ADDENDUM NO. 1

City of Franklin Engineering Department 109 Third Avenue South, Suite 133 Franklin, TN 37064	Project: East McEwen Drive Phase 4 Improvements TDOT PIN: 125418.00 Contract No: 2024-0246 Federal Project No: STP-M-9305(31) State Project No: 94LPLM-F3-096

Date of Issuance: Wednesday, October 30, 2024

Bidders are directed to make the following change(s) in the Bidding Documents:

I. Changes and Clarifications to the Bid Documents, Bid Submittal Process, and/or Bid Opening Deadline:

1. Bid Submittal Deadline & Bid Opening Date Change:
   To allow additional time for Bidders to prepare, the Bid Submittal Deadline *and* the Bid Opening Date has been extended by one (1) week, from Friday, November 8, 2024 to **Friday, November 15, 2024**. The times will remain the same at **2:00 PM** and 2:10 PM (Central Time) for the **Bid Submittal Deadline** and Bid Opening times, respectively.

2. Final Date & Time for Questions by Bidders Set:
   There was no deadline set for final questions by Bidders in the original Bid Documents. With the issuance of this Addendum 1, the final date and time that questions may be submitted for this project is **Wednesday, November 6, 2024 at 2:00 PM** (Central Time).

3. Bid Form Revised:
   Due to several duplicates and inconsistencies within the original Bid Form, a revised Bid Form is issued as attachments (**Attachment A1** and **Attachment A2**) to this Addendum 1. Due to the size and complexity of this project, the City has decided to issue this revised Bid Form in both PDF (**Attachment A1**) and Microsoft Excel (**Attachment A2**) formats. The line items have been broken down into the same groups/categories as they are listed within the Construction Plans. If there is a discrepancy between the quantities listed in the Construction Plans and the revised Bid Form, the Bidder is directed to use the information listed in the revised Bid Form, as it shall control.

   The Microsoft Excel file is a macro-enabled file, as noted by its .xlsm file extension. To allow this Excel file to function properly, the user may need to perform two (2) steps:

   a. After downloading the Excel file, Right Click (in Windows) on the file and select "Properties". Under the "General" tab, IF there is a message at the bottom of the window that says "Security: This file came from another computer and might be blocked to help

protect this computer", then Check the Box next to the word "Unblock" and Click the "OK" button.

b. When opening the Excel file, you may encounter a message highlighted in yellow at the top of the window that states: "SECURITY WARNING Macros have been disabled." If you receive this message, simply Click the "Enable Content" button.

The highlighted "Unit Price" cells are the only cells in the worksheet where the Bidders are allowed to modify the worksheet. As data is entered, the highlights will disappear. Once data has been entered in all "Unit Price" cells, the worksheet should automatically calculate the "Total Bid Price" in both "Figures" (e.g., $123.45) and "Words" (e.g., One Hundred Twenty-Three and 45/100 Dollars). However, this will only occur when ALL blank "Unit Price" cells have been filled in.

4. Changes to Proprietary Products listed within Item Numbers for Estimated Roadway Lighting Quantities:
Several line items within the Estimated Roadway Lighting Quantities list specific, proprietary products to be used as a part of those item numbers.

1. For the Item Numbers **714-01.36, 714-08.28, 714-08.43, and 714-25.22**, please disregard the branded, proprietary products listed within the Item Description. Any brand product/device meeting the needs and requirements of the project, City, and Middle Tennessee Electric (MTE) for these item numbers shall be deemed acceptable. These changes have been reflected in the revised Bid Form and its accompanying Footnotes, which are attached to this Addendum. The BID FORM – EXHIBIT A – Part 2 of 2 – FOOTNOTES document has been revised and attached (**Attachment B**) to this Addendum 1 to reflect these changes as well.

2. The lighting design was completed several years ago. As such, the model information listed on both the Estimated Quantities (Roadway-Lighting), Sheet 2B, and the Lighting System, Sheets 19 thru 19T, are no longer accurate for both the "**Light Standards**," series, Item Nos. **714-08.09 thru 714-08.11**, and the "**LED Luminaires**" series, Item Nos. **714-09.47 thru 714-09.49**. The Bid Form Footnotes for these Item Nos. have been updated to reflect the latest known information regarding these proprietary products. This information was also sent to TDOT for approval prior to the project being released for Bid Advertisement. The BID FORM – EXHIBIT A – Part 2 of 2 – FOOTNOTES document has been revised and attached (**Attachment B**) to this Addendum 1 to reflect these changes as well.

   All Bidders shall price these aforementioned items based on this new information provided with the revised Bid Form and Footnotes thru Addendum 1. Please note that the Construction Plans have NOT been revised at this time.

3. The "Item Description" for the Estimated Roadway Lighting Quantities Item Number **714-25.01** has been revised to read "**ELECTRICAL SERVICE CONNECTION (SERVICE / METER PEDESTAL – MILBANK, SERIES CP3B, STANDARD UNIT)**" within the Bid Form. Please note that the Construction Plans have NOT been revised at this time.

4. Acknowledgement of Addenda:
   All Bidders shall acknowledge the receipt of all Addenda on the cover of the original Project Manual as purchased from the City of Franklin. Typed or handwritten acknowledgement is acceptable.

5. Download a Full Copy of Addendum 1 on the City of Franklin Website:
   Full Copy of Addendum 1, including all attachments, is available on the City of Franklin website at: Business Opportunities with the City | City of Franklin, TN or https://www.franklintn.gov/business/business-opportunities-with-the-city-1494.

II. Questions from Bidders and City Responses (in RED):

(Q1) The plans include water and sewer estimated quantities that are not listed on the bid form. Will these be added via addendum?

(A1) There were some discrepancies between the Bid Form originally provided and the quantities listed within the Estimated Quantities tables shown on the Construction Plans. These discrepancies have been corrected. A revised Bid Form (**Attachment A1** & **Attachment A2**), revised Bid Form Footnotes (**Attachment B**), and revised Plan Sheets (**Attachment C** & **Attachment D**) are attached as a part of this Addendum 1.

(Q2) All the estimated quantities in the gas plans are not listed on the bid form (some are included on bid form not at all), will these be added via addendum?

