MATAGORDA COUNTY DRAINAGE DISTRICT #1 (DISTRICT) GENERAL CONSTRUCTION NOTES:

1. THIS PROJECT HAS BEEN REVIEWED; HOWEVER, THIS DOES NOT IMPLY THAT ALL SUPPORTING DATA, CALCULATIONS, OR DETAILS HAVE BEEN FULLY CHECKED OR VERIFIED. THE DRAWINGS ARE SIGNED, DATED, AND SEALED BY A PROFESSIONAL ENGINEER (PE) LICENSED IN TEXAS, ESTABLISHING THE ENGINEER'S RESPONSIBILITY AND ACCOUNTABILITY. OMISSIONS DURING THE PERMIT APPLICATION REVIEW DO NOT RELIEVE THE DEVELOPMENT OR ITS PE FROM OBTAINING AND COMPLYING WITH ALL APPLICABLE PERMITS REQUIRED BY THE DISTRICT AND OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION (CITY, COUNTY, STATE, OR FEDERAL) PRIOR TO COMMENCING CONSTRUCTION. FULL COMPLIANCE WITH ALL RELEVANT ENVIRONMENTAL LAWS, REGULATIONS, AND ORDINANCES GOVERNING THE PROPOSED DEVELOPMENT REMAINS MANDATORY, EVEN IF SPECIFIC REQUIREMENTS WERE NOT EXPLICITLY ADDRESSED DURING THE REVIEW PROCESS.

2. ALL DRAINAGE PLANS AND PLATS SHALL BE IN CONFORMANCE WITH THE DISTRICT'S RULES & REGULATIONS. BOARD APPROVAL OF A DRAINAGE PLAN DOES NOT CONSTITUTE PERMISSION TO DEVIATE. NO WORK IS TO BE PERFORMED WITHIN A DISTRICT EASEMENT OR WITHIN A SURROUNDING AREA THAT COULD IMPACT A DISTRICT FACILITY WITHOUT OBTAINING PROPER APPROVALS FROM THE DISTRICT PRIOR TO BEGINNING WORK WITHIN A DISTRICT EASEMENT, AND IN ACCORDANCE WITH THE APPROVED DISTRICT PERMIT.

3. _____, SERVING AS THE PROFESSIONAL ENGINEER WHO PREPARED, SIGNED, DATED, AND SEALED THE SUBJECT CONSTRUCTION DRAWINGS, CERTIFIES THAT THE FOLLOWING: A) THAT THE PROPOSED DEVELOPMENT WILL BE CONSTRUCTED IN ACCORDANCE WITH THE APPROVED DISTRICT PERMIT. B) ALL OFFSITE SHEET FLOW FROM ADJACENT PROPERTIES HAVE BEEN IDENTIFIED AND ACCOUNTED FOR IN THE PROJECT. THE SIGNING ENGINEER HERBY CERTIFIES THAT THESE AREAS HAVE BEEN ADDRESSED. C) ADDITIONALLY, _____ CERTIFIES THAT, UPON COMPLETION, THE PROJECT WILL NOT CAUSE ANY ADVERSE IMPACTS TO THE NEIGHBORING PROPERTIES OR DOWNSTREAM/UPSTREAM FACILITIES AND/OR STRUCTURES FOR STORMS UP TO AND INCLUDING THE ATLAS 14, 100-YR STORM EVENT.

4. THE CONTRACTOR SHALL CONTACT THE DISTRICT'S GENERAL MANAGER AT (979) 245-6751 AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO THE START OF CONSTRUCTION.

5. THE DISTRICT'S PERSONNEL SHALL HAVE THE RIGHT TO ENTER UPON THE PROPERTY FOR INSPECTION AT ANY TIME DURING CONSTRUCTION OR AS MAY BE WARRANTED TO ENSURE THE DETENTION FACILITIES AND DRAINAGE SYSTEM ARE OPERATING PROPERLY.

6. DETENTION FACILITIES AND OUTFALL MUST BE CONSTRUCTED AND AVAILABLE PRIOR TO BEGINNING CONSTRUCTION OF ANY IMPERVIOUS IMPROVEMENTS.

7. 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 THE STATIC WATER LEVEL DOES NOT EXCEED THE DESIGN WATER SURFACE LEVEL DURING NORMAL CONDITIONS.

8. MAINTAIN NATURAL FLOW CONDITIONS IN THE RECEIVING BODY OF WATER DURING CONSTRUCTION. IN NO EVENT SHALL FLOW BE IMPEDED OR REDIRECTED DURING CONSTRUCTION. THE RECEIVING BODY OF WATER SHALL BE RESTORED TO ITS ORIGINAL OR BETTER CONDITION IMMEDIATELY FOLLOWING THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES.

9. NO FILL IS TO BE PLACED WITHIN A DESIGNATED FLOOD PLAIN AREA WITHOUT FIRST OBTAINING A FILL PERMIT FROM THE APPROPRIATE JURISDICTIONAL AUTHORITY.

10. PROTECT, MAINTAIN, AND RESTORE ALL EXISTING DRAINAGE AND DETENTION FACILITIES THAT MAY BE IMPACTED BY CONSTRUCTION ACTIVITIES.

11. PERMANENT STRUCTURES, INCLUDING FENCES AND LANDSCAPING, SHALL NOT BE ERECTED IN A DRAINAGE EASEMENT, ACCESS EASEMENT, OR FEE STRIP.

12. ACCESS EASEMENTS SHALL BE USED FOR INGRESS AND EGRESS TO THE DISTRICT'S DRAINAGE FACILITIES AND SHALL BE KEPT CLEAR OF ANY AND ALL OBSTRUCTIONS.

13. APPROPRIATE COVER FOR THE SIDE SLOPES, BOTTOM, AND MAINTENANCE BERM SHALL BE ESTABLISHED PRIOR TO ACCEPTANCE OF THE CONSTRUCTION BY THE DISTRICT. AT LEAST 95% GERMINATION OF THE GRASS COVER MUST BE ESTABLISHED.

14. MAINTENANCE OF DETENTION FACILITIES IS THE SOLE RESPONSIBILITY OF THE OWNER OF THE PROPERTY AND SHALL BE UPHELD TO THE DISTRICT'S STANDARDS AND REQUIREMENTS.

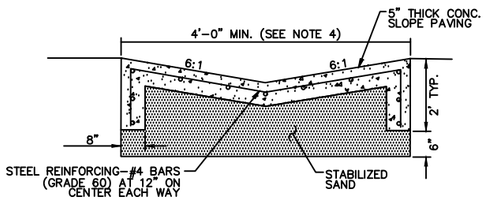
DISCLAIMER:

1. THIS DETAIL SHEET HAS BEEN PREPARED FOR USE ON DISTRICT PROJECTS.
2. AN ENGINEER WHO INCORPORATES THE DETAIL(S) FROM THIS SHEET BECOMES RESPONSIBLE FOR ITS USE IN THE END PRODUCT IN ACCORDANCE WITH RULE 137.33 (B) AND (C) OF THE TEXAS BOARD OF PROFESSIONAL ENGINEERS.

MATAGORDA COUNTY DRAINAGE DISTRICT #1
2604 NICHOLS AVE.,
BAY CITY, TX 77414
OFFICE (979) 245-6751
WWW.MCDD1.ORG

GENERAL NOTES

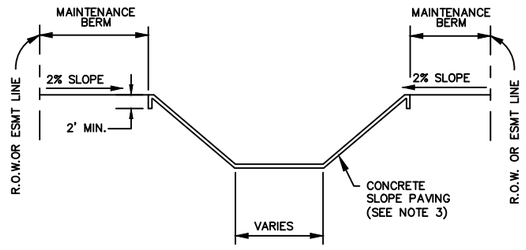
LAST REVISION DATE:
9-13-2024



NOTES:

1. THE DIMENSIONS SHOWN ARE THE MINIMUM REQUIRED BY THE DISTRICT.
2. THE PAVING THICKNESS AND REBAR PLACEMENT SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THIS DETAIL. THE ENGINEER IS RESPONSIBLE FOR DESIGNING THE PAVEMENT AND REINFORCEMENT BASED UPON THE SITE CONDITIONS.
3. ALL CONCRETE MUST HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.
4. PILOT CHANNEL SHALL BE AT LEAST 2 FOOT WIDER THAN THE DIAMETER OF ANY PIPE CONNECTED TO THE PILOT CHANNEL.

