



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY  
GOVERNOR

ANTHONY J. TATA  
SECRETARY

July 11, 2014

MEMORANDUM TO: J. Stuart Bourne, P.E.  
State Traffic Management Engineer

ATTENTION: David Bissett, P.E.  
Acting Central WZTC Engineer

FROM: DS  
KK John L. Pilipchuk, LG, P.E..  
State Geotechnical Engineer DocuSigned by:  
John Pilipchuk  
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STATE PROJECT: 34915.1.1 (U-3308)

F. A. PROJECT: STP-0055(20)

COUNTY: Durham

DESCRIPTION: NC 55 (Alston Ave.) from NC 147 (Buck Dean Freeway) to US 70 Business/NC 98 (Holloway St.)

SUBJECT: **Temporary Shoring Recommendations**

The Geotechnical Engineering Unit (GEU) has received the following proposed temporary shoring locations for the referenced project:

Shoring Location No.	Begin Station & Offset	End Station & Offset	Estimated Average Height	Estimated Maximum Height	Shoring Location Type
No. 1	-LALT- 15+25 ±, 7.5' LT	-LALT- 15+57 ±, 7.5' LT	6.0'	10.0'	Structure
No. 2	-LALT- 17+36 ±, 7.5' LT	-LALT- 17+70 ±, 7.5' LT	6.5'	11.0'	Structure
No. 3	-LALT- 59+80 ±, 6.0'-9.0' LT	-LALT- 61+75 ±, 6.0'-9.0' LT	3.0'	6.0'	Roadway

The GEU recommends the following notes on plans for the proposed shoring locations:

MAILING ADDRESS:  
NC DEPARTMENT OF TRANSPORTATION  
GEOTECHNICAL ENGINEERING UNIT  
1589 MAIL SERVICE CENTER  
RALEIGH NC 27699-1589

TELEPHONE: 919-707-6850  
Fax: 919-250-4237

[www.ncdot.gov/doh/preconstruct/highway/geotech](http://www.ncdot.gov/doh/preconstruct/highway/geotech)

LOCATION:  
CENTURY CENTER COMPLEX  
ENTRANCE B-2  
1020 BIRCH RIDGE DRIVE  
RALEIGH NC 27610

Shoring Location No. 1

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROJECT SPECIAL PROVISION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM STATION -LALT- 15+25 ±, 7.5 FT LEFT, TO STATION -LALT- 15+57 ±, 7.5 FT LEFT, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

- UNIT WEIGHT ( $\gamma$ ) = 120 LB/CF
- FRICTION ANGLE ( $\phi$ ) = 24 DEGREES (RESIDUAL SOIL)
- FRICTION ANGLE ( $\phi$ ) = 30 DEGREES (EMBANKMENT SOIL)
- FRICTION ANGLE ( $\phi$ ) = 36 DEGREES (WEATHERED ROCK)
- COHESION ( $c$ ) = 0 LB/SF
- GROUNDWATER ELEVATION = 376.5 FT ±

DRIVEN PILING FOR TEMPORARY SHORING FROM STATION -LALT- 15+25 ±, 7.5 FT LEFT, TO STATION -LALT- 15+57 ±, 7.5 FT LEFT, MAY NOT PENETRATE BELOW ELEVATION 365.8 FT DUE TO OBSTRUCTIONS, VERY DENSE OR HARD SOIL, BOULDERS OR WEATHERED OR HARD ROCK.

DO NOT USE A TEMPORARY WALL FOR TEMPORARY SHORING FROM STATION -LALT- 15+25 ±, 7.5 FT LEFT, TO STATION -LALT- 15+57 ±, 7.5 FT LEFT.

TEMPORARY SHORING FROM STATION -LALT- 15+25 ±, 7.5 FT LEFT, TO STATION -LALT- 15+57 ±, 7.5 FT LEFT, WILL BE REQUIRED TO REMAIN IN PLACE AND CUT OFF BELOW THE PAVEMENT STRUCTURE. USE PRECAST CONCRETE OR STEEL PLATE LAGGING FOR TEMPORARY SHORING.

