STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0015	1	

PROJECT: 67015 REFERENCE: BR-0015

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY *DAVIDSON*

PROJECT DESCRIPTION *BRIDGE NO. 67 AND NO. 68 REPLACEMENTS ON US 29/US 70 NB & SB OVER SR 1192 (W. 5TH AVENUE)*

CONTENTS

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

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PERSONNEL

M. FOSTER

TRIGON EXPLORATION

INVESTIGATED BY *M. FOSTER*

DRAWN BY *D. KUBINSKI*

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DATE *JUNE 2023*

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Daniel H. Kubinski 06/22/2023
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SIGNATURE DATE

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PROJECT REFERENCE NO.	SHEET NO.
BR-0015	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,

VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX		50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	— 6 MX		— NP		40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0		0		4 MX		8 MX	12 MX	16 MX	NO MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND		SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD								FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	< 4	
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	N/A
	DENSE	30 TO 50	
	VERY DENSE	> 50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	< 2	< 0.25
	SOFT	2 TO 4	0.25 TO 0.5
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	> 30	> 4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE		4	10	40	60	200	270
OPENING (MM)		4.76	2.00	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL — SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.
UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LL < 31
MODERATELY COMPRESSIBLE	LL = 31 - 50
HIGHLY COMPRESSIBLE	LL > 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	20 - 35%
HIGHLY ORGANIC	> 10%	> 20%	HIGHLY	35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW — PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT / DPT DMT / VST PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT
- SHALLOW UNDERCUT
- UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
- UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK
- UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] CME-45C
- [X] CME-55
- [ ] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [X] TRICONE 2-15/16" TUNG.-CARB.
- [ ] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B _____ [ ] -H _____
- [ ] -N _____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [ ] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] _____

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FOOT
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: GPS-2 (N. 758,007.44 FT, E. 1,621,938.93 FT)

ELEVATION: 732.299 FEET

NOTES:

FIAD - FILLED IMMEDIATELY AFTER DRILLING

BRIDGE BORING ELEVATIONS WERE SURVEYED BY TRANSYSTEMS CORPORATION USING A SUB CENTIMETER GPS AND BASE STATION.

DATE: 8-15-14

5/26/20

BR-0015
1" = 40' | SHEET 3

NC GRID
NAD 83 NA 2011

WOODS

10" DIP

-Y1-

15+00

W/ LT.

OLD HWY 64 "32' BST"

54" RCP

18" RCP

DR. "24' BST"

GRASS

ING R\W

LP

WOODS

CONCRETE DITCH

18" RCP

18" RCP

18" RCP

BEGIN BRIDGE (W.P. #1)
STA. 28+90.99 -L-

EB2-A
29+72 -L-
68' LT

M'TL. GUARDRAIL

EB1-A
28+65 -L-
34' LT

EB1-C
28+69 -L-
16' LT

BRIDGE 280068

EB2-C
30+12 -L-
15' LT

US 70 SB "28' BST"

-L- 28+00 NCDOT GPS-2

31+00

EB1-D
28+68 -L-
15' RT

EB2-D
30+28 -L-
19' RT

US 70 NB "28' BST"

BRIDGE 280067

TO I-85 BUS/US 52

EB1-B
28+88 -L-
33' RT

EB2-B
30+22 -L-
33' RT

TO LEXINGTON

18" CMP

10" DIP

54" RCP

END BRIDGE (W.P. #2)
STA. 30+00.83 -L-

WOODS

"21' BST"

15" RCP

10" DIP

W/ LT

WOODS

18+00

WOODS

10"

WOODS

SKEW: 72°-08'-49.4"

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 28+65	**OFFSET** 34 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 733.4 ft	**TOTAL DEPTH** 54.3 ft	**NORTHING** 758,017	**EASTING** 1,621,910	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 04/19/23	**COMP. DATE** 04/19/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
735											
										733.4 GROUND SURFACE	0.0
										732.4 **ROADWAY EMBANKMENT**	1.0
										Asphalt & ABC Stone (0.0 - 1.0 Foot)	
730	730.8	2.6	3	3	3	6		M		Medium Stiff, Reddish Brown, Silty CLAY, Trace Mica	
	728.9	4.5	2	2	2	4		M			
725	724.7	8.7	2	3	3	6		M			
720	719.8	13.6	WOH	1	2	3		M		722.4 Soft to Medium Stiff, Yellowish Brown, Fine Sandy SILT, Trace Mica	11.0
715	714.8	18.6	1	1	2	3		M			
710	709.8	23.6	1	2	2	4		M			
705	704.8	28.6	1	3	4	7		W		706.9 **ALLUVIAL** Medium Stiff, Dark Brown and Gray, Silty CLAY	26.5
700	699.8	33.6	WOH	2	3	5		Sat.			
695	694.8	38.6	32	35	50	85		Sat.		695.4 **RESIDUAL** Hard, Olive Brown, Coarse to Fine Sandy SILT, Trace Mica	38.0
690	689.8	43.6	16	38	62/0.4	100/0.9					
685	684.8	48.6	62	38/0.1		100/0.6				688.8 **WEATHERED ROCK** Olive Brown, METAGABBRO	44.6
680	679.8	53.6	57	43/0.2		100/0.7				679.1 Boring Terminated at Elevation 679.1 ft in Weathered Rock (METAGABBRO)	54.3

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. EB1-C	**STATION** 28+69	**OFFSET** 16 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 733.1 ft	**TOTAL DEPTH** 73.5 ft	**NORTHING** 758,009	**EASTING** 1,621,927	**24 HR.** 21.1
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 04/20/23	**COMP. DATE** 04/20/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
735										
										733.1 GROUND SURFACE 0.0
										732.1 **ROADWAY EMBANKMENT** 1.0
										Asphalt & ABC Stone (0.0 - 1.0 Foot)
730	731.0	2.1	4	2	2	4		M		Medium Stiff, Reddish Brown to Dark Reddish Brown, Silty CLAY, Trace Mica
	728.6	4.5	1	2	3	5		M		
725	724.7	8.4	1	2	2	4		M		
720	719.7	13.4	1	3	3	6		M		
715	714.7	18.4	1	2	2	4		M		
710	709.8	23.3	2	2	2	4		W		707.1 **ALLUVIAL** Medium Stiff, Dark Brown and Dark Reddish Brown to Gray, Silty CLAY 26.0
705	704.8	28.3	3	3	3	6		W		
700	699.8	33.3	2	3	4	7		Sat.		
695	694.8	38.3	12	16	17	33		Sat.		694.6 **RESIDUAL** Hard to Very Stiff, Olive Brown, Coarse to Fine Sandy SILT, Trace Mica 38.5
690	689.8	43.3	21	16	12	28		Sat.		
685	684.8	48.3	37	63/0.4		100/0.9				686.6 **WEATHERED ROCK** Olive Brown, METAGABBRO 46.5
680	679.8	53.3	7	13	18	31		Sat.		682.1 **RESIDUAL** Hard to Very Stiff, Olive Brown and Olive Gray, Coarse to Fine Sandy SILT, Trace Mica 51.0
675	674.8	58.3	8	14	14	28		Sat.		
670	669.8	63.3	100/0.4			100/0.4				671.6 **WEATHERED ROCK** Olive Brown, METAGABBRO 61.5
665	664.8	68.3	66	34/0.1		100/0.6				
660	659.8	73.3	100/0.2			100/0.2				659.6 Boring Terminated at Elevation 659.6 ft in Weathered Rock (METAGABBRO) 73.5

