



**SPURLOCK STATION LANDFILL
AREA C, PHASE 4 CELL CONSTRUCTION**

**LOCATION RESTRICTIONS
COMPLIANCE DEMONSTRATION**



EAST KENTUCKY POWER COOPERATIVE

COAL COMBUSTION RESIDUAL RULE COMPLIANCE

REV. 0 (10/15/2019)


CERTIFICATION

EAST KENTUCKY POWER COOPERATIVE
SPURLOCK STATION – AREA C, PHASE 4
LOCATION RESTRICTIONS COMPLIANCE DEMONSTRATION

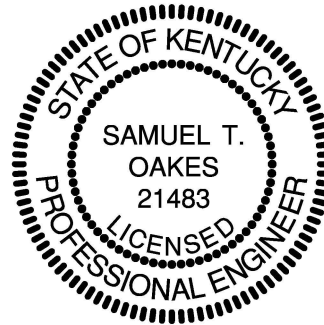
CERTIFICATION

I hereby certify, as a Professional Engineer in the Commonwealth of Kentucky, that the Spurlock Station CCR Landfill, Area C, Phase 4 at East Kentucky Power Cooperative's Spurlock Station has been sited and constructed to meet the requirements of the following provisions of the CCR Rule: 40 CFR §§ 257.60 (placement above the uppermost aquifer); 257.61 (wetlands); 257.62 (fault areas); 257.63 (seismic impact zones) and 257.64 (unstable areas).

I further certify that the information in this document was assembled under my direct supervisory control. This report is not intended or represented to be suitable for reuse by East Kentucky Power Cooperative or others without specific verification or adaptation by the Engineer.



S. Tim Oakes, P.E. [21,483] - Kenvirons, Inc.



Date: 11/4/19

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1.0 INTRODUCTION

On April 17, 2015, the Environmental Protection Agency (EPA) issued the final version of the federal Coal Combustion Residual Rule (CCR Rule) to regulate the disposal of coal combustion residual (CCR) materials generated at coal-fired units. The rule, codified at 40 CFR §257.50 through §257.107, will be administered as part of the Resource Conservation and Recovery Act [RCRA, 42 United States Code (U.S.C.) §6901 et seq.], under Subtitle D.

East Kentucky Power Cooperative (EKPC) is subject to the CCR Rule and as such must demonstrate compliance with location restrictions per 40 Code of Federal Regulations (CFR) §257.60 through §257.64. This document serves as EKPC's location restriction demonstration for Spurlock Station CCR Landfill Area C Phase 4. This unit is a lateral expansion of the existing Landfill as defined in 40 CFR §257.53. The site plans can be found in Attachment 2.

A compliance summary of the CCR Rule location restrictions requirements addressed in this document are provided in Table 1-1 below.

TABLE 1-1 LOCATION RESTRICTIONS SUMMARY

LOCATION RESTRICTIONS			
Unit: Spurlock Station Landfill Lateral Expansion (Area C, Phase 4)			
DESCRIPTION	CCR RULE COMPLIANCE		
	YES	NO	REPORT REFERENCE
Placement Above Uppermost Aquifer	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See Section 2.1
Wetlands	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See Section 2.2
Fault Areas	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See Section 2.3
Seismic Impact Zones	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See Section 2.4
Unstable Areas ¹	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See Section 2.5

¹ Certification based on incorporation of recognized and generally accepted engineering practices to ensure integrity of the structural components of the CCR unit per 40 CFR §257.64(a).

2.0 LOCATION RESTRICTIONS

2.1 Placement Above the Uppermost Aquifer

40 CFR §257.60(a) states that CCR landfills “must be constructed with a base that is located no less than 1.52 meters (five feet) above the upper limit of the uppermost aquifer, or must demonstrate that there will not be an intermittent, recurring, or sustained hydraulic connection between any portion of the base of the CCR unit and the uppermost aquifer due to normal fluctuations in groundwater elevations (including the seasonal high water table).”

A hydrogeological field investigation was conducted by Tetra Tech, Inc. (Tetra Tech) in October 2017 for Spurlock Station Landfill. Based on this investigation and published regional geological information, each hollow in the area represents a separate groundwater regime, with the recharge area bounded by the top of the ridges that define the watershed. Although the centers of the ridges may be saturated, flow between the hollows is constrained due to the absence of fracture porosity. The uppermost aquifer at the site is considered to be within the weathered and fractured bedrock zone in the valley floors (natural drainage courses) underlain by shale bedrock strata. The weathered/fractured zone extends 15 to 45 feet below the bedrock surface.

The landfill subgrade (base) is designed to be no less than five feet above the seasonal high saturated zone that is situated along the weathered/fractured bedrock zone in the valley bottoms. However, if isolated saturated zones (seeps) are encountered within the vadose zone during construction of the liner system, an underdrain will be installed to capture and convey groundwater seeps outside the landfill.

The seasonal high saturated zone (potentiometric surface) for the landfill was determined by Tetra-Tech in 2015 as part of their hydrogeological investigation referenced previously in this section. Comparing design subgrade to Tetra-Tech’s potentiometric surface, the distance from the seasonal high saturated zone to the lowest elevations of the landfill subgrade (cell floor) range from 22 to 36 feet, well above the 5 feet requirement stated in 40 CFR §257.60(a). See Attachment 1 for the landfill subgrade (base grades) versus the seasonal high saturated zone map.

2.2 Wetlands

40 CFR §257.61(a) states that CCR landfills “must not be located in wetlands, as defined in §232.2 of this chapter, unless the owner or operator demonstrates by the dates specified in paragraph (c) of this section that the CCR unit meets the requirements of paragraph (a)(1) through (5) of this section.” Based on jurisdictional determinations performed by Redwing Ecological Services, Inc. on behalf of EKPC, the Spurlock Station Landfill Area C Phase 4 waste boundary is not located in wetlands, as defined under the CCR Rule.

2.3 Fault Areas

40 CFR §257.62(a) states that CCR landfills “must not be located within 60 meters (200 feet) of the outermost damage zone of a fault that has had displacement in Holocene time unless the owner or operator demonstrates by the dates specified in paragraph (c) of this section that an alternative setback distance of less than 60 meters (200 feet) will prevent damage to the structural integrity of the CCR unit.”

Based on mapping data obtained from the Kentucky Geologic Survey (KGS) and United States Geologic Survey (USGS), the facility will not be located within 60 meters (200 feet) of the outermost damage zone of a fault that has displaced in Holocene time. See Attachment 4 for fault mapping.

2.4 Seismic Impact Zones

40 CFR §257.63(a) states that CCR landfills “must not be located in seismic impact zones unless the owner or operator demonstrates by the dates specified in paragraph (c) of this section that all structural components including liners, leachate collection and removal systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site.”

Based on the 2008 USGS seismic mapping, the site is located in an area with a peak ground acceleration (PGA) of 0.0867 g. The definition of a seismic impact zone is as follows: “A seismic impact zone means an area having a 2% or greater probability that the maximum expected horizontal acceleration, expressed as a percentage of the earth’s gravitational pull (g), will exceed 0.10 g in 50 years.” 40 CFR §257.53. Based on the definition, the facility is not located within a seismic impact zone. A copy of the USGS Unified Hazard Tool with the site specific PGA value is provided in Attachment 3.

2.5 Unstable Areas

40 CFR §257.64(a) states that CCR landfills “must not be located in an unstable area unless the owner or operator demonstrates by the dates specified in paragraph (d) of this section that recognized and generally accepted good engineering practices have been incorporated into the design of the CCR unit to ensure that the integrity of the structural components of the CCR unit will not be disrupted.”

Based on a review of KGS mapping and available regional geologic information (see Attachment 4), a portion of the facility is underlain by geologic formations that are susceptible to karst topography which the CCR Rule defines as unstable areas. Site studies performed at the existing CCR landfill by S&ME – Report of Geotechnical Services, EKPC CCR Siting Exploration – Spurlock Station Ash Landfill, dated March 2, 2016 and geotechnical and hydrogeological investigations performed for Spurlock

Station Landfill by Tetra Tech in October 2017, show no evidence of karst topography at the site.

Despite the lack of evidence of karst topography and thus the lack of evidence of unstable areas, Kenvirons, Inc. has nevertheless prepared the landfill design using generally accepted good engineering practices to ensure that the integrity of the structural components of the CCR unit will not be disrupted. These practices include industry and regulatory standards specified for the design of an EPA CCR Landfill, Kentucky Division of Waste Management (KDWM) CCR Landfill, EPA Subtitle D Landfill and KDWM Contained Landfill facility.

Construction of the landfill liner system will be performed to meet generally accepted good engineering/construction standards through the use of a Construction Quality Assurance (CQA) Plan. The plan will be utilized to ensure, to the utmost extent possible, that the landfill is constructed to maintain its structural integrity and any unstable materials encountered during construction activities are mitigated.

Once operations begin for the landfill, periodic inspections will be conducted to monitor the landfill for the appearance of actual or potential structural weakness.

With the combined components of design, construction quality control/assurance, and periodic operations inspections, the Spurlock Station CCR Landfill will meet the alternative location restriction demonstration for unstable areas pursuant to the CCR Rule.

See Attachment 2 for the liner system design plans.

3.0 REPORT LIMITATIONS

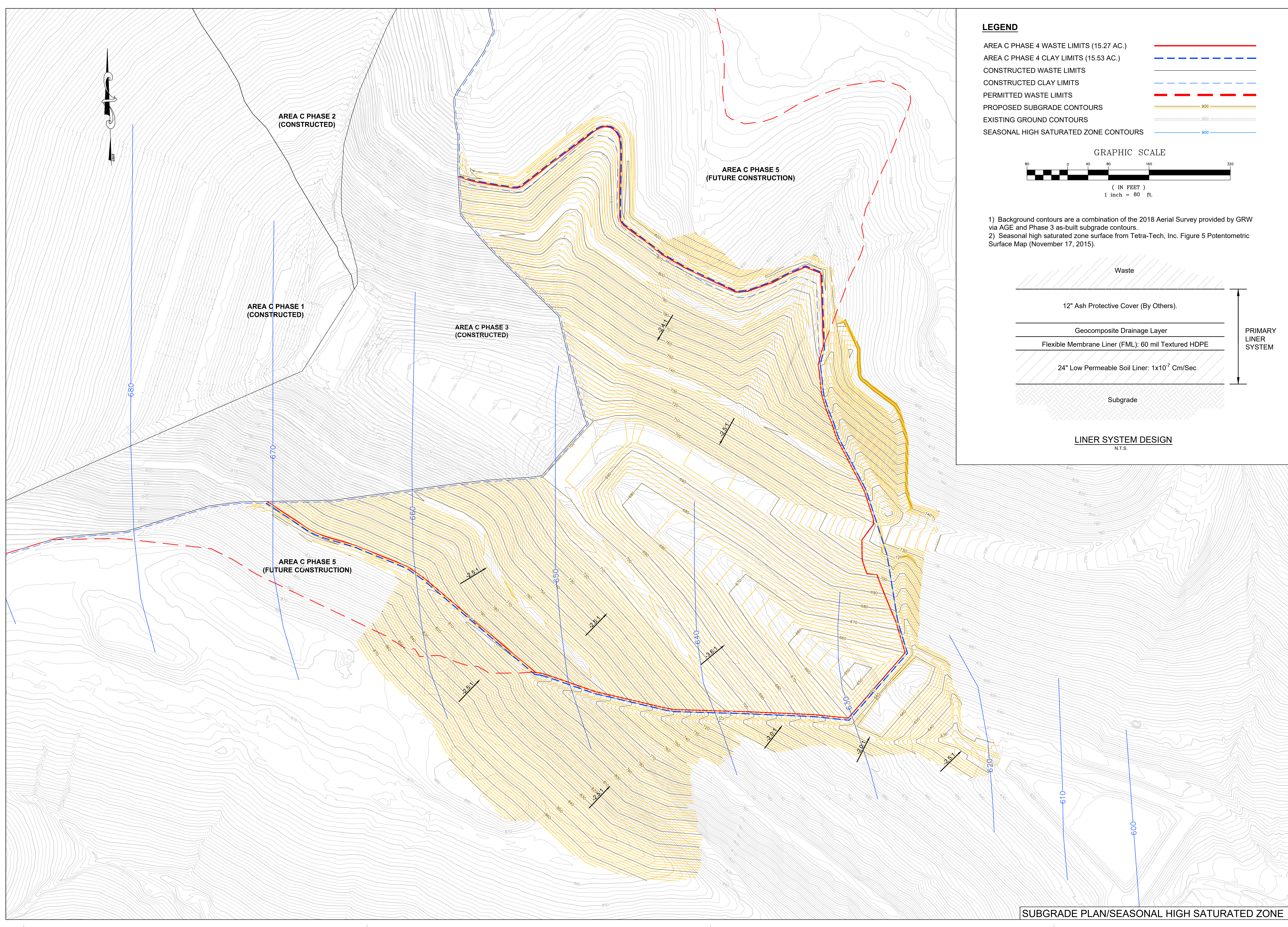
This report is based on observations made of features that could be visually seen at the time of site reconnaissance, review of previous engineering investigations and design documents, permits and survey information provided by EKPC as well as work performed by Kenvirons for the design of Area C, Phase 4 Cell Construction. The design basis and documents are based on Kenvirons' understanding of current plant operations, maintenance, storm water handling and CCR handling procedures for the landfill, as provided by EKPC. Changes in any of these operations or procedures may result in deviation from the intended design and operation of the landfill.

The design is based on established engineering principles and provided in a manner consistent with the level of care and skill ordinarily exercised by the engineering consultants under similar circumstances. No other representation is intended.

ATTACHMENT 1

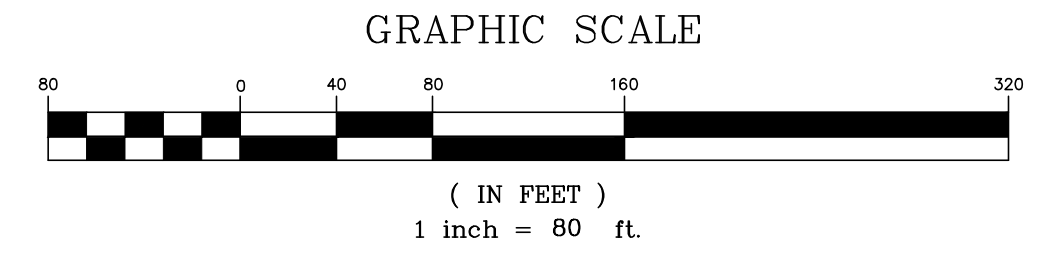
LINER SYSTEM SUBGRADE SEASONAL HIGH SATURATED ZONE MAP

N:\P\2018\2018\Location Restriction Design Drawings\SPURLOCK_ACP4_SUBGRADE VS SEASONAL HIGH.dwg, 10/17/2019 2:21:24 PM

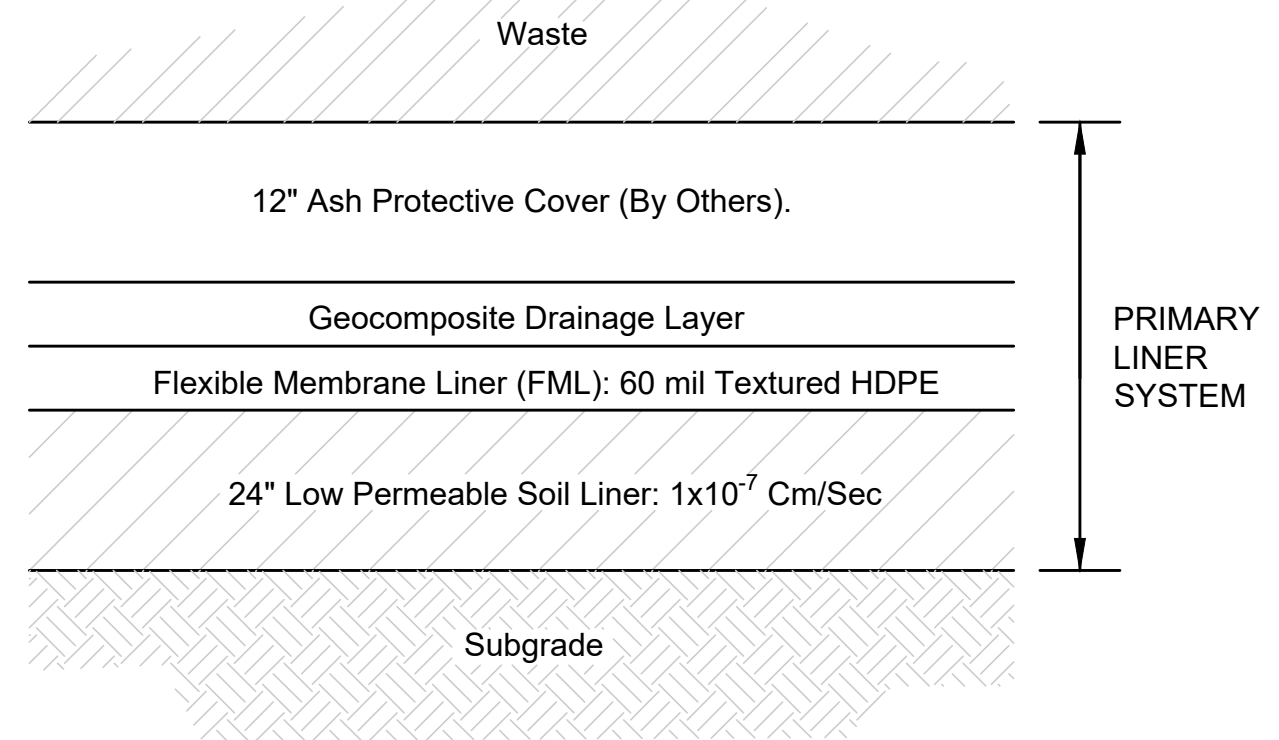


LEGEND

- AREA C PHASE 4 WASTE LIMITS (15.27 AC.) ---
- AREA C PHASE 4 CLAY LIMITS (15.53 AC.) ---
- CONSTRUCTED WASTE LIMITS ---
- CONSTRUCTED CLAY LIMITS ---
- PERMITTED WASTE LIMITS ---
- PERMITTED CLAY LIMITS ---
- PROPOSED SUBGRADE CONTOURS ---
- EXISTING GROUND CONTOURS ---
- SEASONAL HIGH SATURATED ZONE CONTOURS ---



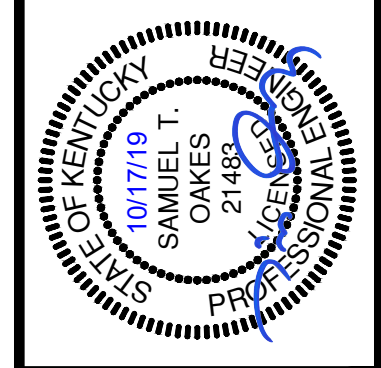
- 1) Background contours are a combination of the 2018 Aerial Survey provided by GRW via AGE and Phase 3 as-built subgrade contours.
- 2) Seasonal high saturated zone surface from Tetra-Tech, Inc. Figure 5 Potentometric Surface Map (November 17, 2015).



LINER SYSTEM DESIGN
N.T.S.



SPURLOCK STATION LANDFILL
 MASON COUNTY, KENTUCKY
 PERMIT NO. 081-00005
 AREA C, PHASE 4
 CONSTRUCTION DRAWINGS



DRAWN BY: MAS
CHECKED BY: SMR
DATE: OCT 2019
SCALE: AS NOTED
REVISIONS

KENVIRONS, INC.
 FRANKFORT, KENTUCKY



PROJECT NO.
2016171

SHEET NO.
1 of 1

SUBGRADE PLAN/SEASONAL HIGH SATURATED ZONE

ATTACHMENT 2

LINER SYSTEM DESIGN PLANS

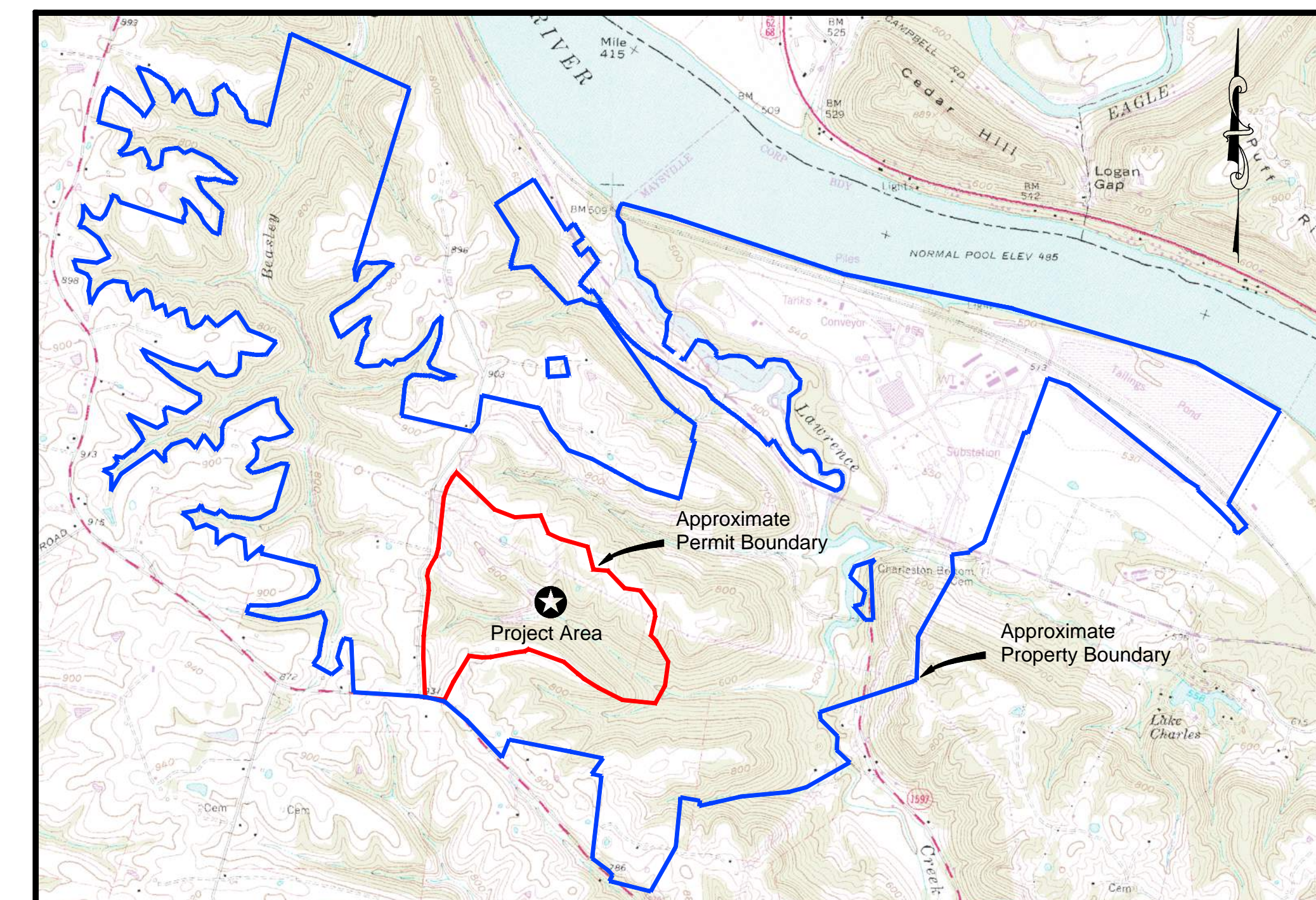
EAST KENTUCKY POWER COOPERATIVE, INC. SPURLOCK STATION LANDFILL

MASON COUNTY, KENTUCKY
PERMIT NO. 081-00005

AREA C, PHASE 4 CONSTRUCTION DRAWINGS FEBRUARY 2018

INDEX OF SHEETS

DESCRIPTION	SHEET NO.
TITLE SHEET	1
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SUBGRADE ISOPACH	6
SOIL LINER STAKING PLAN	7
LEACHATE COLLECTION SYSTEM & GEOSYNTHETICS PLAN	8
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LOCATION MAP
SCALE: 1"=2000'

Prepared For:

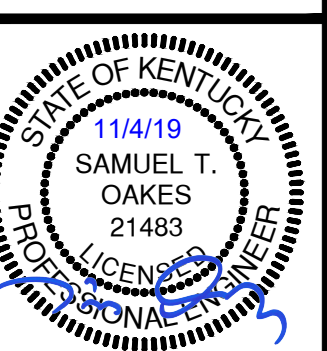


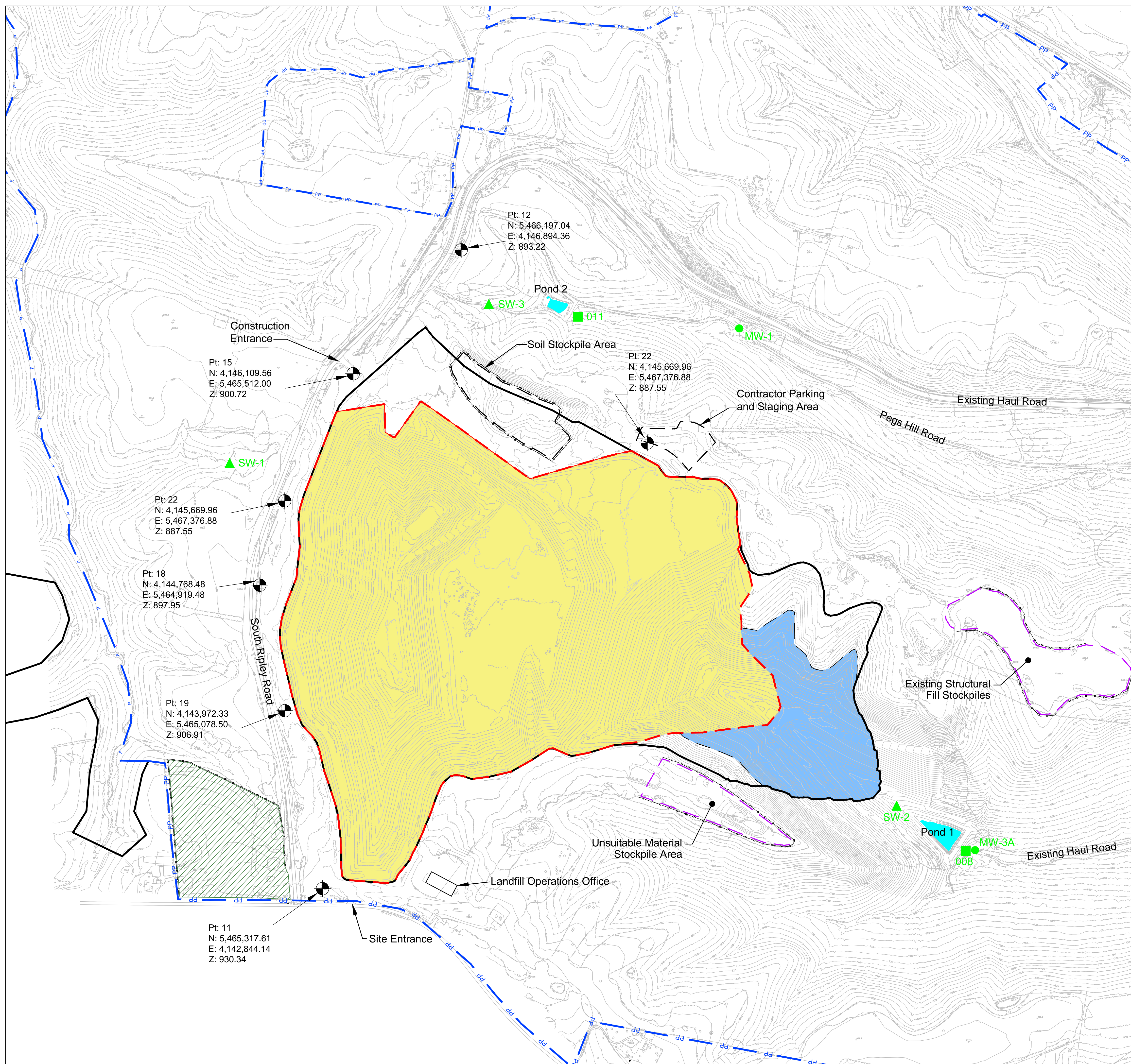
East Kentucky Power Cooperative
4775 Lexington Road
P.O. Box 707
Winchester, Kentucky 40392-0707

Prepared By:



KENVIRONS, INC.
452 Versailles Road - Frankfort, Kentucky 40601
502 695-4357 502 695-4363 Fax



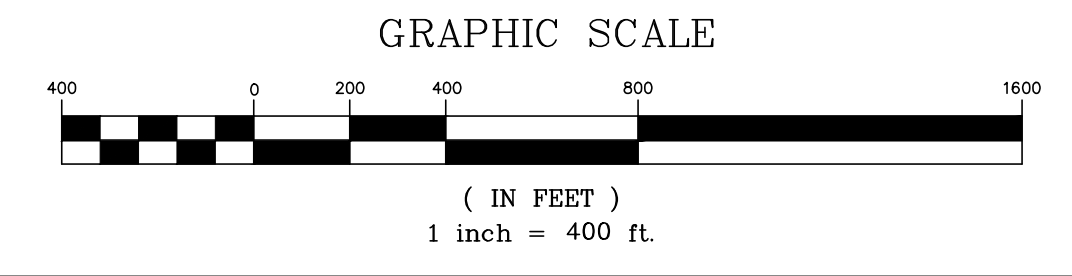


LEGEND

- Existing Contours
- Tree Line
- Tree
- Utility Pole
- Drain
- Fence
- Spot Elevation
- Existing Access Road
- Approximate Property Boundary
- Approximate Permit Boundary
- Approximate Property & Permit Boundary
- Permitted Waste Limits
- Phase Limits
- Previously Constructed Liner Area
- Proposed Area C, Phase 4
- Soil Layer Borrow Area
- Permanent Survey Marker
- Groundwater Monitoring Well
- Surface Water Monitoring Point
- KPDES Monitoring Point
- Proposed Silt Fence

NOTES

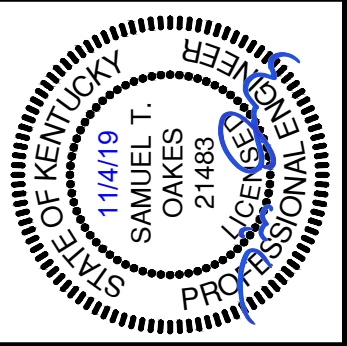
1. Contractor may only perform tree clearing activities within the identified borrow area(s) between October 15th and March 31st.
2. Grading of Borrow Areas shall maintain positive drainage without any standing water. Proper sediment control shall be used to prohibit the migration of sediments per the site's existing Stormwater Pollution Prevention Plan (SWP3). All disturbed areas shall be re-vegetated to a minimum of 90% vegetative growth.
3. Sediment controls shown are minimum required controls. Contractor shall be responsible for providing and maintaining as many structures as needed to eliminate the migration of sediment offsite and/or into Waters of the Commonwealth. This is incidental to construction activities and therefore the responsibility of the Contractor to provide at no expense to EKPC beyond those items addressed on the Bid Schedule.
4. No equipment allowed on grout mat ditch.
5. All horizontal coordinates listed are projected in NAD83 State Plane Kentucky Single Zone (US Foot). Elevation data is based on the NAVD88 vertical datum.
6. Topography from Aerial Surveys performed on Feb. 24, 2013 by Photo Science, Inc. and in 2016 by Kucera International, Inc.



