



**Lower Colorado River Authority**  
3700 Lake Austin Blvd.  
Austin, TX 78703

Date: 1/31/2025

Curt Campbell  
Westward  
#4 Shooting Club Rd  
Boerne TX 78006  
ccampbell@westwardenv.com

RE: Burnet Quarry  
Application #2024-5606 U0  
Address: 3221 FM 3509, Burnet, TX 78611

Dear Curt Campbell,

We have reviewed the plans for the referenced permit application. The project proposes the use of Quarry Pits to meet the Performance Standards established by LCRA's Highland Lakes Watershed Ordinance. We have the following comments regarding the plans and application:

**Notice of the Application**

*-in accordance with Section 6.0(e) of the Highland Lakes Watershed Ordinance.*

A parcel map and supportive adjacent property owner information (10853-256) documented was submitted to demonstrate the applicant mailed a notice of the permit application to persons who own property located within 500 feet to the site or within 1,000 feet of the project limits.

1. Provide the first-class mailed receipts proving that each adjacent property owner identified on the parcel map was mailed the permit application notice.
2. Please confirm with supportive documentation that a notice of quarry-mine activity was mailed to officials of nearby municipalities, county, and groundwater conservation district.

**Quarry Mine Operator/Owner**

*-in accordance with Section 3.0 of the Highland Lakes Watershed Ordinance.*

The permit application was submitted listing Asphalt Inc, LLC as the owner. The evidence of ownership documentation demonstrates HVPR4 LLC (grantor) selling the subject property to Burnet Ranch Investments, LLC. Burnet County Appraisal District documents the property (ID No. 47495) owned by Burnet Ranch Investments LLC.

3. The permittee is a landowner or quarry mine operator authorized to undertake development or quarry mine activities pursuant to a permit granted. Please provide legal supportive documentation demonstrating an authorized agent of Burnet Ranch Investments LLC has allowed an authorized agent of Asphalt Inc LLC to be the permittee.

## **Cost Estimates for Erosion/Sediment Control Fiscal Security**

4. Review the following items in the engineer's cost estimate for erosion and sediment controls document:
  - Compare the cost per unit prices to the LCRA Cost Estimate for ESC Fiscal Security bulletin. Please update the prices accordingly or provide counter cost estimates from local contractors or recent bids to propose a price that is less than what is listed.
5. Add a quantity and pricing for a concrete washout to account for the wheel wash area.
6. Add a quantity and pricing for the diversion/interception/perimeter berms item to account for the proposed berm areas.
7. Add a quantity and pricing for rock berms, check dams, and high service rock berms. Refer to the markups on sheet C.2 for more information.
8. All proposed work, including the final conditions need to be included within the limits of construction. The total acreage within the limits of construction needs to be the amount of seeding proposed (Seed mixture+ Hydromulching= Acreage within limits of construction).

## **Hydrologic Report**

*-in accordance with Section 5.2(b)(iv)(1)(a) of the Highland Lakes Watershed Ordinance.*

### **1.2 Site Description, Post Development Conditions**

9. Revise the section to describe any offsite areas draining to the project site or if those areas will be redirected around the site. Also, see comment below regarding offsite drainage.

The eastern property boundary has multiple drainage lows conveying offsite drainage through the property. The final conditions show berm breaks allowing offsite drainage to enter the main pit. If the drainage is not diverted from the quarry pit and the intent is to impound the offsite drainage, coordination with TCEQ and LCRA may be needed for the proposed impoundment.

10. Revise the section to describe the drainage features located onsite that drain into Peters Creek and reference the soil resource report included in this section.
11. Revise the section to include a detailed description of the 40-acre processing plant area including information about the rock crusher (stationary or portable), storage of chemicals used in washing of the aggregates, proposed water well (protection measures), process water storage area, reuse of water (e.g. closed-loop design), and include a description of best management practices designed to control runoff directly impacting this area or if all of it is diverted to on pit.
12. Provide a plan sheet to illustrate the processing plant area details. Include what is described above.
13. Provide a plan sheet to illustrate the schematic of the office area, parking, scale house and proposed onsite sewage facilities (illustrate setbacks).
14. State what the proposed depth for the quarry pit will be.
15. Revise section to clarify the proposed Garman Pits (corrected to Gorman Pit) to include purpose of the pits (e.g. initial quarrying area), approximate mining depth, proposed future use of the area, if applicable.
16. Will the Gorman Pits have a liner installed underneath?
17. It is stated that two Gorman pits are proposed but the initial conditions plan sheet (C.2 of C.4) shows 3 pits with a total acreage of 6.99 acres.

18. Add to the following statement: *In an effort to be extremely conservative the site has been evaluated assuming that impervious surface may be placed anywhere onsite. This is a very conservative approach since there is no intent to develop the entire site as impervious surface.* Include language that other improvements that are not illustrated on the Final Conditions plan sheet will be submitted to LCRA for permit revision and approval.
19. In accordance with Section 5.2(b)(ii) of the Highland Lakes Watershed Ordinance a quarry pit can be used as a permanent BMP if it is sufficiently sized to contain the runoff of a 10-year (24-hr) storm without discharging during a rain event. At least five of the “pit BMPs” (pits 2B, 2A, 1, 3B & 3A) described in this report are in areas not proposed for quarrying activity. Please clarify the pit BMPs are designed for a 10-year (24-hour) storm event without any discharge. Additional information requested below.
20. “Appendix I- Stormwater Runoff Calculations” was not provided in this submittal.

#### XX Erosion Sedimentation Control

21. Add a section that briefly describes the erosion and sedimentation controls in place during the initial phases of the quarry project. The information should align with plan sheet C.1 and C.2, include details about sedimentation ponds in drainage areas DA-1 and DA-2.
22. Describe a timeline when the initial phase will move into a more operational phase and how the BMPs will be updated. Refer to the language included in plan sheet notes. Also, describe the erosion control phasing for the various quarrying phases.
23. Describe measures proposed to manage erosion and sedimentation during the operational stages of the quarry project. For example, use of water trucks, wheel wash, berms to direct runoff, etc.

#### XX Onsite Features

24. Reference the wells described in the Hydrogeologic Report and state if the two wells (S-1 & S-3) will be maintained or closed.
25. Reference the man-made stock ponds described in the Hydrogeologic Report and state if the stock ponds (S-2, S-4, & S-5) will be maintained onsite or mined through.

#### 2 Buffer Zones

26. Please revise section to include any details how the buffer zone will be protected from any heavy equipment, disturbances, and how access to the buffer zone will be prevented.
27. The buffer zone was not delineated correctly on the Quarry and Mine plan sheets based on the field visit. The buffer zone boundary is currently shown 50’ from the creek centerline, not 75’. Please revise.

#### 3 Roadway Treatment

28. Revise section to describe how the natural vegetative filter strip (NVFS) will be protected from vehicles. Revise to account for emergency shoulders, as needed, but please illustrate in the plan sheets.
29. Describe how the NVFS was sized for the haul road and what type of NVFS is proposed.
30. Describe if any roads will be proposed around the perimeter of the project site and what treatment will be proposed.
31. Describe and illustrate access roads to stormwater pits for maintenance purposes.
32. Describe and illustrate any access roads between the property line and the earthen berms.

#### 4 Proposed Stormwater Earthen Berms

33. Revise section to include language about perimeter buffer.
34. Proof needs to be provided that the diversion berms and swales are sized for the 10-year, 24-hour storm event based on the criteria stated in section 2.2.3 sheet 270 within the HLWO technical manual.
35. Swales are mentioned as a stormwater conveyance feature for the site. Revise the quarry plan sheets showing the proposed grading and locations of these swales.

#### XX Stormwater Basins (Pits)

36. Add a section for Stormwater Basins (Pits) and update Stormwater Earthen Berm section as applicable. Provide the following details related to the basins in the narrative and supportive plan sheets.
  - BMP sizing calculations need to be provided showing that these pit BMPs were designed based on the impervious cover assumptions for each drainage area and sized for the 10-year, 24-hour storm event.
  - Describe how any recharge features (e.g. fractures, cavities) on the floor will be mitigated during construction of these pits.
  - Describe how the collected stormwater will be managed.
  - Describe if the basins will incorporate outfalls or spillways and what storm event they're designed for.
  - Describe if those potential discharges will go through additional water quality best management practices prior to discharging the site.
  - Provide supportive plan sheets with construction details of each individual basin.
37. Within this section it states that there will be basin walls, but the pits are shown as embankments. Will any of the pits use retaining walls?
38. Add sediment depth markers to the basins.

#### XX Dewatering

39. Include a section that describes any dewatering activities in accordance with Section 3.3.14 of the LCRA HLWO technical manual (starts on sheet 149).

#### XX Quarry Pit (319.1-acre)

40. Include a section that describes the quarry pit ("Pit 4" 319.1-acres) and describe the approximate timeframe for quarrying the area.
41. Describe the depth of the pit using the unit of ft below ground surface (bgs) to match well data and elevation.
42. Describe how any recharge features (e.g. cavities or fractures) located on the surface of the quarry floor will be mitigated in accordance with Section 5.2(b)(ii) of the Highland Lakes Watershed Ordinance and Section 2.3.2 of the LCRA technical manual.