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. EB1-D	**STATION** 28+68	**OFFSET** 15 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 733.2 ft	**TOTAL DEPTH** 58.9 ft	**NORTHING** 757,989	**EASTING** 1,621,951	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 05/01/23	**COMP. DATE** 05/01/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
735										733.2 GROUND SURFACE	0.0
										732.2 **ROADWAY EMBANKMENT** Asphalt & ABC Stone (0.0 - 1.0 Foot)	1.0
730	729.7	3.5	2	3	2	5		M		Medium Stiff, Reddish Brown and Brown, Silty CLAY, Trace Mica	
725	724.8	8.4	2	3	4	7		M			
720	719.9	13.3	WOH	2	2	4		M			
715	714.9	18.3	WOH	2	2	4		M			
710	709.9	23.3	WOH	2	2	4		M			
705	704.9	28.3	2	2	4	6		M		706.6 **ALLUVIAL** Medium Stiff, Dark Reddish Brown and Dark Brown, Silty CLAY	26.6
700	699.9	33.3	1	4	4	8		M			
695	694.9	38.3	2	4	15	19		M		696.6 **RESIDUAL** Very Stiff to Hard, Olive Brown and Olive Gray, Coarse to Fine Sandy SILT, Trace Mica	36.6
690	689.9	43.3	24	35	46	81		M			
685	684.9	48.3	47	53/0.3		100/0.8				686.7 **WEATHERED ROCK** Olive Brown and Light Brownish Gray, METAGABBRO	46.5
680	679.9	53.3	50	50/0.1		100/0.6					
675	674.9	58.3	87	13/0.1		100/0.6				674.3 Boring Terminated at Elevation 674.3 ft in Weathered Rock (METAGABBRO)	58.9

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. EB1-B	**STATION** 28+88	**OFFSET** 33 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 733.2 ft	**TOTAL DEPTH** 53.9 ft	**NORTHING** 757,994	**EASTING** 1,621,977	**24 HR.** 15.7
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 04/24/23	**COMP. DATE** 04/24/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
735										733.2 GROUND SURFACE 0.0
										732.2 **ROADWAY EMBANKMENT** Asphalt & ABC Stone (0.0 - 1.0 Feet) 1.0
730	729.8	3.4	1	2	3	5		M		Medium Stiff, Reddish Brown, Olive Brown, and Brown, Silty CLAY, Trace Mica
725	724.8	8.4	2	2	3	5		M		
720	719.9	13.3	2	2	2	4		M		
715	714.9	18.3	2	3	2	5		W		
710	709.9	23.3	2	2	2	4		W		
705	704.9	28.3	3	3	3	6		Sat.		706.7 **ALLUVIAL** Medium Stiff, Dark Reddish Brown, Dark Brown, and Gray, Silty CLAY, Trace Mica 26.5
700	699.9	33.3	3	3	3	6		Sat.		
695	694.9	38.3	29	46	43	89		Sat.		696.5 **RESIDUAL** Hard, Olive Gray, Coarse to Fine Sandy SILT 36.7
690	689.9	43.3	100/0.5			100/0.5				691.5 **WEATHERED ROCK** Dark Gray to Olive Gray, METAGABBRO 41.7
685	684.9	48.3	41	59/0.4		100/0.9				
680	679.9	53.3	49	51/0.1		100/0.6				679.3 Boring Terminated at Elevation 679.3 ft in Weathered Rock (METAGABBRO) 53.9

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. EB2-A	**STATION** 29+72	**OFFSET** 68 ft LT	**ALIGNMENT** -L-	**0 HR.** 18.8
COLLAR ELEV. 718.8 ft	**TOTAL DEPTH** 54.1 ft	**NORTHING** 758,123	**EASTING** 1,621,949	**24 HR.** 12.4
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 04/18/23	**COMP. DATE** 04/18/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
720										718.8	0.0
	717.8	1.0								GROUND SURFACE **ROADWAY EMBANKMENT** Medium Stiff, Reddish Brown, Silty CLAY	
715	715.0	3.8	2	2	3	5		M			
			2	3	2	5		M			
710	710.0	8.8								712.3	6.5
			1	2	2	4		M		**RESIDUAL** Medium Stiff, Reddish Brown to Dark Reddish Brown, Silty CLAY	
705	705.0	13.8									
			1	2	4	6		M			
700	700.0	18.8								702.3	16.5
			2	3	4	7		W		Medium Stiff to Hard, Reddish Brown, Gray, Brown, and Light Brownish Gray, Coarse to Fine Sandy SILT, Trace Mica	
695	695.0	23.8									
			5	8	9	17		Sat.			
690	690.0	28.8	4	7	8	15		Sat.			
685	685.0	33.8	3	5	4	9		Sat.			
680	680.0	38.8	9	19	34	53		Sat.			
675	675.0	43.8	46	54/0.3		100/0.8				677.3	41.5
670	670.0	48.8	65	35/0.2		100/0.7				**WEATHERED ROCK** Olive Brown, METAGABBRO	
665	665.0	53.8	100/0.3			100/0.3					
										664.7 Boring Terminated at Elevation 664.7 ft in Weathered Rock (METAGABBRO)	54.1

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. EB2-C	**STATION** 30+12	**OFFSET** 15 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 732.9 ft	**TOTAL DEPTH** 73.9 ft	**NORTHING** 758,122	**EASTING** 1,622,015	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 04/21/23	**COMP. DATE** 04/21/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
735										732.9	0.0
										GROUND SURFACE	
										731.9	1.0
										ROADWAY EMBANKMENT Asphalt & ABC Stone (0.0 - 1.0 Foot) Soft to Medium Stiff, Reddish Brown, Silty CLAY, Trace Mica	
730	729.5	3.4									
			2	2	2	4		M			
725	724.5	8.4									
			2	2	1	3		M			
720	719.6	13.3									
			1	2	2	4		M			
715	714.6	18.3								716.4	16.5
			2	4	6	10		M		**RESIDUAL** Stiff, Brown and Dark Brown, Silty CLAY	
710	709.6	23.3									
			3	5	5	10		W		711.4 Medium Stiff to Hard, Brown, Gray, and Light Brownish Gray, Coarse to Fine Sandy SILT	21.5
705	704.6	28.3									
			2	2	5	7		Sat.			
700	699.6	33.3									
			2	4	6	10		Sat.			
695	694.6	38.3									
			3	5	8	13		Sat.			
690	689.6	43.3									
			4	9	12	21		M			
685	684.6	48.3									
			6	11	14	25		M			
680	679.6	53.3									
			6	24	27	51		M			
675	674.6	58.3									
			16	25	24	49		M			
670	669.6	63.3									
			13	25	36	61		M			
665	664.6	68.3								666.4	66.5
			100/0.5			100/0.5				**WEATHERED ROCK** Olive Gray, METAGABBRO	
660	659.6	73.3									
			66	34/0.1		100/0.6				659.0 Boring Terminated at Elevation 659.0 ft in Weathered Rock (METAGABBRO)	73.9

