VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** U.S. ROUTE 50 EAST BOUND

**16EB-01**
**PAGE 1 OF 1**

STATION: 207+00 OFFSET: 37' Lt
NORTHING: 7028339.628 ft Easting: 11750994.3 ft
SURFACE ELEVATION: 321.25 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 05-24-16 - 05-24-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: S. Consolvo, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT LL | PLASTICITY INDEX PI | MOISTURE CONTENT (%) | FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 0.0 / 321.25<br>4" TOPSOIL **TOPS** | | | | |
| | | | | | | | | | | | 0.3 / 320.95<br>*Fill*, Yellowish light brown, LEAN CLAY, contains rootlets, soft, wet **CL** | | | | |
| | 320 | 1<br>2<br>2<br>3 | 85 | | 2 | | | | | | | | | | |
| 2 | | 1<br>1<br>1 | 75 | | | | | | | | SAME, moist | 28 | 8 | 23.5 | 93.8 |
| | | 1<br>1 | | | 4 | | | | | | SAME, firm | | | | |
| 4 | | 1<br>2<br>3 | 65 | | | | | | | | | | | | |
| | | 5<br>6 | | | 6 | | | | | | SAME, very stiff | | | | |
| 6 | 315 | 6<br>11<br>14 | 100 | | | | | | | | | | | | |
| | | 23<br>50/5 | 100 | | 8<br>8.4 | | | | | | 8.0 / 313.25<br>*IGM*, Brown, SILT, moist **ML**<br>*Boring Terminated at 8.4 feet.* | | | | |
| 8 | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 4.0 feet
Bulk sample obtained for CBR testing from 1.0 to 5.0 feet

**PAGE 1 OF 1**
**16EB-01**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** U.S. ROUTE 50 EAST BOUND

**16EB-02**
**PAGE 1 OF 1**

STATION: 209+00 OFFSET: 9' Rt
NORTHING: 7028223.353 ft Easting: 11751141.96 ft
SURFACE ELEVATION: 324.17 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 05-24-16 - 05-24-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: S. Consolvo, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND / SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | 0.0 / 324.17<br>10" ASHPALT **ASPH** | | | |
| | | | | | | | | | | 0.8 / 323.37<br>3" AGGREGATE BASE **GP** | | | |
| 2 | | 7<br>10 | | 1.5 | | | | | | 1.1 / 323.07<br>*Fill*, Brown, fine to medium, SILTY SAND contains siltstone rock fragments, medium dense, moist **SM** | | | |
| | | 13 | 85 | | | | | | | 2.2 / 321.97<br>*Residuum*, Brown, SILT with sand, medium dense, moist **ML** | | | 16.0 |
| | | 15<br>16 | | 3.5 | | | | | | | | | |
| 4 | 320 | 37 | 100 | | | | | | | | | | 15.8 |
| | | 50/3 | | 4.8 | | | | | | 4.5 / 319.67<br>*IGM*, Brown, SILT, moist **ML** | | | |
| | | 36 | | 5.5 | | | | | | | | | |
| 6 | | 50/5 | 89 | 6.4 | | | | | | | | | 9.9 |
| | | 50/2 | 100 | 7.5<br>7.7 | | | | | | | | | 9.4 |
| 8 | | | | | | | | | | | | | |
| | 315 | 50/4 | 33 | 9.5<br>9.8 | | | | | | | | | 2.1 |
| 10 | | | | | | | | | | *Boring Terminated at 9.8 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 6.3 feet

**PAGE 1 OF 1**
**16EB-02**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** U.S. ROUTE 50 EAST BOUND

**16EB-03**
**PAGE 1 OF 1**

STATION: 211+00 OFFSET: 25' Lt
NORTHING: 7028175.427 ft Easting: 11751338.61 ft
SURFACE ELEVATION: 329.2 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 05-27-16 - 05-27-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: R. Wilcher, Connelly & Associates, Inc.
Logger: S. Consolvo, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | | | | | | | | | 0.0 / 329.2<br>3" TOPSOIL **TOPS** | | | |
| | | 1 | | | | | | | | | 0.3 / 328.9<br>*Fill*, Brown, SILTY LEAN CLAY, trace sand, contains rootlets, soft, moist **CL-ML** | | | 15.2 |
| | | 3 | 100 | | | | | | | | | | | |
| | | 5 | | | | | | | | | | | | |
| 2 | | 12 | | | 2 | | | | | | 2.0 / 327.2<br>*Residdum*, Brown, SANDY SILT, hard, moist **ML** | | | |
| | | 22 | | | | | | | | | | | | 10.5 |
| | | 38 | 100 | | | | | | | | | | | |
| | | 50/2 | | | 3.7 | | | | | | 3.2 / 326.0<br>*IGM*, Gray, SANDY SILT, moist **ML** | | | |
| 4 | | 9 | | | 4 | | | | | | | | | |
| | 325 | 50/4 | 100 | | | | | | | | SAME, Brown | | | 42.3 |
| | | | | | 4.8 | | | | | | Auger grinding observed at 4.5' | | | |
| 6 | | 100/1 | 100 | | 6<br>6.1 | | | | | | *Split-Spoon Refusal at 6.1 feet.* | | | 2.2 |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 4.1 feet

**PAGE 1 OF 1**
**16EB-03**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** U.S. ROUTE 50 EAST BOUND

**16EB-04**
**PAGE 1 OF 1**

STATION: 213+00 OFFSET: 7' Rt
NORTHING: 7028043.382 ft Easting: 11751505.05 ft
SURFACE ELEVATION: 335.42 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 05-24-16 - 05-24-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: S. Consolvo, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT LL | PLASTICITY INDEX PI | MOISTURE CONTENT (%) | FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 335 | | | | | | | | | | 0.0 / 335.42<br>13.5" ASPHALT **ASPH** | | | | |
| | | | | | | | | | | | 1.1 / 334.32<br>3" AGGREGATE BASE **GP** | | | | |
| 2 | | 7<br>9<br>13 | 100 | | 1.6 | | | | | | 1.4 / 334.02<br>*FILL*, Brown, SANDY LEAN CLAY, contains siltstone rock fragments, very stiff, moist **CL** | 29 | 10 | 4.8 | 55.5 |
| | | 16 | | | 3.6 | | | | | | 2.6 / 332.82<br>*Residuum*, Brown, SANDY LEAN CLAY, very stiff, moist **CL** | | | | |
| 4 | | 16<br>38<br>50/3 | 100 | | 4.9 | | | | | | | | | 14.4 | |
| | 330 | 50/4 | 100 | | 5.6<br>6 | | | | | | 4.4 / 331.02<br>*IGM*, Gray, fine to medium, POORLY GRADED GRAVEL (siltstone rock fragments), with clay and sand, moist **GP-GC** | | | 8.2 | |
| 6 | | | | | | | | | | | | | | | |
| | | 26<br>34<br>50/5 | 57 | | 7.6<br>9 | | | | | | | | | 8.2 | |
| 8 | | | | | | | | | | | | | | | |
| | | 24<br>43<br>50/5 | 100 | | 9.6<br>11 | | | | | | | | | 11.7 | |
| 10 | 325 | | | | | | | | | | *Boring Terminated at 11.0 feet.* | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 4.8 feet
Bulk sample obtained for CBR testing from 1.5 to 5.5 feet

**PAGE 1 OF 1**
**16EB-04**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000.012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** U.S. ROUTE 50 EAST BOUND

**16EB-05**
**PAGE 1 OF 1**

STATION: 215+00 OFFSET: 6.5' Rt
NORTHING: 7027918.197 ft Easting: 11751773.03 ft
SURFACE ELEVATION: 342.54 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 05-25-16 - 05-25-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: I. Whitehead, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) | FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 6 | | | | | | | | | 0.0 / 342.54<br>6" POORLY GRADED GRAVEL **GP** | | | | |
| | | 7 | | | | | | | | | 0.5 / 342.04<br>*Fill*, Light brown and orange, LEAN CLAY with sand, trace gravel, very stiff, moist **CL** | | | | |
| | | 9 | 75 | | | | | | | | | | | 24.0 | |
| | | 15 | | | | | | | | | 1.0 / 341.54<br>*Residuum*, Red and brown, SILT, with sand, stiff to very stiff **ML** | | | | |
| 2 | | 4 | | | 2 | | | | | | | | | | |
| | 340 | 6 | | | | | | | | | | | | | |
| | | 6 | 100 | | | | | | | | | | | 23.1 | |
| | | 8 | | | | | | | | | | | | | |
| 4 | | 4 | | | 4 | | | | | | SAME, Brown, contains slight siltstone rock fragments, very stiff | | | | |
| | | 7 | | | | | | | | | | | | | |
| | | 11 | 100 | | | | | | | | | NP | NP | 18.9 | 72.0 |
| | | 13 | | | | | | | | | | | | | |
| 6 | | 4 | | | 6 | | | | | | | | | | |
| | | 9 | | | | | | | | | | | | | |
| | | 20 | 100 | | | | | | | | | | | 22.7 | |
| | 335 | 24 | | | | | | | | | | | | | |
| 8 | | 15 | | | 8 | | | | | | 8.0 / 334.54<br>Red and brown, SANDY LEAN CLAY, contains slight siltstone rock fragments, hard **CL** | | | | |
| | | 17 | | | | | | | | | | | | | |
| | | 22 | 100 | | | | | | | | | | | 16.1 | |
| | | 27 | | | | | | | | | | | | | |
| 10 | | | | | 10 | | | | | | *Boring Terminated at 10.0 feet.* | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 5.6 feet

**PAGE 1 OF 1**
**16EB-05**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000.012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** U.S. ROUTE 50 EAST BOUND

**16EB-06**
**PAGE 1 OF 1**

STATION: 218+00 OFFSET: 5.5' Rt
NORTHING: 7027832.353 ft Easting: 11751951.92 ft
SURFACE ELEVATION: 341.88 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 05-25-16 - 05-25-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: I. Whitehead, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | | | | | | | | | 0.0 / 341.88<br>6" POORLY GRADED GRAVEL **GP** | | | |
| | | 9 | 25 | | | | | | | | 0.5 / 341.38<br>*Fill*, Dark brown, LEAN CLAY with sand, stiff, moist **CL** | | | 18.2 |
| 2 | 340 | 5 | | | 2 | | | | | | | | | |
| | | 3 | | | | | | | | | | | | |
| | | 1 | 65 | | | | | | | | SAME, Red and brown, soft | | | 21.0 |
| | | 2 | | | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | |
| 4 | | 4 | | | 4 | | | | | | | | | |
| | | 3 | | | | | | | | | | | | |
| | | 1 | 75 | | | | | | | | 4.5 / 337.38<br>*Fill*, Light brown, SILTY LEAN CLAY, contains rootlets, trace sand, soft, moist **CL-ML** | | | 22.6 |
| | | 1 | | | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | |
| 6 | | 2 | | | 6 | | | | | | SAME, firm | | | |
| | 335 | 2 | 100 | | | | | | | | | | | 22.6 |
| | | 3 | | | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | |
| 8 | | 1 | | | 8 | | | | | | 8.0 / 333.88<br>*Residuum*, Red and brown, LEAN CLAY with sand, contains slight siltstone rock fragments, firm, moist **CL** | | | |
| | | 2 | | | | | | | | | | | | |
| | | 4 | 100 | | | | | | | | | | | 24.3 |
| | | 10 | | | | | | | | | | | | |
| 10 | | 4 | | | 10 | | | | | | SAME, stiff | | | |
| | | 7 | | | | | | | | | | | | |
| | | 8 | 75 | | | | | | | | | | | 25.3 |
| | | 11 | | | | | | | | | | | | |
| 12 | 330 | | | | 12 | | | | | | *Boring Terminated at 12.0 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 6.0 feet

**PAGE 1 OF 1**
**16EB-06**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** U.S. ROUTE 50 EAST BOUND

**16EB-07**
**PAGE 1 OF 1**

STATION: 220+00 OFFSET: 5' Rt
NORTHING: 7027744.382 ft Easting: 11752134.53 ft
SURFACE ELEVATION: 337.72 ft COORD. DATUM: VA North

Date(s) Drilled: 05-25-16 - 05-25-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: I. Whitehead, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**FIELD DATA** / **LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LAB: LIQUID LIMIT (LL) | LAB: PLASTICITY INDEX (PI) | LAB: MOISTURE CONTENT (%) | LAB: FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 7 | | | | | | | | | 0.0 / 337.72<br>4" POORLY GRADED GRAVEL **GP** | | | | |
| | | 6 | 75 | | | | | | | | 0.3 / 337.42<br>*Residdum*, Red and brown, LEAN CLAY with sand, contains slight siltstone rock fragments, very stiff to very hard **CL** | 31 | 9 | 15.8 | 81.2 |
| | | 10 | | | | | | | | | | | | | |
| | | 12 | | | | | | | | | | | | | |
| 2 | | 8 | | | 2 | | | | | | SAME, very hard | | | | |
| | | 21 | | | | | | | | | | | | | |
| | 335 | | 81 | | | | | | | | | | | 11.7 | |
| | | 76 | | | | | | | | | | | | | |
| | | 24/1 | | | 3.6 | | | | | | 3.0 / 334.72<br>*IGM*, Gray and brown, LEAN CLAY, trace sand, moist **CL** | | | | |
| 4 | | 100/3 | 67 | | 4<br>4.3 | | | | | | | | | 13.4 | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 6 | | 100/5 | 100 | | 6<br>6.4 | | | | | | | | | 11.7 | |
| | | | | | | | | | | | *Boring Terminated at 6.4 feet.* | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 3.4 feet

**PAGE 1 OF 1**
**16EB-07**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** U.S. ROUTE 50 EAST BOUND

**16EB-08**
**PAGE 1 OF 1**

STATION: 222+00 OFFSET: 5.7' Rt
NORTHING: 7027655.906 ft Easting: 11752312.59 ft
SURFACE ELEVATION: 327.04 ft COORD. DATUM: VA North

## FIELD DATA

Date(s) Drilled: 05-25-16 - 05-25-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: I. Whitehead, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

## LAB DATA

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LAB: LIQUID LIMIT (LL) | LAB: PLASTICITY INDEX (PI) | LAB: MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 7 | | | | | | | | | 0.0 / 327.04<br>*FILL*, SILTY SAND, trace gravel, loose, moist **SM** | | | |
| | | 6 | | | | | | | | | 0.3 / 326.74<br>Fill, Dark brown, SILTY LEAN CLAY, trace sand and gravel, medium dense, moist **CL-ML** | | | 6.2 |
| | | 4 | 60 | | | | | | | | | | | |
| 2 | 325 | 3 | | | 2 | | | | | | SAME, medium dense | | | |
| | | 6 | | | | | | | | | | | | |
| | | 8 | 75 | | | | | | | | | | | 16.5 |
| | | 9 | | | | | | | | | | | | |
| | | 11 | | | 4 | | | | | | | | | |
| 4 | | 5 | | | | | | | | | 4.0 / 323.04<br>Light brown, LEAN CLAY, trace sand, stiff, moist **CL** | | | |
| | | 7 | | | | | | | | | | | | |
| | | 5 | 100 | | | | | | | | | | | 20.9 |
| | | 5 | | | | | | | | | | | | |
| 6 | | 3 | | | 6 | | | | | | | | | |
| | | 4 | | | | | | | | | | | | |
| | 320 | 6 | 80 | | | | | | | | | | | 29.8 |
| | | 10 | | | | | | | | | | | | |
| 8 | | 4 | | | 8 | | | | | | | | | |
| | | 6 | | | | | | | | | | | | |
| | | 5 | 100 | | | | | | | | | | | 15.8 |
| | | 7 | | | | | | | | | | | | |
| 10 | | 11 | | | 10 | | | | | | 9.5 / 317.54<br>*Residuum*, Red and brown, LEAN CLAY with sand, very stiff, moist **CL** | | | |
| | | 13 | | | | | | | | | | | | |
| | | 14 | 100 | | | | | | | | | | | 21.1 |
| | | 18 | | | | | | | | | | | | |
| 12 | | | | | 12 | | | | | | *Boring Terminated at 12.0 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 5.8 feet

**PAGE 1 OF 1**
**16EB-08**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** U.S. ROUTE 50 EAST BOUND

**16EB-09**
**PAGE 1 OF 1**

STATION: 224+00 OFFSET: 7.4' Rt
NORTHING: 7027564.789 ft Easting: 11752491.94 ft
SURFACE ELEVATION: 318.54 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 05-25-16 - 05-25-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: I. Whitehead, ECS Mid-Atlantic, LLC

**GROUND WATER**
▽ FIRST ENCOUNTERED AT 8.0 ft DEPTH
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT LL | PLASTICITY INDEX PI | MOISTURE CONTENT (%) | FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 0.0 / 318.54<br>4" POORLY GRADED GRAVEL **GP** | | | | |
| | | 7<br>5<br>4 | 75 | | | | | | | | 0.3 / 318.24<br>*Fill*, Brown, fine to medium, CLAYEY SAND contains siltstone rock fragments, loose, moist **SC** | | | 18.1 | |
| 2 | | 12<br>15<br>21 | 100 | | 2 | | | | | | 1.0 / 317.54<br>*Residuum*, Brown, SANDY LEAN CLAY, slightly micaceous, moist, stiff **CL**<br>SAME, hard | 27 | 15 | 6.8 | 55.3 |
| | 315 | 35<br>65/5 | | | 3.9 | | | | | | | | | | |
| 4 | | 29<br>33 | 100 | | 4 | | | | | | SAME, very hard | | | 12.6 | |
| | | 67 | | | 5.5 | | | | | | 5.0 / 313.54<br>*IGM*, Brown, SILTY CLAY, contains slight siltstone rock fragments, moist **CL-ML** | | | | |
| 6 | | 22<br>42 | 93 | | 6 | | | | | | | | | 14.4 | |
| | | 58/5 | | | 7.4 | | | | | | | | | | |
| 8 ▽ | | 16 | | | 8 | | | | | | | | | | |
| | 310 | 33<br>67/5 | 100 | | 9.4 | | | | | | *Boring Terminated at 8.9 feet.* | | | 15.8 | |
| 10 | | | | | | | | | | | | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 6.0 feet
Bulk sample obtained for CBR testing from 1.0 to 5.0 feet

**PAGE 1 OF 1**
**16EB-09**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000.012512:16-6-27

Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** ABUTMENT A

**16LBG-01**
**PAGE 1 OF 1**

STATION: 388+50 OFFSET: 67' Lt
NORTHING: 7026270.94 ft Easting: 11750236.44 ft
SURFACE ELEVATION: 301.11 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-11-16 - 03-11-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: D. Caria, ECS Mid-Atlantic, LLC

