVED FROM THE FIRM DELINEATED FLOODFLAIN; PROPOSED TO BE REMOVED FROM THE FIRM i.e., BELOW ELEVATION (2001 ADJ.) (UBIC YARDS REFERENCE / BASIS OF DETERMINATION SENVIRONMENTAL CONSULTANT REPORT LEFT TURN LANE STORMWATER DETENTION FOR THE PROPOSED WORK CONTAINED IN THESE PLANS IS PROVIDED BY OTHER PLANS: □ OTHER CONSTRUCTION PLAN TITLE GREEN TEE TERRACE HIKE AND BIKE TRAIL REPORT ENGINEERING FIRM ______RPS_____ DATE SIGNED BY HCFCD ______BD_____ HCFCD PROJECT # 180802105 OTHER NOTES: II. HCFCD STANDARD NOTES: SEE SHEET _____ OF THESE PLANS. C. FILL AREA & VOLUME CALCULATIONS ARE SHOWN ON SHEET A PERMIT IS REQUIRED FOR EACH SCOPE OF WORK ON SITE. A NOTIFICATION IS REQUIRED FOR EACH SCOPE OF WORK IN HC OR HCFCD ROW. III. HCFCD STANDARD DETAILS: SEE SHEET_____ OF THESE PLANS. REFER TO www.eng.hctx.net/permits FOR EACH SCOPE OF WORK IN HC OR IN HCFCD ROW. IV. LOMR REQUIRED CLOMP UIRED JLES: 1. - III, REQUIRED ON PROJECTS WITH WORK IN A HCHED CHANNE! PLANSE REFERENCE SECTION 17 OF THE FLOOD CONTROL DISTRICT POLICY, CRITERIA, AND PROCEDURE MANUAL FOR MORE INFORMATION IV. REFER TO PLAN SHEETS FOR EXISTING AND PROPOSED RIGHT OF WAY DELINEATION AND COMPLETE RECORDING INFORMATION TO INCLUDE CLERK'S FILE NUMBERS, TYPE OF ESTATE (e.g., DRAINAGE EASEMENT, FEE STRIP, ETC.) AND GRANTEE (e.g. COH, HCFCD, PUBLIC, TXDOT, ETC.) 11. <u>CURB RAMPS</u> A. ARE CURB RAMPS THAT CONNECT TO PUBLIC STREETS PROPOSED II THIS SET OF PLANS? [X] YES [] NO NOTES: I. COMPLETE ONLY IF HCFCD OR HARRIS COUNTY IS REQUIRING DETENTION. I. COMPLETE ONLY IF PROJECT HAS WITHIN IT OR IS IMMEDIATELY ADJACENT TO AN EXISTING OR PROPOSED HCFCD MAITINGD CHANNEL OR DETENTION BASIN. 12. LANDSCAPING REQUIRED AND SHOWN ON SHEET(S) 118 - 131 PROFUSED TOJUS MAINIARED UMAINEL OF DELENION BASIN.
IC COMPLETE ONLY IF PROJECT INCLUES NEW OUTRAL, BACKSLOPE INTERCEPTOR OR OTHER RELIED WORK WITHIN AN EXISTING OR PROPOSED INFOCTO MAINTANED CHANNEL OR DETENTION BASI IN. COMPLETE ONLY OF PROJECT HAS WITHIN OR INVERSITELY TO JUST AN EXISTING OR PROPOSED PUBLIC DRAINAGE CHANNEL OR DETENTION BASIN. BENCHMARK REQUIREMENTS FOR PROPOSED BRIDGES AND OR NEW RESIDENTIAL SUBIDIVSIONS NOT REQUIRED en the County Engineer has determined that a new benchmark will be required to be established for ject, the developer shall be required to install a benchmark per section 8.0, part 2 of t frastructure Regulations new Benchmark required for this project? (to be determined by Harris County) [_] yes [_] DATE SHEET NO. ew Benchmark is required, the proposed benchmark information is shown on sheets HARRIS COUNTY GEOTECHNICAL INVESTIGATIONS WERE COMPLETED BY. GEOTEST ENGINEERING, INC ENGINEERING DEPARTMENT 5600 BINTLIFF, HOUSTON, TEXAS 77036 REFER TO APPROVED MAY 31, 2018 REPORT (1140225001) **REVIEW SHEET** VERSION 16.0 JANUARY 1, 2018 HARRIS COUNTY PROJ