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. EB2-D	**STATION** 30+28	**OFFSET** 19 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 733.3 ft	**TOTAL DEPTH** 64.2 ft	**NORTHING** 758,114	**EASTING** 1,622,052	**24 HR.** 11.2
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 04/26/23	**COMP. DATE** 04/26/23	**SURFACE WATER DEPTH** N/A	

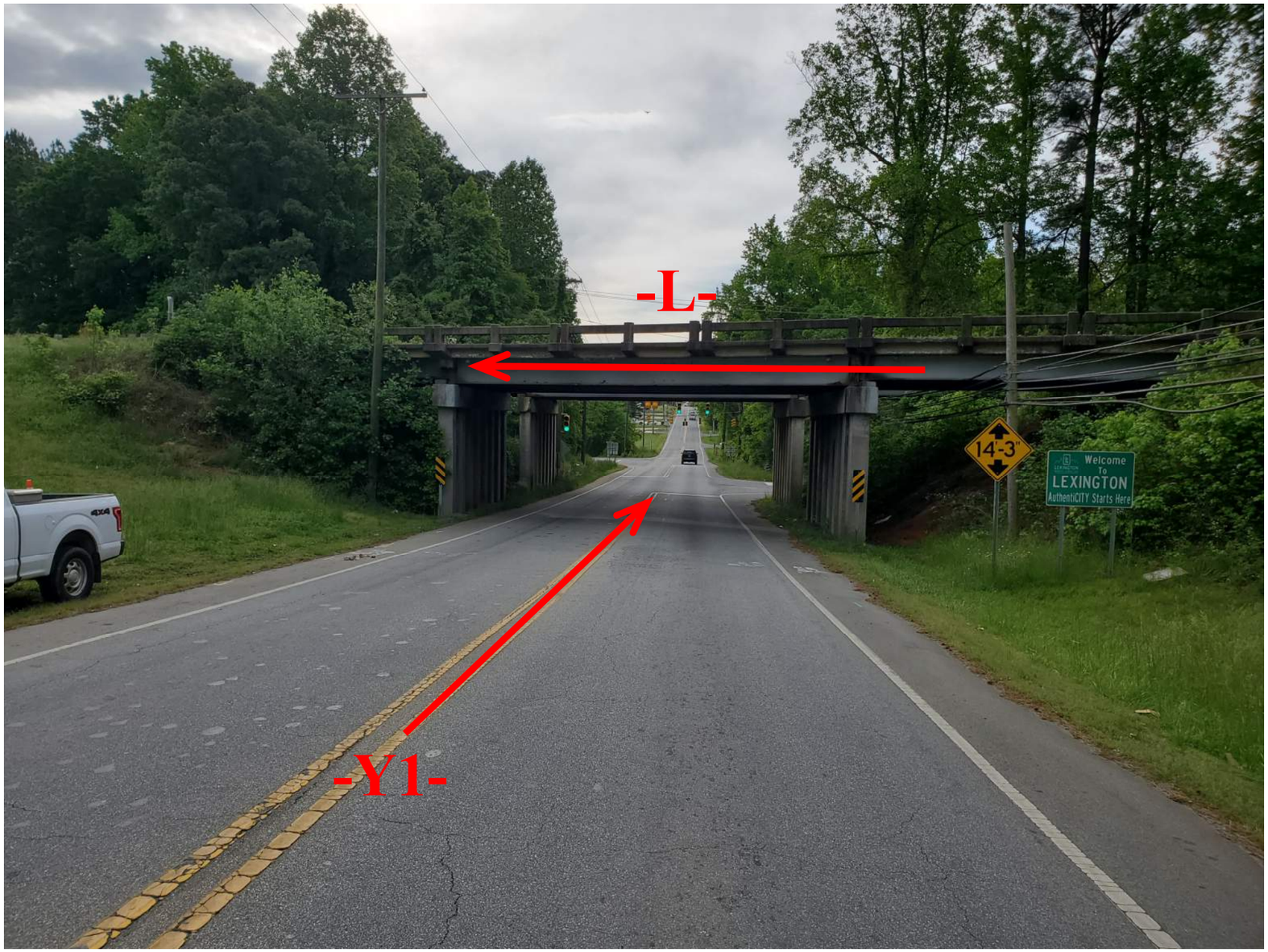
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
735										733.3 / 0.0 GROUND SURFACE
										732.3 / 1.0 **ROADWAY EMBANKMENT** Asphalt & ABC Stone (0.0 - 1.0 Foot) / Medium Stiff, Reddish Brown, Silty CLAY, Trace Mica
730	730.0	3.3	2	3	3	6		M		
725	724.8	8.5	3	3	3	6		M		
720	720.0	13.3	3	4	4	8		M		721.4 / 11.9 **RESIDUAL** Medium Stiff to Stiff, Reddish Brown and Yellowish Brown, Silty CLAY, Trace Mica
715	715.0	18.3	3	5	6	11		W		
710	710.0	23.3	3	3	4	7		W		711.7 / 21.6 Medium Stiff to Hard, Reddish Yellow, Light Brownish Gray, Brown, and Pale Red, Coarse to Fine Sandy SILT, Trace Mica
705	705.0	28.3	2	2	3	5		Sat.		
700	700.0	33.3	6	7	17	24		Sat.		
695	695.0	38.3	10	8	7	15		Sat.		
690	690.0	43.3	6	11	15	26		Sat.		
685	685.0	48.3	10	19	28	47				
680	680.0	53.3	18	27	38	65		Sat.		
675	675.0	58.3	30	60	40/0.2	100/0.7				
670	670.0	63.3	16	84/0.4		100/0.9				674.0 / 59.3 **WEATHERED ROCK** Olive Gray and Light Brownish Gray, METAGABBRO
										669.1 / 64.2 Boring Terminated at Elevation 669.1 ft in Weathered Rock (METAGABBRO)

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 30+22	**OFFSET** 33 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 733.2 ft	**TOTAL DEPTH** 54.8 ft	**NORTHING** 758,100	**EASTING** 1,622,059	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 04/25/23	**COMP. DATE** 04/25/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
735										733.2 / 0.0 GROUND SURFACE
										732.2 / 1.0 **ROADWAY EMBANKMENT** Asphalt & ABC Stone (0.0 - 1.0 Feet) / Medium Stiff, Reddish Brown, Silty CLAY
730	729.9	3.3	2	3	4	7		M		
725	724.8	8.4	2	3	3	6		M		
720	719.9	13.3	3	5	7	12		M		721.6 / 11.6 **RESIDUAL** Stiff, Reddish Yellow, Silty CLAY
715	714.9	18.3	5	7	11	18		M		716.6 / 16.6 Very Stiff to Hard, Yellowish Brown, Olive Brown, Olive, Coarse to Fine Sandy SILT, Trace to Little Mica, Trace Rock Fragments and Quartz
710	709.9	23.3	10	12	15	27		M		
705	704.9	28.3	9	14	18	32		M		
700	699.9	33.3	10	16	20	36		M		
695	694.9	38.3	8	13	17	30		M		
690	689.9	43.3	18	24	26	50		M		
685	684.9	48.3	20	27	47	74		M		
680	679.9	53.3	35	35	49	84		M		678.4 / 54.8 Boring Terminated at Elevation 678.4 ft in RESIDUAL (Sandy SILT)