#### 5 Groundwater Monitoring Statement

**\*This request is under review based on supportive information provided and review of hydrogeologic report\***

43. Describe the approximate separation depth proposed between the quarry pit floor and water table.

44. Please revise the section to state LCRA will be contacted if during quarrying activity groundwater is encountered.

45. Has any groundwater monitoring been completed for this site that can establish background conditions?

#### 6 Surface Water Monitoring Statement

**\*This request is under review based on supportive information provided\***

46. Add a statement that monitoring information collected to meet TCEQ MSGP permit requirements will be submitted to LCRA in an annual report.

#### **Hydrogeologic Report**

*-in accordance with Section 5.2(b)(iv)(1)(b) of the Highland Lakes Watershed Ordinance.*

47. Describe the tributaries to Peters creek located onsite in the Hydrogeologic Report, which is illustrated in the Soil Resource Report Soil Map attached to the Hydrologic Report.

48. Describe the buffer setback for the tributary located near the western property boundary.

#### 4.2 Karst Identification

*It is stated, A field investigation was performed at the site by Connor P. Tierney, P.G. on August 29, 2024.*

49. Please describe how the field study was conducted. For example, walking in equally spaced transects across the site etc.

50. Please describe if any additional field investigations were completed at the site by Westward Geologist(s).

#### 5.2 DRASTIC Classification

DRASTIC Classification was calculated at 121.

51. Depth to Water Table referenced a well located 0.75 miles NW of the site. This well is not available in the Well & Spring Inventory map. Revise the Depth to Water Table criteria to reference one of the wells illustrated in the Well & Spring Inventory Map.

52. Topography (Slope) documents a 4.61 percent slope for the site and noted a rating of 5. The table documents a rating of 9. Revise the table or noted rating in the narrative.

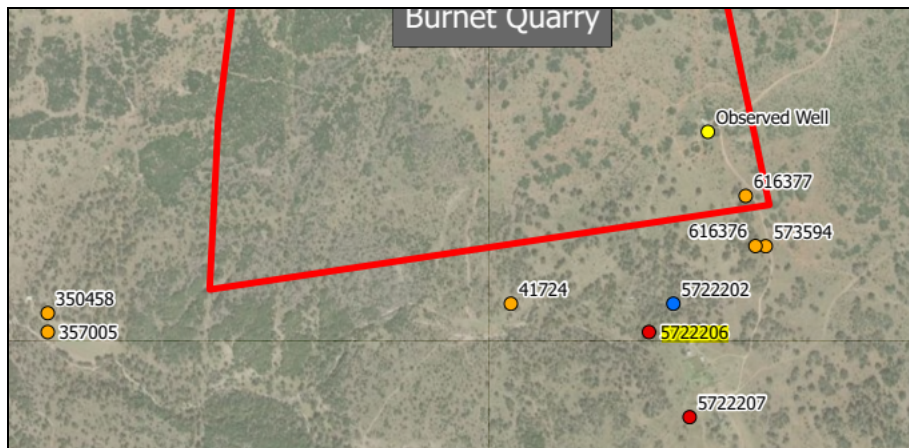
#### 7.0 Well & Spring Inventory

53. Update the following statement, if the location of this specific well was confirmed. *Well 164367 is mapped onsite, however the well address is for a location north of FM 3509. No evidence of this well was observed during the field investigation.*

**8.0 Discussion**

Discussion states, *given the absence of sensitive karst features at the Site and significant depth to groundwater, quarrying activities likely will not impact groundwater quality. A groundwater monitoring plan is not proposed.*

The south and southeast portion of Burnet Quarry is proposed to be the main pit, approximately 319.1-acres to have a depth of approximately 80 feet from the surface level. A few wells identified in the vicinity range from 100-300 feet depth.



Well & Spring Inventory Map

WELL	DEPTH	WELL	DEPTH
350458	300 feet	616377	740 feet
357005	200 feet	573594	736 feet
41724	100 feet	616376	740 feet
Observed Well	No data	5722202	No data
5722207	650 feet	5722206	100 feet

54. Please provide additional supportive information to support a groundwater monitoring plan is not required with this submittal.

**Mine & Quarry Plan**

*-in accordance with Section 5.2(b)(iv)(1)(c) of the Highland Lakes Watershed Ordinance.*

55. Please see marked up sheets to address any changes requested for this section or other sections.

- Plan sheet C.1 Erosion & Sedimentation Control Plan
- Plan sheet C.2. Initial Conditions
- Plan sheet C.3 Final Conditions
- Plan sheet C.4 Temporary General Notes

56. Only one sheet was submitted as an erosion control plan. Since the quarry will expand gradually, ESC plan sheets need to be provided for the initial conditions, intermediate conditions, and the final conditions. The appropriate ESC's for each phase will need to be provided.

## **General Reclamation Guidance Plan**

*-in accordance with Section 5.2(b)(iv)(1)(e) of the Highland Lakes Watershed Ordinance.*

### **BMP Maintenance Plan**

57. Revise the maintenance plan to include the following:

- An introduction paragraph stating the type of BMP's to be maintained on site.
- A schedule for maintenance activities.
- Provision for access to the tract by LCRA or other designated inspectors.
- Name, qualifications, and contact information for the party(ies) responsible for maintaining the BMP's.

58. Provide a detailed description of the various dewatering practices to be used for the pit basins.

59. Within the detailed inspection section, include the second paragraph from section 5.5.1 within the HLWO technical manual.

60. Within the maintenance plan describe how often the settled sediment will be removed from the BMP pits and how the sediment will be disposed of.

61. Provide an example of an inspection form.

62. Include a BMP specific section within the maintenance plan and include the following statement for the proposed VFS, "No portion of the filter area will be greater than a 10% slope. The vegetated density must be greater than 80% with no large bare areas. The filter area should be densely vegetated with a mix of erosion-resistant plant species that effectively bind the soil. Native or adapted Grasses are appropriate because they require less fertilizer and are more drought resistant than exotic plants."

63. Before the "Name and Signature of Responsible Party for maintenance of BMP's" section, Include the following paragraphs:

The OWNER or SUBSEQUENT OWNER shall bear all expenses for the operation and maintenance of these permanent Best Management Practices (BMP) including but not limited to all general maintenance activities needed to keep this system in proper operation condition. If this system is abused or not maintained, then it may contribute to malfunction of the storm water system. All designated BMP areas shall remain free of construction, development, and encroachments.

You as the OWNER of this property have a responsibility to provide any SUBSEQUENT OWNER or your real estate agent with a copy of this Best Management Practices (BMP) Maintenance Plan if this facility is sold so that the BMPs can be properly maintained and operated. The same rights, duties, and responsibilities borne by the current OWNER shall be borne by each subsequent OWNER.

An amended copy of this document will be provided to the LCRA within thirty (30) days of any changes in the following information:

Responsible Party for Maintenance: [Insert New Owner name]

Address: [Insert Street Address]

City, State, Zip: [Insert Information]

Telephone Number: [Insert BMP Maintenance Provider Telephone Number]

**Other Local, State, and Federal Regulations (5.2(b)(iii))**

*-in accordance with Section 5.2(b)(iii) of the Highland Lakes Watershed Ordinance.*

64. Provide the status for the following permitting/authorization applicable to the proposed quarry project. Please state if an authorization is not applicable and provide a copy of an approval, if issued.

- EPA National Pollutant Discharge Elimination System (NPDES) permit
- Mine Safety and Health Administration (MSHA/OSHA) authorization
- US Army Corp 404 permit
- TCEQ MSGP permit, Air New Source permit, Aggregate Production Operation (APO) registration
- Central Texas Groundwater Conservation District (GCD) well approval
- TxDOT safety certificate

If you have any questions about these comments, please call me at 512-578-7500, or by e-mail at hlwo@lcra.org.

Additional information addressing these comments or revised application materials must be provided within 30 calendar days from the date of this letter. An extension of time to provide information may be requested, however the cumulative amount of time to provide additional information may not exceed 6 months from the date that the application for permit was filed.

