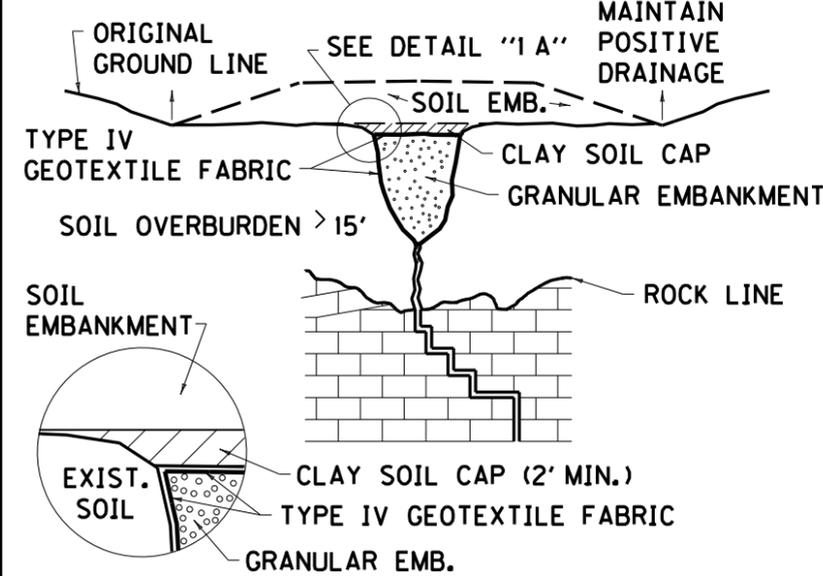


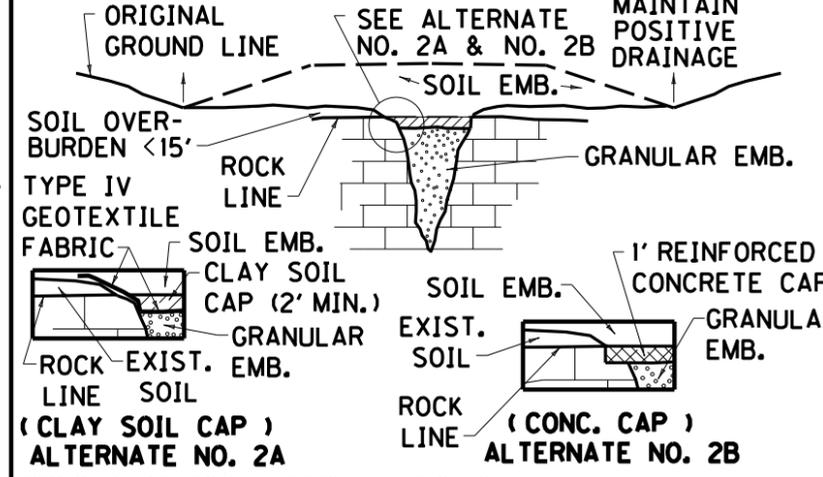
FILE NAME: G:\USERS\HENRY.WELLS\DESKTOP\ALLP\EXPORTS\SEPIA\003.DGN  
 USER: henry.wells  
 DATE PLOTTED: August 17, 2012  
 E-SHEET NAME:  
 MicroStation v8.11.9.459

**CONDITION NO. 1: SOIL EMBANKMENT OVER DEEP OVERBURDEN WITH OPEN SINKHOLES**



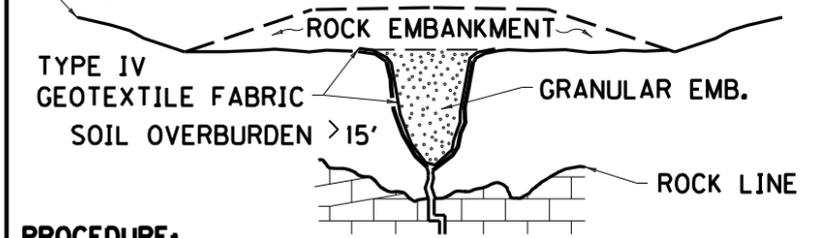
**DETAIL "1 A"**  
**PROCEDURE:**  
 a. REMOVE DEBRIS. DO NOT EXCAVATE SOIL OVERBURDEN.  
 b. LINE OPENING WITH TYPE IV GEOTEXTILE FABRIC.  
 c. REFILL WITH GRANULAR EMBANKMENT.  
 d. PLACE TYPE IV GEOTEXTILE FABRIC ON TOP OF GRANULAR EMBANKMENT.  
 e. REFILL WITH (2' MINIMUM) CLAY SOIL CAP.

