Texas Commission on Environmental Quality

Waste Permits Division Correspondence Cover Sheet

Date: 11/18/2025
Facility Name: Greater El Paso Landfill
Permit or Registration No.: 2284A

Nature of Correspondence:
☐ Initial/New
☒ Response/Revision to TCEQ Tracking No.: 30295149 (from subject line of TCEQ letter regarding initial submission)

Affix this cover sheet to the front of your submission to the Waste Permits Division. Check appropriate box for type of correspondence. Contact WPD at (512) 239-2335 if you have questions regarding this form.

Table 1 - Municipal Solid Waste Correspondence

Applications	Reports and Notifications
☐ New Notice of Intent	☐ Alternative Daily Cover Report
☐ Notice of Intent Revision	☐ Closure Report
☐ New Permit (including Subchapter T)	☐ Compost Report
☐ New Registration (including Subchapter T)	☐ Groundwater Alternate Source Demonstration
☒ Major Amendment	☐ Groundwater Corrective Action
☐ Minor Amendment	☐ Groundwater Monitoring Report
☐ Limited Scope Major Amendment	☐ Groundwater Background Evaluation
☐ Notice Modification	☐ Landfill Gas Corrective Action
☐ Non-Notice Modification	☐ Landfill Gas Monitoring
☐ Transfer/Name Change Modification	☐ Liner Evaluation Report
☐ Temporary Authorization	☐ Soil Boring Plan
☐ Voluntary Revocation	☐ Special Waste Request
☐ Subchapter T Disturbance Non-Enclosed Structure	☐ Other:
☐ Other:	

Table 2 - Industrial & Hazardous Waste Correspondence

Applications	Reports and Responses
☐ New	☐ Annual/Biennial Site Activity Report
☐ Renewal	☐ CPT Plan/Result
☐ Post-Closure Order	☐ Closure Certification/Report
☐ Major Amendment	☐ Construction Certification/Report
☐ Minor Amendment	☐ CPT Plan/Result
☐ CCR Registration	☐ Extension Request
☐ CCR Registration Major Amendment	☐ Groundwater Monitoring Report
☐ CCR Registration Minor Amendment	☐ Interim Status Change
☐ Class 3 Modification	☐ Interim Status Closure Plan
☐ Class 2 Modification	☐ Soil Core Monitoring Report
☐ Class 1 ED Modification	☐ Treatability Study
☐ Class 1 Modification	☐ Trial Burn Plan/Result
☐ Endorsement	☐ Unsaturated Zone Monitoring Report
☐ Temporary Authorization	☐ Waste Minimization Report
☐ Voluntary Revocation	☐ Other:
☐ 335.6 Notification	
☐ Other:	

November 18, 2025

Ms. Arin Anderson
Project Manager
Texas Commission on Environmental Quality
12100 Park 35 Circle
Austin, TX 78753

RE: Response to Third Technical Notice of Deficiency (TCEQ Tracking No. 30295149)
Greater El Paso Landfill (Type I)
Major Amendment Permit Application
TCEQ Permit Number MSW 2284A
El Paso County, Texas

Dear Ms. Anderson,

On behalf of the City of El Paso, Texas, Burns & McDonnell Engineering Company, Inc. is submitting the enclosed response to the third technical Notice of Deficiency (NOD) provided via email on October 21, 2025 from the Texas Commission on Environmental Quality (TCEQ) for the Greater El Paso Landfill, MSW 2284A (Landfill) major amendment permit application. This major amendment is focused on the vertical expansion of the existing Landfill. The permit application has been revised to address the NOD comments. The NOD comments and associated responses are provided below. Comments from the TCEQ are provided below in *italics* immediately followed by the response. Revised sections and appendices are included as an attachment to this letter and are identified as to the appropriate replacement location in the existing application.

NOD ID 1, Citation 330.63(c)(1)(D)(ii), Location Part III, Attachment III.B: As discussed in the meeting dated August 15, 2025, and in the second technical NOD, provide hydraulic calculations for sizing each of the drainage structures, as provided on Drawings III.B.5, III.B.6, III.B.13, and III.B.14 for

a. final cover side slope berms,
b. toe berm,
c. final cover letdowns/downchutes,
d. low water crossing structure,
e. water energy dissipator, and
f. spillway.

To facilitate our review, please identify in the response cover letter the specific pages (e.g. Attachment no., pages no.) of the revised submittal that contain the calculations for each of the drainage structures listed above.

Response: Calculations for each of the drainage structures are located:

a. Final cover side slope berms: As indicated on Details 4 and 7 on Drawing III.B.5, the calculations start on page III.B.129 and the "Intermediate Cover Side Slope Interceptor Ditches/Berms/Terraces" on page III.B.133 and the "Side Slope Interceptor Ditches/Berms/Terraces" on page III.B.137.
b. Toe berm: "Active Face Diversion berm" calculations for Run on/Run-off berms start on Page III.B-131 and 187 and are portrayed on Detail 8 on Drawing III.B.5; toe/top/diversion berm portrayed on Detail 3 on Drawing III.B.5 start on page III.B.129 and the "Intermediate Cover Toe/Top/Diversion Berm" on page III.B.135 and the "Toe/Top/Diversion Berm" on page III.B.139.
c. Final cover letdowns/downchutes: As indicated on Detail 5 on Drawing III.B.5, the calculations start on page III.B.129 and the "Letdown Structure" specifically on III.B.141.

d. Low water crossing structure: As indicated on Detail 1 on Drawing III.B.6, the calculations start on page III.B.129 and the "Low Water crossing" specifically on III.B.186.5.
e. Water energy dissipator: As indicated on Detail 6 on Drawing III.B.6, the calculations start on page III.B. 211.1.
f. Spillways: Spillways were modeled in HEC-HMS as a function of the Outfalls for Basins BC and DE. Results provided on page III.B.87, 88, 112, & 113 and additional calculations are included on pages III.B.186.1-186.4.

NOD ID 2, Citation 330.63(c)(1)(D)(ii) and 330.57(h)(3), Location Part III, Attachment III.B: Revise Drawings III.B.5, III.B.6, III.B.13, and III.B.14 to provide cross-sectional drawings per hydraulic calculations, drawn to an engineering scale.

Response: Cross section drawings are provided to scale on Drawing III.B.5, III.B.6, III.B.13, and III.B.14. It is noted that the scale on Drawing III.B.5 was inadvertently left off for NOD2 and a revised draft drawing is provided. Calculations were completed for the worst-case scenario (e.g., greatest flow) for each of the structures to verify sizing. This means for all top berms including Phase 1, the size/capacity of the berm was sized based on the area B3 which has the largest contributing area to the berm. For the interceptor/side slope ditches, an area from sub-catchment area B5 was used. Sub-catchments B2 & B5 together were used to check the size of the letdowns.

Enclosed is one (1) original copy and two (2) unmarked copies of the pages that were revised to address the NOD. In addition, one redline/strikeout copy of the revised pages is also attached. An additional one (1) unmarked copy will be mailed directly to the TCEQ Region 6 Office.

We appreciate your review of the enclosed materials and look forward to your comments. If you need additional clarification on anything presented in this NOD response, please do not hesitate to contact me directly to discuss your questions or concerns.

Sincerely,

Tonya Koller, PE
Project Manager
952-656-3615
[redacted]

Enclosure

cc: Nicholas Ybarra, City of El Paso
Cristian Benitez, City of El Paso

Please replace Appendix III.B with the following pages

MSW AUTH NO. 2284A

APPENDIX III.B – SURFACE WATER DRAINAGE REPORT

CITY OF EL PASO, TEXAS
GREATER EL PASO LANDFILL MAJOR AMENDMENT
PROJECT NO. 155488

REVISION 3
NOVEMBER 14, 2025

Part III, Appendix B
Surface Water Drainage Report
MSW Auth No. 2284A

prepared for

City of El Paso, Texas
Greater El Paso Landfill Major Amendment
El Paso County, Texas

Project No. 155488

Revision 0, October 31, 2024
Revision 1, May 16, 2025
Revision 2, September 12, 2025
Revision 3, November 14, 2025

prepared by

Burns & McDonnell Engineering Company, Inc.
6200 Bridge Point Pkwy, Building 4, Suite 400, Austin, TX 78730
Texas Firm Registration No. F-845

RATIONAL METHOD AND MANNING'S EQUATION CALCULATIONS

RATIONAL METHOD **Q = C I A**

C = RUNOFF COEFFICIENT, refer to Table 4-10: Runoff Coefficients for Urban Watersheds Texas Department of Transportation Hydraulic Design Manual (2019)
I = Rainfall intensity, per Atlas of Depth-Duration Frequency of Precipitation Annual Maxima for Texas
A = Area, largest sub-area contributing to drainage control