(A2) There were some discrepancies between the Bid Form originally provided and the quantities listed on the Gas Relocation and Improvements Plans. These discrepancies have been corrected. The revised Gas Relocation plan sheet has been attached (**Attachment E**) as a part of this Addendum 1.

(Q3) Is the City conducting a pre-bid meeting for this project?

(A3) No, a Pre-Bid meeting will not be held for this project.

(Q4) Would it be possible to get the CADD files and geotechnical reports for the project?

(A4) The CADD files will be provided to the contractor that is awarded the project. The Retaining Wall Sheets, Sheet 18 thru 18AG, contain some of the most recent geotechnical information obtained within the project limits. Also, the following two (2) geotechnical reports will be provided as a part of this Addendum 1:

- ***Draft*** Report of Geotechnical Exploration – McEwen Drive Extension – Phase 4 – Franklin, Tennessee – S&ME Project No. 1247-15-066B – Dated July 15, 2018 (as **Attachment F**)

- Report of Subsurface Exploration and Geotechnical Engineering Study – Proposed Widening & Improvements to McEwen Road – Franklin, Tennessee – AMEC Earth & Environmental File No. 3-518-40000 – Dated April 17, 2006 (as **Attachment G**)

  NOTE: The limits of this older study stretch from approximately 0.30 miles east of I-65 to the intersection at Wilson Pike. Therefore, this report encompasses both Phase 3 and Phase 4 of East McEwen Drive.

(Q5) It appears a few of the Bridge Pay Items may have been doubled up in the Roadway items upon importing into Bid [Estimated Quantities]. Can you look into this? For example: 202-04.01 Removal of Structures (Cantilever and Railing).

(A5) Yes, the Estimated Bridge Quantities were also listed in the Estimated Roadway Quantities table of the Construction Plans, and this error carried over onto the original Bid Form. The duplicate line items have been removed from the Estimated Roadway Quantities table, and the Bid Form has been revised. A revised Bid Form and revised Plan Sheets are attached (**Attachment H**) as a part of this Addendum 1.

(Q6) Could you provide an Excel file of the bid form?

(A6) The City does not normally provide an Excel copy of the Bid Form. However, due to this size and complexity of this project, along with the errors in the original Bid Form, the City has decided to issue the revised Bid Form in both PDF (**Attachment A1**) and Excel (**Attachment A2**) formats. Also, the line items have been broken into the same groupings/sections as listed on the Construction Plans.

NOTE: For the final Bid Submittal, the Bidders are directed to attach, by staple, their completed, revised Bid Form sheets as single-sided, tabloid size (11" x 17"), hard copies to the original Project Manual. The macro-enabled Excel spreadsheet (.xlsm) has been provided by the City solely for the convenience of the Bidders. Please be advised that the City offers no support or warranty regarding the functionality of the spreadsheet or the accuracy of its formula calculations. Bidders are responsible for ensuring the correctness of their Bid submissions.

(Q7) Due to the large number of bid items on East McEwen Drive Phase 4 Project, is there any way the owner could provide an electronic copy in Excel or PDF format for the contractors' use? This will help the contractors ensure a bid item is not missed when entering into a bidding software.

(A7) The City does not normally provide an Excel copy of the Bid Form. However, due to this size and complexity of this project, along with the errors in the original Bid Form, the City has decided to issue the revised Bid Form in both PDF and Excel formats. Also, the line items have been broken into the same groupings/sections as listed on the Construction Plans.

NOTE: For the final Bid Submittal, the Bidders are directed to attach, by staple, their completed, revised Bid Form sheets as single-sided, tabloid size (11" x 17"), hard copies to the original Project Manual. The macro-enabled Excel spreadsheet (.xlsm) has been provided by the City solely for the convenience of the Bidders. Please be advised that the City offers no support or warranty regarding the functionality of the spreadsheet or the accuracy of its formula calculations. Bidders are responsible for ensuring the correctness of their Bid submissions.

(Q8) For Retaining Wall K1, we [i.e., contractor/bidder] are requesting a modification to the soldier pile wall. Instead of using precast panels, we are requesting to use a cast-in-place wall-pour similar to the attached design. (Contractor example will be provided as an attachment to this Addendum.) This design has been used on other TDOT projects in the City of Franklin & Brentwood. It's my belief that the CIP option would be a cost savings versus the precast panels.

(A8) Bidders are directed to price the retaining walls as currently designed. Following the award of the construction contract, the City will request permission from the TDOT Local Programs Development Office (LPDO), as this project involves federal transportation dollars and is administered thru the TDOT LPDO, to utilize the TDOT Value Engineering process as listed in their 2021 Standard Specifications for Road and Bridge Construction.

(Q9) In order to remove the pavement markings between traffic control phases, can a 797-08.30 item for hydroblasting be added to the project?

(A9) No, the Bidders should include the cost of any pavement marking removal between traffic control phases in the cost of other traffic control or pavement marking line items.

(Q10) Can the quantity for the 716-02.04 Channelization Striping be checked? We believe the units may be incorrect.

(A10) The Bidder's assumption is correct, the original quantity of 1,432 is a Square Foot measurement, when the line item calls for a Square Yard unit. Therefore, the Bid Form has been revised to reflect the correct Quantity and Unit of 160 Square Yards (S.Y.), respectively. Please note, that the Estimated Roadway Quantities table, was NOT revised.

(Q11) Can a geotech report be provided for this job?

(A11) The Retaining Wall Sheets, Sheet 18 thru 18AG, contain some of the most recent geotechnical information obtained within the project limits. Also, the following two (2) geotechnical reports will be provided as a part of this Addendum 1:

- ***Draft*** Report of Geotechnical Exploration – McEwen Drive Extension – Phase 4 – Franklin, Tennessee – S&ME Project No. 1247-15-066B – Dated July 15, 2018 (**Attachment F**)

- Report of Subsurface Exploration and Geotechnical Engineering Study – Proposed Widening & Improvements to McEwen Road – Franklin, Tennessee – AMEC Earth & Environmental File No. 3-518-40000 – Dated April 17, 2006 (**Attachment G**)

NOTE: The limits of this older study stretch from approximately 0.30 miles east of I-65 to the intersection at Wilson Pike. Therefore, this report encompasses both Phase 3 and Phase 4 of East McEwen Drive.