Thank you,

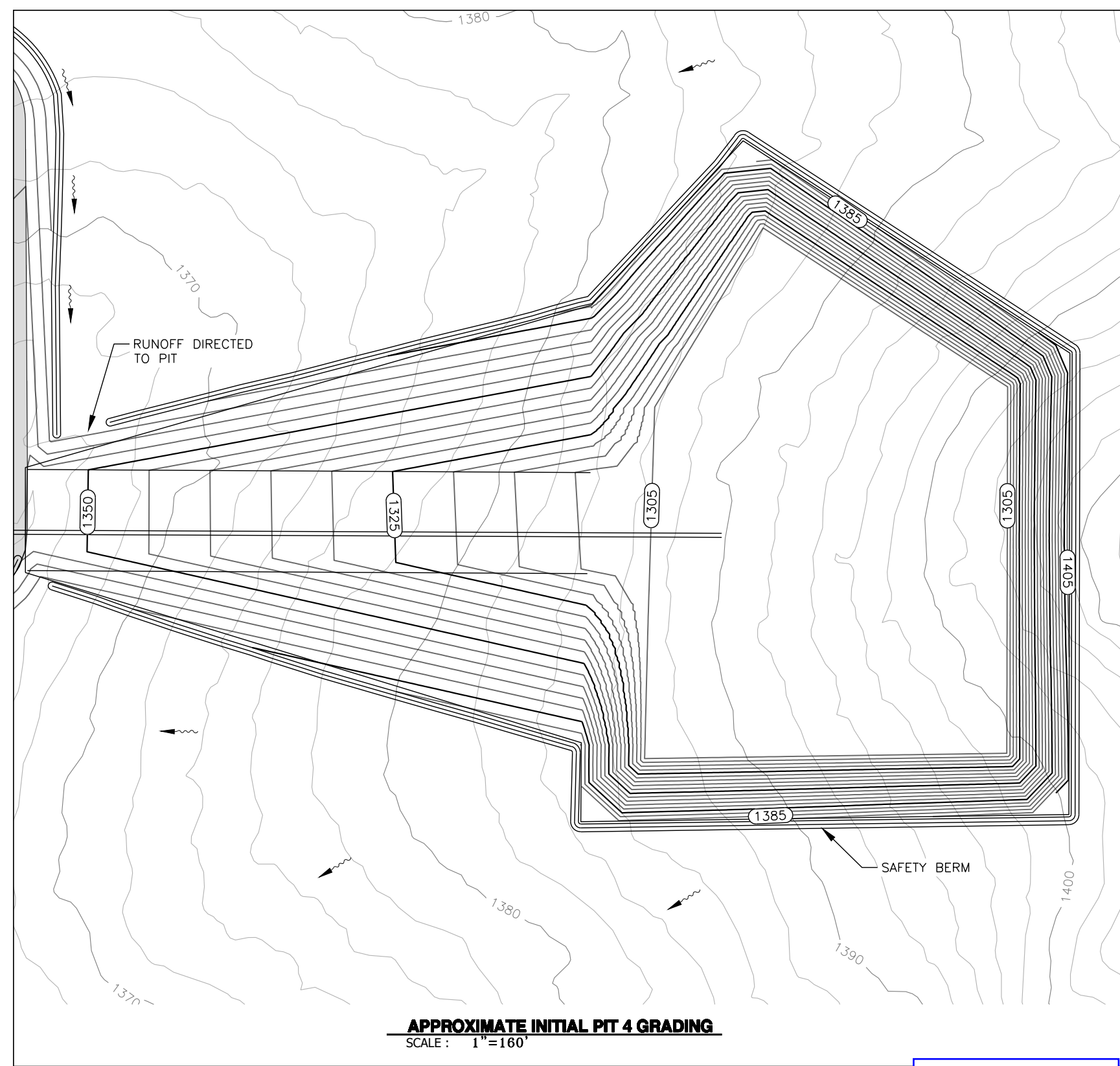
**Brian Burkitt**

Water Quality Protection

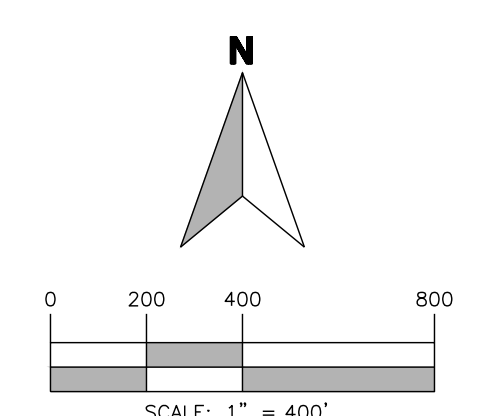
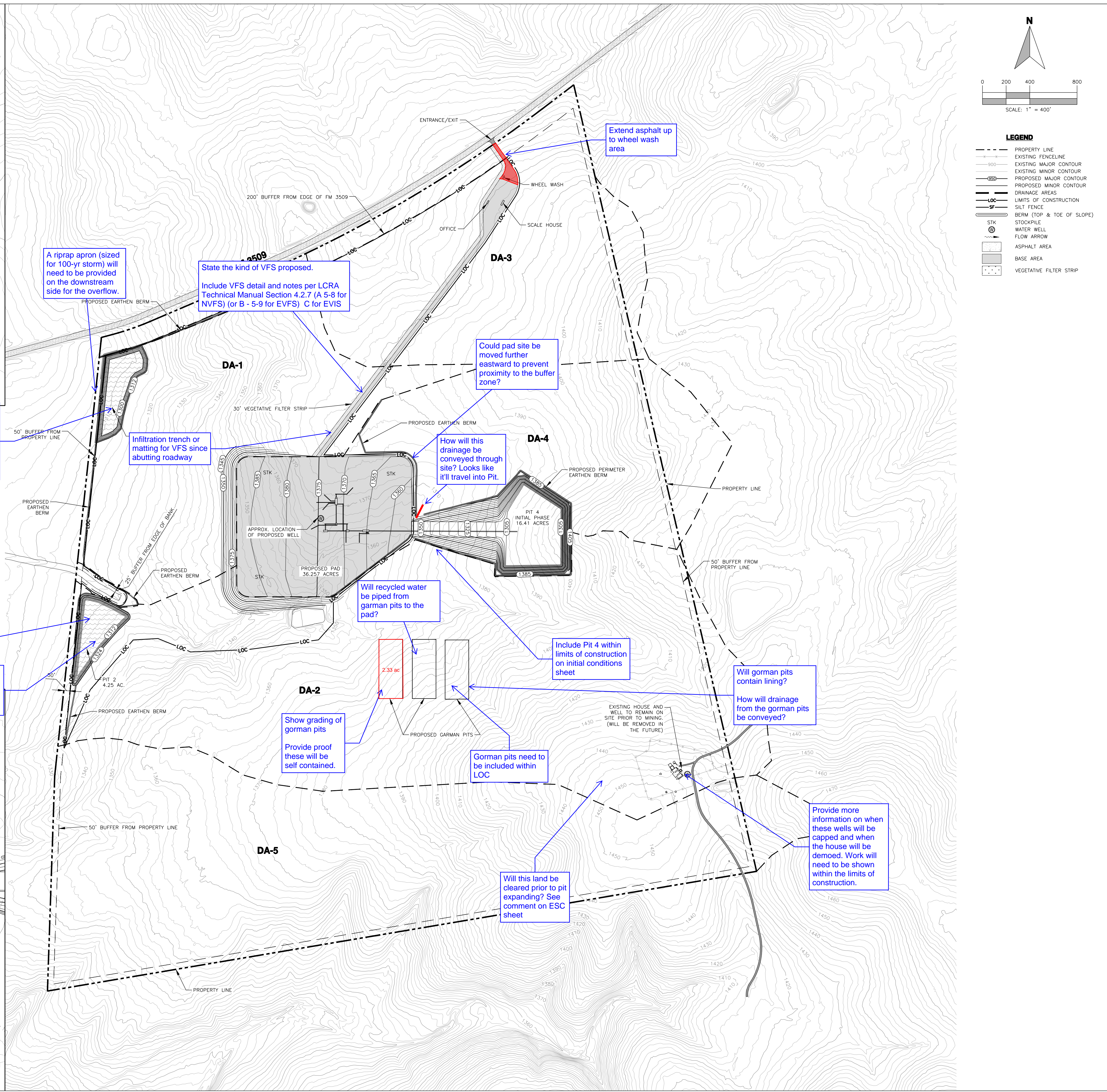
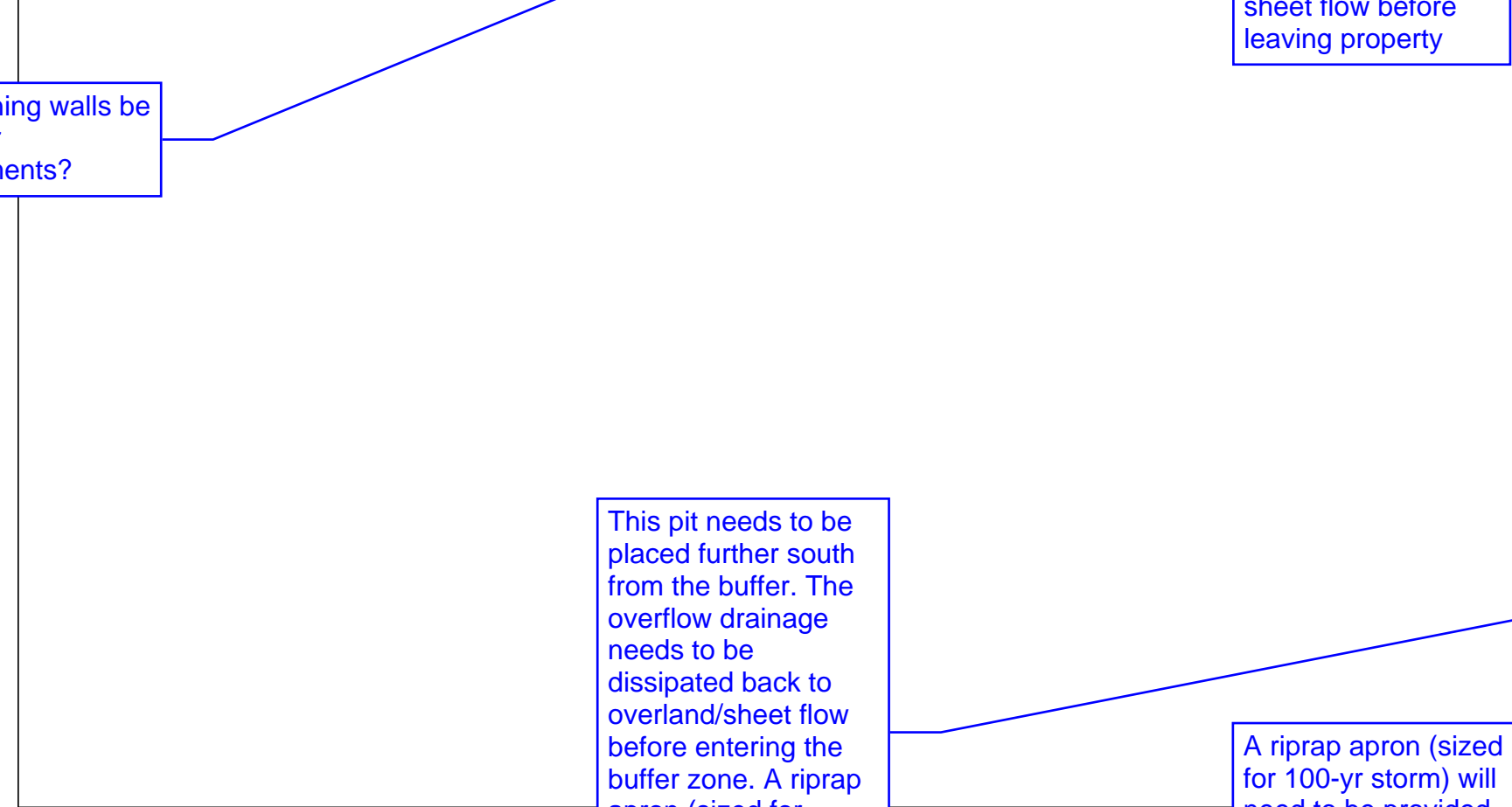
CC: Herb Darling, Burnet County  
Brett Poage, Burnet County  
Mitchell Sodek, Central Texas Groundwater Conservation District