Active Face Diversion Berm

Q = (0.58)*(6.12)*(4) = 14.2 cfs

C = 0.58, calculated in Contaminated Water Containment worksheet
I = 6.12 in/hr
A = 4 acres, calculated in Contaminated Water Containment worksheet

Intermediate Cover Side Slope Interceptor Ditches / Terraces

Q = (0.25)*(6.12)*(3.88) = 5.94 cfs

C = 0.25, Sand or sandy loam soil, 5%
I = 6.12 in/hr
A = 3.88 acres, Drainage Area from B5

Intermediate Cover Top/Toe/Diversion Berms

Q = (0.25)*(6.12)*(7.23) = 11.06 cfs

C = 0.25, Sand or sandy loam soil, 5%
I = 6.12 in/hr
A = 7.23 acres, Drainage Area from B3

Side Slope Interceptor Ditches / Terraces

Q = (0.8)*(6.12)*(3.88) = 19.0 cfs

C = 0.8, Riprap
I = 6.12 in/hr
A = 3.88 acres, Drainage Area from B5

Top/Toe/Diversion Berms

Q = (0.8)*(6.12)*(7.23) = 35.4 cfs

C = 0.8, Riprap
I = 6.12 in/hr
A = 7.23 acres, Drainage Area from B3

Letdown Structure

Q = (0.8)*(6.12)*(35.98) = 176.2 cfs

C = 0.8, Riprap
I = 6.12 in/hr
A = 35.98 acres, Drainage Area from B2 & B5

Perimeter Ditches

- Calculated using HEC-HMS

Worksheet for Active Face Diversion Berm

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.018	
Channel Slope	0.005	ft/ft
Left Side Slope	3.000	H:V
Right Side Slope	2.000	H:V
Discharge	14.20	cfs ← See Page III.B-129

Results		
Normal Depth	14.4	in
Flow Area	3.6	ft²
Wetted Perimeter	6.5	ft
Hydraulic Radius	6.7	in
Top Width	6.00	ft
Critical Depth	13.8	in
Critical Slope	0.006	ft/ft
Velocity	3.95	ft/s
Velocity Head	0.24	ft
Specific Energy	1.44	ft
Froude Number	0.898	
Flow Type	Subcritical	

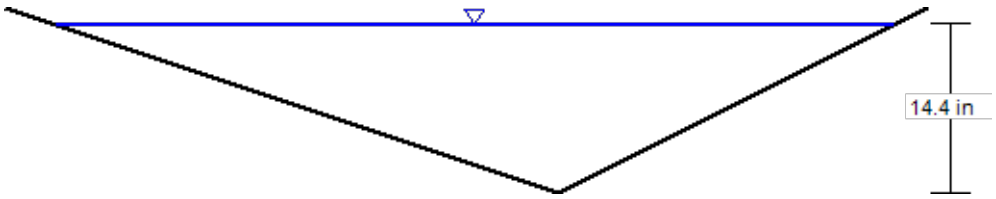
GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	14.4	in
Critical Depth	13.8	in
Channel Slope	0.005	ft/ft
Critical Slope	0.006	ft/ft

Cross Section for Active Face Diversion Berm

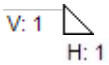
Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.018
Channel Slope	0.005 ft/ft
Normal Depth	14.4 in
Left Side Slope	3.000 H:V
Right Side Slope	2.000 H:V
Discharge	14.20 cfs



Normal Depth 14.4 in < 27 in Berm Height, See Detail 8 on Drawing III.B.5.

SIZING CALCULATIONS FOR CONTAINMENT AND DIVERSION BERMS INCLUDING WATER DEPTH AND DESIGN FREEBOARD OF 1-FOOT CAN BE FOUND IN ATTACHMENT III.B.1, P.III.B-187.



Worksheet for Intermediate Cover Side Slope Interceptor Ditches/Berms/Terraces

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.020	
Channel Slope	0.010	ft/ft
Left Side Slope	4.000	H:V
Right Side Slope	2.000	H:V
Discharge	5.94	cfs ← See Page III.B-129

Results		
Normal Depth	8.8	in
Flow Area	1.6	ft²
Wetted Perimeter	4.7	ft
Hydraulic Radius	4.2	in
Top Width	4.41	ft
Critical Depth	9.0	in
Critical Slope	0.009	ft/ft
Velocity	3.67	ft/s
Velocity Head	0.21	ft
Specific Energy	0.94	ft
Froude Number	1.066	
Flow Type	Supercritical	

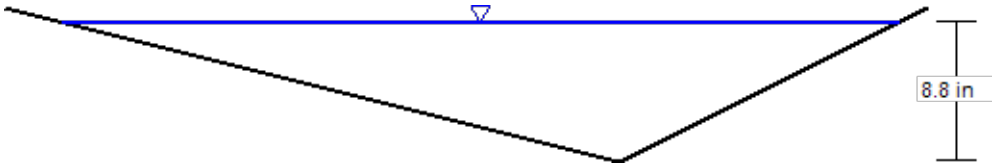
GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	8.8	in
Critical Depth	9.0	in
Channel Slope	0.010	ft/ft
Critical Slope	0.009	ft/ft

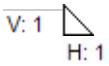
Cross Section for Intermediate Cover Side Slope Interceptor Ditches/Berms/Terraces

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.020
Channel Slope	0.010 ft/ft
Normal Depth	8.8 in
Left Side Slope	4.000 H:V
Right Side Slope	2.000 H:V
Discharge	5.94 cfs



Normal Depth 8.8 in < 24 in Berm Height, See Details 4 & 7, on Drawing III.B.5 (while these represent final cover conditions, the berm detail will be the same for intermediate cover conditions).



Worksheet for Intermediate Cover Top/Toe/Diversion Berms

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.020	
Channel Slope	0.005	ft/ft
Left Side Slope	20.000	H:V
Right Side Slope	2.000	H:V
Discharge	11.06	cfs ← See Page III.B-129

Results		
Normal Depth	7.7	in
Flow Area	4.5	ft²
Wetted Perimeter	14.3	ft
Hydraulic Radius	3.8	in
Top Width	14.12	ft
Critical Depth	6.9	in
Critical Slope	0.009	ft/ft
Velocity	2.44	ft/s
Velocity Head	0.09	ft
Specific Energy	0.73	ft
Froude Number	0.760	
Flow Type	Subcritical	

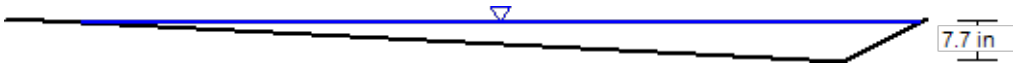
GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	7.7	in
Critical Depth	6.9	in
Channel Slope	0.005	ft/ft
Critical Slope	0.009	ft/ft

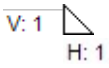
Cross Section for Intermediate Cover Top/Toe/Diversion Berms

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.020
Channel Slope	0.005 ft/ft
Normal Depth	7.7 in
Left Side Slope	20.000 H:V
Right Side Slope	2.000 H:V
Discharge	11.06 cfs



Normal Depth 7.7 in < 24 in Berm Height, See Detail 3 on Drawing III.B.5 (while these represent final cover conditions, the berm detail will be the same for intermediate cover conditions).



Worksheet for Side Slope Interceptor Ditches/Berms/Terraces

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.035	
Channel Slope	0.010	ft/ft
Left Side Slope	4.000	H:V
Right Side Slope	2.000	H:V
Discharge	19.00	cfs ← See Page III.B-129

Results		
Normal Depth	16.8	in
Flow Area	5.9	ft²
Wetted Perimeter	8.9	ft
Hydraulic Radius	7.9	in
Top Width	8.41	ft
Critical Depth	14.4	in
Critical Slope	0.023	ft/ft
Velocity	3.22	ft/s
Velocity Head	0.16	ft
Specific Energy	1.56	ft
Froude Number	0.679	
Flow Type	Subcritical	

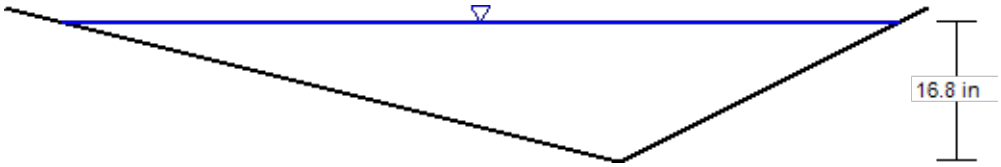
GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	16.8	in
Critical Depth	14.4	in
Channel Slope	0.010	ft/ft
Critical Slope	0.023	ft/ft

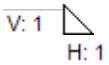
Cross Section for Side Slope Interceptor Ditches/Berms/Terraces

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	0.010 ft/ft
Normal Depth	16.8 in
Left Side Slope	4.000 H:V
Right Side Slope	2.000 H:V
Discharge	19.00 cfs



Normal Depth 16.8 in < 24 in Berm Height, See Details 4 & 7, on Drawing III.B.5.