Shoring Location No. 2

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROJECT SPECIAL PROVISION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM STATION -LALT- 17+36 ±, 7.5 FT LEFT, TO STATION -LALT- 17+70 ±, 7.5 FT LEFT, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

MAILING ADDRESS:  
NC DEPARTMENT OF TRANSPORTATION  
GEOTECHNICAL ENGINEERING UNIT  
1589 MAIL SERVICE CENTER  
RALEIGH NC 27699-1589

TELEPHONE: 919-707-6850  
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[www.ncdot.gov/doh/preconstruct/highway/geotech](http://www.ncdot.gov/doh/preconstruct/highway/geotech)

LOCATION:  
CENTURY CENTER COMPLEX  
ENTRANCE B-2  
1020 BIRCH RIDGE DRIVE  
RALEIGH NC 27610

UNIT WEIGHT ( $\gamma$ ) = 120 LB/CF  
FRICTION ANGLE ( $\phi$ ) = 24 DEGREES (RESIDUAL SOIL)  
FRICTION ANGLE ( $\phi$ ) = 30 DEGREES (EMBANKMENT SOIL)  
FRICTION ANGLE ( $\phi$ ) = 36 DEGREES (WEATHERED ROCK)  
COHESION ( $c$ ) = 0 LB/SF  
GROUNDWATER ELEVATION = 376.5 FT  $\pm$

DRIVEN PILING FOR TEMPORARY SHORING FROM STATION -LALT- 17+36  $\pm$ , 7.5 FT LEFT, TO STATION -LALT- 17+70  $\pm$ , 7.5 FT LEFT, MAY NOT PENETRATE BELOW ELEVATION 365.8 FT DUE TO OBSTRUCTIONS, VERY DENSE OR HARD SOIL, BOULDERS OR WEATHERED OR HARD ROCK.

DO NOT USE A TEMPORARY WALL FOR TEMPORARY SHORING FROM STATION -LALT- 17+36  $\pm$ , 7.5 FT LEFT, TO STATION -LALT- 17+70  $\pm$ , 7.5 FT LEFT.

TEMPORARY SHORING FROM STATION -LALT- 17+36  $\pm$ , 7.5 FT LEFT, TO STATION -LALT- 17+70  $\pm$ , 7.5 FT LEFT, WILL BE REQUIRED TO REMAIN IN PLACE AND CUT OFF BELOW THE PAVEMENT STRUCTURE. USE PRECAST CONCRETE OR STEEL PLATE LAGGING FOR TEMPORARY SHORING.

### Shoring Location No. 3

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROJECT SPECIAL PROVISION.

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING FROM STATION -LALT- 59+80  $\pm$ , 6.0-9.0 FT LEFT, TO STATION -LALT- 61+75  $\pm$ , 6.0-9.0 FT LEFT FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:

UNIT WEIGHT ( $\gamma$ ) = 120 LB/CF  
FRICTION ANGLE ( $\phi$ ) = 24 DEGREES (RESIDUAL SOIL)  
FRICTION ANGLE ( $\phi$ ) = 30 DEGREES (EMBANKMENT SOIL)  
FRICTION ANGLE ( $\phi$ ) = 36 DEGREES (WEATHERED ROCK)  
COHESION ( $c$ ) = 0 LB/SF  
GROUNDWATER ELEVATION = 348.0 FT  $\pm$

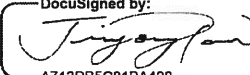
DRIVEN PILING FOR TEMPORARY SHORING FROM STATION -LALT- 59+80  $\pm$ , 6.0-9.0 FT LEFT, TO STATION -LALT- 61+75  $\pm$ , 6.0-9.0 FT LEFT, MAY NOT PENETRATE BELOW ELEVATION 347.5 FT DUE TO OBSTRUCTIONS, VERY DENSE OR HARD SOIL, BOULDERS OR WEATHERED OR HARD ROCK.

DO NOT USE A TEMPORARY WALL FOR TEMPORARY SHORING STATION -LALT-59+80 ±, 6.0-9.0 FT LEFT, TO STATION -LALT- 61+75 ±, 6.0-9.0 FT LEFT.

The GEU recommends including the Temporary Shoring Provision (Special) in the contract for the referenced project. Please contact Jinyoung Park, P.E. or James R. Batts, P.E. at (919) 662-4710 if there are any questions concerning this memorandum.

Prepared by



DocuSigned by:  
  
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7/11/2014

Jinyoung Park, P.E.  
Geotechnical Design Engineer

JLP/JRB/JYP

Attachments : Temporary Shoring Provision (Special)