6. <u>STORMWATER QUALITY</u>		
I. SWPPP: CONSTRUCTION MEASURES. (Complete for	r ALL projects)	
DISTURBS >1AC. SITE PLAN & DETAILS ON SHEET(S) 103 - 113	
DISTURBS <1AC. N/A II. APPLICABILITY FOR PERMANENT FEATURES. (must	be completed on all project	te)
EXEMPT NEW DEVELOPMENT:		<u>(5)</u>
PROJECT IS ON A PARCEL (A COMMON PLAN OF D (must be verified with plat)	VELOPMENT) LESS THAN 5 ACRE	ïS.
Y, EXEMPT REDEVELOPMENT:		
PROJECT DOES NOT MEET THE DEFINITION OF SIGN Sec. 2.39 of Regulations of Harris County, Texas fi		nt)
EXEMPT GRANDFATHERED:		,
PROJECT'S DRAINAGE TIES <u>DIRECTLY</u> INTO AN EXIST OCTOBER 1, 2001.	NG DRAINAGE SYSTEM PRIOR TO	
PRIVATE (FOR VERIFICATION: PROVIDE ORIGINAL DRAINAGE AF	EA MAP INCLUDING CALCULATION	S)
GENERAL:	IRISDICTION OF CITY OF PEARLAI	ND
STORWATER QUALITY PERMIT REQUIREMENT IS COVE		
PROJECT TITLE:		
	SWQ PERMIT NO	_
STORMWATER QUALITY MANAGEMENT PLAN:		
III. PERMANENT SWQ FEATURES. (COMPLETE IF NO	EXEMPT)	-
□ VEGETATIVE CONTROLS USED: (FILTER STRIP, GRASS	SWALE, URBAN FORESTRY)	
DETAILS AND CALCULATIONS APPEAR ON SHEET(S) _ POND STRUCTURE USED (WET, DRY, WETLANDS) DE	AILS AND CALCULATIONS	
APPEAR ON SHEET(S)		
HYDRODYNAMIC TYPE SEPARATOR MODEL:		
□ OTHER(S):		
HCED SIGNATURE BL	ЭСК	
PROJECT NAME: <u>GREEN TEE TERRACE HIKE AND BIKE TF</u>		
ADDRESS: O BRAZORIA CITY L		
WAS ACCEPTED BY THE FOLLOWING GROUPS FOR THE F	URPOSES LISTED BELOW:	
ENGINEERING DIVISIO	r	
BY INTERPOSE NO OBJECTION	DATE	
BY AS TO LOCATION OF ITEMS IN COUNTY RIGHT OF WAY	DATE	
RY AS TO PAVING AND/OR DRAINAGE ONLY		
BY AS TO PAVING AND/OR DRAINAGE ONLY	DATE	
BY AS TO STORM WATER QUALITY	DATE	
ADDITIONAL COMMENTS:	UNIC	
HARRIS COUNTY FLOOD CONTROL	DISTRICT	
INTERPOSE NO OBJECTION		
FOR ITEMS LOCATED OUTSIDE OF HCFCD RIGHT-OF-WAY	DATE	
APPROVED: BY	DATE	
FOR ITEMS LOCATED WITHIN EXISTING HCFCD RIGHT-OF-WAY		
PV	DATE	
FOR ITEMS LOCATED WITHIN PROPOSED HCFCD RIGHT-OF-WAY		
ADDITIONAL COMMENTS:		
THE PROJECT WAS REVIEWED, HOWEVER, THIS DOES NOT MEAN THE ENTIRE PROJE	T, INCLUDING ALL SUPPORTING DATA	
THE PROJECT WAS REVIEWED, HOWEVER, THIS DOES NOT MEAN THE ENTIRE PROJE AND CALCULATIONS HAVE BEEN COMMETELY CHECKED AND VERHED. THESE DRAW BY A RROFESSIONAL ENDERRE LICENSED TO PRACICE IN THE STATE OF TEXAS. Y RESPONSIBILITY AND ACCOUNTABILITY. THIS DOES NOT RELIEVE ANY PRATY FROM AND LOCAL ENVIRONMENTA RULES, LANS, AND REQULATIONS AND ANY OTHER LEE RELATED TO LAND DEVILOPMENT. IF THE CITY SIGNATURES ARE REQUIRED BY CORE UNIT SUCH SIGNATURES ARE OBINING. THESE SIGNATURES ARE REQUIRED BY CORE UNIT. SUCH SIGNATURES ARE OBINING. THESE SIGNATURES ARE UNDER DIF OR A MA	VGS ARE SIGNED, DATED AND SEALED HICH THEREFORE CONVEYS THE ENGINEER'S DMPLYING WITH APPROPRIATE FEDERAL, STATE	
AND LOCAL ENVIRONMENTAL RULES, LAWS, AND REGULATIONS AND ANY OTHER LEC RELATED TO LAND DEVELOPMENT. IF THE CITY SIGNATURES ARE REQUIRED BY ORD INTIL SICH SIGNATIONS ADDR DE ORTAINED THESE SIGNATIONS AND EVALUE FOR A MAX	ALLY ADOPTED REGULATION OR ORDINANCE VANCE, COUNTY PERMITS WILL NOT BE ISSUE	C
ENGINEER'S CERTIFICATIO		
I, MIKE MCCLUNG , A LICENSED PROFESSIONAL ENGINEER IN THE		Υ
THAT THE INFORMATION PRESENTED ON THIS SHEET IS TRUE AND CORRE AND THAT I AM NOT VIOLATING ANY PROVISION OF THE CURRENT TEXAS	CT TO THE BEST OF MY KNOWLEDGE ENGINEERING PRACTICE ACT AND RU	ES
CONCERNING THE PRACTICE OF ENGINEERING AND PROFESSIONAL ENGINE	RING LICENSURE.	
ANY VIOLATIONS WILL BE FORWARDED TO THE HARRIS COUNTY DISTRICT THE COMPLETED PROJECT CONSISTS OF DRAWING SHEETS THR	(ee.)	<u>n.</u>
Mat 09/17/2018	STALL STREET	k.
SIGNATURE		
REVISIONS	105080	,
NOTE: REVISION BLOCK IS TO BE USED ONLY FOR CHANGES MADE	SS/ONAL ENGLAND	
AFTER PLANS HAVE BEEN APPROVED BY HARRIS COUNTY. DESCRIPTION	P.E. INITIAL H.C. APPROVED DATE	
		_
		_
		_
ECT NO.	SHEET NUMBER 72 OF 1	35







Culvert Station and/or Creek name followed by applicable end (Lt, Rt or Both)	Description of Box Culvert No. Spans ~ Span X Height	Max Fill Height (Ft)	Applicable Box Culvert Standard (4)	Applicable Wingwall or End Treatment Standard	Skew Angle (0°,15°, 30° or 45°)	Side Slope or Channel Slope Ratio (SL:1)	T Culvert Top Slab Thickness (In)	U Culvert Wall Thickness (In)	C Estimated Curb Height (Ft)	Hw (1) Height of Wingwall (Ft)	A Curb to End of Wingwall (Ft)	B Offset of End of Wingwall (Ft)	Lw Length of Longest Wingwall (Ft)	Ltw Culvert Toewall Length (Ft)	Atw Anchor Toewall Length (Ft)	Riprap Apron (C.Y.)	"C" Conc (Curb)	Class "C" Conc (Wingwall) (C.Y.)	Total Wingwall Area (S.F.)
RAIL SOUTH STA 10+17.36 RT	1-6' x3'	2.5'	SCP-6	FW-O	15°	4:1	7	7	0.250	3.583	9.750	5,629	11.258	N/A	N/A	1.8	0,1	3.2	44
RAIL NORTH1 STA 28+65 LT	1-6'×6'	2.5′	SCP-6	PW-2	0°	4:1	7	7	0.396	6.979	N/A	N/A	17.938	7.167	N/A	0.0	0.1	15.9	244

