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Date: July 19, 2022

Memorandum to: Greg Purvis, PE
Wetherill Engineering Inc.

From: Kelly Plummer, PG
Project Manager
Terracon Consultants

State Project: BP6.R003

County: Harnett

Description: Replace Structure No. 420028 over Beaverdam Swamp Canal on NC 217

Subject: Culvert Foundation Recommendations

Terracon Consultants has completed a subsurface investigation for this project and recommends the following for the proposed culvert.

Double 10' x 8' Reinforced Concrete Box Culvert – Station 14+39 -L-

- Recommend 370 square yards of Type 4 Geotextile to wrap and stabilize the foundation conditioning material beneath the culvert.
- Recommend 145 cubic yards of Undercut Excavation and 220 tons of Select Material, Class VI for undercut backfill to be used at the wingwalls.
- Recommend 50 cubic yards of Undercut Excavation and 75 tons of Select Material, Class VI for undercut backfill be included as a contingency in the project contract.

Sincerely,
Terracon Consultants, Inc.



7/20/2022

DocuSigned by:

Kelly P. Plummer

ABAD25CB98EE418...

Kelly R. Plummer, PG
Project Manager

DocuSigned by:

Matt Alexander

18774C886D9544A...

Matthew J. Alexander, PE
Senior Geotechnical Engineer

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED.

FOUNDATION RECOMMENDATIONS

PROJECT:	BP6.R003	DESCRIPTION:	REPLACE STRUCTURE NO.
TIP NO.:	N/A		420028 OVER BEAVERDAM SWAMP CANAL ON
COUNTY:	HARNETT		NC 217
STATION:	14+39 -L-		

	INITIALS	DATE
DESIGN:	KRP	6/16/2022
CHECKED:	MJA	6/16/2022
FINAL:	MJA	6/17/2022
REVISED:	MJA	7/19/2022



STRUCTURE	STATION	FOUNDATION TYPE	FACTORED RESISTANCE	MISCELLANEOUS DETAILS
Double 10'x 8' Reinforced Concrete Box Culvert w/ 6" Top Beveled HW buried 1'	14+39 -L-	Concrete Box Culvert on Geotextile Wrapped Foundation Conditioning Material	N/A	Culvert Length = 80 ± ft. Culvert Skew = 133° Culvert Invert Elevation = 99.7' at Centerline Slope = 0.3%

COMMENTS & NOTES (See Following Page)

FOUNDATION RECOMMENDATION NOTE ON PLANS AND COMMENTS

PROJECT: BP6.R003 TIP: N/A COUNTY: HARNETT
DESCRIPTION: REPLACE STRUCTURE NO. 420028 OVER BEAVERDAM SWAMP CANAL ON NC 217

NOTE ON PLANS:

1. BACKFILL WITH SELECT MATERIAL, CLASS VI MEETING THE REQUIREMENTS OF SECTION 1016 OF THE STANDARD SPECIFICATIONS.
2. SEE SECTION 414 OF THE STANDARD SPECIFICATIONS FOR CULVERT EXCAVATION AND BACKFILLING. EXCAVATE 1 FOOT BELOW CULVERT AND FOOTING AND REPLACE WITH FOUNDATION CONDITIONING MATERIAL IN ACCORDANCE WITH ARTICLE 414-4 OF THE STANDARD SPECIFICATIONS. WRAP FOUNDATION CONDITIONING MATERIAL WITH TYPE 4 GEOTEXTILE.
3. UNDERCUT WINGWALL FOUNDATIONS APPROXIMATELY 4 FEET AND BACKFILL WITH FOUNDATION CONDITIONING MATERIAL.