**GROUND WATER**
▽ FIRST ENCOUNTERED AT 8.2 ft DEPTH
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT LL | PLASTICITY INDEX PI | MOISTURE CONTENT (%) | FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 3 | | | | | | | | | 0.0 / 301.11 | | | | |
| | 300 | 4 5 9 | 85 | | 2 | | | | | | *Residuum*, Dark brown, SILT, contains rootlets, stiff, moist **ML** | | | 21.8 | |
| 2 | | 5 16 18 14 | 100 | | 4 | | | | | | SAME, Red-brown, no rootlets, hard | | | 22.6 | |
| 4 | | 17 23 26 31 | 100 | | | | | | | | 4.0 / 297.11 Reddish brown, CLAYEY GRAVEL, with sand, dense, moist **GC** | | | 9.4 | 23.9 |
| 6 | 295 | 50/1 | 100 | | 6 6.1 | | | | | | 6.0 / 295.11 *IGM*, Red-brown, SILT, moist **ML** | | | 6.9 | |
| 8 | | | | | 8.5 | | | | | | *Auger Refusal at 8.5 feet.* | | | | |
| 10 | | | | | | | | | | | 8.5 / 292.61 Moderately weathered, hard, thin bedding, moderately fractured, brown, SILTSTONE, 9.3' to 9.7'; highly weathered **SLS** | | | | |
| | 290 | | | | | 96 | 83 | | | | | | | | |
| 12 | | | | | | | | | | | | | | | |
| 14 | | | | | 13.5 | | | | | | SAME, 13.5' to 14.5' and 15.2' to 15.6' highly weathered | | | | |
| 16 | 285 | | | | | 84 | 48 | | | | | | | | |
| 18 | | | | | 18.5 | | | | | | SAME, 19.9' to 20.1' highly weathered | | | | |
| 20 | | | | | | | | | | | | | | | |
| | 280 | | | | | 98 | 73 | | | | | | | | |
| 22 | | | | | 23.5 | | | | | | *Boring Terminated at 23.5 feet.* | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 8.5 feet

**PAGE 1 OF 1**
**16LBG-01**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** ABUTMENT A

**16LBG-02**
**PAGE 1 OF 1**

STATION: 390+50 OFFSET: 67.5' Rt
NORTHING: 7026357.819 ft Easting: 11750465.66 ft
SURFACE ELEVATION: 300.97 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-11-16 - 03-11-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: D. Caria, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 300 | 1<br>1<br>1<br>1 | 85 | | 2 | | | | | | 0.0 / 300.97<br>*Residuum*, Brown, SILT, trace sand and clay, contains slight rootlets, soft **ML** | | | 20.6 |
| 2 | | 2<br>2<br>1<br>2 | 100 | | 4 | | | | | | | | | 14.7 |
| 4 | | 3<br>14<br>17<br>23 | 60 | | 6 | | | | | | SAME, Red-brown, no rootlets, hard | | | 6.4 |
| 6 | 295 | 41<br>50/3 | 100 | | 6.8 | | | | | | 6.0 / 294.97<br>*IGM*, Red-brown, SILT, moist **ML** | | | |
| 8 | | 50/1 | 100 | | 8<br>8.1 | | | | | | *Split-Spoon Refusal at 8.1 feet.*<br>8.1 / 292.87<br>Moderately weathered, moderately hard, thin bedding, moderately fractured, brown, SILTSTONE **SLS** | | | |
| 10 | | | | | | 100 | 80 | | | | | | | |
| 12 | 290 | | | | | | | | | | | | | |
| 14 | | | | | 13.1 | | | | | | | | | |
| 16 | 285 | | | | | 100 | 80 | | | | | | | |
| 18 | | | | | 18.1 | | | | | | *Boring Terminated at 18.1 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 8.0 feet

**PAGE 1 OF 1**
**16LBG-02**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** ABUTMENT B

**16LBG-03**
**PAGE 1 OF 1**

STATION: 389+70 OFFSET: 67.5' Lt
NORTHING: 7026360.144 ft Easting: 11750308.97 ft
SURFACE ELEVATION: 301.46 ft COORD. DATUM: VA North

Date(s) Drilled: 03-16-16 - 03-16-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
▽ FIRST ENCOUNTERED AT 6.0 ft DEPTH
NO LONG-TERM MEASUREMENTS TAKEN

**FIELD DATA** / **LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LAB: LIQUID LIMIT (LL) | LAB: PLASTICITY INDEX (PI) | LAB: MOISTURE CONTENT (%) | LAB: FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | 0.0 / 301.46<br>4" TOPSOIL **TOPS** | | | 24.3 | |
| 2 | 300 | 1 2 1 3 | 100 | | 2 | | | | | | 0.4 / 301.06<br>*Alluvium*, Dark brown, LEAN CLAY with sand, contains slight rootlets, soft **CL** | 41 | 23 | 26.5 | 77.9 |
| 4 | | 1 2 2 3 | 100 | | 4 | | | | | | SAME, Tan-brown, very stiff | | | | |
| 6 | 295 | 8 11 16 23<br>53 47/4 | 80<br>38 | | 6<br>6.8 | | | | | | 5.0 / 296.46<br>*Residumm*, Dark brown, SANDY GRAVEL (siltstone rock fragments) with clay, very stiff, moist **GW-GC** | | | 6.2<br>9.9 | |
| 8 | | 100/4 | 67 | | 8<br>8.3 | | | | | | 6.0 / 295.46<br>*IGM*, Brown, CLAYEY SAND, contains siltstone rock fragments, very dense, wet **SC** | | | 6.2 | |
| 10 | | | | | | | | | | | | | | | |
| 12 | 290 | | | | | | | | | | | | | | |
| 14 | | 100/4 | 100 | | 13.5<br>13.8 | | | | | | SAME, Red, moist | | | 8.6 | |
| 16 | 285 | | | | | | | | | | | | | | |
| 18 | | 100/3<br>50/1 | 100<br>80 | | 18.5<br>18.7<br>19<br>19.1 | | | | | | *Split-Spoon Refusal at 19.1 feet.* | | | 8.1<br>13.4 | |
| 20 | | | | | | | | | | | 19.1 / 282.36<br>Moderately weathered, moderately hard, thin bedding, moderately fractured, brown, SILTSTONE, 19.1' to 22.7' washed out **SLS** | | | | |
| 22 | 280 | | | | | 28 | 13 | | | | | | | | |
| 24 | | | | | 24.1 | | | | | | SAME, Red-brown to maroon and gray, slightly effervescent | | | | |
| 26 | 275 | | | | | 96 | 72 | | | | | | | | |
| 28 | | | | | 29.1 | | | | | | SAME, slightly fractured | | | | |
| 30 | | | | | | | | | | | | | | | |
| 32 | 270 | | | | | 96 | 91 | | | | | | | | |
| 34 | | | | | 34.1 | | | | | | *Boring Terminated at 34.1 feet.* | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 11.4 feet

**PAGE 1 OF 1**
**16LBG-03**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000.012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** ABUTMENT B

**16LBG-04**
**PAGE 1 OF 1**

STATION: 391+75 OFFSET: 69.5' Rt
NORTHING: 7026455.252 ft Easting: 11750535.85 ft
SURFACE ELEVATION: 297.73 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-16-16 - 03-16-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 0.0 / 297.73<br>8" TOPSOIL **TOPS** | | | |
| 2 | 295 | 2<br>1<br>2<br>2<br>2<br>3<br>3<br>1 | 50 | | 2 | | | | | | 0.5 / 297.23<br>*Alluvium*, Gray, tan, and red, LEAN CLAY with sand, contains slight rootlets, soft, moist **CL** | | | 29.8 |
| 4 | | 18<br>37<br>63/3 | 45 | | 4<br>5.2 | | | | | | SAME, firm | | | 23.6 |
| 6 | | 68<br>32/2 | | | 6<br>6.7 | | | | | | 5.0 / 292.73<br>*IGM*, Red, CLAYEY SAND, contains siltstone rock fragments, moist **SC** | | | 9.3 |
| 8 | 290 | 50/1 | 80 | | 8<br>8.1 | | | | | | | | | 4.6 |
| 10 | | | | | | | | | | | 8.0 / 289.73<br>Red, POORLY GRADED GRAVEL (silstone rock fragments), with clay and sand, moist **GP** | | | 2.2 |
| 12 | 285 | | | | | | | | | | | | | |
| 14 | | 50/1 | 80 | | 13.5<br>13.6<br>14 | | | | | | *Auger Refusal at 14.0 feet.*<br>14.0 / 283.73<br>Moderately weathered, moderately hard, thin bedding, moderately to highly fractured, red to maroon, SILTSTONE, slightly effervescent **SLS** | | | 2.9 |
| 16 | | | | | | 100 | 54 | | | | | | | |
| 18 | 280 | | | | | | | | | | SAME, gray (from 18.5' to 19.0') | | | |
| 20 | | | | | 19<br>20 | 100 | 80 | | | | 19.0 / 278.73<br>Slightly weathered, moderately hard, slightly to moderately fractured, gray, HORNFELS, core barrel clog/not working properly, so coring run was terminated **MSLS** | | | |
| 22 | 275 | | | | | 97 | 57 | | | | 20.0 / 277.73<br>Moderately weathered, moderately hard, thin bedding, slightly to moderately fractured, red to maroon, SILTSTONE, slightly effervescent **SLS** | | | |
| 24 | | | | | 25 | | | | | | *Boring Terminated at 25.0 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 1.0 feet

**PAGE 1 OF 1**
**16LBG-04**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** MARWOOD DRIVE

**16MD-01**
**PAGE 1 OF 1**

STATION: 43+00 OFFSET: 5' Lt
NORTHING: 7026887.086 ft Easting: 11750673.66 ft
SURFACE ELEVATION: 324.58 ft COORD. DATUM: VA North

Date(s) Drilled: 03-15-16 - 03-15-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**FIELD DATA** | **LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LAB: LIQUID LIMIT (LL) | LAB: PLASTICITY INDEX (PI) | LAB: MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.3 | | | | | | 0.0 / 324.58<br>4" ASPHALT **ASPH** | | | |
| | | | | | | | | | | | 0.3 / 324.28<br>8" AGGREGATE BASE **GP** | | | 7.0 |
| 2 | | 7 9 8 14 | 63 | | 2.3 | | | | | | 1.0 / 323.58<br>*Fill*, Red, CLAYEY SAND, with gravel, medium dense, wet from coring **SC** | | | |
| | | 2 2 3 3 | 65 | | 2.5 | | | | | | 1.5 / 323.08<br>Red, POORLY GRADED GRAVEL, with clay and sand, medium dense, moist **GP-GC** | | | 13.9 |
| 4 | 320 | 4 7 4 6 | 75 | | 4.5 | | | | | | 2.2 / 322.38<br>Red, CLAYEY GRAVEL, with sand, medium dense, moist **GC**<br>SAME, loose | | | |
| 6 | | 7 9 8 11 | 80 | | 6.5 | | | | | | 4.6 / 319.98<br>*Residuum*, Red, SILT, with sand, slightly micaceous, stiff, moist **ML**<br>SAME, very stiff | | | 20.1 |
| 8 | | 9 13 14 13 | 100 | | 8.5 | | | | | | | | | 19.9 |
| 10 | 315 | | | | 10.5 | | | | | | | | | 13.9 |
| 12 | | | | | | | | | | | | | | |
| 14 | | 7 11 9 | 107 | | 13.5 | | | | | | | | | 17.1 |
| | 310 | | | | 15 | | | | | | 15.0 / 309.58<br>*IGM*, Red, SANDY LEAN CLAY, contains slight siltstone rock fragments, moist **CL** | | | |
| 16 | | | | | 17 | | | | | | | | | |
| 18 | | 14 22 45 | 107 | | 18.5 | | | | | | *Boring Terminated at 18.5 feet.* | | | 10.7 |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 6.3 feet

**PAGE 1 OF 1**
**16MD-01**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** MARWOOD DRIVE

**16MD-02**
**PAGE 1 OF 1**

STATION: 45+00 OFFSET: 6.5' Lt
NORTHING: 7026887.086 ft Easting: 11750673.66 ft
SURFACE ELEVATION: 319.26 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-15-16 - 03-15-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | | | | | | | | | 0.0 / 319.26<br>1" TOPSOIL **TOPS** | | | |
| | | 2 | | | | | | | | | 0.08 / 319.18<br>*Residuum*, Red, LEAN CLAY with sand, contains heavy concentrations of siltstone rock fragments, firm, moist **CL** | | | |
| | | 3 | 100 | | | | | | | | | | | 17.5 |
| | | 4 | | | | | | | | | | | | |
| 2 | | 3 | | | 2 | | | | | | SAME, stiff | | | |
| | | 3 | | | | | | | | | | | | |
| | | 3 | 100 | | | | | | | | | | | 10.4 |
| | | 8 | | | | | | | | | | | | |
| | | 19 | | | | | | | | | | | | |
| 4 | | | | | 4 | | | | | | SAME, very hard | | | |
| | 315 | 23 | | | | | | | | | | | | |
| | | 34 | 93 | | | | | | | | 4.5 / 314.76<br>*IGM*, Tan and gray, CLAYEY GRAVEL (siltstone rock fragments), with sand, moist **GC** | | | 5.1 |
| | | 66/5 | | | 5.4 | | | | | | | | | |
| 6 | | 100/5 | | | 6 | | | | | | 6.0 / 313.26<br>Gray, SANDY LEAN CLAY, contains siltstone rock fragments, moist **CL** | | | |
| | | | 100 | | 6.4 | | | | | | | | | |
| 8 | | 50/1 | 80 | | 8<br>8.1 | | | | | | 8.0 / 311.26<br>Gray, CLAYEY GRAVEL (siltstone rock fragments), with sand, moist **GC**<br>*Split-Spoon Refusal at 8.1 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 5.3 feet

**PAGE 1 OF 1**
**16MD-02**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-01**
**PAGE 1 OF 1**

STATION: 372+00 OFFSET: 22' Lt
NORTHING: 7024853.49 ft Easting: 11749408.49 ft
SURFACE ELEVATION: 327.58 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-09-16 - 03-09-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: D. Caria, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT LL | PLASTICITY INDEX PI | MOISTURE CONTENT (%) | FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | | | | | | | | | 0.0 / 327.58<br>2" TOPSOIL **TOPS** | | | | |
| | | 15 | 65 | | | | | | | | 0.2 / 327.38<br>*FILL*, Dark brown, SANDY SILT, contains slight rootlets, very stiff, moist **SM** | | | | |
| | | 15 | | | | | | | | | 0.5 / 327.08<br>*RESIDUUM*, Gray, fine to coarse, SILTY GRAVEL (siltstone rock fragments) with sand, dense, moist **GM** | | | 33.5 | |
| | | 28 | | | | | | | | | | | | | |
| 2 | | 14 | | | 2 | | | | | | 2.0 / 325.58<br>*IGM*, Gray, fine to coarse, CLAYEY GRAVEL (siltstone rock fragments), with sand, very dense, moist **GC** | | | | |
| | 325 | 50/5 | 100 | | 2.9 | | | | | | | 31 | 13 | 7.1 | 24.3 |
| 4 | | 14 | | | 4 | | | | | | SAME, Red and brown | | | | |
| | | 31 | 69 | | | | | | | | | | | 29.6 | |
| | | 50/5 | | | 5.3 | | | | | | | | | | |
| 6 | | 50/5 | | | 6 | | | | | | | | | | |
| | | | 44 | | 6.9 | | | | | | | | | 14.0 | |
| | 320 | 50/1 | 80 | | 7.5<br>7.6 | | | | | | SAME, Gray<br>*Split-Spoon Refusal at 7.6 feet.* | | | 9.4 | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 6.2 feet
Bulk sample obtained for CBR testing from 2.0 to 6.0 feet

**PAGE 1 OF 1**
**16NB-01**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000.012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-02**
**PAGE 1 OF 1**

STATION: 374+00 OFFSET: 30' Lt
NORTHING: 7025047.141 ft Easting: 11749462.37 ft
SURFACE ELEVATION: 330.32 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-09-16 - 03-09-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: D. Caria, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) | FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 330 | 1 | | | | | | | | | 0.0 / 330.32<br>2" TOPSOIL **TOPS** | | | | |
| | | 3 | 75 | | | | | | | | 0.2 / 330.12<br>*Fill*, Brown, CLAYEY SAND, with gravel, medium dense, moist **SC** | | | 26.2 | |
| | | 8 | | | | | | | | | | | | | |
| 2 | | 6 | | | 2 | | | | | | SAME, Red and brown | | | | |
| | | 4 | | | | | | | | | | | | | |
| | | 8 | 80 | | | | | | | | | 29 | 12 | 8.7 | 28.0 |
| | | 13 | | | | | | | | | 3.0 / 327.32<br>*IGM*, Red and brown, fine to medium, SILTY GRAVEL (siltstone rock fragments) with sand, very hard, moist **GM** | | | | |
| | | 17 | | | | | | | | | | | | | |
| 4 | | 27 | | | 4 | | | | | | | | | | |
| | | 50/3 | 88 | | | | | | | | | | | 7.4 | |
| | | | | | 4.8 | | | | | | | | | | |
| | 325 | | | | | | | | | | | | | | |
| 6 | | 50/4 | 100 | | 6 | | | | | | | | | 8.4 | |
| | | | | | 6.3 | | | | | | | | | | |
| 8 | | 26 | | | 8 | | | | | | SAME, Green and red | | | | |
| | | 50/2 | 86 | | | | | | | | | | | 0.1 | |
| | | | | | 8.7 | | | | | | *Boring Terminated at 8.7 feet.* | | | | |
| 10 | | | | | | | | | | | | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 5.3 feet
Bulk sample obtained for CBR testing from 1.0 to 5.0 feet

**PAGE 1 OF 1**
**16NB-02**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-03**
**PAGE 1 OF 1**

STATION: 376+00 OFFSET: 27' Lt
NORTHING: 7025229.665 ft Easting: 11749550.84 ft
SURFACE ELEVATION: 332.17 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-09-16 - 03-09-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: D. Caria, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | | | | | | | | | 0.0 / 332.17<br>2" TOPSOIL **TOPS** | | | |
| | | 2 | | | | | | | | | 0.2 / 331.97<br>*Fill*, Brown, SANDY SILT with gravel, contains slight rootlets, firm, moist **SM** | | | 24.4 |
| | | 3 | 80 | | | | | | | | | | | |
| | | 5 | | | | | | | | | | | | |
| 2 | 330 | 4 | | | 2 | | | | | | SAME, Green and brown, stiff | | | |
| | | 5 | | | | | | | | | | | | |
| | | 4 | 100 | | | | | | | | | | | 24.2 |
| | | 4 | | | | | | | | | | | | |
| 4 | | 4 | | | 4 | | | | | | 4.0 / 328.17<br>*Residuum*, Gray and brown, FAT CLAY, firm, moist **CH** | | | |
| | | 3 | | | | | | | | | | | | 41.4 |
| | | 2 | 75 | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | |
| 6 | | 4 | | | 6 | | | | | | 6.0 / 326.17<br>Red and brown, medium to coarse, LEAN CLAY, with sand, contains heavy concentrations of siltstone rock fragments, stiff, moist **CL** | | | |
| | | 8 | | | | | | | | | | | | |
| | 325 | 6 | 65 | | | | | | | | | | | 19.2 |
| | | 4 | | | | | | | | | | | | |
| 8 | | 4 | | | 8 | | | | | | SAME, firm | | | |
| | | 3 | | | | | | | | | | | | |
| | | 4 | 100 | | | | | | | | | | | 24.4 |
| | | 4 | | | | | | | | | | | | |
| 10 | | 50/2 | 50 | | 10<br>10.2 | | | | | | 10.0 / 322.17<br>*IGM*, Red and brown, fine to medium, CLAYEY GRAVEL (siltstone rock fragments), with sand, very dense, moist **GC**<br>*Boring Terminated at 10.2 feet.* | | | 6.1 |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 7.3 feet