NOTES:

- Skew Angle = 0° for SW-0, FW-0, SETB-CD, SETB-SW-0, and SETB-FW-0 standards. 30° Maximum for Safety End Treatment
- SL:1 = Horizontal:1 Vertical
 - Side Slope at culvert for Flared or Straight Wingwalls. Channel Slope for Parallel Wingwalls. Slope shall be 3:1 or flatter for Safety End Treatments.
- T = Box Culvert Top Slab Thickness. Dimension can be found on the applicable Box Culvert Standard.
- U = Box Culvert Wall Thickness. Dimension can be found on the applicable Box Culvert Standard.
- C = Curb Height.

See applicable wing or end treatment standards for calculations of Hw, A, B, Lw, Ltw, Atw, and Total Wingwall Area. Hw = Height of Wingwall. A = Distance from Face of Curb to End of Wingwall (Not applicable to Parallel or Straight Wingwalls). B = Offset of End of Wingwall (Not applicable to Parallel or Straight Wingwalls).

- Lw = Length of Longest Wingwall. Ltw = Length of Culvert Toewall (Not applicable when using Riprap Apron). Atw = Length of Anchor Toewall (Applicable to Safety End Treatment only). Total Wingwall Area = Wingwall area in S.F. for two wingwalls (one structure end) if Lt or Rt. Area for four wingwalls (two structure ends) if Both.

- (1) The wall heights shown will be rounded to the nearest Foot for bidding purposes.
- 2 Concrete volume shown is for box culvert curb only. For curbs using the RAC standard, quantities shown must be increased by a factor of 2. If Class "S" concrete is required for the top slab of the culvert, the curb concrete shall also be Class "S". Curb concrete is considered part of the Box Culvert for payment.
- 3 Concrete volume shown is total of wing, footing, culvert toewall (if any), anchor toewall (if any) and wingwall toewall. Riprop apron, culvert and curb quantities are not included.
- (4) Regardless of the type of culvert shown on this sheet, the Contractor shall have the option of furnishing cast-in-place or precast culverts unless otherwise shown elsewhere on the plans. If the Contractor elects to provide culverts of a different type than those shown on this sheet, it shall be the Contractor' responsibility to make the necessary adjustments to the dimensions and quantities shown.



SPECIAL NOTE:

This sheet is a supplement to the Box Culvert standards. It is to be filled out by the culvert specifier and provides dimensions for the construction of the Box Culvert Wingwalls and Safety End Treatments.

An Excel 97 spreadsheet to assist in completing this table can be downloaded from the Bridge Standards (English) web page on the TxDOT web site. The completed sheet shall be signed, sealed, and dated by a licensed Professional Engineer.

S			Bridge Division Standard						
		X CULVER						-	
	FILE:	bcsstde1.dgn	DN: TxD	OT	BC	_	TxDOT	CK	GAF
	-	•				Dw:	-		-
	CTXDOT	February 2010	CONT	SECT	JOB			HWAY	
		REVISIONS	0912	31	291		۱ I	VA	

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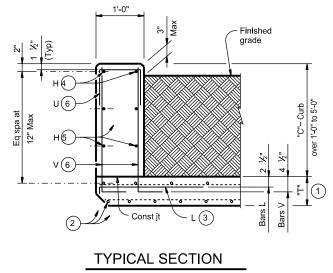
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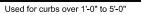
COUNTY

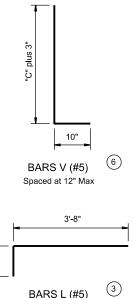
BRAZORIA / HARRIS

SHEET NO.

76

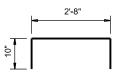




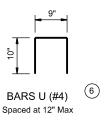


BARS L (#5) Spaced at 12" Max

0



OPTIONAL BARS L (#5) 37 Spaced at 12" Max



 "T" is equal to the culvert top slab thickness. For precast boxes with slabs less than 7" thick, see SCP-MD standard for additional details.

2 Adjust normal culvert slab bars as necessary to clear obstructions.

- (3) Place bars L as shown. Tilt hook as necessary to maintain cover.
- Place normal culvert curb bars H(#4) as shown. Adjust as necessary to clear obstructions.
- 5 Additional bars H(#4) as required to maintain 12" Max spacing.
- 6 Replace normal culvert curb bars K with one bar U and two bars V as shown spaced at 12" Max. Adjust length of bars V as necessary to maintain clear cover.
- Optional bars L are to be used only for precast box culverts with 3'-0" closure pour.
- (8) Quantities shown are for Contractor's information only. Quantities are per linear foot of curb length. The value in table can be interpolated for intermediate values of curb height, "C". Quantity includes bars K (when applicable).