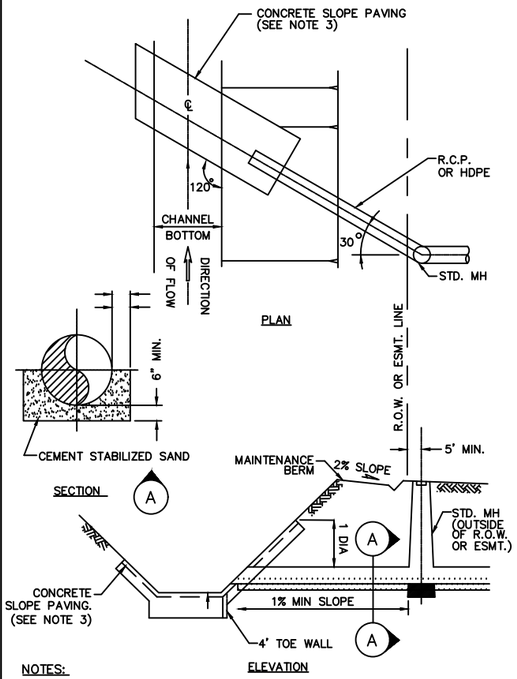
TYPICAL CONCRETE PILOT CHANNEL
N.T.S



NOTES:

1. SEE RULES, REGULATIONS, AND GUIDE LINES FOR SIDE SLOPE REQUIREMENT. A GEOTECHNICAL ANALYSIS MAY BE REQUIRED.
2. BACK SLOPE SWALES ARE AND INTERCEPTORS ARE NOT REQUIRED FOR CONCRETE LINED SECTIONS.
3. SEE OTHER DETAILS FOR SLOPE PAVING AND TOE WALL REQUIREMENTS.
4. MAINTENANCE BERM WIDTHS VARY BASED UPON CHANNEL DEPTH AND OTHER FACTORS SEE RULES REGULATIONS, AND GUIDELINES FOR ADDITIONAL INFORMATION.

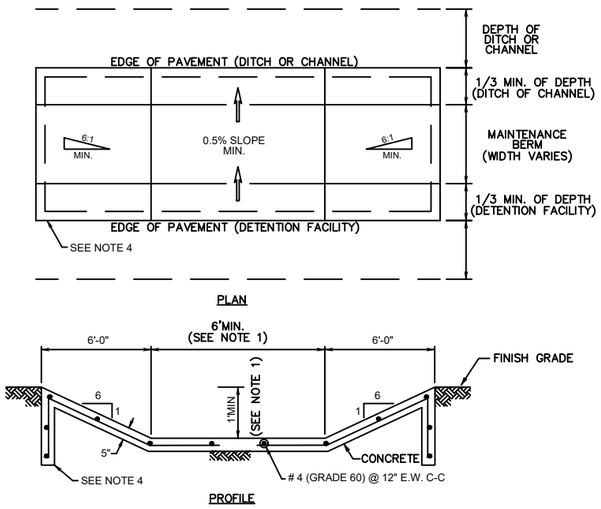
TYPICAL CONCRETE LINED TRAPEZOIDAL CHANNEL SECTION
N.T.S



NOTES:

1. CEMENT STABILIZED SAND TO BE PLACED TO SPRINGLINE FOR RCP.
2. CEMENT STABILIZED SAND SHALL BE PLACED A MINIMUM OF 6" ABOVE TOP OF PIPE FOR HDPE.
3. SEE OTHER DETAILS FOR SLOPE PAVING AND TOEWALL REQUIREMENTS.

TYPCIAL STORM SEWER OUTFALL LAYOUT
N.T.S

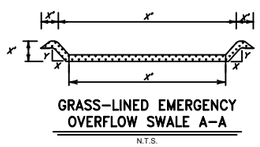


NOTES:

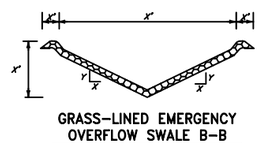
1. THE 1 FOOT MINIMUM DEPTH FOR THE WEIR MAY BE REDUCED TO AN AMOUNT EQUAL TO THE PROPOSED FREEBOARD DEPTH FOR THE PROJECT.
2. THE PAVING THICKNESS AND REBAR PLACEMENT SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THIS DETAIL. THE ENGINEER IS RESPONSIBLE FOR DESIGNING THE PAVEMENT AND REINFORCEMENT BASED UPON THE ACTUAL SITE CONDITIONS.
3. ALL CONCRETE MUST HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.
4. 2' DEEP X 12" WIDE TOE WALL AROUND PERIMETER REQUIRED WHEN ADJACENT TO A DISTRICT OWNED OR MAINTAINED FACILITY.

TYPICAL CONCRETE-LINED EMERGENCY OVERFLOW SWALE
N.T.S
(TYPICAL FROM POND TO PUBLIC R.O.W.)

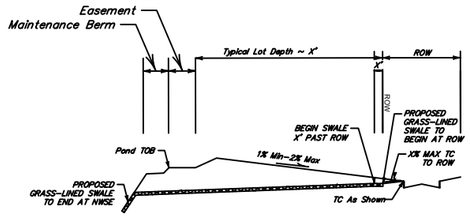
DRAINAGE SWALE CALCULATIONS						
	SIDE SLOPE	DEPTH(FT)	SLOPE (%)	"n"	REQUIRED CAPACITY	DESIGN CAPACITY
A-A	X:Y					
B-B	X:Y					



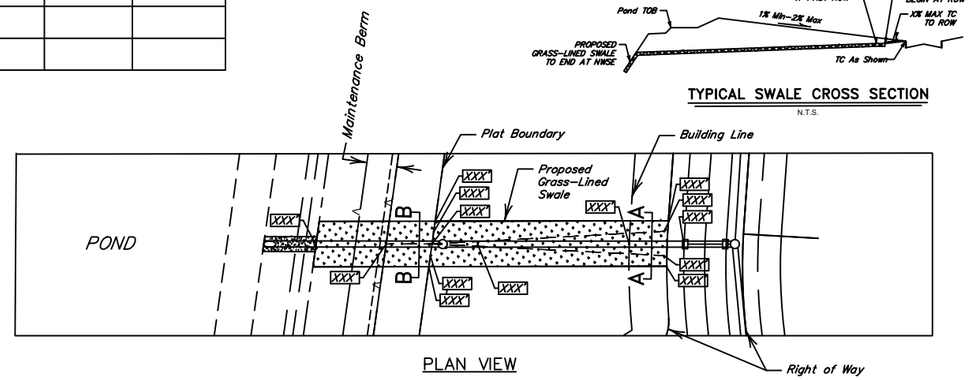
GRASS-LINED EMERGENCY OVERFLOW SWALE A-A
N.T.S.



GRASS-LINED EMERGENCY OVERFLOW SWALE B-B
N.T.S.