(Q12) Do you have a timeline for when the power poles will be relocated?

(A12) This work is to be performed by Middle Tennessee Electric (MTE) thru and agreement between the City and MTE as a part of Phase A of Stage 1 of construction.

(Q13) Is there a deadline for questions?

(A13) Because no original deadline for questions was set and there has been a delay in the issuance of Addendum 1, the City has decided to extend the Bid Submittal Deadline and Bid Opening by one (1) week to Friday, November 15, 2024.

Therefore, the final date and time that questions will be accepted for this project is now set at **2:00 PM (Central Time) on Wednesday, November 6, 2024**. This will allow time for Staff to issue a final Addendum to respond to any remaining questions.

(Q14) Will any questions and answers be made public?

(A14) Any questions received so far are being made public via this Addendum 1. Any questions received after Addendum 1 and prior to the newly set Final Question Deadline of Wednesday, November 6, 2024 at 2:00 PM (Central Time) will be answered via another Addendum.

(Q15) It appears that there are several duplicates on the bid form that [were] provided. Can you confirm the quantities and correct the bid form along with putting them in the correct order? If you could provide an Excel format of the bid form that would be extremely helpful too.

(A15) Yes, there were several duplicates that appeared in multiple quantities tables within the Construction Plans **and** in the original Bid Form. These duplicate quantities have been removed completely from the revised Bid Form

III. Summary of Attachments:

- **Attachment A1** – PDF copy of Revised Bid Form – Exhibit A – Part 1 of 2 – Project Estimated Quantities.
- **Attachment A2** – Macro-enabled Microsoft Excel (.xlsm) copy of Revised Bid Form – Exhibit A – Part 1 of 2 – Project Estimated Quantities.
- **Attachment B** – PDF copy of Revised Bid Form – Exhibit A – Part 2 of 2 – Footnotes.
- **Attachment C** – PDF copy of Revised Utility Sheet W1, Milcrofton Utility District – Water Relocation and Improvements, Cover Sheet.
- **Attachment D** – PDF copy of Revised Utility Sheet S1, City of Franklin – Force Main Relocation, Cover Sheet.
- **Attachment E** – PDF copy of Revised Utility Sheet G1, Atmos Energy Corporation – Gas Relocation and Improvements, Cover Sheet.
- **Attachment F** – *Draft* Report of Geotechnical Exploration – McEwen Drive Extension – Phase 4 – Franklin, Tennessee – S&ME Project No. 1247-15-066B – Dated July 15, 2018.
- **Attachment G** – Report of Subsurface Exploration and Geotechnical Engineering Study – Proposed Widening & Improvements to McEwen Road – Franklin, Tennessee – AMEC Earth & Environmental File No. 3-518-40000 – Dated April 17, 2006.
- **Attachment H** – PDF copy of Revised Sheet 2A, Estimated Quantities (Roadway/Bridge).

End of Addendum 1

BID FORM for COF Construction Contract No. 2024-0246

East McEwen Drive Phase 4 Improvements (COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A - PART 1 of 2 - BID FORM - PROJECT ESTIMATED QUANTITIES

Revised Per Addendum 1 on October 31, 2024

FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
ESTIMATED ROADWAY QUANTITIES								
FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
	105-01	CONSTRUCTION STAKES, LINES AND GRADES	LS	1	0	1		
9, 31	201-01	CLEARING AND GRUBBING	LS	1	0	1		
18, 40	202-01	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LS	1	0	1		
19	203-01	ROAD & DRAINAGE EXCAVATION (UNCLASSIFIED)	C.Y.	164,567	0	164,567		
14	203-02.01	BORROW EXCAVATION (GRADED SOLID ROCK)	TON	93,033	0	93,033		
	203-03	BORROW EXCAVATION (UNCLASSIFIED)	C.Y.	25,289	0	25,289		
	203-04	PLACING AND SPREADING TOPSOIL	C.Y.	3,032	0	3,032		
20	203-05	UNDERCUTTING	C.Y.	16,394	0	16,394		
21	203-06	WATER	M.G.	5,732	0	5,732		
	203-07	FURNISHING & SPREADING TOPSOIL	C.Y.	15,375	0	15,375		
1	204-07	BEDDING MATERIAL (PIPE) CLASS B	C.Y.	1,743	0	1,743		
	204-08	FOUNDATION FILL MATERIAL	C.Y.	14	0	14		
34	204-08.01	BACKFILL MATERIAL (FLOWABLE FILL)	C.Y.	42	1,979	2,021		

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4	209-03.53	STREAM MITIGATION - ARTICULATED CONCRETE MAT	S.Y.	1,500	0	1,500		
	209-05	SEDIMENT REMOVAL	C.Y.	1,062	0	1,062		
42	209-06.05	BALED HAY OR STRAW	BALE	48	0	48		
2, 22	209-08.02	TEMPORARY SILT FENCE (WITH BACKING)	L.F.	126,000	0	126,000		
7, 22	209-08.07	ROCK CHECK DAM	EACH	5	0	5		
7, 22	209-08.08	ENHANCED ROCK CHECK DAM	EACH	28	0	28		
7	209-09.04	SEDIMENT FILTER BAG(15' X 10')	EACH	6	0	6		
7, 22	209-09.43	CURB INLET PROTECTION (TYPE 4)	EACH	1	0	1		
7, 23, 43	209-10.02	8IN SKIMMER W/6IN HEAD	EACH	4	0	4		
23	209-11.01	SEDIMENT BASIN RISER (48", STRUCTURE B5)	EACH	1	0	1		
23	209-11.02	SEDIMENT BASIN RISER (48", STRUCTURE F9)	EACH	1	0	1		
23	209-11.03	SEDIMENT BASIN RISER (48", STRUCTURE K7)	EACH	1	0	1		
23	209-11.04	SEDIMENT BASIN RISER (48", STRUCTURE J34)	EACH	1	0	1		
23	209-11.05	SEDIMENT BASIN RISER (48", STRUCTURE J7)	EACH	1	0	1		
23	209-11.06	SEDIMENT BASIN RISER (48", STRUCTURE X2)	EACH	1	0	1		
23	209-11.07	SEDIMENT BASIN RISER (48", STRUCTURE X4)	EACH	1	0	1		

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Revised Per Addendum 1 on October 31, 2024