TABLE OF ESTIMATED CURB QUANTITIES(8)										
Curb Height "C"	Conc (CY/LF)	Reinf Steel (Lb/LF)								
1'-0"	0.037	8.9								
1'-6"	0.056	14.3								
2'-0"	0.074	15.4								
2'-6"	0.093	17.7								
3'-0"	0.111	18.8								
3'-6"	0.130	21.2								
4'-0"	0.148	22.2								
4'-6"	0.167	24.6								
5'-0"	0.185	25.6								

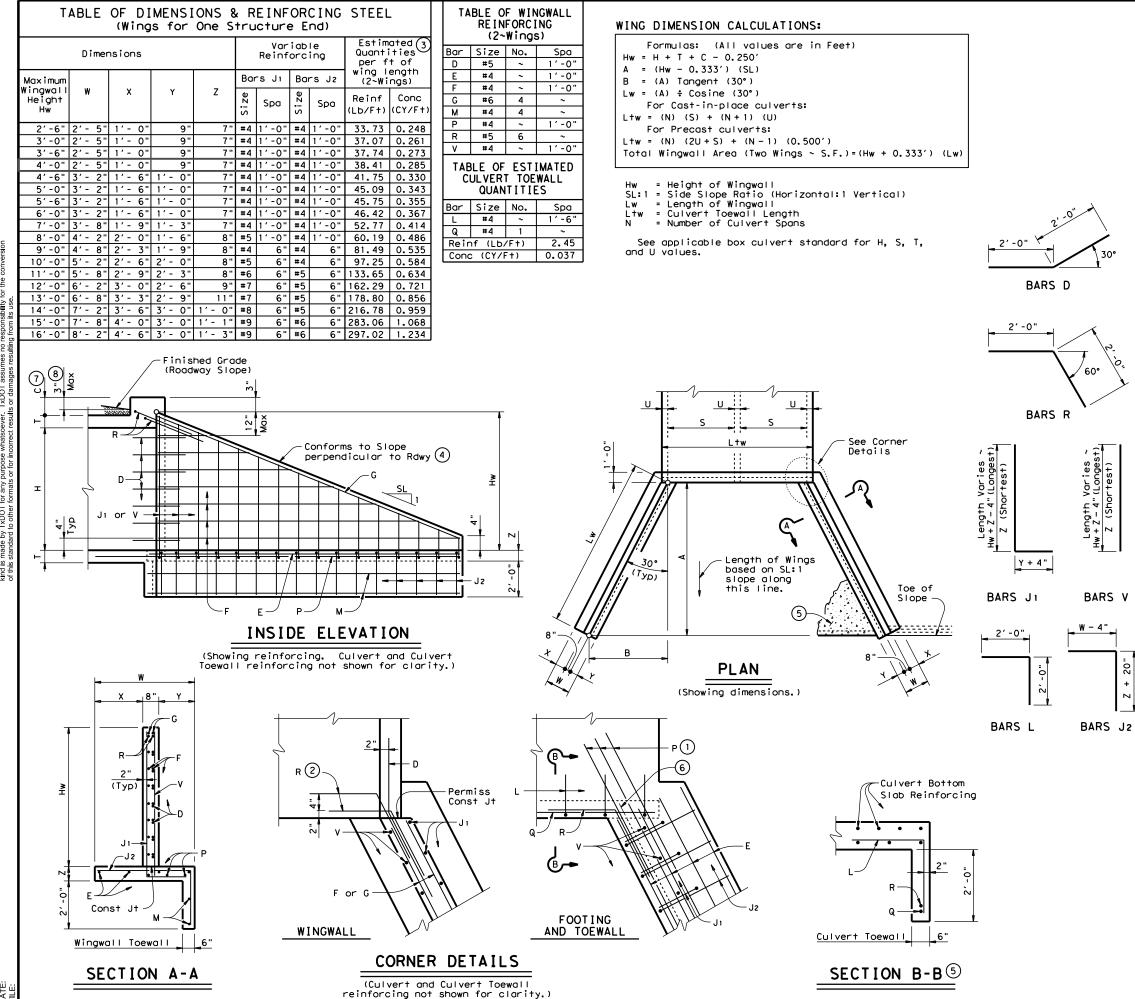
1/4" cover.

Adjustreaming steel as necessary to provide 1 and 2 an

CONSTRUCTION NOTES: Adjust reinforcing steel as necessary to provide 1

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

Texas Department	D	Bridge Division Standard							
EXTENDED CURB DETAILS									
FOR BOX CULVERTS WITH									
CURBS OVER 1'-0" TO 5'-0" TALL									
		-							
		E	CD						
FILE: ecdstde1.dgn	dn: GA	F	ск: ТхDOT	DW:	TxDOT	ск: GAF			
CTxDOT February 2010	CONT	SECT	JOB			HIGHWAY			
REVISIONS	0912	31	291		VA				
03-16: General Notes added T631-CM.	DIST		COUNTY		SHEET NO.				
	HOU	В	razor i a / H	IARR	IS	77			



standard xDOT for

- (1) Extend Bars P 3'-0" minimum into bottom slab of Box Culvert.
- Adjust to fit as necessary to maintain 1 $\frac{1}{4}$ " clear cover and 4" minimum between bars. 2
- 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 (3) by Lw.
- (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 riprap shall be constructed. Payment for riprap shall be as required by Item 432, "Riprap". Unless otherwise 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 ground; the toewall shall be reinforced by extending typical riprop reinforcing into the toewall; construction joints or grooved joints, oriented in the direction of flow, shall extend across the full distance of the riprop, at intervals of approximately 20'. When such riprop is provided, the culvert toewall shown in SECTION B-B will not be required.
- At Contractor's option, Culvert Toewall may be ended flush with Wingwall Toewall. Adjust reinforcing 6 from that shown as necessary.
- (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, other than T6, refer to RAC standard.
- (8) For vehicle safety, curb heights and wall heights 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 will be allowed for this work.