**PAGE 1 OF 1**
**16NB-03**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-04**
**PAGE 1 OF 1**

STATION: 377+00 OFFSET: 0'
NORTHING: 7025399.441 ft Easting: 11749649.54 ft
SURFACE ELEVATION: 331.52 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 06-02-16 - 06-02-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: R. Wilcher, Connelly & Associates, Inc.
Logger: S. Consolvo, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT LL | PLASTICITY INDEX PI | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 6 12 22 | 100 | | | | | | | | 0.0 / 331.52<br>1" TOPSOIL **TOPS**<br>0.1 / 331.42<br>*Fill*, Red and gray, SANDY SILT with gravel, contains slight rootlets, hard, moist **ML** | | | |
| | 330 | 10 | | | | | | | | | 1.5 / 330.02<br>Gray, fine to medium, SILTY GRAVEL, slightly micaceous, dense, moist **GM** | | | |
| 2 | | 5 5 9 | 100 | | 2 | | | | | | 2.0 / 329.52<br>Red and brown, SANDY SILT with gravel, slightly micaceous, stiff, moist **ML** | | | |
| | | 8 | | | | | | | | | | | | |
| 4 | | 5 13 18 | 100 | | 4 | | | | | | 4.0 / 327.52<br>*Residuum*, Red and brown, SANDY SILT, contains siltstone rock fragments, hard, moist **ML** | | | |
| | | 20 | | | | | | | | | | | | |
| 6 | | 10 | | | 6 | | | | | | SAME, Green and red | | | |
| | 325 | 25 | 100 | | | | | | | | | | | |
| | | 27 | | | | | | | | | | | | |
| | | 32 | | | | | | | | | | | | |
| 8 | | 100/2 | 100 | | 8<br>8.2 | | | | | | 8.0 / 323.52<br>*IGM*, Gray and green, medium to coarse, SILTY GRAVEL (siltstone rock fragments), with sand, very dense, moist **GM** | | | |
| | | 100/1 | 100 | | 8.7<br>8.8 | | | | | | *Split-Spoon Refusal at 8.8 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 8.3 feet

**PAGE 1 OF 1**
**16NB-04**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-05**
**PAGE 1 OF 1**

STATION: 378+00 OFFSET: 39.5' Lt
NORTHING: 7025399.441 ft Easting: 11749649.54 ft
SURFACE ELEVATION: 330.42 ft COORD. DATUM: VA North

Date(s) Drilled: 03-09-16 - 03-09-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: D. Caria, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**FIELD DATA** / **LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) | FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 330 | 6 | | | | | | | | | 0.0 / 330.42<br>2" TOPSOIL **TOPS** | | | | |
| | | 8 | | | | | | | | | 0.1 / 330.32<br>*Fill*, Brown, fine to medium, SILTY SAND, with gravel, slightly micaceous, medium dense, moist **SM** | | | | |
| | | 11 | 75 | | | | | | | | | | | 18.8 | |
| | | 15 | | | | | | | | | | | | | |
| 2 | | | | | 2 | | | | | | 2.0 / 328.42<br>*RESIDUUM*, Red and brown, CLAYEY SAND, contains siltstone rock fragments, dense, moist **SC** | | | | |
| | | 8 | | | | | | | | | | | | | |
| | | 13 | | | | | | | | | | | | | |
| | | 17 | 65 | | | | | | | | | 37 | 16 | 14.2 | 41.6 |
| | | 15 | | | | | | | | | | | | | |
| 4 | | | | | 4 | | | | | | SAME, very dense | | | | |
| | | 8 | | | | | | | | | | | | | |
| | | 32 | 86 | | | | | | | | 4.5 / 325.92<br>*IGM*, Red and brown, SANDY SILT, very hard, moist **ML** | | | 11.3 | |
| | | 50/5 | | | | | | | | | | | | | |
| | 325 | | | | 5.4 | | | | | | | | | | |
| 6 | | | | | 6 | | | | | | | | | | |
| | | 34 | | | | | | | | | | | | | |
| | | 31 | | | | | | | | | | | | | |
| | | | 94 | | | | | | | | | | | 17.2 | |
| | | 46 | | | | | | | | | | | | | |
| | | 50/2 | | | 7.7 | | | | | | | | | | |
| 8 | | | | | 8 | | | | | | | | | | |
| | | 24 | | | | | | | | | | | | | |
| | | 50/2 | | | 8.7 | | | | | | | | | 12.1 | |
| | | | | | | | | | | | *Boring Terminated at 8.7 feet.* | | | | |
| 10 | | | | | | | | | | | | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 6.3 feet
Bulk sample obtained for CBR testing from 2.0 to 5.0 feet

**PAGE 1 OF 1**
**16NB-05**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000.012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-06**


STATION: 379+00 OFFSET: 45' Rt
NORTHING: 7025442.259 ft Easting: 11749783.94 ft
SURFACE ELEVATION: 329.47 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-09-16 - 03-09-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: D. Caria, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT LL | PLASTICITY INDEX PI | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 0.0 / 329.47<br>6" ASPHALT **ASPH** | | | |
| | | 33 | | | 0.5 | | | | | | 0.5 / 328.97<br>24" AGGREGATE BASE **GP** | | | |
| | | 26 | | | | | | | | | | | | |
| | | | 75 | | | | | | | | | | | 6.4 |
| | | 22 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | |
| | | 15 | | | 2.5 | | | | | | 2.5 / 326.97<br>*Fill*, Gray, medium to coarse, SILTY GRAVEL (siltstone rock fragments), with sand, dense, moist **GM** | | | |
| | | 9 | | | | | | | | | | | | |
| | | 11 | | | | | | | | | | | | |
| | | | 40 | | | | | | | | | | | 6.2 |
| | | 21 | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | |
| | | 32 | | | | | | | | | | | | |
| | 325 | | | | 4.5 | | | | | | 4.5 / 324.97<br>*Residuum*, Red and brown, medium to coarse, SILTY GRAVEL(siltstone rock fragments), with sand, very dense, moist **GM** | | | |
| | | 14 | | | | | | | | | | | | |
| | | 25 | | | | | | | | | | | | |
| | | | 60 | | | | | | | | | | | 4.7 |
| | | 33 | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | |
| | | 36 | | | | | | | | | | | | |
| | | 50/3 | 100 | | 6.5<br>6.7 | | | | | | 6.5 / 322.97<br>*IGM*, Gray, medium to coarse, SILTY GRAVEL (siltstone rock fragments), with sand, very dense, moist **GM** | | | 3.1 |
| | | 50/1 | 80 | | 7.5<br>7.6 | | | | | | *Split-Spoon Refusal at 7.6 feet.* | | | 1.0 |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 4.3 feet



SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-07**
**PAGE 1 OF 1**

STATION: 380+00 OFFSET: 20' Lt
NORTHING: 7025564.622 ft Easting: 11749781.28 ft
SURFACE ELEVATION: 333.36 ft COORD. DATUM: VA North

Date(s) Drilled: 03-10-16 - 03-10-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: D. Caria, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**FIELD DATA** / **LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 7 | | | | | | | | | 0.0 / 333.36<br>2" TOPSOIL **TOPS** | | | |
| | | 7 | | | | | | | | | 0.2 / 333.16<br>*Fill*, Light brown, SANDY SILT with gravel, slightly micaceous, stiff, moist **ML** | | | 28.8 |
| | | 7 | 100 | | | | | | | | | | | |
| | | 10 | | | 2 | | | | | | | | | |
| 2 | | 9 | | | | | | | | | 2.0 / 331.36<br>*Residuum*, Brown and red, SANDY SILT, hard, moist **ML** | | | |
| | | 15 | | | | | | | | | | | | 12.6 |
| | 330 | 24 | 100 | | | | | | | | | | | |
| | | 42 | | | 4 | | | | | | SAME, very hard | | | |
| 4 | | 17 | | | | | | | | | | | | |
| | | 23 | | | | | | | | | | | | 9.3 |
| | | 36 | 75 | | | | | | | | | | | |
| | | 45 | | | 6 | | | | | | | | | |
| 6 | | 50 | | | | | | | | | 6.0 / 327.36<br>*IGM*, Gray and brown, SANDY SILT, very hard, moist **ML** | | | 11.9 |
| | | 50/2 | 86 | | 6.7 | | | | | | | | | |
| | | 19 | | | 8 | | | | | | SAME, Red and brown, slightly micaceous | | | |
| 8 | 325 | 81/4 | 100 | | 8.8 | | | | | | | | | 6.1 |
| 10 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| | 320 | 100/2 | 50 | | 13.5<br>13.7 | | | | | | SAME, contains siltstone rock fragments<br>*Split-Spoon Refusal at 13.7 feet.* | | | 4.8 |
| 14 | | | | | | | | | | | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 8.6 feet

**PAGE 1 OF 1**
**16NB-07**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-08**
**PAGE 1 OF 1**

STATION: 381+00 OFFSET: 25' Rt
NORTHING: 7025608.447 ft Easting: 11749874.96 ft
SURFACE ELEVATION: 334.51 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-10-16 - 03-10-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: D. Caria, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 0.0 / 334.51<br>2" TOPSOIL **TOPS** | | | |
| | | 5<br>7<br>8<br>10 | 100 | | | | | | | | 0.2 / 334.31<br>*Residuum*, Brown, SANDY SILT, contains slight rootlets, stiff, moist **ML** | | | 18.7 |
| 2 | | 7<br>9<br>11<br>13 | 100 | | 2 | | | | | | SAME, slightly micaceous, no rootlets, very stiff | | | 18.8 |
| 4 | 330 | 57<br>43/5 | 89 | | 4<br>4.9 | | | | | | 4.0 / 330.51<br>*IGM*, Red and brown, SANDY SILT, slightly micaceous, very hard **ML** | | | 7.4 |
| 6 | | 100/4 | 33 | | 6<br>6.3 | | | | | | SAME, Brown, contains siltstone rock fragments | | | 8.6 |
| 8 | | 50/1 | 100 | | 8<br>8.1 | | | | | | | | | 5.7 |
| 10 | 325 | | | | | | | | | | | | | |
| 12 | | 50/1 | 100 | | 12.4<br>12.5 | | | | | | *Split-Spoon Refusal at 12.5 feet.* | | | 2.0 |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 6.3 feet

**PAGE 1 OF 1**
**16NB-08**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-09**
**PAGE 1 OF 1**

STATION: 382+00 OFFSET: 41' Lt
NORTHING: 7025730.405 ft Easting: 11749880.92 ft
SURFACE ELEVATION: 332.76 ft COORD. DATUM: VA North

Date(s) Drilled: 03-10-16 - 03-10-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: D. Caria, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**FIELD DATA** | **LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT LL | PLASTICITY INDEX PI | MOISTURE CONTENT (%) | FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 3 | | | | | | | | | 0.0 / 332.76<br>2" TOPSOIL **TOPS** | | | | |
| | | 3 | 63 | | | | | | | | 0.2 / 332.56<br>*Fill*, Red and brown, CLAYEY SAND, with gravel, slightly micaceous, contains slight rootlets, loose, moist **SC** | | | 8.6 | |
| | | 6 | | | | | | | | | | | | | |
| 2 | | 9 | | | 2 | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | | |
| | 330 | 4 | 45 | | | | | | | | | 29 | 10 | 16.7 | 45.0 |
| | | 2 | | | | | | | | | | | | | |
| 4 | | 3 | | | 4 | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | | |
| | | 4 | 10 | | | | | | | | | | | 13.8 | |
| | | 5 | | | | | | | | | | | | | |
| 6 | | 7 | | | 6 | | | | | | SAME, Gray and brown, medium dense | | | | |
| | | 3 | | | | | | | | | | | | | |
| | | 5 | 25 | | | | | | | | | | | 7.6 | |
| | | 5 | | | | | | | | | | | | | |
| | 325 | 7 | | | 8 | | | | | | | | | | |
| 8 | | 5 | | | | | | | | | 8.0 / 324.76<br>*Residuum*, Brown, SANDY SILT, slightly micaceous, very stiff, moist **ML** | | | | |
| | | 7 | | | | | | | | | | | | | |
| | | 10 | 100 | | | | | | | | | | | 17.7 | |
| | | 15 | | | 10 | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | |
| | 320 | | | | | | | | | | | | | | |
| | | 17 | | | 13.5 | | | | | | 13.5 / 319.26<br>*IGM*, Brown, SANDY SILT, very hard, moist **ML** | | | | |
| 14 | | 43 | 100 | | | | | | | | | | | 9.9 | |
| | | 49 | | | 15 | | | | | | *Boring Terminated at 15.0 feet.* | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 9.0 feet

**PAGE 1 OF 1**
**16NB-09**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000.012512:16-6-27

Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-10**
**PAGE 1 OF 1**

STATION: 383+00 OFFSET: 36' Rt
NORTHING: 7025761.917 ft Easting: 11749999.75 ft
SURFACE ELEVATION: 333.6 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-10-16 - 03-10-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: D. Caria, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 0.0 / 333.6<br>2" TOPSOIL **TOPS** | | | |
| | | 10<br>17<br>33<br>47/3 | 89 | | 1.8 | | | | | | 0.2 / 333.4<br>*Fill*, Brown, SANDY SILT, contains slight rootlets, hard, moist **ML** | | | 5.5 |
| 2 | | 100/5 | 100 | | 2<br>2.4 | | | | | | 1.0 / 332.6<br>*IGM*, Brown, SANDY SILT, very hard, moist **ML**<br><br>SAME, contains siltstone rock fragments | | | 4.6 |
| | 330 | | | | | | | | | | | | | |
| 4 | | 62<br>38/3 | 71 | | 4<br>4.7 | | | | | | | | | 5.2 |
| 6 | | 50/1 | 100 | | 6<br>6.1 | | | | | | | | | 7.4 |
| 8 | | 50/1 | 100 | | 8<br>8.1 | | | | | | *Split-Spoon Refusal at 8.1 feet.* | | | 6.2 |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 5.2 feet

**PAGE 1 OF 1**
**16NB-10**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-11**
**PAGE 1 OF 1**

STATION: 384+00 OFFSET: 26' Lt
NORTHING: 7025882.638 ft Easting: 11750009.12 ft
SURFACE ELEVATION: 335.14 ft COORD. DATUM: VA North

Date(s) Drilled: 03-10-16 - 03-10-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: D. Caria, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**FIELD DATA** / **LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LAB: LIQUID LIMIT (LL) | LAB: PLASTICITY INDEX (PI) | LAB: MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 335 | 5<br>8<br>11<br>15 | 80 | | | | | | | | 0.0 / 335.14<br>2" TOPSOIL **TOPS**<br>0.1 / 335.04<br>*Fill*, Brown, SANDY SILT, contains slight rootlets, very stiff, moist **ML** | | | 23.1 |
| 2 | | 37<br>63/3 | 88 | | 2<br>2.8 | | | | | | 2.0 / 333.14<br>*IGM*, Gray and brown, SANDY SILT, slightly micaceous, moist **ML** | | | 8.9 |
| 4 | 330 | 100/4 | 100 | | 4<br>4.3 | | | | | | SAME, Red and brown | | | 7.7 |
| 6 | | 100/2 | 100 | | 6<br>6.2 | | | | | | SAME, contains siltstone rock fragments | | | 6.9 |
| 8 | | 77<br>23/3 | 75 | | 8<br>8.8 | | | | | | | | | 7.2 |
| 10 | 325 | 50/1 | 100 | | 11.4<br>11.5 | | | | | | *Split-Spoon Refusal at 11.5 feet.* | | | 6.0 |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 5.9 feet

**PAGE 1 OF 1**
**16NB-11**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-12**
**PAGE 1 OF 1**

STATION: 385+00 OFFSET: 28' Rt
NORTHING: 7025927.124 ft Easting: 11750107.6 ft
SURFACE ELEVATION: 330.39 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-10-16 - 03-10-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: D. Caria, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT LL | PLASTICITY INDEX PI | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 330 | 3 3 3 4 | 100 | | 2 | | | | | | 0.0 / 330.39<br>2" TOPSOIL **TOPS**<br>0.2 / 330.19<br>*Fill*, Red and brown, SANDY SILT with gravel, contains slight rootlets, firm, moist **ML** | | | 19.4 |
| 2 | | 3 3 2 3 | 45 | | 4 | | | | | | | | | 20.7 |
| 4 | | 8 9 11 17 | 100 | | 6 | | | | | | 4.0 / 326.39<br>*Residuum*, Red and brown, SANDY SILT, slightly micaceous, very stiff, moist **ML** | | | 15.0 |
| 6 | 325 | 7 13 14 18 | 80 | | 8 | | | | | | | | | 19.2 |
| 8 | | 11 14 17 23 | 100 | | 10 | | | | | | SAME, hard | | | 11.0 |
| 10 | 320 | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | 12.0 / 318.39<br>*IGM*, Red and brown, SANDY SILT, contains siltstone rock fragments, slightly micaceous, moist **ML** | | | |
| 14 | | 27 73/3 | 100 | | 13.5<br>14.2 | | | | | | *Boring Terminated at 14.2 feet.* | | | 9.8 |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 6.3 feet

**PAGE 1 OF 1**
**16NB-12**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-13**
**PAGE 1 OF 1**

STATION: 386+00 OFFSET: 28' Lt
NORTHING: 7026052.452 ft Easting: 11750120.32 ft
SURFACE ELEVATION: 332.24 ft COORD. DATUM: VA North

## FIELD DATA

Date(s) Drilled: 03-10-16 - 03-10-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: D. Caria, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

## LAB DATA

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LAB: LIQUID LIMIT LL | LAB: PLASTICITY INDEX PI | LAB: MOISTURE CONTENT (%) | LAB: FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5 | | | | | | | | | 0.0 / 332.24<br>2" TOPSOIL **TOPS** | | | | |
| | | 8 | 100 | | | | | | | | 0.2 / 332.04<br>*Fill*, Red and brown, SANDY SILT with gravel, slightly micaceous, contains slight rootlets, very stiff, moist **ML** | | | 21.5 | |
| 2 | 330 | 11 | | | 2 | | | | | | 2.0 / 330.24<br>*Residuum*, Brown, SANDY LEAN CLAY, slightly micaceous, very stiff, moist **CL** | 33 | 11 | 17.3 | 67.1 |
| | | 15 | | | | | | | | | | | | | |
| | | 5 | | | | | | | | | | | | | |
| | | 7 | 100 | | | | | | | | | | | | |
| | | 9 | | | | | | | | | | | | | |
| 4 | | 12 | | | 4 | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | | |
| | | 5 | | | | | | | | | | | | 18.0 | |
| | | 11 | 100 | | | | | | | | | | | | |
| | | 13 | | | | | | | | | | | | | |
| 6 | | 4 | | | 6 | | | | | | | | | | |
| | | 9 | | | | | | | | | | | | | |
| | 325 | 11 | 65 | | | | | | | | | | | 21.1 | |
| | | 15 | | | | | | | | | | | | | |
| 8 | | 7 | | | 8 | | | | | | SAME, contains siltstone rock fragments | | | | |
| | | 13 | | | | | | | | | | | | | |
| | | 17 | 100 | | | | | | | | | | | 15.2 | |
| | | 24 | | | | | | | | | | | | | |
| 10 | | | | | 10 | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| 12 | 320 | | | | 13 | | | | | | | | | | |
| | | 19 | | | | | | | | | | | | | |
| | | 21 | | | | | | | | | SAME, hard | | | | |
| 14 | | 23 | 100 | | | | | | | | | | | 13.7 | |
| | | 26 | | | 15 | | | | | | | | | | |
| | | | | | | | | | | | *Boring Terminated at 15.0 feet.* | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 4.3 feet
Bulk sample obtained for CBR testing from 2.0 to 6.0 feet