GENERAL SITE LAYOUT



SPURLOCK STATION LANDFILL
 MASON COUNTY, KENTUCKY
 PERMIT NO. 081-00005
 AREA C, PHASE 4
CONSTRUCTION DRAWINGS



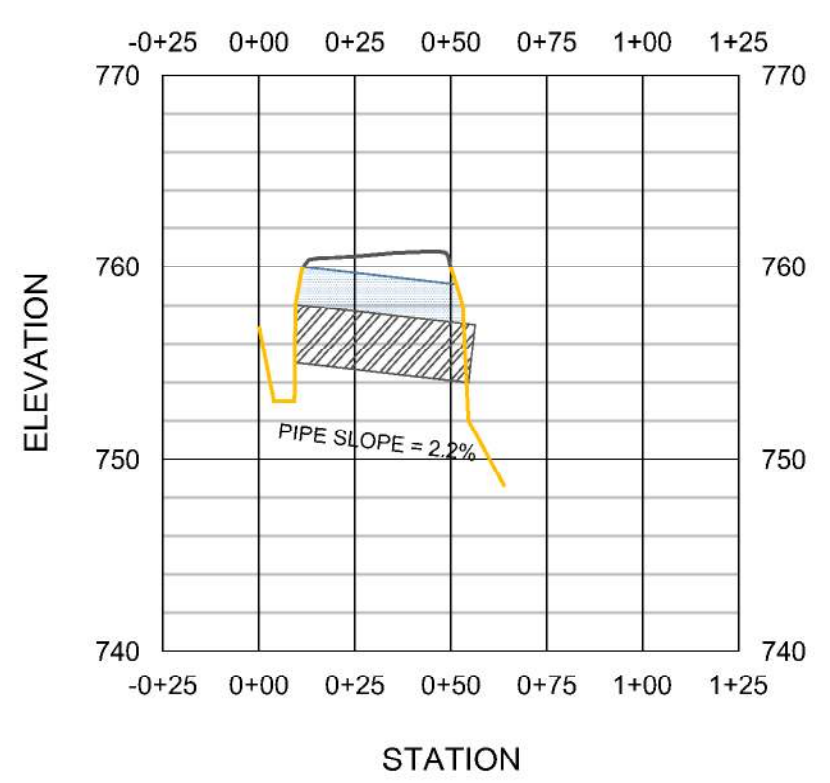
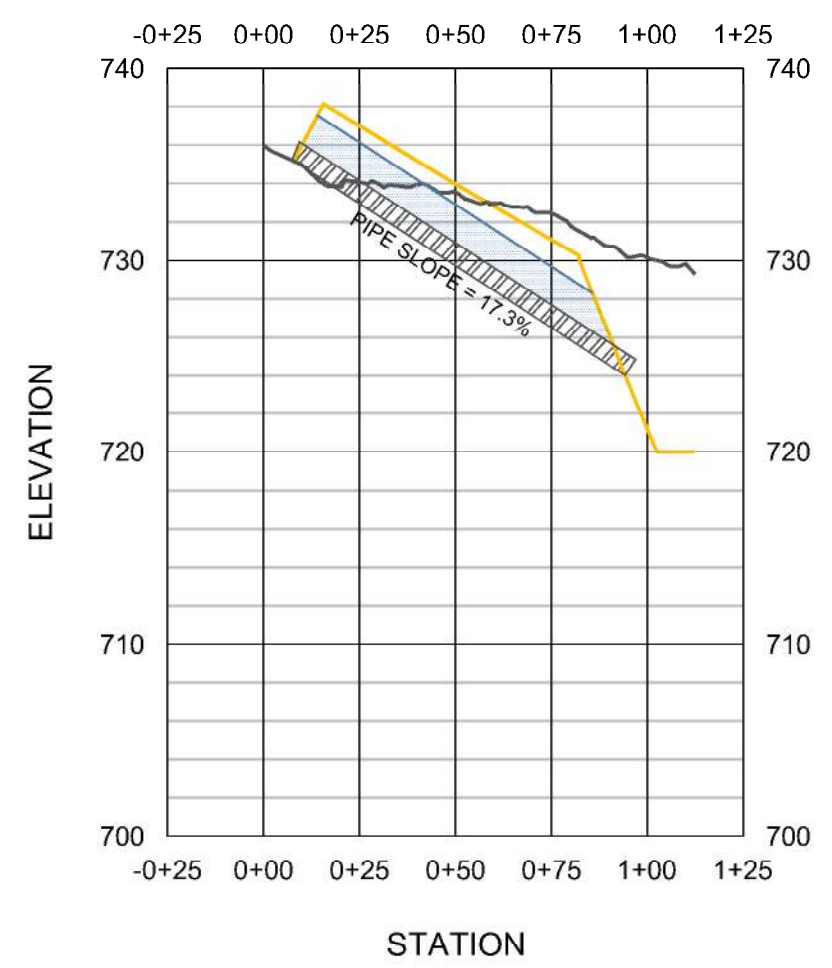
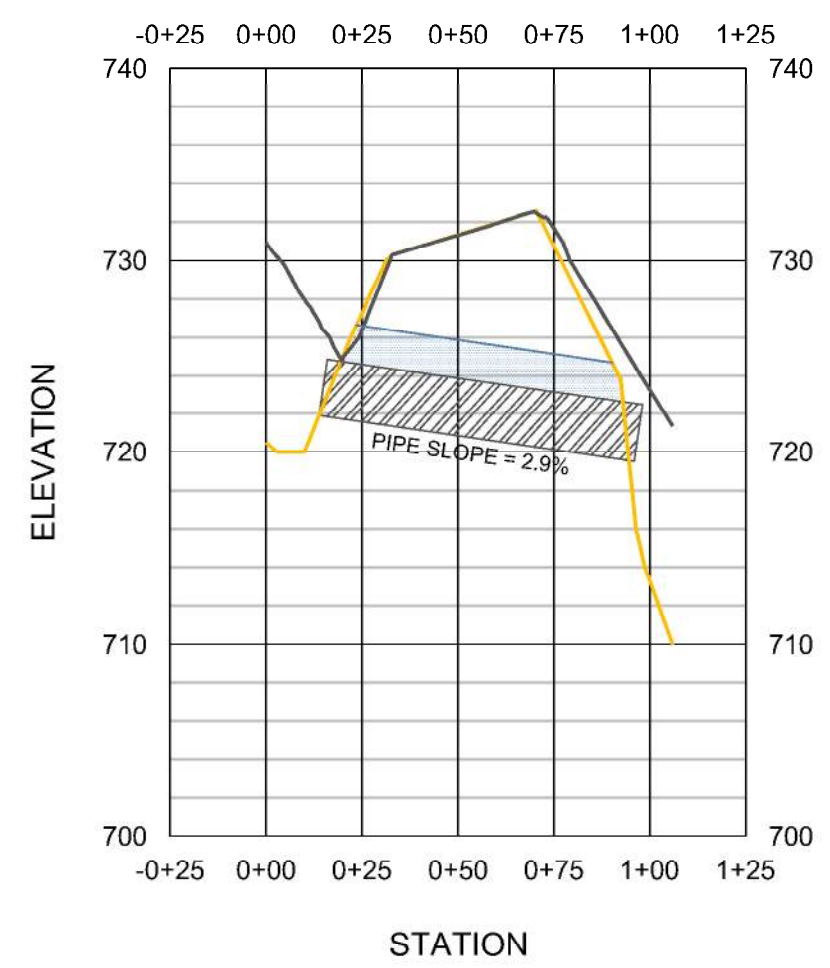
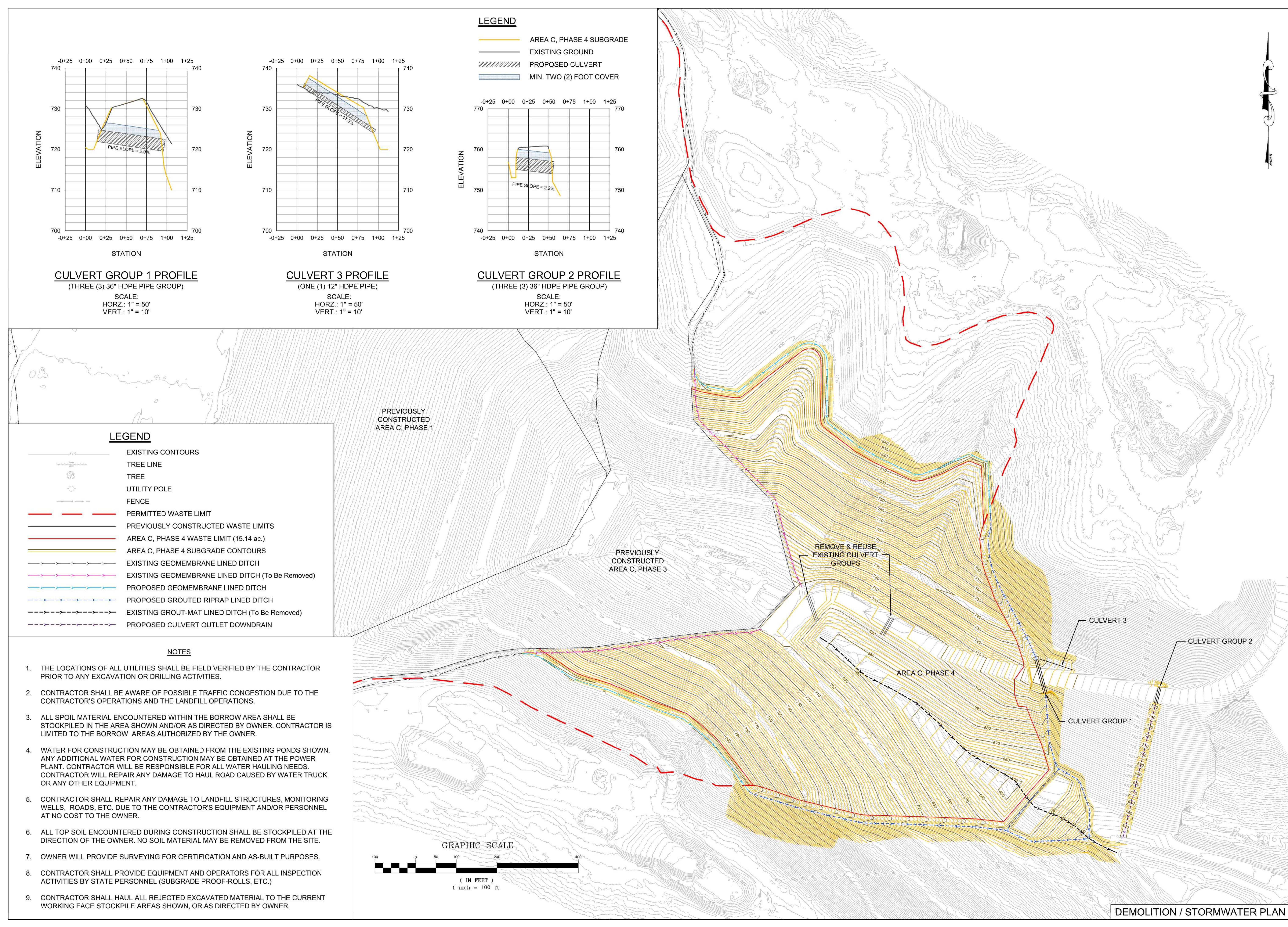
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DATE: MARCH 2018	
SCALE: 1"=400'	

KENVIRONS, INC.
 FRANKFORT, KENTUCKY



PROJECT NO.
 2016171
 SHEET NO.
 2 of 13

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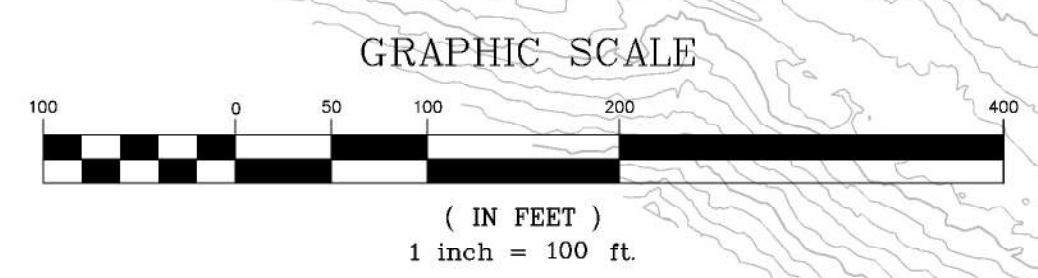
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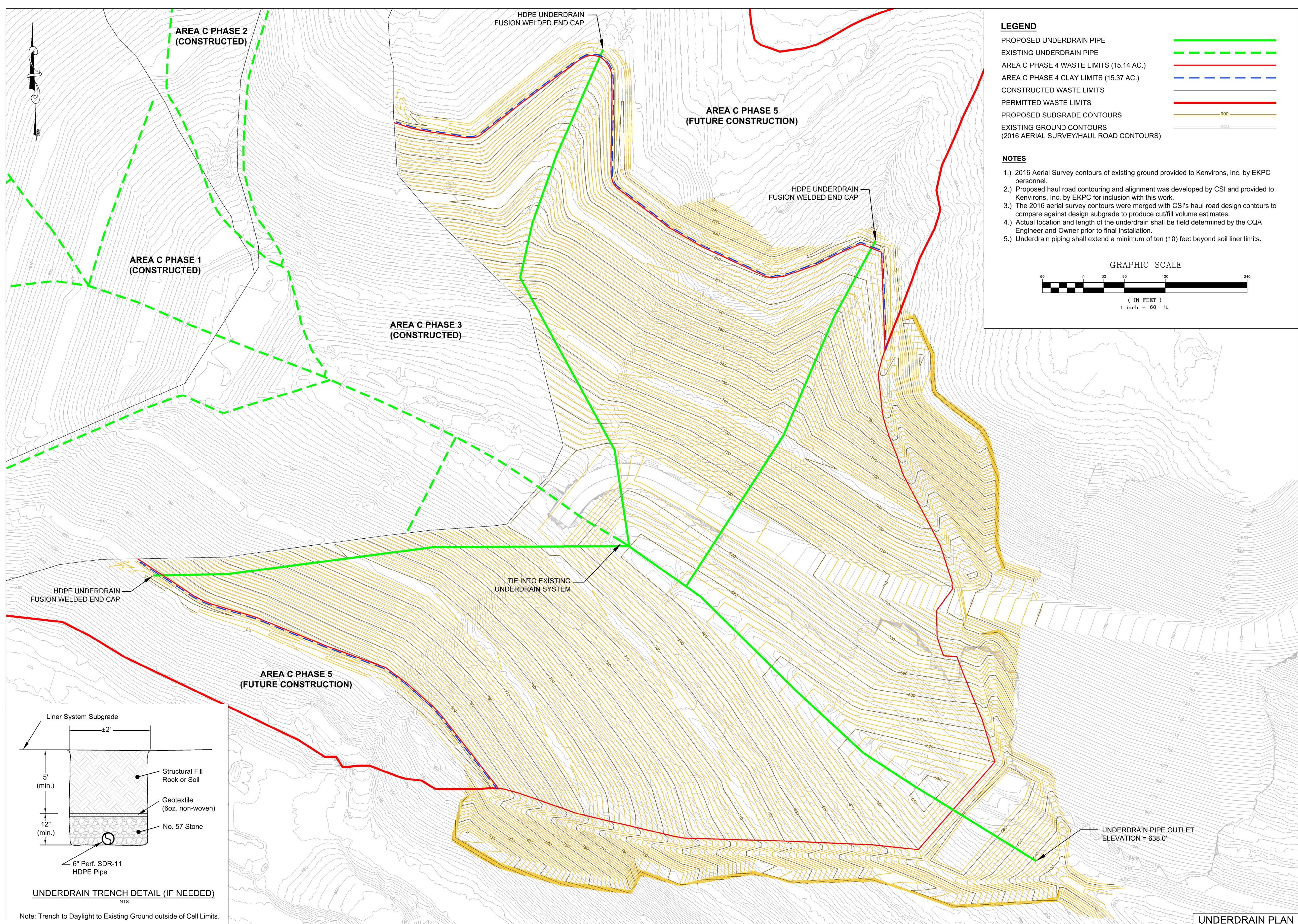
- AREA C, PHASE 4 SUBGRADE
- EXISTING GROUND
- PROPOSED CULVERT
- MIN. TWO (2) FOOT COVER

LEGEND

- EXISTING CONTOURS
- TREE LINE
- TREE
- UTILITY POLE
- FENCE
- PERMITTED WASTE LIMIT
- PREVIOUSLY CONSTRUCTED WASTE LIMITS
- AREA C, PHASE 4 WASTE LIMIT (15.14 ac.)
- AREA C, PHASE 4 SUBGRADE CONTOURS
- EXISTING GEOMEMBRANE LINED DITCH
- EXISTING GEOMEMBRANE LINED DITCH (To Be Removed)
- PROPOSED GEOMEMBRANE LINED DITCH
- PROPOSED GROUTED RIPRAP LINED DITCH
- EXISTING GROUT-MAT LINED DITCH (To Be Removed)
- PROPOSED CULVERT OUTLET DOWNDRAIN

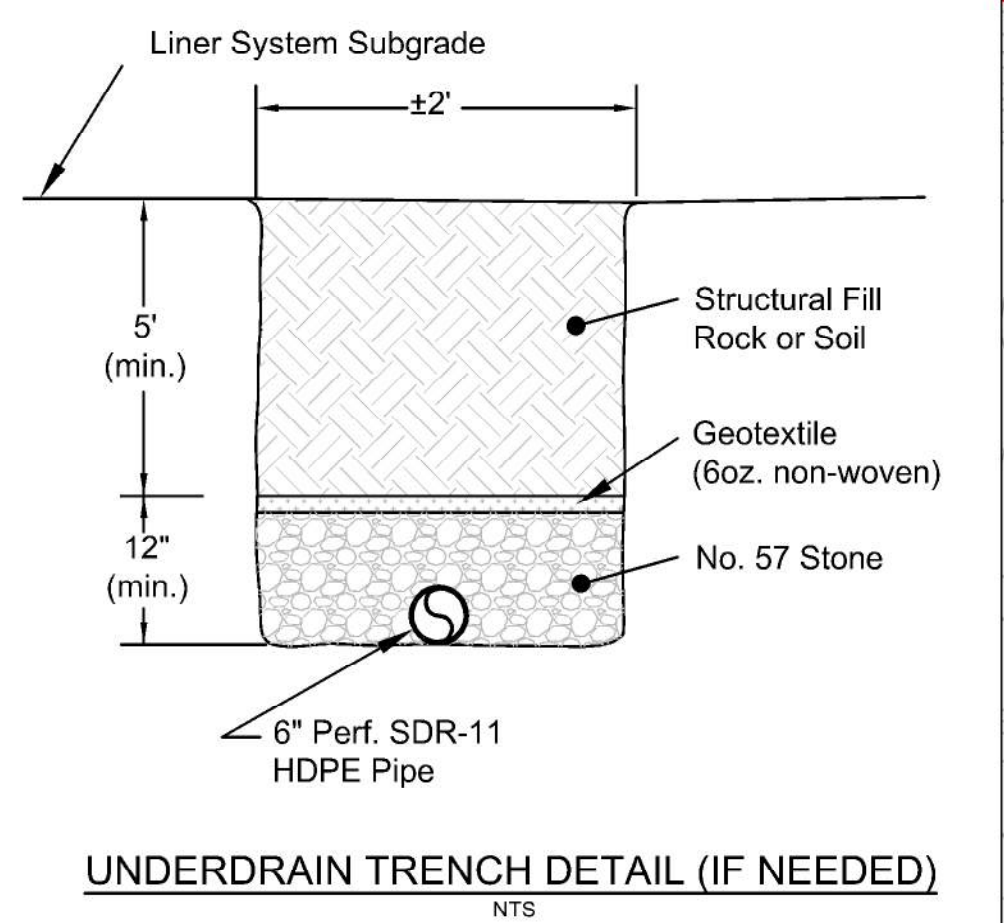
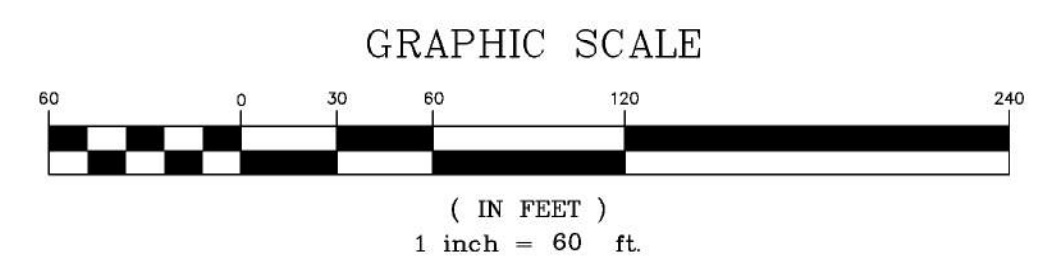
- NOTES**
1. THE LOCATIONS OF ALL UTILITIES SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO ANY EXCAVATION OR DRILLING ACTIVITIES.
 2. CONTRACTOR SHALL BE AWARE OF POSSIBLE TRAFFIC CONGESTION DUE TO THE CONTRACTOR'S OPERATIONS AND THE LANDFILL OPERATIONS.
 3. ALL SPOIL MATERIAL ENCOUNTERED WITHIN THE BORROW AREA SHALL BE STOCKPILED IN THE AREA SHOWN AND/OR AS DIRECTED BY OWNER. CONTRACTOR IS LIMITED TO THE BORROW AREAS AUTHORIZED BY THE OWNER.
 4. WATER FOR CONSTRUCTION MAY BE OBTAINED FROM THE EXISTING PONDS SHOWN. ANY ADDITIONAL WATER FOR CONSTRUCTION MAY BE OBTAINED AT THE POWER PLANT. CONTRACTOR WILL BE RESPONSIBLE FOR ALL WATER HAULING NEEDS. CONTRACTOR WILL REPAIR ANY DAMAGE TO HAUL ROAD CAUSED BY WATER TRUCK OR ANY OTHER EQUIPMENT.
 5. CONTRACTOR SHALL REPAIR ANY DAMAGE TO LANDFILL STRUCTURES, MONITORING WELLS, ROADS, ETC. DUE TO THE CONTRACTOR'S EQUIPMENT AND/OR PERSONNEL AT NO COST TO THE OWNER.
 6. ALL TOP SOIL ENCOUNTERED DURING CONSTRUCTION SHALL BE STOCKPILED AT THE DIRECTION OF THE OWNER. NO SOIL MATERIAL MAY BE REMOVED FROM THE SITE.
 7. OWNER WILL PROVIDE SURVEYING FOR CERTIFICATION AND AS-BUILT PURPOSES.
 8. CONTRACTOR SHALL PROVIDE EQUIPMENT AND OPERATORS FOR ALL INSPECTION ACTIVITIES BY STATE PERSONNEL (SUBGRADE PROOF-ROLLS, ETC.)
 9. CONTRACTOR SHALL HAUL ALL REJECTED EXCAVATED MATERIAL TO THE CURRENT WORKING FACE STOCKPILE AREAS SHOWN, OR AS DIRECTED BY OWNER.