SITE PHOTOGRAPH

BRIDGE NO. 67 AND NO. 68 REPLACEMENTS ON US 29/US 70 (-L-) NB & SB OVER SR 1192 (W. 5TH AVENUE, -Y1-)



LOOKING EAST ON SR 1192 (W. 5TH AVENUE, -Y1-) TOWARDS BRIDGE NO. 67 AND NO. 68 ON US 29/US 70 (-L-) NB & SB

REFERENCE: BR-0015

PROJECT: 67015

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0015	1	

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY *DAVIDSON*

PROJECT DESCRIPTION *BRIDGE NO. 67 AND NO. 68 REPLACEMENTS ON US 29/US 70 NB & SB OVER SR 1192 (W. 5TH AVENUE)*

SITE DESCRIPTION *RETAINING WALLS*
STA. 24+60.37 (54' RT) –L– TO 28+66.66 (96' LT) –L–
STA. 15+53.00 (34' LT) –Y1– TO 17+73.00 (34' LT) –Y1–

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2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

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TRIGON EXPLORATION

INVESTIGATED BY *KLEINFELDER, INC*

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DATE *JUNE 2023*

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DocuSigned by:
Daniel H. Kubinski 06/22/2023
AB2F7FFB796A411... SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
BR-0015	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,

VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX		50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	— 6 MX		— NP		40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0		0		4 MX		8 MX	12 MX	16 MX	NO MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND		SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD								FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	< 4	
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	N/A
	DENSE	30 TO 50	
	VERY DENSE	> 50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	< 2	< 0.25
	SOFT	2 TO 4	0.25 TO 0.5
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	> 30	> 4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE		4	10	40	60	200	270
OPENING (MM)		4.76	2.00	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL — SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.
UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LL < 31
MODERATELY COMPRESSIBLE	LL = 31 - 50
HIGHLY COMPRESSIBLE	LL > 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	20 - 35%
HIGHLY ORGANIC	> 10%	> 20%	HIGHLY	35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW — PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT / DPT DMT / VST PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT
- SHALLOW UNDERCUT
- UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
- UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK
- UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] CME-45C
- [X] CME-55
- [ ] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [X] TRICONE 2-15/16" TUNG.-CARB.
- [ ] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B _____ [ ] -H _____
- [ ] -N _____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [X] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [X] DYNAMIC CONE PENETROMETER

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FOOT
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: GPS-2 (N. 758,007.44 FT, E. 1,621,938.93 FT)

ELEVATION: 732.299 FEET

NOTES:

FIAD - FILLED IMMEDIATELY AFTER DRILLING

RETAINING WALL BORING ELEVATIONS TAKEN FROM PROJECT TIN FILE "BR0015.TIN" DATED 9/23/2022

BRIDGE BORING ELEVATIONS WERE SURVEYED BY TRANSYSTEMS CORPORATION USING A SUB CENTIMETER GPS AND BASE STATION.

HAND AUGER AND DYNAMIC CONE PENETROMETER TEST

DATE: 8-15-14

BR-0015

1" = 100' | SHEET 3

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** J. Kardon	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. L_2460	**STATION** 24+60	**OFFSET** 90 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 722.0 ft	**TOTAL DEPTH** 30.0 ft	**NORTHING** 757,621	**EASTING** 1,621,760	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 05/09/23	**COMP. DATE** 05/09/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
725										
										722.0 / 0.0 GROUND SURFACE
720	721.0	1.0	2	4	2	6				721.0 / 1.0 **ROADWAY EMBANKMENT** Asphalt (0.0 - 0.5 Foot) ABC Stone (0.5 - 1.0 Foot) Medium Stiff, Highly Plastic, Red, Silty CLAY, Trace Mica
	718.5	3.5	3	5	6	11	SS-9	37%		719.0 / 3.0 **RESIDUAL** Stiff, Highly Plastic, Red, Silty CLAY, Trace Mica
715								M		Stiff to Very Stiff, Olive Brown, Coarse to Fine Sandy SILT
	713.5	8.5	3	5	5	10				715.0 / 7.0
710								M		
	708.5	13.5	2	4	5	9				
705								M		
	703.5	18.5	3	4	7	11				
700								M		
	698.5	23.5	5	10	12	22				
695								M		
	693.5	28.5	5	9	14	23		M		692.0 / 30.0 Boring Terminated at Elevation 692.0 ft in RESIDUAL (Sandy SILT)

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. L_2492	**STATION** 24+92	**OFFSET** 26 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 737.7 ft	**TOTAL DEPTH** 20.0 ft	**NORTHING** 757,686	**EASTING** 1,621,729	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 05/05/23	**COMP. DATE** 05/05/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
740										
										737.7 / 0.0 GROUND SURFACE
	736.5	1.2	4	6	2	8		M		736.8 / 0.9 **ROADWAY EMBANKMENT** Asphalt and ABC Stone (0.0 - 0.9 Foot)
735	734.2	3.5	1	2	2	4		M		734.6 / 3.1 Medium Stiff, Reddish Brown, Coarse to Fine Sandy SILT, Trace Mica
730										Medium Stiff, Highly Plastic, Reddish Brown, Silty CLAY, Trace Mica
	729.2	8.5	2	2	3	5		M		
725										726.6 / 11.1 **RESIDUAL** Medium Stiff to Stiff, Yellowish Brown to Light Brownish Gray, Coarse to Fine Sandy SILT, Trace Mica
	724.2	13.5	2	3	5	8		M		
720	719.2	18.5	3	4	6	10		M		717.7 / 20.0 Boring Terminated at Elevation 717.7 ft in RESIDUAL (Sandy SILT)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** J. Kardon	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. L_2550	**STATION** 25+50	**OFFSET** 90 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 718.8 ft	**TOTAL DEPTH** 15.0 ft	**NORTHING** 757,692	**EASTING** 1,621,815	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 05/09/23	**COMP. DATE** 05/09/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
720										718.8 GROUND SURFACE	0.0
	717.8	1.0						M		717.8 **ROADWAY EMBANKMENT** Asphalt (0.0 - 0.5 Foot) ABC Stone (0.5 - 1.0 Foot) Medium Stiff to Stiff, Highly Plastic, Red, Silty CLAY, Trace Mica	1.0
715	715.3	3.5	5	2	3	5		M		712.8 **RESIDUAL** Medium Stiff, Reddish Brown, Clayey SILT, Trace Mica	6.0
			2	4	6	10					
710	710.3	8.5	2	3	3	6		M		706.8 Stiff, Brown, Coarse to Fine Sandy SILT	12.0
705	705.3	13.5	3	5	6	11		M		703.8 Boring Terminated at Elevation 703.8 ft in RESIDUAL (Sandy SILT)	15.0