**PAGE 1 OF 1**
**16NB-13**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-14**
**PAGE 1 OF 1**

STATION: 387+00 OFFSET: 40' Rt
NORTHING: 7026081.867 ft Easting: 11750233.88 ft
SURFACE ELEVATION: 320.9 ft COORD. DATUM: VA North

Date(s) Drilled: 03-10-16 - 03-10-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: D. Caria, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**FIELD DATA** | **LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LAB: LIQUID LIMIT (LL) | LAB: PLASTICITY INDEX (PI) | LAB: MOISTURE CONTENT (%) | LAB: FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 0.0 / 320.9<br>2" TOPSOIL **TOPS** | | | | |
| | 320 | 2<br>3<br>3 | 30 | | 2 | | | | | | 0.2 / 320.7<br>*Fill*, Red and brown, LEAN CLAY, with sand, slightly micaceous, contains slight rootlets, firm, moist **CL** | | | 13.2 | |
| 2 | | 2<br>2<br>2 | 40 | | 4 | | | | | | SAME, soft | | | 21.0 | |
| 4 | | 2<br>3<br>3 | 45 | | 6 | | | | | | SAME, stiff | 30 | 9 | 18.0 | 80.5 |
| 6 | 315 | 6<br>5<br>4 | 100 | | 8 | | | | | | | | | 20.8 | |
| 8 | | 5<br>5<br>7 | 65 | | 10 | | | | | | SAME, hard | | | 10.3 | |
| | | 17<br>17<br>23<br>24 | | | | | | | | | | | | | |
| 10 | 310 | | | | | | | | | | 11.0 / 309.9<br>*IGM*, Red and brown, medium to coarse, SILTY GRAVEL (siltstone rock fragments) with sand, slightly micaceous, moist **GM** | | | | |
| 12 | | | | | | | | | | | | | | | |
| 14 | | 100/5 | 25 | | 13.5<br>13.9 | | | | | | *Boring Terminated at 13.9 feet.* | | | 6.4 | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 8.3 feet

**PAGE 1 OF 1**
**16NB-14**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000.012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-15**
**PAGE 1 OF 1**

STATION: 388+00 OFFSET: 25' Lt
NORTHING: 7026204.772 ft Easting: 11750241.98 ft
SURFACE ELEVATION: 311.82 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-11-16 - 03-11-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: D. Caria, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 2 | | | | | | | | | 0.0 / 311.82<br>2" TOPSOIL **TOPS** | | | |
| | | 4 | | | | | | | | | 0.16 / 311.66<br>*Residuum*, Dark brown, medium to coarse, POORLY GRADED SAND with clay, contains slight rootlets and siltstone rock fragments, loose, moist **SP-SC** | | | 16.5 |
| | | 4 | 75 | | | | | | | | | | | |
| 2 | 310 | 7 | | | 2 | | | | | | | | | |
| | | 2 | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | 13.1 |
| | | 3 | 65 | | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | |
| 4 | | 2 | | | 4 | | | | | | SAME, no rootlets | | | |
| | | 3 | | | | | | | | | | | | |
| | | 1 | 15 | | | | | | | | | | | 13.0 |
| | | WOH | | | | | | | | | | | | |
| 6 | | 11 | | | 6 | | | | | | SAME, medium dense | | | |
| | 305 | 10 | | | | | | | | | | | | |
| | | 5 | 55 | | | | | | | | | | | 8.4 |
| | | 5 | | | | | | | | | | | | |
| 8 | | 16 | | | 8 | | | | | | 8.0 / 303.82<br>IGM, Red-brown, SILT, moist **ML** | | | |
| | | 19 | | | | | | | | | | | | |
| | | 27 | 65 | | | | | | | | | | | 5.2 |
| | | 34 | | | | | | | | | | | | |
| 10 | | | | | 10 | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 12 | 300 | | | | | | | | | | | | | |
| | | 50/1 | 100 | | 13<br>13.1 | | | | | | *Split-Spoon Refusal at 13.1 feet.* | | | 2.5 |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 6.2 feet

**PAGE 1 OF 1**
**16NB-15**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-16**
**PAGE 1 OF 1**

STATION: 389+00 OFFSET: 28.5' Rt
NORTHING: 7026254.342 ft Easting: 11750343.15 ft
SURFACE ELEVATION: 315.44 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-10-16 - 03-10-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: D. Caria, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT LL | PLASTICITY INDEX PI | MOISTURE CONTENT (%) | FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 315 | 16 19 21 23 | 80 | | 2 | | | | | | 0.0 / 315.44<br>2" TOPSOIL **TOPS**<br>0.2 / 315.24<br>*Residuum*, Red and brown, medium to coarse, POORLY GRADED GRAVEL (siltstone rock fragments), with clay and sand, slightly micaceous, dense, moist **GP-GC** | | | 3.7 | |
| 2 | | 10 12 24 26 | 40 | | 4 | | | | | | | | | 4.2 | |
| 4 | | 7 7 13 9 | 100 | | 6 | | | | | | SAME, medium dense | 23 | 7 | 5.3 | 10.2 |
| 6 | 310 | 8 10 15 17 | 100 | | 8 | | | | | | | | | 5.5 | |
| 8 | | 16 24 36 37 | 40 | | 10 | | | | | | SAME, dense | | | 5.5 | |
| 10 | 305 | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | 12.0 / 303.44<br>*IGM*, Red and brown, medium to coarse, SILTY GRAVEL (siltstone rock fragments) with sand, slightly micaceous, moist **GM** | | | | |
| 14 | | 50/1 | 100 | | 13.5<br>13.6 | | | | | | *Split-Spoon Refusal at 13.6 feet.* | | | 3.6 | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 8.3 feet

**PAGE 1 OF 1**
**16NB-16**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000.012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-17**
**PAGE 1 OF 1**

STATION: 391+00 OFFSET: 37' Lt
NORTHING: 7026453.76 ft Easting: 11750405.51 ft
SURFACE ELEVATION: 298.94 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-15-16 - 03-15-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 1 | | | | | | | | | 0.0 / 298.94<br>6" TOPSOIL **TOPS** | | | |
| | | 1 | 75 | | 2 | | | | | | 0.5 / 298.44<br>*Residuum*, Brown and tan, LEAN CLAY, with sand, soft, moist **CL** | | | 25.1 |
| | | 1 | | | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | |
| 2 | | 2 | | | | | | | | | SAME, firm | | | |
| | | 2 | | | | | | | | | | | | |
| | | 2 | 60 | | | | | | | | | | | 24.7 |
| | | 3 | | | | | | | | | | | | |
| | | 2 | | | 4 | | | | | | | | | |
| 4 | 295 | 2 | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | |
| | | 3 | 100 | | | | | | | | | | | 22.3 |
| | | 5 | | | | | | | | | | | | |
| | | 16 | | | | | | | | | | | | |
| 6 | | 32 | | | 6 | | | | | | 5.9 / 293.04<br>Red, Sandy LEAN CLAY, contains siltstone rock fragments, very stiff, moist **CL** | | | 4.6 |
| | | 68/4 | 63 | | 6.8 | | | | | | 6.1 / 292.84<br>*IGM*, Red, CLAYEY SAND, contains siltstone rock fragments, moist **SC** | | | |
| 8 | | 50/1 | 100 | | 8<br>8.1 | | | | | | *Split-Spoon Refusal at 8.1 feet.* | | | 3.1 |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 5.8 feet

**PAGE 1 OF 1**
**16NB-17**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-18**
**PAGE 1 OF 1**

STATION: 392+00 OFFSET: 43.25' Rt
NORTHING: 7026484.376 ft Easting: 11750526.28 ft
SURFACE ELEVATION: 297.63 ft COORD. DATUM: VA North

Date(s) Drilled: 03-15-16 - 03-15-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
▽ FIRST ENCOUNTERED AT 6.4 ft DEPTH
NO LONG-TERM MEASUREMENTS TAKEN

**FIELD DATA** | **LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LAB: LIQUID LIMIT (LL) | LAB: PLASTICITY INDEX (PI) | LAB: MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | | | | | | | | | 0.0 / 297.63<br>6" TOPSOIL **TOPS** | | | |
| | | 1 | 75 | | 2 | | | | | | 0.5 / 297.13<br>*Fill*, Tan and brown, LEAN CLAY, with sand, soft, moist **CL** | | | 34.0 |
| 2 | | 1<br>2 | | | | | | | | | | | | |
| | 295 | 2<br>2 | 100 | | 4 | | | | | | 2.1 / 295.53<br>*Alluvium*, Gray and tan, FAT CLAY, with sand, firm, moist **CH** | | | 27.1 |
| | | 4<br>6 | | | | | | | | | | | | |
| 4 | | 18<br>33 | 62 | | 5.3 | | | | | | 4.0 / 293.63<br>*IGM*, Red, CLAYEY SAND, contains siltstone rock fragments, moist **SC** | | | 10.1 |
| | | 67/4 | | | | | | | | | | | | |
| 6 | | 50/1 | 100 | | 6<br>6.1 | | | | | | | | | 8.5 |
| | | 50/1 | 100 | | 7.1<br>7.2 | | | | | | *Split-Spoon Refusal at 7.2 feet.* | | | 5.4 |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 5.9 feet

**PAGE 1 OF 1**
**16NB-18**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-19**
**PAGE 1 OF 1**

STATION: 393+00 OFFSET: 33' Lt
NORTHING: 7026627.258 ft Easting: 11750535 ft
SURFACE ELEVATION: 305.66 ft COORD. DATUM: VA North

## FIELD DATA

Date(s) Drilled: 03-15-16 - 03-15-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

## LAB DATA

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT LL | PLASTICITY INDEX PI | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 3 | | | | | | | | | 0.0 / 305.66<br>6" TOPSOIL **TOPS** | | | |
| | 305 | 4 | 100 | | | | | | | | 0.5 / 305.16<br>*Residuum*, Red and brown, LEAN CLAY, with sand, contains siltstone rock fragments, firm, moist **CL** | | | 19.8 |
| | | 4 | | | | | | | | | | | | |
| | | 7 | | | | | | | | | | | | |
| 2 | | | | | 2 | | | | | | | | | |
| | | 19 | | | | | | | | | 2.2 / 303.46<br>Red, CLAYEY SAND, contains siltstone rock fragments, dense, moist **SC** | | | |
| | | 17 | | | | | | | | | | | | |
| | | | 100 | | | | | | | | | | | 16.1 |
| | | 20 | | | | | | | | | | | | |
| | | 21 | | | | | | | | | | | | |
| 4 | | | | | 4 | | | | | | SAME, very dense | | | |
| | | 18 | | | | | | | | | | | | |
| | | 29 | | | | | | | | | | | | |
| | | | 50 | | | | | | | | | | | 17.2 |
| | | 37 | | | | | | | | | | | | |
| | | 63/4 | | | | | | | | | 5.0 / 300.66<br>*IGM*, Red, CLAYEY SAND, contains siltstone rock fragments, moist **SC** | | | |
| | 300 | | | | 5.8 | | | | | | | | | |
| 6 | | 100/5 | | | 6 | | | | | | | | | |
| | | | 50 | | 6.4 | | | | | | | | | 14.2 |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 8 | | 50/1 | 100 | | 8<br>8.1 | | | | | | *Split-Spoon Refusal at 8.1 feet.* | | | 3.2 |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 5.5 feet

**PAGE 1 OF 1**
**16NB-19**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-20**
**PAGE 1 OF 1**

STATION: 394+00 OFFSET: 21' Rt
NORTHING: 7026674.201 ft Easting: 11750635.09 ft
SURFACE ELEVATION: 307.98 ft COORD. DATUM: VA North

Date(s) Drilled: 03-15-16 - 03-15-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**FIELD DATA** / **LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LAB: LIQUID LIMIT (LL) | LAB: PLASTICITY INDEX (PI) | LAB: MOISTURE CONTENT (%) | LAB: FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | | | | | | | | | 0.0 / 307.98<br>6" TOPSOIL **TOPS** | | | | |
| | | 1 | 75 | | | | | | | | 0.5 / 307.48<br>*Residuum*, Light brown, LEAN CLAY, contains slight rootlets, soft, moist **CL** | | | 22.0 | |
| | | 1 | | | | | | | | | | | | | |
| 2 | | 2 | | | 2 | | | | | | SAME, firm, no rootlets | | | | |
| | | 6 | | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | | |
| | 305 | | 100 | | | | | | | | | 37 | 19 | 25.0 | 92.8 |
| | | 5 | | | | | | | | | | | | | |
| | | 6 | | | | | | | | | | | | | |
| 4 | | 11 | | | 4 | | | | | | SAME, very stiff | | | | |
| | | 13 | | | | | | | | | | | | | |
| | | | 75 | | | | | | | | | | | 11.3 | |
| | | 17 | | | | | | | | | 5.0 / 302.98<br>Tan and brown, SILT, with sand, contains slight siltstone rock fragments, very stiff, moist **ML** | | | | |
| | | 29 | | | | | | | | | | | | | |
| 6 | | 46 | | | 6 | | | | | | 6.0 / 301.98<br>*IGM*, Gray and brown, SANDY SILT, contains siltstone rock fragments, moist **ML** | | | | |
| | | 54/4 | 100 | | | | | | | | | | | 8.9 | |
| | | | | | 6.8 | | | | | | | | | | |
| | | 50/1 | 80 | | 7.8<br>7.9 | | | | | | 7.8 / 300.18<br>Red, SILTY GRAVEL (siltstone rock fragments), with sand, moist **GM** | | | 7.7 | |
| | | | | | | | | | | | *Split-Spoon Refusal at 7.9 feet.* | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 4.7 feet

**PAGE 1 OF 1**
**16NB-20**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000.012512:16-6-27

Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-21**
**PAGE 1 OF 1**

STATION: 395+00 OFFSET: 44.25' Lt
NORTHING: 7026794.216 ft Easting: 11750641.09 ft
SURFACE ELEVATION: 317.13 ft COORD. DATUM: VA North

Date(s) Drilled: 03-15-16 - 03-15-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**FIELD DATA** | **LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LAB: LIQUID LIMIT (LL) | LAB: PLASTICITY INDEX (PI) | LAB: MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | | | | | | | | | 0.0 / 317.13<br>4" TOPSOIL **TOPS** | | | |
| | | 13 | 75 | | | | | | | | 0.3 / 316.83<br>*Residuum*, Red and brown, SANDY LEAN CLAY, contains siltstone rock fragments, very stiff, moist **CL** | | | 7.2 |
| | | 13 | | | | | | | | | | | | |
| | | 17 | | | | | | | | | 1.1 / 316.03<br>Brownish red, CLAYEY GRAVEL (siltstone rock fragments), with sand, very stiff, moist **GC** | | | |
| 2 | 315 | 14 | | | 2 | | | | | | SAME, hard | | | |
| | | 25 | 75 | | | | | | | | | | | 9.2 |
| | | 37 | | | | | | | | | 3.0 / 314.13<br>*IGM*, Gray, SANDY GRAVEL (siltstone rock fragments), with clay, moist **GP-GC** | | | |
| | | 43 | | | | | | | | | | | | |
| 4 | | 36 | | | 4 | | | | | | | | | |
| | | 64/5 | 33 | | 4.9 | | | | | | | | | 6.0 |
| | | | | | | | | | | | | | | |
| 6 | | 100/4 | 100 | | 6<br>6.3 | | | | | | 5.75 / 311.38<br>Gray, CLAYEY SAND, moist **SC** | | | 5.5 |
| | 310 | | | | | | | | | | | | | |
| 8 | | 100/5 | 25 | | 8<br>8.4 | | | | | | 8.0 / 309.13<br>Red, POORLY GRADED GRAVEL, with clay and sand, moist **GP-GC** | | | 3.8 |
| | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 12 | 305 | 50/1 | 80 | | 12.4<br>12.5 | | | | | | *Split-Spoon Refusal at 12.5 feet.* | | | 6.6 |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 9.6 feet

**PAGE 1 OF 1**
**16NB-21**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-22**
**PAGE 1 OF 1**

STATION: 396+00 OFFSET: 35' Rt
NORTHING: 7026821.559 ft Easting: 11750759.29 ft
SURFACE ELEVATION: 308.27 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-14-16 - 03-14-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) | FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | | | | | | | | | 0.0 / 308.27<br>4" TOPSOIL **TOPS** | | | | |
| | | 2 | | | | | | | | | 0.3 / 307.97<br>*Residuum*, Red, LEAN CLAY, with sand, contains siltstone rock fragments, firm, moist **CL** | | | | |
| | | 3 | 100 | | | | | | | | | | | 23.9 | |
| | | 5 | | | | | | | | | | | | | |
| 2 | | 10 | | | 2 | | | | | | | | | | |
| | | 16 | | | | | | | | | 2.25 / 306.02<br>Red, SANDY LEAN CLAY, contains siltstone rock fragments, hard, moist **CL** | | | | |
| | 305 | 19 | 100 | | | | | | | | | | | 16.2 | |
| | | 23 | | | | | | | | | | | | | |
| 4 | | 14 | | | 4 | | | | | | | | | | |
| | | 19 | | | | | | | | | 4.3 / 303.97<br>Red, POORLY GRADED SAND, with clay, contains silstone rock fragments, dense, moist **SP-SC** | | | | |
| | | 21 | 100 | | | | | | | | | | | 10.1 | |
| | | 25 | | | | | | | | | | | | | |
| 6 | | 21 | | | 6 | | | | | | | | | | |
| | | 23 | | | | | | | | | 6.0 / 302.27<br>Red brown, SANDY LEAN CLAY, contains siltstone rock fragments, hard, moist **CL** | | | | |
| | | 34 | 25 | | | | | | | | | 28 | 11 | 10.7 | 69.7 |
| | | 36 | | | | | | | | | | | | | |
| 8 | | 100/4 | | | 8 | | | | | | | | | | |
| | 300 | | 100 | | 8.3 | | | | | | 8.0 / 300.27<br>*IGM*, Red, LEAN CLAY, with sand, contains siltstone rock fragments, very hard, moist **CL** | | | 4.3 | |
| | | 50/1 | 0 | | 9.5<br>9.6 | | | | | | *Split-Spoon Refusal at 9.6 feet.* | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 5.5 feet