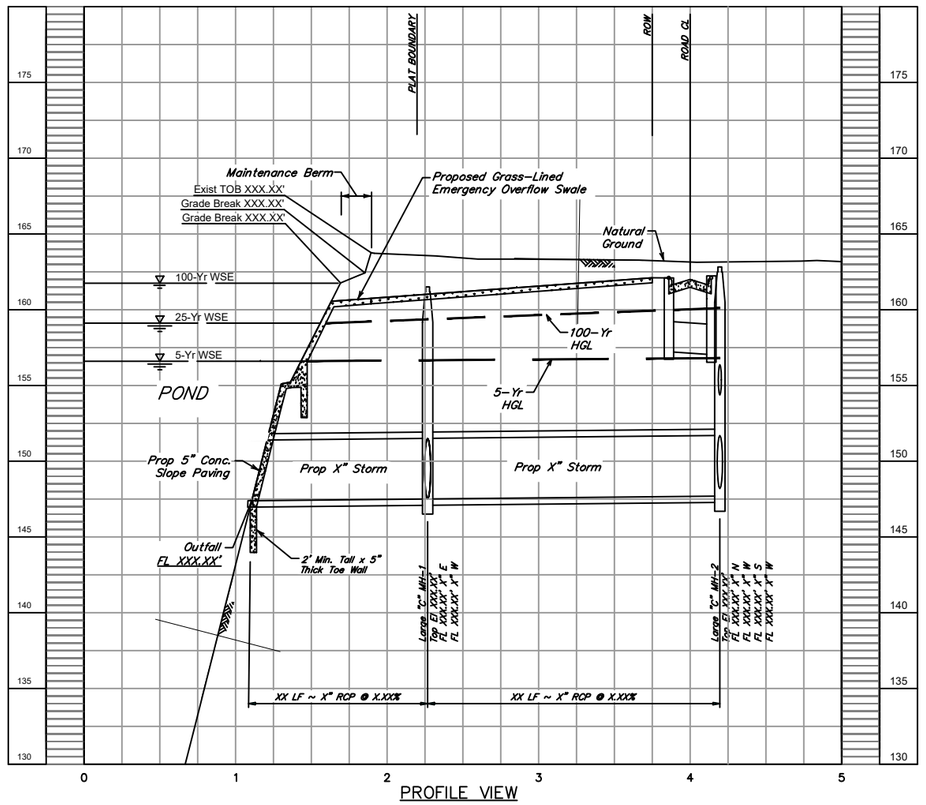


TYPICAL SWALE CROSS SECTION
N.T.S.



PLAN VIEW

TYPICAL PLAN VIEW GRASS-LINED EMERGENCY OVERFLOW SWALE
N.T.S



PROFILE VIEW

TYPICAL PROFILE VIEW OF OUTFALL AND EMERGENCY OVERFLOW SWALE
N.T.S
(TYPICAL FROM POND TO PUBLIC R.O.W.)

DISCLAIMER:

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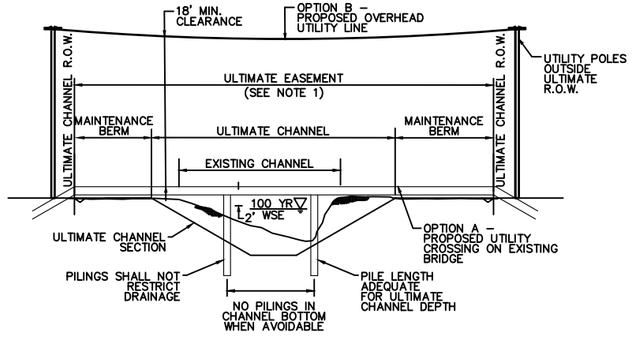
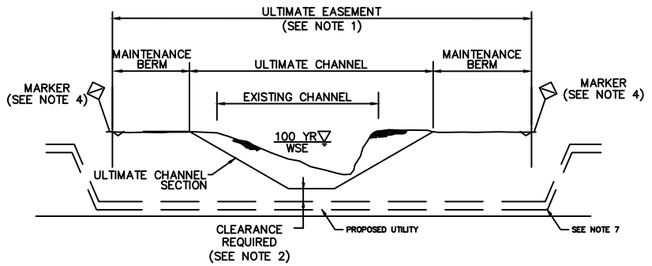
GENERAL DETAILS - SHEET 1 OF 2

LAST REVISION DATE: 9-13-2024

EXHIBIT: 2 OF 6



AERIAL CROSSING (TYP)

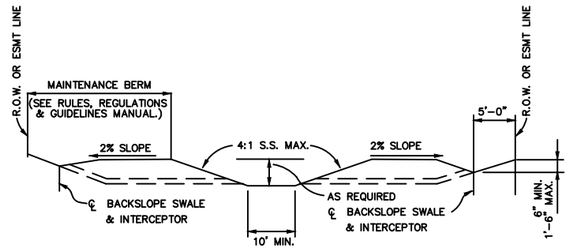


UNDERGROUND CROSSING (TYP) (SEE NOTE 8)

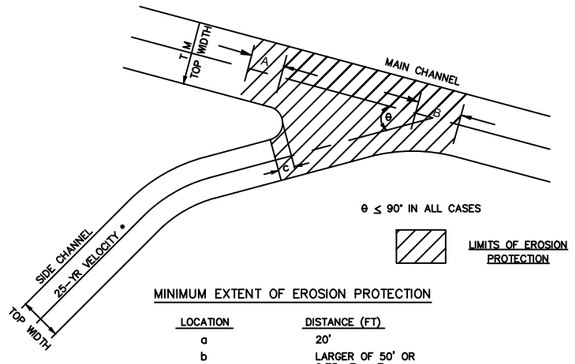
NOTES:

1. CONTACT DISTRICT FOR DEPTH AND WIDTH OF ULTIMATE CHANNEL SECTION AND THE ULTIMATE EASEMENT WIDTH
2. PIPELINES SHALL HAVE 10' MIN. DEPTH OF COVER AS MEASURED FROM THE ULTIMATE CHANNEL SECTION. ALL OTHER UTILITIES SHALL HAVE 5' MIN. DEPTH OF COVER AS MEASURED FROM THE ULTIMATE CHANNEL SECTION.
3. ALL MANHOLES SHALL BE LOCATED OUTSIDE OF THE DISTRICT EASEMENT OR FEE STRIP.
4. UNDERGROUND FACILITIES MUST BE IDENTIFIED WITH A PROMINENT MARKER LOCATED IMMEDIATELY OUTSIDE OF THE DISTRICT EASEMENT OR FEE STRIP.
5. AERIAL CROSSING MUST BE CONSTRUCTED WITH MINIMAL OBSTRUCTION TO THE CHANNEL AND EASEMENT/ FEE STRIP.
6. LABEL INTERSECTING CENTERLINES OF UTILITY OR PIPELINE WITH STATE PLANE COORDINATES OR LATITUDE AND LONGITUDE.
7. HORIZONTAL BENDS ARE NOT ALLOWED WITHIN EASEMENT. VERTICAL BEND SHOULD BE PLACED NO CLOSER THAN 5' FROM EDGE OF EASEMENT.
8. OPEN CUT CONSTRUCTION IS NOT ALLOWED WITHIN THE DISTRICT EASEMENT.

UTILITY AND PIPELINE CROSSING OF DISTRICT FACILITY
N.T.S.



TYPICAL GRASS LINED TRAPEZOIDAL CHANNEL SECTION
N.T.S.