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. L_2599	**STATION** 25+99	**OFFSET** 35 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 735.6 ft	**TOTAL DEPTH** 25.0 ft	**NORTHING** 757,765	**EASTING** 1,621,802	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 05/05/23	**COMP. DATE** 05/05/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
740										735.6 GROUND SURFACE 0.0
	734.6	1.0								734.9 **ROADWAY EMBANKMENT** 0.7
735			3	2	3	5		M		733.3 Asphalt and ABC Stone (0.0 - 0.7 Foot) 2.3
	732.0	3.6								Medium Stiff, Highly Plastic, Reddish Brown, Silty CLAY, Trace Mica
730			2	2	3	5		M		Medium Stiff, Reddish Brown, Fine Sandy SILT, Trace Mica
	727.1	8.5								728.1 **RESIDUAL** 7.5
725			3	3	5	8	SS-10	39%		Medium Stiff, Highly Plastic, Reddish Brown to Reddish Yellow, Silty CLAY
	722.1	13.5								
720			1	3	4	7		W		
	717.1	18.5								718.6 17.0
715			2	4	4	8		M		Medium Stiff, Reddish Yellow and Light Brownish Gray to Yellowish Brown and Light Brownish Gray, Coarse to Fine Sandy SILT, Trace Mica and Rock Fragments
	712.1	23.5								
			2	2	4	6		M		710.6 25.0
										Boring Terminated at Elevation 710.6 ft in RESIDUAL (Sandy SILT)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** J. Kardon	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. L_2650	**STATION** 26+50	**OFFSET** 90 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 715.9 ft	**TOTAL DEPTH** 20.0 ft	**NORTHING** 757,771	**EASTING** 1,621,877	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 05/09/23	**COMP. DATE** 05/09/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
720										
715	715.9									715.9 / 0.0 GROUND SURFACE
	714.9	1.0	3	3	4	7	SS-11	32%		714.9 / 1.0 **ROADWAY EMBANKMENT** Asphalt (0.0 - 0.5 Foot) ABC Stone (0.5 - 1.0 Foot) Medium Stiff, Highly Plastic, Red, Silty CLAY, Trace Mica
	712.4	3.5	2	3	3	6		M		
710										
	707.4	8.5	3	6	6	12		M		708.9 / 7.0 **RESIDUAL** Stiff to Very Stiff, Yellowish Brown, Coarse to Fine Sandy SILT
705										
	702.4	13.5	3	6	9	15		M		
700										
	697.4	18.5	7	11	13	24		M		695.9 / 20.0 Boring Terminated at Elevation 695.9 ft in RESIDUAL (Sandy SILT)

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. L_2700	**STATION** 27+00	**OFFSET** 31 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 734.2 ft	**TOTAL DEPTH** 30.0 ft	**NORTHING** 757,847	**EASTING** 1,621,861	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 05/05/23	**COMP. DATE** 05/05/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
735										
	734.2									734.2 / 0.0 GROUND SURFACE
730	730.5	3.7	1	3	3	6	SS-12	33%		732.3 / 1.9 **ROADWAY EMBANKMENT** Asphalt and ABC Stone (0.0 - 1.9 Feet) Medium Stiff to Stiff, Moderately Plastic, Reddish Brown to Dark Reddish Brown, Reddish Brown and Olive Gray, Silty CLAY, Trace Mica
725	725.7	8.5	2	3	4	7		W		
720	720.7	13.5	2	3	5	8		W		
715	715.7	18.5	3	5	5	10		W		
710	710.7	23.5	4	6	8	14		M		712.4 / 21.8 **RESIDUAL** Stiff to Very Stiff, Yellowish Brown to Gray, Fine Sandy SILT
705	705.7	28.5	7	8	12	20		M		704.2 / 30.0 Boring Terminated at Elevation 704.2 ft in RESIDUAL (Sandy SILT)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** J. Kardon	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. L_2750	**STATION** 27+50	**OFFSET** 90 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 712.8 ft	**TOTAL DEPTH** 24.8 ft	**NORTHING** 757,850	**EASTING** 1,621,938	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 05/09/23	**COMP. DATE** 05/09/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
715										712.8 GROUND SURFACE 0.0
	711.8	1.0	2	3	2	5	SS-13	22%		711.8 **ROADWAY EMBANKMENT** 1.0 Asphalt (0.0 - 0.5 Foot) ABC Stone (0.5 - 1.0 Foot) Medium Stiff to Stiff, Moderately Plastic, Red, Silty CLAY, Trace Mica
710	709.3	3.5	5	3	4	7		M		
705	704.3	8.5	4	6	5	11				
700	699.3	13.5	2	4	4	8		M		696.8 16.0 **ALLUVIAL** Loose, Gray, Clayey Fine to Coarse SAND
695	694.3	18.5	2	1	4	5		M		
690	689.3	23.5	15	46	54/0.3	100/0.8				688.3 24.5 688.0 24.8 **WEATHERED ROCK** Brown, METAGABBRO Boring Terminated at Elevation 688.0 ft in WEATHERED ROCK (METAGABBRO)

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. L_2800	**STATION** 28+00	**OFFSET** 29 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 733.4 ft	**TOTAL DEPTH** 35.0 ft	**NORTHING** 757,927	**EASTING** 1,621,920	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 05/05/23	**COMP. DATE** 05/05/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
735										733.4 GROUND SURFACE 0.0
	729.9	3.5	2	2	3	5		M		731.6 **ROADWAY EMBANKMENT** 1.8 Asphalt and ABC Stone (0.0 - 1.8 Feet) Medium Stiff, Reddish Brown, Fine Sandy SILT, Little Mica
730	724.9	8.5	2	2	3	5		M		726.6 6.8 Medium Stiff, Moderately Plastic, Reddish Brown and Olive Gray to Reddish Brown to Olive Brown, Silty CLAY, Trace Mica
725	719.9	13.5	2	3	4	7	SS-14	30%		
720	714.9	18.5	2	4	4	8		M		
715	709.9	23.5	2	2	3	5		M		706.4 27.0 **ALLUVIAL** Stiff, Highly Plastic, Dark Brown and Gray, Silty CLAY
710	704.9	28.5	1	3	6	9		M		701.6 31.8 **RESIDUAL** Stiff, Light Brownish Gray, Silty CLAY
705	699.9	33.5	2	4	5	9		M		698.4 35.0 Boring Terminated at Elevation 698.4 ft in RESIDUAL (Silty CLAY)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** J. Kardon	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. L_2850	**STATION** 28+50	**OFFSET** 93 ft RT	**ALIGNMENT** -L-	**0 HR.** 17.0
COLLAR ELEV. 711.9 ft	**TOTAL DEPTH** 29.3 ft	**NORTHING** 757,927	**EASTING** 1,622,001	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 05/09/23	**COMP. DATE** 05/09/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
715											
										711.9	0.0
	710.9	1.0								GROUND SURFACE	
710			2	3	3	6		M		710.9	1.0
	708.4	3.5								**ROADWAY EMBANKMENT** Asphalt (0.0 - 0.5 Foot) ABC Stone (0.5 - 1.0 Foot) Medium Stiff to Soft, Red to Reddish Brown, Silty CLAY, Trace Mica	
			2	2	3	5		M			
705											
	703.3	8.6									
			1	1	2	3		M			
700										700.9	11.0
	698.3	13.6								**ALLUVIAL** Very Soft, Highly Plastic, Dark Brown and Dark Gray, Silty CLAY	
			WOH	1	1	2		M			
695								▽			
	693.3	18.6								694.9	17.0
			15	29	31	60		W		**RESIDUAL** Very Dense, Brown, Silty Coarse to Fine SAND	
690											
	688.3	23.6	15	76	24/0.1	100/0.6				687.3	24.6
685										**WEATHERED ROCK** Gray, METAGABBRO	
	683.3	28.6	60	40/0.2		100/0.7				682.6	29.3
										Boring Terminated at Elevation 682.6 ft in WEATHERED ROCK (METAGABBRO)	

