

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF KENTUCKY UTILITIES)	
COMPANY FOR A CERTIFICATE OF PUBLIC)	CASE NO. 2017-00483
CONVENIENCE AND NECESSITY AND)	
APPROVAL OF AMENDMENT TO ITS 2016)	
COMPLIANCE PLAN FOR RECOVERY BY)	
ENVIRONMENTAL SURCHARGE)	

RESPONSE OF
KENTUCKY UTILITIES COMPANY
TO COMMISSION STAFF'S REQUEST FOR INFORMATION
AT INFORMAL CONFERENCE ON MAY 18, 2018

FILED: June 5, 2018

VERIFICATION

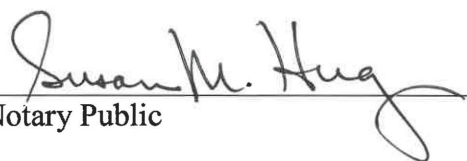
COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF JEFFERSON)

The undersigned, **Gary H. Revlett**, being duly sworn, deposes and says that he is Director – Environmental Affairs for LG&E and KU Services Company, and that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge and belief.



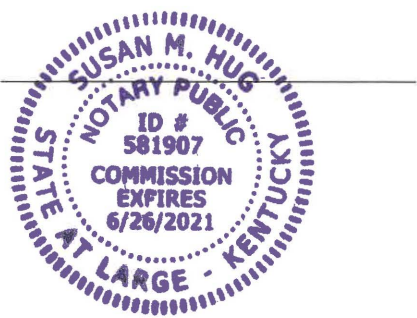
Gary H. Revlett

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 4th day of June 2018.



Notary Public (SEAL)

My Commission Expires:



KENTUCKY UTILITIES COMPANY

**Response to Commission Staffs Request for Information
at Informal Conference on May 18, 2018**

Case No. 2017-00483

Question No. 1

Witness: Gary H. Revlett, Director, Environmental Affairs

- Q-1. Please submit the Main Ash Pond Closure Plan referenced in the Division of Waste Management permit contained in Application Exhibit 3 and discussed in the testimony of Mr. Revlett.

- A-1. Please see attached.

Main Ash Pond Closure Plan E.W. Brown Generating Station Mercer County, Kentucky

Prepared For:



LG&E and KU Services Company
815 Dix Dam Road
Harrodsburg, KY 40330

Prepared By:

AMEC
11003 Bluegrass Parkway, Suite 690
Louisville, KY 40299

Project No. 3143-10-1364

April 25, 2014



Main Ash Pond Closure Plan E.W. Brown Generating Station Mercer County, Kentucky

Prepared For:



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Project No. 3143-10-1364

April 25, 2014





April 25, 2014

Mr. Ron Gruzesky
Manager, Solid Waste Branch
Division of Waste Management
Kentucky Dept. for Environmental Protection
200 Fair Oaks Lane, 2nd Floor
Frankfort, KY 40601

**Subject: Main Ash Pond Closure Plan
E.W. Brown Generating Station
Burgin, Mercer County, Kentucky
AI # 3148, Activity ID No. APE20110003
AMEC Project No. 3143-10-1364**

Dear Mr. Gruzesky:

On behalf of LG&E and KU Services Company (LG&E-KU), AMEC Environment & Infrastructure, Inc. (AMEC) has prepared this Closure Plan to respond to the Request for Clarification from the Kentucky Division of Waste Management's (DWM), contained in a letter to Mr. W. Paul Puckett of LG&E-KU dated March 19, 2014.

In August 2011, LG&E-KU submitted an Application for Special Waste Landfill Permit (APE20110003) to construct a landfill for coal combustion residuals (CCR) on top of the existing CCR impoundment referred to as the Main Ash Pond. The new landfill, besides providing long-term disposal for new CCR generated at the E.W. Brown Generating Station, will isolate and cut off infiltration into existing CCR in the Main Ash Pond. Therefore, construction of the new landfill will also serve as closure for the Main Ash Pond.

Most of the information necessary to support closure of the Main Ash Pond has previously been submitted as part of the Landfill Application (APE20110003). This Closure Plan provides additional clarification on how the areas of the Main Ash Pond outside the footprint of the new landfill will be handled to insure appropriate closure. Implementation of the various elements of this Closure Plan, including construction of the landfill and capping of the adjacent areas of the Main Ash Pond, will not interfere with planned corrective action for groundwater.

If you have any questions regarding this submittal, please do not hesitate to contact Jeffrey Heun of LG&E-KU at (502) 627-4525 or Paul Puckett of LG&E-KU at (502) 627-4659.

Sincerely,
AMEC Environment & Infrastructure, Inc.

A blue ink signature of M. Brian Cole, P.E., consisting of stylized, overlapping loops and lines.

M. Brian Cole, P.E.
Senior Engineer

A blue ink signature of Nicholas G. Schmitt, P.E., featuring a series of fluid, interconnected loops and curves.

Nicholas G. Schmitt, P.E.
Senior Principal Engineer

Correspondence:
AMEC Environment & Infrastructure, Inc.
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Louisville, Kentucky 40299
Tel (502) 267-0700
Fax (502) 267-5900

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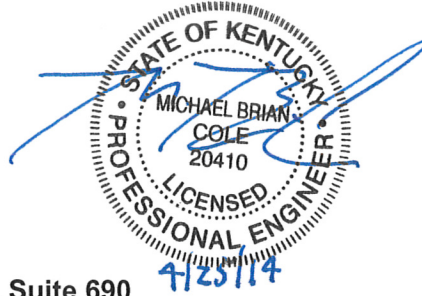
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CLOSURE PLAN PREPARATION INFORMATION

1. Engineer M. Brian Cole, P.E.



Kentucky Registration No. 20410

Address 11003 Bluegrass Parkway, Suite 690

City Louisville State Kentucky Zip Code 40299

Company Name AMEC Environment & Infrastructure, Inc.

Phone No. (502) 267-0700

2. Geologist or Geotechnical Engineer Nicholas G. Schmitt, P.E.



Address 11003 Bluegrass Parkway, Suite 690

City Louisville State Kentucky Zip Code 40299

Company Name AMEC Environment & Infrastructure, Inc.

Phone No. (502) 267-0700

CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitted false information, including the possibility of fine or imprisonment for such violations."

Jeffrey S. Fraley
Original Signature of Responsible Official

4/24/14
Date

Jeffrey S. Fraley
Typed Name of Responsible Official

General Manager – E.W. Brown
Title

[Signature]
Notary State of Large Ky
Notary ID# 436137
My commission expires March -11-2015

NARRATIVE

Background

In August 2011, LG&E and KU Services Company (LG&E-KU) submitted to the Kentucky Division of Waste Management (DWM) an application to construct a Special Waste Landfill for coal combustion residuals (CCR) at the E.W. Brown Generating Station in Mercer County, Kentucky (Agency Interest No. 3148, Activity ID No. APE20110003). The landfill is proposed to be constructed on top of a former CCR impoundment referred to as the Main Ash Pond. Operation of the Main Ash Pond as an impoundment ceased in late 2008. Since that time, CCR has been managed in a separate impoundment referred to as the Auxiliary Pond.

On November 5, 2013, the DWM issued a Draft Permit identifying three separate activities:

- ACTV 002 – Special Waste Landfill (new proposed landfill, 105.30 acres) – Construction
- ACTV 004 – CCR Impoundment (Main Ash Pond, 114.10 acres) – Permit-by-Rule
- ACTV 005 – CCR Impoundment (Auxiliary Pond, 29.90 acres) – Permit-by-Rule

On March 19, 2014, the DWM issued a letter to LG&E-KU requesting clarification of several items related to the landfill application. Item No. 1 of the letter requested that LG&E-KU provide a Closure Plan for the Main Ash Pond. This Closure Plan has been prepared in response to that request. Most of the information necessary to support closure of the Main Ash Pond has previously been submitted as part of the Landfill Application (APE20110003). This Closure Plan provides additional clarification on how the areas of the Main Ash Pond outside the footprint of the new landfill will be handled to insure appropriate closure, and how closure of the Main Ash Pond will be integrated into construction of the new (proposed) landfill.

This Closure Plan addresses the CCR Impoundment referred to as the Main Ash Pond (ACTV 004), and draws on information associated with the new (proposed) landfill (ACTV 002). The CCR Pond referred to as the Auxiliary Pond (ACTV 005) is not addressed in this Closure Plan.

Physical Setting and Water Quality

The Main Ash Pond was operated from the late 1950s to late 2008, as an impoundment for sluiced products of coal combustion. In late 2008, the sluicing operation was transferred to the Auxiliary Ash Pond, located south of the Main Ash Pond.

The Main Ash Pond has a surface area of 114.1 acres and contains on the order of 6 million cubic yards (CY) of CCR, including bottom ash, fly ash, coal fines and pyrites. The proposed special waste landfill will be located directly over the Main Ash Pond, and extend slightly beyond it to the south and west.