- LEGEND**
- PROPOSED UNDERDRAIN PIPE —
 - EXISTING UNDERDRAIN PIPE - - -
 - AREA C PHASE 4 WASTE LIMITS (15.14 AC.) —
 - AREA C PHASE 4 CLAY LIMITS (15.37 AC.) - - -
 - CONSTRUCTED WASTE LIMITS —
 - PERMITTED WASTE LIMITS —
 - PROPOSED SUBGRADE CONTOURS —
 - EXISTING GROUND CONTOURS (2016 AERIAL SURVEY/HAUL ROAD CONTOURS) —

- NOTES**
- 1.) 2016 Aerial Survey contours of existing ground provided to Kenvirons, Inc. by EKPC personnel.
 - 2.) Proposed haul road contouring and alignment was developed by CSI and provided to Kenvirons, Inc. by EKPC for inclusion with this work.
 - 3.) The 2016 aerial survey contours were merged with CSI's haul road design contours to compare against design subgrade to produce cut/fill volume estimates.
 - 4.) Actual location and length of the underdrain shall be field determined by the CQA Engineer and Owner prior to final installation.
 - 5.) Underdrain piping shall extend a minimum of ten (10) feet beyond soil liner limits.

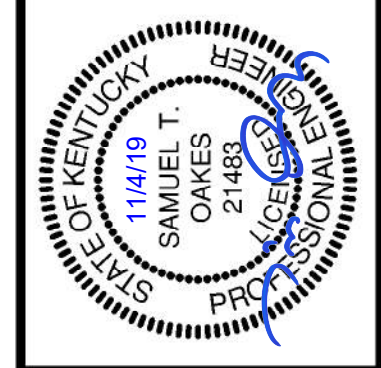


Note: Trench to Daylight to Existing Ground outside of Cell Limits.

UNDERDRAIN PLAN



SPURLOCK STATION LANDFILL
 MASON COUNTY, KENTUCKY
 PERMIT NO. 081-00005
 AREA C, PHASE 4
 CONSTRUCTION DRAWINGS



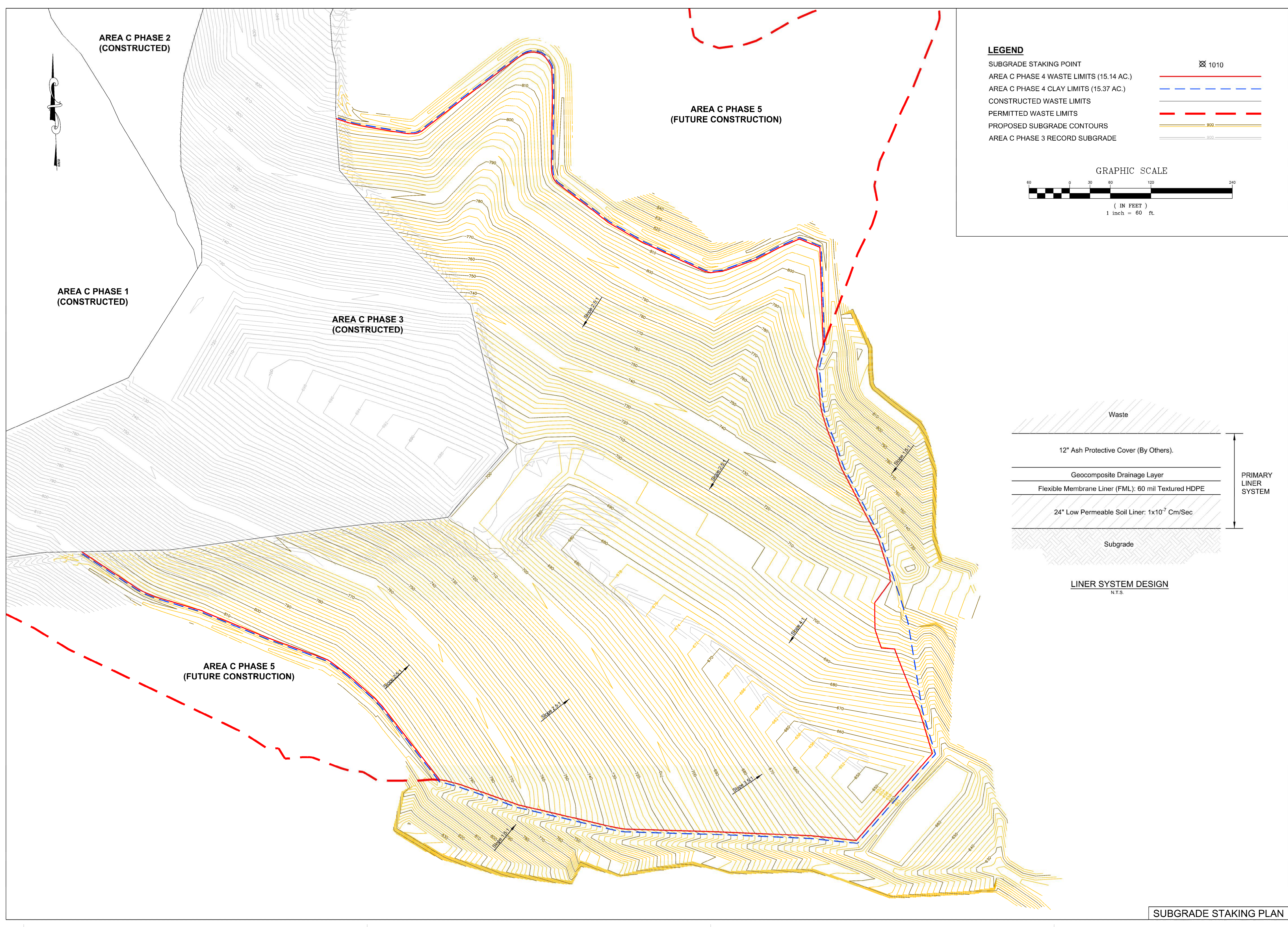
DRAWN BY: JAMISNR
CHECKED BY: SMR
DATE: MARCH 2018
SCALE: AS NOTED
REVISIONS
04/02/18 TAB. NO. 1

KENVIRONS, INC.
 FRANKFORT, KENTUCKY

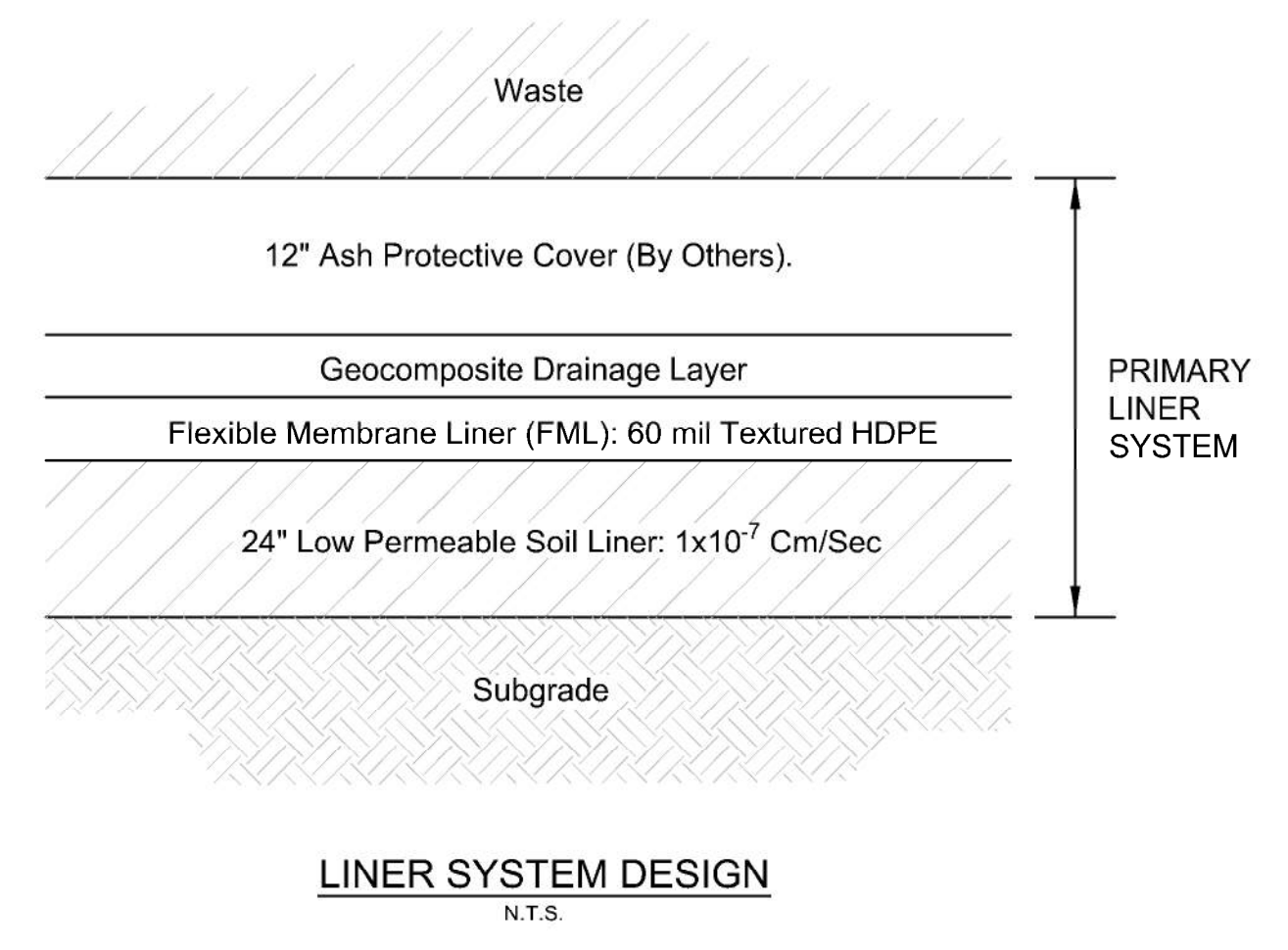
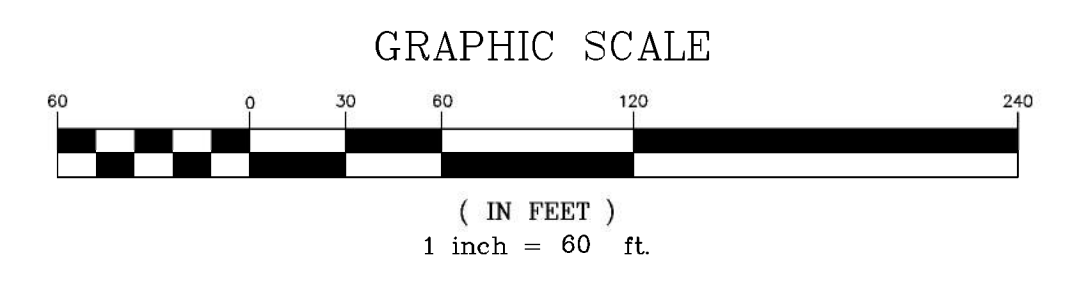


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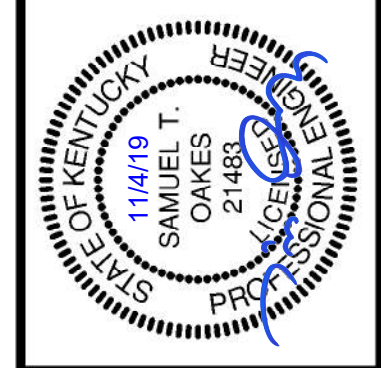
SHEET NO.
4 of 13



- LEGEND**
- SUBGRADE STAKING POINT X 1010
 - AREA C PHASE 4 WASTE LIMITS (15.14 AC.) —
 - AREA C PHASE 4 CLAY LIMITS (15.37 AC.) - - -
 - CONSTRUCTED WASTE LIMITS —
 - PERMITTED WASTE LIMITS - - -
 - PROPOSED SUBGRADE CONTOURS —
 - AREA C PHASE 3 RECORD SUBGRADE —



SPURLOCK STATION LANDFILL
 MASON COUNTY, KENTUCKY
 PERMIT NO. 081-00005
 AREA C, PHASE 4
 CONSTRUCTION DRAWINGS



DRAWN BY: JAM
CHECKED BY: SMR
DATE: MARCH 2018
SCALE: AS NOTED
REVISIONS:
03/27/18 T. Addendum 1

KENVIRONS, INC.
 FRANKFORT, KENTUCKY

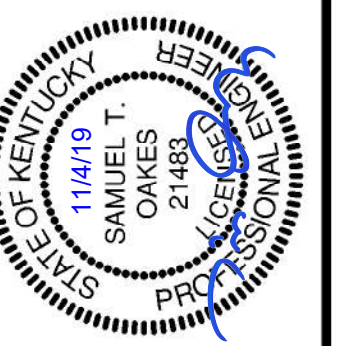


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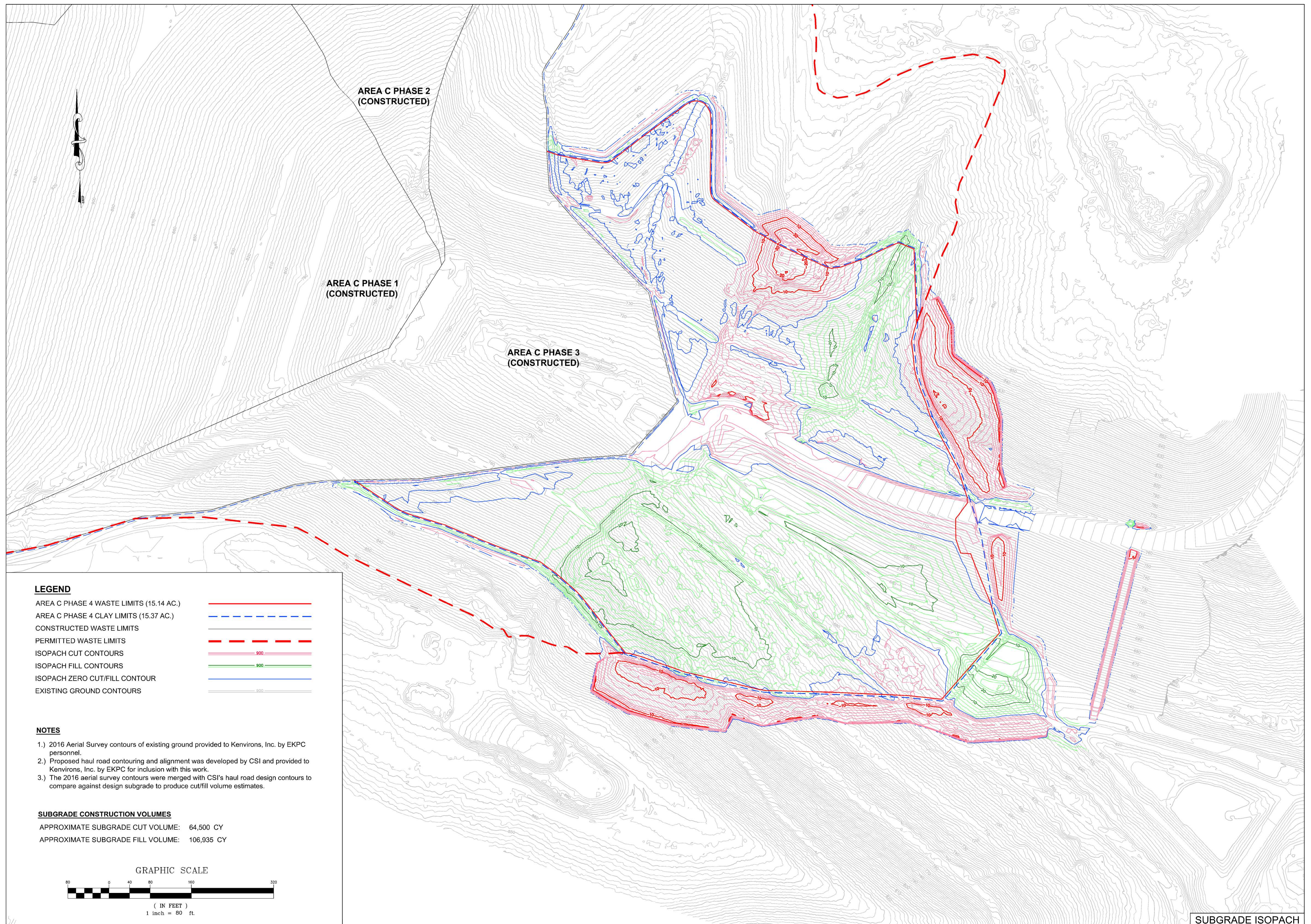
SHEET NO.
 5 of 13

SUBGRADE STAKING PLAN









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CHECKED BY: SMR
DATE: MARCH 2018
SCALE: AS NOTED
REVISIONS:
03/27/18 T Addendum 1



LEGEND

AREA C PHASE 4 WASTE LIMITS (15.14 AC.)	
AREA C PHASE 4 CLAY LIMITS (15.37 AC.)	
CONSTRUCTED WASTE LIMITS	
PERMITTED WASTE LIMITS	
ISOPACH CUT CONTOURS	
ISOPACH FILL CONTOURS	
ISOPACH ZERO CUT/FILL CONTOUR	
EXISTING GROUND CONTOURS	

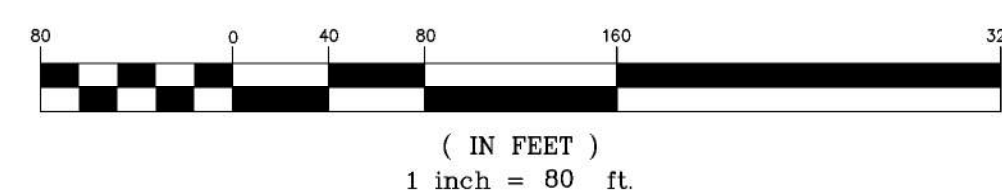
NOTES

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SUBGRADE CONSTRUCTION VOLUMES

APPROXIMATE SUBGRADE CUT VOLUME: 64,500 CY
 APPROXIMATE SUBGRADE FILL VOLUME: 106,935 CY

GRAPHIC SCALE





AREA C PHASE 2
(CONSTRUCTED)

AREA C PHASE 1
(CONSTRUCTED)

AREA C PHASE 3
(CONSTRUCTED)

AREA C PHASE 5
(FUTURE CONSTRUCTION)

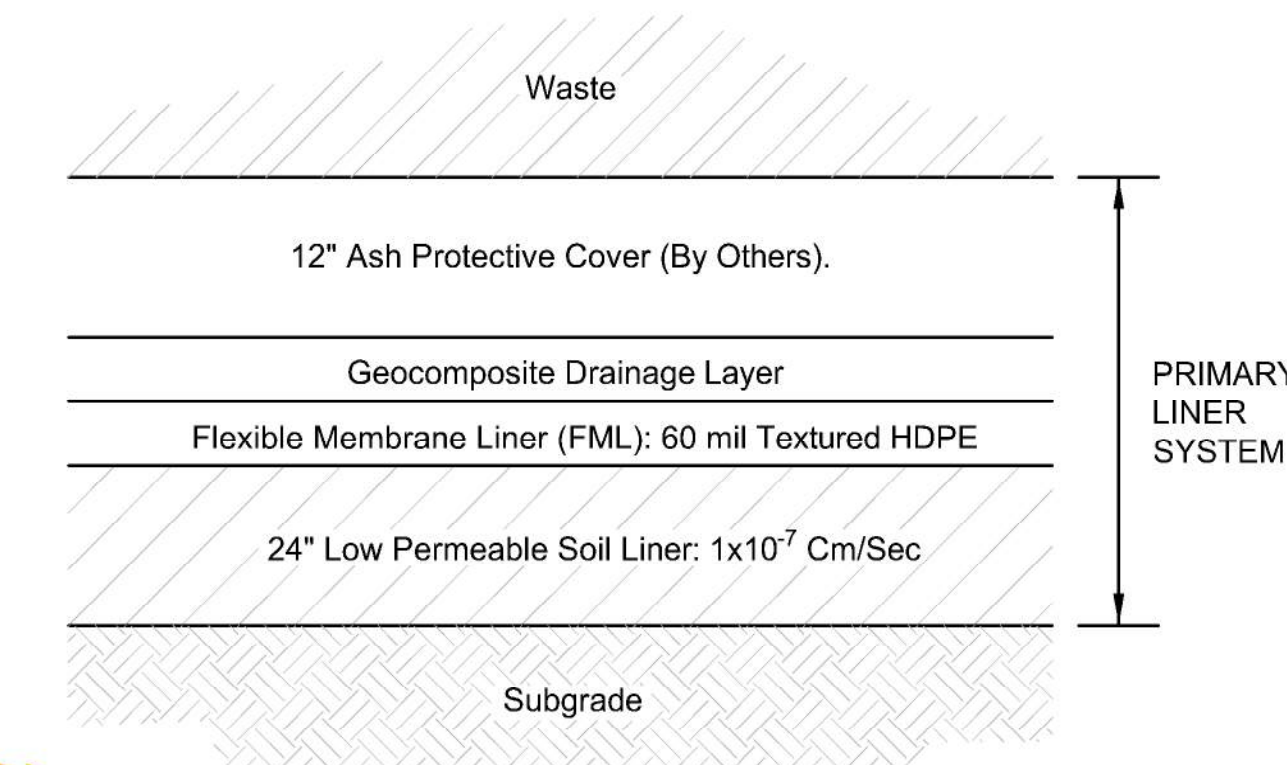
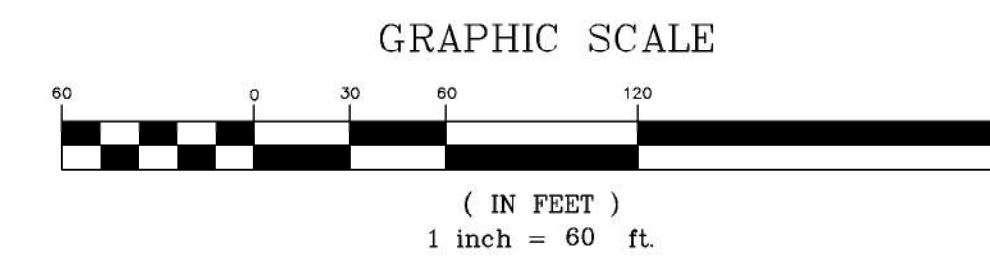
AREA C PHASE 5
(FUTURE CONSTRUCTION)

LEGEND

- SOIL LINER STAKING POINT X 2010
- AREA C PHASE 4 WASTE LIMITS (15.14 AC.)
- AREA C PHASE 4 SOIL LINER LIMITS (15.37 AC.)
- CONSTRUCTED WASTE LIMITS
- PERMITTED WASTE LIMITS
- PROPOSED SUBGRADE CONTOURS
- PROPOSED SOIL LINER CONTOURS
- AREA C PHASE 3 RECORD SUBGRADE

SOIL LINER CONSTRUCTION VOLUMES

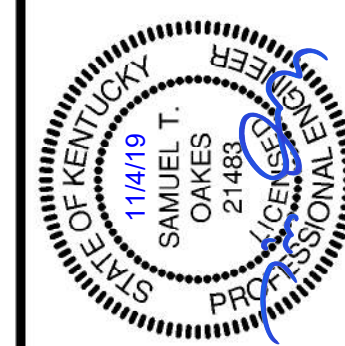
APPROXIMATE SOIL LINER FILL VOLUME: 52,835 CY



LINER SYSTEM DESIGN
N.T.S.