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. EB1-B	**STATION** 28+88	**OFFSET** 33 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 733.2 ft	**TOTAL DEPTH** 53.9 ft	**NORTHING** 757,994	**EASTING** 1,621,977	**24 HR.** 15.7
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 04/24/23	**COMP. DATE** 04/24/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
735										
										733.2 GROUND SURFACE 0.0
										732.2 **ROADWAY EMBANKMENT** 1.0
730	729.8	3.4								Asphalt & ABC Stone (0.0 - 1.0 Feet) Medium Stiff, Reddish Brown, Olive Brown, and Brown, Silty CLAY, Trace Mica
			1	2	3	5		M		
725	724.8	8.4								
			2	2	3	5		M		
720	719.9	13.3								
			2	2	2	4		M		
715	714.9	18.3						▽		
			2	3	2	5		W		
710	709.9	23.3								
			2	2	2	4		W		
705	704.9	28.3								706.7 26.5
			3	3	3	6		Sat.		**ALLUVIAL** Medium Stiff, Dark Reddish Brown, Dark Brown, and Gray, Silty CLAY, Trace Mica
700	699.9	33.3								
			3	3	3	6		Sat.		
695	694.9	38.3								696.5 36.7
			29	46	43	89		Sat.		**RESIDUAL** Hard, Olive Gray, Coarse to Fine Sandy SILT
690	689.9	43.3								691.5 41.7
			100/0.5			100/0.5				**WEATHERED ROCK** Dark Gray to Olive Gray, METAGABBRO
685	684.9	48.3								
			41	59/0.4		100/0.9				
680	679.9	53.3								679.3 53.9
			49	51/0.1		100/0.6				Boring Terminated at Elevation 679.3 ft in Weathered Rock (METAGABBRO)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. EB1-D	**STATION** 28+68	**OFFSET** 15 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 733.2 ft	**TOTAL DEPTH** 58.9 ft	**NORTHING** 757,989	**EASTING** 1,621,951	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 05/01/23	**COMP. DATE** 05/01/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
735										733.2 GROUND SURFACE	0.0
										732.2 **ROADWAY EMBANKMENT** Asphalt & ABC Stone (0.0 - 1.0 Foot) / Medium Stiff, Reddish Brown and Brown, Silty CLAY, Trace Mica	1.0
730	729.7	3.5	2	3	2	5		M			
725	724.8	8.4	2	3	4	7		M			
720	719.9	13.3	WOH	2	2	4		M			
715	714.9	18.3	WOH	2	2	4		M			
710	709.9	23.3	WOH	2	2	4		M			
705	704.9	28.3	2	2	4	6		M			
700	699.9	33.3	1	4	4	8		M			
695	694.9	38.3	2	4	15	19		M			
690	689.9	43.3	24	35	46	81		M		706.6 **ALLUVIAL** Medium Stiff, Dark Reddish Brown and Dark Brown, Silty CLAY	26.6
685	684.9	48.3	47	53/0.3		100/0.8				696.6 **RESIDUAL** Very Stiff to Hard, Olive Brown and Olive Gray, Coarse to Fine Sandy SILT, Trace Mica	36.6
680	679.9	53.3	50	50/0.1		100/0.6				686.7 **WEATHERED ROCK** Olive Brown and Light Brownish Gray, METAGABBRO	46.5
675	674.9	58.3	87	13/0.1		100/0.6				674.3 Boring Terminated at Elevation 674.3 ft in Weathered Rock (METAGABBRO)	58.9

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. EB1-C	**STATION** 28+69	**OFFSET** 16 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 733.1 ft	**TOTAL DEPTH** 73.5 ft	**NORTHING** 758,009	**EASTING** 1,621,927	**24 HR.** 21.1
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 04/20/23	**COMP. DATE** 04/20/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
735										733.1 GROUND SURFACE	0.0
										732.1 **ROADWAY EMBANKMENT** Asphalt & ABC Stone (0.0 - 1.0 Foot) / Medium Stiff, Reddish Brown to Dark Reddish Brown, Silty CLAY, Trace Mica	1.0
730	731.0	2.1	4	2	2	4		M			
	728.6	4.5	1	2	3	5		M			
725	724.7	8.4	1	2	2	4		M			
720	719.7	13.4	1	3	3	6					
715	714.7	18.4	1	2	2	4		W			
710	709.8	23.3	2	2	2	4		W			
705	704.8	28.3	3	3	3	6		W			
700	699.8	33.3	2	3	4	7		Sat.			
695	694.8	38.3	12	16	17	33		Sat.		707.1 **ALLUVIAL** Medium Stiff, Dark Brown and Dark Reddish Brown to Gray, Silty CLAY	26.0
690	689.8	43.3	21	16	12	28		Sat.		694.6 **RESIDUAL** Hard to Very Stiff, Olive Brown, Coarse to Fine Sandy SILT, Trace Mica	38.5
685	684.8	48.3	37	63/0.4		100/0.9				686.6 **WEATHERED ROCK** Olive Brown, METAGABBRO	46.5
680	679.8	53.3	7	13	18	31		Sat.		682.1 **RESIDUAL** Hard to Very Stiff, Olive Brown and Olive Gray, Coarse to Fine Sandy SILT, Trace Mica	51.0
675	674.8	58.3	8	14	14	28		Sat.			
670	669.8	63.3	100/0.4			100/0.4				671.6 **WEATHERED ROCK** Olive Brown, METAGABBRO	61.5
665	664.8	68.3	66	34/0.1		100/0.6					
660	659.8	73.3	100/0.2			100/0.2				659.6 Boring Terminated at Elevation 659.6 ft in Weathered Rock (METAGABBRO)	73.5

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 28+65	**OFFSET** 34 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 733.4 ft	**TOTAL DEPTH** 54.3 ft	**NORTHING** 758,017	**EASTING** 1,621,910	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 04/19/23	**COMP. DATE** 04/19/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)
735										733.4 GROUND SURFACE 0.0
										732.4 **ROADWAY EMBANKMENT** 1.0 Asphalt & ABC Stone (0.0 - 1.0 Foot) Medium Stiff, Reddish Brown, Silty CLAY, Trace Mica
730	730.8	2.6	3	3	3	6		M		
	728.9	4.5	2	2	2	4		M		
725	724.7	8.7	2	3	3	6		M		
720	719.8	13.6	WOH	1	2	3		M		722.4 11.0 Soft to Medium Stiff, Yellowish Brown, Fine Sandy SILT, Trace Mica
715	714.8	18.6	1	1	2	3		M		
710	709.8	23.6	1	2	2	4		M		706.9 26.5 **ALLUVIAL** Medium Stiff, Dark Brown and Gray, Silty CLAY
705	704.8	28.6	1	3	4	7		W		
700	699.8	33.6	WOH	2	3	5		Sat.		
695	694.8	38.6	32	35	50	85		Sat.		695.4 38.0 **RESIDUAL** Hard, Olive Brown, Coarse to Fine Sandy SILT, Trace Mica
690	689.8	43.6	16	38	62/0.4	100/0.9				688.8 44.6 **WEATHERED ROCK** Olive Brown, METAGABBRO
685	684.8	48.6	62	38/0.1		100/0.6				
680	679.8	53.6	57	43/0.2		100/0.7				679.1 54.3 Boring Terminated at Elevation 679.1 ft in Weathered Rock (METAGABBRO)