Worksheet for Top/Toe/Diversion Berms

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.035	
Channel Slope	0.005	ft/ft
Left Side Slope	20.000	H:V
Right Side Slope	2.000	H:V
Discharge	35.40	cfs ← See Page III.B-129

Results		
Normal Depth	14.7	in
Flow Area	16.5	ft²
Wetted Perimeter	27.3	ft
Hydraulic Radius	7.3	in
Top Width	26.93	ft
Critical Depth	11.0	in
Critical Slope	0.024	ft/ft
Velocity	2.15	ft/s
Velocity Head	0.07	ft
Specific Energy	1.30	ft
Froude Number	0.484	
Flow Type	Subcritical	

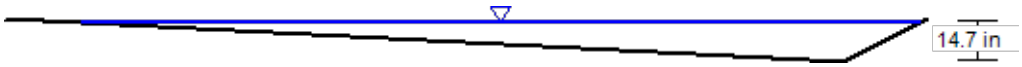
GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	14.7	in
Critical Depth	11.0	in
Channel Slope	0.005	ft/ft
Critical Slope	0.024	ft/ft

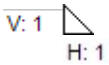
Cross Section for Top/Toe/Diversion Berms

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.035
Channel Slope	0.005 ft/ft
Normal Depth	14.7 in
Left Side Slope	20.000 H:V
Right Side Slope	2.000 H:V
Discharge	35.40 cfs



Normal Depth 14.7 in < 24 in Berm Height, See Detail 3 on Drawing III.B.5.



Worksheet for Letdown Structure

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Roughness Coefficient	0.041	
Channel Slope	0.250	ft/ft
Left Side Slope	2.000	H:V
Right Side Slope	2.000	H:V
Bottom Width	8.00	ft
Discharge	176.20	cfs ← See Page III.B-129

Results		
Normal Depth	12.8	in
Flow Area	10.9	ft²
Wetted Perimeter	12.8	ft
Hydraulic Radius	10.2	in
Top Width	12.28	ft
Critical Depth	24.8	in
Critical Slope	0.023	ft/ft
Velocity	16.24	ft/s
Velocity Head	4.10	ft
Specific Energy	5.17	ft
Froude Number	3.045	
Flow Type	Supercritical	

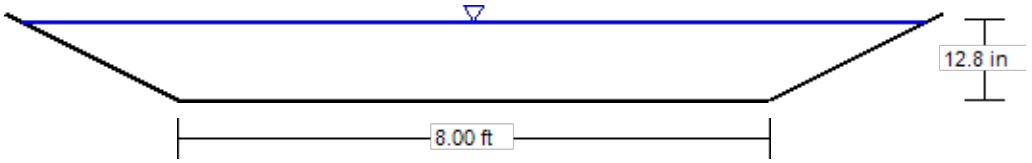
GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	12.8	in
Critical Depth	24.8	in
Channel Slope	0.250	ft/ft
Critical Slope	0.023	ft/ft

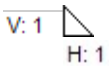
Cross Section for Letdown Structure

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.041
Channel Slope	0.250 ft/ft
Normal Depth	12.8 in
Left Side Slope	2.000 H:V
Right Side Slope	2.000 H:V
Bottom Width	8.00 ft
Discharge	176.20 cfs



Normal Depth 12.8 in < 18 in Berm Height, See Detail 5 on Drawing III.B.5.



Worksheet for Basin BC Spillway

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data - See Drawing III.B.13.	
Roughness Coefficient	0.069
Channel Slope	0.020 ft/ft
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	31.00 ft
Discharge	95.71 cfs ← See Page III.B-88

Results	
Normal Depth	11.9 in
Flow Area	33.6 ft²
Wetted Perimeter	37.3 ft
Hydraulic Radius	10.8 in
Top Width	36.94 ft
Critical Depth	7.8 in
Critical Slope	0.082 ft/ft
Velocity	2.85 ft/s
Velocity Head	0.13 ft
Specific Energy	1.12 ft
Froude Number	0.526
Flow Type	Subcritical

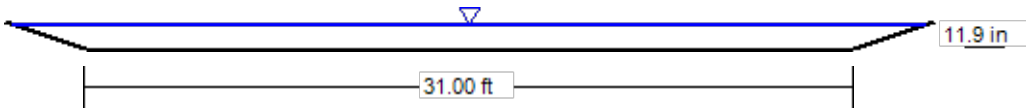
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	11.9 in
Critical Depth	7.8 in
Channel Slope	0.020 ft/ft
Critical Slope	0.082 ft/ft

Cross Section for Basin BC Spillway

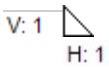
Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.069
Channel Slope	0.020 ft/ft
Normal Depth	11.9 in
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	31.00 ft
Discharge	95.71 cfs



Normal Depth 11.9 in < 24 in Spillway Depth, See Drawing III.B.13.

NOTE: During normal conditions, the pond high water level will be a foot below the emergency spillway. If the outlet structure were to malfunction, then the pond will safely pass the 25-year, 24-hour storm event as calculated above.



Worksheet for Basin DE Spillway

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data - See Drawing III.B.14.		
Roughness Coefficient	0.069	
Channel Slope	0.020	ft/ft
Left Side Slope	3.000	H:V
Right Side Slope	3.000	H:V
Bottom Width	10.00	ft
Discharge	17.56	cfs ← (2 Spillways) See Page III.B-113.

Results		
Normal Depth	8.3	in
Flow Area	8.3	ft²
Wetted Perimeter	14.4	ft
Hydraulic Radius	6.9	in
Top Width	14.13	ft
Critical Depth	5.2	in
Critical Slope	0.096	ft/ft
Velocity	2.11	ft/s
Velocity Head	0.07	ft
Specific Energy	0.76	ft
Froude Number	0.486	
Flow Type	Subcritical	

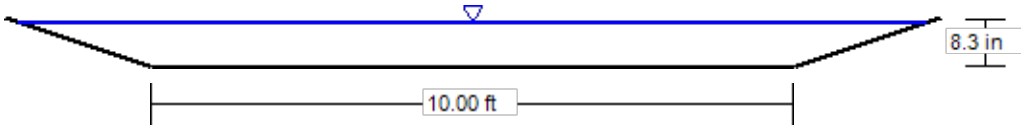
GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	8.3	in
Critical Depth	5.2	in
Channel Slope	0.020	ft/ft
Critical Slope	0.096	ft/ft

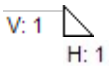
Cross Section for Basin DE Spillway

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.069
Channel Slope	0.020 ft/ft
Normal Depth	8.3 in
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	10.00 ft
Discharge	17.56 cfs



Normal Depth 8.3 in < 24 in Spillway Depth, See Drawing III.B.14.



NOTE: During normal conditions, the pond high water level will be a foot below the emergency spillway. If the outlet structure were to malfunction, then the pond will safely pass the 25-year, 24-hour storm event as calculated above.

Low Water Crossing

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data - See Detail 1, Drawing III.B.6.		
Roughness Coefficient	0.018	
Channel Slope	0.250	ft/ft
Left Side Slope	10.000	H:V
Right Side Slope	10.000	H:V
Bottom Width	10.00	ft
Discharge	176.20	cfs ← See Page III.B-129

Results		
Normal Depth	6.3	in
Flow Area	8.0	ft²
Wetted Perimeter	20.6	ft
Hydraulic Radius	4.7	in
Top Width	20.50	ft
Critical Depth	16.7	in
Critical Slope	0.005	ft/ft
Velocity	22.01	ft/s
Velocity Head	7.53	ft
Specific Energy	8.06	ft
Froude Number	6.211	
Flow Type	Supercritical	

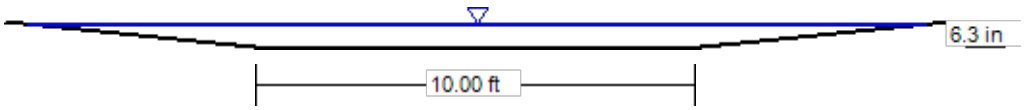
GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	6.3	in
Critical Depth	16.7	in
Channel Slope	0.250	ft/ft
Critical Slope	0.005	ft/ft

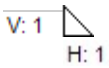
Cross Section for Low Water Crossing

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.018
Channel Slope	0.250 ft/ft
Normal Depth	6.3 in
Left Side Slope	10.000 H:V
Right Side Slope	10.000 H:V
Bottom Width	10.00 ft
Discharge	176.20 cfs



Normal Depth 6.3 in < 12 in Channel Height, See Detail 1 on Drawing III.B.6.