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	209-11.20	SEDIMENT BASIN BAFFLES	L.F.	760	0	760		
7, 23	209-40.41	CATCH BASIN FILTER ASSEMBLY (TYPE 1)	EACH	13	0	13		
7, 23	209-40.42	CATCH BASIN FILTER ASSEMBLY (TYPE 2)	EACH	48	0	48		
7, 23	209-40.43	CATCH BASIN FILTER ASSEMBLY (TYPE 3)	EACH	10	0	10		
7, 23	209-40.44	CATCH BASIN FILTER ASSEMBLY (TYPE 4)	EACH	4	0	4		
7, 23	209-40.45	CATCH BASIN FILTER ASSEMBLY(TYPE 5)	EACH	11	0	11		
7, 23	209-40.46	CATCH BASIN FILTER ASSEMBLY (TYPE 6)	EACH	135	0	135		
7, 23	209-40.47	CATCH BASIN FILTER ASSEMBLY (TYPE 7)	EACH	31	0	31		
	209-65.04	TEMPORARY IN STREAM DIVERSION	L.F.	30	0	30		
24	303-01	MINERAL AGGREGATE, TYPE A BASE, GRADING D	TON	63,598	0	63,598		
	303-01.02	GRANULAR BACKFILL (BRIDGES)	TON	268	0	268		
44	303-10.01	MINERAL AGGREGATE (SIZE 57)	TON	12	0	12		
	307-01.21	ASP. CONC. MIX (PG70-22) (BPMB-HM) GR. A-S	TON	8,509	0	8,509		
	307-02.01	ASPHALT CONCRETE MIX (PG70-22) (BPMB-HM) GRADING A	TON	16,130	0	16,130		
	307-02.08	ASPHALT CONCRETE MIX (PG70-22) (BPMB-HM) GRADING B-M2	TON	9,523	0	9,523		
17	308-01.10	COLD IN-PLACE RECYCLED BITUMINOUS PAVEMENT	TON	2,500	0	2,500		

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	402-01	BITUMINOUS MATERIAL FOR PRIME COAT (PC)	TON	169	0	169		
	402-02	AGGREGATE FOR COVER MATERIAL (PC)	TON	671	0	671		
	403-02.01	TRACKLESS TACK COAT	TON	52	0	52		
7, 15	407-20.05	SAW CUTTING ASPHALT PAVEMENT	L.F.	3,313	0	3,313		
	411-01.11	ACS MIX (PG64-22) GRADING E RDWY	TON	1,677	0	1,677		
	411-02.10	ACS MIX (PG70-22) GRADING D	TON	3,750	0	3,750		
17	411-50.02	ASPHALT CONC. MAINT. MIX (PG64-22) GRADING D (PLACED)	TON	1,250	0	1,250		
16	415-01.02	COLD PLANING BITUMINOUS PAVEMENT	S.Y.	21,710	0	21,710		
7, 15	502-04.01	SAWING CONCRETE PAVEMENT (FULL DEPTH)	L.F.	100	0	100		
	604-02.01	CLASS A CONCRETE (BOX BRIDGES)	C.Y.	118	0	118		
	604-02.02	STEEL BAR REINFORCEMENT (BOX BRIDGES)	LB.	21,022	0	21,022		
36	607-03.02	18" CONCRETE PIPE CULVERT (CLASS III)	L.F.	10,640	0	10,640		
36	607-05.02	24" CONCRETE PIPE CULVERT (CLASS III)	L.F.	2,584	0	2,584		
36	607-06.02	30" CONCRETE PIPE CULVERT (CLASS III)	L.F.	496	0	496		
36	607-07.02	36" CONCRETE PIPE CULVERT (CLASS III)	L.F.	404	0	404		
36	607-09.02	48" CONCRETE PIPE CULVERT (CLASS III)	L.F.	35	0	35		

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EXHIBIT A - PART 1 of 2 - BID FORM - PROJECT ESTIMATED QUANTITIES

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FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
	611-07.01	CLASS A CONCRETE (PIPE ENDWALLS)	C.Y.	16	0	16		
	611-07.02	STEEL BAR REINFORCEMENT (PIPE ENDWALLS)	LB.	292	0	292		
	611-07.54	18IN ENDWALL (CROSS DRAIN) 3:1	EACH	12	0	12		
	611-07-57	24IN ENDWALL (CROSS DRAIN) 3:1	EACH	6	0	6		
	611-07.60	30IN ENDWALL (CROSS DRAIN) 3:1	EACH	2	0	2		
5, 13	611-12.02	CATCH BASINS, TYPE 12, > 4' - 8' DEPTH	EACH	181	0	181		
5, 13	611-12.03	CATCH BASINS, TYPE 12, > 8' - 12' DEPTH	EACH	11	0	11		
5, 13	611-12.04	CATCH BASINS, TYPE 12, > 12' - 16' DEPTH	EACH	4	0	4		
5, 13	611-12.05	CATCH BASINS, TYPE 12, > 16' - 20' DEPTH	EACH	2	0	2		
5, 13	611-14.02	CATCH BASINS, TYPE 14, > 4' - 8' DEPTH	EACH	21	0	21		
5, 13	611-14.03	CATCH BASINS, TYPE 14, > 8' - 12' DEPTH	EACH	7	0	7		
5, 13	611-14.04	CATCH BASINS, TYPE 14, > 12' - 16' DEPTH	EACH	1	0	1		
5, 13	611-14.05	CATCH BASINS, TYPE 14, > 16' - 20' DEPTH	EACH	1	0	1		
13	611-42.01	CATCH BASINS, TYPE 42, 0' - 4' DEPTH	EACH	3	0	3		
13	611-42.02	CATCH BASINS, TYPE 42, > 4' - 8' DEPTH	EACH	11	0	11		
13	611-42.03	CATCH BASINS, TYPE 42, > 8' - 12' DEPTH	EACH	2	0	2		

