

STRUCTURE RECOMMENDATIONS

W.B.S. NO. 50231 DESCRIPTION Segmental Gravity Retaining Wall #1
 T.I.P. NO. U-5840
 COUNTY Henderson
 STATION 10+00.00 to 10+79.75
-W1-

| | INITIALS | DATE |
|---------|----------|----------|
| DESIGN | PDM | 3/9/2018 |
| CHECKED | DJC | 3/9/2018 |
| FINAL | DJC | 3/9/2018 |



COMMENTS & NOTES

Note on Plans:

1. FOR SEGMENTAL GRAVITY RETAINING WALLS, SEE SEGMENTAL GRAVITY RETAINING WALLS PROVISION.
2. FREEZE-THAW DURABLE SRW UNITS THAT MEET ARTICLE 1040-4 OF THE STANDARD SPECIFICATIONS ARE REQUIRED.
3. A DRAIN PIPE IS REQUIRED FOR RETAINING WALL NO. 1.
4. DESIGN RETAINING WALL NO. 1 FOR WALL HEIGHTS EQUAL TO THE DESIGN HEIGHT PLUS DEPTH TO TOP OF FOOTING (DIFFERENCE BETWEEN GRADE ELEVATION AND TOP OF FOOTING ELEVATION).
5. DESIGN RETAINING WALL NO. 1 FOR THE FOLLOWING:
 - 1) MAXIMUM FACTORED VERTICAL STRESS ON FOUNDATION MATERIAL = 2,000 LB/SF. THIS ASSUMES ANY FILL OR SOFT SOILS, IF ENCOUNTERED, WILL BE UNDERCUT AND REPLACED.
 - 2) MAXIMUM COEFFICIENT OF FRICTION = 0.35
 - 3) GROUNDWATER WAS NOT ENCOUNTERED IN THE BORING TERMINATION DEPTHS.
 - 4) IN-SITU ASSUMED MATERIAL PARAMETERS:

| MATERIAL TYPE | UNIT WEIGHT (γ) PCF | FRICTION ANGLE (Φ) DEGREES | COHESION (c) PSF |
|---------------|------------------------------------|---|------------------------|
| BACKFILL | 120 | 30 | 0 |
| FOUNDATION | 120 | 28 | 0 |

6. DESIGN RETAINING WALL NO. 1 FOR A LIVE LOAD (TRAFFIC) SURCHARGE.
7. IGNORE PASSIVE EARTH PRESSURES IN THE UPPER 18 INCHES.

STRUCTURE RECOMMENDATION NOTES ON PLANS AND COMMENTS

PROJECT No.: U-5840 WALL NO: 1 COUNTY: Henderson
STATION: 10+00.00 to 10+79.75 -W1- DESCRIPTION: SR1547 FROM US 25 TO SR1551

8. DO NOT PLACE NO. 57 STONE FOR FOOTINGS FOR RETAINING WALL NO. 1 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

GEOTECHNICAL BORING REPORT

BORE LOG

| WBS 50231 | | | TIP U-5840 | | | COUNTY HENDERSON | | | GEOLOGIST McCloud, P.D. | | | | | | | | |
|--|-----------------|------------|---------------------|-------|-------|--------------------------|----|----|-------------------------|-----|-----------|-----|-----|---------------------------|---|----------------|-----|
| SITE DESCRIPTION SR 1547 (Old Airport Road) from US 25 (Hendersonville Road) to SR 1551 (Mills Gap Road) | | | | | | | | | GROUND WTR (ft) | | | | | | | | |
| BORING NO. B-01 | | | STATION 10+06 | | | OFFSET 10 ft RT | | | ALIGNMENT -W1- | | | | | | | | |
| COLLAR ELEV. 2,224.2 ft | | | TOTAL DEPTH 15.0 ft | | | NORTHING 634,362 | | | EASTING 956,146 | | | | | | | | |
| DRILL RIG/HAMMER EFF./DATE HPC8513 CME-550 81% 06/06/2016 | | | | | | DRILL METHOD H.S. Augers | | | HAMMER TYPE Automatic | | | | | | | | |
| DRILLER Odom, C.J. | | | START DATE 05/17/17 | | | COMP. DATE 05/17/17 | | | SURFACE WATER DEPTH N/A | | | | | | | | |
| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT | | | BLOWS PER FOOT | | | | | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION | DEPTH (ft) | | |
| | | | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 | 100 | | | | | | | |
| 2225 | | | | | | | | | | | | | | | | | |
| | 2,223.0 | 1.3 | | | | | | | | | | | | | 2,224.2 | GROUND SURFACE | 0.0 |
| | 2,220.7 | 3.5 | 3 | 4 | 4 | | | | | | SS-1 | M | | 2,223.0 | 9" Asphalt over 6" Stone Base | 1.3 | |
| 2220 | 2,218.2 | 6.0 | 2 | 3 | 4 | | | | | | SS-2 | M | | 2,221.2 | ROADWAY EMBANKMENT Stiff, brown, tan, and gray, SILT with sand (A-4) | 3.0 | |
| | 2,215.7 | 8.5 | 4 | 3 | 4 | | | | | | SS-3 | M | | | Medium stiff, gray to gray and tan, SILT with sand (A-4) | | |
| 2215 | 2,210.7 | 13.5 | 5 | 5 | 6 | | | | | | SS-4 | M | | 2,216.2 | RESIDUAL Stiff to very stiff, tan and gray to tan, gray, and red, SILT with sand (A-4) | 8.0 | |
| 2210 | | | 6 | 10 | 17 | | | | | | SS-5 | M | | 2,209.2 | Boring Terminated at Elevation 2,209.2 ft in Silt with Sand | 15.0 | |