The physical setting of the Main Ash Pond, including the site location, topography, surrounding land use, final site use, climatic conditions, geology, soil and subsurface hydrology have been studied and described in the landfill application. Potential water quality impacts on groundwater from the CCR in the Main Ash Pond have been evaluated in a Groundwater Assessment program previously requested by the DWM. A Groundwater Assessment Report (GWAR) was submitted to DWM in September 2013. After the GWAR is approved by the DWM, a Corrective Action Plan (CAP) will be prepared to address water quality impacts, including the mobility and expected rates of migration of the waste or leachate constituents, and will be provided to the DWM as a separate submittal. The closure elements described in this plan will not interfere with groundwater corrective action. In fact, covering of the CCR (through construction of the landfill and the associated elements described herein) represents an important component of the planned corrective action, since it will serve to minimize infiltration and water flow through the CCR in the Main Ash Pond.

During the landfill application process, correspondence from the appropriate agencies was obtained to demonstrate that the proposed landfill would not have an adverse impact on various resources. Those determinations therefore also apply to the Main Ash Pond Closure Plan. In addition, various geotechnical analyses were conducted to evaluate the CCR in the Main Ash Pond as a foundation for the proposed landfill. These analyses also apply to the Main Ash Pond Closure Plan.

Pond and Landfill Areas

The approximate limits of the existing ash (CCR) in the Main Ash Pond are shown in Figure 1, and represent an area of 114.1 acres. As shown in Figure 1, the new landfill will extend slightly beyond the limits of the existing CCR to the south and west. To the east of the landfill, the existing ash will be covered by two storm water ponds, a leachate storage pond, and a materials handling area referred to as the CCR Treatment (CCRT) Area. Therefore, all of the Main Ash Pond (and some areas beyond the limits of the existing Main Ash Pond), will be covered by the components of the landfill and the CCRT Area. The area of overlap between the new landfill and the existing Main Ash Pond will be 98.9 acres, and the landfill will extend 6.4 acres beyond the Main Ash Pond, for a total of 105.3 acres associated with the new landfill.

A breakdown by area of the various components that will constitute the closure of the Main Ash Pond, as depicted in Figure 1, can be found in the table below:

Description	Area (acres)
Landfill Phase 1 (not including area beyond ash)	39.4
Landfill Phase 2 (not including area beyond ash)	33.7
Landfill Phase 3 (not including area beyond ash)	25.8
Sediment/Stormwater Pond 1	5.3
Sediment/Stormwater Pond 2	3.1
Leachate Pond	2.4
CCRT Area	4.4

Description	Area (acres)
Total	114.1

Additional information concerning the closure design is provided in the next section.

Main Ash Pond Closure Design

The design for closure of the Main Ash Pond is provided in the attached drawings (Figures 1-4). The primary objective of the closure plan is to cap the existing CCR in a manner that will promote runoff and minimize potential seepage into the pond from precipitation, in order to reduce the potential for future leaching of mineral constituents from the CCR.

The future construction being proposed over the Main Ash Pond will include a 105.3-acre special waste landfill, along with two storm water ponds and a leachate storage pond located along the east side of the landfill and inside the eastern embankment of the Main Ash Pond. Each of these components will be underlain by a liner system including at least one geomembrane layer. The various liner system details can be found in Figure 3. Details for various “edge conditions” around the perimeter and internal boundaries are contained in Figures 2 and 3, including the gaps between ponds, landfill liner, and the CCRT Area. Together, these components will cover 109.7 acres of the Main Ash Pond, and extend over an area of 6.4 acres beyond the limits of the Main Ash Pond on the west and south sides.

The remaining area within the Main Ash Pond consists of approximately 4.4 acres in the northeast corner, referred to as the CCRT Area. This area will be used for materials handling in converting CCR from wet to dry condition for landfilling. This area will be completely capped by “hardscaping” with concrete or asphalt pavement. The internal roadways running between the landfill and the ponds will also be paved, so that all areas of existing CCR in the Main Ash Pond will be capped.

Overall, as depicted in Figure 3, the surface of the Main Ash Pond is relatively flat, and the characteristics of the cover materials will be sufficient in terms of chemical and physical composition, erodibility, slope stability, final surface contours, thickness, porosity, permeability, slope, and length of run of slope to limit infiltration into the existing CCR.

Installation of the cap over the Main Ash Pond will be phased so that it can be integrated into the construction of the new landfill, to avoid damage to the components of the cap after they are installed. Figure 4 depicts the proposed liner subgrade configuration for Phases 1 and 2 of the special waste landfill, as well as the contours of the three ponds being proposed along the east side of the landfill, inside the eastern embankment of the Main Ash Pond. In the Phase 3 landfill area, an interim 12-inch soil cap is proposed to limit infiltration until the CCRT area can be completed and filling of Phase 2 of the landfill is in progress. This interim soil cap will consist of an 8-inch layer of compacted soil and a 4-inch layer of topsoil. The final cap will be placed in the Phase 3 area once that phase of the landfill is ready to be built.

Vegetative cover will not be necessary in Phases 1 and 2, since construction of those phases of the landfill will proceed fairly quickly. To protect the interim soil cap in Phase 3, a 4-inch topsoil layer will be placed and be sown with the seed mix specified in Attachment 45-B of the landfill permit application:

Seed - Common Name	PLS Seeding Rate (lb/acre)
30% Kentucky 31 Tall Fescue	100
20% Creeping Red Fescue	
35% Hard fescue	
10% Ryegrass, Perennial	
5% White Dutch Clover	

Implementation Schedule

The proposed schedule to implement the critical initial elements of this Closure Plan is December 2016. Implementation by December 2016 will include: completion of the Phase 1 cover (landfill geomembrane liner over Phase 1); completion of the three lined ponds east of the landfill area; starting construction of the Phase 2 cover (landfill geomembrane liner over Phase 2); placement of the 12-inch interim soil cap over the Phase 3 area; hardscaping of the CCRT Area; and paving of the internal roadways between the landfill and the ponds.

Post-Closure Care

Post-closure care of the Main Ash Pond will be integrated into post-closure care of the new landfill. A post-closure plan (including a monitoring and maintenance schedule, as well as a post-closure cost estimate) is included in the landfill application (Attachment 48).

A deed notice will be filed with the deed at the County Clerk's office. The deed notice shall in perpetuity notify any potential purchaser of the property of the location and time of the operation of the facility, the nature of the waste placed in the site and a caution against future disturbance of the area. This notice shall be recorded in accordance with KRS Chapter 382 and proof of recording shall be submitted to the cabinet prior to acceptance of certification of closure of the facility.

Closure and Post-Closure Cost Estimates

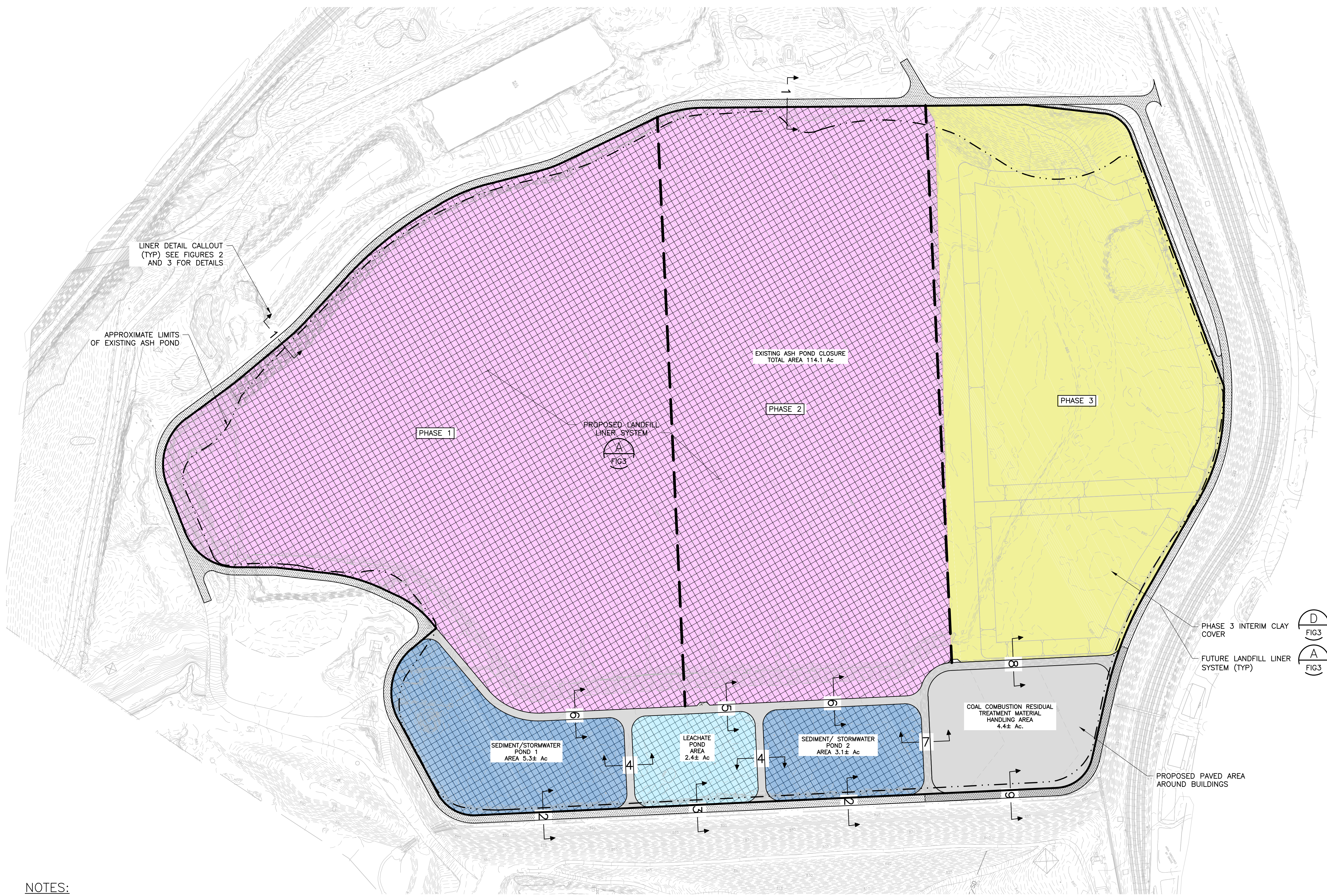
The closure of the Main Ash Pond, as well as post-closure care, will be integrated with construction, operation, and post-closure care of the new landfill. The Landfill Application (APE20110003) includes cost estimates for landfill closure (\$9,512,874) and post-closure care (\$790,326 over a 5-year period). For the Main Ash Pond, the closure and post-closure costs will be covered to a large extent by the construction and operating budget for the new landfill.