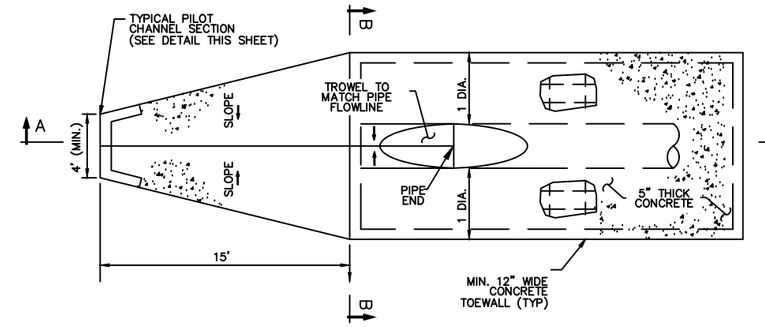
MINIMUM EXTENT OF EROSION PROTECTION

LOCATION	DISTANCE (FT)
a	20'
b	LARGER OF 50' OR 0.75x Tm ÷ Tan θ
c	20'

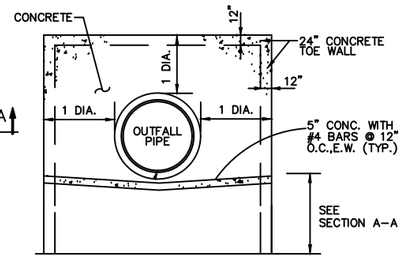
25 – YEAR VELOCITY * IN SIDE CHANNEL (FEET PER SECOND)	ANGLE OF INTERSECTION, θ 15° – 45°	45° – 90°
4 OR MORE	PROTECTION	PROTECTION
2–4	NO PROTECTION	PROTECTION
2 OR LESS	NO PROTECTION	NO PROTECTION

* NOTE: 25–YEAR VELOCITY IN SIDE CHANNEL ASSUMING NO BACKWATER FROM MAIN CHANNEL.

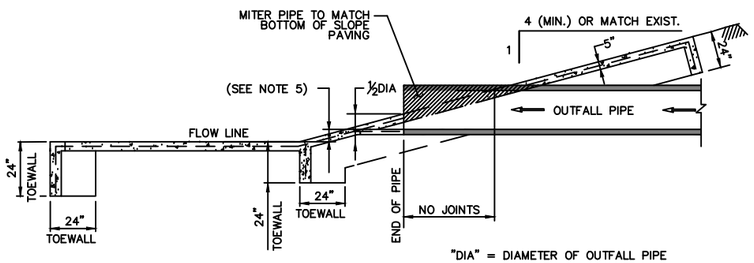
CHANNEL CONFLUENCE EROSION PROTECTION REQUIREMENTS
N.T.S



PLAN VIEW



SECTION B–B



"DIA" = DIAMETER OF OUTFALL PIPE

SECTION A–A

NOTES:

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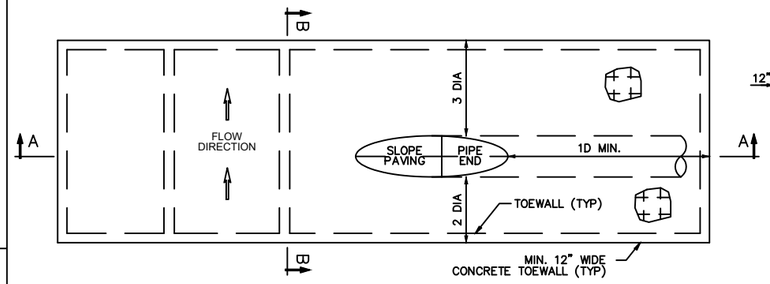
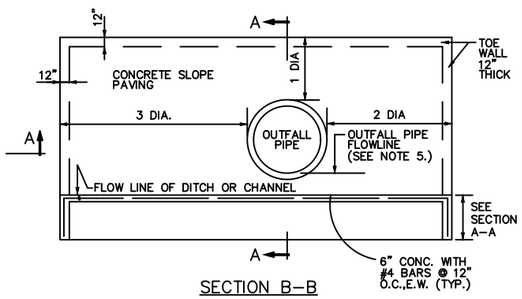
2. THE PAVING THICKNESS AND REBAR PLACEMENT SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THIS DETAIL
3. ALL CONCRETE MUST HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.
4. MINIMUM YIELD STRENGTH OF REBAR SHALL BE #4 BARS, 60,000 PSI (GRADE 60) AND PLACED AT 12" C/C EACH WAY.
5. THE PROPOSED FLOWLINE OF THE PIPE SHALL BE DESIGNED BY THE PROFESSIONAL ENGINEER OF RECORD TO ENSURE NO ADVERSE IMPACTS FROM THE RECEIVING CHANNEL OR DITCH.

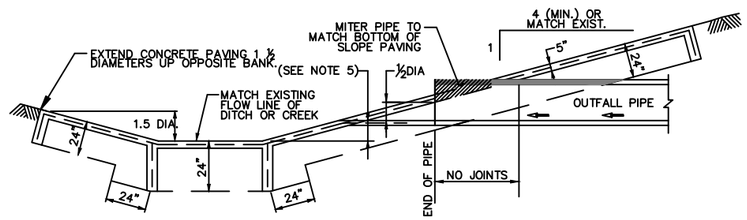
OUTFALL PIPE INTO DETENTION POND
N.T.S.



PLAN VIEW



SECTION B–B



"DIA" = DIAMETER OF OUTFALL PIPE

SECTION A–A

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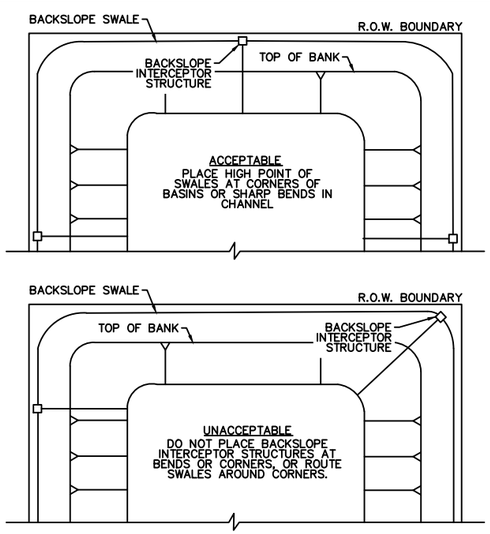
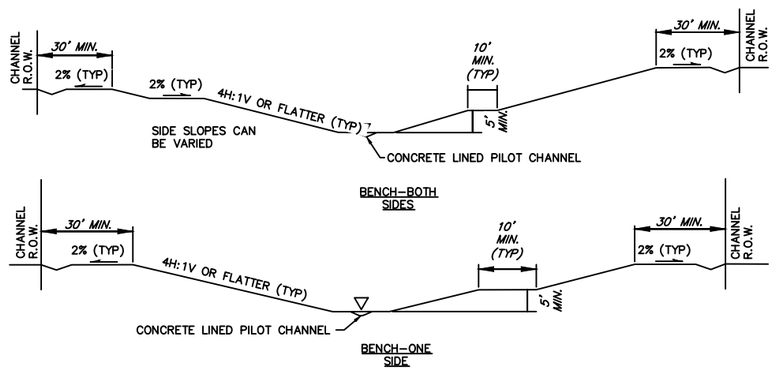
OUTFALL PIPE TO CHANNEL OR DITCH
N.T.S.



TYPICAL DETENTION SECTIONS
N.T.S



TYPICAL CHANNEL SECTIONS
N.T.S

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GENERAL DETAILS – SHEET 2 OF 2

LAST REVISION DATE: *9–13–2024*

EXHIBIT: 3 OF 6

TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

Dimensions					Variable Reinforcing				Estimated Quantities per ft of wing length (2~wings) ③	
					Bars J1		Bars J2			
Maximum Wingwall Height Hw	W	X	Y	Z	Size	Spa	Size	Spa	Reinf. (Lb/Ft)	Conc. (CY/Ft)
2'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'-8"	1'-9"	1'-3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'-2"	2'-0"	1'-6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'-8"	2'-3"	1'-9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'-2"	2'-6"	2'-0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'-8"	2'-9"	2'-3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'-2"	3'-0"	2'-6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'-8"	3'-3"	2'-9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'-2"	3'-6"	3'-0"	1'-0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'-8"	4'-0"	3'-0"	1'-1"	#9	6"	#6	6"	283.06	1.068
16'-0"	8'-2"	4'-6"	3'-0"	1'-3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING
(2~wings)

Bar	Size	No.	Spa
D	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
R	#5	6	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

Bar	Size	No.	Spa
L	#4	~	1'-6"
Q	#4	1	~
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION FORMULAS:
(All values are in feet.)