NOTE:  
 • NO EXCAVATION IS PROPOSED IN THE 50' BUFFER FROM THE PROPERTY LINE OR THE 200' BUFFER FROM FM 3509.  
 • 50' PROPERTY LINE SETBACK DUE TO TEXAS PIT SAFETY RULES FOR SLOPE STABILITY.  
 • NORTH PROPERTY LINE SETBACK (200' MEASURED FROM EDGE OF PAVEMENT) IS DUE TO TXDOT PIT SAFE FOR QUARRIES ALONG PUBLIC ROADWAYS.  
 • ACTUAL PIT SLOPE WILL VARY AND WILL BE BASED ON HIGH WALL STABILITY OF IN PLACE MATERIAL.



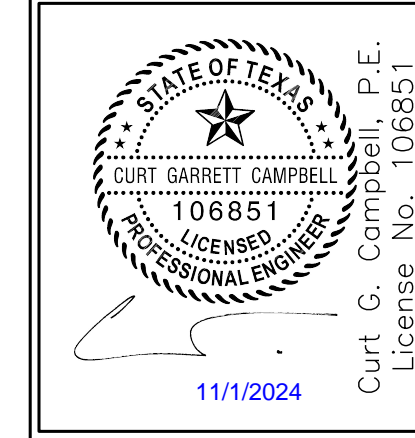
- LEGEND**
- PROPERTY LINE
  - - - EXISTING FENCELINE
  - - - EXISTING MAJOR CONTOUR
  - - - EXISTING MINOR CONTOUR
  - - - PROPOSED MAJOR CONTOUR
  - - - PROPOSED MINOR CONTOUR
  - - - DRAINAGE AREAS
  - - - LIMITS OF CONSTRUCTION
  - - - SILT FENCE
  - - - BERM (TOP & TOE OF SLOPE)
  - STK STOCKPILE
  - WATER WELL
  - FLOW ARROW
  - ASPHALT AREA
  - BASE AREA
  - VEGETATIVE FILTER STRIP

ISSUE DATE: 11/01/2024  
 DRAWN BY: JPM  
 CHECKED BY: CGC  
 SCALE: 1" = 400'  
 JOB NO.: 10853-256

SHEET NO.: **C.2**  
 OF C.4

**WESTWARD**  
 Environmental, Engineering, Natural Resources  
 P.O. Box 2205 Boerne, Texas 78006  
 (830) 249-8284 Fax: (830) 249-0221  
 TBPE REG. NO.: F-4524  
 TBPE REG. NO.: 50112

NO.	DATE	DESCRIPTION



**INITIAL CONDITIONS**  
 LCRA PERMITTING - BURNET QUARRY  
 ASPHALT INC.  
 3221 FM 3509, BURNET, TX 78611

Will retaining walls be utilized or embankments?

Both pit boundaries about to the 50' buffer from the property line. BMP drainage needs to be converted back to sheet flow before leaving property

This pit needs to be placed further south from the buffer. The overflow drainage needs to be dissipated back to overland/sheet flow before entering the buffer zone. A riprap apron (sized for 100-yr storm) will need to be provided on the downstream side for the overflow.

A riprap apron (sized for 100-yr storm) will need to be provided on the downstream side for the overflow.

ed to be in the side of the area to by stockpile draining

Matting needs to be

A riprap apron (sized for 100-yr storm) will need to be provided on the downstream side for the overflow.

State the kind of VFS proposed. Include VFS detail and notes per LCRA Technical Manual Section 4.2.7 (A 5-8 for NVFS) (or B - 5-9 for EVFS) C for EVIS

Could pad site be moved further eastward to prevent proximity to the buffer zone?

How will this drainage be conveyed through site? Looks like it'll travel into Pit.

Infiltration trench or matting for VFS since abutting roadway

Will recycled water be piped from gorman pits to the pad?

Include Pit 4 within limits of construction on initial conditions sheet

Will gorman pits contain lining? How will drainage from the gorman pits be conveyed?

Show grading of gorman pits. Provide proof these will be self contained.

Gorman pits need to be included within LOC

Provide more information on when these wells will be capped and when the house will be demoed. Work will need to be shown within the limits of construction.

Will this land be cleared prior to pit expanding? See comment on ESC sheet



**PROPOSED SEQUENCE OF CONSTRUCTION**

THE GENERAL SEQUENCE OF CONSTRUCTION CONSISTS OF ESTABLISHING THE CONSTRUCTION ENTRANCE, CLEARING VEGETATION AND MULCHING IT IN PLACE TO PROVIDE STABILIZATION OF ANY DISTURBED AREAS, INSTALLATION OF TEMPORARY BEST MANAGEMENT PRACTICES (BMPs), AND SIMULTANEOUS GRADING AND FOUNDATION LAYING WHILE PERMANENT BMPs ARE INSTALLED. CONSTRUCTION ACTIVITIES WILL MOST LIKELY BEGIN IN THE PROPOSED PLANT AREA (A) FIRST, FOLLOWED BY INITIATING THE INITIAL PIT AREA.

**A – PLANT AREA:** WORK WILL BEGIN WITHIN THE IMMEDIATE AREA OF THE PROPOSED PLANT LOCATION AND EXPAND OUTWARD AT NO MORE THAN FIVE ACRES WITHIN ONE DRAINAGE AREA AT A TIME UNTIL PERMANENT BMPs HAVE BEEN CONSTRUCTED SUFFICIENTLY TO ACT AS SEDIMENTATION BASINS. SILT FENCE AND ROCK FILTER DAMS MAY BE USED AS TEMPORARY BMPs FOR INITIAL WORK AREAS. TREES AND BRUSH WILL BE CLEARED AND MULCHED IN PLACE PROVIDING STABILIZATION FOR DISTURBED AREAS. TEMPORARY BMPs WILL BE INSTALLED, PONDING THREE THROUGH SIX WILL BE ALLOWED IN AND UTILIZED AS TEMPORARY SEDIMENTATION BASINS. THEN DRILLING AND BLASTING WILL COMMENCE TO BEGIN EXCAVATION OF THE PLANT AREA. TEMPORARY BMPs MAY BE USED TO DIRECT RUNOFF FROM DISTURBED AREAS TO SEDIMENTATION BASINS DURING CONSTRUCTION AS NEEDED TO ENSURE RUNOFF FROM DISTURBED AREAS DOES NOT LEAVE UNTREATED. CUT AND FILL ACTIVITIES WILL PREPARE THE PLANT PAD AND PROVIDE MATERIALS FOR THE CONSTRUCTION OF THE PROPOSED EARTHEN BERMS AND FINAL PONDS. AFTER CONSTRUCTION OF NECESSARY BERMS AND PONDS (INCLUDING THEIR OUTFALL STRUCTURES) IS COMPLETED, THE PLANT EQUIPMENT WILL BE BROUGHT IN AND ERECTED, AND CONSTRUCTION WILL BEGIN ON THE CREEK CROSSING. NEXT, EXCAVATION WILL BEGIN FOR THE FRESHWATER/PROCESS WATER POND, AND UPON COMPLETION OF THE PLANT AND FRESHWATER POND CONSTRUCTION, CRUSHING ACTIVITIES WILL COMMENCE. LATER, EXCAVATION WILL BEGIN IN THE ENTRANCE AREA INCLUDING A TEMPORARY BUILDING PAD.