An additional cost associated with closure of the Main Ash Pond, that is not already covered by the budget for the new landfill, is associated with the areas requiring low-permeability cover that are not addressed in the landfill design, i.e. the CCRT Area in the northwest corner of the Main

Ash Pond, and the internal roads that run between the various areas. By the end of 2016, those areas will be completely surfaced with concrete or asphalt pavement, designed based on the maximum anticipated equipment loads. For closure cost estimating purposes, it can be assumed that the remaining unlined areas will be completely surfaced with concrete or asphalt pavement. Utilizing unit prices for similar paving projects at other power plants in Kentucky (i.e., pavement sections designed for off-road trucks), the cost can be estimated as: 300,000 SF x \$ 10/SF = \$ 3 million.

Financial assurance for this additional amount will be provided at the time that the Closure Plan for the Main Ash Pond is approved, or when the Operating Permit for the new landfill is issued, whichever occurs first.

FIGURES



LINER DETAIL CALLOUT (TYP) SEE FIGURES 2 AND 3 FOR DETAILS

APPROXIMATE LIMITS OF EXISTING ASH POND

EXISTING ASH POND CLOSURE
 TOTAL AREA 114.1 Ac

PHASE 1

PHASE 2

PHASE 3

PROPOSED LANDFILL LINER SYSTEM
 FIG 3

PHASE 3 INTERIM CLAY COVER
 FIG 3

FUTURE LANDFILL LINER SYSTEM (TYP)
 FIG 3

SEDIMENT/STORMWATER POND 1
 AREA 5.3± Ac

LEACHATE POND AREA
 2.4± Ac

SEDIMENT/STORMWATER POND 2
 AREA 3.1± Ac

COAL COMBUSTION RESIDUAL TREATMENT MATERIAL HANDLING AREA
 4.4± Ac

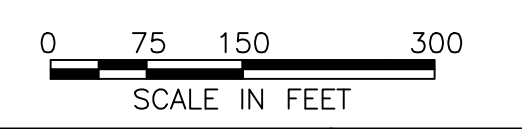
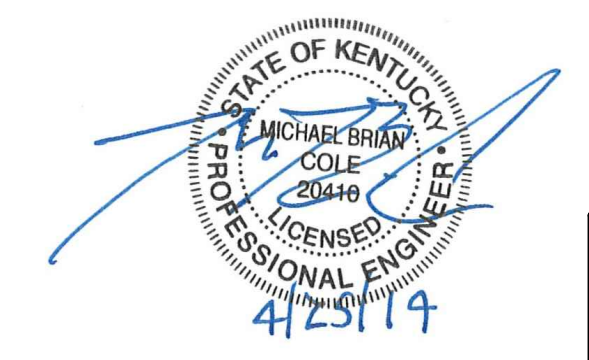
PROPOSED PAVED AREA AROUND BUILDINGS

LEGEND

- PHASE 1 AND 2 EXISTING CLAY CAP IN PLACE
- INTERIM CLAY COVER (PHASE 3)
- SEDIMENTATION/STORM WATER POND LINER SYSTEM
- LEACHATE POND LINER SYSTEM
- PAVED AREAS
- LIMITS OF PROPOSED LANDFILL LINER SYSTEM
- PERIMETER/ACCESS ROAD
- LIMITS OF EXISTING MAIN ASH POND
- LANDFILL PERMIT AREA LIMITS

NOTES:

1. EXISTING SITE CONDITIONS ARE BASED ON THE 2011 AERIAL TOPOGRAPHY AND SUBSEQUENT SURVEYS.
2. PORTIONS OF THE ACCESS ROADS WITHIN THE MAIN POND FOOTPRINT WILL BE PAVED AS SHOWN.



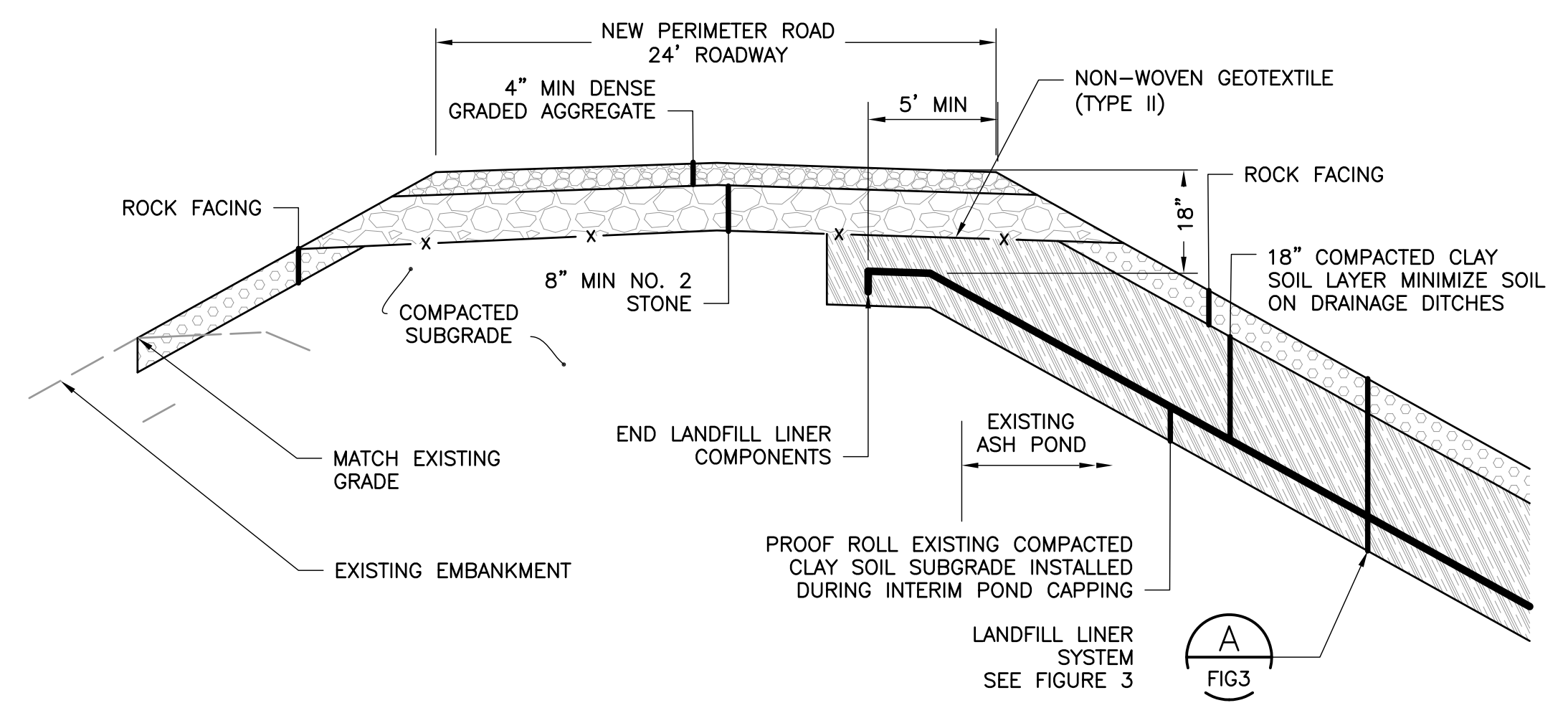
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 Checked/Date: MAP 04/15/2014