Hw = H + T + C - 0.250'
A = (Hw - 0.333') (SL)
B = (A) tangent (30°)
Lw = (A) ÷ cosine (30°)

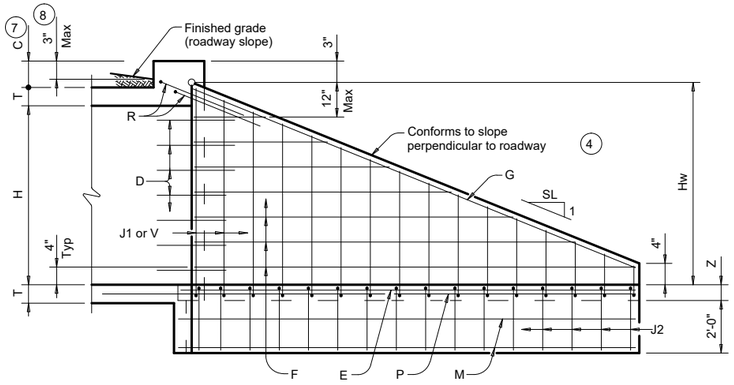
For cast-in-place culverts:
Ltw = (N) (S) + (N + 1) (U)

For precast culverts:
Ltw = (N) (2U + S) + (N - 1) (0.5')

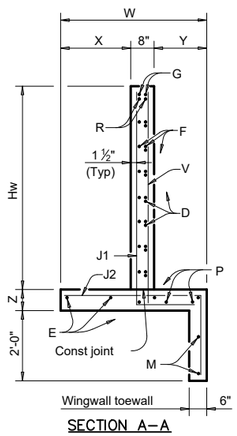
Total wingwall area (two wings ~ SF) = (Hw + 0.333') (Lw)

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 sheet for H, S, T, and U values.

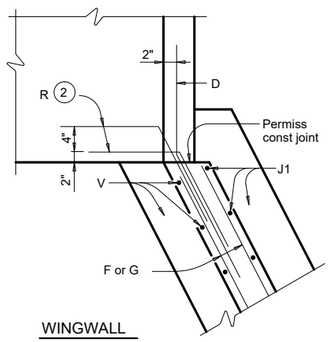


INSIDE ELEVATION
(SHOWING REINFORCING. CULVERT AND CULVERT TOEWALL REINFORCING NOT SHOWN FOR CLARITY.)



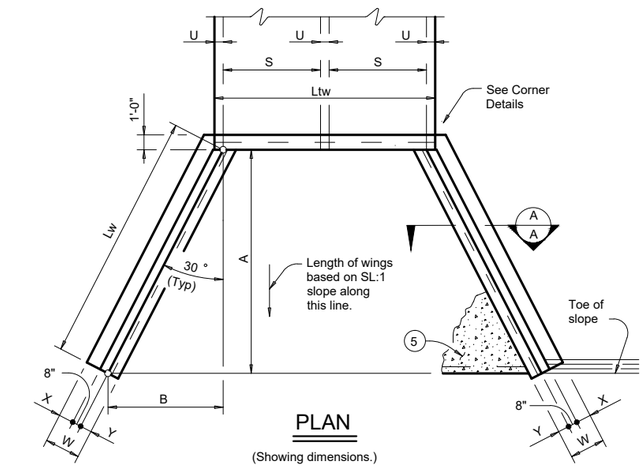
SECTION A–A

SECTION A-A

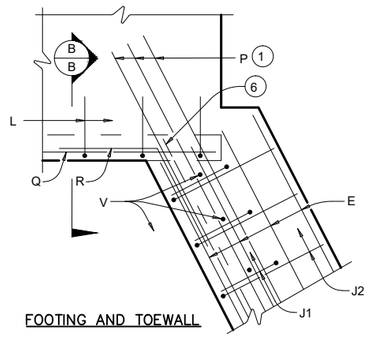


WINGWALL

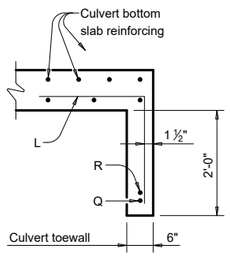
CORNER DETAILS
(CULVERT AND CULVERT TOEWALL REINFORCING NOT SHOWN FOR CLARITY.)



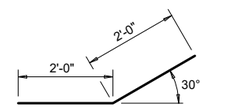
PLAN
(Showing dimensions.)



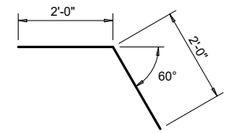
FOOTING AND TOEWALL



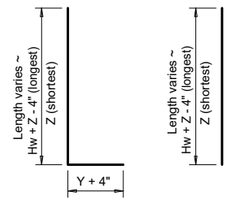
SECTION B–B



BARS D

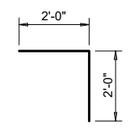


BARS R

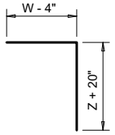


BARS J1

BARS V



BARS L



BARS J2

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 Lw.
4. Recommended values of side slope are: 4:1.
5. When shown elsewhere on the plans, construct 5" deep concrete 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. 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.

   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.
8. 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 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.

DISCLAIMER:
1. THIS DETAIL SHEET HAS BEEN PREPARED FOR USE ON DISTRICT PROJECTS.
2. AN ENGINEER WHO INCORPORATES THE DETAIL(S) FROM THIS SHEET BECOMES RESPONSIBLE FOR ITS USE IN THE END PRODUCT IN ACCORDANCE WITH RULE 137.33 (B) AND (C) OF THE TEXAS BOARD OF PROFESSIONAL ENGINEERS.
3. THE ENGINEER IS RESPONSIBLE FOR DESIGNING THE PAVEMENT AND REINFORCEMENT BASED UPON THE ACTUAL SITE CONDITIONS.

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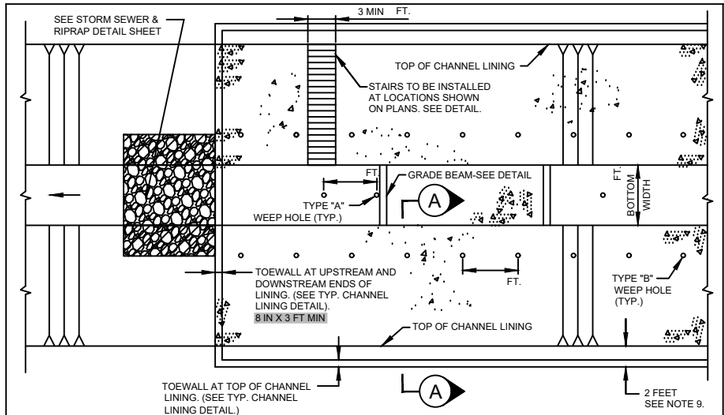
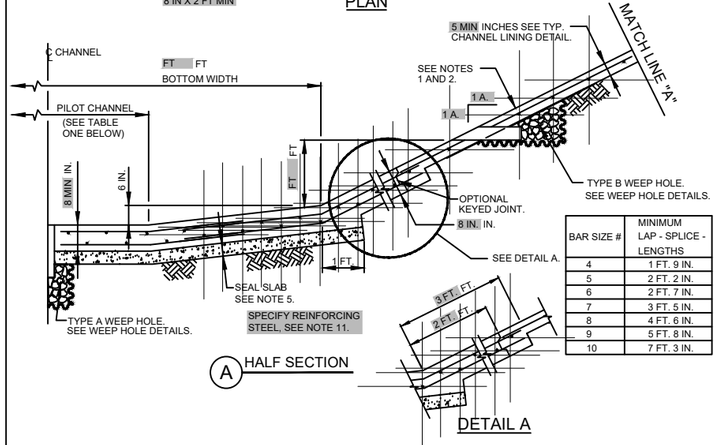
CONCRETE WING STRUCTURE DETAILS