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FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
	701-01.01	CONCRETE SIDEWALK (4 ")	S.F.	60,852	0	60,852		
25	701-02	CONCRETE DRIVEWAY	S.F.	6,373	0	6,373		
26	701-02.02	CONCRETE DRIVEWAY (8")	S.F.	1,357	0	1,357		
	701-02.03	CONCRETE CURB RAMP	S.F.	925	0	925		
	702-01.01	EXTRUDED SLOPING CURB	L.F.	1,018	0	1,018		
38	702-01.02	CONCRETE CURB	L.F.	40	0	40		
38	702-03	CONCRETE COMBINED CURB & GUTTER	C.Y.	2,543	0	2,543		
	705-01.04	METAL BEAM GUARD FENCE	L.F.	438	0	438		
	705-06.10	GR TERMINALTRAILING END (TYPE 13) MASH TL3	EACH	1	0	1		
	705-06.11	GR TERMINAL (IN-INLINE) MASH TL3	EACH	3	0	3		
	705-06.20	TANGENT ENERGY ABSORBING TERM MASH TL-3	EACH	2	0	2		
	705-06.25	THRIE BEAM BRIDGE TRANSITION MASH TL-3	EACH	5	0	5		
	705-06.30	GR TERMINAL (ENERGY ABSORBING) MASH TL2	EACH	6	0	6		
8	706-01	GUARDRAIL REMOVED	L.F.	2,060	0	2,060		
	706-06.03	RADIUS RAIL	L.F.	325	0	325		
	706-10.26	ROUNDED END ELEMENT	EACH	1	0	1		

BID FORM for COF Construction Contract No. 2024-0246

East McEwen Drive Phase 4 Improvements (COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A - PART 1 of 2 - BID FORM - PROJECT ESTIMATED QUANTITIES

Revised Per Addendum 1 on October 31, 2024

FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
	706-10.80	MICHIGAN AND MODIFIED MICHIGAN END SHOE	EACH	5	0	5		
3, 27	707-08.11	HIGH-VISIBILITY CONSTRUCTION FENCE	L.F.	2,400	0	2,400		
39	708-02.02	MARKERS (CONCRETE R.O.W. POSTS)	EACH	48	0	48		
10	709-05.05	MACHINED RIP-RAP (CLASS A-3)	TON	410	0	410		
	709-05.06	MACHINED RIP-RAP (CLASS A-1)	TON	886	0	886		
	709-05.08	MACHINED RIP-RAP (CLASS B)	TON	34	0	34		
	710-02	AGGREGATE UNDERDRAINS (WITH PIPE)	L.F.	32,979	0	32,979		
28	712-01	TRAFFIC CONTROL	LS	1	0	1		
29	712-02.02	INTERCONNECTED PORTABLE BARRIER RAIL	L.F.	7,600	0	7,600		
	712-02.47	BRIDGE MOUNTED INTERCONNECTED PORTABLE BARRIER RAIL	L.F.	72	0	72		
29	712-04.01	FLEXIBLE DRUMS (CHANNELIZING)	EACH	174	0	174		
30	712-04.10	TEMPORARY FLEXIBLE TUBULAR DELINEATOR	EACH	60	0	60		
	712-04.50	BARRIER RAIL DELINEATOR	EACH	760	0	760		
29	712-06	SIGNS (CONSTRUCTION)	S.F.	939	0	939		
29	712-07.03	TEMPORARY BARRICADES (TYPE III)	L.F.	567	0	567		
7, 52	712-08.01	UNIFORMED POLICE OFFICER	DOLL	50,000	0	50,000		

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EXHIBIT A - PART 1 of 2 - BID FORM - PROJECT ESTIMATED QUANTITIES

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FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
7	712-08.03	ARROW BOARD (TYPE C)	EACH	1	0	1		
	712-09.08	REMOVABLE PAVEMENT MARKING (6" LINE)	L.F.	2,500	0	2,500		
	713-02.21	SIGN POST DELINEATION ENHANCEMENT	L.F.	203	0	203		
41	713-15	REMOVAL OF SIGNS, POSTS AND FOOTINGS	LS	1	0	1		
45	713-15.35	METAL BARRICADE (TYPE III)	EACH	24	0	24		
53	713-16.04	CHANGEABLE MESSAGE SIGN UNIT	EACH	4	0	4		
6, 12	713-16.20	SIGNS (STOP, R1-1, 30"x30")	EACH	5	0	5		
6, 12	713-16.21	SIGNS (SPEED LIMIT, R2-1, 24"x30")	EACH	7	0	7		
6, 12	713-16.22	SIGNS (DEAD END, W14-1, 30"x30")	EACH	2	0	2		
6, 12	713-16.23	SIGNS (KEEP RIGHT, R4-7, 24"x30")	EACH	7	0	7		
6, 12	713-16.24	SIGNS (OBJECT MARKER, OM1-1, 18"x18")	EACH	7	0	7		
6, 12	713-16.25	SIGNS (NO MOTOR VEHICLES, R5-3, 24"x24")	EACH	4	0	4		
6, 12	713-16.26	SIGNS (ADA ACCESSIBLE ROUTE, R4-4 (MOD), 36"x30")	EACH	2	0	2		
6, 12	713-16.27	SIGNS (ADVANCE INTERSECTION LANE CONTROL, R3-8, 30"x48")	EACH	1	0	1		
6, 12	713-16.28	SIGNS (STREET NAME, D3-1, 36"x8")	EACH	10	0	10		
6, 12	713-16.29	SIGNS (STOP AHEAD, W3-1A, 36"x36")	EACH	2	0	2		

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East McEwen Drive Phase 4 Improvements (COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A - PART 1 of 2 - BID FORM - PROJECT ESTIMATED QUANTITIES