Kentucky Utilities Company
 EW Brown Generating Station

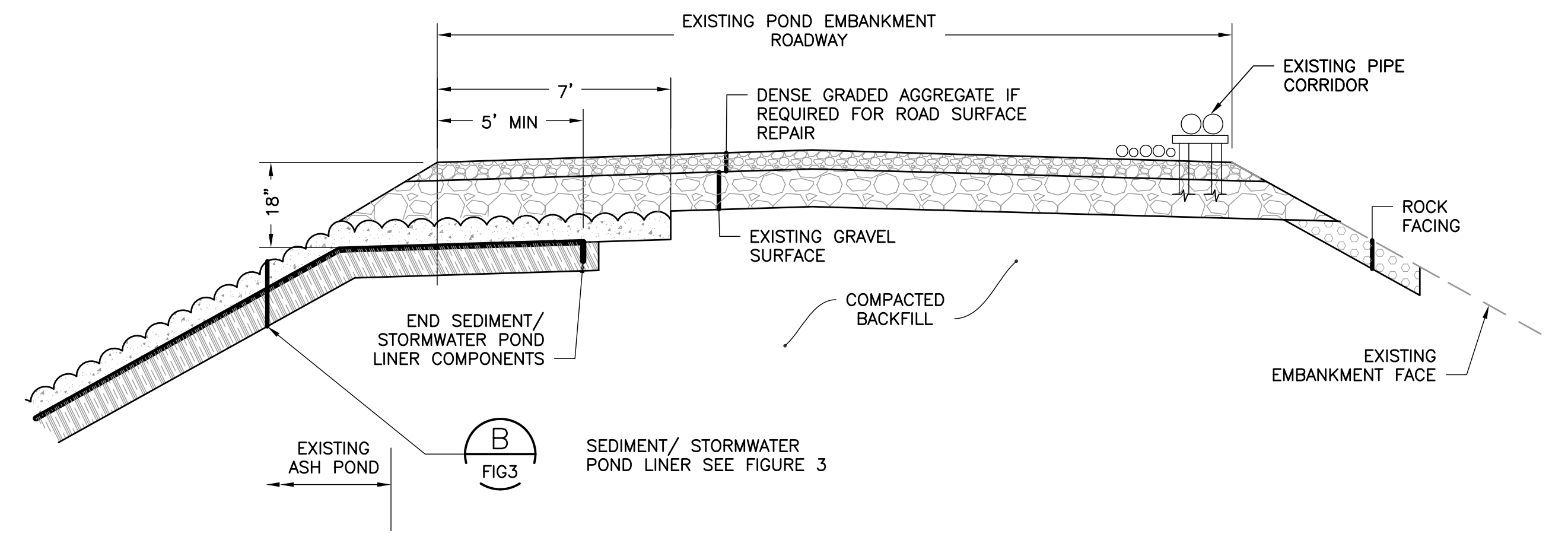


CLOSURE PLAN
 AND LINER DETAILS
 Project 3143-10-1364
 Figure 1 of 4

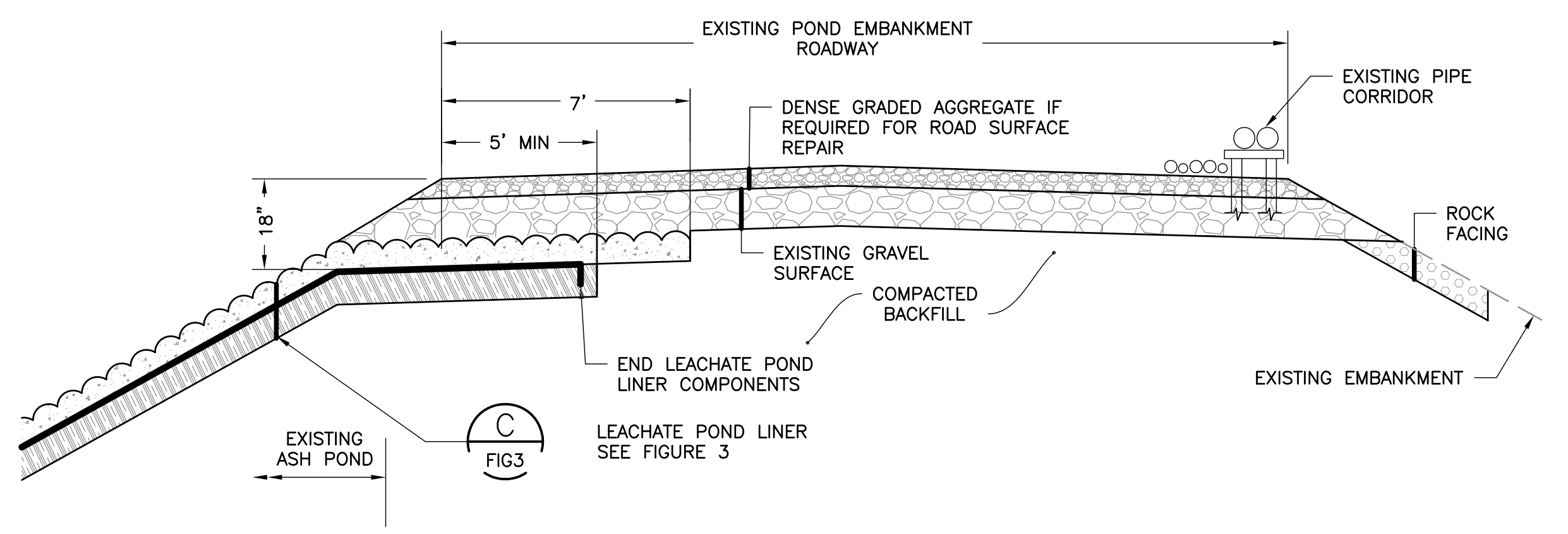
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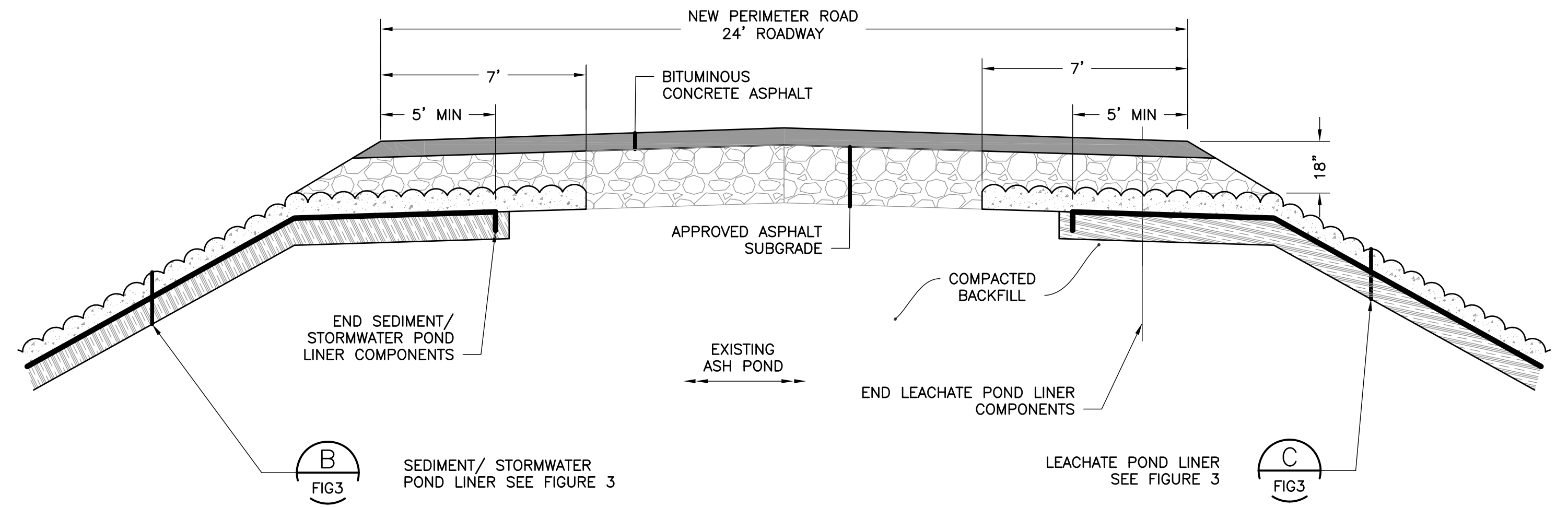
LINER EDGE CONDITION 1