**B – QUARRY PIT WORK:** WILL BEGIN IN THE PROPOSED INITIAL PIT AREA AFTER THE WORK IN THE PLANT AREA HAS STARTED. CLEARING AND MULCHING WILL TAKE PLACE TO STABILIZE THE CLEARED AREAS, FOLLOWED BY EXCAVATION TO A DEPTH OF AT LEAST 2.5 FEET AT NO MORE THAN TEN ACRES OF DISTURBANCE. AFTER THE INITIAL PIT EXCAVATION IS COMPLETED, MULCH WILL BE REMOVED FROM AREAS UPGRADIENT OF THE INITIAL PIT AND THE PIT EXCAVATION WILL BE EXPANDED. FOR PIT EXPANSION AREAS THAT DO NOT NATURALLY DRAIN TO THE PIT NO MORE THAN FIVE ACRES WILL BE DISTURBED AT A TIME FOR AREAS THAT NATURALLY DRAIN TO THE PIT THE PERIMETER BERM WILL BE EXPANDED AND ANY RUNOFF WILL BE DIRECTED INTO THE PIT. THE INITIAL PIT WILL RETAIN TO YEAR 24-HOUR STORM RUNOFF FROM ALL OF SUB-BASIN DA-04, APPROXIMATELY 16.41 ACRES OF DISTURBANCE, WHICH DRAINS TO THE PIT. MATERIALS EXCAVATED WILL BE USED FOR TEMPORARY BERMS SURROUNDING THE INITIAL PIT AREA.

RESTORATION OF THE SITE WILL INCLUDE REMOVAL OF BUILDINGS AND STRUCTURES SUCH AS THE SCALE, OFFICE, PROCESSING PLANT, AND THEIR ASSOCIATED FOUNDATION MATERIALS, WHERE PRACTICABLE. THE SITE WILL BE REVEGETATED, AS APPROPRIATE. MULCH CREATED AND STORED FROM INITIAL CLEARING ACTIVITIES CAN BE SPREAD ACROSS THE DISTURBED AREAS TO PROVIDE STABILIZATION. ROADWAYS WILL REMAIN IN PLACE THROUGHOUT THE SITE TO ALLOW ACCESS FOR MONITORING PURPOSES.

**ROAD CROSSINGS**

A VARIETY OF TECHNIQUES MAY BE USED DEPENDING ON LOCAL TOPOGRAPHY AND SOIL CONDITIONS. THESE INCLUDE FORD CROSSINGS, CULVERT CROSSINGS, DRAGLINE MATS, AND BRIDGES.

**GENERAL CONSIDERATIONS**

CONSTRUCT TEMPORARY CROSSINGS AT PROPOSED ROADWAY CROSSINGS AND ANY ADDITIONAL CROSSING POINTS. MINIMIZE THE NUMBER OF ADDITIONAL CROSSINGS TO REDUCE IMPACT TO CREEKS.

WHERE A STREAM CROSSING IS REQUIRED, SELECT A CROSSING SITE WITH THESE FEATURES:

1. STRAIGHT AND NARROW CREEK CHANNEL WITH HIGH BANKS;
2. STABLE CREEK BANKS THAT PROVIDE SOLID FOUNDATION FOR A CROSSING;
3. MINIMAL ELEVATION CHANGES (0-10% PREFERRED) ON ROAD/TRAIL LEADING TO CROSSING.

**INSTALLATION**

- KEEP HEAVY EQUIPMENT OUT OF CREEK.
- CONSTRUCT A SWALE OR BERM ACROSS THE APPROACH TO THE CROSSING ON BOTH SIDES OF THE CROSSING. OTHER WATER DIVERSION DEVICES (ROAD BASED DIPS, WATER BARS, ETC.) SHOULD BE USED ON LONG APPROACHES TO MINIMIZE THE AMOUNT OF WATER FLOWING TO THE CROSSING.

STABILIZE EXPOSED SOIL AROUND THE CROSSING WITH MULCH, TEMPORARY SEEDING AND/OR EROSION CONTROL BLANKETS/MATTING.

- KEEP CROSSING SURFACE FREE OF SOIL AND DEBRIS THAT COULD ENTER STREAM.
- CHECK CROSSING COMPONENTS WEEKLY AND AFTER RAINFALL TO MAINTAIN STRENGTH AND INTEGRITY.

REMOVE LARGE BRANCHES OR OTHER FLOW OBSTRUCTIONS THAT COULD IMPAIR THE FUNCTION OF THE CROSSING OR CAUSE A FAILURE OF THE CROSSING.

**REMOVAL & RESTORATION**

- CLEAN EXCAVATED MATERIAL; KEEP DEBRIS OUT OF THE CREEK CHANNEL.
- CAREFULLY REMOVE CROSSING MATERIALS, MINIMIZING DISTURBANCE TO THE CREEK CHANNEL.
- PERMANENTLY STABILIZE DISTURBED PORTIONS OF CREEK BANK AND APPROACHES WITH PERENNIAL GRASSES, EROSION CONTROL BLANKETS/MATTING AND/OR RIP RAP.
- LEAVE APPROPRIATE WATER DIVERSION STRUCTURES IN PLACE ON BOTH SIDES OF CREEK.

**CREEK CROSSINGS**

CREEK CROSSINGS SHOULD BE MADE PERPENDICULAR TO THE CREEK FLOWLINE.

IN-STREAM CONTROLS SHOULD ONLY BE USED AS A SECONDARY BMP. STORMWATER RUNOFF APPROACHING A CREEK CROSSING SHOULD BE DIVERTED TO A SEDIMENT TRAPPING BMP BEFORE IT REACHES THE CREEK.

IF BASEFLOW IS PRESENT, LCRA PERSONNEL SHOULD BE CONSULTED, AS IT MAY BE NECESSARY TO DIVERT OR PUMP WATER AROUND THE CONSTRUCTION AREA.

EVERY EFFORT SHOULD BE MADE TO KEEP THE ZONE OF IMMEDIATE CONSTRUCTION FREE OF SURFACE AND GROUND WATER. FOR CONSTRUCTION IN THE CREEK CHANNEL, A PIPE OF ADEQUATE SIZE TO DIVERT NORMAL STREAM FLOW SHOULD BE PROVIDED AROUND THE CONSTRUCTION AREA. DIVERSION MAY BE BY PUMPING OR GRAVITY FLOW USING TEMPORARY DAMS.

WHERE WATER MUST BE PUMPED FROM THE CONSTRUCTION ZONE, DISCHARGES SHOULD BE IN A MANNER THAT WILL NOT CAUSE SCOURING OR EROSION. ALL DISCHARGES SHALL BE ON THE UPSTREAM OR UPSLOPE SIDE OF EMPLOYED EROSION CONTROL STRUCTURES. IF DISCHARGES ARE NECESSARY IN EASILY ERODIBLE AREAS, A STABILIZED, ENERGY-DISSIPATING DISCHARGE APRON SHALL BE CONSTRUCTED OF RIPRAP WITH MINIMUM STONE DIAMETER OF 6 INCHES AND MINIMUM DEPTH OF 12 INCHES. SIZE OF THE APRON IN LINEAR DIMENSIONS SHALL BE APPROXIMATELY 10 TIMES THE DIAMETER OF THE DISCHARGE PIPE.

**NOTES FOR CONSTRUCTION IN CREEKS**

SCHEDULE WORK WHEN A MINIMUM OF 30 DAYS OF DRY WEATHER ARE FORECAST. DEWATER OR DIVERT FLOW PRIOR TO COMMENCING WORK WITHIN CREEK CHANNELS. CONTACT LCRA FOR INSPECTION OF DEWATERING/DIVERSION SYSTEM PRIOR TO COMMENCING WORK.

NO LOOSE EXCAVATED MATERIAL SHALL BE LEFT IN THE CREEK AT THE END OF THE WORK DAY. REMOVE ALL LOOSE EXCAVATED MATERIAL TO A SECURE LOCATION OUTSIDE THE CREEK CHANNEL AND SUSPEND FURTHER CONSTRUCTION IN THE CREEK AREA IF RAINFALL THREATENS.

**KARST FEATURES**

NO SENSITIVE KARST FEATURES WERE IDENTIFIED ON SITE.