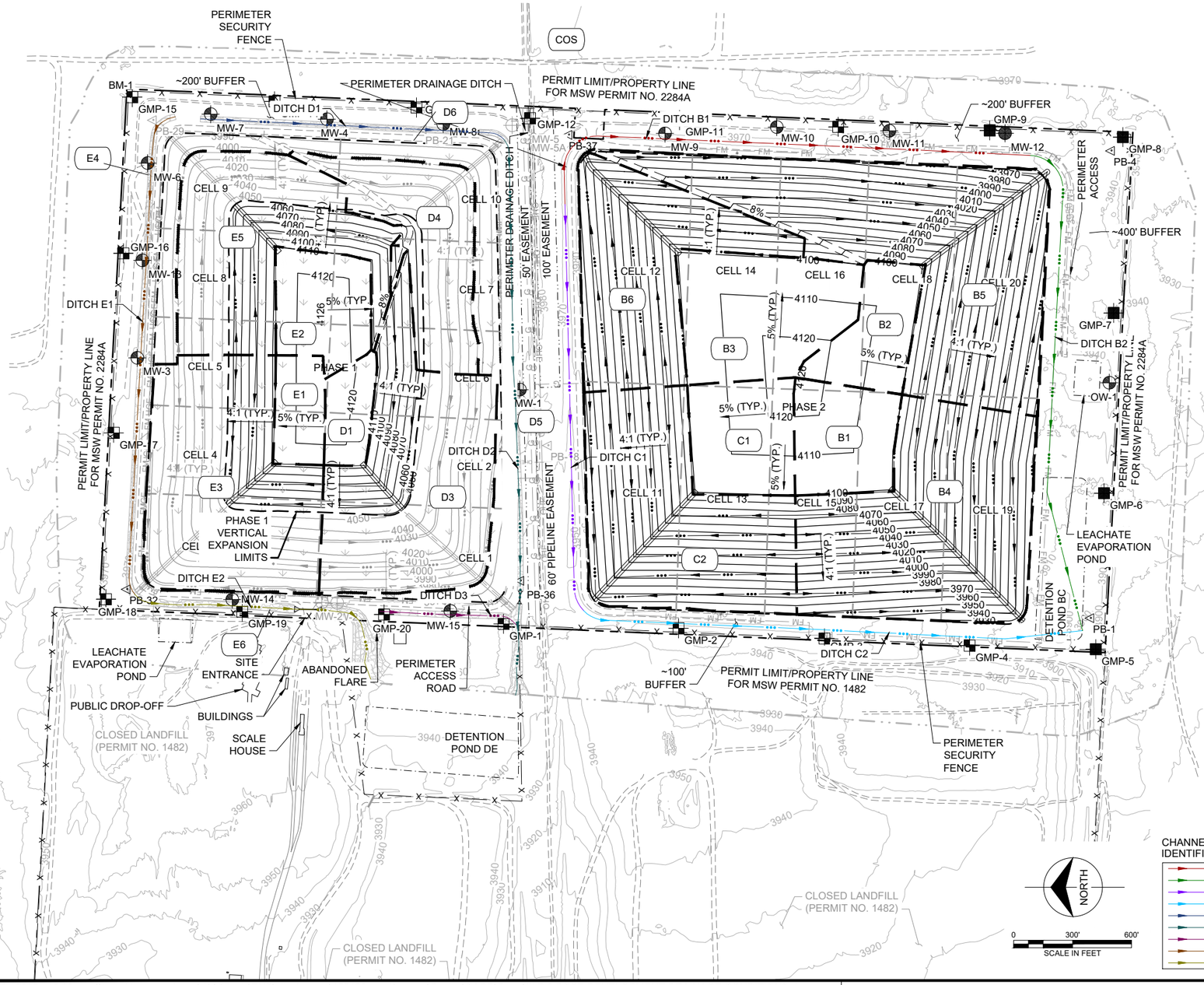


WATER ENERGY DISSIPATOR CALCULATIONS

Open Channel Energy Dissipator – Trapezoidal Channel (Low-Water Crossing)

INPUTS		
Design Discharge Q (cfs)	176.200	
Bottom Width b (ft)	8.000	
Side Slope z (H:V, both sides)	2.000	
Channel Longitudinal Slope S0 (ft/ft)	0.250	
Manning n (dimensionless)	0.041	
G (ft/s^2)	32.174	
Initial Guess: Depth y1 (ft) – use Goal Seek	1.336	
CALCULATIONS (trapezoidal channel)		
Top Width T (ft)	13.344	
Area A (ft^2)	14.257	
Wetted Perimeter P (ft)	13.974	
Hydraulic Radius R (ft)	1.020	
Velocity V (ft/s)	12.359	
Hydraulic Depth D=A/T (ft)	1.068	
Normal Depth Residual f(y)=Q-(1/n)A R^(2/3) S0^(1/2)	0.000	
Unit Discharge q per top width (cfs/ft)	13.205	
Froude Number Fr1 = V/sqrt(g*D)	2.108	Supercritical
Approx. Sequent Depth y2 (ft) [uses Belanger with Fr1 and y1]	3.370	
Minimum Basin Length (ft) (per HEC-14)	18.824	< 30' Road Width
		Crossing Contains Hydraulic Jump
		SEE DETAILS ON DRAWING III.B.6.

- The chute delivers supercritical flow to the crossing ($Fr_1 \approx 2.1$), the dissipators reduce the Energy of the flow and reduce it to sub-critical prior to discharge into the basin or perimeter channels.
- The two dissipator rows act as perforated sills that force and stabilize the hydraulic jump on the slab.



PLAN LEGEND

- DRAINAGE SUBBASIN
- PERMIT LIMIT
- FLOW DIRECTION
- A — DISCHARGE POINT
- B5 — DRAINAGE BASIN IDENTIFIER
- STREAM OR DITCH
- CULVERT

NOTE: SEE DRAWING III.A.1 FOR COMPLETE LEGEND.

DEVELOPED CONDITIONS SUMMARY

DISCHARGE	SUBBASIN	AREA (AC.)	DISCHARGE (CFS)
	A1	5.0	4.57
@A		5.0	4.57
	B1	6.5	38.91
	B2	5.6	32.49
	B3	12.0	66.37
	B4	24.8	147.65
	B5	30.4	151.27
	B6	16.0	95.76
	B7	16.3	12.51
	B8	15.4	25.96
	COS	151.4	42.5
	C1	7.1	40.61
	C2	20.8	129.52
	C3	9.4	26.89
INFLOW @ POND BC		315.5	545.27
OUTFLOW @ POND BC			95.71
	D1	2.8	66.08
	D3	19.2	68.52
	D4	15.0	44.54
	D5	24.8	56
	D6	12.9	45.14
	E1	3.2	63.77
	E2	6.1	62.76
	E3	20.7	70.98
	E4	12.5	39.7
	E5	14.6	44.54
	E6	11.9	50.61
INFLOW @ POND DE		143.8	396.8
OUTFLOW @ POND DE			35.12

CHANNEL IDENTIFICATION	SIDE SLOPES	CHANNEL SLOPE (FT/FT) (SEE ATT.III.B.1, P. III.B-128)	BOTTOM WIDTH (FT)
DITCH B1	3:1	VARIES	8
DITCH B2	3:1		8
DITCH C1	3:1		8
DITCH C2	3:1		8
DITCH D1	3:1		8
DITCH D2	3:1		8
DITCH D3	3:1		8
DITCH E1	3:1		8
DITCH E2	3:1		8

no.	date	by	ckd	description
0	5/1/24	TMC	TLK	2284A PERMIT MOD
1	5/16/25	AAN	TJS	TCEQ NOD 1
2	9/12/25	JGP	TLK	TCEQ NOD 2
3	11/14/25	JGP	TLK	TCEQ NOD 3

NOTES:

1. INDEX CONTOUR INTERVAL, 10 FEET.
2. GREATER EL PASO LANDFILL EXISTING SITE TOPOGRAPHY (2284A PERMIT AREA) DERIVED FROM ORTHO-PHOTOGRAPHY FROM AN UNMANNED AERIAL SURVEY TIED TO GROUND CONTROL PANELS PROVIDED BY PARKHILL, SMITH & COOPER, AUGUST 28, 2019. TOPOGRAPHY WITHIN CELLS 11 THROUGH 14 COMPLETED WITH GROUND CONTROL POINTS PROVIDED BY THE CITY OF EL PASO, AUGUST 2022. TOPOGRAPHY OUTSIDE OF THE SURVEY EXTENTS WAS OBTAINED FROM THE TEXAS NATURAL RESOURCES INFORMATION SYSTEM, DATED APRIL 2008.
3. THE SURVEY COORDINATES ARE ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE 4203, NAD83. HORIZONTAL DATUM IS NAD83. VERTICAL DATUM IS NAVD88.
4. EXISTING TOP OF FINAL COVER SURFACE FOR PHASE 1 PREPARED BY PARKHILL, SMITH & COOPER, INC. AND REPRESENTS DESIGN FINAL COVER ELEVATIONS. CONTOUR INTERVAL IS 10 FEET. PHASE 1 RECEIVED FINAL COVER IN 2021.
5. DESIGN CONTOURS REPRESENT TOP OF FINAL COVER SURFACE FOR PHASE 1 AND PHASE 2. CONTOUR INTERVAL IS 10 FEET. 2284 PERMITTED DESIGN CONTOURS WERE BASED ON CITY DATUM ELEVATIONS AND WERE ADJUSTED TO NAVD88 BY ADDING 10.39 FEET AS CERTIFIED BY BROCK & BUSTILLOS INC. ON DECEMBER 7, 2023. DATUM CERTIFICATION LETTER INCLUDED IN APPENDIX I/II.B.

FOR PERMITTING PURPOSES ONLY

BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co, Inc.
FIRM REG. NO. F-845

date	detailed
MAY 2024	D. KAMBLE
designed	checked
T. CAMMACK	T. KOLLER

EPTX CITY OF EL PASO

City of El Paso, Texas

2284A PERMIT AMENDMENT

POST-DEVELOPMENT DRAINAGE CONDITIONS

project	contract
155488	-

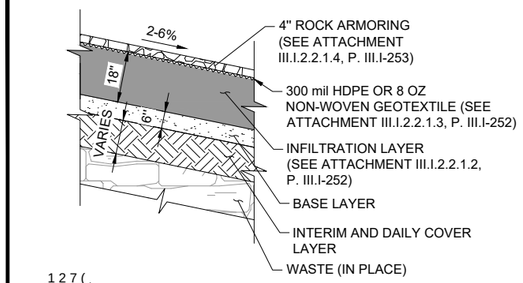
drawing **III.B.3** rev. **3**

file III.B.3 POST-DEVELOPMENT DRAINAGE CONDITIONS.dwg

STATE OF TEXAS
TONYA L. KOLLER
133943
LICENSED
PROFESSIONAL ENGINEER
11-18-25

TONYA L. KOLLER P.E.
LICENSE NO. 133943

Scale For Microfilming: Millimeters / Inches



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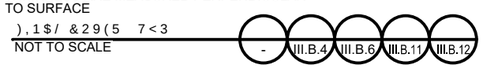

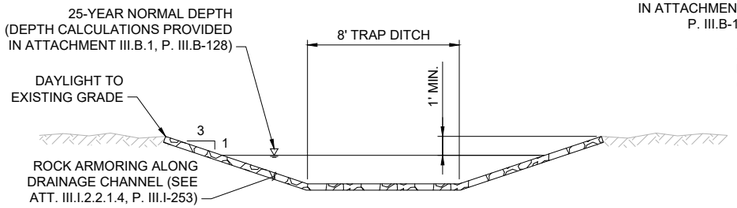

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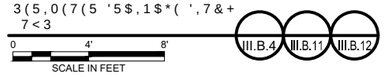

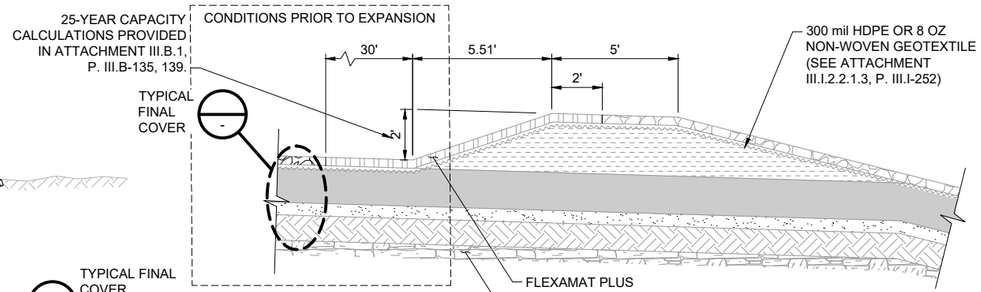

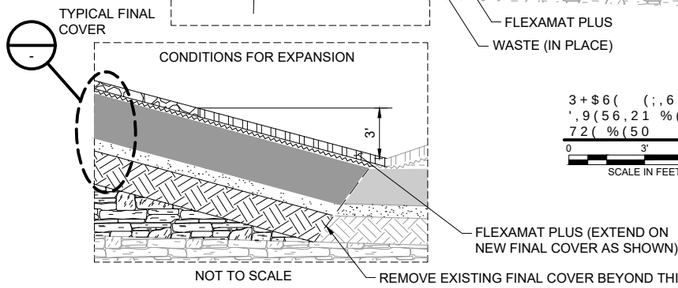

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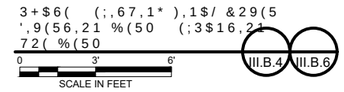

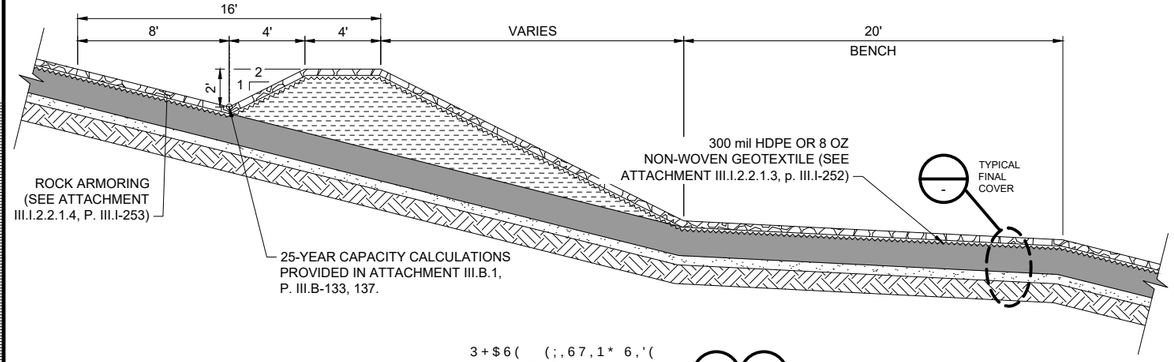

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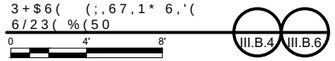