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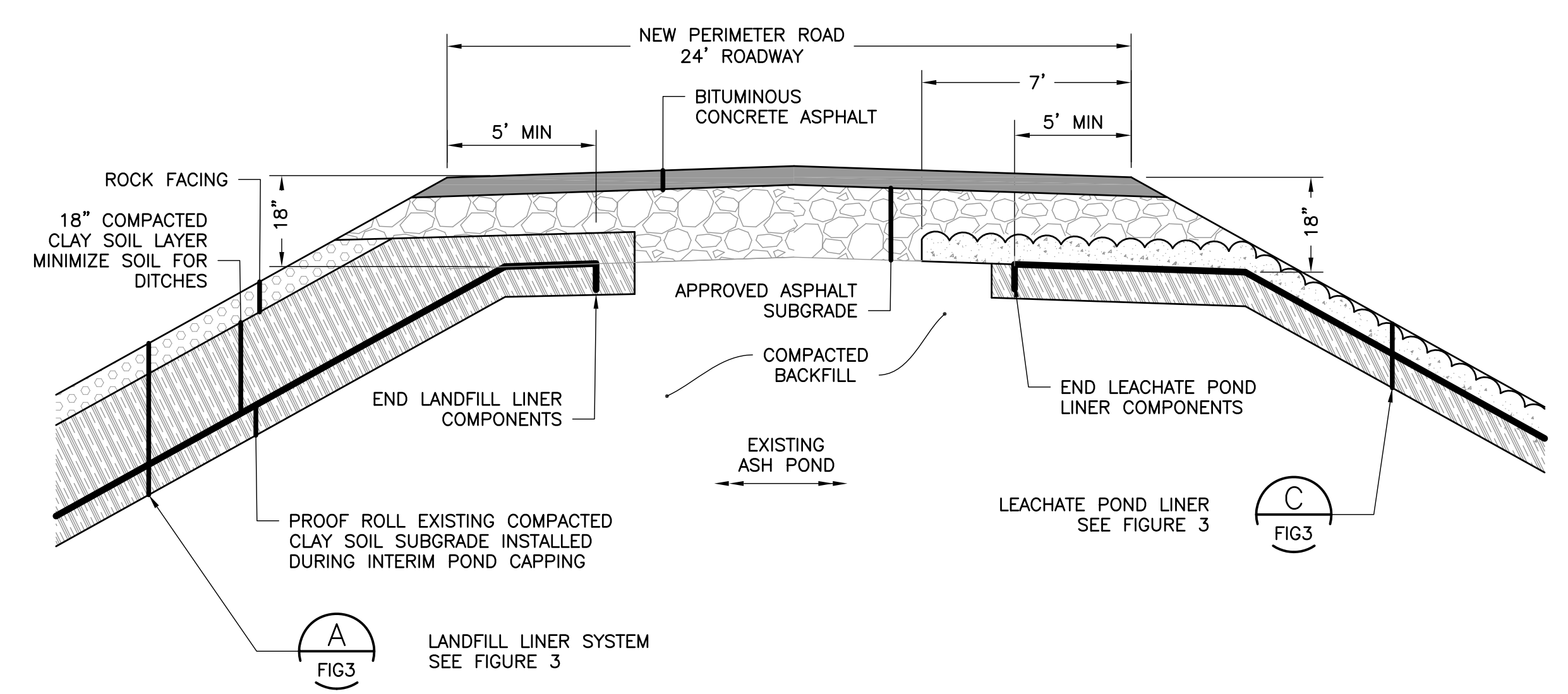
LINER EDGE CONDITION 2
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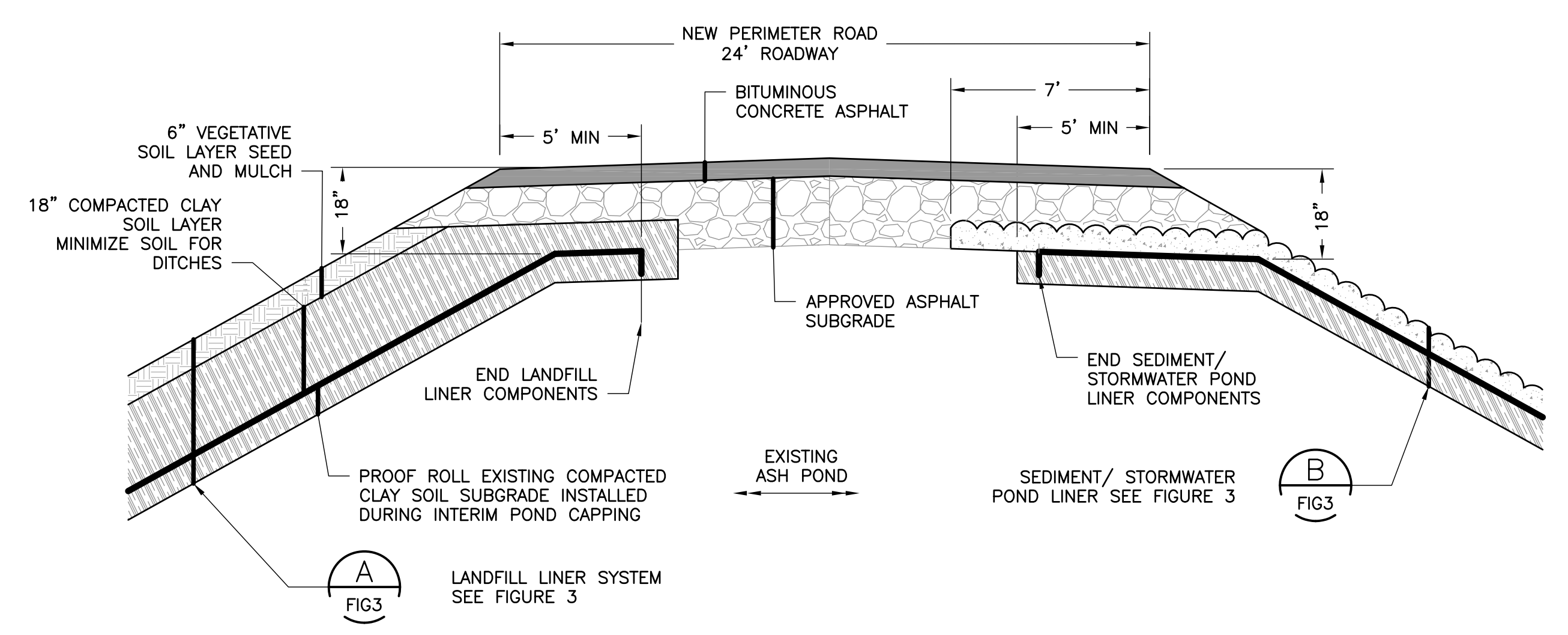
LINER EDGE CONDITION 3
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LINER EDGE CONDITION 4
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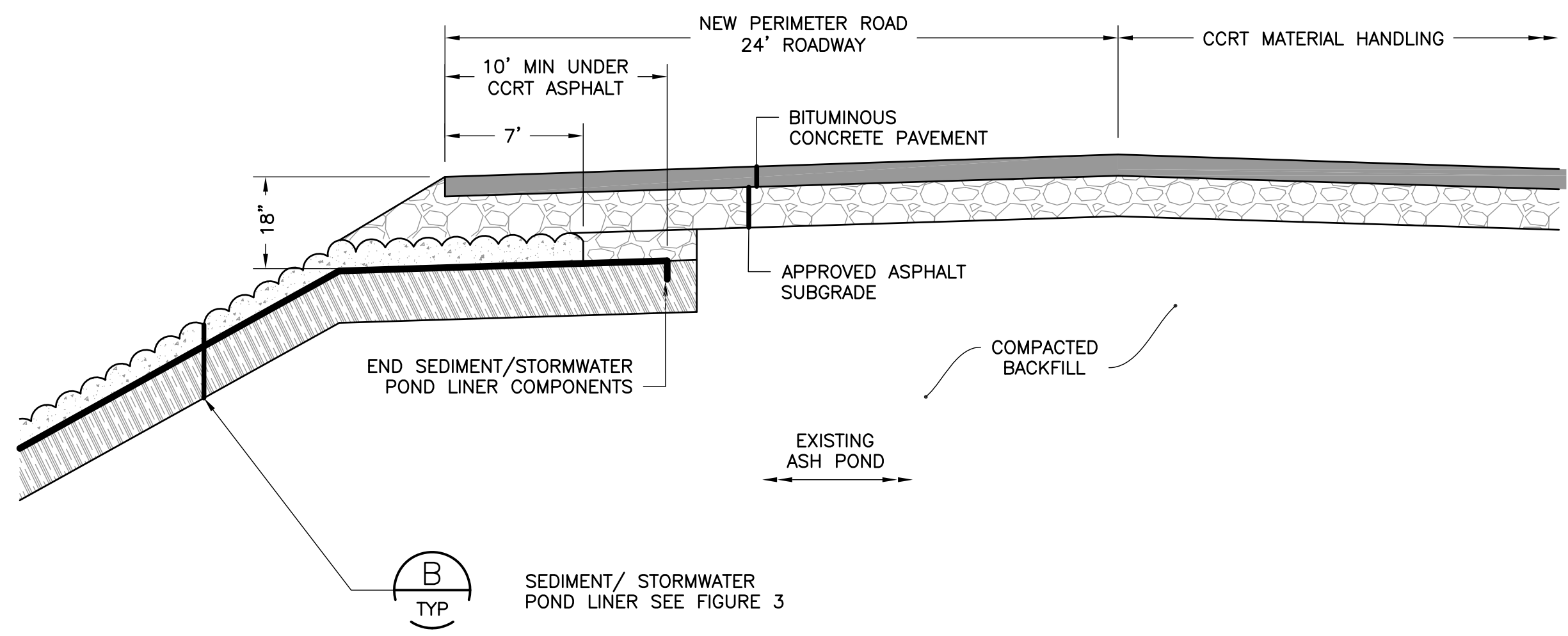