GENERAL NOTES:

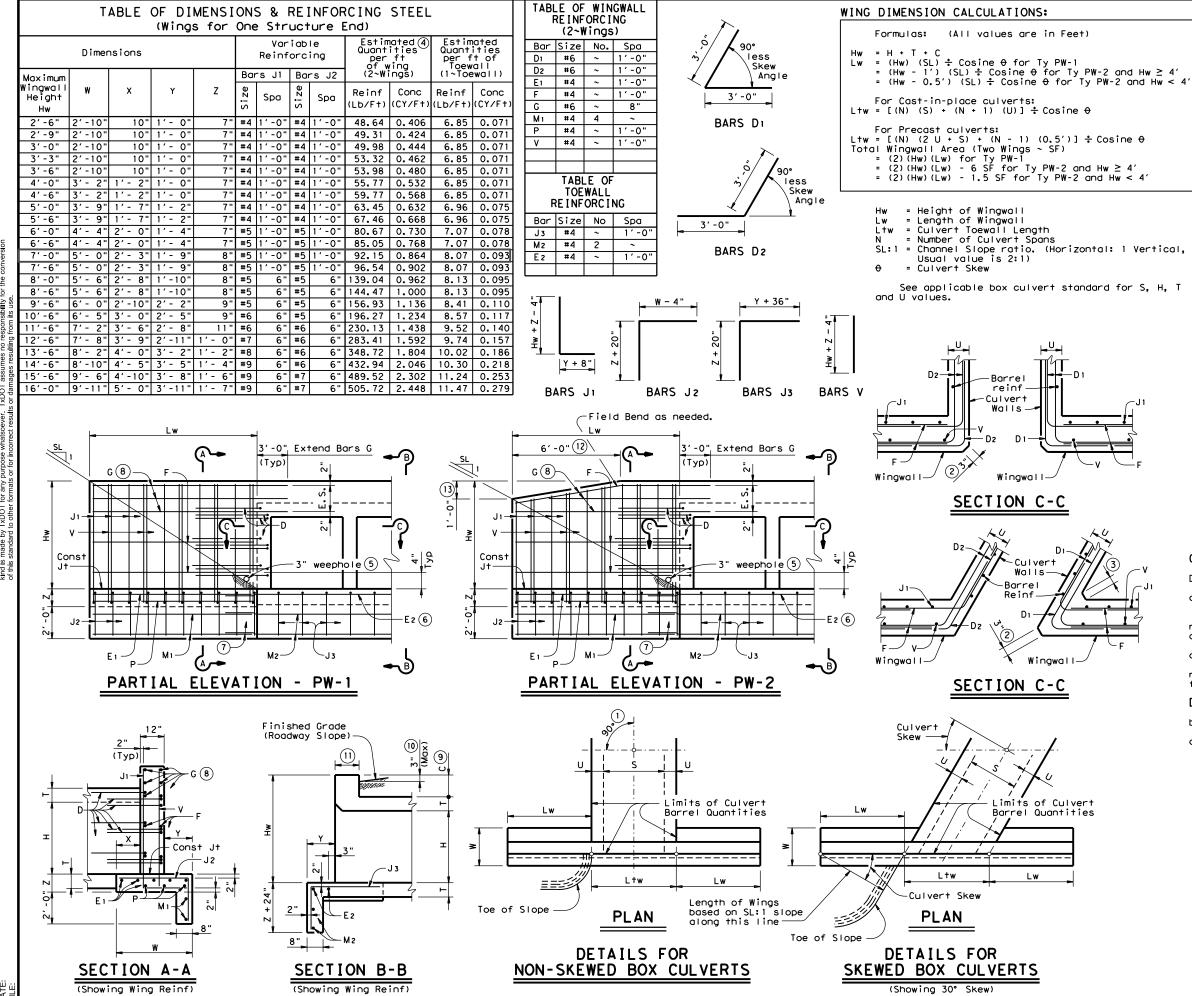
Designed according to AASHTO LRFD Specifications. All reinforcing steel shall be Grade 60. Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

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 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 auantities for concrete and reinforcing steel

resulting from the formulas given on this sheet are for Contractor's information only.

Texas Department	,	Bridge Division Standard								
CONCRETE WINGWALLS										
WITH FLARED WINGS FOR										
0° SKEW BOX CULVERTS										
			FW	-0						
FILE: fw-Ostde.dgn	DN: GAF		CK: CAT	<u> </u>	TxDOT	ск: GAF				
CTxDOT February 2010	CONT	SECT	JOB			HIGHWAY				
REVISIONS	0912	31	291		VA					
11-10: Add note for synthetic fibers.	DIST		COUNTY			SHEET NO.				
ŕ	HOU	BR	AZORIA /	RIS	78					



DISCLAIMER: The use of this standard is governed by kind is made by TXDOT for any purpose w of this erandard to other formats or for income

- 1 Skew Angle = 0° $^{(2)}$ At discharge end, chamfer may be $\frac{3}{4}$ ". (3) For 15° Skew ~ 1 For 30° Skew ~ 2" For 45° Skew ~ 3"
- (4) Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, Quantities shown do not include weight of Bars D.
- (5) Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.
- $^{(6)}$ Extend Bars E2 1'-6" minimum into the wingwall footing.
- () Lap Bars Mi 1'-6" minimum with Bars M2.
- 8 Bars G equally spaced at 8" maximum, place as shown. Provide at least two pair Bars G per wing.
- 9 0" min to 5'-0" max. Estimated_curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.
- (10) For vehicle safety, the following requirements must be met: - For structures without bridge rail, curbs
 - cannot project more than 3" above finished grade. - For structures with bridge rail, build curbs
- Flush with finished grade. Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- (1)1'-0" typical. 2'-0" typical when RAC standard is referenced elsewhere in the plans.
- (12) 3' 0'' for Hw < 4'.
- (13) 6" for Hw < 4'.

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Bridge Design Specifications, Provide Class "C" Concrete (f'c = 3,600 psi Min)

and Grade 60 reinforcing steel. Provide 1 1/4" Min clear cover to reinforcing steel. Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer. See BCS sheet for wingwall type and additional dimensions and information.