**PAGE 1 OF 1**
**16NB-22**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-23**
**PAGE 1 OF 1**

STATION: 397+00 OFFSET: 30' Lt
NORTHING: 7026947.773 ft Easting: 11750766.84 ft
SURFACE ELEVATION: 310.9 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-14-16 - 03-14-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 3 | | | | | | | | | 0.0 / 310.9<br>4" TOPSOIL **TOPS** | | | |
| | | 4 | | | | | | | | | 0.3 / 310.6<br>*Residuum*, Red, SANDY LEAN CLAY, contains siltstone rock fragments, firm, moist **CL** | | | |
| | 310 | 4 | 100 | | | | | | | | | | | 14.0 |
| | | 7 | | | | | | | | | | | | |
| 2 | | 10 | | | 2 | | | | | | 1.6 / 309.3<br>Dark red, CLAYEY SAND, contains siltstone rock fragments, very dense **SC** | | | |
| | | 27 | | | | | | | | | | | | |
| | | 31 | 80 | | | | | | | | | | | 10.5 |
| | | 37 | | | | | | | | | | | | |
| 4 | | 100/3 | 50 | | 4<br>4.4 | | | | | | 4.0 / 306.9<br>*IGM*, Red, POORLY GRADED GRAVEL (siltstone rock fragments), with clay and sand, moist **GP-GC** | | | 16.0 |
| | 305 | | | | | | | | | | | | | |
| 6 | | 100/3 | 33 | | 6<br>6.3 | | | | | | | | | 7.9 |
| | | 50/1 | 100 | | 7.8<br>7.9 | | | | | | *Split-Spoon Refusal at 7.9 feet.* | | | 2.3 |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 6.8 feet

**PAGE 1 OF 1**
**16NB-23**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-24**
**PAGE 1 OF 1**

STATION: 398+00 OFFSET: 21.5' Rt
NORTHING: 7026979.906 ft Easting: 11750877.31 ft
SURFACE ELEVATION: 305.64 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-14-16 - 03-14-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 6 | | | | | | | | | 0.0 / 305.64<br>4" TOPSOIL **TOPS** | | | |
| | 305 | 13 | 100 | | | | | | | | 0.3 / 305.34<br>*Residuum*, Brown, LEAN CLAY, with sand, contains siltstone rock fragments, very stiff, moist **CL** | | | 23.7 |
| | | 15 | | | | | | | | | | | | |
| | | 14 | | | | | | | | | 1.5 / 304.14<br>Red, POORLY GRADED GRAVEL (siltstone rock fragments), with clay and sand, medium dense, moist **GP-GC** | | | |
| 2 | | 11 | | | 2 | | | | | | | | | |
| | | 89/5 | 89 | | 2.9 | | | | | | 2.5 / 303.14<br>*IGM*, Red, CLAYEY SAND, contains siltstone rock fragments, very dense, moist **SC** | | | 11.9 |
| | | | | | | | | | | | 3.5 / 302.14<br>Red, POORLY GRADED GRAVEL (siltstone rock fragments), trace clay and sand, very dense, moist **GP** | | | |
| 4 | | 50/1 | 80 | | 4<br>4.1 | | | | | | | | | 3.4 |
| | 300 | | | | | | | | | | | | | |
| 6 | | 50/1 | 80 | | 6<br>6.1 | | | | | | *Split-Spoon Refusal at 6.1 feet.* | | | 3.3 |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 4.7 feet

**PAGE 1 OF 1**
**16NB-24**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-25**
**PAGE 1 OF 1**

STATION: 399+00 OFFSET: 41.8' Lt
NORTHING: 7027093.936 ft Easting: 11750901.58 ft
SURFACE ELEVATION: 306.52 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-14-16 - 03-14-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | | | | | | | | | 0.0 / 306.52<br>5" TOPSOIL **TOPS** | | | |
| | | 2 | 100 | | | | | | | | 0.4 / 306.12<br>*Residuum*, Red and brown, LEAN CLAY, with sand, contains slight rootlets, soft, moist **CL** | | | 24.2 |
| | | 2 | | | | | | | | | | | | |
| | 305 | | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | |
| 2 | | 17 | | | 2 | | | | | | SAME, very hard | | | |
| | | 48 | 93 | | | | | | | | | | | 11.3 |
| | | 52/4 | | | 3.4 | | | | | | 3.0 / 303.52<br>*IGM*, Red, SANDY LEAN CLAY, contains siltstone rock fragments, very hard, moist **CL** | | | |
| 4 | | 50/1 | 80 | | 4<br>4.1 | | | | | | 4.0 / 302.52<br>Red, POORLY GRADED GRAVEL (siltstone fragments), with clay and sand, very dense, moist **GP-GC** | | | 4.9 |
| 6 | | 50/1 | 80 | | 6<br>6.1 | | | | | | *Split-Spoon Refusal at 6.1 feet.* | | | 3.9 |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 3.2 feet

**PAGE 1 OF 1**
**16NB-25**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-26**
**PAGE 1 OF 1**

STATION: 400+00 OFFSET: 36.3' Rt
NORTHING: 7027108.095 ft Easting: 11751026.96 ft
SURFACE ELEVATION: 311.53 ft COORD. DATUM: VA North

Date(s) Drilled: 03-11-16 - 03-11-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: Roberts, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**FIELD DATA** / **LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LAB: LIQUID LIMIT (LL) | LAB: PLASTICITY INDEX (PI) | LAB: MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | | | | | | | | | 0.0 / 311.53<br>6" TOPSOIL **TOPS** | | | |
| | | 2 | | | | | | | | | 0.5 / 311.03<br>*Residuum*, Red and brown, LEAN CLAY, with sand, contains siltstone rock fragments, firm, moist **CL** | | | 22.6 |
| | 310 | 3 | 100 | | | | | | | | | | | |
| | | 5 | | | 2 | | | | | | | | | |
| 2 | | 2 | | | | | | | | | SAME, very stiff | | | |
| | | 15 | | | | | | | | | | | | |
| | | 13 | 100 | | | | | | | | | | | 16.7 |
| | | 21 | | | | | | | | | | | | |
| 4 | | 12 | | | 4 | | | | | | 3.3 / 308.23<br>Dark red, SILTY SAND, contains siltstone rock fragments, slightly micaceous, medium dense, moist **SM** | | | |
| | | 38 | 100 | | | | | | | | SAME, very dense | | | 18.3 |
| | | 62/2 | | | 5.2 | | | | | | 4.5 / 307.03<br>*IGM*, Red, SANDY LEAN CLAY, contains siltstone rock fragments, very hard, moist **CL** | | | |
| 6 | | 48 | | | 6 | | | | | | 6.0 / 305.53<br>SAME, Red and gray, sampled as POORLY GRADED GRAVEL (siltstone rock fragments), with sand, slightly micaceous, very dense, moist **GP** | | | |
| | 305 | 50/1 | 71 | | 6.7 | | | | | | | | | 6.0 |
| 8 | | 36 | | | 8 | | | | | | | | | |
| | | 64/2 | 71 | | 8.7 | | | | | | | | | 4.8 |
| 10 | | | | | | | | | | | | | | |
| | | 50/0 | | | 11 | | | | | | *Split-Spoon Refusal at 11.0 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 9.7 feet

**PAGE 1 OF 1**
**16NB-26**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-27**
**PAGE 1 OF 1**

STATION: 401+00 OFFSET: 28.3' Lt
NORTHING: 7027228.212 ft Easting: 11751056.52 ft
SURFACE ELEVATION: 314.58 ft COORD. DATUM: VA North

Date(s) Drilled: 03-11-16 - 03-11-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: Roberts, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**FIELD DATA** / **LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LAB: LIQUID LIMIT (LL) | LAB: PLASTICITY INDEX (PI) | LAB: MOISTURE CONTENT (%) | LAB: FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | | | | | | | | | 0.0 / 314.58<br>5" TOPSOIL **TOPS** | | | | |
| | | 28 | 100 | | | | | | | | 0.4 / 314.18<br>*Residuum*, Tan, POORLY GRADED SAND, with clay, contains heavy concentrations of siltstone rock fragments, very dense, moist **SW** | | | 8.7 | |
| | | 31 | | | | | | | | | | | | | |
| | | 38 | | | 2 | | | | | | | | | | |
| 2 | | 12 | | | | | | | | | 1.0 / 313.58<br>*IGM*, Brown, CLAYEY SAND, contains siltstone rock fragments, moist **SC** | | | | |
| | | 30 | 100 | | | | | | | | | 37 | 16 | 8.8 | 41.6 |
| | | 50 | | | | | | | | | | | | | |
| | | 50/2 | | | 3.3 | | | | | | | | | | |
| 4 | | 66 | | | 4 | | | | | | | | | | |
| | 310 | 34/2 | 86 | | 4.7 | | | | | | | | | 5.5 | |
| | | | | | | | | | | | Auger grinding observed at 5.0' | | | | |
| 6 | | 21 | | | 6 | | | | | | | | | | |
| | | 79/4 | 75 | | 6.8 | | | | | | | | | 8.5 | |
| 8 | | 15 | | | 8 | | | | | | | | | | |
| | | 85/4 | 75 | | 8.8 | | | | | | | | | 9.6 | |
| | 305 | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | |
| | | 50/0 | | | 13 | | | | | | *Auger and Split-Refusal at 13.0 feet.* | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 10.8 feet
Bulk sample obtained for CBR testing from 1.0 to 5.0 feet

**PAGE 1 OF 1**
**16NB-27**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

# 16NB-28



STATION: 402+00 OFFSET: 23.25' Rt
NORTHING: 7027258.794 ft Easting: 11751161.18 ft
SURFACE ELEVATION: 324.52 ft COORD. DATUM: VA North

## FIELD DATA

Date(s) Drilled: 03-11-16 - 03-11-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: Roberts, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

## LAB DATA

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | | | | | | | | | 0.0 / 324.52<br>5" TOPSOIL **TOPS** | | | |
| | | 2 | 100 | | | | | | | | 0.4 / 324.12<br>*Residuum*, Tan and brown, LEAN CLAY, with sand, contains siltstone rock fragments, firm, moist **CL** | | | 28.8 |
| | | 4 | | | | | | | | | | | | |
| | | 6 | | | | | | | | | | | | |
| 2 | | 6 | | | 2 | | | | | | 1.5 / 323.02<br>Tan and brown, SANDY LEAN CLAY, contains siltstone rock fragments, firm, moist **CL** | | | |
| | | 14 | 100 | | | | | | | | SAME, hard | | | 11.1 |
| | | 27 | | | | | | | | | 3.0 / 321.52<br>Tan and brown, CLAYEY SAND, contains siltstone rock fragments, dense, moist **SC** | | | |
| | | 52 | | | | | | | | | | | | |
| 4 | | 24 | | | 4 | | | | | | SAME, very dense | | | |
| | 320 | 41 | 93 | | | | | | | | | | | 9.2 |
| | | 59/4 | | | 5.4 | | | | | | 5.0 / 319.52<br>*IGM*, Tan and brown, POORLY GRADED SAND, with clay, contains siltstone rock fragments, very dense, moist **SP-SC** | | | |
| 6 | | | | | 6 | | | | | | 6.0 / 318.52<br>Red and brown, SANDY GRAVEL (siltstone rock fragments), with clay, very dense, moist **GP-GC** | | | |
| | | 22 | | | | | | | | | | | | |
| | | 78/4 | 40 | | | | | | | | | | | 8.0 |
| 8 | | 20 | | | 8 | | | | | | | | | |
| | | 67 | 100 | | | | | | | | | | | 8.3 |
| | | 33/1 | | | 9.1 | | | | | | | | | |
| | 315 | | | | | | | | | | *Boring Terminated at 9.1 feet.* | | | |
| 10 | | | | | | | | | | | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 7.7 feet



SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-29**
**PAGE 1 OF 1**

STATION: 402+20 OFFSET: 77.7' Rt
NORTHING: 7027233.986 ft Easting: 11751213.49 ft
SURFACE ELEVATION: 329.09 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-11-16 - 03-11-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: Roberts, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | | | | | | | | | 0.0 / 329.09<br>6" TOPSOIL **TOPS** | | | |
| | | 3 | | | | | | | | | 0.5 / 328.59<br>*Residuum*, Red and brown, SANDY SILT, contains siltstone rock fragments and rootlets, firm, moist **ML** | | | 15.2 |
| | | 4 | 100 | | | | | | | | | | | |
| | | 10 | | | | | | | | | 1.5 / 327.59<br>Red and brown, SILTY GRAVEL (siltstone rock fragments), loose, moist **GM** | | | |
| 2 | | 7 | | | 2 | | | | | | | | | |
| | | 11 | | | | | | | | | 2.2 / 326.89<br>Red and Brown, SILTY SAND, contains siltstone rock fragments, medium dense, moist **SM** | | | 14.8 |
| | | 17 | 100 | | | | | | | | | | | |
| | | 27 | | | | | | | | | | | | |
| 4 | 325 | 9 | | | 4 | | | | | | SAME, dense | | | |
| | | 15 | | | | | | | | | | | | 14.6 |
| | | 21 | 100 | | | | | | | | | | | |
| | | 25 | | | | | | | | | | | | |
| 6 | | 5 | | | 6 | | | | | | | | | |
| | | 15 | | | | | | | | | | | | 8.8 |
| | | 27 | 100 | | | | | | | | | | | |
| | | 28 | | | | | | | | | | | | |
| 8 | | 12 | | | 8 | | | | | | 8.0 / 321.09<br>*IGM*, Red and brown, SILTY SAND, contains siltstone rock fragments, very dense, moist **SM** | | | |
| | | 49 | 96 | | | | | | | | | | | 10.5 |
| | 320 | 51/3 | | | 9.3 | | | | | | | | | |
| 10 | | | | | | | | | | | *Boring Terminated at 9.3 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 8.6 feet

**PAGE 1 OF 1**
**16NB-29**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-30**
**PAGE 1 OF 1**

STATION: 403+00 OFFSET: 42.75 Lt
NORTHING: 7027377.8 ft Easting: 11751187.3 ft
SURFACE ELEVATION: 326.47 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-11-16 - 03-11-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: Roberts, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 326.47 | 3 | | | | | | | | | 0.0 / 326.47<br>8" TOPSOIL **TOPS** | | | |
| | | 2 | | | | | | | | | 0.7 / 325.77<br>*Residuum*, Red and brown, LEAN CLAY, with sand, firm, moist **CL** | | | 14.8 |
| | 325 | 3 | 100 | | | | | | | | | | | |
| 2 | | 3 | | | 2 | | | | | | SAME, Tan, contains siltstone rock fragments, stiff | | | |
| | | 2 | | | | | | | | | | | | 21.8 |
| | | 3 | 100 | | | | | | | | | | | |
| | | 7 | | | | | | | | | | | | |
| | | 12 | | | | | | | | | | | | |
| 4 | | 10 | | | 4 | | | | | | 4.0 / 322.47<br>Tan, SILTY SAND, contains siltstone rock fragments, very dense, moist **SM** | | | |
| | | 22 | 100 | | | | | | | | | | | 15.4 |
| | | 30 | | | | | | | | | | | | |
| | | 40 | | | | | | | | | | | | |
| 6 | | 8 | | | 6 | | | | | | 6.0 / 320.47<br>Tan and brown, POORLY GRADED GRAVEL (siltstone rock fragments), with clay and sand, dense, moist **GP-GC** | | | |
| | 320 | 13 | 90 | | | | | | | | | | | 11.9 |
| | | 37 | | | | | | | | | | | | |
| | | 63/4 | | | | | | | | | | | | |
| 8 | | 22 | | | 8 | | | | | | 8.0 / 318.47<br>*IGM*, Red, POORLY GRADED GRAVEL (siltstone rock fragments), with sand, very dense, dry **GP** | | | |
| | | 78/5 | 100 | | 8.9 | | | | | | | | | 9.0 |
| | | | | | | | | | | | *Boring Terminated at 8.9 feet.* | | | |
| 10 | | | | | | | | | | | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 8.5 feet

**PAGE 1 OF 1**
**16NB-30**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-31**
**PAGE 1 OF 1**

STATION: 404+00 OFFSET: 38' Rt
NORTHING: 7027387.742 ft Easting: 11751312.12 ft
SURFACE ELEVATION: 331.41 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-11-16 - 03-11-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: Roberts, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 331 | 2 | | | | | | | | | 0.0 / 331.41<br>*Residuum*, Brown, LEAN CLAY, with sand, firm, moist **CL** | | | |
| | | 1 | 25 | | | | | | | | | | | 33.7 |
| | 330 | 4 | | | | | | | | | | | | |
| 2 | | 4 | | | 2 | | | | | | SAME, stiff | | | |
| | | 3 | | | | | | | | | | | | |
| | | 4 | 90 | | | | | | | | | | | 26.1 |
| | | 5 | | | | | | | | | | | | |
| | | 7 | | | | | | | | | | | | |
| 4 | | 3 | | | 4 | | | | | | | | | |
| | | 5 | 90 | | | | | | | | | | | 9.3 |
| | | 10 | | | | | | | | | | | | |
| | | 17 | | | | | | | | | | | | |
| 6 | | 6 | | | 6 | | | | | | | | | |
| | 325 | 9 | | | | | | | | | 6.25 / 325.16<br>Brown, SANDY LEAN CLAY, very stiff, moist **CL** | | | |
| | | 13 | 100 | | | | | | | | | | | 21.1 |
| | | 22 | | | | | | | | | | | | |
| 8 | | 12 | | | 8 | | | | | | | | | |
| | | 15 | | | | | | | | | 8.5 / 322.91<br>Brown, CLAYEY SAND, contains siltstone rock fragments, dense, moist **SC** | | | |
| | | 29 | 100 | | | | | | | | | | | 13.6 |
| | | 42 | | | | | | | | | | | | |
| 10 | | | | | 10 | | | | | | *Boring Terminated at 10.0 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 8.0 feet

**PAGE 1 OF 1**
**16NB-31**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-32**
**PAGE 1 OF 1**

STATION: 405+00 OFFSET: 20' Lt
NORTHING: 7027501.746 ft Easting: 11751336.27 ft
SURFACE ELEVATION: 333.01 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-10-16 - 03-10-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: Roberts, Connelly & Associates, Inc.
Logger: N. Waugh, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) | FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | | | | | | | | | 0.0 / 333.01<br>6" TOPSOIL **TOPS** | | | | |
| | | 2 | | | | | | | | | 0.5 / 332.51<br>*Fill*, Brown, SANDY LEAN CLAY, contains slight rootlets, soft, moist **CL** | | | | |
| | | 2 | 100 | | | | | | | | | | | 22.7 | |
| 2 | | 4 | | | 2 | | | | | | | | | | |
| | | 2 | | | | | | | | | SAME, no rootlets, stiff | | | | |
| | 330 | 6 | | | | | | | | | | 33 | 11 | 23.1 | 58.5 |
| | | 8 | 100 | | | | | | | | | | | | |
| | | 10 | | | | | | | | | | | | | |
| 4 | | 6 | | | 4 | | | | | | | | | | |
| | | 11 | | | | | | | | | | | | | |
| | | 14 | 100 | | | | | | | | | | | 20.5 | |
| | | 20 | | | | | | | | | | | | | |
| 6 | | 11 | | | 6 | | | | | | | | | | |
| | | 30 | | | | | | | | | 6.5 / 326.51<br>*IGM*, Brown, SILT, very hard, moist **ML** | | | | |
| | | 50 | 89 | | | | | | | | | | | 13.3 | |
| | | 50/3 | | | 7.8 | | | | | | | | | | |
| 8 | 325 | 14 | | | 8 | | | | | | | | | | |
| | | 33 | 94 | | | | | | | | | | | 10.3 | |
| | | 62 | | | | | | | | | | | | | |
| | | 38/2 | | | 9.7 | | | | | | | | | | |
| 10 | | | | | | | | | | | *Boring Terminated at 9.7 feet.* | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 7.6 feet
Bulk sample obtained for CBR testing from 1.0 to 5.0 feet