**CONDITION NO. 2: SOIL EMBANKMENT OVER SHALLOW OVERBURDEN WITH SINKHOLE OPENING IN ROCK**



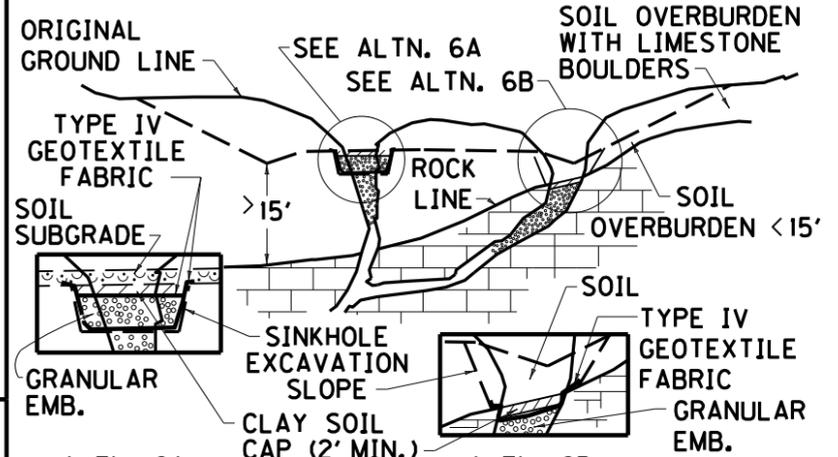
**(CLAY SOIL CAP) ALTERNATE NO. 2A**  
**PROCEDURE FOR ALTERNATE NO. 2A**  
 a. REMOVE DEBRIS AND SOIL OVERBURDEN.  
 b. REFILL OPENING WITH GRANULAR EMBANKMENT TO 2' MIN. BELOW ROCK LINE.  
 c. PLACE TYPE IV GEOTEXTILE FABRIC ON TOP OF GRANULAR EMB. OVERLAPPING ORIG. GROUND LINE.  
 d. REFILL WITH (2' MIN.) CLAY SOIL CAP.  
**(CONC. CAP) ALTERNATE NO. 2B**  
**PROCEDURE FOR ALTERNATE NO. 2B**  
 a. REMOVE DEBRIS AND SOIL OVERBURDEN.  
 b. REFILL OPENING WITH GRANULAR EMBANKMENT TO 1' MIN. BELOW ROCK LINE.  
 c. CONST. 1' REINFORCED CONC. CAP. CAP SHOULD BE INTERLOCKED WITH ROCK FOR SUPPORT.

**CONDIT. NO. 3: ROCK EMB. OVER DEEP OVERBURDEN WITH OPEN SINKHOLES**



**PROCEDURE:**  
 a. REMOVE DEBRIS. DO NOT EXCAVATE SOIL OVERBURDEN.  
 b. LINE OPENING WITH TYPE IV GEOTEXTILE FABRIC.  
 c. REFILL OPENING WITH GRANULAR EMBANKMENT TO TOP OF DEPRESSION.

**CONDITION NO. 6: CUT SECTIONS WITH SINKHOLE OPENINGS IN SOIL**

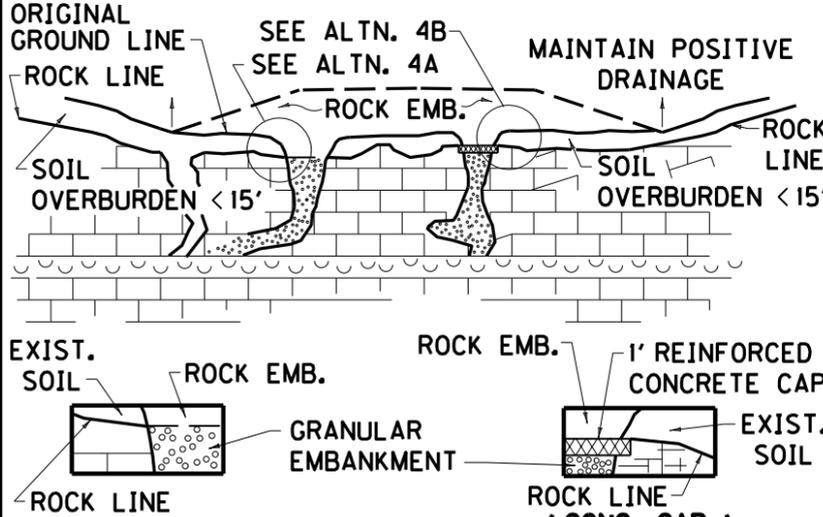


**ALTN. 6A**  
**ALTERNATE NO. 6A SOIL OVERBURDEN GREATER THAN 15'**  
 a. REMOVE DEBRIS. DO NOT EXCAVATE SOIL OVERBURDEN.  
 b. LINE OPENING WITH TYPE IV GEOTEXTILE FABRIC.  
 c. REFILL WITH GRANULAR EMB.  
 d. PLACE TYPE IV GEOTEXTILE FABRIC OVER GRANULAR EMBANKMENT OVERLAPPING ORIG. GROUND LINE.  
 e. REFILL WITH (2' MIN.) CLAY SOIL CAP. IF ROCK SUBGRADE IS USED OMIT SOIL CAP AND FABRIC UNDERLYING SOIL CAP.