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. Y1_1512	**STATION** 15+12	**OFFSET** 46 ft RT	**ALIGNMENT** -Y1-	**0 HR.** Dry
COLLAR ELEV. 715.1 ft	**TOTAL DEPTH** 19.9 ft	**NORTHING** 758,063	**EASTING** 1,621,845	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 05/10/23	**COMP. DATE** 05/10/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)
720										
715	715.1	0.0	2	3	2	5		M		715.1 GROUND SURFACE 0.0 **ROADWAY EMBANKMENT**
	711.7	3.4	2	2	2	4	SS-23	39%		712.6 2.5 Medium Stiff, Reddish Brown, Silty CLAY, Trace Mica and Gravel 711.0 4.1 Medium Stiff, Slightly Plastic, Reddish Yellow, Clayey SILT, Trace Mica
710	706.7	8.4	WOH	1	3	4		M		**ALLUVIAL** Medium Stiff to Stiff, Highly Plastic, Dark Gray and Dark Brown to Dark Reddish Brown and Dark Brown, Silty CLAY, Trace Mica and Organic Matter (Topsoil, Wood Fragments)
705	701.7	13.4	WOH	2	2	4		W		
700	696.7	18.4	5	7	8	15		Sat.		695.2 19.9 Boring Terminated at Elevation 695.2 ft in ALLUVIAL (Silty CLAY)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. Y1_1550	**STATION** 15+50	**OFFSET** 45 ft LT	**ALIGNMENT** -Y1-	**0 HR.** Dry
COLLAR ELEV. 717.8 ft	**TOTAL DEPTH** 13.5 ft	**NORTHING** 758,135	**EASTING** 1,621,912	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 04/18/23	**COMP. DATE** 04/18/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
720										
	716.8	1.0								717.8 GROUND SURFACE 0.0
715	714.3	3.5	4	4	3	7		M		**ROADWAY EMBANKMENT** Stiff to Medium Stiff, Moderately Plastic, Reddish Brown, Silty CLAY
			3	4	5	9	SS-24	29%		
710	709.3	8.5								
			2	2	2	4		M		
705										704.3 13.5
										Boring Terminated at Elevation 704.3 ft in ROADWAY EMBANKMENT (Silty CLAY)
										NOTE:
										No Sample taken at 13.5 ft due to potential obstruction on 54" RCP.

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. EB2-A	**STATION** 29+72	**OFFSET** 68 ft LT	**ALIGNMENT** -L-	**0 HR.** 18.8
COLLAR ELEV. 718.8 ft	**TOTAL DEPTH** 54.1 ft	**NORTHING** 758,123	**EASTING** 1,621,949	**24 HR.** 12.4
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 04/18/23	**COMP. DATE** 04/18/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
720										
	717.8	1.0								718.8 GROUND SURFACE 0.0
715	715.0	3.8	2	2	3	5		M		**ROADWAY EMBANKMENT** Medium Stiff, Reddish Brown, Silty CLAY
			2	3	2	5		M		
710	710.0	8.8								712.3 6.5
			1	2	2	4		M		**RESIDUAL** Medium Stiff, Reddish Brown to Dark Reddish Brown, Silty CLAY
705	705.0	13.8								
			1	2	4	6		M		
700	700.0	18.8								702.3 16.5
			2	3	4	7		W		Medium Stiff to Hard, Reddish Brown, Gray, Brown, and Light Brownish Gray, Coarse to Fine Sandy SILT, Trace Mica
695	695.0	23.8								
			5	8	9	17		Sat.		
690	690.0	28.8								
			4	7	8	15		Sat.		
685	685.0	33.8								
			3	5	4	9		Sat.		
680	680.0	38.8								
			9	19	34	53		Sat.		677.3 41.5
675	675.0	43.8								**WEATHERED ROCK** Olive Brown, METAGABBRO
			46	54/0.3		100/0.8				
670	670.0	48.8								
			65	35/0.2		100/0.7				
665	665.0	53.8								664.7 54.1
			100/0.3			100/0.3				Boring Terminated at Elevation 664.7 ft in Weathered Rock (METAGABBRO)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. EB2-C	**STATION** 30+12	**OFFSET** 15 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 732.9 ft	**TOTAL DEPTH** 73.9 ft	**NORTHING** 758,122	**EASTING** 1,622,015	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 04/21/23	**COMP. DATE** 04/21/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
735										
										732.9 GROUND SURFACE 0.0
										731.9 **ROADWAY EMBANKMENT** 1.0
730	729.5	3.4	2	2	2	4		M		Asphalt & ABC Stone (0.0 - 1.0 Foot) / Soft to Medium Stiff, Reddish Brown, Silty CLAY, Trace Mica
725	724.5	8.4	2	2	1	3		M		
720	719.6	13.3	1	2	2	4		M		
715	714.6	18.3	2	4	6	10		M		716.4 16.5 **RESIDUAL** Stiff, Brown and Dark Brown, Silty CLAY
710	709.6	23.3	3	5	5	10		W		711.4 21.5 Medium Stiff to Hard, Brown, Gray, and Light Brownish Gray, Coarse to Fine Sandy SILT
705	704.6	28.3	2	2	5	7		Sat.		
700	699.6	33.3	2	4	6	10		Sat.		
695	694.6	38.3	3	5	8	13		Sat.		
690	689.6	43.3	4	9	12	21		M		
685	684.6	48.3	6	11	14	25		M		
680	679.6	53.3	6	24	27	51		M		
675	674.6	58.3	16	25	24	49		M		
670	669.6	63.3	13	25	36	61		M		
665	664.6	68.3	100/0.5			100/0.5				
660	659.6	73.3	66	34/0.1		100/0.6				666.4 66.5 **WEATHERED ROCK** Olive Gray, METAGABBRO
										659.0 73.9 Boring Terminated at Elevation 659.0 ft in Weathered Rock (METAGABBRO)