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FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
6, 12	713-16.30	SIGNS (SIDEWALK CLOSED, R9-9, 12"x24")	EACH	2	0	2		
37	716-02.04	PLASTIC PAVEMENT MARKING(CHANNELIZATION STRIPING)	S.Y.	1,432	0	1,432		
37	716-02.05	PLASTIC PAVEMENT MARKING (STOP LINE)	L.F.	152	0	152		
37	716-02.06	PLASTIC PAVEMENT MARKING (TURN LANE ARROW)	EACH	4	0	4		
32, 37	716-02.09	PLASTIC PAVEMENT MARKING (LONGITUDINAL CROSS-WALK)	L.F.	30	0	30		
37	716-04.05	PLASTIC PAVEMENT MARKING (STRAIGHT ARROW)	EACH	2	0	2		
37	716-04.15	PLASTIC PAVEMENT MARKING-BIKE SYMBOL/ARROW SHARED	EACH	5	3	8		
33	716-05.01	PAINTED PAVEMENT MARKING (4" LINE)	L.M.	28	0	28		
	716-05.05	PAINTED PAVEMENT MARKING (STOP LINE)	L.F.	156	0	156		
	716-05.06	PAINTED PAVEMENT MARKING (TURN LANE ARROW)	EACH	10	0	10		
	716-05.20	PAINTED PAVEMENT MARKING (6" LINE)	L.M.	5	0	5		
33	716-12.01	ENHANCED FLATLINE THERMO PVMT MRKNG (4IN LINE)	L.M.	9	0	9		
	716-12.04	ENHANCED FLATLINE THERMO PVMT MRKNG (4IN DOTTED LINE)	L.F.	400	0	400		
	717-01	MOBILIZATION	LS	1	0	1		
	730-02.48	SIGNAL HEAD MODIFICATION (RELOCATION)	EACH	1	0	1		
7, 10	740-10.03	GEOTEXTILE (TYPE III)(EROSION CONTROL)	S.Y.	2,700	0	2,700		

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EXHIBIT A - PART 1 of 2 - BID FORM - PROJECT ESTIMATED QUANTITIES

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FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
2, 7	740-11.03	TEMPORARY SEDIMENT TUBE 18IN	L.F.	11,150	0	11,150		
	801-01.07	TEMPORARY SEEDING (WITH MULCH)	UNIT	650	0	650		
	801-01.38	NATVE SEED MIX FINAL STABLIZATN OF SLOPES	UNIT	31	0	31		
7	801-02	SEEDING (WITHOUT MULCH)	UNIT	650	0	650		
	801-03	WATER (SEEDING & SODDING)	M.G.	787	0	787		
35	803-01	SODDING (NEW SOD)	S.Y.	72,179	0	72,179		
11	805-01.03	TURF REINFORCEMENT MAT (CLASS III)	S.Y.	217	0	217		
4	805-12.02	EROSION CONTROL BLANKET (TYPE II)	S.Y.	60,500	0	60,500		
4, 45	805-12.04	EROSION CONTROL BLANKET (TYPE IV)	S.Y.	2,635	0	2,635		
51	806-02.03	PROJECT MOWING	CYCL	12	0	12		
							ESTIMATED ROADWAY QUANTITIES Subtotal:	

ESTIMATED RETAINING WALL QUANTITIES								
FOOTNOTE(S)	**ITEM NO.**	**ITEM DESCRIPTION**	**UNIT**	**EST QTY (PART)**	**EST QTY (NON-PART)**	**EST QTY (TOTAL)**	**UNIT PRICE**	**EXT. AMOUNT**
	604-01.20	BOX TUBE SAFETY RAIL	L.F.	1,021	0	1,021		
48, 50	604-07.01	RETAINING WALL (WALL B)	S.F.	3,401	0	3,401		
48, 50	604-07.02	RETAINING WALL (WALL C)	S.F.	2,872	0	2,872		

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East McEwen Drive Phase 4 Improvements (COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A - PART 1 of 2 - BID FORM - PROJECT ESTIMATED QUANTITIES

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FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
48, 50	604-07.03	RETAINING WALL (WALL D)	S.F.	2,872	0	2,872		
48, 50	604-07.04	RETAINING WALL (WALL ME)	S.F.	15,310	0	15,310		
50	604-07.05	RETAINING WALL (WALL G1	S.F.	1,473	0	1,473		
50	604-07.06	RETAINING WALL (WALL H1)	S.F.	4,098	0	4,098		
46, 50	604-07.08	RETAINING WALL (WALL K1)	S.F.	1,444	0	1,444		
48, 50	604-07.09	RETAINING WALL (WALL L)	S.F.	3,823	0	3,823		
48, 50	604-07.10	RETAINING WALL (WALL P1)	S.F.	1,750	0	1,750		
48, 50	604-07.11	RETAINING WALL (WALL P2)	S.F.	2,481	0	2,481		
48, 50	604-07.12	RETAINING WALL (WALL P3)	S.F.	516	0	516		
	620-06	CONCRETE RAILING	L.F.	1,973	0	1,973		
47	621-05.02	TEMPORARY SHORING	LS	1	0	1		
49	920-11	CONCRETE PARAPET RAIL WITH MOMENT SLAB	L.F.	1,471	0	1,471		
						ESTIMATED RETAINING WALL QUANTITIES Subtotal:		

ESTIMATED BRIDGE QUANTITIES								
FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
54	202-04.01	REMOVAL OF STRUCTURES (CANTILEVER AND RAILING)	LS	1	0	1		

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FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
54	604-02.03	EPOXY COATED REINFORCING STEEL	LB.	3,850	0	3,850		
54	604-03.09	CLASS D CONCRETE (BRIDGE DECK)	C.Y.	13	0	13		
54	604-04.01	APPLIED TEXTURE FINISH (NEW STRUCTURE)	S.Y.	94	0	94		
54	604-04.10	GRAFFITI PROTECTION SYSTEM (NON-SACRIFICIAL)	S.Y.	94	0	94		
54	604-05.31	BRIDGE DECK GROOVING (MECHANICAL)	S.Y.	28	0	28		
54	617-02	BRIDGE DECK CRACK SEALING	L.F.	72	0	72		
54	620-05.01	CONC PARAPET SINGLE SLOPE (STD-1-1SS)	L.F.	72	0	72		
54	707-07.01	CHAIN-LINK FENCE (BRIDGES)	S.F.	740	0	740		
							ESTIMATED BRIDGE QUANTITIES Subtotal:	

ESTIMATED ROADWAY LIGHTING QUANTITIES

FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
56	714-01.36	ROADWAY LIGHTING	LS	1	0	1		
	714-03.01	DIRECT BURIAL CONDUIT (2" PVC, SCHEDULE 40)	L.F.	16,325	0	16,325		
	714-03.02	DIRECT BURIAL CONDUIT (3" PVC, SCHEDULE 40)	L.F.	70	0	70		
	714-03.03	DIRECT BURIAL CONDUIT (1" PVC, SCHEDULE 40 WITH PULL TAPE)	L.F.	160	0	160		
	714-03.04	DIRECT BURIAL CONDUIT (3/4" PVC, SCHEDULE 40 WITH PULL TAPE)	L.F.	60	0	60		