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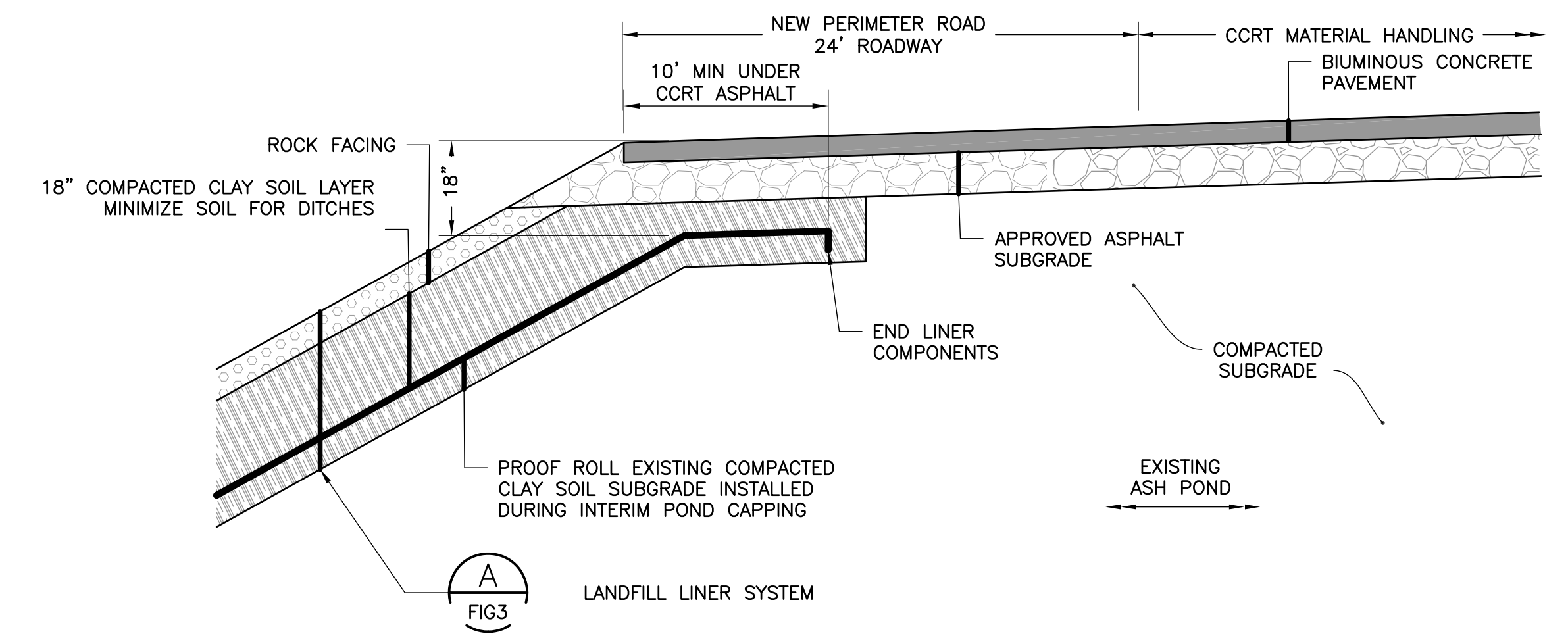
LINER EDGE CONDITION 6
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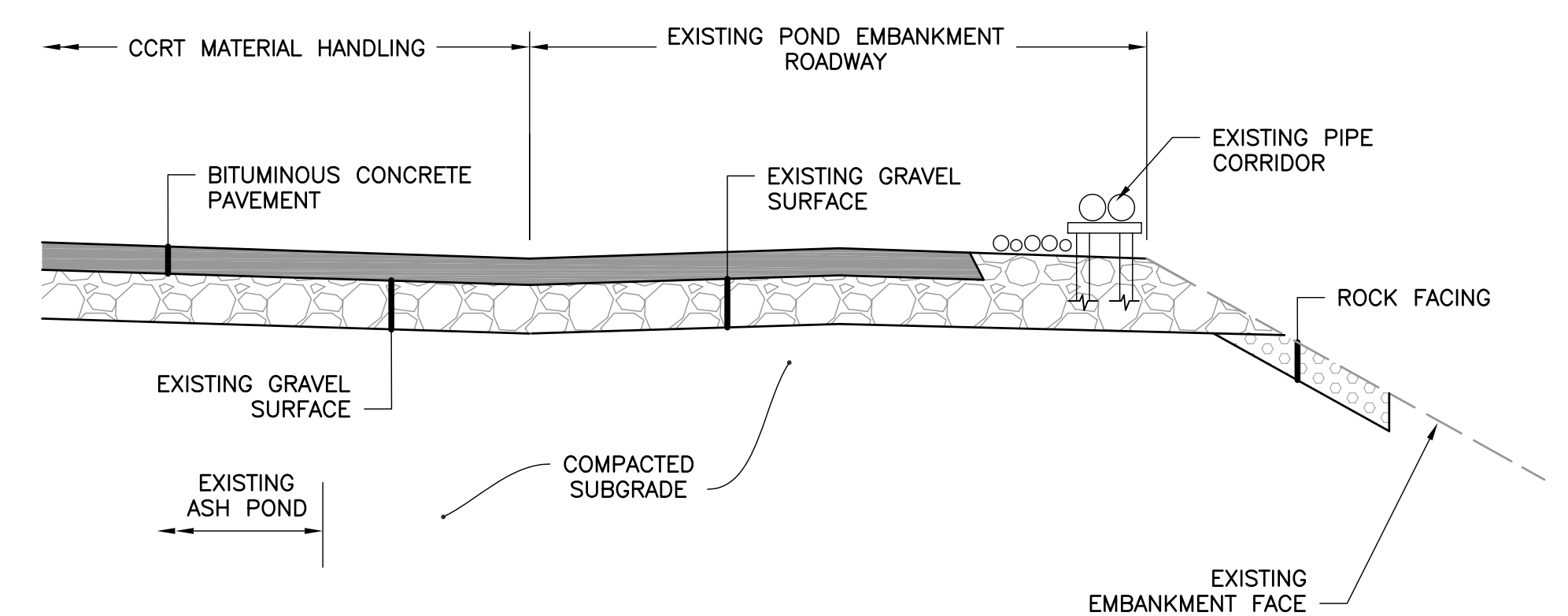
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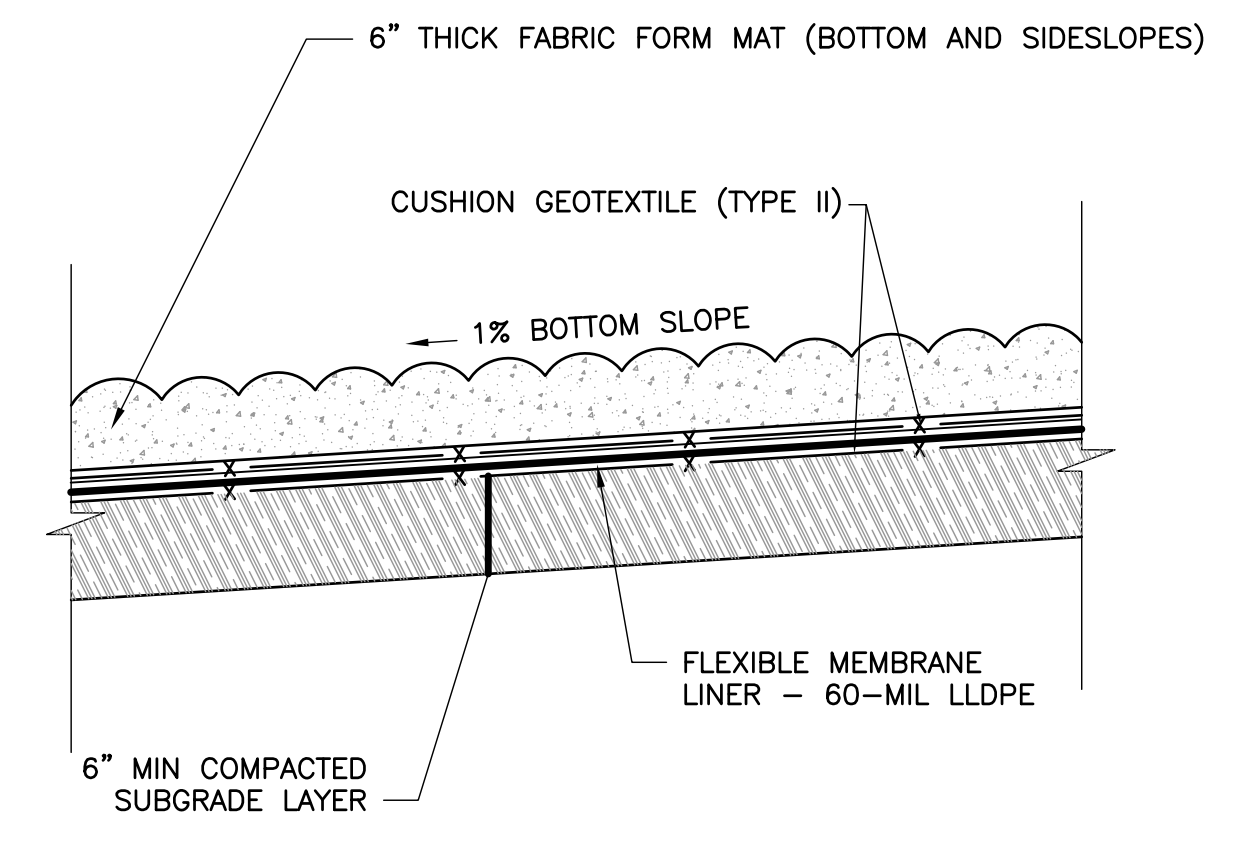
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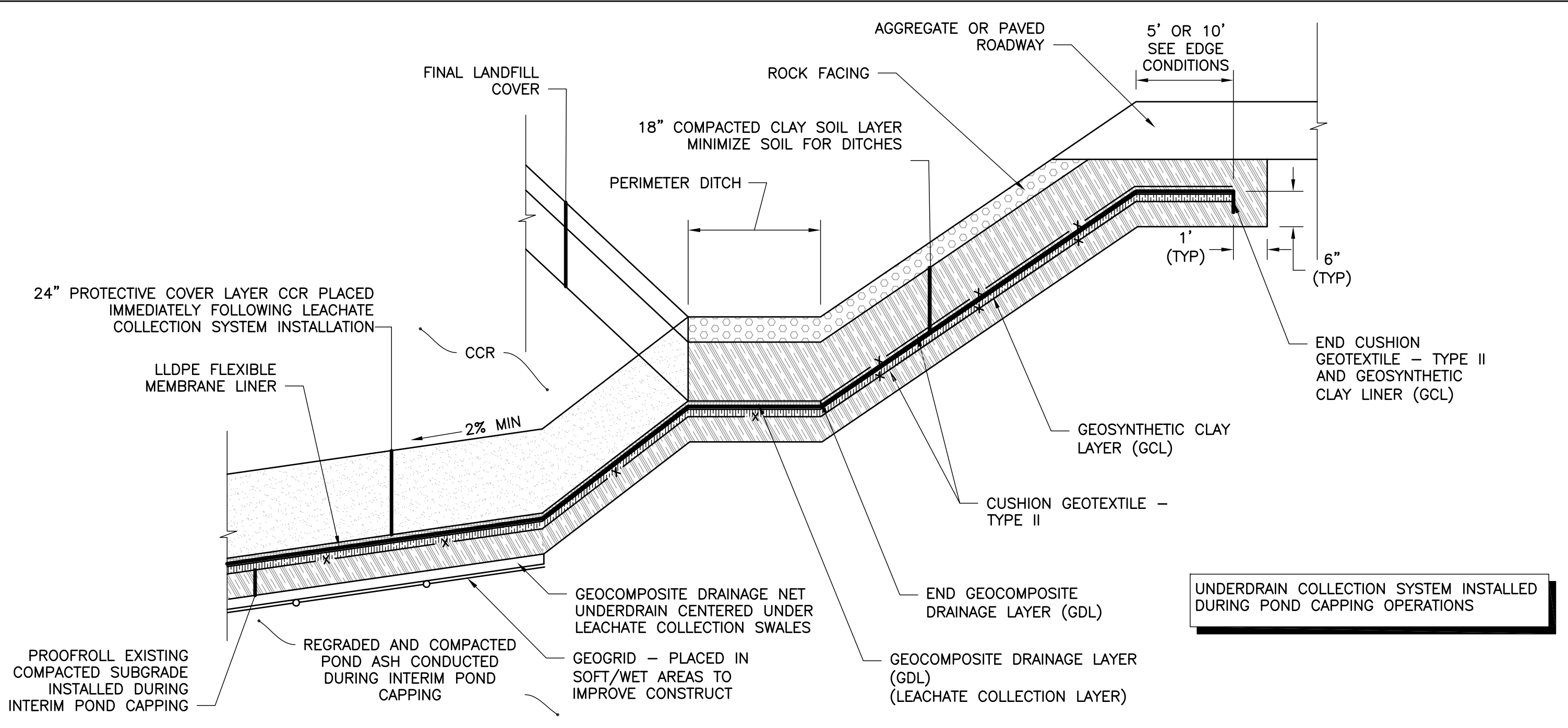