SPURLOCK STATION LANDFILL
 MASON COUNTY, KENTUCKY
 PERMIT NO. 081-00005
 AREA C, PHASE 4
 CONSTRUCTION DRAWINGS



DRAWN BY: JAMISNR
CHECKED BY: SMR
DATE: MARCH 2018
SCALE: AS NOTED
REVISIONS:
03/27/18 T Addendum 1

KENVIRONS, INC.
 FRANKFORT, KENTUCKY

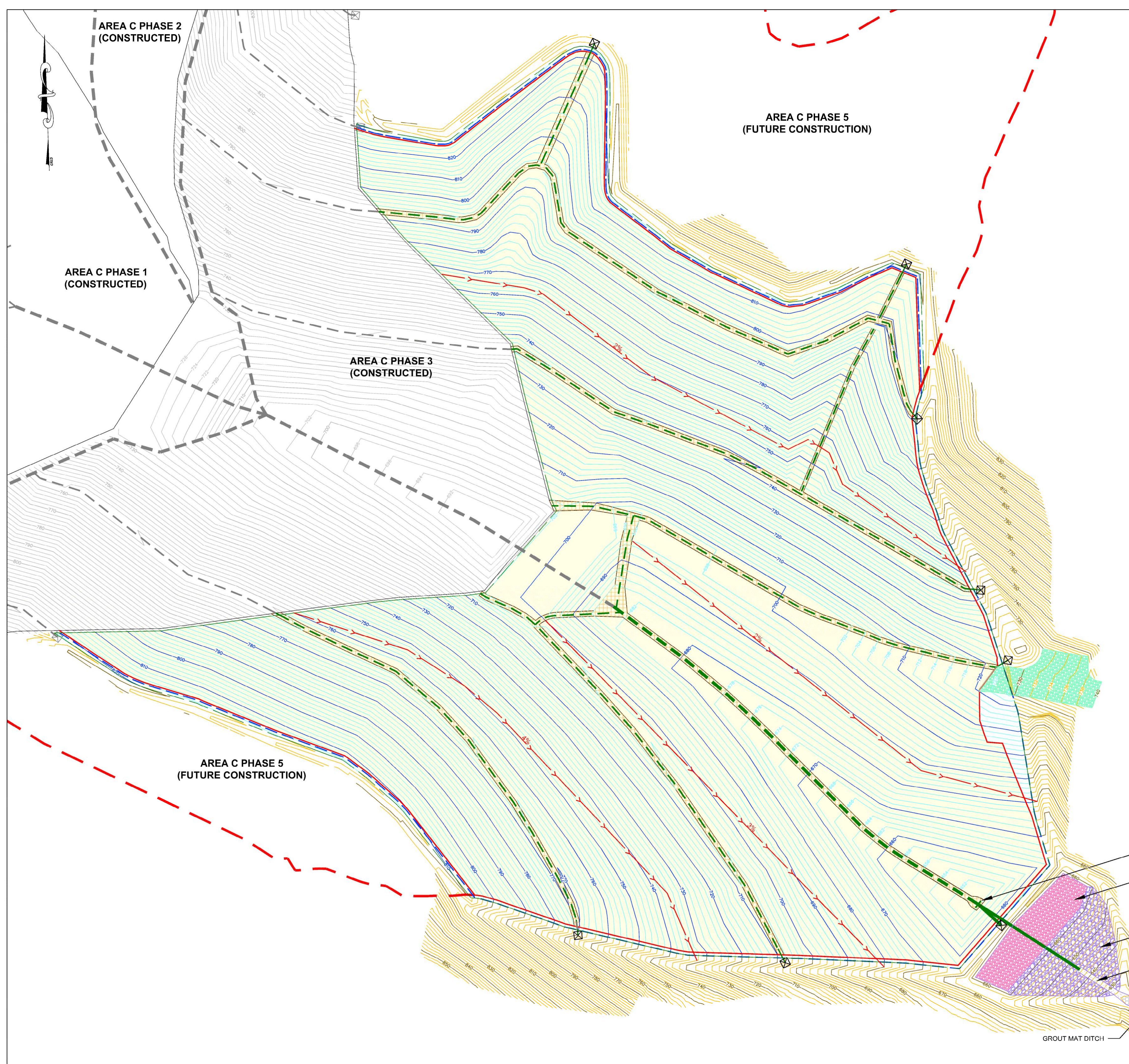


PROJECT NO.
2016171

SHEET NO.
7 of 13

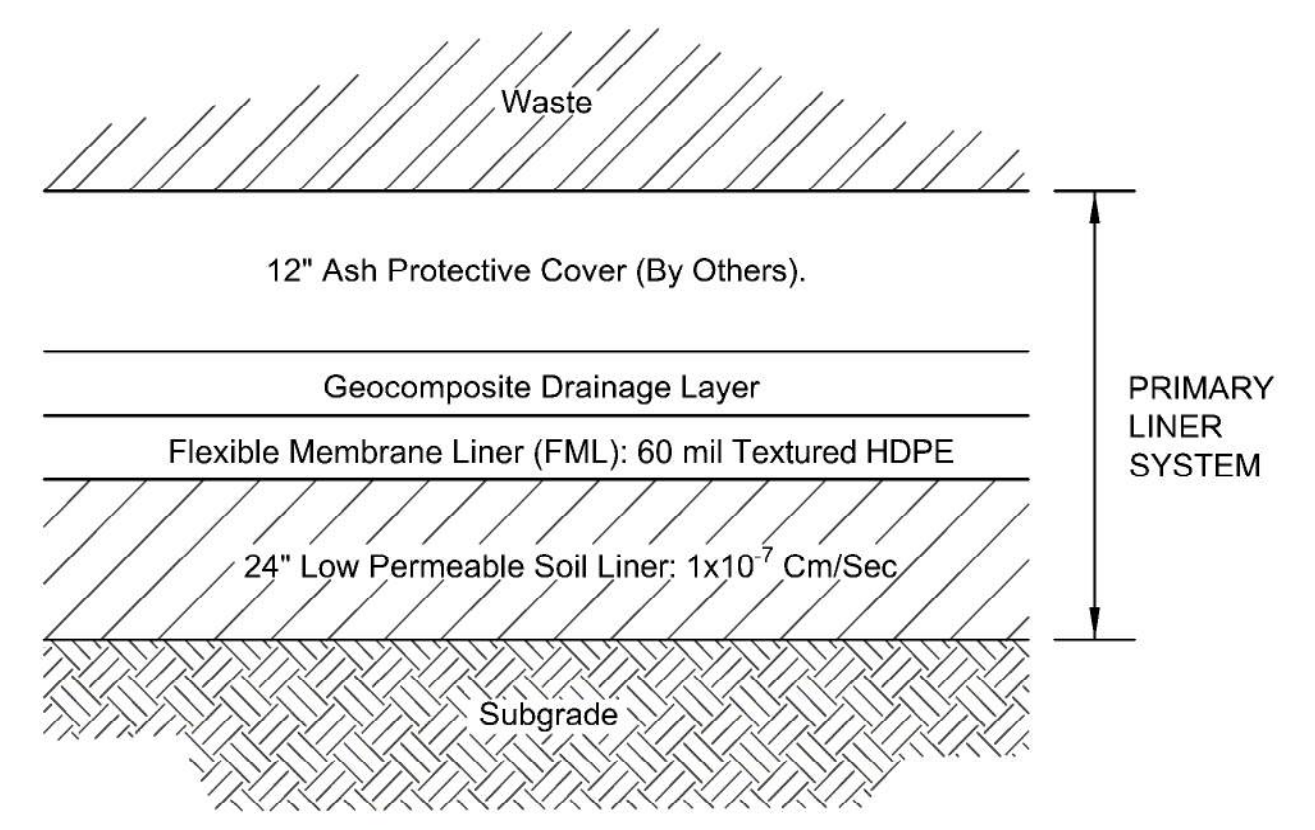
SOIL LINER STAKING PLAN

K:\PROJECTS\2016\2016171\SPURLOCK\DWG\SOIL LINER STAKING PLAN.DWG

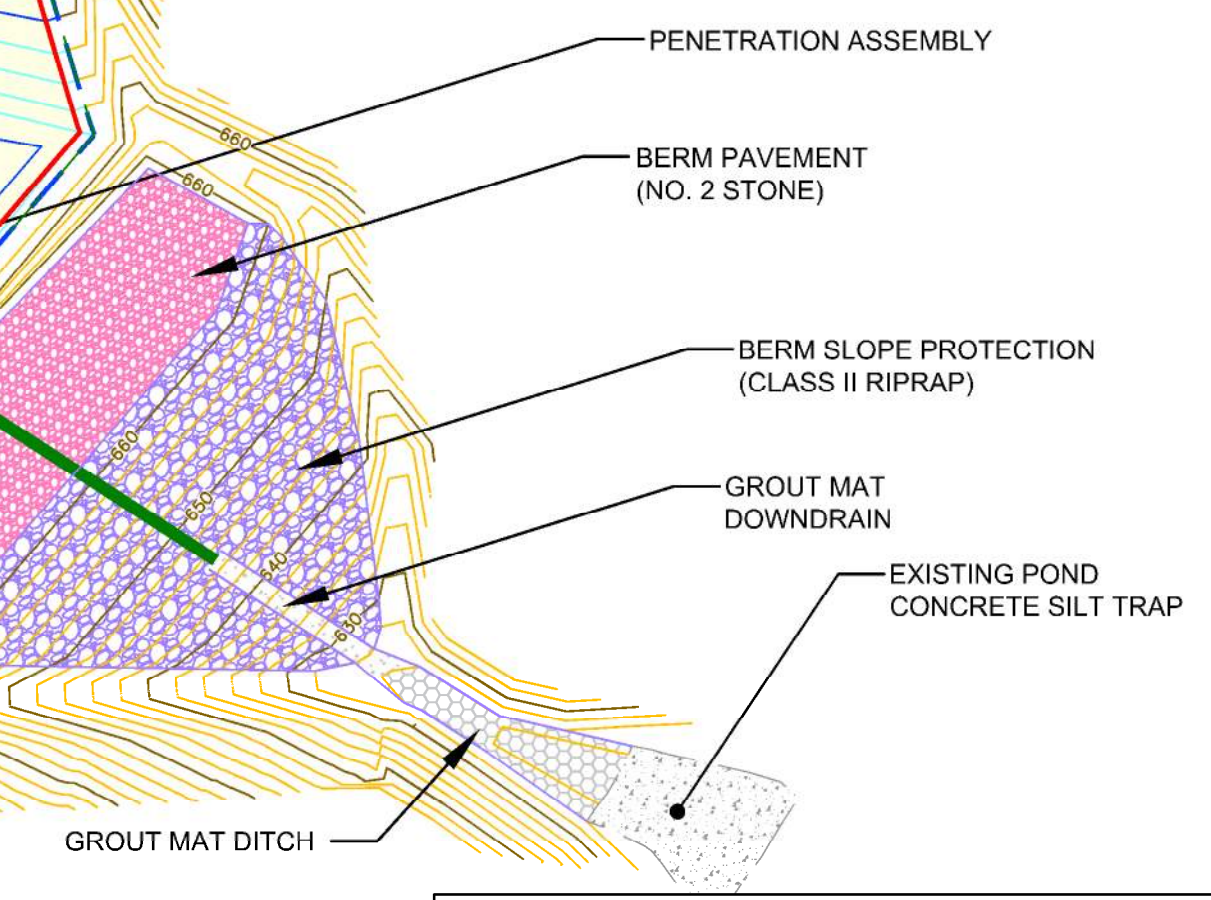
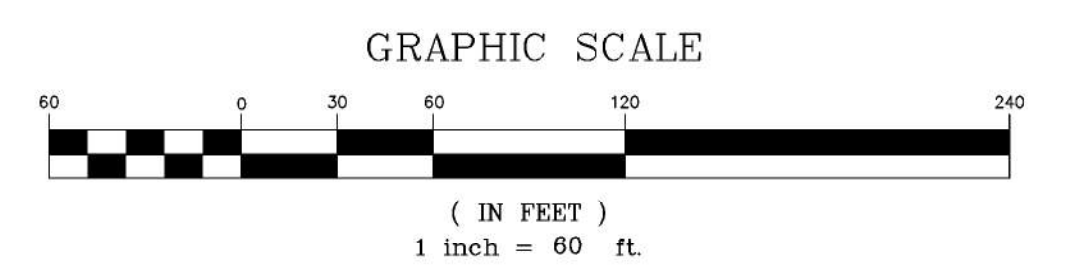


LEGEND

LEACHATE PIPING POINT	⊠ 1010
PROPOSED LEACHATE PIPE CLEANOUT	⊠
EXISTING LEACHATE PIPE CLEANOUT	⊠
4" PROPOSED LEACHATE COLLECTION PIPE	— PERFORATED — SOLID —
8" PROPOSED LEACHATE COLLECTION PIPE	— PERFORATED — SOLID —
4" EXISTING LEACHATE COLLECTION PIPE	— PERFORATED — SOLID —
8" EXISTING LEACHATE COLLECTION PIPE	— PERFORATED — SOLID —
AREA C PHASE 4 WASTE LIMITS (15.14 AC.)	— — — — —
AREA C PHASE 4 SOIL LINER LIMITS (15.37 AC.)	— — — — —
CONSTRUCTED WASTE LIMITS	— — — — —
PERMITTED WASTE LIMITS	— — — — —
LEACHATE COLLECTION GRAVEL	▨
300-MIL COAL DRAIN GEOCOMPOSITE	▨
PROPOSED SOIL LINER CONTOURS	— 900 — — 850 —
AREA C PHASE 3 RECORD SUBGRADE	— — — — —
12" RAIN GUTTER	— — — — —
TRUCK TURN AROUND	▨



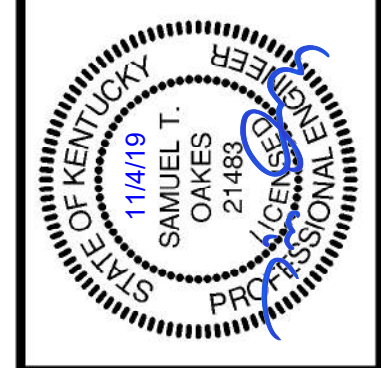
LINER SYSTEM DESIGN
N.T.S.



LEACHATE COLLECTION SYSTEM & GEOSYNTHETICS LAYOUT



SPURLOCK STATION LANDFILL
MASON COUNTY, KENTUCKY
PERMIT NO. 081-00005
AREA C, PHASE 4
CONSTRUCTION DRAWINGS

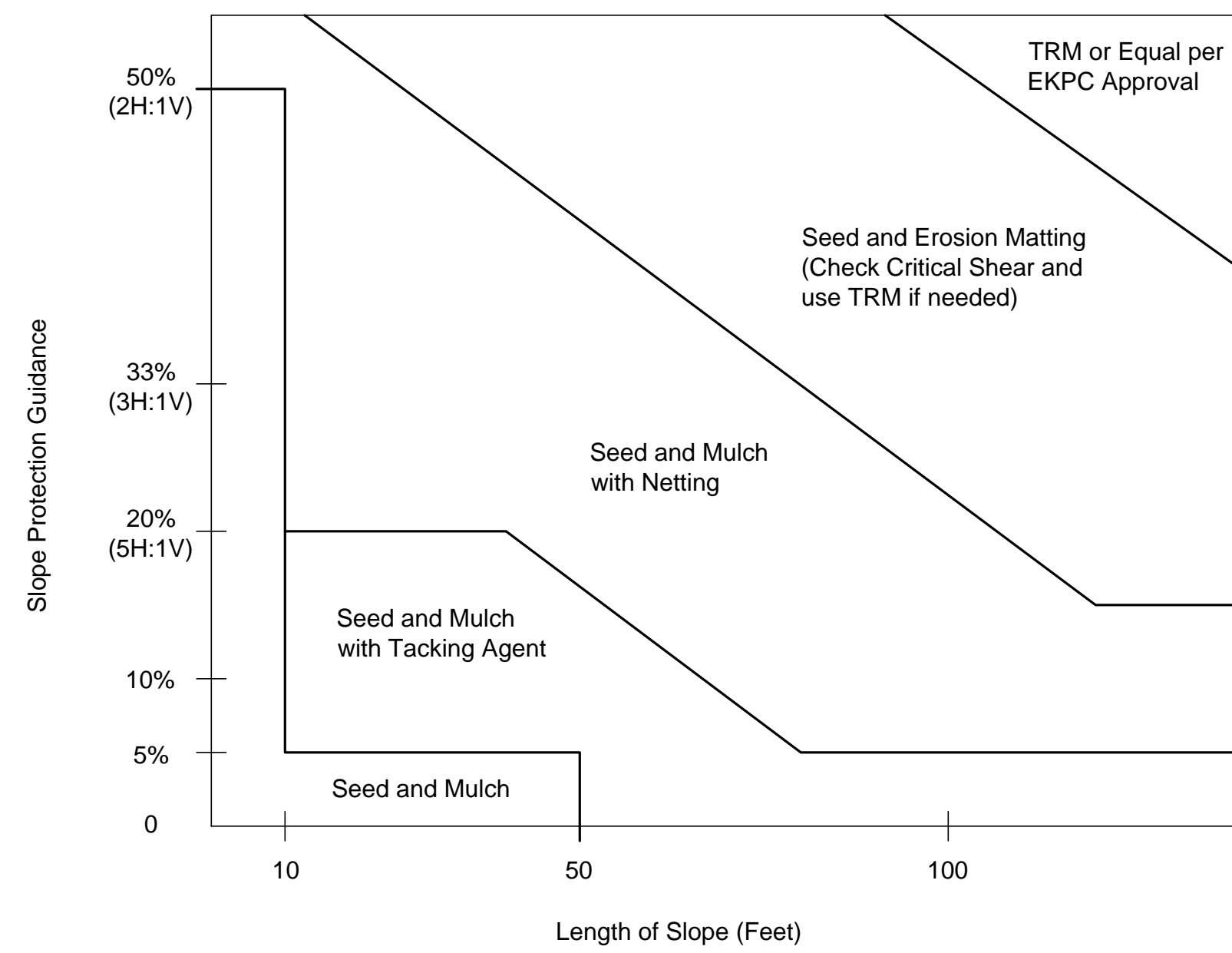


DRAWN BY: JAM
CHECKED BY: SMR
DATE: MARCH 2018
SCALE: AS NOTED
REVISIONS:
03/27/18 T Addendum 1

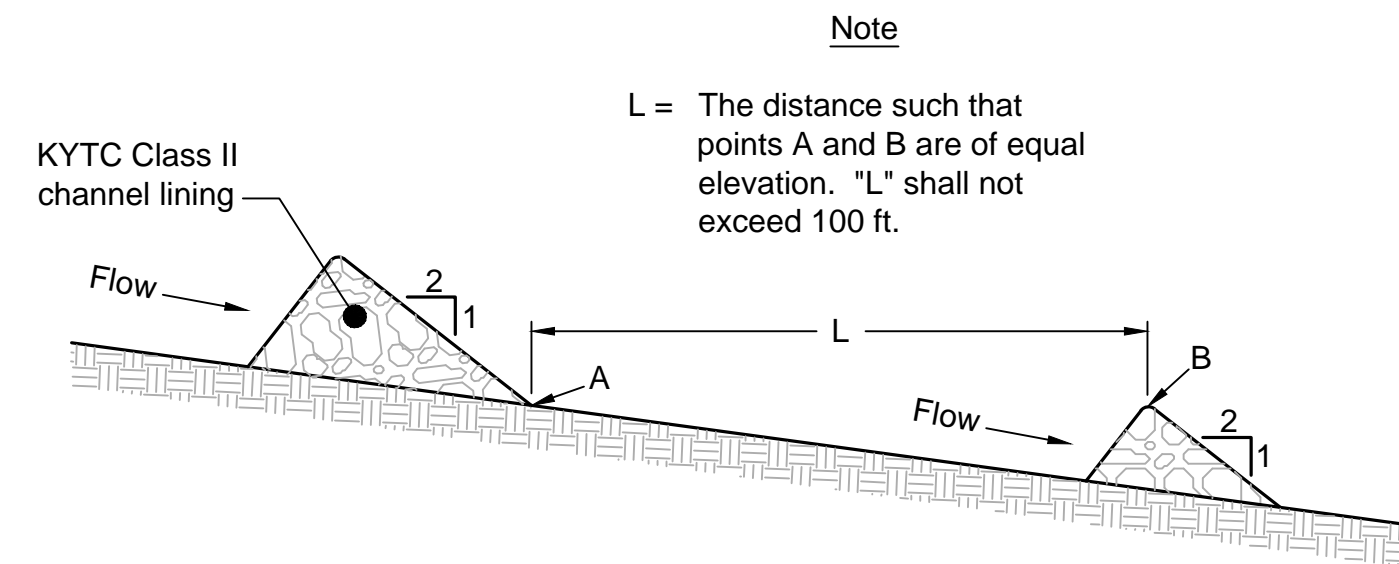
KENVIRONS, INC.
FRANKFORT, KENTUCKY



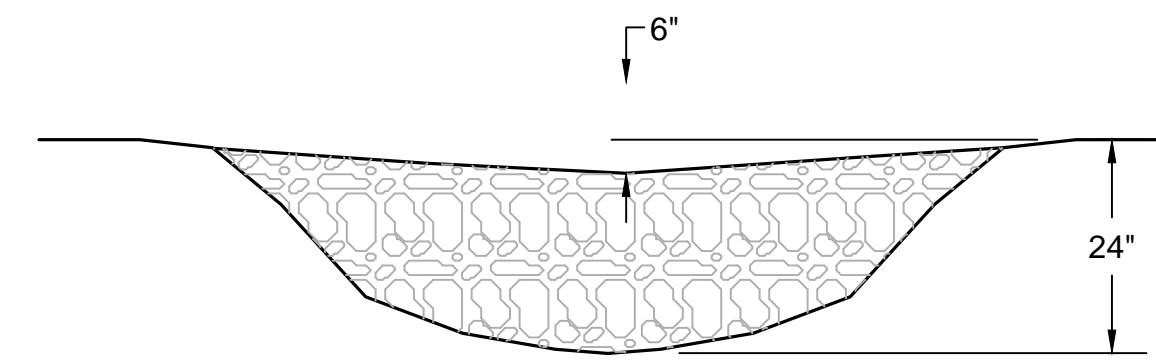
PROJECT NO.
2016171
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SLOPE PROTECTION GUIDANCE
N.T.S.

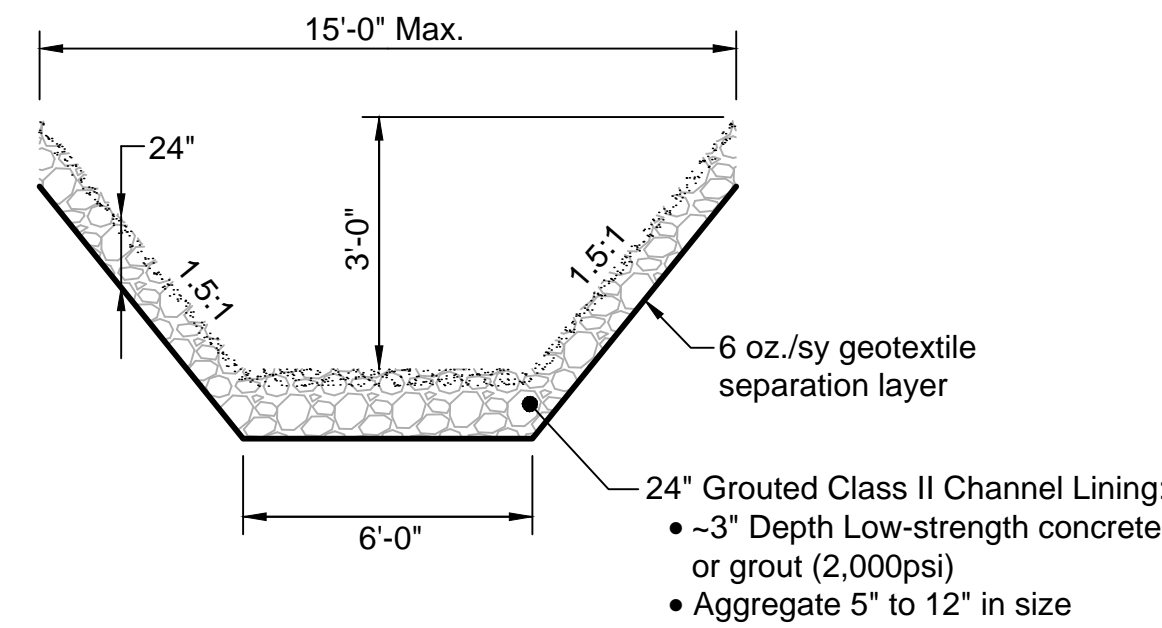


ROCK CHECK SPACING DIAGRAM



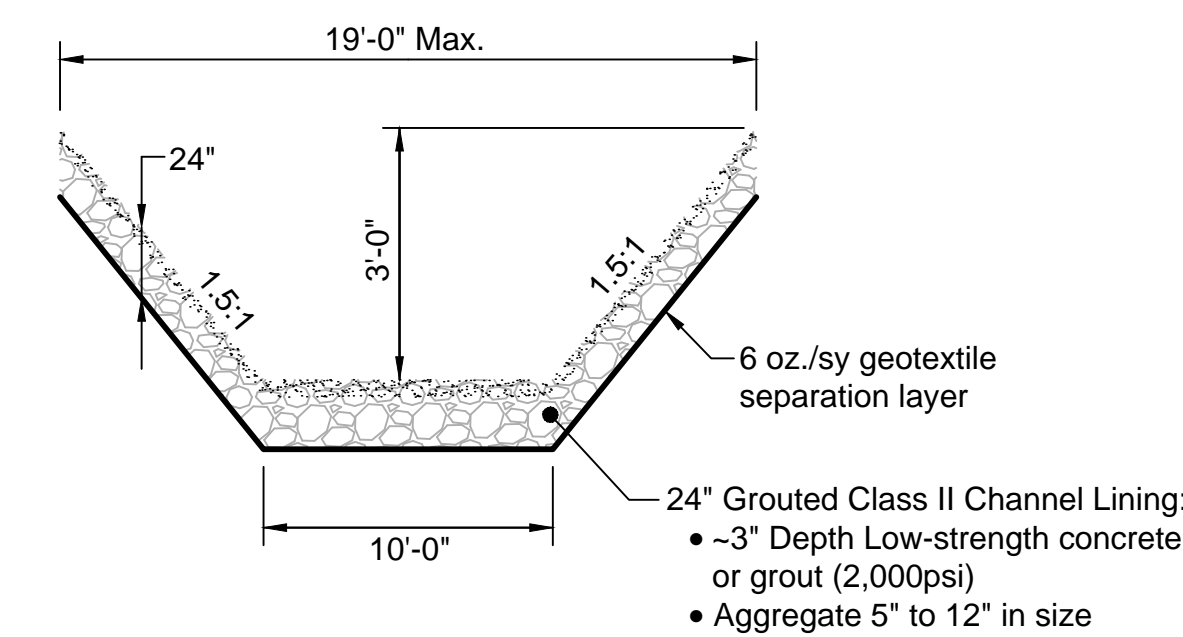
CROSS SECTION

TEMPORARY SILT CHECK
N.T.S.



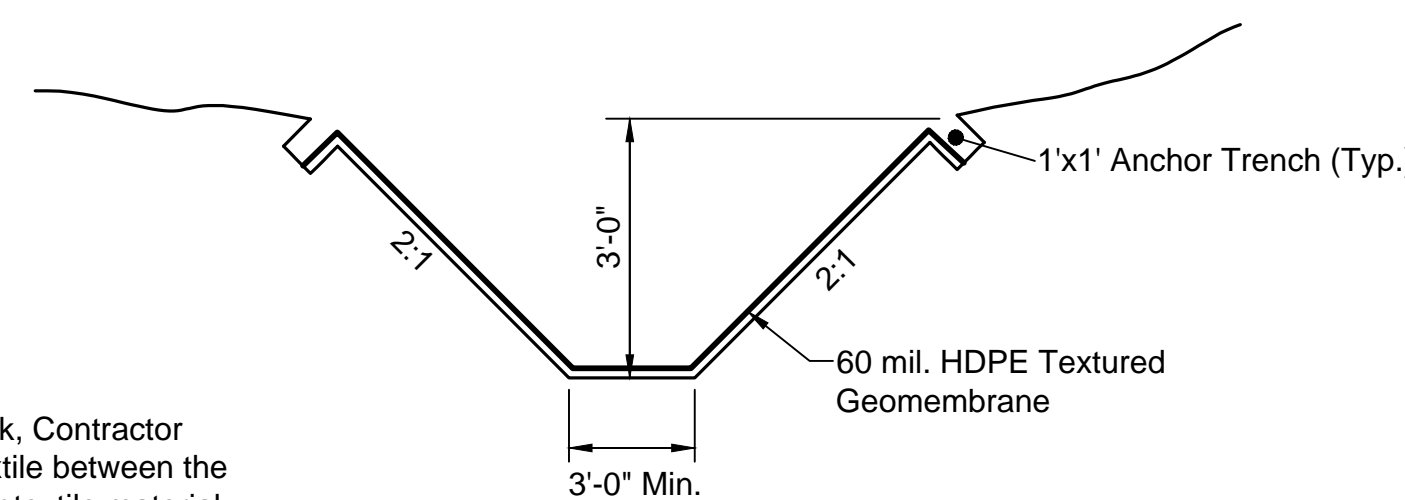
CLASS III - TRAPEZOIDAL

PERMANENT DIVERSION DITCH
N.T.S.



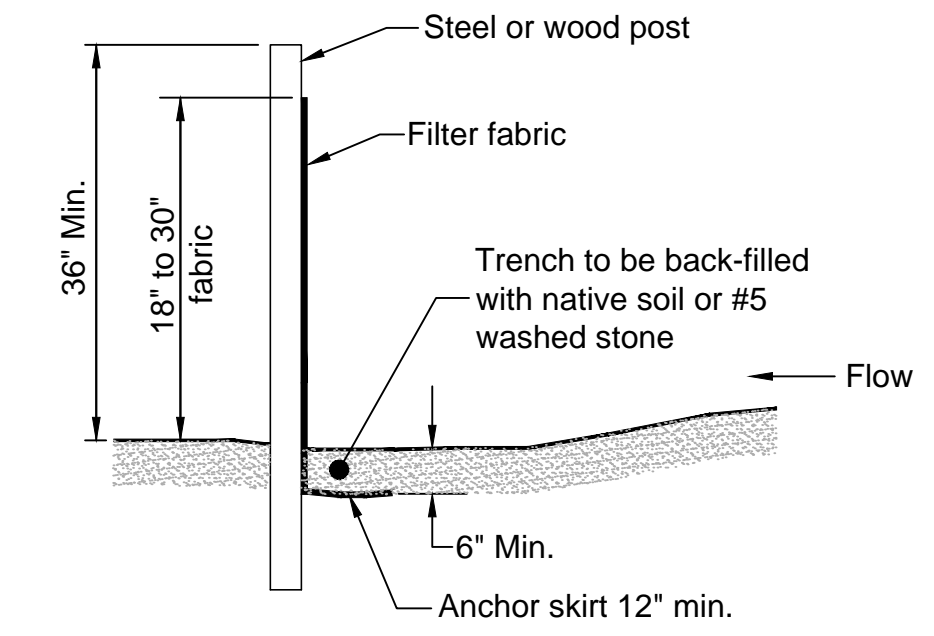
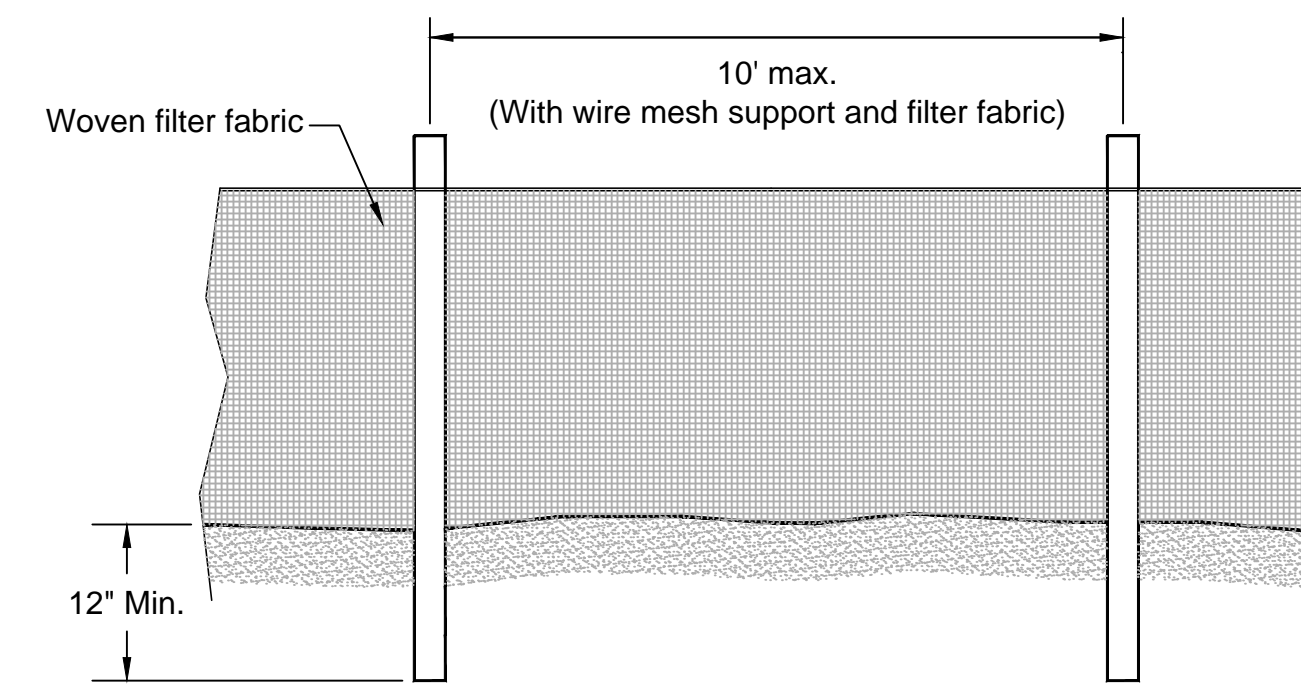
CLASS III - TRAPEZOIDAL

CULVERT OUTLET DOWNDRAIN (CULVERT GROUP 2)
N.T.S.