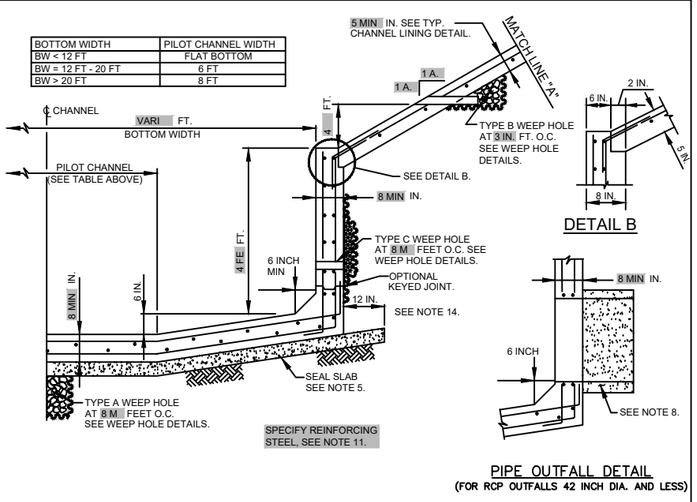
LAST REVISION DATE: 9-13-2024





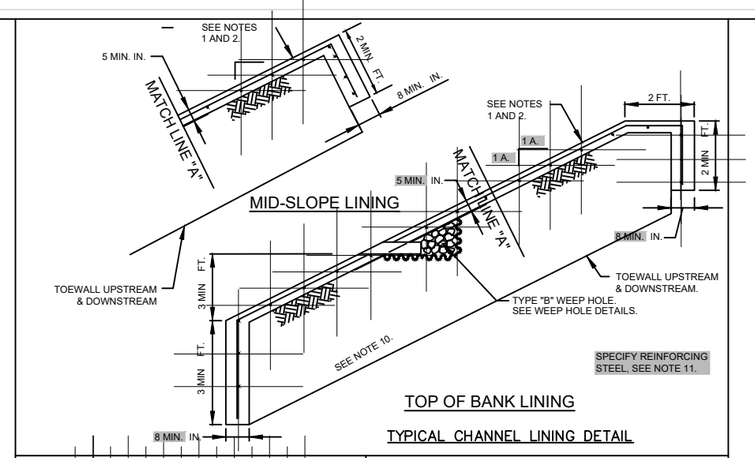
BAR SIZE #	MINIMUM LAP - SPLICE - LENGTHS
4	1 FT. 9 IN.
5	2 FT. 2 IN.
6	2 FT. 7 IN.
7	3 FT. 5 IN.
8	4 FT. 6 IN.
9	5 FT. 8 IN.
10	7 FT. 3 IN.

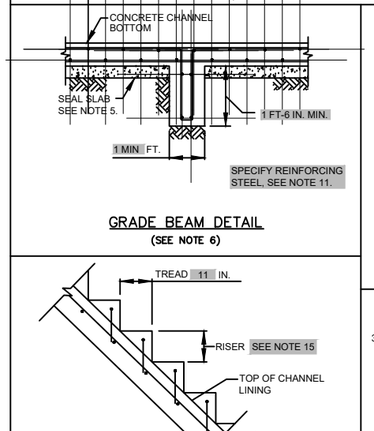
TYPICAL TRAPEZOIDAL CHANNEL LINING

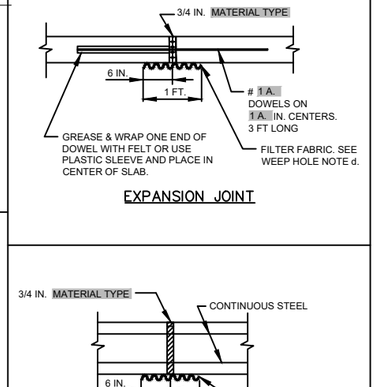


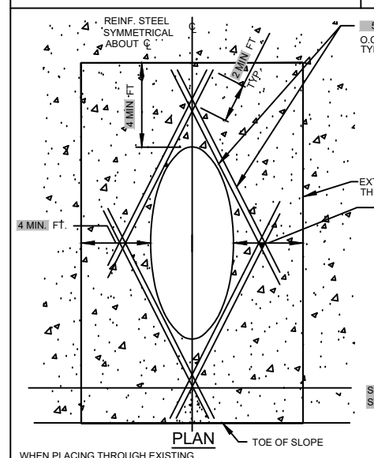
BOTTOM WIDTH	PILOT CHANNEL WIDTH
BW < 12 FT	FLAT BOTTOM
BW = 12 FT - 20 FT	6 FT
BW > 20 FT	8 FT

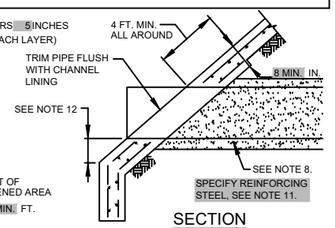
TYPICAL RECTANGULAR CONCRETE CHANNEL LINING HALF SECTION

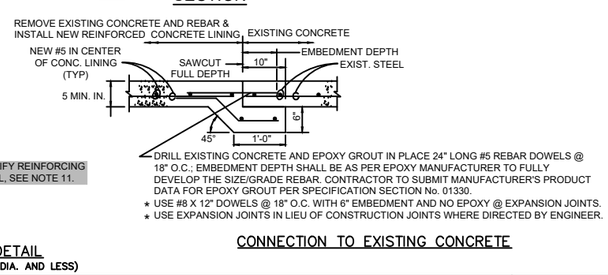


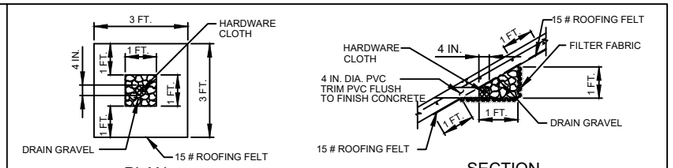


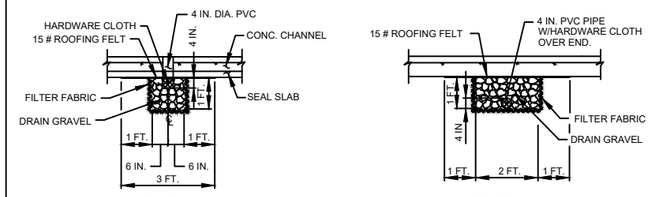


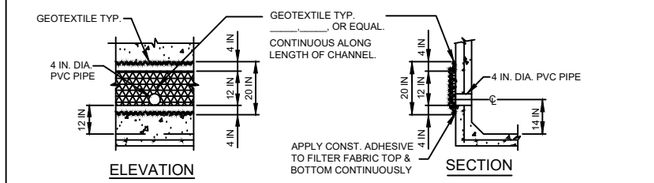












WEEP HOLE NOTES:

1. MATERIALS:
   a. PIPE: 4 INCH DIA. SCH. 40 PVC
   b. DRAIN GRAVEL: SEE NOTE 14

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

   c. HARDWARE CLOTH: MIN. OPEN 1/8 IN, MAX. OPEN 1/4 IN
   d. FILTER FABRIC: NON-WOVEN GEOTEXTILE

MIN. AOS	SIEVE NO.	100 MIN
MAX. AOS	SIEVE NO.	70 MAX
WEIGHT	OZ/SY	6 OZ. MIN

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

WEEP HOLE DETAILS

NOTES:

1. STRUCTURAL CONCRETE FOR CONCRETE CHANNEL LINING AND NONSTRUCTURAL CONCRETE FOR SEAL SLAB SHALL BE IN ACCORDANCE WITH CONCRETE SPECIFICATION.
2. REINFORCING STEEL SHALL BE IN ACCORDANCE WITH CONCRETE SPECIFICATION.
3. EXCAVATION AND BACKFILL FOR CONCRETE CHANNEL LINING SHALL BE IN ACCORDANCE WITH STRUCTURAL EXCAVATING AND BACKFILLING.
4. RIPRAP SHALL BE IN ACCORDANCE WITH SPECIFICATION RIPRAP AND GRANULAR FILL SPECIFICATION.
5. A NON-REINFORCED 4 INCH MINIMUM NONSTRUCTURAL CONCRETE SEAL SLAB IS REQUIRED BENEATH THE BOTTOM OF CONCRETE CHANNELS. STRUCTURAL CONCRETE GRADE BEAMS SHALL BE INSTALLED TRANSVERSELY AT 20 FOOT MAX.
6. CENTERS ON CONCRETE LINED CHANNELS WITH BOTTOM WIDTHS EQUAL TO OR GREATER THAN 20 FEET.
7. JOINTS:
   a. PLACE CONSTRUCTION JOINT IN CONCRETE LOW-FLOW, TRAPEZOIDAL BOTTOM SECTIONS AND SLOPES AT 20 FOOT MIN., SPACING CONTINUOUSLY THROUGH CHANNEL LINING.
   b. PLACE EXPANSION JOINT IN CONCRETE LOW-FLOW, TRAPEZOIDAL BOTTOM SECTIONS, AND SLOPES AT 60 FOOT MAX. SPACING CONTINUOUSLY THOUGH CHANNEL LINING.
8. CEMENT STABILIZED SAND SHALL BE PROVIDED AND PLACED IN ACCORDANCE WITH CEMENT STABILIZED SAND SPECIFICATION.
9. DELETE 2 FT FLAT EDGE WHEN LINING IS BELOW TOP OF BANK. SEE MID-SLOPE LINING DETAIL.
10. UPSTREAM AND DOWNSTREAM TOE WALL 3 FOOT MIN. DEPTH AT BOTTOM OF SLOPE AND 8 INCHES THICK.
11. MINIMUM #4 BARS (GRADE 60) AT 12 INCHES ON CENTER EACH WAY.
12. VARIES BASED ON SIDE SLOPE. MINIMUM 1 FOOT VERTICAL AT TOE OF SLOPE.
13. FOR RCP OUTFALLS 48 INCHES DIA. AND LARGER, USE HEADWALL/WINGWALL DETAIL.
14. FOR STRUCTURAL BACKFILL MATERIAL, USE CONCRETE COARSE AGGREGATE ASTM C33 SIZE NO. 467. LIMESTONE AND RECYCLED CONCRETE NOT ALLOWED.
15. RISE DIMENSION VARIES AS A FUNCTION OF SLIDE SLOPE.

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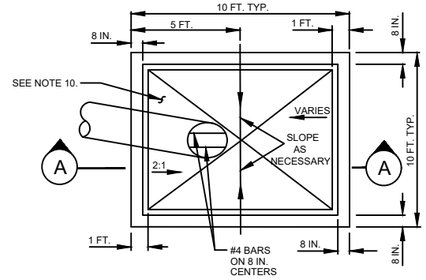
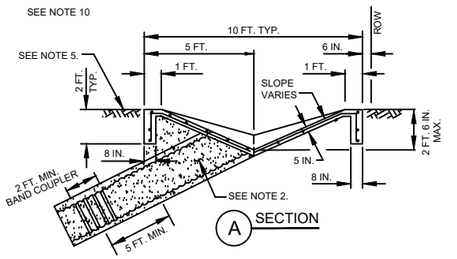
CONCRETE CHANNEL LINING DETAILS