FOUNDATION RECOMMENDATION COMMENTS:

1. DEWATERING WILL BE REQUIRED DURING CONSTRUCTION.
2. SUBGRADE NEEDS TO BE VERIFIED BY THE ENGINEER OR THEIR REPRESENTATIVE PRIOR TO PLACING TYPE 4 GEOTEXTILE AND FOUNDATION CONDITIONING MATERIAL.
3. CULVERT CAMBER IS NOT REQUIRED.
4. USE TYPE 2 GEOTEXTILE UNDER RIP-RAP FOR BANK STABILIZATION MEETING SECTION 1056 OF THE NCDOT STANDARD SPECIFICATIONS.
5. BACKFILL BARRELS TO THE HEIGHT OF SILL WITH NATIVE STREAM MATERIAL.
6. RECOMMEND 370 SQUARE YARDS OF TYPE 4 GEOTEXTILE TO WRAP AND STABLIZE THE FOUNDATION CONDITIONING MATERIAL BELOW THE CULVERT.
7. RECOMMEND 145 CUBIC YARDS OF UNDERCUT EXCAVATION AND 220 TONS OF SELECT MATERIAL, CLASS VI FOR UNDERCUT BACKFILL TO BE USED AT THE WINGWALLS. SEE ATTACHED LOCATION SKETCH.
8. RECOMMEND 50 CUBIC YARDS OF UNDERCUT EXCAVATION AND 75 TONS OF SELECT MATERIAL, CLASS VI FOR UNDERCUT BACKFILL BE INCLUDED AS A CONTINGENCY IN THE PROJECT CONTRACT.