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FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
59	714-05.05	PULL BOXES (SMALL)	EACH	75	0	75		
60	714-05.06	PULL BOXES (LARGE)	EACH	2	0	2		
	714-05.07	PULL BOXES (ELECTRICAL ROUND, 4", 1" KNOCKOUT, TUNNEL LIGHTING)	EACH	1	0	1		
66	714-08.09	LIGHT STANDARDS (ROADWAY, 30' SQUARE ALUMINUM, BLACK)	EACH	31	0	31		
67	714-08.10	LIGHT STANDARDS (ROADWAY, 25' SQUARE ALUMINUM, BLACK, WALL MOUNTED)	EACH	7	0	7		
68	714-08.11	LIGHT STANDARDS (DECORATIVE, 16' ALUMINUM, BLACK)	EACH	22	0	22		
	714-08.28	FOUNDATION FOR LIGHT STANDARDS - ROADWAY (FOUNDATION PREPARATION, INCLUSIVE OF ALL RELATED ITEMS FOR ROADWAY LIGHT STANDARDS, INCLUDING BUT NOT LIMITED TO CONCRETE CAST IN-PLACE FOUNDATION, 24" DIAMETER, 6'-6" DEPTH. NO. 2 REINFORCING STEEL BAR, NO. 4 REINFORCING STEEL BAR, 8' GROUND ROD 5/8" DIA COPPER-CLAD STEEL, GROUND BONDING CLAMP FOR 5/8" GROUND ROD, BREAKAWAY FUSE HOLDER FOR EACH POLE MOUNT, FUSE FOR BREAKAWAY FUSE HOLDER, PARALLEL BONDING CONNECTOR FOR POLE GROUNDS, SUBMERSIBLE SECONDARY CONNECTORS, ABOVE GRADE CONNECTOR FOR #12 CONDUCTOR, RED WIRE NUT)	EACH	46	0	46		
58	714-08.32	REMOVAL OF LIGHT STANDARD & FOUNDATION	EACH	6	0	6		

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FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
	714-08.43	FOUNDATION FOR LIGHT STANDARDS - ROADWAY (FOUNDATION PREPARATION, INCLUSIVE OF ALL RELATED ITEMS FOR ROADWAY LIGHT STANDARDS, INCLUDING BUT NOT LIMITED TO CAST IN PLACE FOUNDATION, 24" DIAMETER, 4' DEPTH, NO. 2 REINFORCING STEEL BAR, NO. 4 REINFORCING STEEL BAR, 8' GROUND ROD 5/8" DIA COPPER-CLAD STEEL, GROUND BONDING CLAMP FOR 5/8" GROUND ROD, BREAKAWAY FUSE HOLDER FOR EACH POLE MOUNT, FUSE FOR BREAKAWAY FUSE HOLDER, PARALLEL BONDING CONNECTOR FOR POLE GROUNDS, SUBMERSIBLE SECONDARY CONNECTORS, ABOVE GRADE CONNECTOR FOR #12 CONDUCTOR, RED WIRE NUT)	EACH	22	0	22		
	714-09.47	LED LUMINAIRE (ROADWAY)	EACH	38	0	38		
	714-09.48	LED LUMINAIRE (DECORATIVE ROADWAY)	EACH	22	0	22		
69	714-09.49	LED LUMINAIRE (PEDESTRIAN TUNNEL)	EACH	1	0	1		
	714-25.01	ELECTRICAL CONNECTION (SERVICE / METER PEDESTAL - MILBANK, SERIES CP3B, STANDARD UNIT)	LS	2	0	2		
57	714-25.22	INSTALL SVC RISER (ROADWAY LIGHTING SERVICE RISER PER MTEMC STANDARDS; ALL INCLUSIVE)	EACH	2	0	2		
62	714-70.02	#10 AWG WIRE WHITE INSL SOLID COPPER	L.F.	350	0	350		
61	714-70.55	#10 AWG GROUND WIRE GREEN INSL SOLID COPPER	L.F.	14,350	0	14,350		
63	714-70.56	#4 BARE SOFT DRAWN COPPER FOR LIGHT POST GROUNDING	L.F.	700	0	700		
64	714-70.57	#4 AWG GROUND WIRE BARE SOLID COPPER	L.F.	20	0	20		

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FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
65	714-70.59	#4 COPPER THHN OR THWN, WHITE, FOR SERVICE GROUNDED CONDUCTOR	L.F.	85	0	85		
					ESTIMATED ROADWAY LIGHTING QUANTITIES Subtotal:			

ESTIMATED FIBER OPTIC COMMUNICATIONS (CITY OF FRANKLIN) QUANTITIES

FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
70	725-02.25	FIELD HUB SWITCH (INSTALL ONLY)	EACH	1	0	1		
71	725-03.80	CCTV CAMERA SYSTEM	EACH	1	0	1		
	725-10.64	FIBER OPTIC CABLE (72 COUNT)	L.F.	10,838	0	10,838		
	730-03.24	INSTALL PULL BOX (FIBER OPTIC-TYPE B)	EACH	19	0	19		
72	730-12.14	CONDUIT 3" DIAMETER (JACK AND BORE)	L.F.	60	0	60		
72	730-12.27	CONDUIT 3" DIAMETER (PVC SCHEDULE 40)	L.F.	7,300	0	7,300		
			ESTIMATED FIBER OPTIC COMMUNICATIONS (CITY OF FRANKLIN) QUANTITIES Subtotal:					

ESTIMATED TRAFFIC SIGNAL (CITY OF FRANKLIN) MODIFICATION QUANTITIES

FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
	713-02.15	FLEXIBLE TUBULAR DELINEATOR	EACH	4	0	4		
	713-16.36	SIGNS (SIDEWALK ENDS, R9-9 (MODIFIED), 24" X 12", UNIT PRICE BID INCLUDES SQUARE TUBE PERFORATED POST P8)	EACH	2	0	2		

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FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
	730-02.48	SIGNAL HEAD MODIFICATION (RELOCATION)	EACH	1	0	1		
			ESTIMATED TRAFFIC SIGNAL (CITY OF FRANKLIN) MODIFICATION QUANTITIES Subtotal:					