LINER EDGE CONDITION 8
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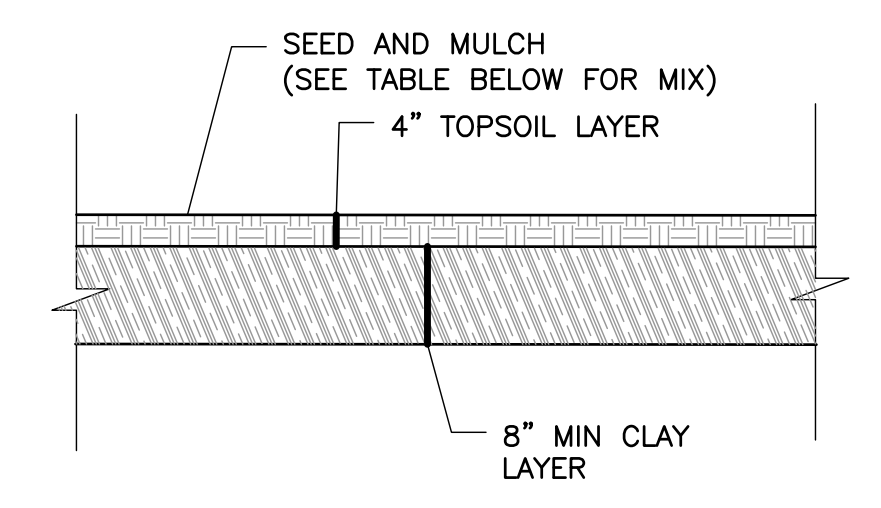
LINER EDGE CONDITION 9
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SEDIMENT/ STORMWATER POND LINER
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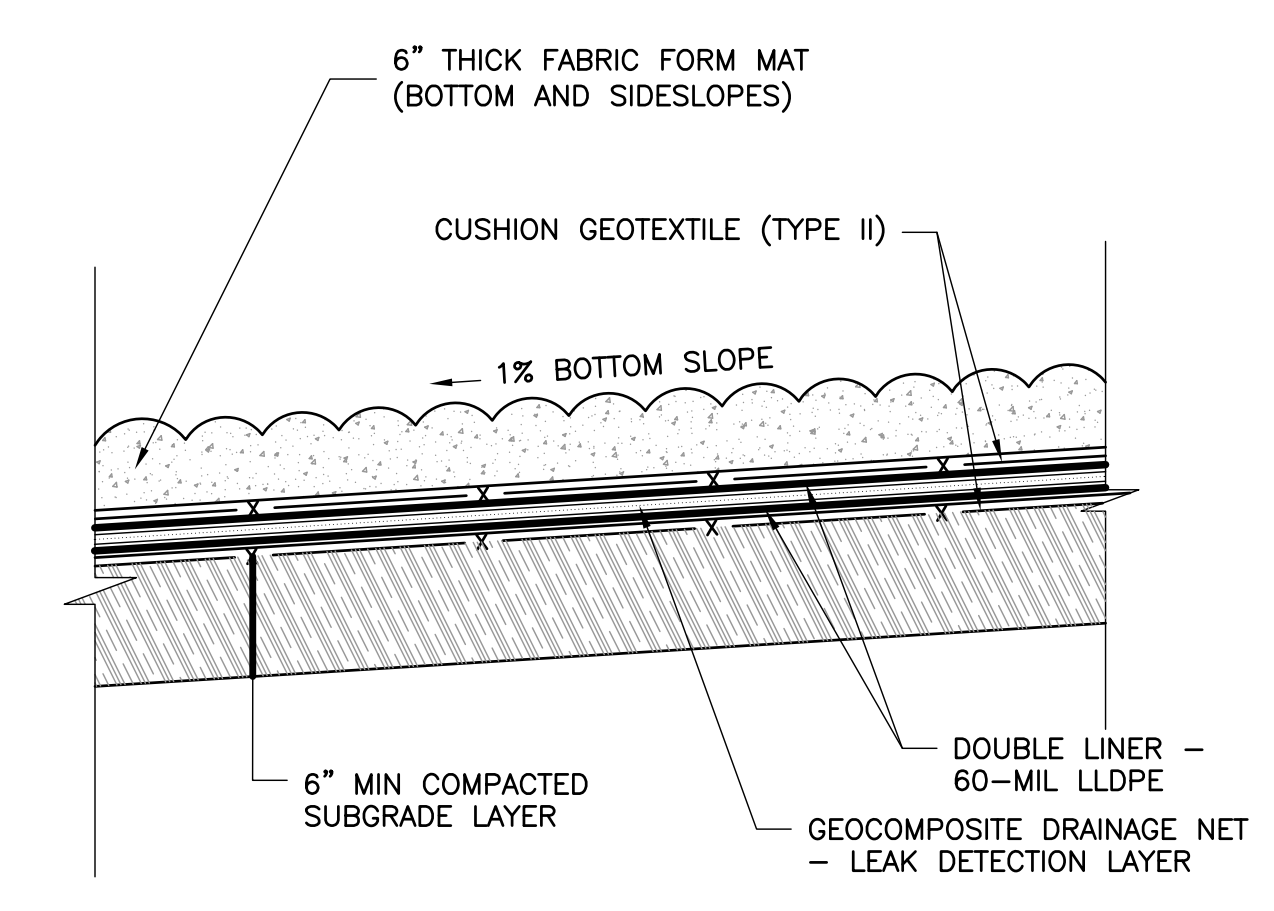