SECTION A-A

GEOMEMBRANE LINED DIVERSION DITCH

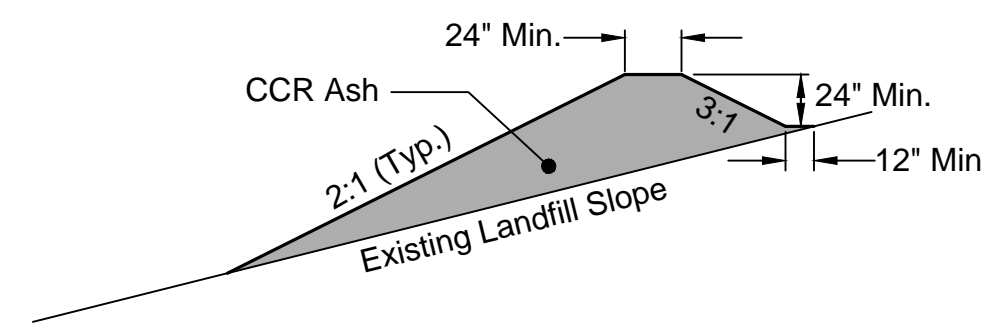


Notes

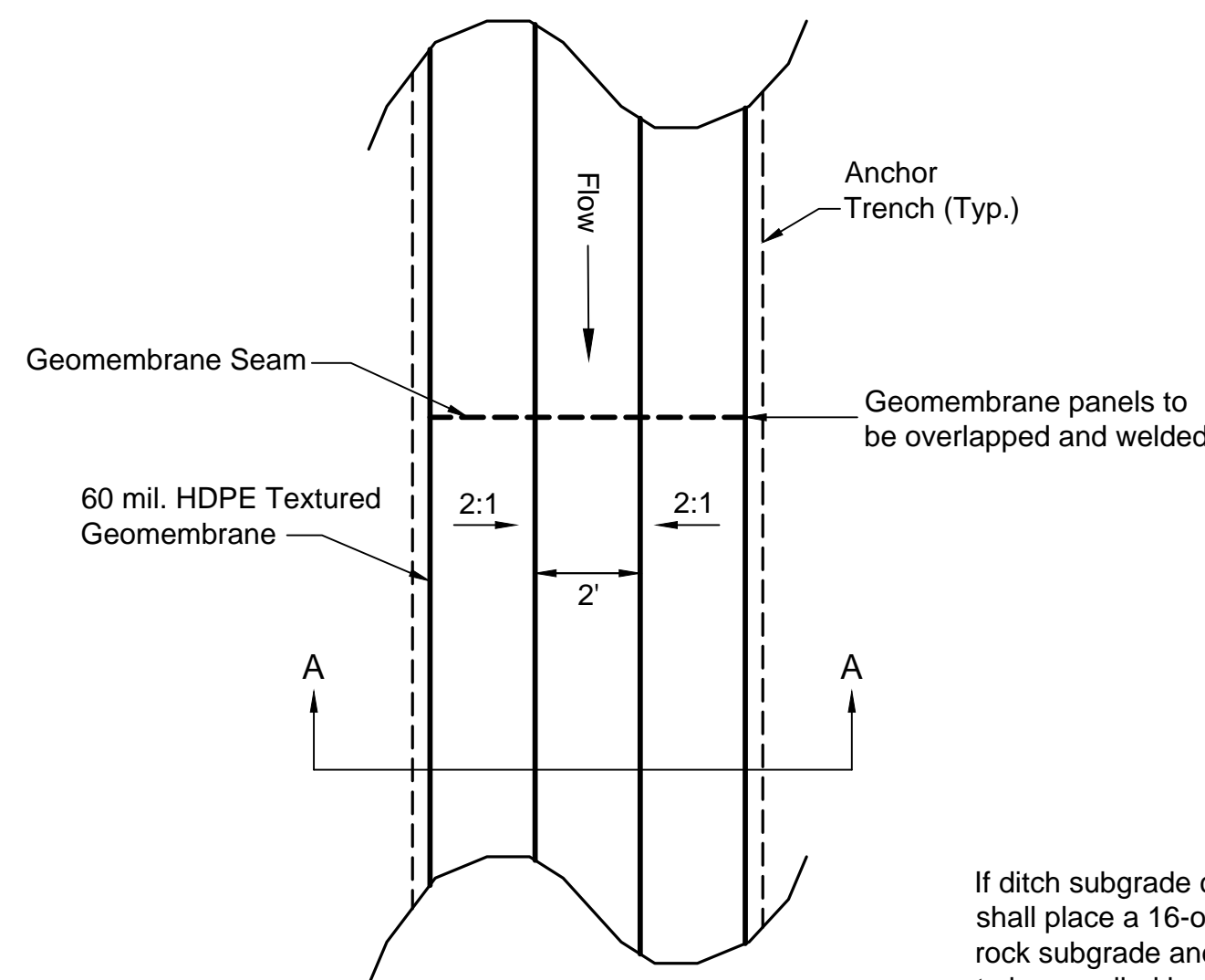
1. Filter fabric shall be purchased in a continuous roll and cut to the length of the barrier. When joints cannot be avoided, filter fabric shall be spliced together only at a post with 3 ft. (min.) overlap, and securely sealed.
2. Posts shall be spaced at 6 ft. intervals in areas of rapid runoff.
3. Posts shall be at least 5 ft. in length.
4. Steel posts shall have projections for fastening wire and fabric.
5. Wood posts shall be 2 inches by 2 inches or equivalent. Steel posts shall be 1.33 lbs per lineal foot.
6. A wire mesh support fence shall be fastened securely to the up-slope side of the posts using heavy duty wire staples at least 1 inch in length, wire ties or hog rings. The wire shall extend into the trench a minimum of 2 inches and shall not extend more than 36 inches above the original ground surface.
7. Washed stone shall be used to bury skirt when silt fence is used adjacent to a channel, creek, or pond.
8. Turn silt fence up-slope at ends.

SILT FENCE
N.T.S.

Note
Diversion berm to be constructed on landfill waste slopes (by earthwork contractor) with CCR material supplied by Owner. Location of berm to be determined by Owner at the start of construction.

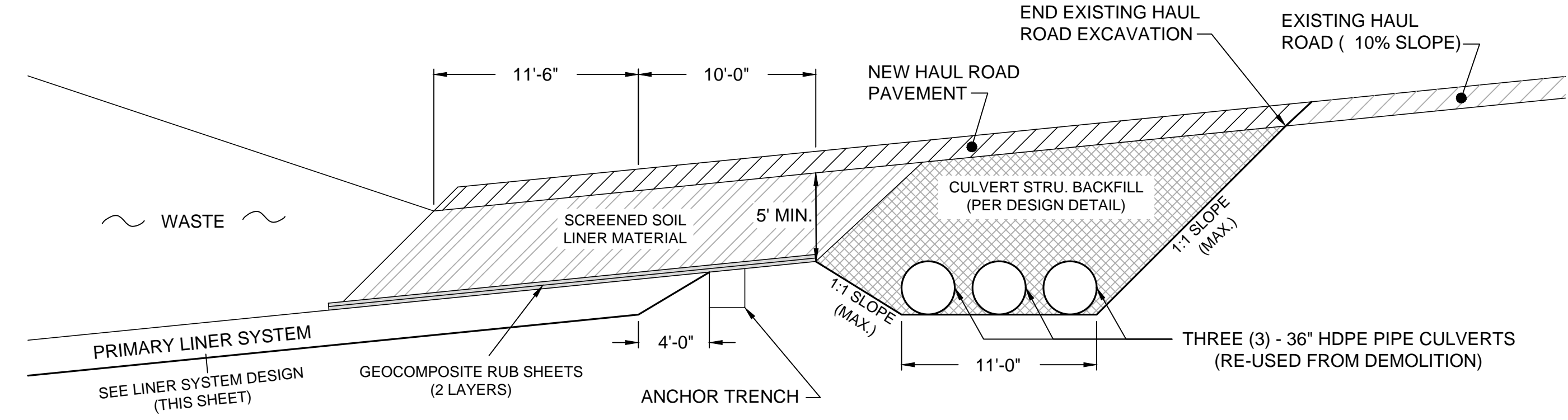


TEMPORARY DRAINAGE BERM DETAIL
N.T.S.



PLAN VIEW

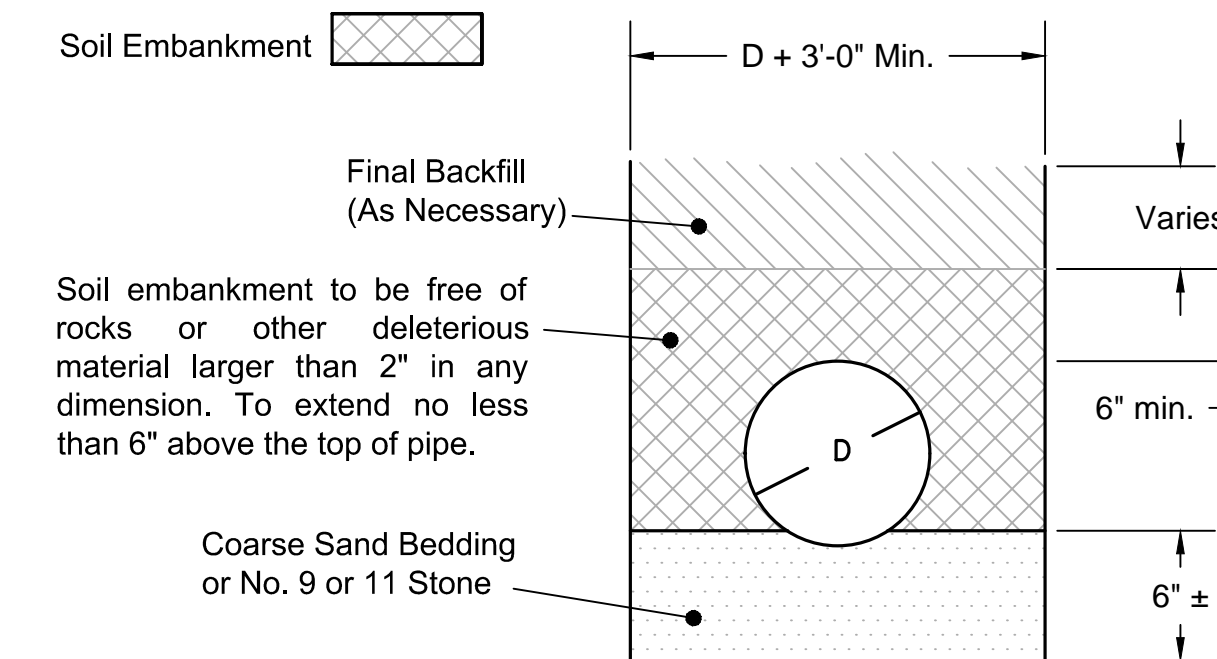
Note
If ditch subgrade consists of in-situ rock, Contractor shall place a 16-oz. non-woven geotextile between the rock subgrade and geomembrane. Geotextile material to be supplied by the Owner.



EXISTING HAUL ROAD / LINER SYSTEM TIE-IN DETAIL
N.T.S.

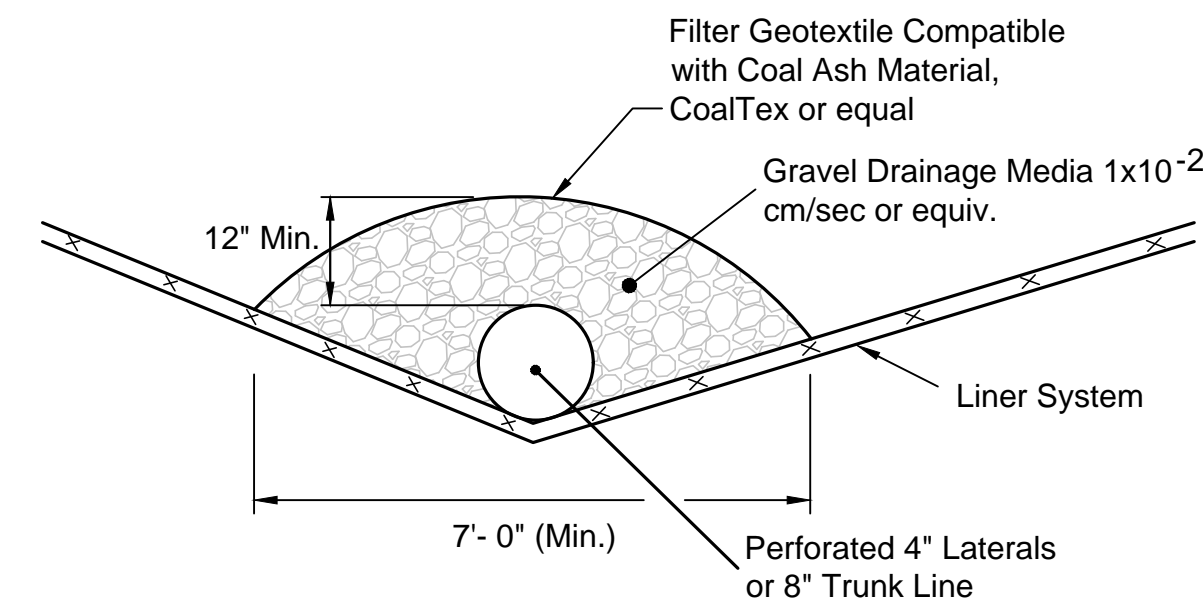
Legend

- Embankment
- Soil Embankment

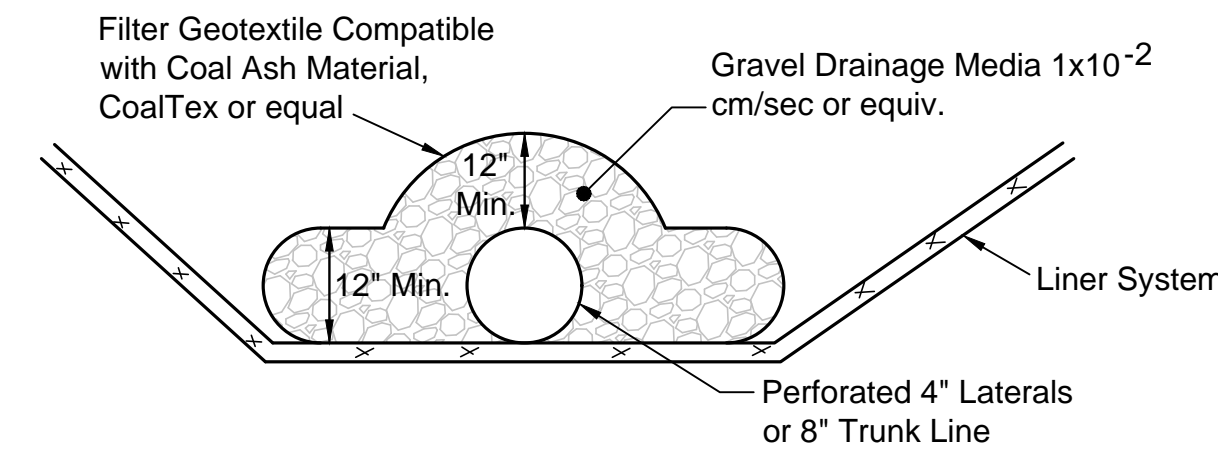


Note: This Detail applies to all Storm Water Drainage Pipes

TYPICAL PIPE TRENCH DETAIL
N.T.S.



TRIANGULAR SHAPED AND BENCH DRAINAGE PATHWAY



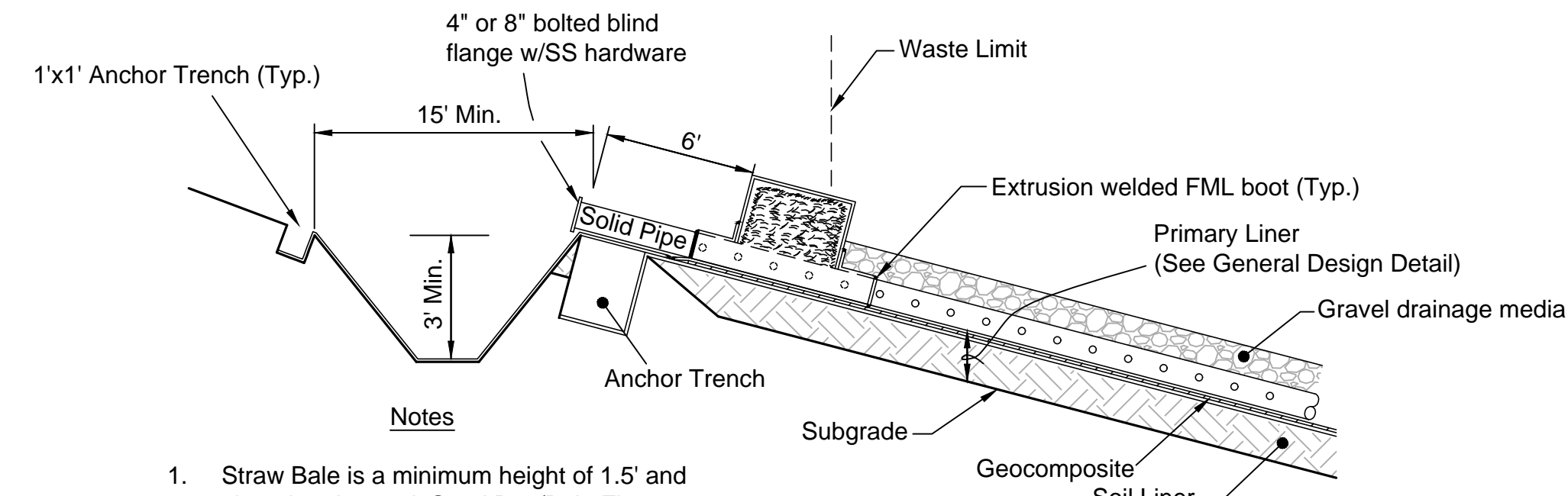
TRAPEZOIDAL SHAPED DRAINAGE PATHWAY

Notes

1. All Gravel shall be placed with equipment that will not exceed ground pressure of 5 psi and must be approved prior to use by the Owner and Engineer.
2. Minimum width of gravel drainage media in trapezoidal pattern shall be 10 feet.
3. Drainage media shall be completely encased inside the geotextile. The geotextile seam shall be sewn or fusion welded. CoalTex geotextile (or equal) shall be placed so the non-woven side will be in contact with the CCR waste.

LEACHATE COLLECTION PIPE DETAIL

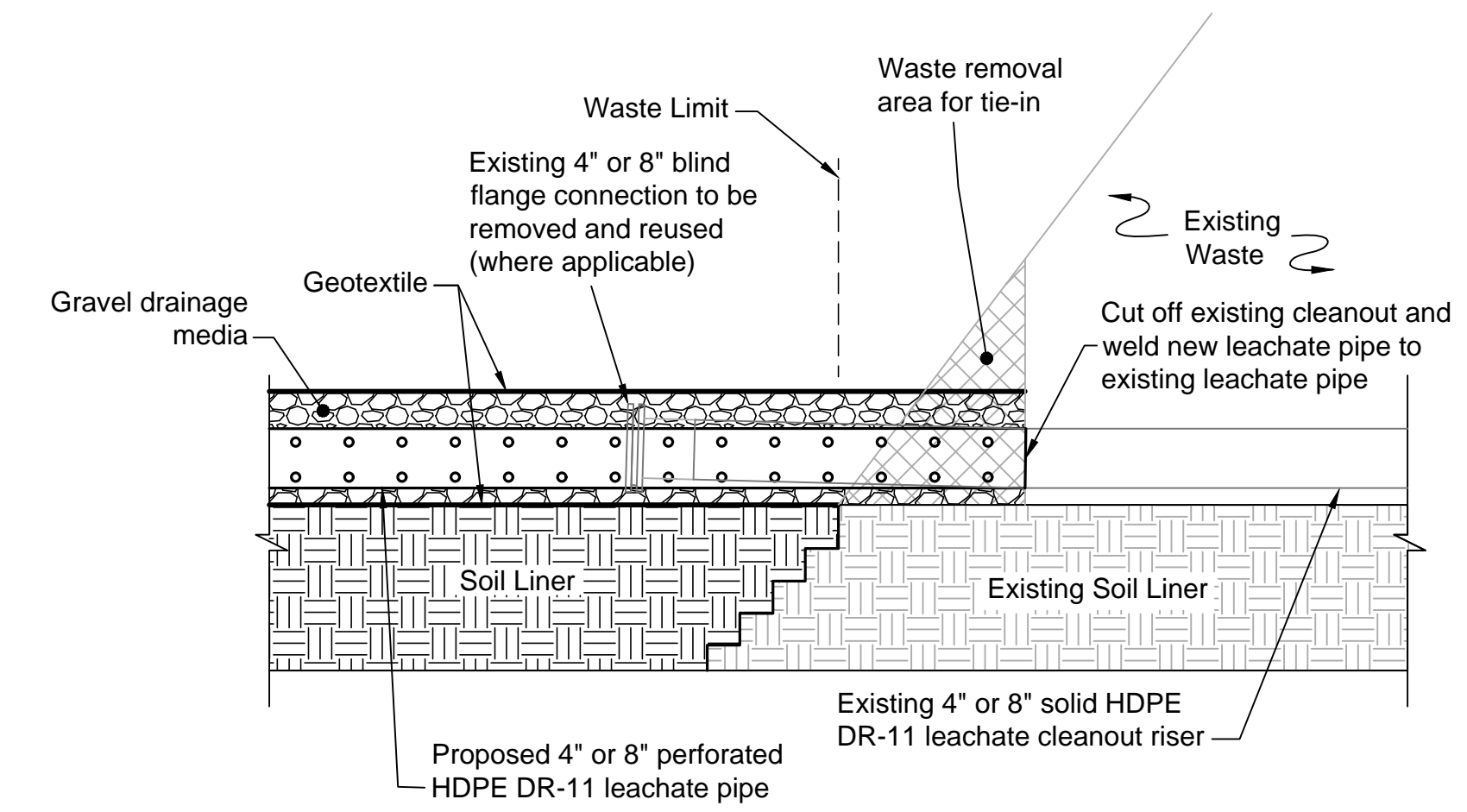
N.T.S.



1. Straw Bale is a minimum height of 1.5' and placed end to end. Sand Bag/Bale Flap width is 12'.
2. Geocomposite shall terminate 1' down slope from the anchor trench.

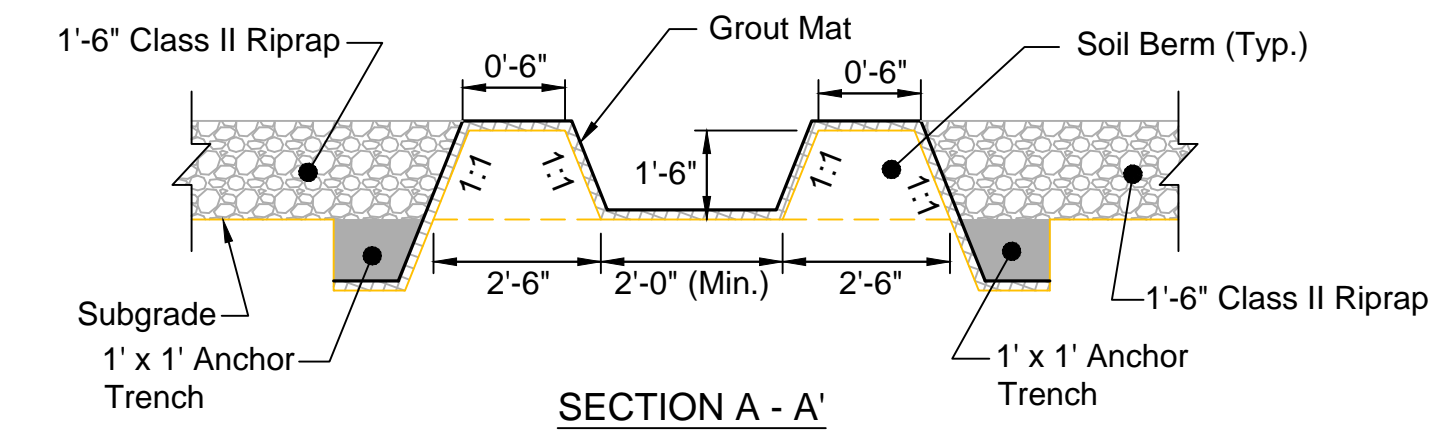
TEMPERARY WASTE LIMIT-LEACHATE PIPE CLEANOUT DETAIL

N.T.S.