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. EB2-D	**STATION** 30+28	**OFFSET** 19 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 733.3 ft	**TOTAL DEPTH** 64.2 ft	**NORTHING** 758,114	**EASTING** 1,622,052	**24 HR.** 11.2
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 04/26/23	**COMP. DATE** 04/26/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
735										
										733.3 GROUND SURFACE 0.0
										732.3 **ROADWAY EMBANKMENT** 1.0
730	730.0	3.3	2	3	3	6		M		Asphalt & ABC Stone (0.0 - 1.0 Foot) / Medium Stiff, Reddish Brown, Silty CLAY, Trace Mica
725	724.8	8.5	3	3	3	6		M		
720	720.0	13.3	3	4	4	8		M		721.4 11.9 **RESIDUAL** Medium Stiff to Stiff, Reddish Brown and Yellowish Brown, Silty CLAY, Trace Mica
715	715.0	18.3	3	5	6	11		W		
710	710.0	23.3	3	3	4	7		W		711.7 21.6 Medium Stiff to Hard, Reddish Yellow, Light Brownish Gray, Brown, and Pale Red, Coarse to Fine Sandy SILT, Trace Mica
705	705.0	28.3	2	2	3	5		Sat.		
700	700.0	33.3	6	7	17	24		Sat.		
695	695.0	38.3	10	8	7	15		Sat.		
690	690.0	43.3	6	11	15	26		Sat.		
685	685.0	48.3	10	19	28	47		Sat.		
680	680.0	53.3	18	27	38	65		Sat.		
675	675.0	58.3	30	60	40/0.2	100/0.7				674.0 59.3 **WEATHERED ROCK** Olive Gray and Light Brownish Gray, METAGABBRO
670	670.0	63.3	16	84/0.4		100/0.9				669.1 64.2 Boring Terminated at Elevation 669.1 ft in Weathered Rock (METAGABBRO)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** M. Foster	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 30+22	**OFFSET** 33 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 733.2 ft	**TOTAL DEPTH** 54.8 ft	**NORTHING** 758,100	**EASTING** 1,622,059	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 83% 05/09/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER R. Toothman	**START DATE** 04/25/23	**COMP. DATE** 04/25/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
735											
										733.2 GROUND SURFACE	0.0
										732.2 **ROADWAY EMBANKMENT**	1.0
730	729.9	3.3	2	3	4	7		M		Asphalt & ABC Stone (0.0 - 1.0 Feet) Medium Stiff, Reddish Brown, Silty CLAY	
725	724.8	8.4	2	3	3	6		M			
720	719.9	13.3	3	5	7	12		M		721.6 **RESIDUAL** Stiff, Reddish Yellow, Silty CLAY	11.6
715	714.9	18.3	5	7	11	18		M		716.6 Very Stiff to Hard, Yellowish Brown, Olive Brown, Olive, Coarse to Fine Sandy SILT, Trace to Little Mica, Trace Rock Fragments and Quartz	16.6
710	709.9	23.3	10	12	15	27		M			
705	704.9	28.3	9	14	18	32		M			
700	699.9	33.3	10	16	20	36		M			
695	694.9	38.3	8	13	17	30		M			
690	689.9	43.3	18	24	26	50		M			
685	684.9	48.3	20	27	47	74		M			
680	679.9	53.3	35	35	49	84		M		678.4	54.8
										Boring Terminated at Elevation 678.4 ft in RESIDUAL (Sandy SILT)	

WBS 67015.1.1	**TIP** BR-0015	**COUNTY** DAVIDSON	**GEOLOGIST** D. Kubinski	
SITE DESCRIPTION Bridge No. 67 and No. 68 Replacements on US 29/US 70 NB & SB over SR 1192 (W. 5th Avenue)				**GROUND WTR (ft)**
BORING NO. Y1_1783	**STATION** 17+83	**OFFSET** 34 ft LT	**ALIGNMENT** -Y1-	**0 HR.** Dry
COLLAR ELEV. 715.2 ft	**TOTAL DEPTH** 10.3 ft	**NORTHING** 758,045	**EASTING** 1,622,127	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Hand Auger	**HAMMER TYPE** N/A	
DRILLER D. Kubinski	**START DATE** 05/02/23	**COMP. DATE** 05/02/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 1.75in	1.75in	1.75in	BLOWS PER INCREMENT 0 25	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
720											
										715.2 GROUND SURFACE	0.0
715	714.2	1.0	11	12	12	12		M		**RESIDUAL** Medium Stiff to Stiff, Olive, Coarse to Fine Sandy SILT, Trace Mica	
	713.2	2.0	7	8	13	11					
	712.2	3.0	9	9	12	11					
	711.2	4.0	22	25+		25					
710	710.2	5.0	19	23	25	24		M			
	709.2	6.0	13	25	25+	25					
	708.2	7.0	15	25+		25					
	707.2	8.0	25+			25					
	706.2	9.0	24	25+		25					
705	705.2	10.0	24	25+		25				704.9	10.3
										Boring Terminated at Elevation 704.9 ft in RESIDUAL (Sandy SILT)	

NOTE:

Conventional dynamic cone penetrometer test performed at 1 foot intervals.

LABORATORY SUMMARY SHEET FOR SOIL SAMPLES

WBS NO. (TIP NO.): 67015.1.1 (BR-0015)
PROJECT ID: 41620
COUNTY: DAVIDSON
DESCRIPTION: BRIDGE NO. 67 AND NO. 68 REPLACEMENTS ON US 29/US 70 NB & SB OVER SR 1192 (W. 5TH AVENUE)

									Atterberg Limits			Gradation Results							
Sample No.	Boring Number	Alignment	Station	Offset	Sample Depth (ft.)	Natural Moisture Content (%)	AASHTO Class.	N-Value (blows/ft)	L.L.	P.L.	P.I.	Retained #4 Sieve	Pass #10 Sieve	Pass #40 Sieve	Pass #200 Sieve	Coarse Sand (%)	Fine Sand (%)	Silt (%)	Clay (%)
SS-9*	L_2460	-L-	24+60	90' RT	1.0 - 2.5	37.1	A-7-5	6	78	45	33	0.0	100.0	97.8	86.5	4.2	13.2	23.4	59.2
SS-10*	L_2599	-L-	25+99	35' RT	8.5 - 10.0	39.4	A-7-5	8	65	34	31	0.0	100.0	99.4	80.3	2.4	25.4	34.6	37.7
SS-11*	L_2650	-L-	26+50	90' RT	1.0 - 2.5	32.1	A-7-5	7	73	35	38	2.0	97.0	94.5	79.0	8.8	16.4	21.4	53.4
SS-12*	L_2700	-L-	27+00	31' RT	3.7 - 5.2	32.5	A-7-5	6	52	30	22	0.0	100.0	90.1	64.0	16.3	25.7	25.6	32.5
SS-13*	L_2750	-L-	27+50	90' RT	1.0 - 2.5	21.7	A-7-5	5	56	31	25	3.0	92.0	88.3	63.3	18.1	24.2	23.0	34.6
SS-14*	L_2800	-L-	28+00	29' RT	13.5 - 15.0	29.7	A-7-5	7	58	34	24	0.0	100.0	96.0	72.4	9.4	23.7	24.9	41.9
SS-23*	Y1_1512	-Y1-	15+12	46' RT	3.4 - 4.1	38.7	A-5	4	50	41	9	0.0	99.0	94.3	66.6	11.8	28.5	25.9	33.8
SS-24*	Y1_1550	-Y1-	15+50	45' LT	3.5 - 5.0	28.6	A-7-5	9	59	35	24	0.0	98.0	94.3	76.3	10.3	15.9	25.7	48.1

*Roadway sample number

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