**PAGE 1 OF 1**
**16NB-32**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000.012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-33**
**PAGE 1 OF 1**

STATION: 406+00 OFFSET: 25.3' Rt
NORTHING: 7027553.476 ft Easting: 11751432.36 ft
SURFACE ELEVATION: 334.8 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-10-16 - 03-10-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: Roberts, Connelly & Associates, Inc.
Logger: N. Waugh, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 1 | | | | | | | | | 0.0 / 334.8<br>6" TOPSOIL **TOPS** | | | |
| | | 2 | 100 | | 2 | | | | | | 0.5 / 334.3<br>*Residuum*, Dark brown, SANDY FAT CLAY, contains slight rootlets, soft, moist **CH** | | | 23.6 |
| | | 2 | | | | | | | | | | | | |
| 2 | | 4 | | | | | | | | | 1.5 / 333.3<br>Red-brown, LEAN CLAY with sand, stiff, moist **CL** | | | |
| | | 3 | | | | | | | | | | | | |
| | | 6 | 100 | | | | | | | | | | | 20.0 |
| | | 8 | | | | | | | | | | | | |
| | | 10 | | | | | | | | | | | | |
| 4 | | 2 | | | 4 | | | | | | 4.0 / 330.8<br>Red-brown, SILTY LEAN CLAY, stiff, moist **CL-ML** | | | |
| | 330 | 4 | 100 | | | | | | | | | | | 22.8 |
| | | 6 | | | | | | | | | | | | |
| | | 7 | | | | | | | | | | | | |
| 6 | | 3 | | | 6 | | | | | | | | | |
| | | 5 | 100 | | | | | | | | | | | 34.3 |
| | | 9 | | | | | | | | | | | | |
| | | 13 | | | | | | | | | | | | |
| 8 | | 5 | | | 8 | | | | | | SAME, hard | | | |
| | | 15 | | | | | | | | | | | | |
| | | 22 | 100 | | | | | | | | | | | 16.7 |
| | | 48 | | | | | | | | | | | | |
| 10 | 325 | | | | 10 | | | | | | 9.0 / 325.8<br>*IGM*, Red-brown, SILT, very hard, moist **ML** | | | |
| | | | | | | | | | | | *Boring Terminated at 10.0 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 7.1 feet

**PAGE 1 OF 1**
**16NB-33**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-34**
**PAGE 1 OF 1**

STATION: 407+00 OFFSET: 49.75 Lt
NORTHING: 7027681.417 ft Easting: 11751424.1 ft
SURFACE ELEVATION: 331.14 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-10-16 - 03-10-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: Roberts, Connelly & Associates, Inc.
Logger: N. Waugh, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT LL | PLASTICITY INDEX PI | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 2 | | | | | | | | | 0.0 / 331.14<br>6" TOPSOIL **TOPS** | | | |
| | | 2 | | | | | | | | | 0.5 / 330.64<br>*Fill*, Dark brown, LEAN CLAY, slightly micaceous, firm, moist **CL** | | | |
| | 330 | 4 | 100 | | | | | | | | | | | 11.6 |
| | | 4 | | | | | | | | | | | | |
| 2 | | 12 | | | 2 | | | | | | 2.0 / 329.14<br>*IGM*, Red-brown, SILT, slightly micaceous, hard, moist **ML** | | | |
| | | 26 | | | | | | | | | | | | |
| | | 37 | 100 | | | | | | | | | | | 12.7 |
| | | 39 | | | | | | | | | | | | |
| 4 | | 13 | | | 4 | | | | | | SAME, very hard | | | |
| | | 36 | | | | | | | | | | | | |
| | | 62 | 80 | | | | | | | | | | | 9.7 |
| | | 38/2 | | | | | | | | | | | | |
| 6 | 325 | 28 | | | 6 | | | | | | | | | |
| | | 72/4 | 100 | | | | | | | | | | | 19.6 |
| | | | | | 6.8 | | | | | | | | | |
| 8 | | 16 | | | 8 | | | | | | | | | |
| | | 43 | 100 | | | | | | | | | | | 10.6 |
| | | 57/5 | | | | | | | | | | | | |
| | | | | | 9.4 | | | | | | *Boring Terminated at 9.4 feet.* | | | |
| 10 | | | | | | | | | | | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 7.7 feet

**PAGE 1 OF 1**
**16NB-34**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-35**
**PAGE 1 OF 1**

STATION: 408+00 OFFSET: 38.25' Rt
NORTHING: 7027726.828 ft Easting: 11751546.91 ft
SURFACE ELEVATION: 333.08 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-10-16 - 03-10-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: Roberts, Connelly & Associates, Inc.
Logger: N. Waugh, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 5 | | | | | | | | | 0.0 / 333.08<br>8" POORLY GRADED GRAVEL **GP** | | | |
| | | 4 | 75 | | | | | | | | 0.7 / 332.38<br>*Residuum*, Brown, LEAN CLAY with sand, contains heavy concentrations of siltstone rock fragments, slightly micaceous, firm, moist **CL** | | | 20.6 |
| | | 3 | | | | | | | | | | | | |
| 2 | | 3 | | | 2 | | | | | | SAME, soft | | | |
| | | 3 | | | | | | | | | | | | |
| | | 1 | 100 | | | | | | | | | | | 24.1 |
| | 330 | 3 | | | | | | | | | | | | |
| | | 5 | | | | | | | | | | | | |
| 4 | | 3 | | | 4 | | | | | | 4.0 / 329.08<br>Brown, SILTY LEAN CLAY, stiff to very stiff, moist **CL-ML** | | | |
| | | 6 | 100 | | | | | | | | | | | 21.4 |
| | | 10 | | | | | | | | | | | | |
| | | 10 | | | | | | | | | | | | |
| 6 | | 4 | | | 6 | | | | | | | | | |
| | | 5 | 100 | | | | | | | | | | | 14.5 |
| | | 9 | | | | | | | | | | | | |
| | | 19 | | | | | | | | | | | | |
| 8 | 325 | 8 | | | 8 | | | | | | | | | |
| | | 25 | 100 | | | | | | | | 8.5 / 324.58<br>*IGM*, Brown, SILT, moist **ML** | | | 10.9 |
| | | 41 | | | | | | | | | | | | |
| | | 59/5 | | | | | | | | | | | | |
| 10 | | | | | 9.9 | | | | | | *Boring Terminated at 9.9 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 6.8 feet

**PAGE 1 OF 1**
**16NB-35**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-36**
**PAGE 1 OF 1**

STATION: 409+00 OFFSET: 38.25' Lt
NORTHING: 7027854.916 ft Easting: 11751517.39 ft
SURFACE ELEVATION: 331.11 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-10-16 - 03-10-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: Roberts, Connelly & Associates, Inc.
Logger: N. Waugh, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 1 | | | | | | | | | 0.0 / 331.11<br>6" TOPSOIL **TOPS** | | | |
| | | 1 | | | | | | | | | 0.5 / 330.61<br>*Residuum*, Brown, SANDY LEAN CLAY, contains slight rootlets, slightly micaceous, soft, moist **CL** | | | 42.1 |
| | 330 | 3 | 100 | | | | | | | | | | | |
| | | 3 | | | 2 | | | | | | SAME, firm | | | |
| 2 | | 2 | | | | | | | | | | | | |
| | | 2 | 100 | | | | | | | | | | | 23.8 |
| | | 3 | | | | | | | | | | | | |
| | | 5 | | | 4 | | | | | | 4.0 / 327.11<br>Brown, SILT, slightly micaceous, very stiff, moist **ML** | | | |
| 4 | | 4 | | | | | | | | | | | | |
| | | 7 | | | | | | | | | | | | 19.1 |
| | | 10 | 100 | | | | | | | | | | | |
| | | 11 | | | 6 | | | | | | SAME, hard | | | |
| 6 | 325 | 6 | | | | | | | | | | | | |
| | | 15 | | | | | | | | | | | | 61.7 |
| | | 20 | 100 | | | | | | | | | | | |
| | | 29 | | | | | | | | | | | | |
| 8 | | 13 | | | 8 | | | | | | 8.0 / 323.11<br>*IGM*, Tan, SILT, moist **ML** | | | 16.1 |
| | | 87/2 | 86 | | 8.7 | | | | | | | | | |
| 10 | | | | | | | | | | | *Boring Terminated at 8.7 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 7.8 feet

**PAGE 1 OF 1**
**16NB-36**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-37**
**PAGE 1 OF 1**

STATION: 410+00 OFFSET: 26.8' Rt
NORTHING: 7027922.629 ft Easting: 11751608.22 ft
SURFACE ELEVATION: 335.63 ft COORD. DATUM: VA North

Date(s) Drilled: 03-10-16 - 03-10-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: Roberts, Connelly & Associates, Inc.
Logger: N. Waugh, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**FIELD DATA** | **LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT LL | PLASTICITY INDEX PI | MOISTURE CONTENT (%) | FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 335 | 2 2 3 | 100 | | 2 | | | | | | 0.0 / 335.63<br>6" TOPSOIL **TOPS** | | | | |
| | | | | | | | | | | | 0.5 / 335.13<br>*Fill*, Brown, SANDY LEAN CLAY, contains slight rootlets, firm, moist **CL** | | | 23.2 | |
| 2 | | 3 2 2 | 100 | | 2 | | | | | | SAME, Tan and brown, no rootlets | 33 | 13 | 17.4 | 65.3 |
| | | 3 4 | | | | | | | | | | | | | |
| 4 | | 3 4 8 | 100 | | 4 | | | | | | 4.0 / 331.63<br>*Residuum*, Tan, SILT, stiff, moist **ML** | | | 21.1 | |
| | 330 | 13 | | | | | | | | | | | | | |
| 6 | | 5 9 12 | 100 | | 6 | | | | | | SAME, Tan and brown, very stiff | | | 16.3 | |
| 8 | | 10 4 8 | 100 | | 8 | | | | | | | | | 12.8 | |
| | | 13 14 | | | | | | | | | | | | | |
| 10 | | | | | 10 | | | | | | *Boring Terminated at 10.0 feet.* | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 7.6 feet
Bulk sample obtained for CBR testing from 2.0 to 6.0 feet

**PAGE 1 OF 1**
**16NB-37**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** NORTHSTAR BOULEVARD

**16NB-38**
**PAGE 1 OF 1**

STATION: 412+63 OFFSET: 7' Rt
NORTHING: 7028185.867 ft Easting: 11751668.55 ft
SURFACE ELEVATION: 340.02 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 05-27-16 - 05-27-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: R. Wilcher, Connelly & Associates, Inc.
Logger: S. Consolvo, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | | | | | | | | | 0.0 / 340.02<br>6" TOPSOIL **TOPS** | | | |
| | | 2 | 100 | | | | | | | | 0.5 / 339.52<br>*Fill*, Brown, SILT, trace sand, contains slight rootlets, firm, moist **ML** | | | 23.2 |
| | | 4 | | | | | | | | | | | | |
| 2 | | 3 | | | 2 | | | | | | | | | |
| | | 6 | | | | | | | | | SAME, very stiff | | | |
| | | 10 | 100 | | | | | | | | | | | |
| | | 11 | | | | | | | | | 2.9 / 337.12<br>*Residuum*, Brown, SILT, trace sand, very stiff, moist **ML** | | | 20.9 |
| 4 | | 20 | | | 4 | | | | | | | | | |
| | | 7 | | | | | | | | | | | | |
| | | 11 | | | | | | | | | | | | |
| | 335 | | 100 | | | | | | | | | | | 20.3 |
| | | 16 | | | | | | | | | | | | |
| | | 29 | | | 6 | | | | | | | | | |
| 6 | | 6 | | | | | | | | | SAME, hard | | | |
| | | 12 | | | | | | | | | | | | |
| | | 24 | 95 | | | | | | | | | | | 18.8 |
| | | 50/5 | | | 7.9 | | | | | | | | | |
| 8 | | 11 | | | 8 | | | | | | 7.4 / 332.62<br>*IGM*, Tan, SILT, moist **ML**<br>SAME, Dark brown | | | |
| | | 19 | | | | | | | | | | | | |
| | | 33 | 100 | | | | | | | | | | | 17.1 |
| | | 50/5 | | | 9.9 | | | | | | | | | |
| 10 | 330 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | 100/5 | | | 13 | | | | | | | | | |
| | | | 100 | | 13.4 | | | | | | SAME, Tan | | | 7.1 |
| | | | | | | | | | | | *Boring Terminated at 13.4 feet.* | | | |
| 14 | | | | | | | | | | | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 9.3 feet

**PAGE 1 OF 1**
**16NB-38**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** STORMWATER PIPE CROSSING

**16P-01**
**PAGE 1 OF 1**

STATION: 398+40 OFFSET: 75.33' Rt
NORTHING: 7026970.72 ft Easting: 11750941.5 ft
SURFACE ELEVATION: 299.55 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-15-16 - 03-15-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
FIRST ENCOUNTERED AT 5.3 ft DEPTH
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 3 | | | | | | | | | 0.0 / 299.55<br>6" TOPSOIL **TOPS** | | | |
| | | 5 | | | | | | | | | 0.5 / 299.05<br>*Residuum*, Tan, LEAN CLAY, with sand, stiff, moist **CL** | | | |
| | | 9 | 100 | | | | | | | | | | | 15.1 |
| | | 11 | | | | | | | | | 1.25 / 298.3<br>Dark brown, CLAYEY SAND, contains siltstone rock fragments, medium dense, moist **SC** | | | |
| 2 | | 17 | | | 2 | | | | | | 2.0 / 297.55<br>*IGM* Dark brown, CLAYEY GRAVEL (siltstone rock fragments), with sand, very dense, moist **GC** | | | |
| | | 25 | | | | | | | | | | | | |
| | | 39 | 72 | | | | | | | | | | | 8.0 |
| | | 61/3 | | | 3.8 | | | | | | | | | |
| 4 | | 19 | | | 4 | | | | | | | | | |
| | 295 | 27 | | | | | | | | | | | | |
| | | 38 | 75 | | | | | | | | | | | 5.5 |
| | | 47 | | | | | | | | | | | | |
| 6 | | 64 | | | 6 | | | | | | SAME, wet | | | |
| | | 36/2 | 57 | | | | | | | | | | | 11.7 |
| | | | | | 6.7 | | | | | | | | | |
| | | 100/2 | 50 | | 7.5<br>7.7 | | | | | | | | | 4.5 |
| 8 | | 50/1 | 80 | | 8<br>8.1 | | | | | | *Split-Spoon Refusal at 8.1 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 5.0 feet

**PAGE 1 OF 1**
**16P-01**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** STORMWATER PIPE CROSSING

**16P-02**
**PAGE 1 OF 1**

STATION: 399+60 OFFSET: 75.7' Rt
NORTHING: 7027160.686 ft Easting: 11750920.9 ft
SURFACE ELEVATION: 305.72 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-14-16 - 03-14-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND / SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 2 | | | | | | | | 0.0 / 305.72<br>4" TOPSOIL **TOPS** | | | |
| | 305 | 2 | 100 | | | | | | | 0.3 / 305.42<br>*Alluvium*, Brown, LEAN CLAY, trace sand, contains slight organics, soft, moist **CL** | | | |
| | | 2 | | | | | | | | | | | |
| | | 3 | | 2 | | | | | | | | | |
| 2 | | 4 | | | | | | | | | | | |
| | | 18 | 100 | | | | | | | | | | |
| | | 48 | | | | | | | | 2.5 / 303.22<br>*IGM*, Red, CLAYEY SAND, contains siltstone rock fragments, very dense, moist **SC** | | | |
| | | 52/3 | | 3.8 | | | | | | | | | |
| 4 | | 48 | | 4 | | | | | | | | | |
| | | 52/4 | 89 | | | | | | | | | | |
| | | | | 4.9 | | | | | | | | | |
| | 300 | | | | | | | | | | | | |
| 6 | | 100/2 | 50 | 6<br>6.2 | | | | | | | | | |
| 8 | | 50/1 | 0 | 8<br>8.1 | | | | | | *Split-Spoon Refusal at 8.1 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 4.3 feet
No laboratory testing performed on the samples obtained

**PAGE 1 OF 1**
**16P-02**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** STORMWATER PIPE CROSSING

**16P-03**
**PAGE 1 OF 1**

STATION: 397+25 OFFSET: 111.33' Lt
NORTHING: 7027011.406 ft Easting: 11750725.72 ft
SURFACE ELEVATION: 317.25 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-14-16 - 03-14-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
TBD
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | | | | | | | | | 0.0 / 317.25<br>TOPSOIL **TOPS** | | | |
| | | 2 | 40 | | | | | | | | 0.4 / 316.85<br>*Residuum*, Red, LEAN CLAY, with sand, contains siltstone rock fragments, soft, moist **CL** | | | 18.2 |
| | | 2 | | | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | |
| 2 | 315 | 10 | | | 2 | | | | | | SAME, hard | | | |
| | | 21 | 100 | | | | | | | | | | | 9.7 |
| | | 33 | | | | | | | | | 3.0 / 314.25<br>*IGM*, Red, CLAYEY SAND, contains siltstone rock fragments, slightly micaceous, very dense, moist **SC** | | | |
| | | 36 | | | | | | | | | | | | |
| 4 | | 37 | | | 4 | | | | | | | | | |
| | | 43/5 | 100 | | 4.9 | | | | | | | | | 10.4 |
| | | | | | | | | | | | | | | |
| 6 | | 27 | | | 6 | | | | | | | | | |
| | | 23/2 | 56 | | 6.9 | | | | | | | | | 7.7 |
| | 310 | | | | | | | | | | | | | |
| 8 | | 50/1 | 80 | | 8<br>8.1 | | | | | | *Split-Spoon Refusal at 8.1 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 5.9 feet