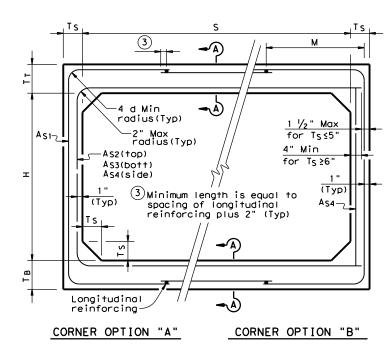
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

DESIGNER NOTES:

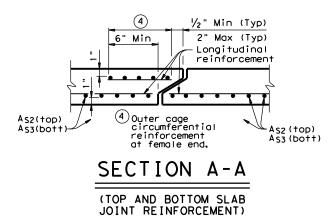
Type PW-1 can be used for all applications and must be used if railing is to be mounted to the wingwall. Type PW-2 can only be used for applications without a railing mounted to the wingwall.

Texas Department	,	Bridge Division Standard						
CONCRETE WINGWALLS								
WITH PARALLEL WINGS FOR BOX CULVERTS								
TYPES PW-								
			Ρ	W				
FILE: pwstde01.dgn	DN: GAF		ск: САТ	DW:	TxDOT	ск: GAF		
CTxDOT February 2010	CONT	SECT	JOB		н	IGHWAY		
REVISIONS	REVISIONS 0912 31 291 VA							
11-10: Reinforcing Quantities. 01-12: PW-1 & PW-2.	DIST	DIST COUNTY				SHEET NO.		
HOU BRAZORIA / HARRIS 79						79		

						E	BOX	DATA	4						
SEC	TION	DIME	NSIC	NS	FIII	м			REII	NFORC	ING (i	n²/ft)	2		Lift
S (ft)	H (ft)	T _T (in)	T _B (in)	T _s (in)	Height (ft)	(Mîn) (în)	A _{S1}	A _{S2}	A _{S3}	A _{S4}	A _{S5}	4 ₅₆	A _{S7}	A ₅₈	Weigh (Tons
6	3	8	7	7	<2	-	0.20	0.31	0.22	0.17	0.19	0.19	0.19	0.17	7.9
6	3	7	7	7	2<3	43	0.21	0.24	0.19	0.17	-	-	-	-	7.5
6	3	7	7	7	3-5	39	0.17	0.18	0.17	0.17	-	-	-	-	7.5
6	3	7	7	7	10	39	0.17	0.18	0.19	0.17	-	-	-	-	7.5
6	3	7	7	7	15	38	0.22	0.24	0.24	0.17	-	-	-	-	7.5
6	3	7	7	7	20	38	0.28	0.31	0.31	0.17	-	-	-	-	7.5
6	3	7	7	7	25	38	0.35	0.38	0.39	0.17	-	-	-	-	7.5
6	3	7	7	7	30	38	0.42	0.46	0.46	0.17	-	-	-	-	7.5
6	4	8	7	7	<2	-	0.19	0.34	0.25	0.17	0.19	0.19	0.19	0.17	8.6
6	4	7	7	7	2<3	43	0.19	0.27	0.21	0.17	-	-	-	-	8.2
6	4	7	7	7	3-5	39	0.17	0.21	0.19	0.17	-	-	-	-	8.2
6	4	7	7	7	10	39	0.17	0.20	0.21	0.17	-	-	-	-	8.2
6	4	7	7	7	15	38	0.18	0.27	0.27	0.17	-	-	<u> </u>	-	8.2
6	4	7	7	7	20	38	0.24	0.34	0.35	0.17	-	-	-	-	8.3
6	4	7	7	7	25	38	0.29	0.43	0.42	0.17	-	-	-	-	8.2
6	4	7	7	7	30	38	0.35	0.51	0.52	0.17	-	-	-	-	8.2
6	5	8	7	7	<2	-	0.19	0.37	0.28	0.17	0.19	0.19	0.19	0.17	9.3
6	5	7	7	7	2<3	43	0.17	0.30	0.20	0.17	-	-	-	-	8.9
6	5	7	7	7	3-5	43	0.17	0.23	0.21	0.17	-	-	-	-	8.9
6	5	7	7	7	10	39	0.17	0.22	0.23	0.17	-	-	-	- 1	8.9
6	5	7	7	7	15	38	0.17	0.28	0.29	0.17	- 1	-	-	- 1	8.9
6	5	7	7	7	20	38	0.20	0.37	0.38	0.17	-	-	-	- 1	8.9
6	5	7	7	7	25	38	0.25	0.45	0.46	0.17	-	-	-	- 1	8.9
6	5	7	7	7	30	38	0.30	0.54	0.55	0.17	-	-	-	-	8.9
6	6	8	7	7	<2	-	0.19	0.38	0.30	0.17	0.19	0.19	0.19	0.17	10.0
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	-	-	-	-	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	-	-	-	-	9.6
6	6	7	7	7	30	38	0.27	0.55	0.57	0.17	-	-	-	-	9.6
				1		İ	l		l						
													[