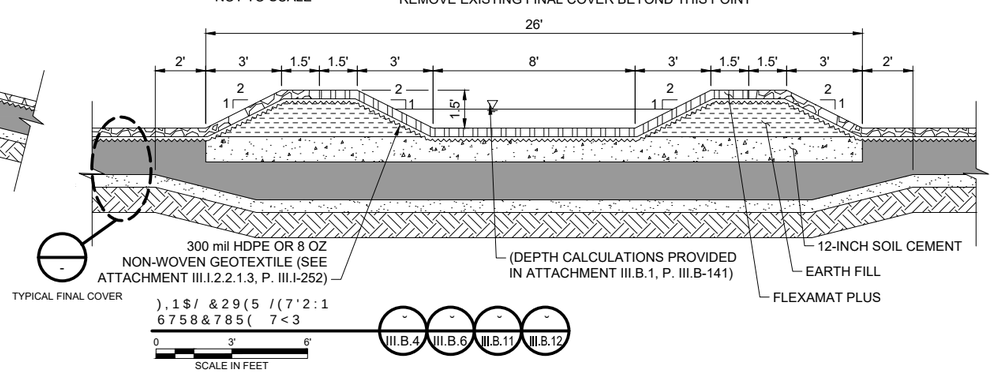

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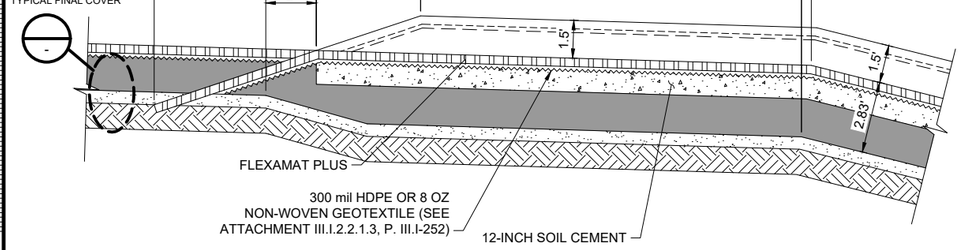
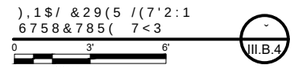
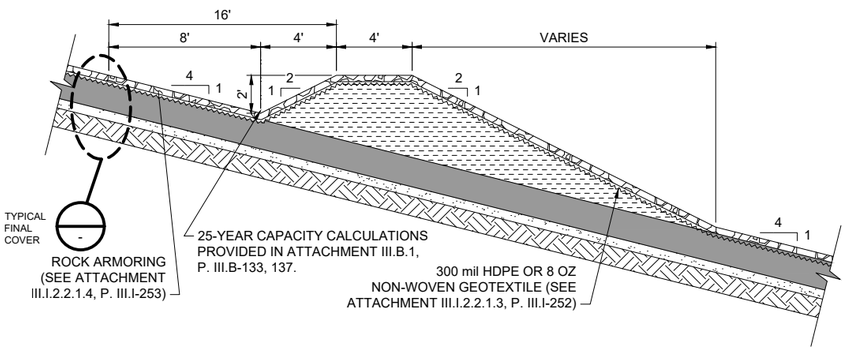
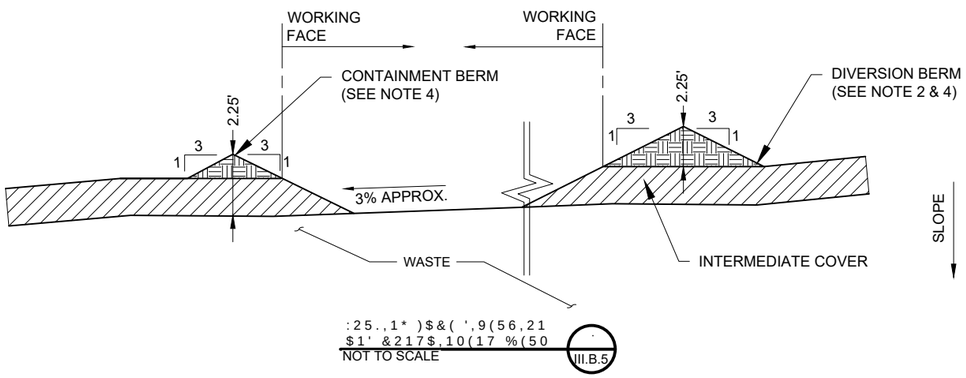


),1$/ &29(5 /(7'2:1 6758&785(7<3







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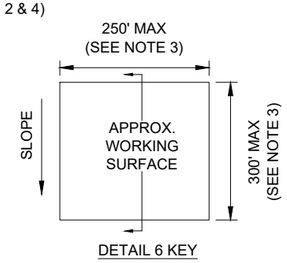

DETAIL 6 KEY

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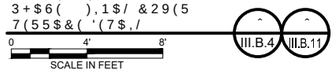

NOTES FOR DETAIL 8:

1. WORKING FACE WILL RELOCATE IN CONJUNCTION WITH CURRENT WASTE FILLING PATTERNS.
2. DIVERSION BERM FLOWLINE SHALL BE 0.5% MINIMUM TO CONVEY UNCONTAMINATED WATER AROUND WORKING FACE.
3. MAXIMUM WORKING FACE DIMENSIONS ARE DEPENDENT UPON WASTE QUANTITY.
4. SIZING CALCULATIONS FOR CONTAINMENT AND DIVERSION BERMS INCLUDING WATER DEPTH AND DESIGN FREEBOARD OF 1-FOOT CAN BE FOUND IN ATTACHMENT III.B.1, P.III.B-187.

TONYA L. KOLLER P.E.
LICENSE NO. 133943

no.	date	by	ckd	description
0	5/1/24	TMC	TLK	2284A PERMIT MOD
1	5/16/25	AAN	TJS	TCEQ NOD 1
2	9/12/25	JGP	TLK	TCEQ NOD 2
3	11/14/25	JGP	TLK	TCEQ NOD 3

)25 3(50,77,1* 385326(6 21/<

BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co, Inc.
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date	detailed
MAY 2024	D. KAMBLE
designed	checked
T. CAMMACK	T. KOLLER

EPTX CITY OF EL PASO

City of El Paso, Texas

$ 3(50,7 $0(1'0(17

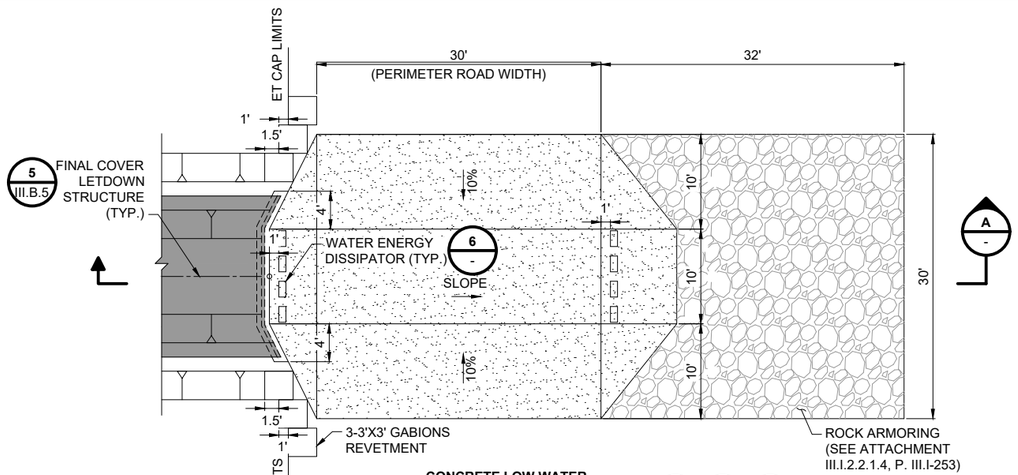
DRAINAGE DETAILS, 1 OF 2

project	contract
155488	-

drawing , , , rev. %

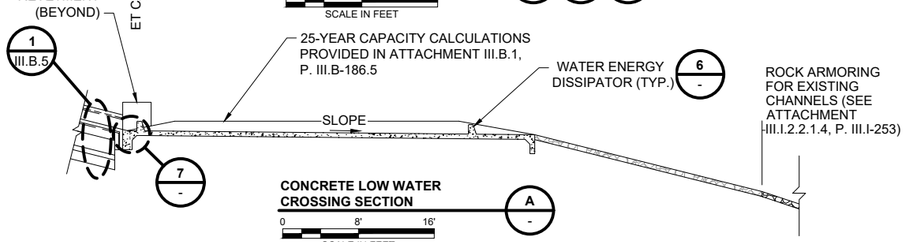
file III.B.5 DRAINAGE DETAILS, 1 OF 2.dwg

Millimeters
Scale For Microfilming
Inches



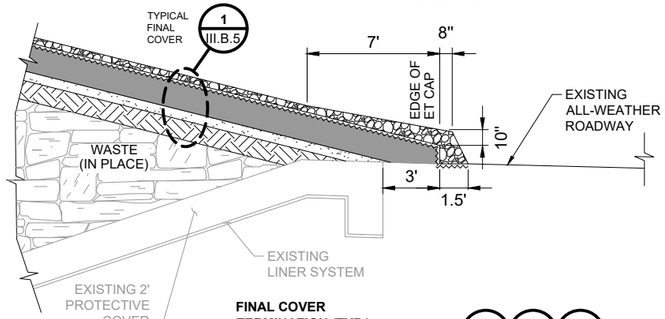
CONCRETE LOW WATER CROSSING PLAN — 1 III.B.4 | 1 III.B.11 | 1 III.B.12