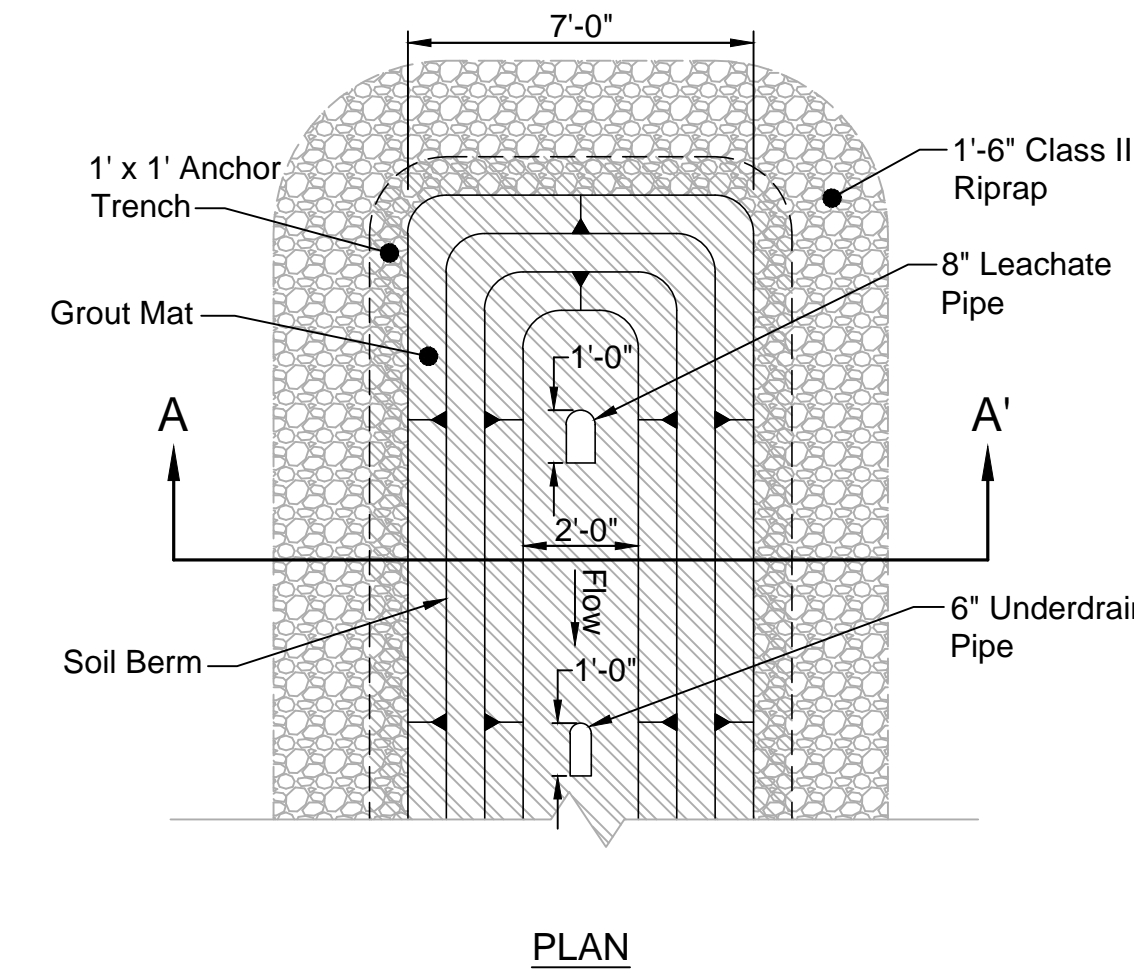


LEACHATE PIPE TIE-IN DETAIL

N.T.S.



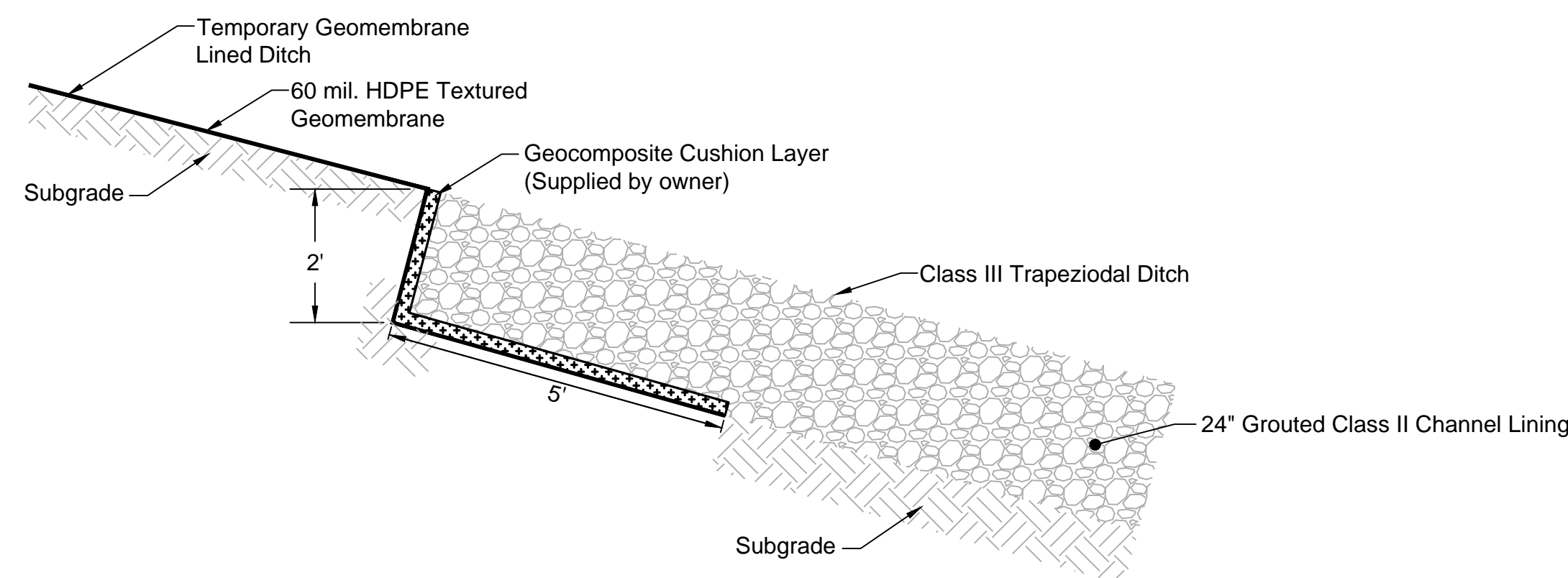
SECTION A - A'



PLAN

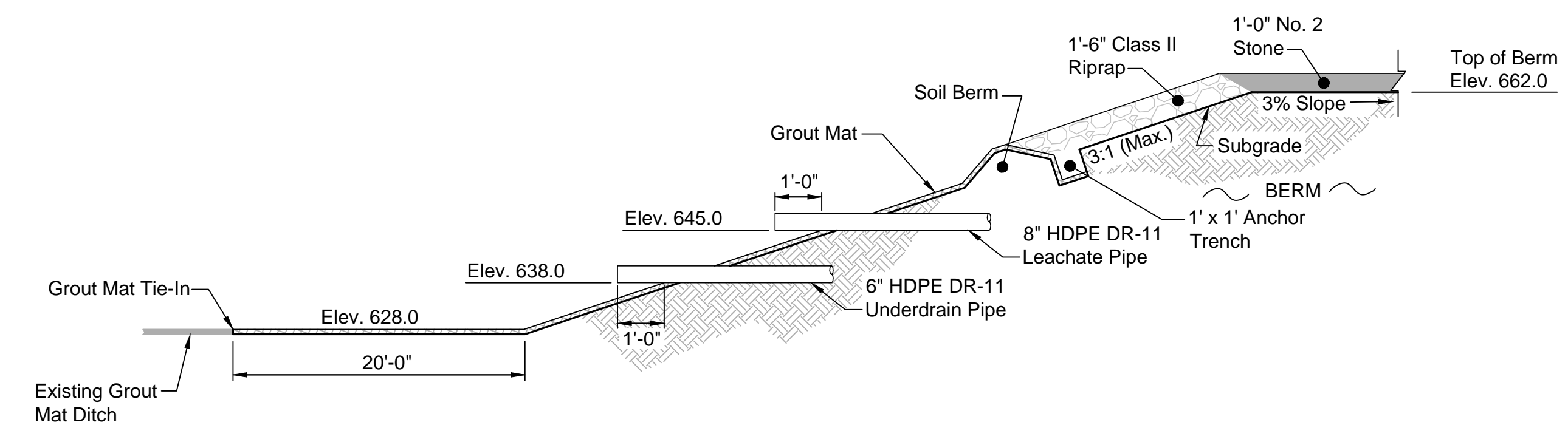
GROUTMAT DOWNDRAIN DETAIL

N.T.S.



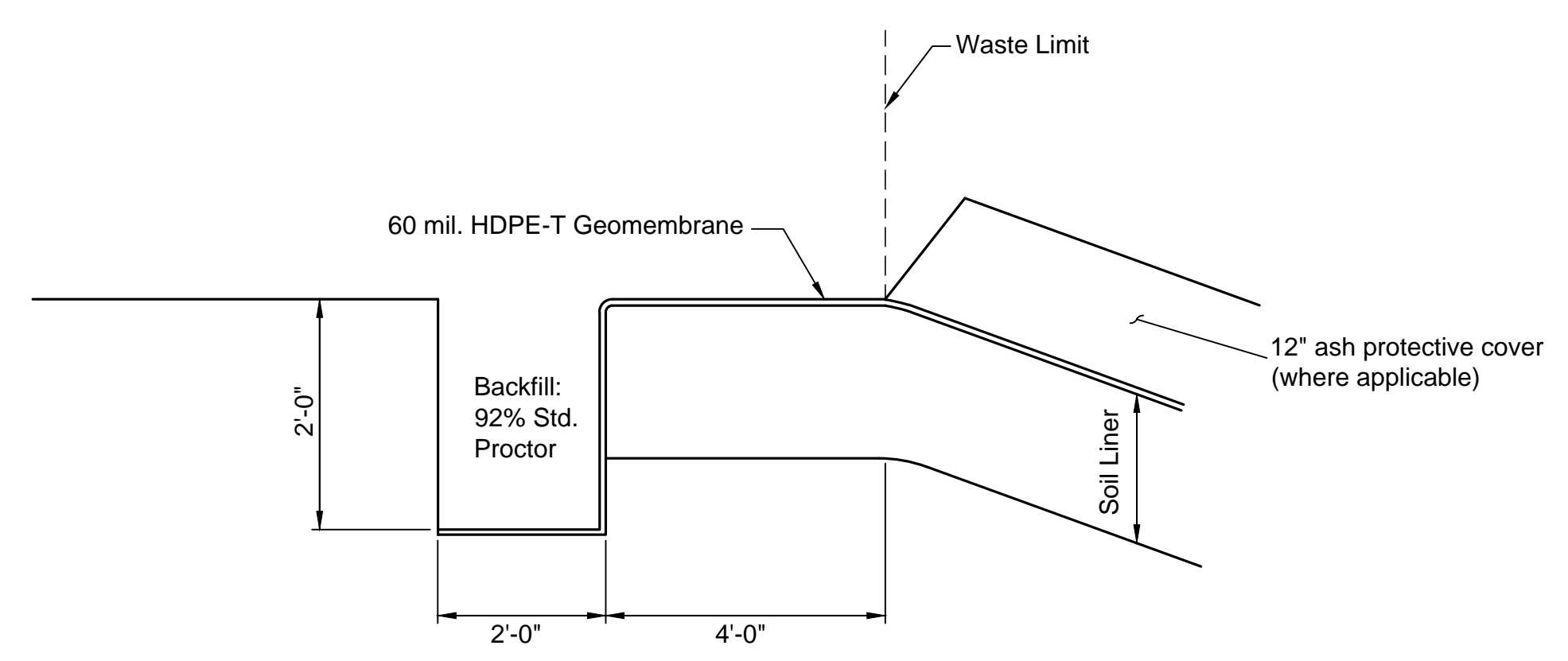
GOMEMBRANE LINED DITCH TO CLASS III TRAPEZOIDAL DITCH TRANSITION

N.T.S.

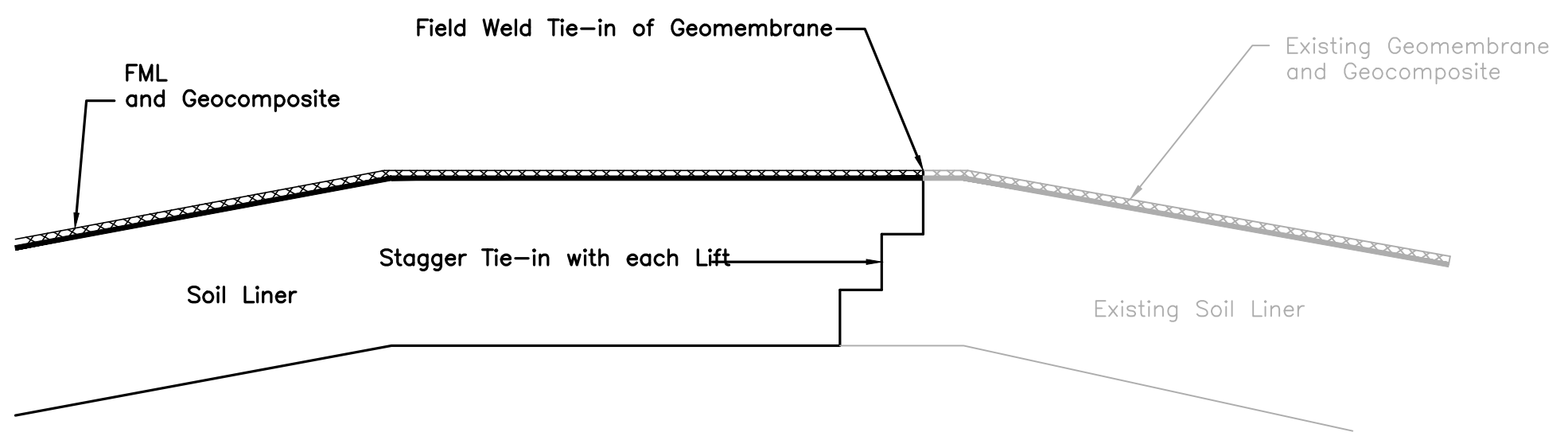


UNDERDRAIN & LEACHATE PIPE TERMINATION DETAIL

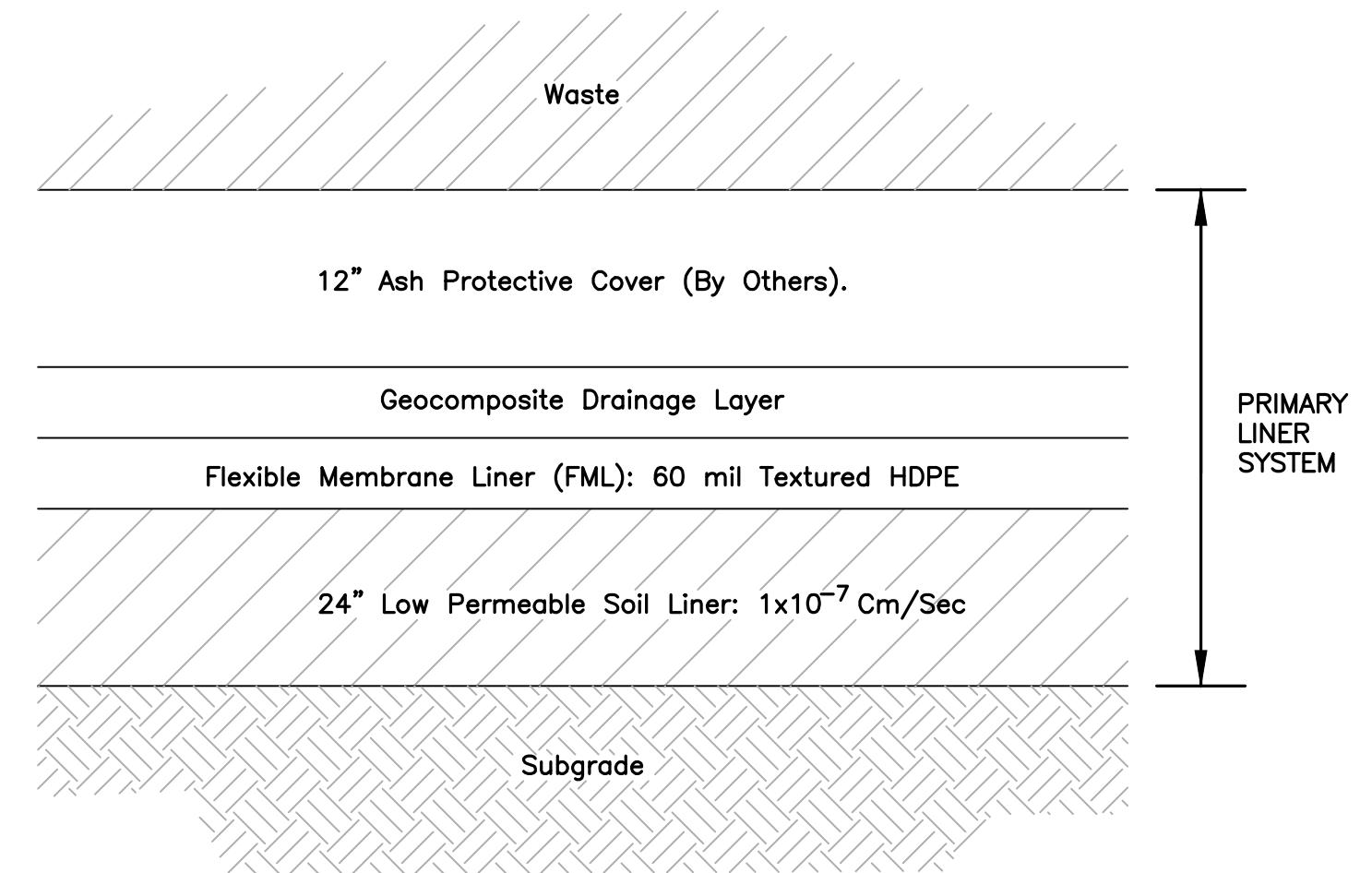
N.T.S.



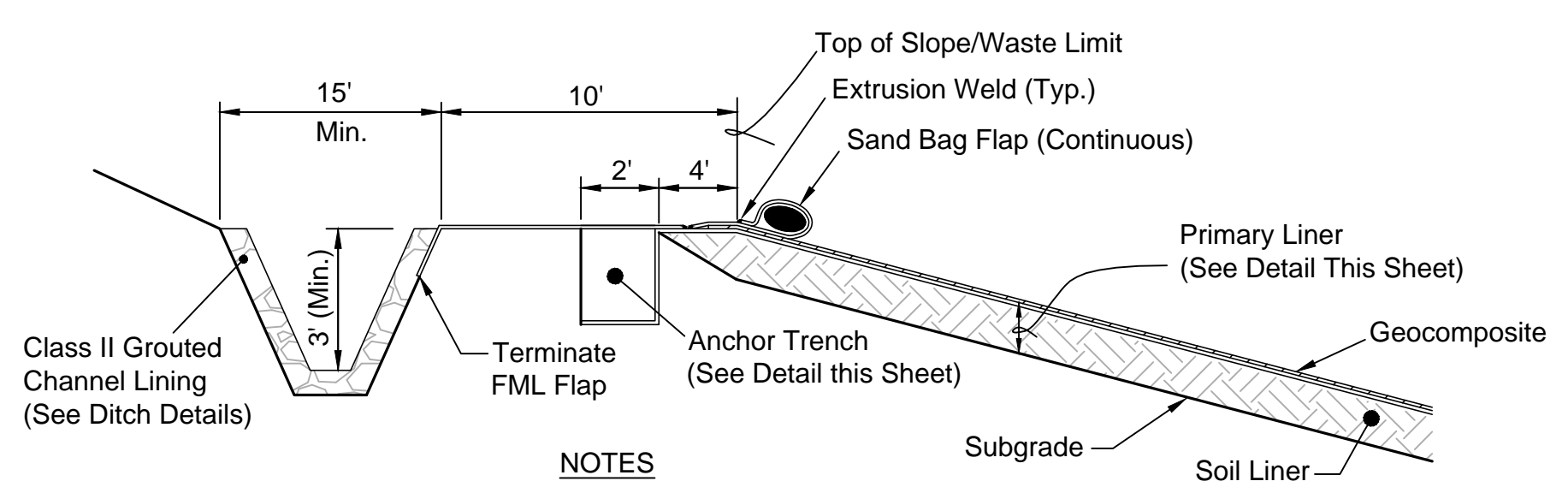
PERMANENT ANCHOR TRENCH DETAIL
N.T.S.



GEOSYNTHETIC LINER TIE-IN DETAIL
N.T.S.

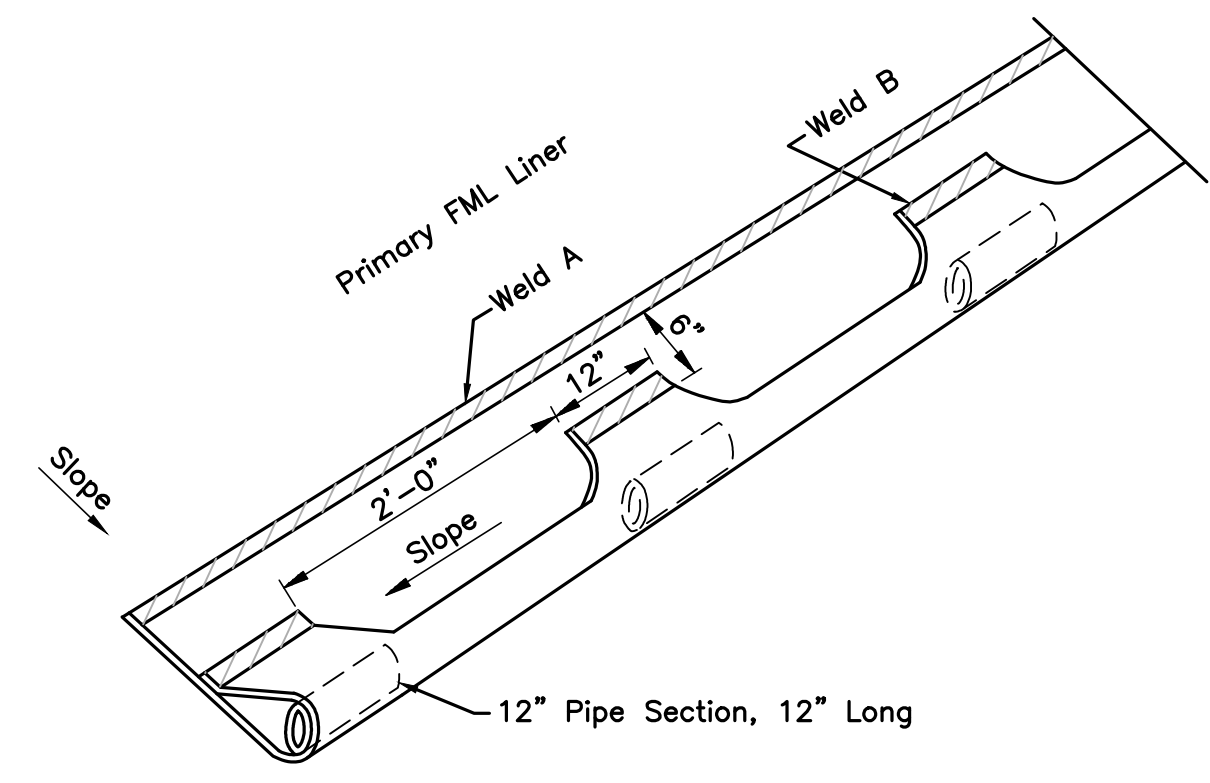


LINER SYSTEM DESIGN
N.T.S.

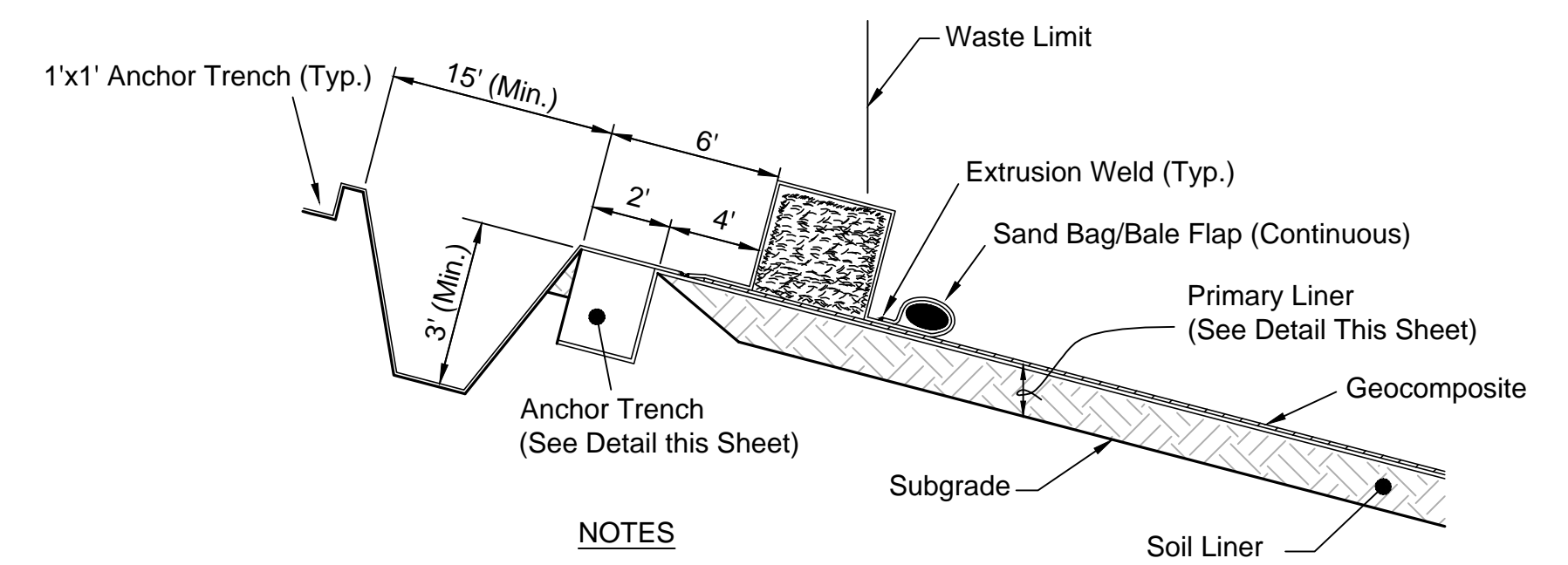


- NOTES**
1. The 10' run out shall be sloped (high to low) from top of slope to the ditch.
 2. Sand bag flap width is 7'
 3. Geocomposite shall terminate 3' outside the top of slope.

PERMANENT WASTE LIMIT - LINER END TREATMENT
N.T.S.