**PAGE 1 OF 1**
**16P-03**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** SIGNAL POLE

**16SP-01**
**PAGE 1 OF 1**

STATION: 412+50 OFFSET: 86' Lt
NORTHING: 7028189.105 ft Easting: 11751571.17 ft
SURFACE ELEVATION: 338.09 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 05-31-16 - 05-31-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: R. Wilcher, Connelly & Associates, Inc.
Logger: S. Consolvo, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT LL | PLASTICITY INDEX PI | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | | | 0.0 / 338.09<br>5" TOPSOIL **TOPS** | | | |
| | | | | | | | | | | | 0.4 / 337.69<br>*Fill*, Brown, SILTY SAND, contains slight rootlets, medium dense, moist **SM** | | | |
| 2 | 335 | 2 6 6 7 | 100 | | 2 | | | | | | SAME, no rootlets, loose | | | |
| 4 | | 4 5 5 6 | 100 | | 4 | | | | | | SAME, medium dense | | | |
| 6 | | 3 5 14 23 | 100 | | 6 | | | | | | 5.0 / 333.09<br>*Residuum*, Red and brown, SANDY SILT, medium dense, moist **ML** | | | |
| 8 | 330 | 20 22 26 33 | 100 | | 8 | | | | | | SAME, dense | | | |
| | | 18 33 50/5 | 100 | | 9.4 | | | | | | 7.0 / 331.09<br>*IGM*, Tan, SILT, very hard, moist **ML** | | | |
| 10 | | | | | | | | | | | SAME, Tan and brown | | | |
| 12 | | | | | | | | | | | | | | |
| 14 | 325 | 100/2 | 100 | | 13<br>13.2 | | | | | | Auger Grinding from 13' to 15.5' | | | |
| | | | | | 15.5 | | | | | | *Auger Refusal at 15.5 feet.* | | | |
| 16 | | | | | | | | | | | 15.5 / 322.59<br>Moderately to highly weathered, moderately hard, medium bedding, highly fractured, light brown, SILTSTONE **SLS** | | | |
| 18 | 320 | | | | | 100 | 38 | | | | | | | |
| 20 | | | | | 20.5 | | | | | | SAME, thin to medium bedding, no recovery from 25.3' to 25.5' | | | |
| 22 | | | | | | | | | | | | | | |
| 24 | 315 | | | | | 96 | 9 | | | | | | | |
| | | | | | 25.5 | | | | | | SAME, moderately weathered, thin bedding | | | |
| 26 | | | | | | | | | | | 26.2 / 311.89<br>Slightly to moderately weathered, moderately hard, highly fractured, blue and gray, HORNFELS **MSLS** | | | |
| 28 | 310 | | | | | 100 | 53 | | | | | | | |
| 30 | | | | | 30.5 | | | | | | *Boring Terminated at 30.5 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 13.3 feet
No laboratory testing performed on the samples obtained

**PAGE 1 OF 1**
**16SP-01**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** SIGNAL POLE

**16SP-02**
**PAGE 1 OF 1**

STATION: 412+00 OFFSET: 47.67' Rt
NORTHING: 7028112.056 ft Easting: 11751694.9 ft
SURFACE ELEVATION: 337.87 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 05-27-16 - 05-31-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: R. Wilcher, Connelly & Associates, Inc.
Logger: S. Consolvo, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 1 | | | | | | | | | 0.0 / 337.87<br>4" TOPSOIL **TOPS** | | | |
| | | 2 | | | | | | | | | 0.3 / 337.57<br>*Fill*, Brown, SILT with sand, contains slight rootlets, soft, moist **ML** | | | |
| 2 | | 2 | 100 | | 2 | | | | | | SAME, firm | | | |
| | 335 | 3 | | | | | | | | | 2.7 / 335.17<br>*Residuum*, Brown, SILT, trace sand, firm, moist **ML** | | | |
| | | 2 | | | | | | | | | | | | |
| | | 3 | 100 | | | | | | | | | | | |
| 4 | | 3 | | | 4 | | | | | | SAME, Light brown, very stiff | | | |
| | | 4 | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | |
| | | 6 | 100 | | | | | | | | | | | |
| 6 | | 10 | | | 6 | | | | | | SAME, hard | | | |
| | | 20 | | | | | | | | | | | | |
| | | 8 | | | | | | | | | | | | |
| | | 14 | 100 | | | | | | | | | | | |
| | | 20 | | | | | | | | | | | | |
| 8 | 330 | 35 | | | 8 | | | | | | 7.5 / 330.37<br>*IGM*, Brown, SILT, moist **ML**<br>Auger Grinding observed at 7.5'<br>*Split-Spoon Refusal at 8.0 feet.* | | | |
| | | 100/0 | | | | | | | | | 8.0 / 329.87<br>Slightly weathered, hard, slightly to moderately fractured, gray, SILTSTONE, highly weathered from 10.7' to 11.0' **SLS** | | | |
| 10 | | | | | | 100 | 88 | | | | | | | |
| | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| | 325 | | | | 13 | | | | | | SAME, Brown, highly weathered 15.0' to 15.3' | | | |
| 14 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 16 | | | | | | 94 | 82 | | | | | | | |
| | | | | | | | | | | | | | | |
| 18 | 320 | | | | 18 | | | | | | *Boring Terminated at 18.0 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 9.5 feet
No laboratory testing performed on the samples obtained

**PAGE 1 OF 1**
**16SP-02**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** SIGNAL POLE

**16SP-03**
**PAGE 1 OF 1**

STATION: 410+50 OFFSET: 83.6' Lt
NORTHING: 7027946.842 ft Easting: 11751669.32 ft
SURFACE ELEVATION: 338.61 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 06-01-16 - 06-01-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: R. Wilcher, Connelly & Associates, Inc.
Logger: S. Consolvo, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LAB: LIQUID LIMIT (LL) | LAB: PLASTICITY INDEX (PI) | LAB: MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 5 | 80 | | 2 | | | | | | 0.0 / 338.61<br>2" TOPSOIL **TOPS** | | | |
| 2 | 335 | 5 4 4<br>3 6 7 8 | | | | | | | | | 0.2 / 338.41<br>*Fill*, Brown, SILTY SAND, contains rootlets, loose, moist **SM** | | | |
| 4 | | 2 6 10 12 | 100 | | 4 | | | | | | SAME, no rootlets, medium dense | | | |
| 6 | | 12 16 18 19 | 100 | | 6 | | | | | | 5.0 / 333.61<br>*Residuum*, Red and brown, SANDY SILT, very stiff, moist **ML** | | | |
| 8 | 330 | 3 3 4 6 | 100 | | 8 | | | | | | SAME, hard<br>SAME, Tan and brown<br>SAME, firm | | | |
| 10 | | | | | 10 | | | | | | 8.5 / 330.11<br>Dark brown, SILT, firm, moist **ML** | | | |
| 12 | | | | | | | | | | | | | | |
| 14 | 325 | 22 100/5 | | | 13<br>13.9 | | | | | | 11.8 / 326.81<br>*IGM*, Tan and brown, SILT, moist **ML** | | | |
| 16 | | | | | | | | | | | | | | |
| 18 | | 60 100/3 | | | 18<br>18.8 | | | | | | | | | |
| 20 | 320 | | | | | | | | | | | | | |
| 22 | | 100/1 | | | 21.7<br>21.8 | | | | | | *Split-Spoon Refusal at 21.8 feet.* | | | |
| 24 | 315 | | | | | 100 | 87 | | | | 21.8 / 316.81<br>Slightly to moderately weathered, moderately hard, thin bedding, moderately fractured, light brown, SILTSTONE **SLS** | | | |
| 26 | | | | | 27 | | | | | | | | | |
| 28 | 310 | | | | | | | | | | | | | |
| 30 | | | | | | 98 | 69 | | | | | | | |
| 32 | | | | | 32 | | | | | | *Boring Terminated at 32.0 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 18.9 feet
No laboratory testing performed on the samples obtained

**PAGE 1 OF 1**
**16SP-03**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** SIGNAL POLE

**16SP-04**
**PAGE 1 OF 1**

STATION: 410+44 OFFSET: 74' Rt
NORTHING: 7028006.197 ft Easting: 11751514.01 ft
SURFACE ELEVATION: 335.63 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 05-31-16 - 06-01-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: R. Wilcher, Connelly & Associates, Inc.
Logger: S. Consolvo, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LAB: LIQUID LIMIT (LL) | LAB: PLASTICITY INDEX (PI) | LAB: MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 335 | 4 5 5 4 | 90 | | 2 | | | | | | 0.0 / 335.63<br>5" TOPSOIL **TOPS** | | | |
| 2 | | 3 3 8 12 | 100 | | 4 | | | | | | 0.4 / 335.23<br>*Fill*, Brown, SILTY SAND, contains slight rootlets, slightly micaceous, loose, moist **SM**<br>SAME, medium dense | | | |
| 4 | | 12 13 14 16 | 100 | | 6 | | | | | | 4.5 / 331.13<br>*Residuum*, Brown and tan, SILTY SAND, medium dense, moist **SM**<br>SAME, dense | | | |
| 6 | 330 | 9 19 30 49 | 100 | | 8 | | | | | | | | | |
| 8 | | 15 70/2 | 57 | | 8.7 | | | | | | 7.0 / 328.63<br>*IGM*, Brown and tan, SILT, with sand, moist **ML**<br>Auger Grinding observed from 8.5' to 18.2' | | | |
| 10 | 325 | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| 14 | | 83 100/2 | 100 | | 13<br>13.7 | | | | | | | | | |
| 16 | 320 | | | | | | | | | | | | | |
| 18 | | 100/2 | 100 | | 18<br>18.2 | | | | | | *Split-Spoon Refusal at 18.2 feet.* | | | |
| 20 | 315 | | | | | 100 | 7 | | | | 18.2 / 317.43<br>Highly weathered, moderately hard, thin bedding, highly fractured, tan, SILTSTONE **SLS** | | | |
| 22 | | | | | 23.2 | | | | | | | | | |
| 24 | | | | | | | | | | | | | | |
| 26 | 310 | | | | | 88 | 8 | | | | | | | |
| 28 | | | | | 28.2 | | | | | | | | | |
| 30 | 305 | | | | | 100 | 20 | | | | | | | |
| 32 | | | | | 33.2 | | | | | | *Boring Terminated at 33.2 feet* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 14.5 feet
No laboratory testing performed on the samples obtained

**PAGE 1 OF 1**
**16SP-04**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** SIGNAL POLE

**16SP-05**
**PAGE 1 OF 1**

STATION: 379+00 OFFSET: 14.5' Lt
NORTHING: 7025520.343 ft Easting: 11749675.76 ft
SURFACE ELEVATION: 330.94 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 06-02-16 - 06-02-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: R. Wilcher, Connelly & Associates, Inc.
Logger: D. Caria, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND / SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 330 | 8 9 11 14 | 100 | 2 | | | | | | 0.0 / 330.94<br>1" TOPSOIL **TOPS**<br>0.1 / 330.84<br>*Residuum*, Red and brown, SANDY SILT, contains siltstone rock fragments, slightly micaceous, very stiff, moist **ML** | | | |
| 2 | | 9 14 18 74 | 100 | 4 | | | | | | SAME, trace clay, hard | | | |
| 4 | | 100/5 | 80 | 4.5 | | | | | | 4.0 / 326.94<br>*IGM*, Red and brown, SANDY SILT, slightly micaceous, moist **ML** | | | |
| 6 | 325 | 85 100/2 | 117 | 6 6.6 | | | | | | | | | |
| | | 100/1 | 100 | 7 7.1 | | | | | | *Split-Spoon Refusal at 7.1 feet.*<br>7.1 / 323.84<br>Moderately weathered, moderately hard, medium bedding, highly fractured, red and brown, SILTSTONE **SLS** | | | |
| 8 | | | | | | | | | | | | | |
| 10 | | | | | 100 | 40 | | | | | | | |
| | 320 | | | | | | | | | | | | |
| 12 | | | | 12.1 | | | | | | | | | |
| 14 | | | | | 100 | 38 | | | | | | | |
| 16 | 315 | | | 17.1 | | | | | | *Boring Terminated at 17.1 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 5.5 feet
No laboratory testing performed on the samples obtained

**PAGE 1 OF 1**
**16SP-05**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** SIGNAL POLE

**16SP-06**
**PAGE 1 OF 1**

STATION: 379+40 OFFSET: 69.5' Rt
NORTHING: 7025450.206 ft Easting: 11749814.05 ft
SURFACE ELEVATION: 329.81 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 06-02-16 - 06-02-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: R. Wilcher, Connelly & Associates, Inc.
Logger: D. Caria, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | DIP °: STRATA | DIP °: JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 6 7 8 8 | 50 | | 2 | | | | | | 0.0 / 329.81<br>2" TOPSOIL **TOPS**<br>0.2 / 329.61<br>*Fill*, Gray and brown, SILTY GRAVEL (siltstone rock fragments), with sand, slighlty micaceous, medium dense, moist **GM** | | | |
| 2 | | 8 34 69 100/5 | 100 | | | | | | | | 2.0 / 327.81<br>*IGM*, Red and brown, SILTY GRAVEL (siltstone rock fragments), with sand, moist **GM** | | | |
| 4 | 325 | 34 100/4 | 88 | | 3.9 4 4.8 | | | | | | | | | |
| 6 | | 100/1 | 100 | | 5.6 5.7 | | | | | | *Split-Spoon Refusal at 5.7 feet.*<br>5.7 / 324.11<br>Slightly weathered, hard, thick bedding, slightly fractured, SILTSTONE **SLS** | | | |
| 8 | | | | | | 100 | 100 | | | | | | | |
| 10 | 320 | | | | 10.7 | | | | | | | | | |
| 12 | | | | | | | | | | | | | | |
| 14 | | | | | | 100 | 88 | | | | | | | |
| | 315 | | | | 15.7 | | | | | | *Boring Terminated at 15.7 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 5.0 feet
No laboratory testing performed on the samples obtained

**PAGE 1 OF 1**
**16SP-06**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** SIGNAL POLE

**16SP-07**
**PAGE 1 OF 1**

STATION: 377+75 OFFSET: 81.5' Rt
NORTHING: 7025312.817 ft Easting: 11749731.61 ft
SURFACE ELEVATION: 330.8 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 06-03-16 - 06-03-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: R. Wilcher, Connelly & Associates, Inc.
Logger: S. Consolvo, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND / SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | DIP °: STRATA | DIP °: JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 330 | 13 | | | | | | | | 0.0 / 330.8<br>2" TOPSOIL **TOPS** | | | |
| | | 11 | 65 | | | | | | | 0.2 / 330.6<br>*FILL*, Light brown and gray, SILTY SAND, contains siltstone rock fragments and slight rootlets, medium dense, moist **SM** | | | |
| 2 | | 6 | | 2 | | | | | | | | | |
| | | 4 | | | | | | | | | | | |
| | | 4 | 50 | | | | | | | | | | |
| | | 4 | | | | | | | | | | | |
| | | 13 | | | | | | | | | | | |
| 4 | | 46 | | 4 | | | | | | 3.4 / 327.4<br>Gray, medium to coarse, POORLY GRADED SAND, with gravel, contains PVC pipe debris, medium dense, moist **SP** | | | |
| | | 6 | 15 | | | | | | | SAME, very dense | | | |
| | | 37 | | 5.3 | | | | | | | | | |
| | | 100/3 | | | | | | | | | | | |
| 6 | 325 | 100/5 | 100 | 6<br>6.4 | | | | | | 5.5 / 325.3<br>*IGM*, Brown, SILT, moist **ML** | | | |
| 8 | | 25 | | 8 | | | | | | | | | |
| | | 100/2 | 57 | 8.7 | | | | | | | | | |
| | | 100/1 | 100 | 9.5<br>9.6 | | | | | | *Split-Spoon Refusal at 9.6 feet.* | | | |
| 10 | | | | | | | | | | 9.6 / 321.2<br>Slightly weathered, moderately hard, thin bedding, moderately fractured, gray, HORNFELS **MSLS** | | | |
| | 320 | | | | | | | | | | | | |
| 12 | | | | | 94 | 81 | | | | | | | |
| 14 | | | | 14.6 | | | | | | | | | |
| 16 | 315 | | | | | | | | | 15.6 / 315.2<br>Slightly weathered, moderately hard, thin bedding, moderately fractured, light brown, SILTSTONE, clay-filled joint at 15.6'<br>**SLS** | | | |
| | | | | | 100 | 43 | | | | | | | |
| 18 | | | | | | | | | | 17.8 / 313.0<br>Slightly weathered, moderately hard, thin bedding, moderately fractured, gray, HORNFELS **MSLS** | | | |
| | | | | 19.6 | | | | | | *Boring Terminated at 19.6 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 9.5 feet
No laboratory testing performed on the samples obtained

**PAGE 1 OF 1**
**16SP-07**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** SIGNAL POLE

**16SP-08**
**PAGE 1 OF 1**

STATION: 377+50 OFFSET: 76.25' Lt
NORTHING: 7025391.001 ft Easting: 11749596.37 ft
SURFACE ELEVATION: 329.44 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 06-01-16 - 06-02-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: R. Wilcher, Connelly & Associates, Inc.
Logger: S. Consolvo, ECS Mid-Atlantic, LLC

**GROUND WATER**
▽ FIRST ENCOUNTERED AT 5.7 ft DEPTH
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT LL | PLASTICITY INDEX PI | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | 7 | | | | | | | | | 0.0 / 329.44<br>1" TOPSOIL **TOPS** | | | |
| | | 11 | | | | | | | | | 0.1 / 329.34<br>*Fill*, Gray, SILTY GRAVEL (siltstone rock fragments), with sand, medium dense, moist **SM** | | | |
| 2 | | 9 | 100 | | 2 | | | | | | SAME, dense | | | |
| | | 10 | | | | | | | | | | | | |
| | | 11 | | | | | | | | | | | | |
| | | 29 | 35 | | | | | | | | | | | |
| | | 10 | | | | | | | | | | | | |
| 4 | | 3 | | | 4 | | | | | | SAME, loose | | | |
| | 325 | 4 | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | |
| | | 4 | 40 | | | | | | | | | | | |
| 6 | | 8 | | | 6 | | | | | | SAME, wet | | | |
| | | 11 | | | | | | | | | | | | |
| | | 13 | | | | | | | | | | | | |
| | | 16 | 80 | | | | | | | | | | | |
| 8 | | 24 | | | 8 | | | | | | 7.0 / 322.44<br>*Residuum*, Red and brown, SILT, with sand, medium dense, moist **ML** | | | |
| | | 7 | | | | | | | | | | | | |
| | | 17 | | | | | | | | | SAME, dense | | | |
| | | 28 | 100 | | | | | | | | | | | |
| | 320 | 100/5 | | | 9.9 | | | | | | 8.9 / 320.54<br>*IGM*, Tan and light brown, SILT, moist **ML** | | | |
| 10 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 12 | | 100/1 | 100 | | 12<br>12.1 | | | | | | *Split-Spoon Refusal at 12.1 feet.* | | | |
| | | | | | | | | | | | 12.1 / 317.34<br>Slightly weathered, moderately hard, thin bedding, slightly fractured, gray, HORNFELS **MSLS** | | | |
| 14 | 315 | | | | | 88 | 71 | | | | | | | |
| | | | | | | | | | | | 14.6 / 314.84<br>Slightly to moderately weathered, hard, thin bedding, slightly fractured, red and brown, SILTSTONE **SLS** | | | |
| 16 | | | | | | | | | | | | | | |
| | | | | | 17.1 | | | | | | | | | |
| 18 | | | | | | | | | | | | | | |
| | 310 | | | | | 100 | 82 | | | | | | | |
| 20 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 22 | | | | | 22.1 | | | | | | *Boring Terminated at 22.1 feet.* | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 11.3 feet
No laboratory testing performed on the samples obtained

**PAGE 1 OF 1**
**16SP-08**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** SWM POND #1

**16SWM-01**
**PAGE 1 OF 1**

STATION: 397+50 OFFSET: 163.1' Lt
NORTHING: 7027070.995 ft Easting: 11750709.33 ft
SURFACE ELEVATION: 321.19 ft COORD. DATUM: VA North