**ALTERNATE NO. 6B SOIL OVERBURDEN LESS THAN 15'**  
 a. REMOVE DEBRIS AND SOIL OVERBURDEN.  
 b. REFILL OPENING WITH GRANULAR EMBANKMENT TO 2' MIN. BELOW ROCK LINE.  
 c. PLACE TYPE IV GEOTEXTILE FABRIC OVER GRANULAR EMB. OVERLAPPING ORIG. GROUND LINE.  
 d. REFILL WITH (2' MIN.) CLAY SOIL CAP. IF CONCRETE CAP IS USED THE FABRIC SHALL BE OMITTED AND CAP SHALL BE INTERLOCKED WITH THE BEDROCK FOR SUPPORT AS DETAILED IN COND. NO. 2 ALTERNATE NO. 2B.

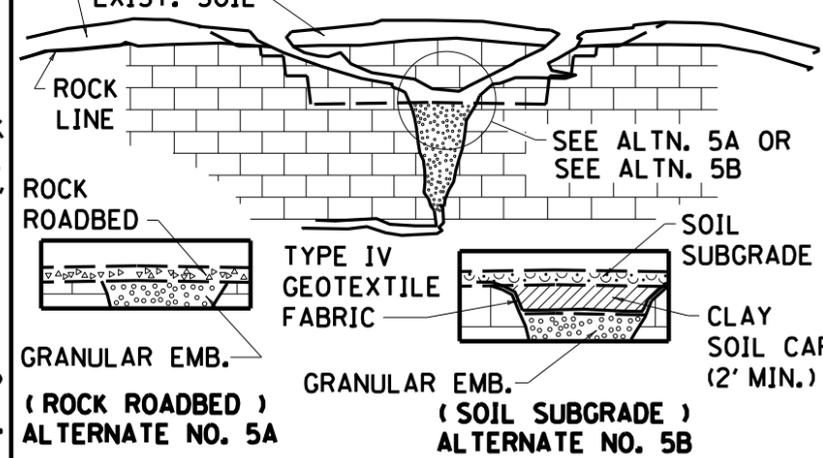
THE CONC. CAP SHALL BE CLASS "B" CONC. AND CONTAIN NO. 8 REINFORCING BARS PLACED AT 12" CTRS. IN BOTH DIRECTIONS AND LOCATED 3" FROM THE BOTTOM SURFACE OF THE CAP.

**CONDITION NO. 4: ROCK EMBANKMENT OVER SHALLOW OVERBURDEN WITH SINKHOLE OPENINGS IN ROCK**



**ALTERNATE NO. 4A**  
**PROCEDURE FOR ALTERNATE NO. 4A**  
 a. REMOVE DEBRIS AND SOIL OVERBURDEN.  
 b. REFILL OPENING TO ROCK LINE WITH GRANULAR EMBANKMENT.  
**ALTERNATE NO. 4B**  
**PROCEDURE FOR ALTERNATE NO. 4B**  
 a. REMOVE DEBRIS AND SOIL OVERBURDEN.  
 b. REFILL OPENING WITH GRANULAR EMBANKMENT TO 1' MIN. BELOW ROCK LINE.  
 c. CONST. 1' REINFORCED CONC. CAP. CAP SHOULD BE INTERLOCKED WITH ROCK FOR SUPPORT.

**CONDITION NO. 5: CUT SECTIONS WITH SINKHOLE OPENINGS IN ROCK**



**(ROCK ROADBED) ALTERNATE NO. 5A**  
**PROCEDURE FOR ALTERNATE NO. 5A**  
 a. REFILL OPENING WITH GRANULAR EMBANKMENT. IF CONCRETE CAP IS USED IT SHALL BE INTERLOCKED WITH THE BEDROCK FOR SUPPORT AS DETAILED IN CONDITION NO. 2 ALTERNATE NO. 2B.  
**(SOIL SUBGRADE) ALTERNATE NO. 5B**  
**PROCEDURE FOR ALTERNATE NO. 5B**  
 a. REFILL OPENING WITH GRANULAR EMBANKMENT TO 2' MINIMUM BELOW SOIL SUBGRADE.  
 b. PLACE TYPE IV GEOTEXTILE FABRIC OVER GRANULAR EMBANKMENT.  
 c. REFILL WITH (2' MIN.) CLAY SOIL CAP. IF CONCRETE CAP IS USED THE FABRIC SHALL BE OMITTED AND CAP SHALL BE INTERLOCKED WITH THE BEDROCK FOR SUPPORT AS DETAILED IN COND. NO. 2 ALTERNATE NO. 2B.

KENTUCKY DEPARTMENT OF HIGHWAYS

TREATMENT OF OPEN SINKHOLES

SUBMITTED *William S. Stull* 12-1-99 DATE  
 TBM DIVISION OF HIGHWAY DESIGN