0 8' 16'
SCALE IN FEET



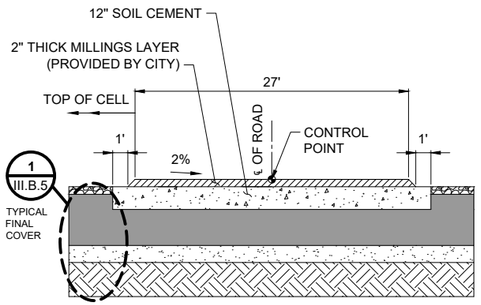
CONCRETE LOW WATER CROSSING SECTION — A -

0 8' 16'
SCALE IN FEET

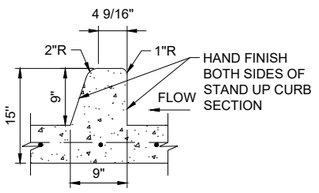


FINAL COVER TERMINATION (TYP.) — 3 III.B.4 | 3 III.B.11 | 3 III.B.12

0 8' 16'
SCALE IN FEET

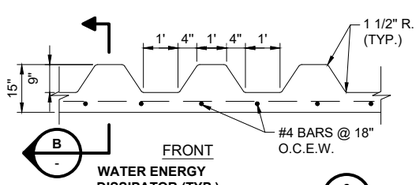


CELL ACCESS ROAD — NOT TO SCALE — 5 III.B.4

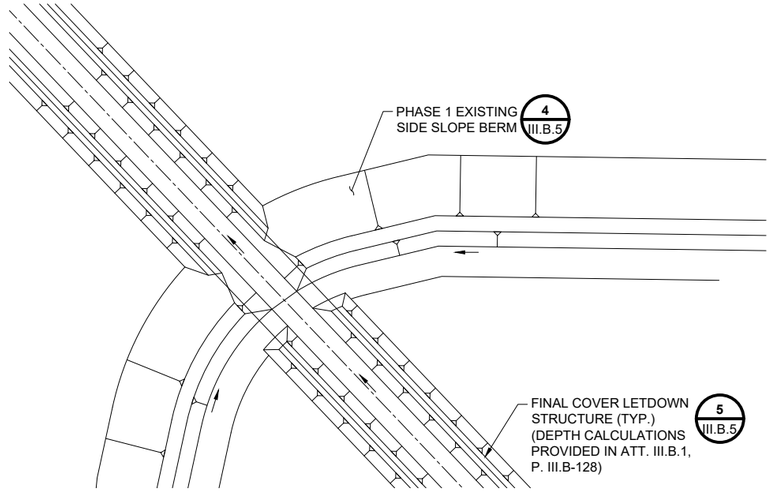


NOTE: HYDRAULIC JUMP CALCULATIONS PROVIDED IN ATTACHMENT III.B.1, P.III.B-211.1

WATER ENERGY DISSIPATOR (TYP.) SECTION — SCALE: 1" = 1' — B -

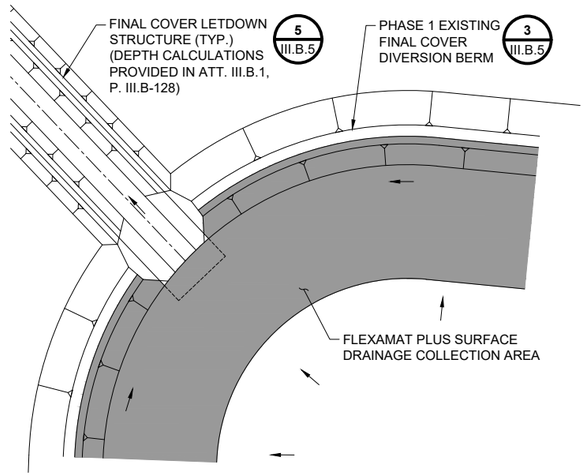


WATER ENERGY DISSIPATOR (TYP.) — NOT TO SCALE — 6 -



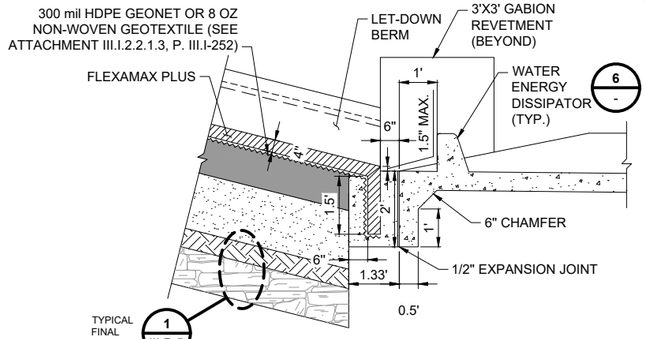
LET-DOWN DRAINAGE COLLECTION AREA (TYP.) — 2 III.B.4 | 2 III.B.11

0 10' 20' 40'
SCALE IN FEET



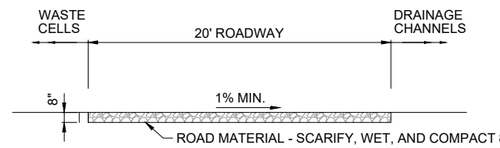
LET-DOWN DRAINAGE AT SIDE SLOPE BERM (TYP.) — 4 III.B.4

0 10' 20' 40'
SCALE IN FEET



LET DOWN CONNECTION — 7 -

0 2' 4'
SCALE IN FEET



PERIMETER ROAD — NOT TO SCALE — 8 III.B.4

no.	date	by	ckd	description
0	5/1/24	TMC	TLK	2284A PERMIT MOD
1	5/16/25	AAN	TJS	TCEQ NOD 1
2	9/12/25	JGP	TLK	TCEQ NOD 2
3	11/14/25	JGP	TLK	TCEQ NOD 3

FOR PERMITTING PURPOSES ONLY

BURNS McDONNELL
9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co, Inc.
FIRM REG. NO. F-845