NCDOT BORE SINGLE 71175059 - U-5840 - HENDERSON COUNTY RETAINING WALLS.GPJ NC_DOT.GDT 6/16/17

GEOTECHNICAL BORING REPORT

BORE LOG

| WBS 50231 | | | TIP U-5840 | | | COUNTY HENDERSON | | | GEOLOGIST McCloud, P.D. | | | | | | | | |
|--|-----------------|------------|---------------------|-------|-------|--------------------------|----|----|-------------------------|-----|-----------|-----|-----|---------------------------|--|----------------|-----|
| SITE DESCRIPTION SR 1547 (Old Airport Road) from US 25 (Hendersonville Road) to SR 1551 (Mills Gap Road) | | | | | | | | | GROUND WTR (ft) | | | | | | | | |
| BORING NO. B-02 | | | STATION 10+76 | | | OFFSET 7 ft RT | | | ALIGNMENT -W1- | | | | | | | | |
| COLLAR ELEV. 2,225.1 ft | | | TOTAL DEPTH 15.0 ft | | | NORTHING 634,365 | | | EASTING 956,215 | | | | | | | | |
| DRILL RIG/HAMMER EFF./DATE HPC8513 CME-550 81% 06/06/2016 | | | | | | DRILL METHOD H.S. Augers | | | HAMMER TYPE Automatic | | | | | | | | |
| DRILLER Odom, C.J. | | | START DATE 05/17/17 | | | COMP. DATE 05/17/17 | | | SURFACE WATER DEPTH N/A | | | | | | | | |
| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT | | | BLOWS PER FOOT | | | | | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION | DEPTH (ft) | | |
| | | | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 | 100 | | | | | | | |
| 2230 | | | | | | | | | | | | | | | | | |
| 2225 | | | | | | | | | | | | | | | | | |
| | 2,223.9 | 1.3 | | | | | | | | | | | | | 2,225.1 | GROUND SURFACE | 0.0 |
| | 2,221.6 | 3.5 | 3 | 7 | 8 | | | | | | SS-6 | M | | 2,223.9 | 9" Asphalt over 6" Stone Base | 1.3 | |
| | 2,219.1 | 6.0 | 2 | 3 | 4 | | | | | | SS-7 | M | | 2,222.1 | ROADWAY EMBANKMENT Medium dense, tan, red, and gray, clayey SAND, little gravel (A-4 (2)) | 3.0 | |
| | 2,216.6 | 8.5 | 4 | 5 | 9 | | | | | | SS-8 | M | | 2,219.6 | Medium stiff, tan, SILT with sand (A-4) | 5.5 | |
| | 2,211.6 | 13.5 | 5 | 7 | 14 | | | | | | SS-9 | M | | | RESIDUAL Stiff to very stiff, tan and gray, SILT with sand (A-4) | | |
| | 2,210.1 | | 3 | 5 | 6 | | | | | | SS-10 | M | | 2,210.1 | Boring Terminated at Elevation 2,210.1 ft in Silt with Sand | 15.0 | |

NCDOT BORE SINGLE 71175059 - U-5840 - HENDERSON COUNTY RETAINING WALLS.GPJ NC_DOT.GDT 6/16/17