**CEDAR MULCH**

CEDAR MULCH CAN BE USED AS AN AID TO CONTROL EROSION ON CRITICAL SITES DURING LAND CLEARING AND PERIODS OF CONSTRUCTION WHEN RE-VEGETATION IS NOT PRACTICAL. THE BEST RESULTS ARE OBTAINED FROM ROUGH, LONG CUT (3 – 6 INCH) MULCHING. THE MOST COMMON USES ARE AS BERMS AT THE BOTTOM OF LONG, STEEP SLOPES AND AS A BLANKET IN CHANNELS WHERE DESIGNED FLOW DOES NOT EXCEED 3.5 FEET PER SECOND. ON INTERCEPTOR SWALES AND DIVERSION DIKES WHEN DESIGN FLOW EXCEEDS 6 FEET PER SECOND, AND ON LONG SLOPES WHERE RILL EROSION HAZARD IS HIGH AND PLANTING IS LIKELY TO BE SLOW TO ESTABLISH ADEQUATE PROTECTIVE COVER.

**MATERIALS:**

CEDAR MULCH IS EASILY OBTAINED AS A BY-PRODUCT OF LAND CLEARING OPERATIONS. IT CAN ALSO BE A COST SAVING ITEM BECAUSE IT IS A RECYCLED MATERIAL AND DOES NOT HAVE TO BE REMOVED FROM THE SITE.

**INSPECTION AND MAINTENANCE GUIDELINES:**

- CEDAR MULCH SHOULD BE INSPECTED WEEKLY AND AFTER EACH RAIN EVENT TO LOCATE AND REPAIR ANY EROSION.
- EROSION FROM STORMS OR OTHER DAMAGE SHOULD BE REPAIRED AS SOON AS PRACTICAL BY APPLYING NEW LAYERS OF MULCH.

**BUFFER ZONES**

BUFFER ZONES SHALL REMAIN UNDISTURBED OTHER THAN THE IMPROVEMENTS SHOWN ON THESE PLANS – ENCROACHMENT INTO A BUFFER ZONE OR DAMAGE TO BUFFER ZONES AREAS WILL BE CONSIDERED A PRIORITY VIOLATION AND WILL RESULT IN A STOP WORK ORDER AND POSSIBLE FINES.

**SEDIMENT RUNOFF PREVENTION**

HIGH POINTS ALONG EACH CREEK CROSSING APPROACH WILL BE MAINTAINED IN ORDER TO PREVENT SEDIMENT LADEN RUNOFF FROM FLOWING INTO THE CREEK VIA THE CREEK CROSSING.

**BMP TYPE**

WHEN SILT FENCE INSTALLATION ISN'T PRACTICABLE, MULCH FROM INITIAL CLEARING ACTIVITIES WILL BE UTILIZED TO STABILIZE ROCKY AREAS PRIOR TO SURFACE DISTURBANCE.

CONTRACTOR MAY OPT TO USE MULCH SOCKS/LOGS IN LIEU OF SILT FENCING BASED ON SURFACE CONDITIONS.

**MULCH BERMS**

MULCH BERMS MADE FROM MULCH PRODUCED ON SITE DURING INITIAL SITE CLEARING WILL BE USED FOR STABILIZATION IN FLAT AREAS OR UPGRADIENT OF SILT FENCE UPON APPROVAL BY LCRA INSPECTOR.

**PERMANENT ROCK BERMS AND LEVEL SPREADERS**

PERMANENT ROCK BERMS AND LEVEL SPREADERS CONSTRUCTED PER THE "ROCK BERM" LIP OPTION IN FIGURE 3-7 OF THE LCRA TECHNICAL MANUAL MUST USE METALLIC-COATED OR PVC-COATED STEEL WITH A MINIMUM WIRE SIZE OF 14 GAUGE (0.080 INCH OR 2.0 MM DIAMETER).

PRIOR TO CONSTRUCTION OF LEVEL SPREADERS, THE LEVEL SPREADERS MUST BE STAKED IN THE FIELD AND INSPECTED BY LCRA. THE OWNER OR HIS AUTHORIZED REPRESENTATIVE IS RESPONSIBLE FOR CONTACTING LCRA FOR AN INSPECTION. IT IS RECOMMENDED THAT THE DESIGN ENGINEER BE PRESENT AT THE INSPECTION.

LEVEL SPREADERS MUST BE TURNED UP GRADIENT AT THE ENDS AS NECESSARY TO PREVENT FLOW FROM SPILLING AROUND THE ENDS.

**DEWATERING/DIVERSION PLAN**

CREEK CROSSING CONSTRUCTION: THE CONTRACTOR MUST OBTAIN LCRA APPROVAL OF THE DEWATERING/DIVERSION PLAN BEFORE BEGINNING WORK ON THE PROPOSED ACCESS ROAD CROSSING.

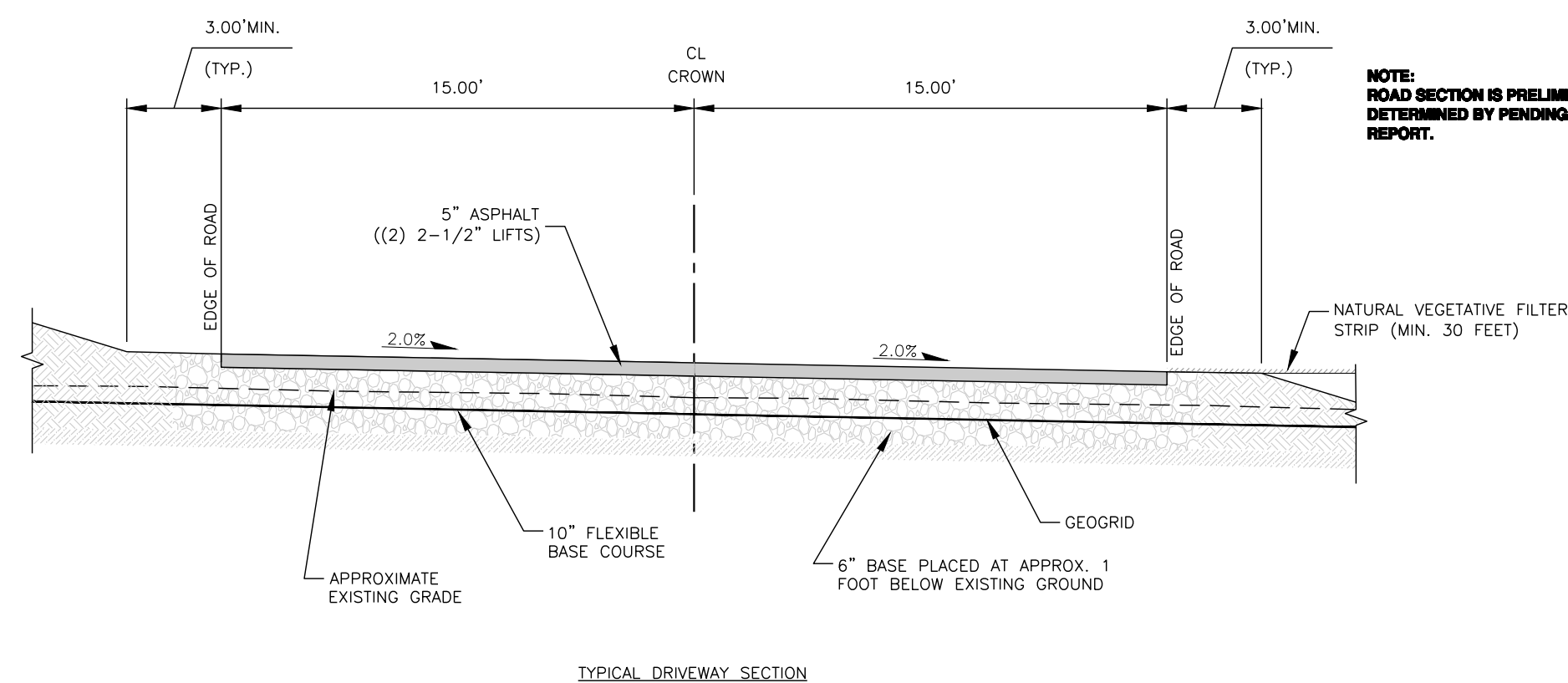
EXTENDED DETENTION BASINS: A 40-HOUR MINIMUM DELAY MUST BE OBSERVED BEFORE DEWATERING FROM EXTENDED DETENTION BASINS CAN TAKE PLACE. DISCHARGE MUST BE DONE IN A MANNER THAT DOES NOT CAUSE EROSION.

**SLOPES**

DURING CONSTRUCTION IF SLOPES ARE GREATER THAN 3:1, COORDINATE WITH PROJECT ENGINEER AND LCRA INSPECTOR FOR APPROPRIATE STABILIZATION OR VERIFICATION THAT CUT IN ROCK IS STABLE ENOUGH AND DOES NOT REQUIRE ADDITIONAL STABILIZATION.

3-6 but the reports states that these ponds will only be constructed on an as needed basis. Please clarify.

Dewatering plans for these pits need to be provided since they will be utilized and temporary sedimentation basins.