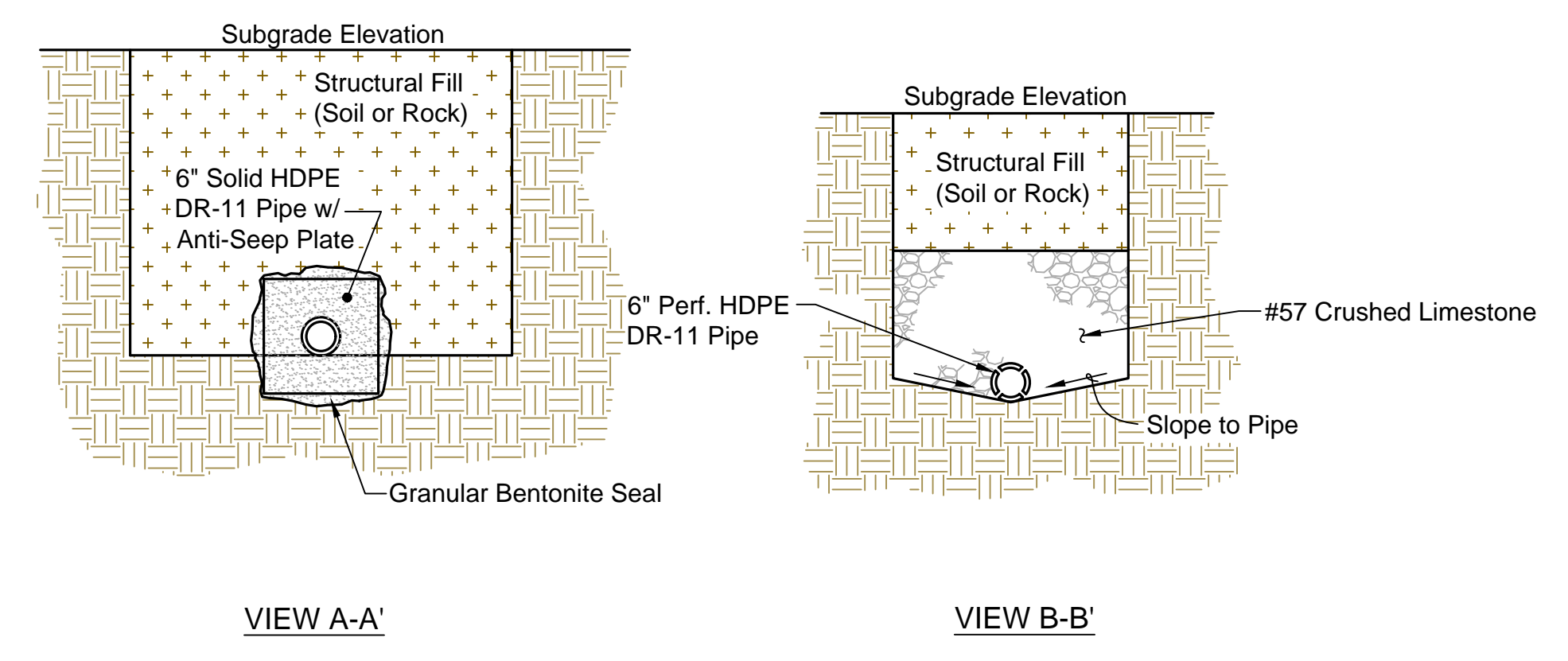


RAIN GUTTER SYSTEM DETAIL
N.T.S.



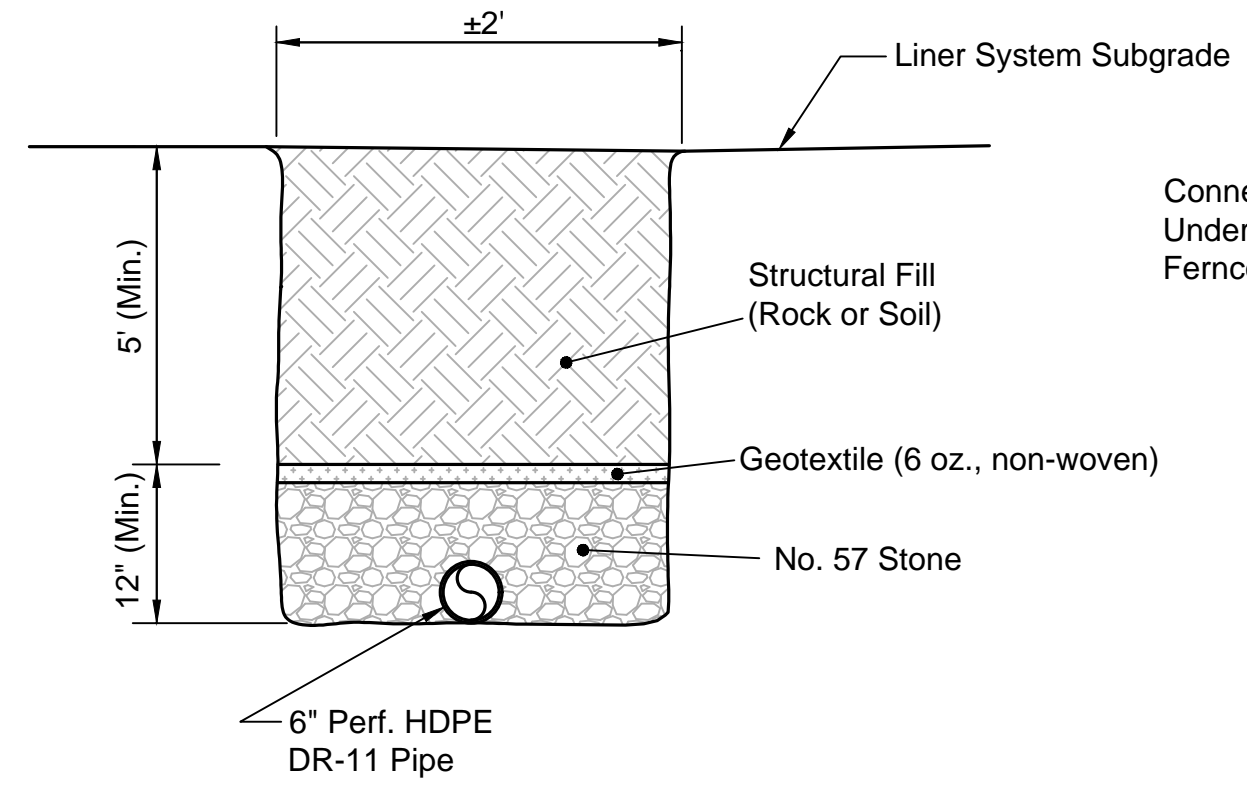
- NOTES**
1. Straw Bale is a minimum height of 1.5' and placed end to end. Sand Bag/Bale Flap width is 12'.
 2. Geocomposite shall terminate 1' down slope from the anchor trench.

TEMPORARY WASTE LIMIT-LINER END TREATMENT
N.T.S.

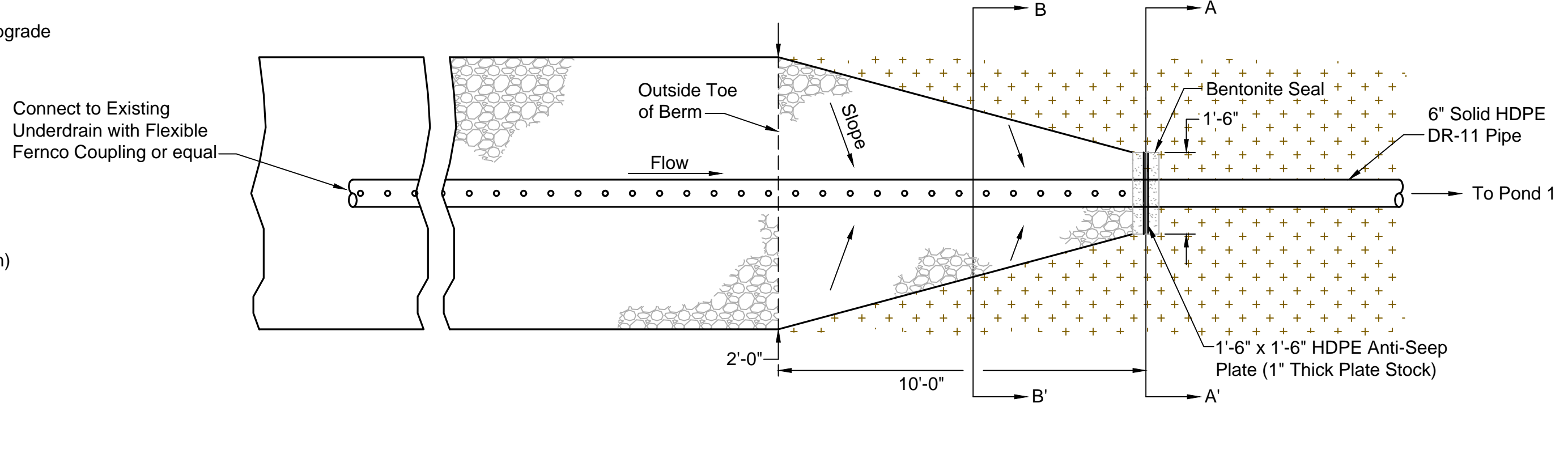


VIEW A-A' VIEW B-B'

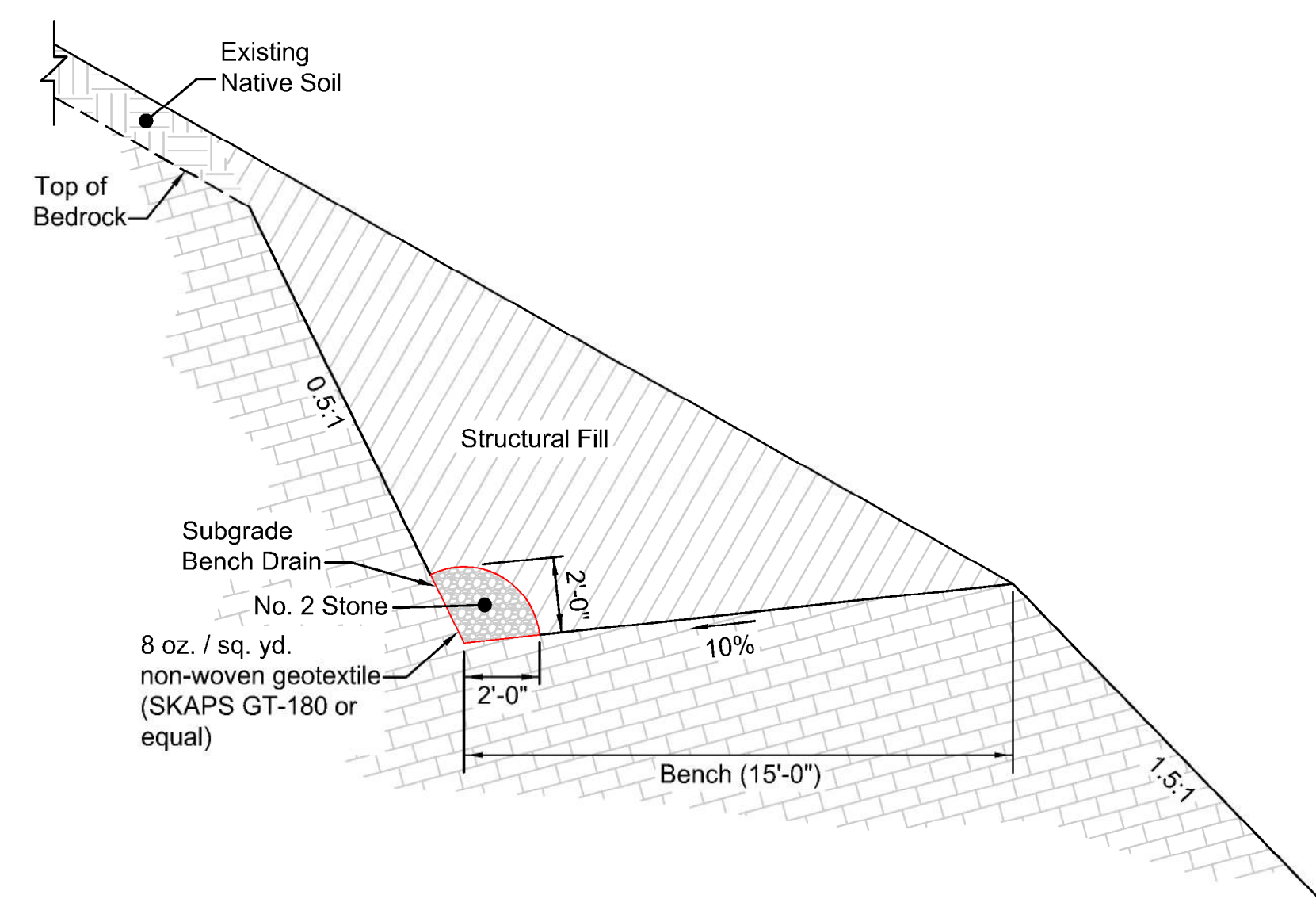
UNDERDRAIN EXIT PIPE DETAIL
N.T.S.



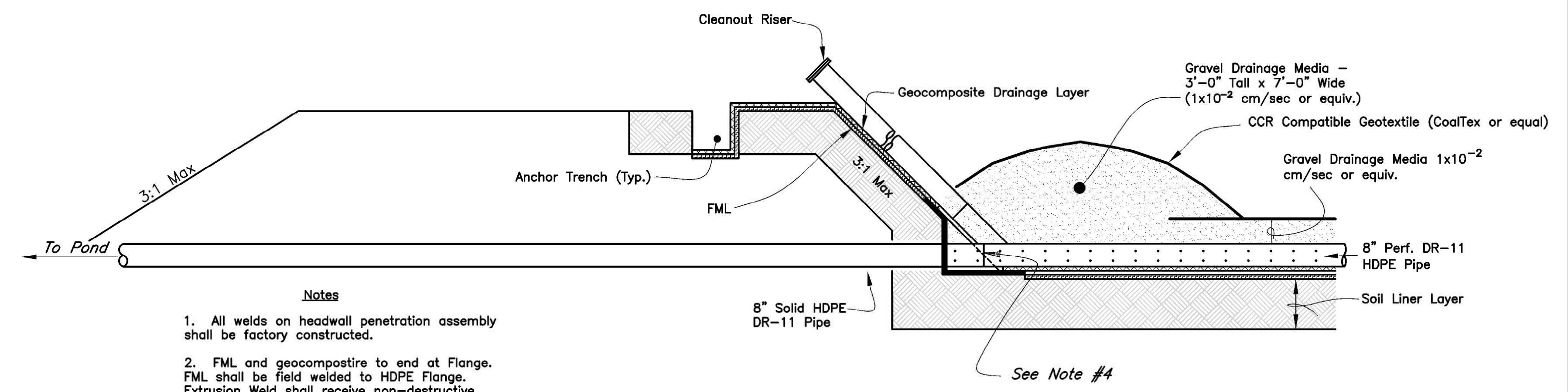
UNDERDRAIN TRENCH DETAIL (IF NEEDED)
N.T.S.



UNDERDRAIN PIPE FLOW TRANSITION DETAIL
N.T.S.

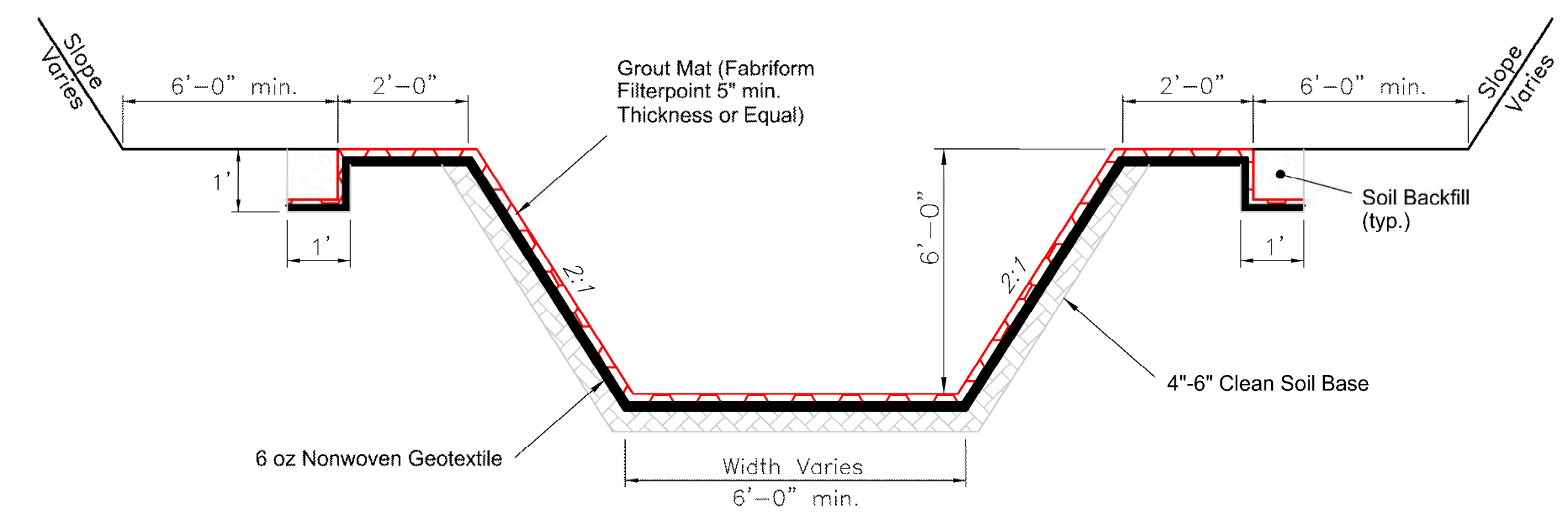


SUBGRADE BENCH DETAIL
N.T.S.

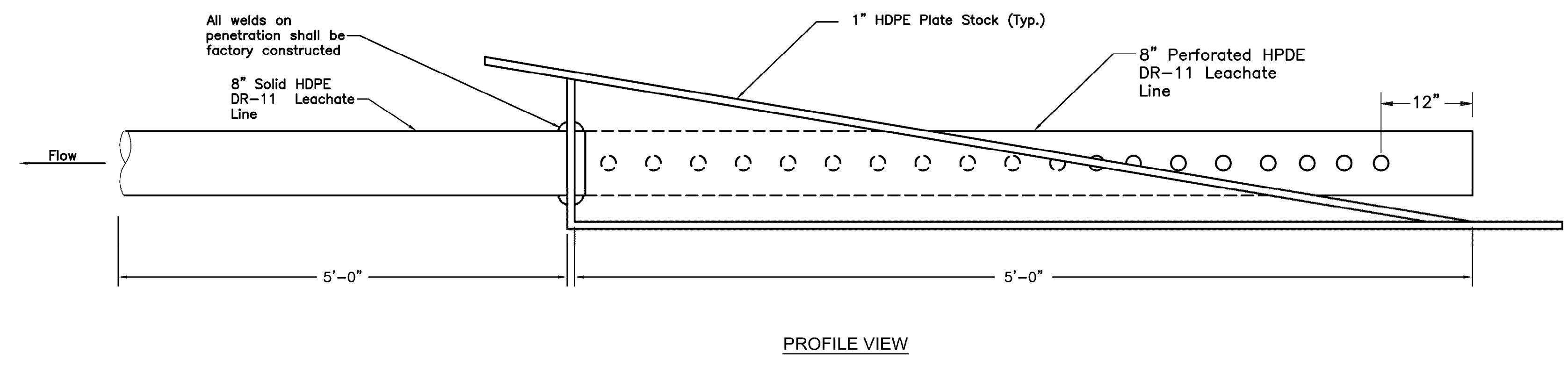


- Notes**
1. All welds on headwall penetration assembly shall be factory constructed.
 2. FML and geocomposite to end at Flange. FML shall be field welded to HDPE Flange. Extrusion Weld shall receive non-destructive testing.
 3. All leachate piping shall be cleaned and/or flushed and accepted by the Owner prior to placing leachate collection system into service.
 4. 8" perforated leachate collection line shall be connected to the headwall penetration assembly stub out pipe by butt-fusion welding or electrofusion coupling.

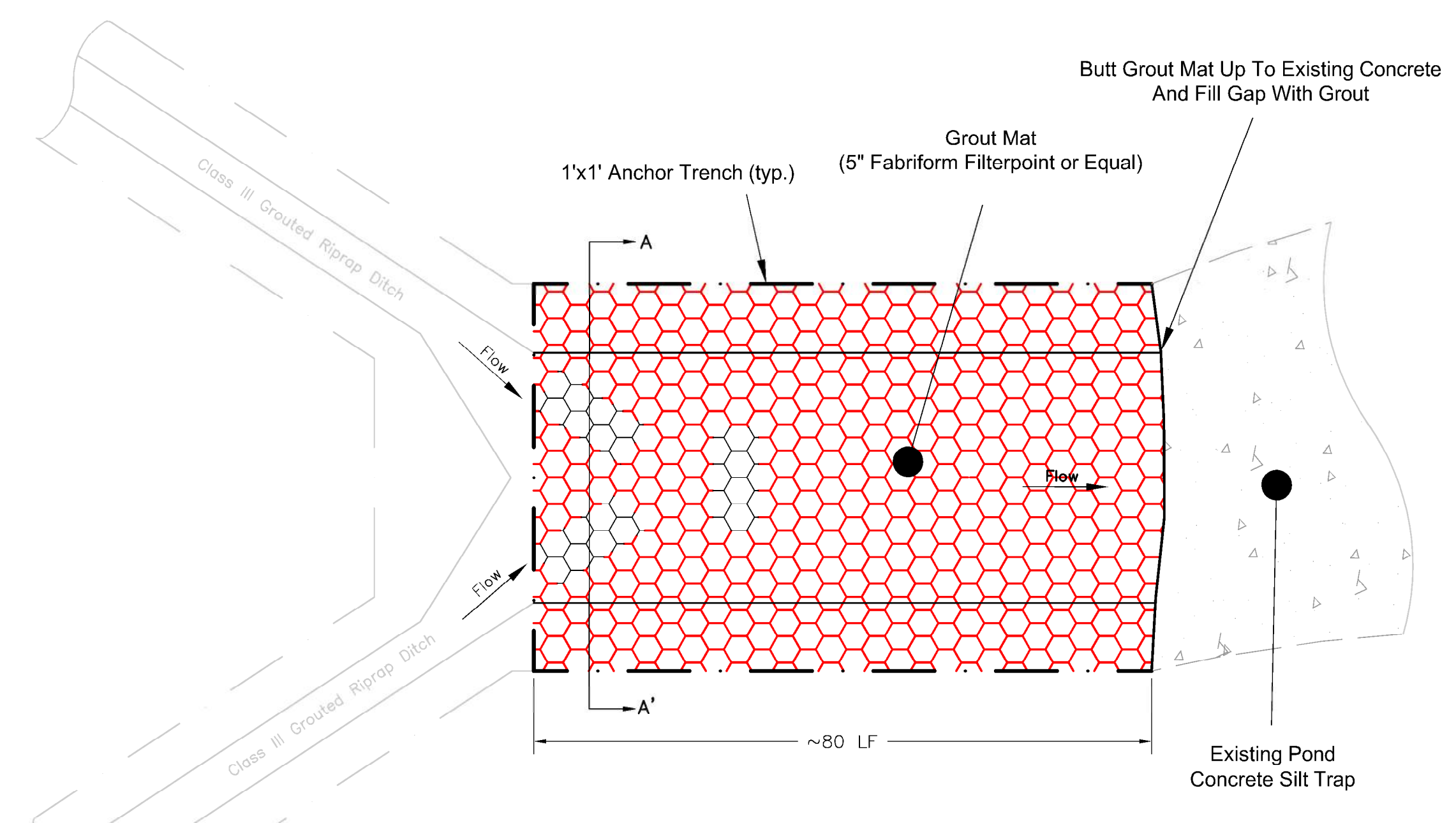
HEADWALL PENETRATION AND TOE DETAIL
N.T.S.



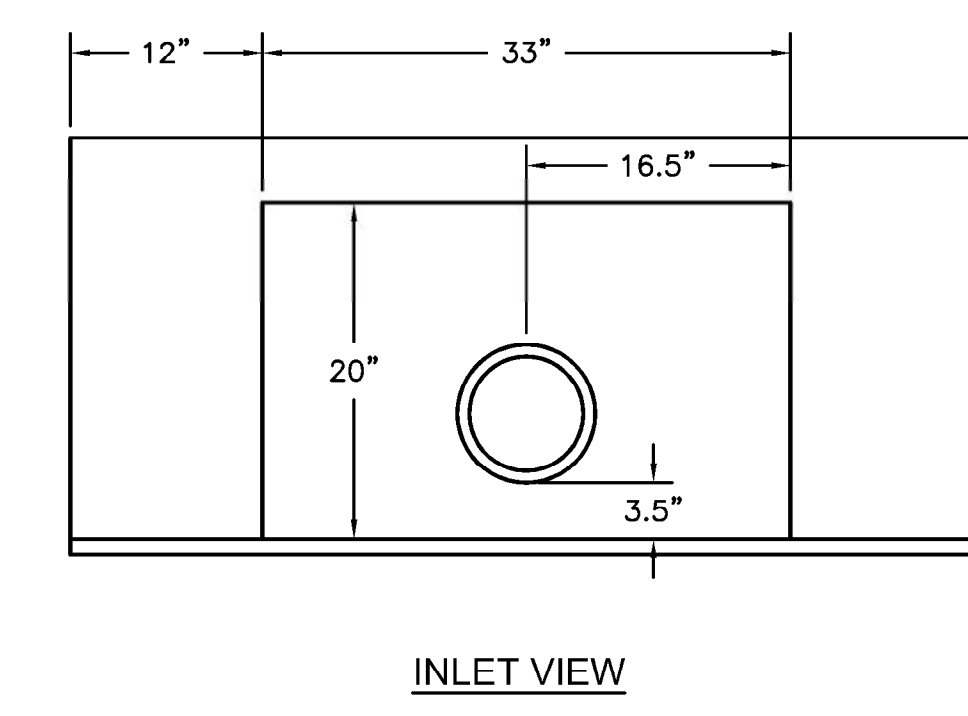
GROUT MAT DITCH SECTION A - A'
N.T.S.



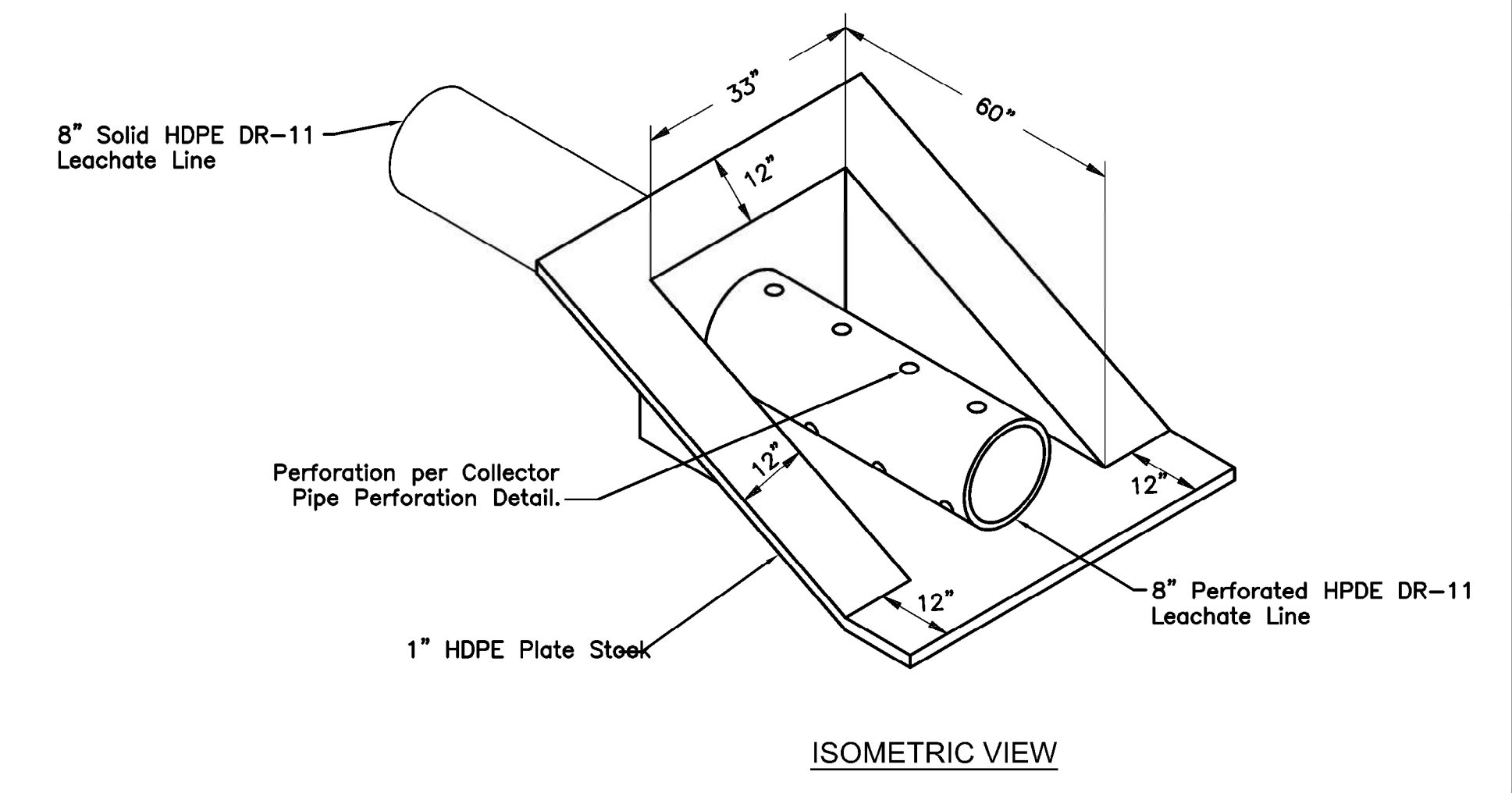
PROFILE VIEW



GROUT MAT DITCH TO POND CONCRETE SILT TRAP
N.T.S.