LANDFILL LINER SYSTEM
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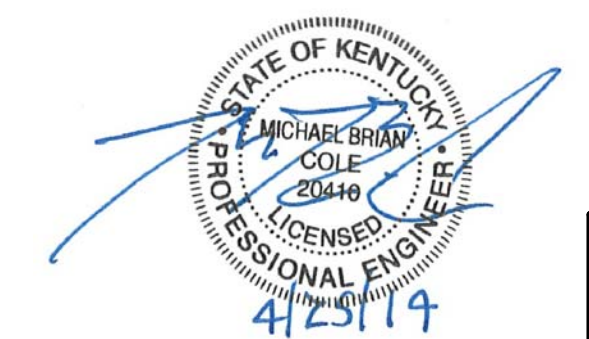


INTERIM CLAY COVER
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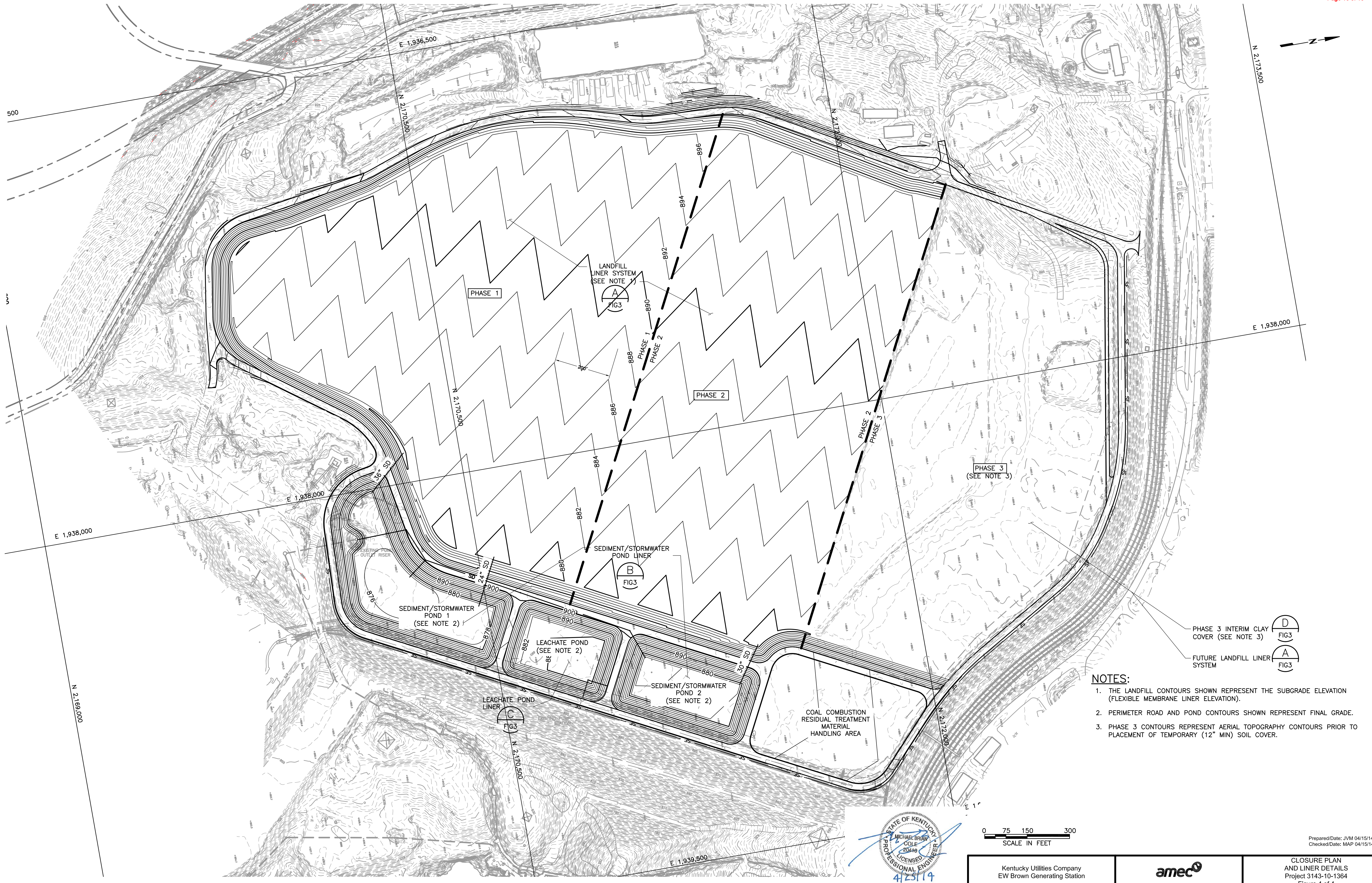
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30% Kentucky 31 Tall Fescue	100
20% Creeping Red Fescue	100
35% Hard Fescue	100
10% Ryegrass, Perennial	100
5% White Dutch Clover	100



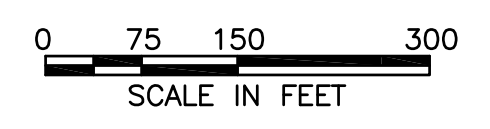
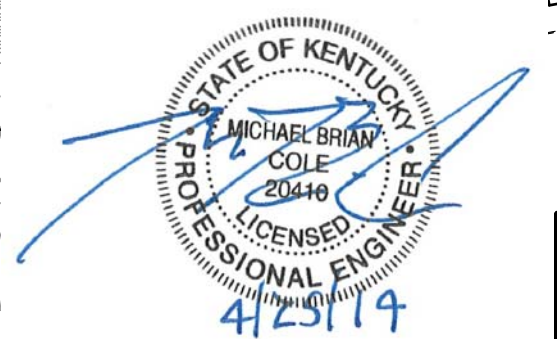
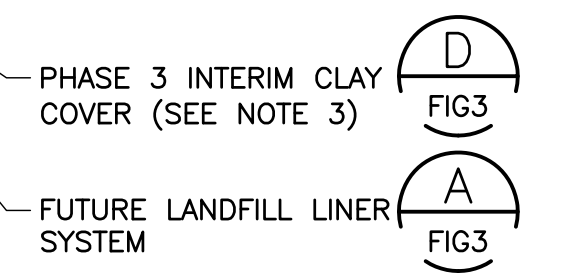
LEACHATE POND LINER
 NTS



Z:\Projects\3143-10-1364_EW Brown\FIG3_Closure Plan and Details_R1.dwg Fr: 25 Apr 2014 - 7:48am noger/figuler



- NOTES:**
1. THE LANDFILL CONTOURS SHOWN REPRESENT THE SUBGRADE ELEVATION (FLEXIBLE MEMBRANE LINER ELEVATION).
 2. PERIMETER ROAD AND POND CONTOURS SHOWN REPRESENT FINAL GRADE.
 3. PHASE 3 CONTOURS REPRESENT AERIAL TOPOGRAPHY CONTOURS PRIOR TO PLACEMENT OF TEMPORARY (12" MIN) SOIL COVER.



Kentucky Utilities Company
 EW Brown Generating Station



CLOSURE PLAN
 AND LINER DETAILS
 Project 3143-10-1364
 Figure 4 of 4

Prepared/Date: JVM 04/15/14
 Checked/Date: MAP 04/15/14

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