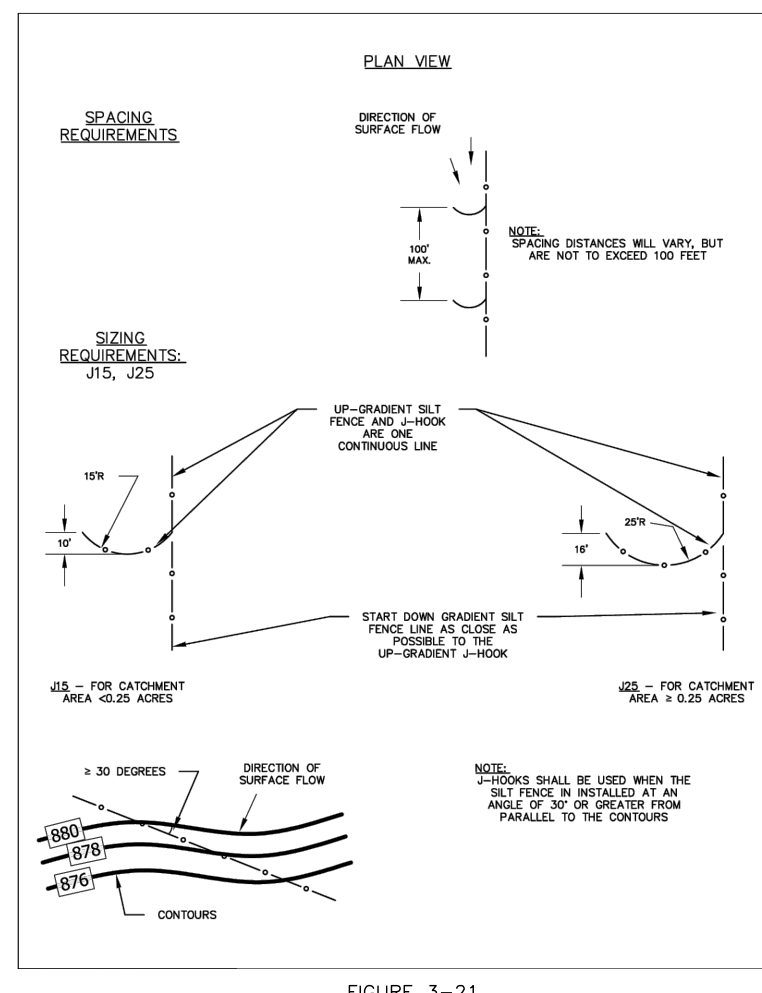


- NOTES:
1. FLEXIBLE BASE SHOULD MEET TxDOT SPECIFICATION ITEM 247, GRADE 1-2, TYPE A. FLEXIBLE BASE SHOULD BE COMPACTED TO A MINIMUM OF 95 PERCENT OF THE MATERIAL'S MAXIMUM MODIFIED PROCTOR DENSITY (ASTM D 1557) AT A MOISTURE CONTENT OF ±2 PERCENTAGE POINTS OF OPTIMUM MOISTURE.
  2. RE-COMPACTED SUBGRADE SHOULD BE SCARIFIED TO A DEPTH OF SIX INCHES AND COMPACTED TO A DRY DENSITY OF AT LEAST 95 PERCENT OF THE MATERIAL'S MAXIMUM MODIFIED PROCTOR DRY DENSITY (ASTM D 1557) AND WITHIN A RANGE OF ±2 PERCENTAGE POINTS OF THE MATERIAL'S OPTIMUM MOISTURE CONTENT.
  3. GEOTGRID SHOULD CONSIST OF TENSAR TX7 AND BE PLACED AT THE BOTTOM OF THE FLEXIBLE BASE MATERIAL.

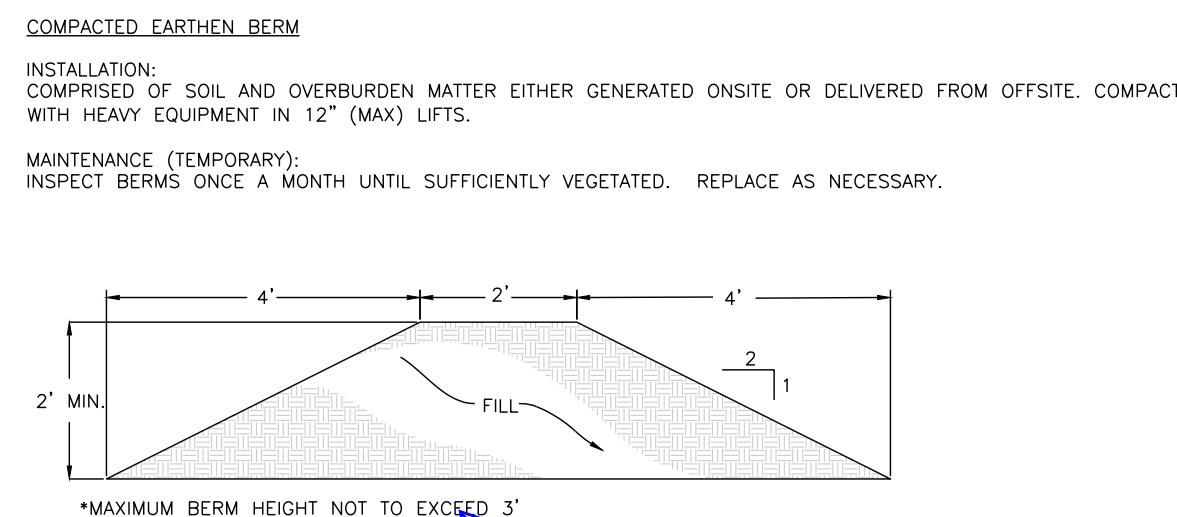
Vegetative filter strip details need to be provided.

Erosion control matting details and installation of erosion control matting details need to be provided

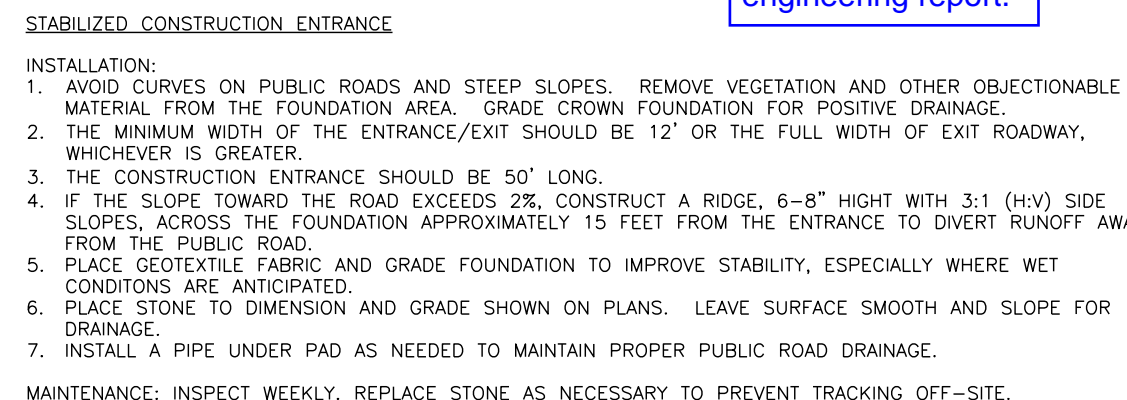
Please provide Creek Crossing details per LCRA Technical Manual Sec. 3.3.16



LCRA requires 6' spacing between posts. Refer to Silt fence detail on sheet 346 within the HLWO technical manual.



Berm is stated to be a minimum of 4' tall within the engineering report.



- GEOTEXTILE FABRIC PROPERTIES:
- MIN. 6 OZ./SQ. YD.; 140 LB./SQ. IN. MULLEN BURST.
  - EQUIVALENT OPENING SIZE MIN. 50 SEIE.
  - GRADE SLOPE TO DRAIN.
  - ADD ADDITIONAL STONE AS REQUIRED.
  - STABILIZED CONSTRUCTION ENT SHOULD EXTEND FULL WIDTH OF ROAD.

**SILT FENCE**

A SILT FENCE IS A BARRIER CONSISTING OF GEOTEXTILE FABRIC SUPPORTED BY METAL POSTS TO PREVENT SOIL AND SEDIMENT LOSS FROM A SITE WHEN PROPERLY USED. SILT FENCES CAN BE HIGHLY EFFECTIVE AT CONTROLLING EROSION FROM DISTURBED AREAS. THEY CAUSE RUNOFF TO FLOW, ALLOWING HEAVIER SOLIDS TO SETTLE OUT, IF NOT PROPERLY INSTALLED, SILT FENCES ARE NOT LIKELY TO BE EFFECTIVE. A SCHEMATIC ILLUSTRATION OF A SILT FENCE IS SHOWN IN FIGURE 3-20.