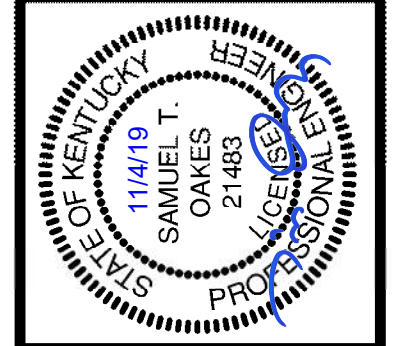
INLET VIEW



HEADWALL PENETRATION ASSEMBLY
N.T.S.

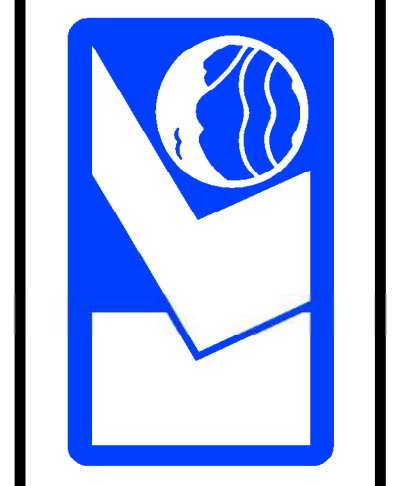


SPURLOCK STATION LANDFILL
MASON COUNTY, KENTUCKY
PERMIT NO. 081-00005
AREA C, PHASE 4
CONSTRUCTION DRAWINGS



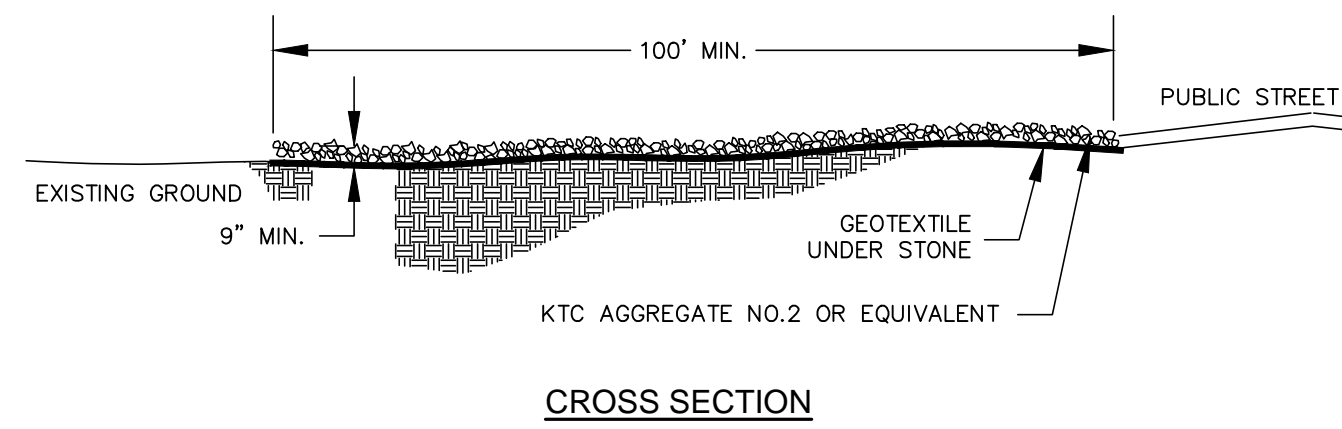
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CHECKED BY: STO	DATE: MARCH 2018
SCALE: AS NOTED	REVISIONS:
	03/27/18 Addendum 1

KENVIRONS, INC.
FRANKFORT, KENTUCKY

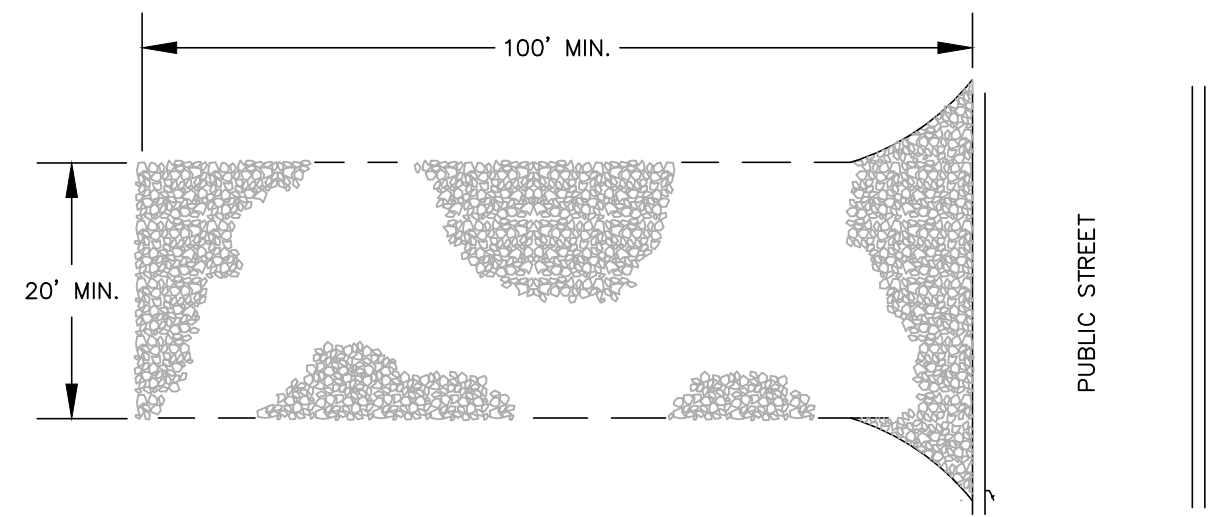


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DETAILS



CROSS SECTION



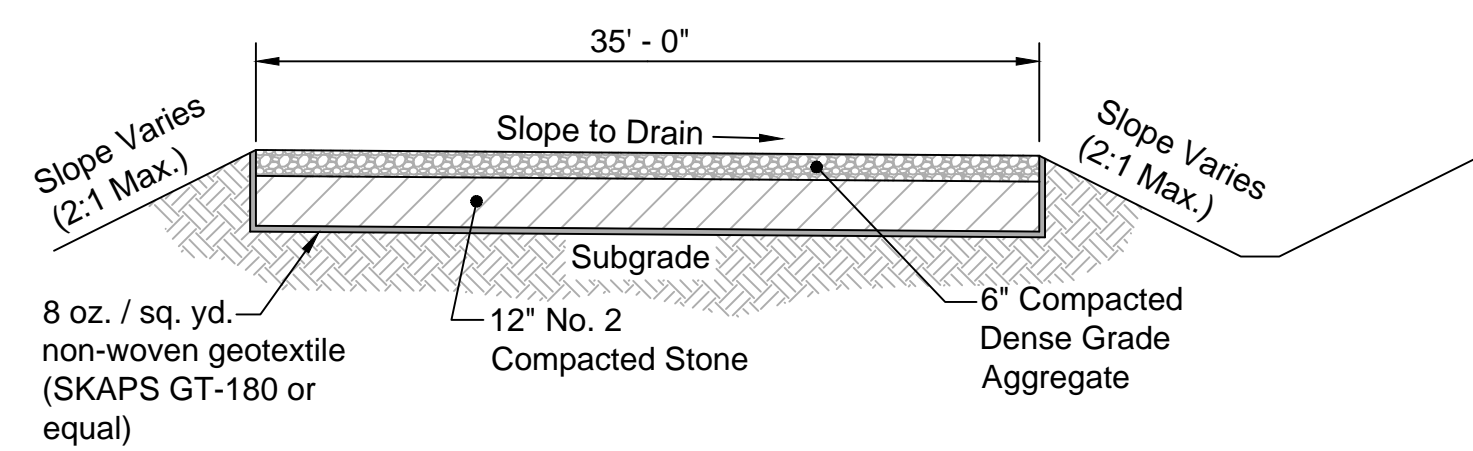
PLAN VIEW

NOTES

1. A STABILIZED ENTRANCE PAD OF CRUSHED STONE SHALL BE LOCATED WHERE TRAFFIC WILL ENTER OR LEAVE THE CONSTRUCTION SITE ONTO A PUBLIC STREET.
2. SOIL STABILIZATION FABRIC SHALL BE USED AS A BASE FOR THE CONSTRUCTION ENTRANCE.
3. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC STREETS OR EXISTING PAVEMENT. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS WARRANT AND REPAIR OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
4. ANY SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC STREETS OR INTO STORM DRAINS MUST BE REMOVED IMMEDIATELY.
5. WHEN APPROPRIATE, WHEELS MUST BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTERING A PUBLIC STREET. WHEN WASHING IS REQUIRED, IT SHALL BE DONE IN AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT BASIN.

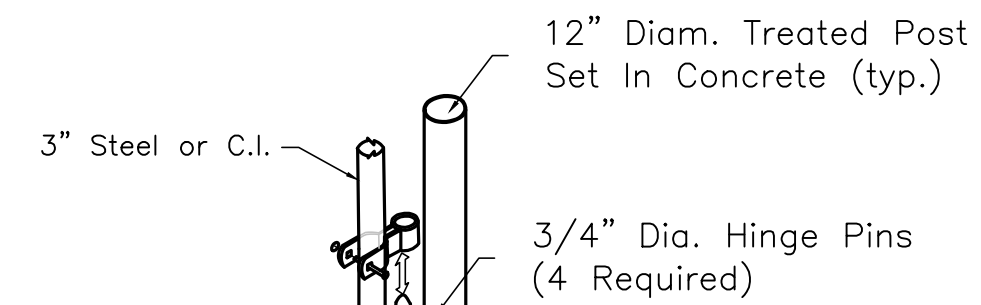
CONSTRUCTION ENTRANCE - GRAVEL PAVEMENT

N.T.S.



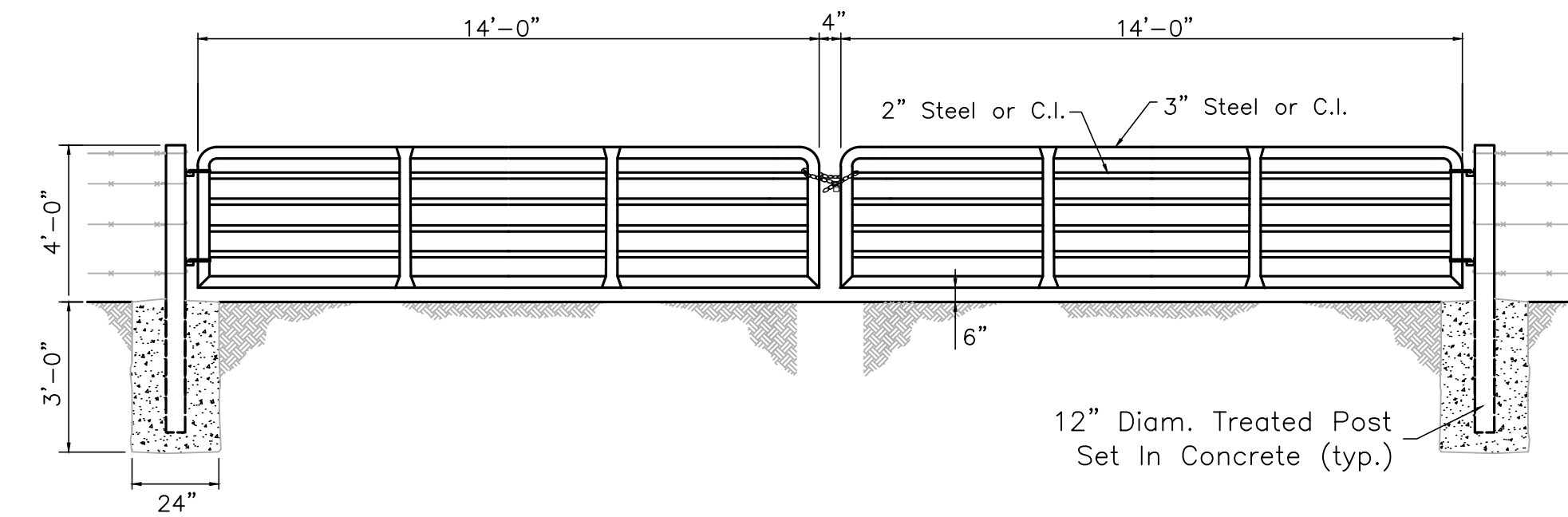
HAUL ROAD DETAIL

N.T.S.



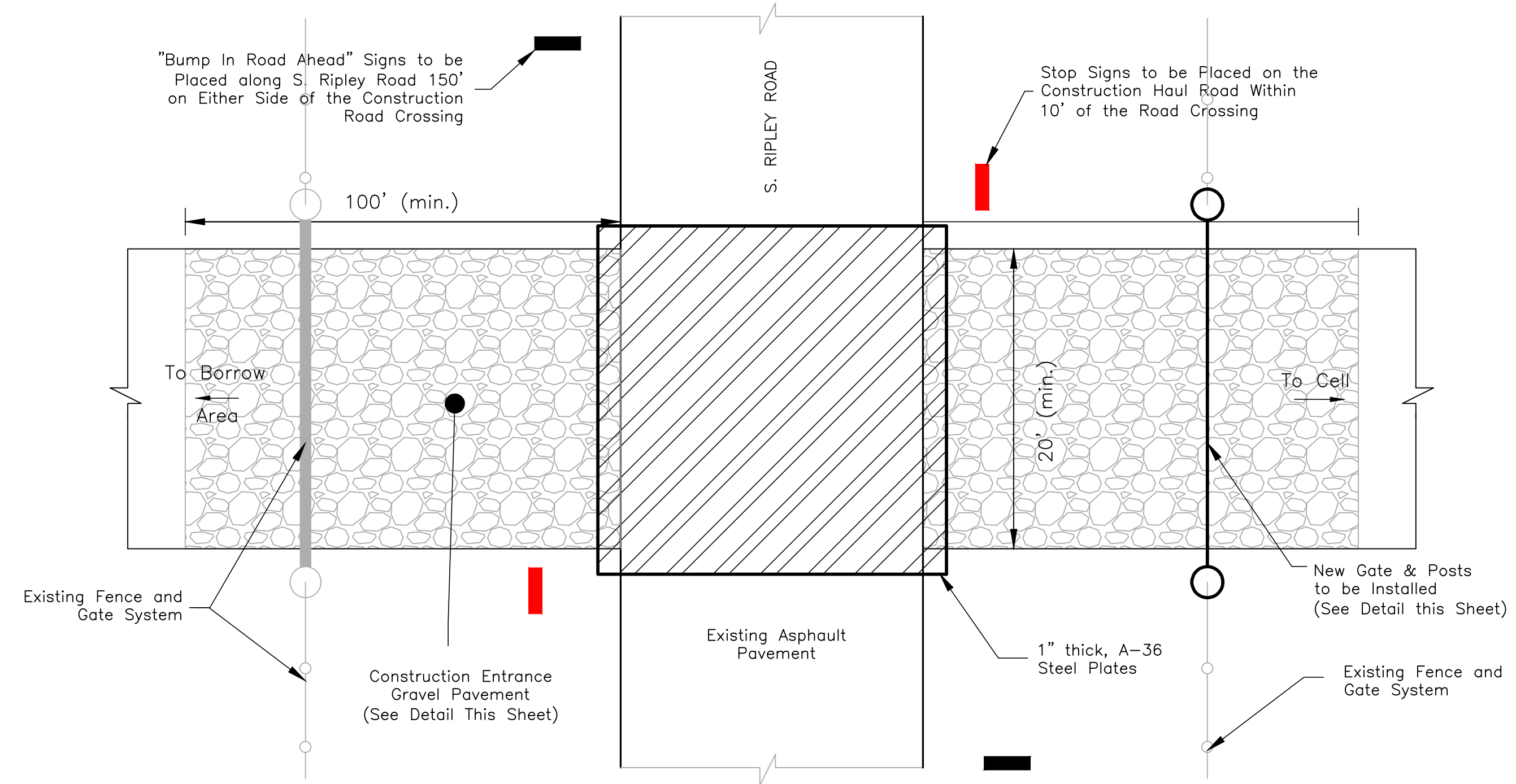
HINGE DETAIL

N.T.S.



CONSTRUCTION ENTRANCE GATE DETAIL

N.T.S.

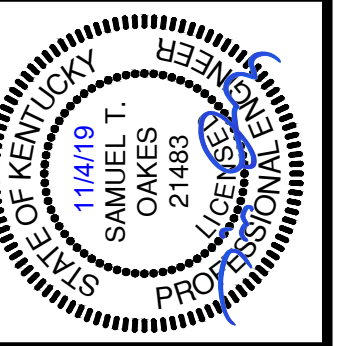


COUNTY ROAD CROSSING DETAIL

N.T.S.



SPURLOCK STATION LANDFILL
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CHECKED BY: STO	DATE: MARCH 2018
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KENVIRONS, INC.
 FRANKFORT, KENTUCKY



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DETAILS

ATTACHMENT 3

USGS UNIFIED HAZARD TOOL RESULTS

Unified Hazard Tool



Please do not use this tool to obtain ground motion parameter values for the design code reference documents covered by the [U.S. Seismic Design Maps web tools](#) (e.g., the International Building Code and the ASCE 7 or 41 Standard). The values returned by the two applications are not identical.

^ Input

Edition

Dynamic: Conterminous U.S. 2008 (v3.3.3)

Spectral Period

Peak Ground Acceleration

Latitude

Decimal degrees

38.686

Time Horizon

Return period in years

2475

Longitude

Decimal degrees, negative values for western longitudes

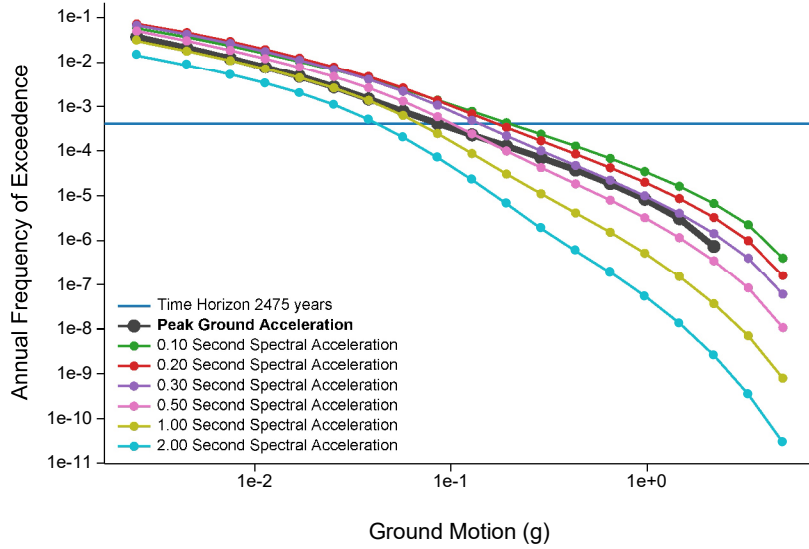
-83.827

Site Class

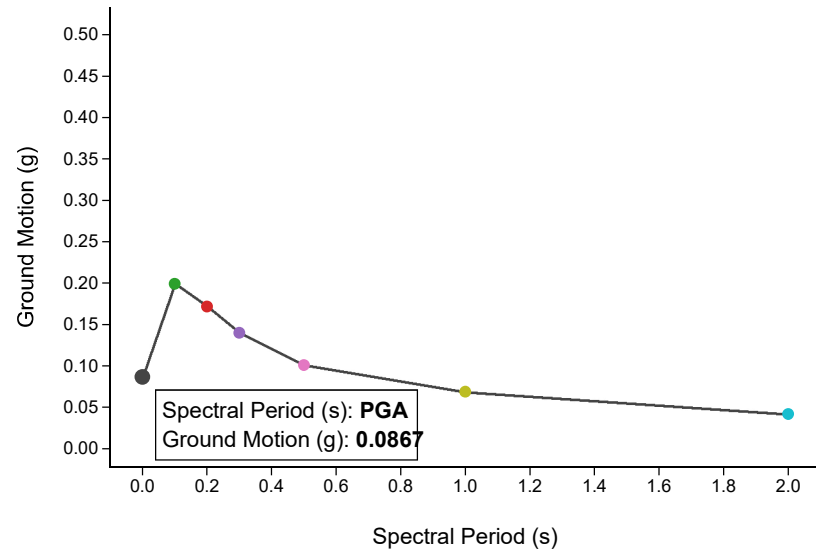
760 m/s (B/C boundary)

^ Hazard Curve

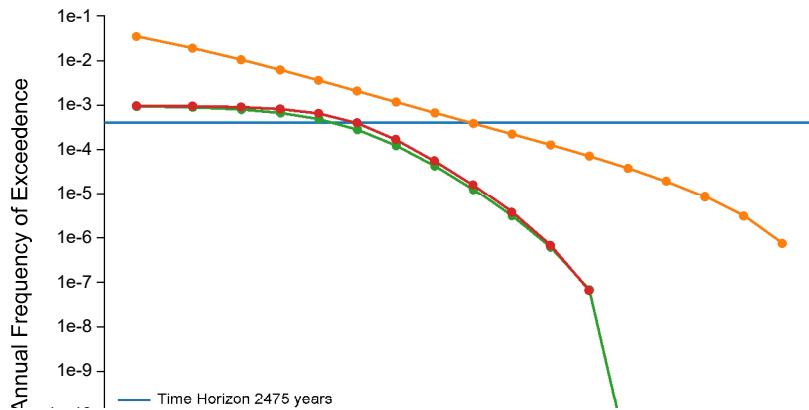
Hazard Curves



Uniform Hazard Response Spectrum



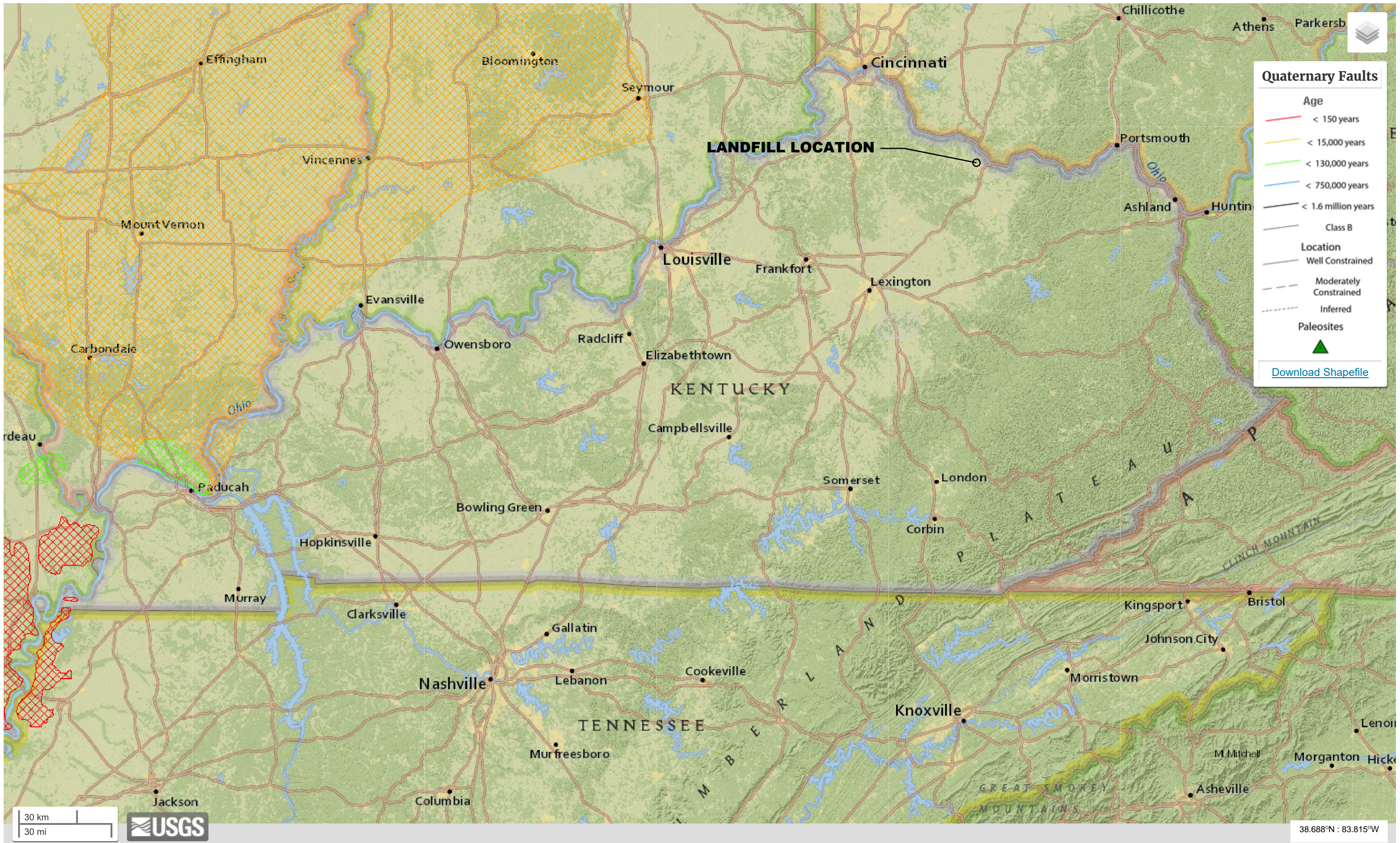
Component Curves for Peak Ground Acceleration



ATTACHMENT 4

USGS FAULT AND KGS KARST POTENTIAL MAPPING

FAULTS MAPPING (HOLOCINE TIME)



Leaflet | Content may not reflect National Geographic's current map policy. Sources: National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.



Kentucky Geologic Map Information Service

Tools Query Legend Layers Geologic Info

Print Legend (opens in a new window)

Karst Potential Units

- very high
- high
- medium
- low
- non-karst

Symbols

map symbols
Symbols are updated as layers are turned on/off and as they become visible by zooming in/out.

KGS LiDAR-derived Sinkholes

LiDAR Sinkholes



KGS Sinkholes

Kentucky Sinkhole Outlines



KGS Geology

24K Geologic Faults

- fault - concealed
- fault
- fault - inferred
- fault - scarp
- fault - secondary

24K Geologic Contacts

- geologic contact
- contact - concealed
- contact - secondary
- contact - arbitrary
- stratigraphic datum shift
- unconformity