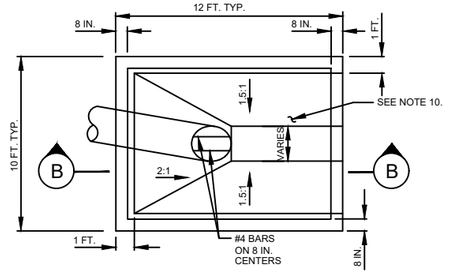
LAST REVISION DATE: 9-13-2024



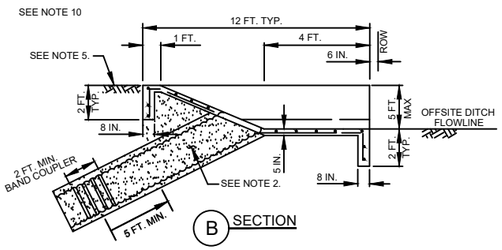
PLAN



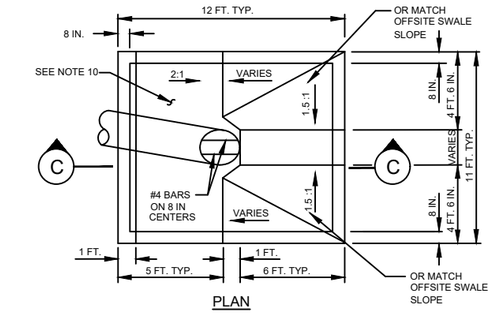
TYPICAL BACKSLOPE INTERCEPTOR STRUCTURE
(24 INCH & 30 INCH ONLY)
N.T.S



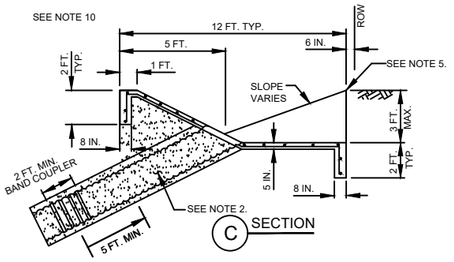
PLAN



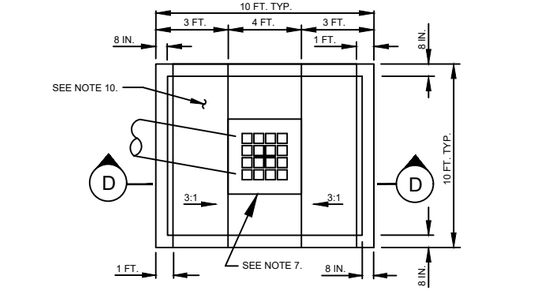
TYPICAL OFFSITE DITCH INTERCEPTOR STRUCTURE
(42 INCH MAX.)
N.T.S



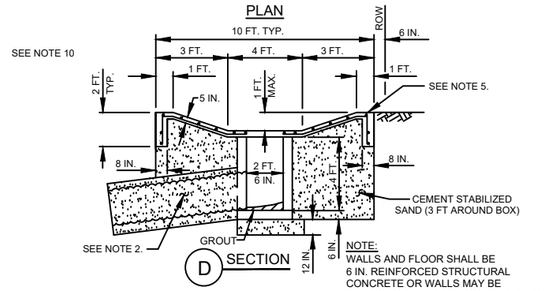
PLAN



COMBINATION BACKSLOPE & OFFSITE DITCH INTERCEPTOR STRUCTURE
(42 INCH MAX.)
N.T.S

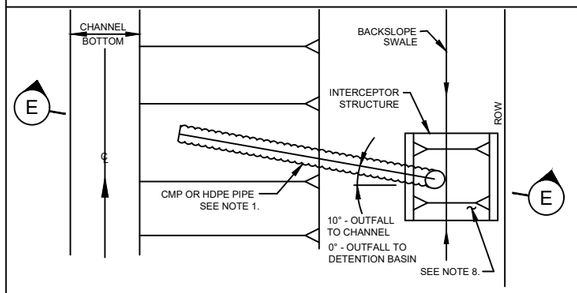


PLAN



NOTE:
WALLS AND FLOOR SHALL BE 6 IN. REINFORCED STRUCTURAL CONCRETE OR WALLS MAY BE 8 IN. CONCRETE BRICK CONSTRUCTION

URBAN BACKSLOPE INTERCEPTOR STRUCTURE
(24 INCH ONLY)
N.T.S



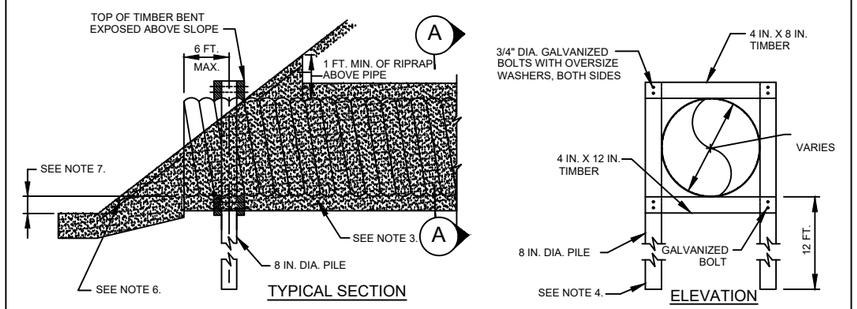
PIPE OUTFALL IN CHANNELS

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

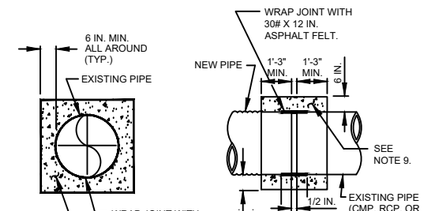
* OR 1 FOOT ABOVE NORMAL WATER LEVEL, WHICHEVER IS HIGHER

PIPE OUTFALL IN DETENTION BASINS
AT TOE OF SLOPE

CONCRETE COLLAR DETAIL
N.T.S



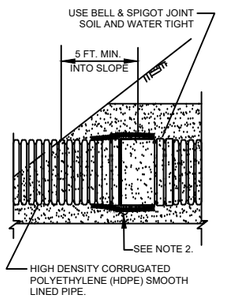
TIMBER BENT DETAIL FOR 48–INCH CMP; 36–INCH HDPE AND LARGER OUTFALLS
N.T.S



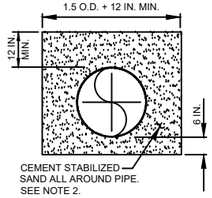
CONCRETE COLLAR DETAIL
N.T.S

NOTES:

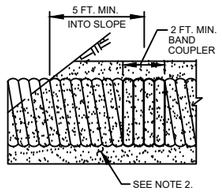
1. INTERCEPTOR OUTFALL PIPES WITHIN THE DISTRICT RIGHT–OF–WAY SHALL BE CMP POLYCOATED OR HDPE PIPE ACCORDINGLY. PLEASE CONSIDER USING HARRIS COUNTY FLOOD CONTROL DISTRICT (HCFCD) SPECIFICATION SECTION 02642– CORRUGATED METAL PIPE, HIGH DENSITY POLYETHYLENE (HDPE) PIPE IN ACCORDANCE WITH SPECIFICATION SECTION 2505–HIGH DENSITY POLYETHYLENE, OR APPROVED EQUAL, OR ANY OTHER AGENCY WITH JURISDICTION. USE TABLE ON STORM SEWER AND RIPRAP DETAILS SHEET FOR CORRUGATED GALVANIZED STEEL PIPE THICKNESS.
2. PROVIDE AND PLACE CEMENT STABILIZED SAND ACCORDINGLY. PLEASE CONSIDER USING HCFCD SPECIFICATION SECTION 0231 – CEMENT STABILIZED SAND AND SECTION 02316 – STRUCTURAL EXCAVATING OR ANY OTHER AGENCY WITH JURISDICTION.
3. EXCAVATION, FILL AND BACKFILL FOR INTERCEPTOR OUTFALLS – PLEASE CONSIDER USING HCFCD SPECIFICATION SECTION 02316–STRUCTURAL EXCAVATING AND BACKFILLING, OR ANY OTHER AGENCY WITH JURISDICTION.
4. CONCRETE SHALL BE STRUCTURAL CONCRETE. PLEASE CONSIDER USING HCFCD SPECIFICATION SECTION 03310–CONCRETE, OR ANY OTHER AGENCY WITH JURISDICTION.
5. INTERCEPTOR STRUCTURES:
   a. ADJUST LENGTH AND WIDTH IN FIELD AS NECESSARY.
   b. 2–FEET DEEP X 8–INCH WIDE TOE ALL AROUND THE STRUCTURE.
   c. STEEL REINFORCING–#4 BARS (GRADE 60) AT 12 INCHES ON CENTER EACH WAY.
   d. ANY INTERCEPTOR OUTFALL PIPE LARGER THAN MAXIMUM SIZE INDICATED REQUIRES A SEPARATE DETAIL.
   e. MATCH TOP OF CONCRETE WITH NATURAL GROUND.
6. CONCRETE PILOT CHANNEL
   a. 2.0 FEET DEEP X 8–INCH WIDE TOE ALL AROUND THE STRUCTURE.
   b. STEEL REINFORCING – #4 BARS (GRADE 60) AT 12 INCHES ON CENTER EACH WAY.
   c. MATCH TOP OF CONCRETE WITH BOTTOM OF DETENTION BASIN.
7. CONCRETE PAD AROUND URBAN BACKSLOPE INTERCEPTOR: PAID FOR AS CONCRETE INTERCEPTOR STRUCTURE PER UNIT PRICE SCHEDULE. TYPE "A" INLET BOX, COH DWG. NO. 2084–08 WITH GRATE TOP, VULCAN FOUNDRY COMPANY, V–4880–1 OR APPROVED EQUAL, APPROX. 473 SQ.IN. OPENING. PAID 2632–05
8. BACKSLOPE SWALE AND INTERCEPTOR STRUCTURE ELEVATIONS AND LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE. FINAL ELEVATIONS AND LOCATIONS SHALL BE FIELD VERIFIED BY THE ENGINEER PRIOR TO INSTALLATION.
9. STRUCTURAL CONCRETE WITH #4 BARS (GRADE 60) 12 INCH O.C. EACH WAY, 3 ROWS MIN. EACH WAY. – FOR COLLARS ONLY. WAIT A MINIMUM OF 24 HOURS AFTER PLACING CONCRETE TO BACKFILL.
10. EPOXY "CLEAN WATER CLEAR CHOICE" LOGO BUTTON ON INTERCEPTORS. LOCATION TO BE DETERMINED BY THE ENGINEER.



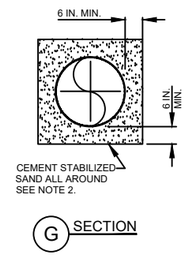
HDPE PIPE COUPLER DETAIL
N.T.S



BEDDING HDPE PIPE DETAIL
N.T.S



CMP BAND COUPLER DETAIL
N.T.S



BEDDING CMP DETAIL
N.T.S

DISCLAIMER:

1. THIS DETAIL SHEET HAS BEEN PREPARED FOR USE ON DISTRICT PROJECTS.
2. AN ENGINEER WHO INCORPORATES THE DETAIL(S) FROM THIS SHEET BECOMES RESPONSIBLE FOR ITS USE IN THE END PRODUCT IN ACCORDANCE WITH RULE 137.33 (B) AND (C) OF THE TEXAS BOARD OF PROFESSIONAL ENGINEERS.
3. THE ENGINEER IS RESPONSIBLE FOR DESIGNING THE PAVEMENT AND REINFORCEMENT BASED UPON THE ACTUAL SITE CONDITIONS.

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INTERCEPTOR STRUCTURE AND CONCRETE PILOT CHANNEL DETAILS

LAST REVISION DATE: *9–13–2024*

EXHIBIT: 6 OF 6