FILL HEIGHT 2 FT AND GREATER

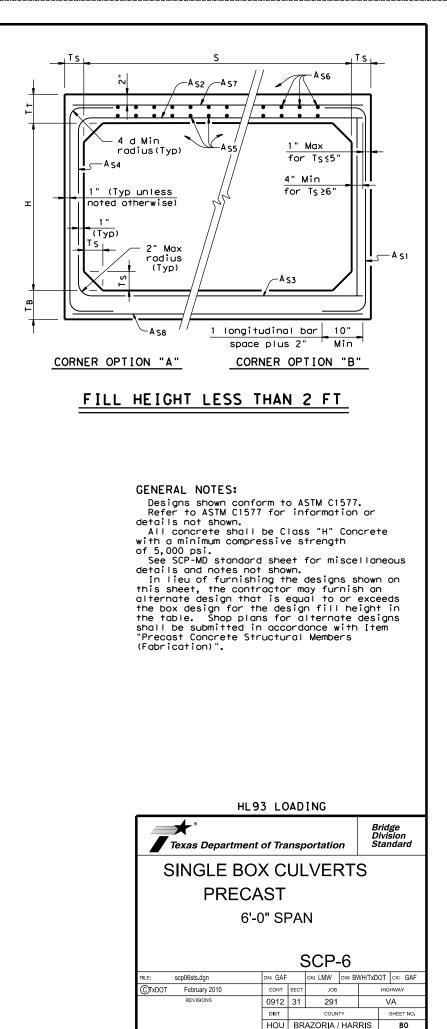


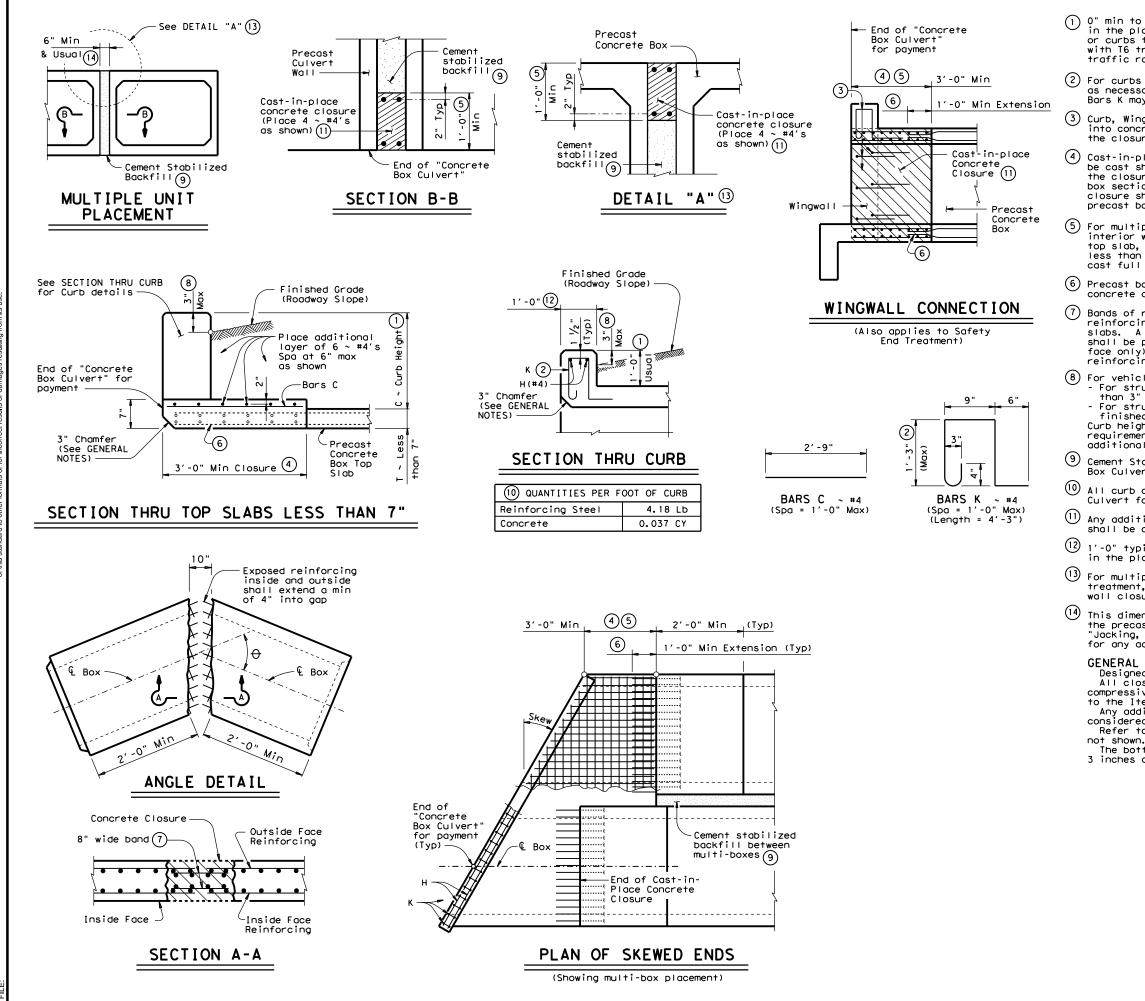
DISCLAIMER: The use of this standard is governed by the "Taxas Engineering Practice Act", the ise of this standard is governed by the "Taxas Engineering Practice Act", this standard to there formats or for incorrect results or damages resulting from

No warranty of any isibility for the convi

(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. As6 and As5 are minimum required areas of reinforcement per linear foot of box width.





No warranty of any sibility for the conv ering Practice assumes no r Engine TxDOT DISCLAIMER: The use of this standard is governed by the and is made by TXDOT for any purpose what (1) 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 traffic rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.

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

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

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

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

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

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

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

For structures with bridge rail, curbs shall be flush with finished grade.