Date(s) Drilled: 03-14-16 - 03-14-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**FIELD DATA** / **LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LAB: LIQUID LIMIT (LL) | LAB: PLASTICITY INDEX (PI) | LAB: MOISTURE CONTENT (%) | LAB: FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 0.0 / 321.19<br>5" TOPSOIL **TOPS** | | | | |
| | 320 | 1<br>2<br>2<br>4 | 63 | | 2 | | | | | | 0.4 / 320.79<br>*Residuum*, Red and brown, LEAN CLAY, with sand, soft, moist **CL** | 28 | 9 | 19.8 | 79.1 |
| 2 | | 17<br>35 | 60 | | 4 | | | | | | 2.5 / 318.69<br>*IGM*, Red, CLAYEY SAND, contains slight siltstone rock fragments, slightly micaceous, moist **SC** | | | 10.1 | |
| | | 41<br>51 | | | | | | | | | | | | | |
| 4 | | 37<br>63/5 | 100 | | 4.9 | | | | | | | | | 11.8 | |
| 6 | 315 | 100/5 | 100 | | 6<br>6.4 | | | | | | | | | 8.7 | |
| 8 | | 49<br>51/2 | 71 | | 8<br>8.7 | | | | | | 8.0 / 313.19<br>Red, POORLY GRADED GRAVEL (siltstone rock fragments), with clay and sand, very dense, moist **GP-GC** | | | 3.1 | |
| 10 | | 50/1 | 80 | | 10.8<br>10.9 | | | | | | *Split-Spoon Refusal at 10.9 feet.* | | | 3.8 | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 6.4 feet

**PAGE 1 OF 1**
**16SWM-01**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** SWM POND #1

**16SWM-02**
**PAGE 1 OF 1**

STATION: 398+50 OFFSET: 266.67' Lt
NORTHING: 7027219.268 ft Easting: 11750708.12 ft
SURFACE ELEVATION: 321.38 ft COORD. DATUM: VA North

Date(s) Drilled: 03-14-16 - 03-14-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**FIELD DATA** | **LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LAB: LIQUID LIMIT (LL) | LAB: PLASTICITY INDEX (PI) | LAB: MOISTURE CONTENT (%) | LAB: FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | | | | | | | | | 0.0 / 321.38<br>4" TOPSOIL **TOPS** | | | | |
| | | 3 | | | | | | | | | 0.3 / 321.08<br>*Residuum*, Red and brown, LEAN CLAY, with sand, contains slight siltstone rock fragments, firm, moist **CL** | | | | |
| | 320 | 5 | 80 | | | | | | | | | | | 20.5 | |
| | | 6 | | | | | | | | | | | | | |
| 2 | | 7 | | | 2 | | | | | | | | | | |
| | | 35 | 100 | | | | | | | | 2.5 / 318.88<br>*IGM*, Red, CLAYEY SAND, contains siltstone rock fragments, very dense, moist **SC** | 30 | 11 | 12.5 | 75.0 |
| | | 65/5 | | | 3.4 | | | | | | | | | | |
| 4 | | 100/3 | 67 | | 4<br>4.3 | | | | | | 4.0 / 317.38<br>Red, POORLY GRADED GRAVEL (siltstone rock fragments), with sand, very dense, moist **GP** | | | 7.4 | |
| 6 | 315 | 50/1 | 80 | | 6<br>6.1 | | | | | | | | | 7.1 | |
| 8 | | 37 | | | 8 | | | | | | | | | | |
| | | 65/3 | 57 | | 8.7 | | | | | | | | | 3.2 | |
| 10 | | | | | | | | | | | | | | | |
| | 310 | | | | | | | | | | | | | | |
| 12 | | 50/1 | 80 | | 11.9<br>12 | | | | | | *Split-Spoon Refusal at 12.0 feet.* | | | 5.0 | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 8.6 feet

**PAGE 1 OF 1**
**16SWM-02**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000.012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** SWM POND #1

**16SWM-03**
**PAGE 1 OF 1**

STATION: 400+50 OFFSET: 270.25' Lt
NORTHING: 7027359.168 ft Easting: 11750845.08 ft
SURFACE ELEVATION: 321.65 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 03-14-16 - 03-14-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: J. Garber, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT LL | PLASTICITY INDEX PI | MOISTURE CONTENT (%) | FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 321.65 | | | | | | | | | | 0.0 / 321.65<br>2" TOPSOIL **TOPS** | | | | |
| | | 1 2 9 4 | 63 | | 2 | | | | | | 0.2 / 321.45<br>*Fill*, Red, LEAN CLAY, trace sand, contains heavy concentrations of siltstone rock fragments, stiff, moist **CL** | | | 15.8 | |
| 2 | 320 | 2 2 2 3 | 15 | | 4 | | | | | | 2.0 / 319.65<br>Red, POORLY GRADED GRAVEL, with clay, soft, moist **GP-GC** | | | 9.9 | |
| 4 | | 2 3 4 3 | 100 | | 6 | | | | | | 4.0 / 317.65<br>*Residuum*, Red, purple, and tan, SANDY LEAN CLAY, firm, moist **CL** | | | 18.2 | |
| 6 | 315 | 4 3 3 2 | 100 | | 8 | | | | | | | | | 21.3 | |
| 8 | | 5 4 2 3 | 25 | | 10 | | | | | | SAME, Red, contains slight siltstone rock fragments | 31 | 12 | 19.7 | 50.0 |
| 10 | | | | | | | | | | | | | | | |
| 12 | 310 | | | | | | | | | | 12.0 / 309.65<br>*IGM*, Red, CLAYEY GRAVEL (siltstone rock fragments), with sand, very dense, moist **GC** | | | | |
| 14 | | 55 45/2 | 86 | | 13.5<br>14.2 | | | | | | | | | 4.8 | |
| 16 | 305 | | | | | | | | | | | | | | |
| 18 | | 45 50/1 | 0 | | 18.5<br>19.1 | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | |
| 22 | 300 | 50/1 | 0 | | 22.3<br>22.4 | | | | | | *Split-Spoon Refusal at 22.4 feet.* | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 11.7 feet

**PAGE 1 OF 1**
**16SWM-03**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000.012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** BIORETENTION FACILITY

**16SWM-04**
**PAGE 1 OF 1**

STATION: 410+65 OFFSET: 626' Lt
NORTHING: 7028180.26 ft Easting: 11751004.07 ft
SURFACE ELEVATION: 317.27 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 05-25-16 - 05-25-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: S. Consolvo, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | | | | | | | | | 0.0 / 317.27<br>1" TOPSOIL **TOPS** | | | |
| | | 2 | | | | | | | | | 0.1 / 317.17<br>*Residuum*, Brown, LEAN CLAY, contains slight rootlets, soft, moist **CL** | | | 32.6 |
| | | 1 | 0 | | | | | | | | | | | |
| | | 1 | | | | | | | | | | | | |
| 2 | 315 | 2 | | | 2 | | | | | | SAME, firm | | | |
| | | 3 | | | | | | | | | | | | |
| | | 5 | 80 | | | | | | | | | | | 29.7 |
| | | 6 | | | | | | | | | | | | |
| 4 | | 2 | | | 4 | | | | | | SAME, very stiff | | | |
| | | 3 | | | | | | | | | | | | |
| | | 18 | 100 | | | | | | | | | | | 28.1 |
| | | 22 | | | | | | | | | | | | |
| 6 | | 50/1 | 80 | | 6<br>6.1 | | | | | | 5.5 / 311.77<br>*IGM*, Brown, SILT, moist **ML** | | | 20.2 |
| | 310 | | | | | | | | | | | | | |
| 8 | | 100/5 | 100 | | 8<br>8.4 | | | | | | *Boring Terminated at 8.4 feet.* | | | 14.2 |
| 10 | | | | | | | | | | | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 5.6 feet

**PAGE 1 OF 1**
**16SWM-04**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** BIORETENTION FACILITY

**16SWM-05**
**PAGE 1 OF 1**

STATION: 410+21 OFFSET: 587.67' Lt
NORTHING: 7028125.863 ft Easting: 11751027.67 ft
SURFACE ELEVATION: 317.48 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 05-25-16 - 05-25-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: S. Consolvo, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | | | | | | | | | 0.0 / 317.48<br>3" TOPSOIL **TOPS** | | | |
| | | 2 | | | | | | | | | 0.3 / 317.18<br>*Residuum*, Brown, LEAN CLAY, soft, moist **CL** | | | 27.8 |
| | | 1 | 100 | | | | | | | | | | | |
| | | 1 | | | | | | | | | | | | |
| 2 | | | | | 2 | | | | | | 2.0 / 315.48<br>Brown, SILTY LEAN CLAY, firm, moist **CL-ML** | | | |
| | 315 | 2 | | | | | | | | | | | | |
| | | 2 | 100 | | | | | | | | | | | 26.2 |
| | | 4 | | | | | | | | | | | | |
| | | 6 | | | | | | | | | | | | |
| 4 | | | | | 4 | | | | | | SAME, very stiff | | | |
| | | 8 | | | | | | | | | | | | |
| | | 9 | | | | | | | | | | | | |
| | | 11 | 100 | | | | | | | | | | | 9.7 |
| | | 56 | | | | | | | | | | | | |
| | | 100/5 | | | 6 | | | | | | 5.5 / 311.98<br>*IGM*, Brown, SILT, moist **ML** | | | |
| 6 | | | 75 | | 6.4 | | | | | | | | | 7.5 |
| | 310 | | | | | | | | | | | | | |
| | | 100/5 | | | 8 | | | | | | | | | |
| 8 | | | 25 | | 8.4 | | | | | | | | | 8.3 |
| | | | | | | | | | | | *Boring Terminated at 8.4 feet.* | | | |
| 10 | | | | | | | | | | | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 6.6 feet

**PAGE 1 OF 1**
**16SWM-05**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** U.S. ROUTE 50 WEST BOUND

**16WB-01**
**PAGE 1 OF 1**

STATION: 115+00 OFFSET: 39.6' Lt
NORTHING: 7028085.771 ft Easting: 11751735.32 ft
SURFACE ELEVATION: 336.56 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 05-26-16 - 05-26-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: S. Consolvo, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SOIL: SAMPLE LEGEND | SOIL: SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 0.0 / 336.56<br>2" POORLY GRADED GRAVEL **GP** | | | |
| | | 4 | | | | | | | | | 0.2 / 336.36<br>*Fill*, Brown, SILT, stiff, moist **ML** | | | |
| | | 4 | | | | | | | | | | | | |
| | | 5 | 100 | | | | | | | | | | | 20.0 |
| | 335 | 6 | | | | | | | | | | | | |
| 2 | | 5 | | | 2 | | | | | | SAME, very stiff | | | |
| | | 9 | | | | | | | | | | | | |
| | | 13 | 100 | | | | | | | | | | | 20.2 |
| | | 24 | | | | | | | | | 3.0 / 333.56<br>*Residuum*, Brown, SILT, moist **ML** | | | |
| 4 | | 21 | | | 4 | | | | | | SAME, very hard | | | |
| | | 24 | | | | | | | | | | | | |
| | | 32 | 107 | | | | | | | | | | | 16.2 |
| | | 32 | | | | | | | | | 5.0 / 331.56<br>*IGM*, Tan and brown, SILT, moist **ML** | | | |
| | | | | | 5.5 | | | | | | | | | |
| 6 | | 100/4 | 67 | | 6<br>6.3 | | | | | | | | | 13.4 |
| | 330 | | | | | | | | | | | | | |
| 8 | | 50/1 | 80 | | 8<br>8.1 | | | | | | *Split-Spoon Refusal at 8.1 feet.* | | | 5.4 |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 4.7 feet

**PAGE 1 OF 1**
**16WB-01**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** U.S. ROUTE 50 WEST BOUND

**16WB-02**
**PAGE 1 OF 1**

STATION: 117+00 OFFSET: 30' Rt
NORTHING: 7027943.373 ft Easting: 11751893.09 ft
SURFACE ELEVATION: 334.08 ft COORD. DATUM: VA North

Date(s) Drilled: 05-26-16 - 05-26-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: S. Consolvo, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**FIELD DATA** | **LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) | FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2 | | | | | | | | | 0.0 / 334.08<br>3" TOPSOIL **TOPS** | | | | |
| | | 3 | | | | | | | | | 0.3 / 333.78<br>*FILL*, Brown, SILT, with sand, firm, moist **ML** | | | | |
| | | 5 | 60 | | | | | | | | | | | 17.1 | |
| 2 | | 5 | | | 2 | | | | | | 2.0 / 332.08<br>*Residuum*, Light brown, SANDY LEAN CLAY, very hard, moist **CL** | | | | |
| | | 17 | | | | | | | | | | 34 | 13 | 11.6 | 55.7 |
| | | 29 | 100 | | | | | | | | | | | | |
| | | 35 | | | | | | | | | | | | | |
| | | 52 | | | | | | | | | | | | | |
| 4 | 330 | 16 | | | 4 | | | | | | SAME, hard | | | | |
| | | 18 | | | | | | | | | | | | | |
| | | 23 | 75 | | | | | | | | | | | 40.2 | |
| | | 35 | | | | | | | | | | | | | |
| 6 | | 12 | | | 6 | | | | | | | | | | |
| | | 23 | | | | | | | | | | | | | |
| | | 32 | 65 | | | | | | | | | | | 13.6 | |
| | | 40 | | | | | | | | | | | | | |
| 8 | | 3 | | | 8 | | | | | | SAME, Red and brown, stiff | | | | |
| | | 5 | | | | | | | | | | | | | |
| | 325 | 7 | 100 | | | | | | | | | | | 22.1 | |
| | | 15 | | | | | | | | | | | | | |
| 10 | | 22 | | | 10 | | | | | | 10.0 / 324.08<br>*IGM*, Brown and red, SILT, moist **ML** | | | | |
| | | 38 | 100 | | | | | | | | | | | 27.1 | |
| | | 62/4 | | | 11.3 | | | | | | *Boring Terminated at 11.3 feet.* | | | | |
| 12 | | | | | | | | | | | | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 5.0 feet
Bulk sample obtained for CBR testing from 2.0 to 6.0 feet

**PAGE 1 OF 1**
**16WB-02**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000.012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** U.S. ROUTE 50 WEST BOUND

**16WB-03**
**PAGE 1 OF 1**

STATION: 119+00 OFFSET: 18.5' Lt
NORTHING: 7027903.547 ft Easting: 11752094.23 ft
SURFACE ELEVATION: 330.81 ft COORD. DATUM: VA North

**FIELD DATA**

Date(s) Drilled: 05-26-16 - 05-26-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: S. Consolvo, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LIQUID LIMIT (LL) | PLASTICITY INDEX (PI) | MOISTURE CONTENT (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 0.0 / 330.81<br>4" TOPSOIL **TOPS** | | | |
| | | 5 | | | | | | | | | 0.3 / 330.51<br>*Fill*, SANDY SILT, with gravel, stiff, moist **ML** | | | |
| | 330 | 7 | 65 | | | | | | | | | | | 0.8 |
| | | 8 | | | | | | | | | | | | |
| | | 10 | | | | | | | | | | | | |
| 2 | | 19 | | | 2 | | | | | | SAME, very hard | | | |
| | | 48 | 100 | | | | | | | | | | | 7.8 |
| | | 52/4 | | | 3.3 | | | | | | 3.0 / 327.81<br>*IGM*, Brown and tan, SILT, trace sand, very hard, moist **ML** | | | |
| 4 | | 36 | | | 4 | | | | | | | | | |
| | | 18 | 100 | | 4.8 | | | | | | | | | 10.5 |
| | 325 | | | | | | | | | | | | | |
| 6 | | 50/1 | 80 | | 6<br>6.1 | | | | | | *Split-Spoon Refusal at 6.1 feet.* | | | 11.7 |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 3.6 feet

**PAGE 1 OF 1**
**16WB-03**

SPT_LOG:22116_LOGS_MDY.GPJ:10.0.000:012512:16-6-27

VDOT Virginia Department of Transportation

**PROJECT #:** 01:25707
**LOCATION:** Northstar Boulevard Extension
**STRUCTURE:** U.S. ROUTE 50 WEST BOUND

**16WB-04**
**PAGE 1 OF 1**

STATION: 121+00 OFFSET: 19.3' Rt
NORTHING: 7027780.344 ft Easting: 11752256.97 ft
SURFACE ELEVATION: 325.17 ft COORD. DATUM: VA North

Date(s) Drilled: 05-26-16 - 05-26-16
Drilling Method(s): 3.25" Hollow Stem Auger
SPT Method: Automatic Hammer
Other Test(s):
Driller: J. Martinez, Connelly & Associates, Inc.
Logger: S. Consolvo, ECS Mid-Atlantic, LLC

**GROUND WATER**
NOT ENCOUNTERED DURING DRILLING
NO LONG-TERM MEASUREMENTS TAKEN

**FIELD DATA** | **LAB DATA**

| DEPTH (ft) | ELEVATION (ft) | SOIL: STANDARD PENETRATION TEST HAMMER BLOWS | SOIL: SOIL RECOVERY (%) | SAMPLE LEGEND | SAMPLE INTERVAL | ROCK: CORE RECOVERY (%) | ROCK: ROCK QUALITY DESIGNATION | ROCK: DIP ° STRATA | ROCK: DIP ° JOINTS | STRATA LEGEND | FIELD DESCRIPTION OF STRATA | LAB: LIQUID LIMIT (LL) | LAB: PLASTICITY INDEX (PI) | LAB: MOISTURE CONTENT (%) | LAB: FINES CONTENT #200 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 325 | 1 2 3 5 | 65 | | 2 | | | | | | 0.0 / 325.17<br>2" TOPSOIL **TOPS**<br>0.2 / 324.97<br>*Fill*, Brown, SILT with sand, firm, moist **ML** | | | 26.3 | |
| 2 | | 3 5 | | | | | | | | | SAME, stiff | | | | |
| | | 8 10 | 100 | | | | | | | | 3.0 / 322.17<br>*Residuum*, Brown, LEAN CLAY, with sand, stiff, moist<br>**CL** | 39 | 18 | 16.6 | 82.2 |
| 4 | | 8 11 | | | 4 | | | | | | | | | | |
| | 320 | 15 | 100 | | | | | | | | SAME, slightly micaceous, very stiff | | | 17.3 | |
| | | 21 | | | 6 | | | | | | | | | | |
| 6 | | 8 16 | 90 | | | | | | | | 7.0 / 318.17<br>*IGM*, Tan and brown, SILT with sand, moist **ML** | | | 13.3 | |
| | | 32 39 | | | 8 | | | | | | | | | | |
| 8 | | 19 27 | 100 | | | | | | | | | | | 6.5 | |
| | | 36 39 | | | 10 | | | | | | *Boring Terminated at 10.0 feet.* | | | | |
| 10 | | | | | | | | | | | | | | | |

**REMARKS:** Rig Type: Diedrich D-50.
Cave-In Depth of 4.6 feet
Bulk sample obtained for CBR testing from 2.0 to 6.0

**PAGE 1 OF 1**
**16WB-04**

SPT_LOGB:22116_LOGS_MDY.GPJ:10.0.000.012512:16-6-27