THE PURPOSE OF A SILT FENCE IS TO INTERCEPT AND DETAIN WATER-BORNE SEDIMENT FROM UNPROTECTED AREAS OF A LIMITED EXTENT. SILT FENCE IS USED DURING THE PERIOD OF CONSTRUCTION NEAR THE PERIMETER OF A DISTURBED AREA TO INTERCEPT SEDIMENT WHILE ALLOWING WATER TO PERCOLATE THROUGH. THIS FENCE SHOULD REMAIN IN PLACE UNTIL THE DISTURBED AREA IS PERMANENTLY STABILIZED. SILT FENCE SHOULD NOT BE USED WHERE THERE IS A CONCENTRATION OF WATER IN A CHANNEL OR DRAINAGE WAY. IF CONCENTRATED FLOW OCCURS AFTER INSTALLATION, CORRECTIVE ACTION SHOULD BE TAKEN SUCH AS PLACING A ROCK BERM IN THE AREAS OF CONCENTRATED FLOW. SILT FENCING WITHIN A SITE MAY BE TEMPORARILY MOVED DURING THE DAY TO ALLOW CONSTRUCTION ACTIVITY PROVIDED IT IS REPLACED AND PROPERLY ANCHORED TO THE GROUND AT THE END OF THE DAY. SILT FENCES ON THE PERIMETER OF THE SITE OR AROUND DRAINAGE WAYS SHOULD NOT BE MOVED AT ANY TIME.

USE J-HOOKS TO TRAP AND POND RUNOFF FLOWING ALONG UPHILL SIDE OF SILT FENCE AS SHOWN IN FIGURE 3-21 OF THE LCRA HIGHLAND LAKES WATERSHED ORDINANCE WATER QUALITY MANAGEMENT TECHNICAL MANUAL. THIS WILL FILTER OR SETTLE OUTFLOWS AND PREVENT RUNOFF FROM ESCAPING AROUND THE SIDES OF THE FENCE.

**MATERIALS:**

- SILT FENCE MATERIAL SHOULD BE POLYPROPYLENE, POLYETHYLENE OR POLYAMIDE WOVEN OR NONWOVEN FABRIC. THE FABRIC WIDTH SHOULD BE 36 INCHES, WITH A MINIMUM UNIT WEIGHT OF 4.5 OZ/YD. ULTRAVIOLET STABILITY EXCEEDING 70% AND MINIMUM APPARENT OPENING SIZE OF U.S. SIEVE NO. 30.
- FENCE POSTS SHOULD BE MADE OF HOT ROLLED STEEL, AT LEAST 4 FEET LONG WITH TEE OR YBAR CROSS SECTION, SURFACE PAINTED OR GALVANIZED, MINIMUM NOMINAL WEIGHT 1.25 LB/FT2, AND BRINDELL HARDNESS EXCEEDING 140.
- WOVEN WIRE BACKING TO SUPPORT THE FABRIC SHOULD BE GALVANIZED 2" X 4" WELDED WIRE, 12 GAUGE MINIMUM.

**INSTALLATION:**

- STEEL POSTS, WHICH SUPPORT THE SILT FENCE, SHOULD BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF 1- FOOT DEEP AND SPACED NOT MORE THAN 6 FEET ON CENTER. WHERE WATER CONCENTRATES, THE MAXIMUM SPACING SHOULD BE 6 FEET.
- LAY OUT FENCING DOWN-SLOPE OF DISTURBED AREA, FOLLOWING THE CONTOUR AS CLOSELY AS POSSIBLE. UTILIZE J-HOOKS AS NECESSARY AS SHOWN IN FIGURE 3-21 . THE FENCE SHOULD BE SITED SO THAT THE MAXIMUM DRAINAGE AREA IS ¼ ACRE/100 FEET OF FENCE.
- THE TOE OF THE SILT FENCE SHOULD BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWN-SLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (E.G., PAVEMENT OR ROCK OUTCROP), WEIGHT FABRIC FLAP WITH 3 INCHES OF PEA GRAVEL ON UPHILL SIDE TO PREVENT FLOW FROM SEEPING UNDER FENCE.
- THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
- SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE SILT FENCE POST. THERE SHOULD BE A 3-FOOT OVERLAP, SECURELY FASTENED WHERE ENDS OF FABRIC MEET.
- SILT FENCE SHOULD BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPED STORM FLOW OR DRAINAGE.

**COMMON TROUBLE POINTS:**

- FENCE NOT INSTALLED ALONG THE CONTOUR CAUSING WATER TO CONCENTRATE AND FLOW OVER THE FENCE.
- FABRIC NOT SEATED SECURELY TO GROUND (RUNOFF PASSING UNDER FENCE)
- FENCE NOT INSTALLED PERPENDICULAR TO FLOW LINE (RUNOFF ESCAPING AROUND SIDES)
- FENCE TREATING TOO LARGE AN AREA, OR EXCESSIVE CHANNEL FLOW (RUNOFF OVERTOPS OR COLLAPSES FENCE)

**INSPECTION AND MAINTENANCE GUIDELINES:**

- INSPECT ALL FENCING WEEKLY, AND AFTER ANY RAINFALL IN EXCESS OF 0.5 INCH OR MORE.
- REMOVE SEDIMENT WHEN BUILDUP REACHES 6 INCHES.
- REPLACE ANY TORN FABRIC.
- REPLACE OR REPAIR ANY SECTIONS CRUSHED OR COLLAPSED IN THE COURSE OF CONSTRUCTION ACTIVITY. IF A SECTION OF FENCE IS OBSTRUCTING VEHICULAR ACCESS, CONSIDER RELOCATING IT TO A SPOT WHERE IT WILL PROVIDE EQUAL PROTECTION, BUT WILL NOT OBSTRUCT VEHICLES. A TRIANGULAR FILTER DOME MAY BE PREFERABLE TO A SILT FENCE AT COMMON VEHICLE ACCESS POINTS.
- WHEN CONSTRUCTION IS COMPLETE THE SEDIMENT SHOULD BE DISPOSED OF IN A MANNER THAT WILL NOT CAUSE ADDITIONAL SILTATION AND THE PRIOR LOCATION OF THE SILT FENCE SHOULD BE REVEGETATED. THE FENCE ITSELF SHOULD BE DISPOSED OF IN AN APPROVED LANDFILL.

SILT FENCE SPACING ON SLOPING SITES			
SLOPE ANGLE	SILTY SOILS	CLAYS	SANDY SOILS
VERY STEEP (1:1)	50 FT.	75 FT.	100 FT.
STEEP (2:1)	75 FT.	100 FT.	125 FT.
MODERATE (4:1)	100 FT.	125 FT.	150 FT.
SLIGHT (10:1)	125 FT.	150 FT.	200 FT.

**HYDROMULCH**

SEED: PROVIDE SEED FROM THE PREVIOUS SEASON'S CROP MEETING THE REQUIREMENTS OF THE TEXAS SEED LAW, INCLUDING THE TESTING AND LABELING FOR PURE LIVE SEED (PLS = PURITY X GERMINATION). USE WITHIN 12 MO. FROM THE DATE OF THE ANALYSIS, WHEN BUFTADGRESS IS SPECIFIED, USE SEED THAT IS TREATED WITH KNO3 (POTASSIUM NITRATE) TO OVERCOME DORMANCY. USE TABLE 1 TO DETERMINE THE APPROPRIATE SEED MIXTURE AND APPLICATION RATES FOR TEMPORARY COLD SEASON PLANTING. CONSULT TABLES 3 & 4 IN SECTION 3.2.2 OF THE ESC PLAN. IMMEDIATELY AFTER PLANTING THE SEED OR SEED MIXTURE, APPLY CELLULOSE FIBER MULCH UNIFORMLY OVER THE SEEDED AREA AT THE FOLLOWING RATES:

- SANDY SOILS WITH SLOPES OF 3:1 OR LESS: 2500 LB. PER ACRE.
- SANDY SOILS WITH SLOPES GREATER THAN 3:1: 3000 LB. PER ACRE.
- CLAY SOILS WITH SLOPES OF 3:1 OR LESS: 2000 LB. PER ACRE.
- CLAY SOILS WITH SLOPES GREATER THAN 3:1: 2300 LB. PER ACRE.

CELLULOSE FIBER MULCH RATES ARE BASED ON DRY WEIGHT OF MULCH PER ACRE. MIX CELLULOSE FIBER MULCH AND WATER TO MAKE A SLURRY AND APPLY UNIFORMLY OVER THE SEEDED AREA USING SUITABLE EQUIPMENT. USE A TACKING AGENT APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS OR A CRIMPING METHOD ON ALL STRAW OR HAY MULCH OPERATIONS. REVEGETATION IS CONSIDERED AS 80% COVERAGE WITH NO LARGE BARE AREAS.

Following details need to be provided: -Rock Berm (Sheet 348)

LCRA general

ISSUE DATE:	11/01/2024
DRAWN BY:	JPW
CHECKED BY:	GGC
SCALE:	1" = AS NOTED
JOB NO.:	10853-256

SHEET NO.: **C.4**  
OF C.4

**WESTWARD**  
Environmental, Engineering, Natural Resources  
P.O. Box 2205 Boerne, Texas 78006  
(830) 249-8284 Fax: (830) 249-0221  
TBP# REG. NO.: F-4524  
TBP# REG. NO.: 50112

DATE	BY	DESCRIPTION

STATE OF TEXAS  
10853-256  
LICENSED PROFESSIONAL ENGINEER  
Curt G. Corrobelli, P.E.  
License No.: 110651-1

11/1/2024

**TEMPORARY BMP GENERAL NOTES**  
LCRA PERMITTING – BURNET QUARRY  
ASPHALT, INC.  
3221 FM 3509, BURNET, TX 78611