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

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

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

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

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

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

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

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

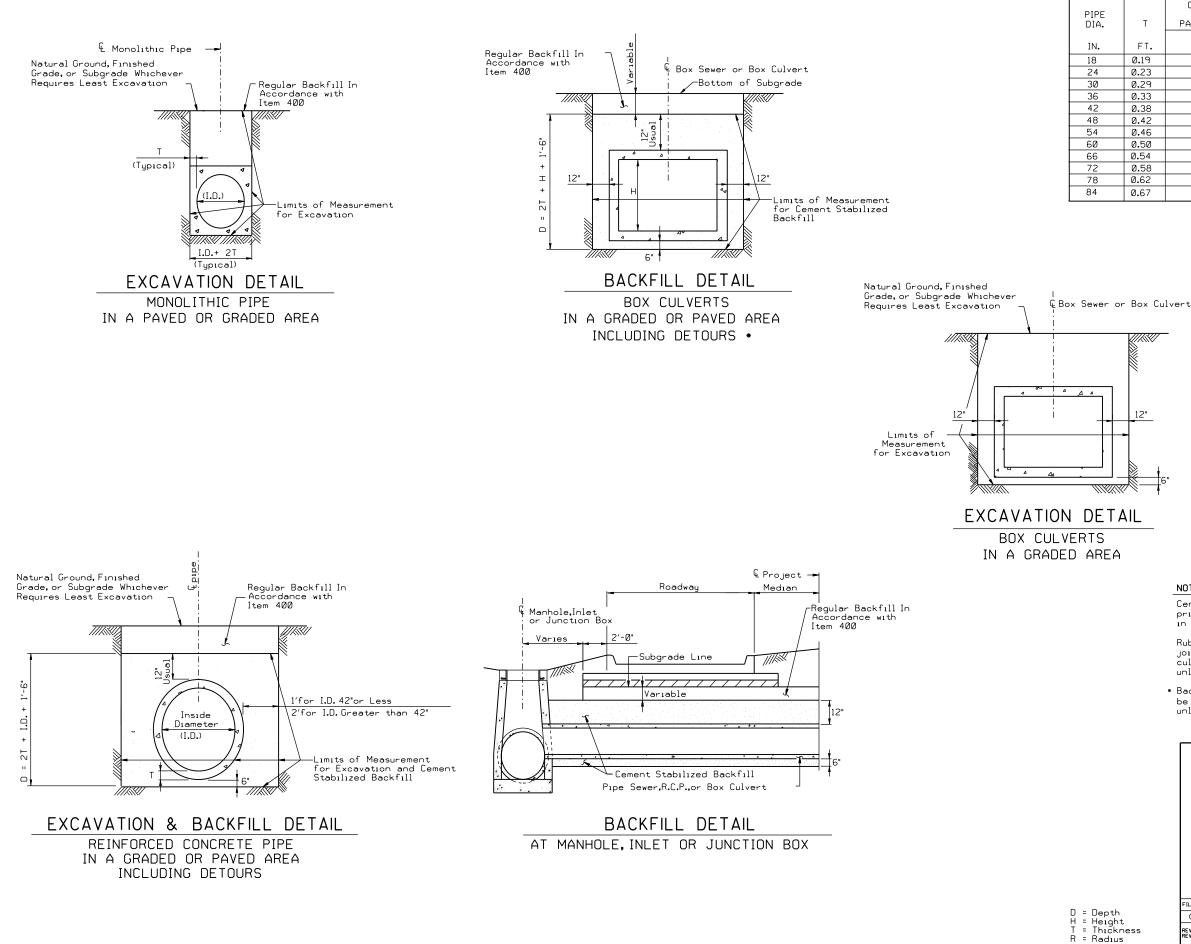
All closure concrete shall be Class "C" with a minimum compressive strength of 3600 psi and shall be placed according to the Item, "Concrete Substructures". Any additional concrete required for the closures shall be

considered as subsidiary to the Concrete Box Culvert. Refer to the Single Box Culverts Precast standard for details

The bottom edge of the top slab closure shall be chamfered

3 inches at the entrance.

HL93 LOADING ***** Bridge Division Texas Department of Transportation Standard BOX CULVERTS PRECAST MISCELLANEOUS DETAILS SCP-MD DN: GAF CK: LMW DW: BWH/TxDOT CK: GAF scpmdsts.dgn CTxDOT February 2010 CONT SEC JOB HIGHWAY 0912 31 291 VA DIST SHEET NO. HOU BRAZORIA / HARRIS 81



REINFORCED CONCRETE PIPE										
EXCAVATION AND BACKFILL QUANTITIES										
т	CULVERT OR SEWER EXCAVATION IN A PAVED OR GRADED AREA	CEMENT STABILIZED BACKFILL IN A PAVED OR GRADED AREA								
FT.	C.Y.PER L.F.PER FT.OF DEPTH	C.Y.PER L.F. OF PIPE								
0.19	Ø.144	Ø.383								
0.23	Ø . 165	0.478								
0.29	Ø . 188	Ø . 586								
0.33	0.210	0.692								
0.38	0.231	0.808								
0.42	0.327	1.394								
0.46	0.349	1.560								
0.50	0.370	1.731								
0.54	0.392	1.907								
0.58	0.414	2.088								
0.62	0.435	2.275								
Ø . 67	0.457	2.474								
	0.19 0.23 0.29 0.33 0.38 0.42 0.46 0.50 0.54 0.54 0.58 0.62	EXCAVATION AND BACKFILL C CULVERT OR SEWER EXCAVATION IN A PAVED OR GRADED AREA C.Y.PER L.F.PER FT. FT.OF DEPTH 0.19 0.144 0.23 0.165 0.29 0.188 0.33 0.210 0.42 0.327 0.46 0.349 0.50 0.370 0.54 0.392 0.58 0.414								

MONOLITHIC PIPE

EXCAVATION QUANTITIES

FT.

0.417

0.583

0.625

0.458

48 0.458

54 0.500

66 0.583

72 0.625

84 0.625

EXCAVATION

C.Y.PER L.F.PER FT.OF DEPTH

0.142

0.164

0.182

0.204

0.228

0.247

0.269

0.287

0.306

NOTE:

Cement stabilized backfill may be omitted in private driveways as indicated elsewhere in the plans.

PIPE DIA.

IN.

36

42

60

78

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

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

SHEET 1 OF 2

Texas Department of Transportation Houston District EXCAVATION AND BACKFILL DIAGRAMS F& BD

		LODD		
	FILE: STDE1.DGN	DN: TxDot CK: TxDot	DW: TxDot	ск: TxDot
D = Depth H = Height T = Thickness R = Radius	© TxDOT FEB 2010	DIST FED REG	PROJECT NO.	SHEET
	REVISIONS REVISED 11/05	HOUSTON 6 STP 1	702 (291)	MM 82
	REVISED 2/2010 Added note to Table 1,Sht 2 of 2. REVISED 6/12	COUNTY	CONTROL SECT	JOB HIGHWAY
Dia = Diameter	REVISED 9/14	BRAZOR I A/HARR I S	0912 31	291 VA