date	detailed
MAY 2024	D. KAMBLE
designed	checked
T. CAMMACK	T. KOLLER

City of El Paso, Texas

2284A PERMIT AMENDMENT

DRAINAGE DETAILS, 2 OF 2

project	contract
155488	-

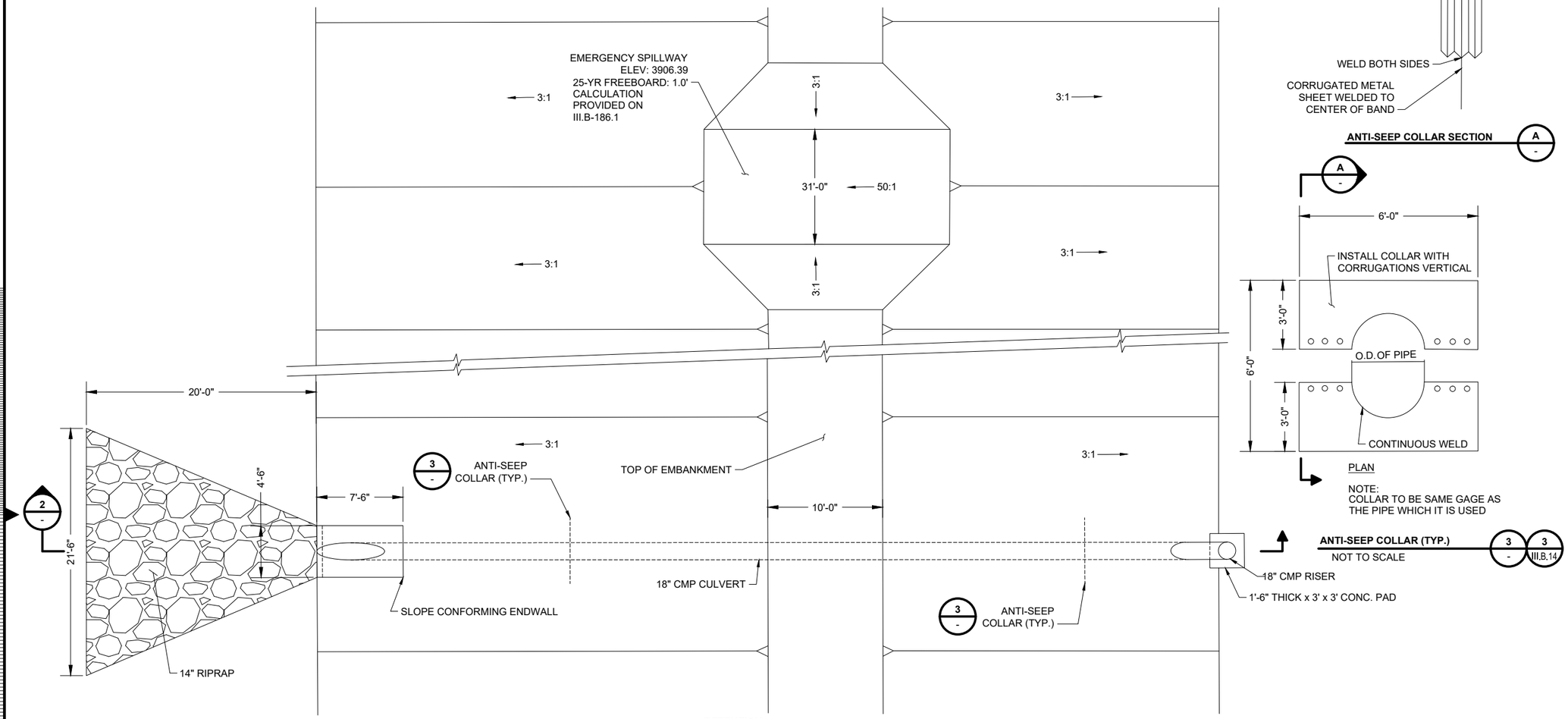
drawing **III.B.6 – 3**

file III.B.6 DRAINAGE DETAILS 2 OF 2.dwg

STATE OF TEXAS
TONYA L. KOLLER
133943
LICENSED PROFESSIONAL ENGINEER
11-10-25

TONYA L. KOLLER P.E.
LICENSE NO. 133943

no.	date	by	ckd	description
0	5/1/24	TMC	TLK	2284A PERMIT MOD
1	5/16/25	AAN	TJS	TCEQ NOD 1
2	9/12/25	JGP	TLK	TCEQ NOD 2
3	11/14/25	JGP	TLK	TCEQ NOD 3



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Burns & McDonnell Engineering Co, Inc.
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date	detailed
MAY 2024	D. KAMBLE
designed	checked
T. CAMMACK	T. KOLLER

City of El Paso, Texas

2284A PERMIT AMENDMENT

POND BC OUTFALL AND SECTIONS

project	contract
155488	-

drawing **III.B.13** rev. **3**

file III.B.13 POND BC OUTFALL AND SECTIONS.dwg

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TONYA L. KOLLER
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LICENSED PROFESSIONAL ENGINEER
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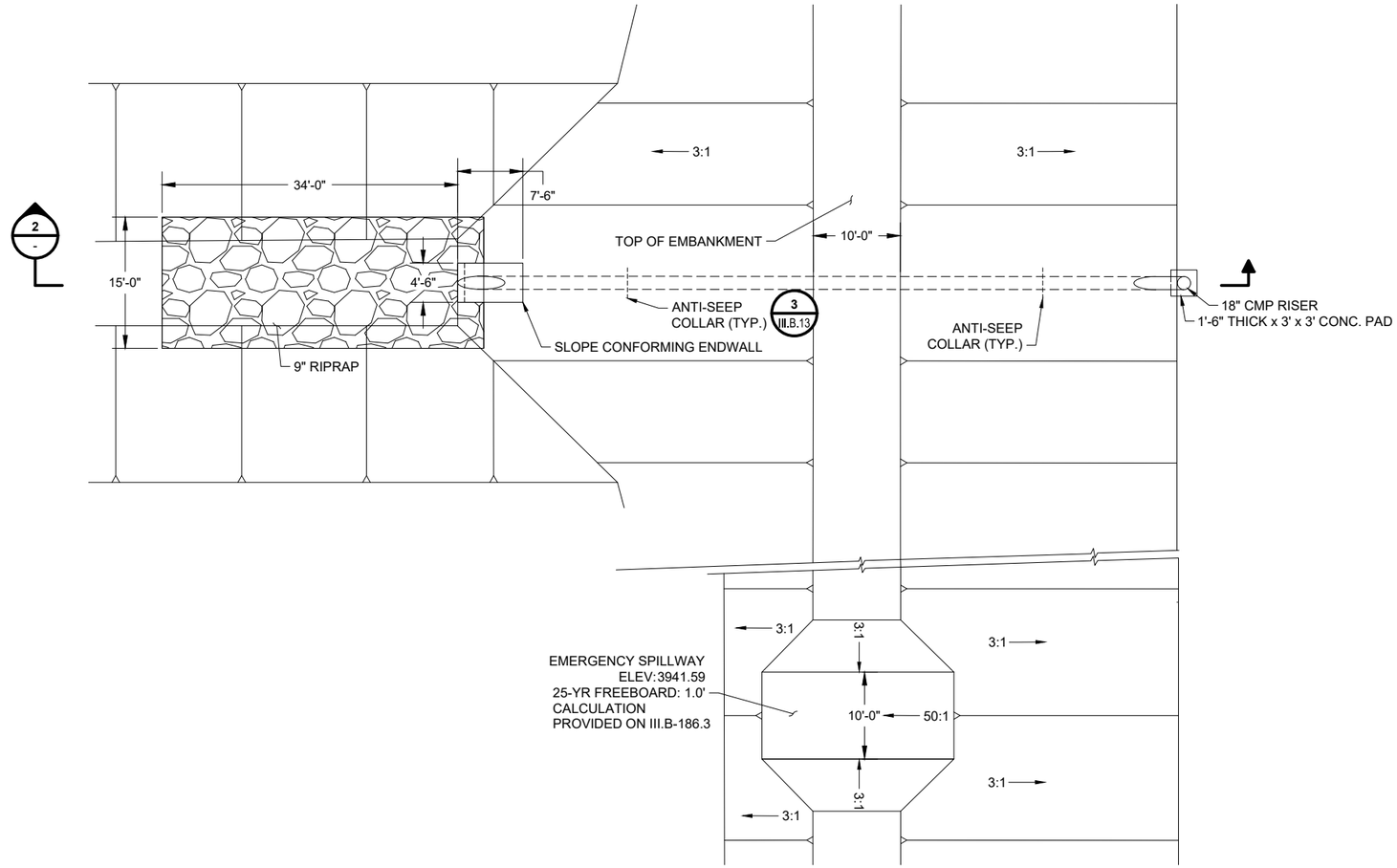
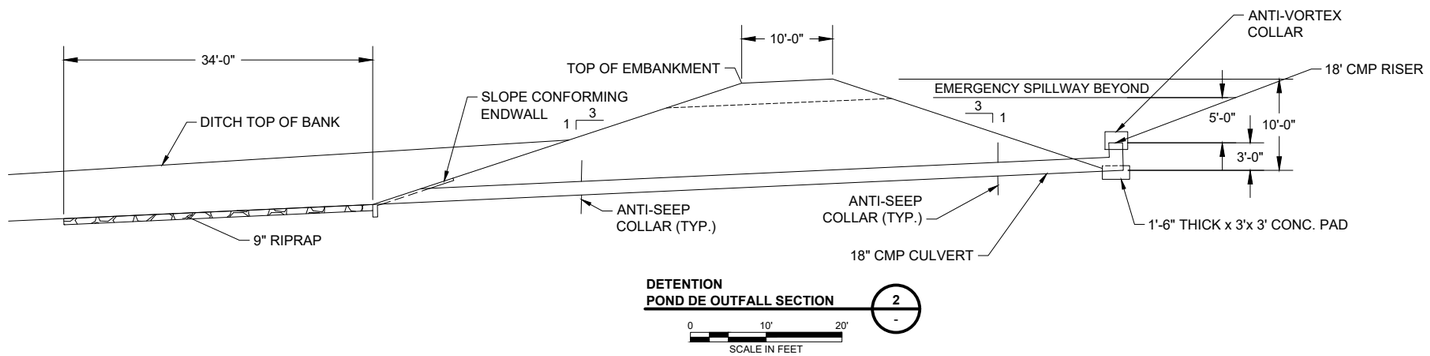
TONYA L. KOLLER P.E.
LICENSE NO. 133943





no.	date	by	ckd	description
0	5/1/24	TMC	TLK	2284A PERMIT MOD
1	5/16/25	AAN	TJS	TCEQ NOD 1
2	9/12/25	JGP	TLK	TCEQ NOD 2
3	11/14/25	JGP	TLK	TCEQ NOD 3

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date	detailed
MAY 2024	D. KAMBLE
designed	checked
T. CAMMACK	T. KOLLER

EP TX CITY OF EL PASO

City of El Paso, Texas

2284A PERMIT AMENDMENT

POND DE OUTFALL AND SECTIONS

project	contract
155488	-

drawing **III.B.14** rev. **3**

file III.B.14 POND DE OUTFALL AND SECTIONS.dwg

STATE OF TEXAS
TONYA L. KOLLER
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Scale For Microfilming
Millimeters
Inches