HANSON AGGREGATES CAROLINA INC.
& C/O MARVIN F. POER & COMPANY

REC PLN

HUGHIE M. STEWART
& VICKIE T. STEWART

NC 217 29' BST

GREU TL-3

GREU TL-3

BEAVERDAM

BEAVERDAM SW

7-00413

GOODS/

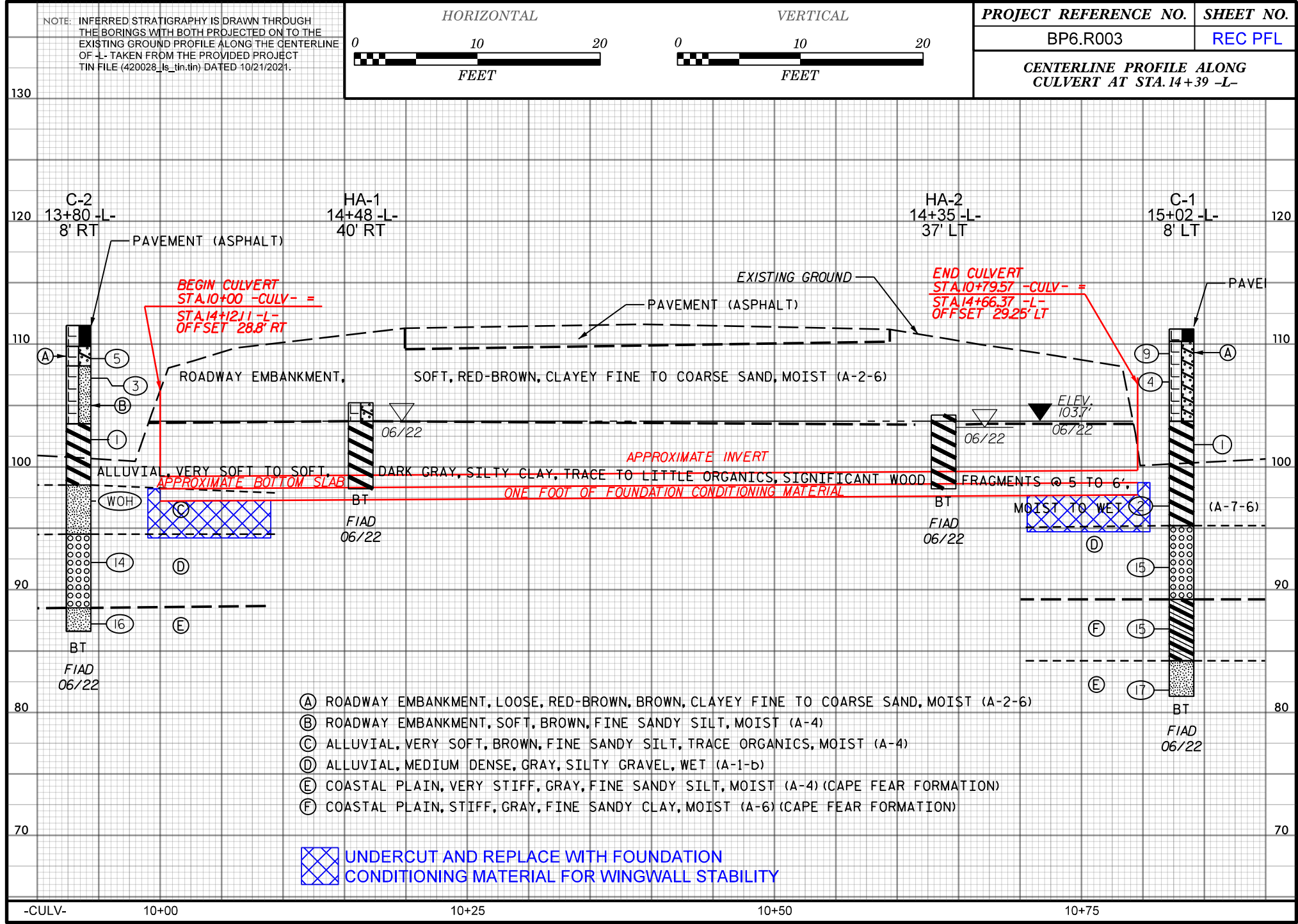
- WLC

FO

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✓ ✓



C-2
13+80 -L-
8' RT

HA-1
14+48 -L-
40' RT

HA-2
14+35 -L-
37' LT

C-1
15+02 -L-
8' LT

BEGIN CULVERT
STA. 10+00 -CULV- =
STA. 14+12.11 -L-
OFFSET 28.8' RT

END CULVERT
STA. 10+79.57 -CULV- =
STA. 14+66.37 -L-
OFFSET 29.25' LT

PAVEMENT (ASPHALT)

EXISTING GROUND

PAVEMENT (ASPHALT)

EXISTING GROUND

ROADWAY EMBANKMENT

SOFT, RED-BROWN, CLAYEY FINE TO COARSE SAND, MOIST (A-2-6)

ALLUVIAL, VERY SOFT TO SOFT, DARK GRAY, SILTY CLAY, TRACE TO LITTLE ORGANICS, SIGNIFICANT WOOD FRAGMENTS @ 5 TO 6', MOIST TO WET (A-7-6)

APPROXIMATE INVERT

APPROXIMATE BOTTOM SLAB

ONE FOOT OF FOUNDATION CONDITIONING MATERIAL

BT
FIAD
06/22

BT
FIAD
06/22

BT
FIAD
06/22

(A) ROADWAY EMBANKMENT, LOOSE, RED-BROWN, BROWN, CLAYEY FINE TO COARSE SAND, MOIST (A-2-6)

(B) ROADWAY EMBANKMENT, SOFT, BROWN, FINE SANDY SILT, MOIST (A-4)

(C) ALLUVIAL, VERY SOFT, BROWN, FINE SANDY SILT, TRACE ORGANICS, MOIST (A-4)

(D) ALLUVIAL, MEDIUM DENSE, GRAY, SILTY GRAVEL, WET (A-1-b)

(E) COASTAL PLAIN, VERY STIFF, GRAY, FINE SANDY SILT, MOIST (A-4) (CAPE FEAR FORMATION)

(F) COASTAL PLAIN, STIFF, GRAY, FINE SANDY CLAY, MOIST (A-6) (CAPE FEAR FORMATION)

UNDERCUT AND REPLACE WITH FOUNDATION
CONDITIONING MATERIAL FOR WINGWALL STABILITY