ESTIMATED ELECTRIC SERVICE INFRASTRUCTURE (MIDDLE TENNESSEE ELECTRIC) QUANTITIES

FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
	790-42.08	2~2" PVC SCHEDULE 40 (PRIMARY DITCH DETAIL 2G) (INCLUDES INSTALLATION, CLEAN GRAVEL, EXCAVATION, INSPECTION)	L.F.	153	0	153		
	790-42.09	2~4" PVC SCHEDULE 40 (PRIMARY DITCH DETAIL 2G) (INCLUDES INSTALLATION, CLEAN GRAVEL, EXCAVATION, INSPECTION)	L.F.	156	0	156		
	790-42.10	2" PVC SCHEDULE 80 ELBOW (36" RADIUS) (INCLUDES INSTALLATION, CLEAN GRAVEL, EXCAVATION, INSPECTION)	EACH	4	0	4		
	790-42.11	4" PVC SCHEDULE 80 ELBOW (48" RADIUS) INCLUDES INSTALLATION, CLEAN GRAVEL, EXCAVATION, INSPECTION)	EACH	12	0	12		
	790-43.47	PRIMARY PULLBOX (48"L X 30"W X 36"D), MTEMC-ELECTRICAL LOGO (INCLUDES INSTALLATION, CLEAN GRAVEL, INSTALLATION)	EACH	3	0	3		
			ESTIMATED ELECTRIC SERVICE INFRASTRUCTURE (MIDDLE TENNESSEE ELECTRIC) QUANTITIES Subtotal:					

ESTIMATED GAS LINE (ATMOS ENERGY) RELOCATION QUANTITIES

FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
	707-01.11	CHAIN LINK FENCE (5-FOOT)	L.F.	0	140	140		

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FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
	707-01.12	END & CORNER POST ASSEMBLY (CHAIN-LINK FENCE 5')	EACH	0	14	14		
	707-01.13	GATE-CHAIN-LINK FENCE 5 FOOT (10' WIDE GATE)	EACH	0	1	1		
73	791-01.04	4IN STEEL GAS MAIN	L.F.	0	95	95		
73	791-01.06	8IN STEEL GAS MAIN	L.F.	6,764	0	6,764		
73	791-01.09	4IN STEEL GAS MAIN (INSTALLED WITH AND ABOVE THE 8IN STEEL GAS MAIN)	L.F.	0	104	104		
73	791-03.02	2IN PE GAS MAIN	L.F.	0	32	32		
73	791-03.04	4IN PE GAS MAIN	L.F.	0	52	52		
73	791-03.09	2IN PE GAS MAIN (INSTALLED WITH AND ABOVE THE 8IN STEEL GAS MAIN)	L.F.	0	1,530	1,530		
73	791-03.10	4IN PE GAS MAIN (INSTALLED WITH AND ABOVE THE 8IN STEEL GAS MAIN)	L.F.	0	893	893		
74	791-04.10	HDD 3/4IN PE SERVICE PIPE (DIRECTIONAL BORE TO BE USED ONLY IF NECESSARY)	L.F.	121	0	121		
74	791-04.13	HDD 4IN PE SERVICE PIPE (DIRECTIONAL BORE TO BE USED ONLY IF NECESSARY)	L.F.	31	0	31		
75	791-06.03	CONNECTION TO 4" EX PE GAS MAIN	EACH	0	2	2		
75	791-06.09	CONNECT TO EX 3/4" GAS SERVICE LINE	EACH	5	0	5		
75	791-06.34	CONNECT TO EX 8" STEEL GAS MAIN W/ STOPPER	EACH	4	0	4		
75	791-06.38	CONNECT TO 8" EX STEEL MAIN W/ BOTTOM OUT STOPPER FITTING	EACH	1	0	1		
76	791-07.09	2 IN STEEL GAS VALVE ASSEMBLY	EACH	0	1	1		

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FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
76	791-07.10	4 IN STEEL GAS VALVE ASSEMBLY	EACH	0	5	5		
76	791-07.12	8 IN STEEL GAS VALVE ASSEMBLY	EACH	1	0	1		
77	791-08.07	3/4IN PE SERVICE PIPE (AN ADDITIONAL 300' OF QTY. HAS BEEN ADDED TO THIS ITEM FOR ADDITIONAL WORK AS DETERMINED BY THE ENGINEER)	L.F.	847	0	847		
79	791-08.41	GAS MAIN REMOVAL (REMOVAL/DISPOSAL OF EXISTING 8" GAS MAIN TO ACCOMODATE ROADWAY CONSTRUCTION; QTY INCLUDES AN ADDITIONAL 200' AS DIRECTED BY THE ENGINEER)	L.F.	1,622	0	1,622		
78	791-09.02	3-WIRE CATHODIC PROTECTION STATION	EACH	0	2	2		
78	791-09.04	4" REGULATING STATION (W/ OPTION #4 ENCLOSED - STD 10-002-05) (REGULATING STATION SHALL BE PREFABRICATED BY APPROVED VENDOR)	EACH	2	0	2		
79	791-09.08	REMOVAL REGULATING STATION (2' BELOW PROPOSED GRADE)	EACH	2	0	2		
79	791-09.23	REMOVAL OF EXISTING FARM TAP (2' BELOW PROPOSED GRADE)	EACH	5	0	5		
80	791-10.01	RETIRE IN PLACE 3/4 IN SERV CUT & PLUG	EACH	5	0	5		
80	791-10.05	RETIRE IN PLACE 4" PE CUT & PLUG	EACH	1	0	1		
80	791-10.07	RETIRE IN PLACE 8" STEEL GAS MAIN CUT & PLUG	EACH	15	0	15		
	791-11.02	CONCRETE CAP (CLASS A)	LS	1	0	1		
75	791-15.71	INSTALL TEMPORARY FARM TAP AS REQUIRED	EACH	2	0	2		
73	791-99.03	SLUG TRAP (ATMOS ENERGY TO PROVIDE PREFABRICATED MATERIAL)	LS	0	1	1		

BID FORM for COF Construction Contract No. 2024-0246

East McEwen Drive Phase 4 Improvements (COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A - PART 1 of 2 - BID FORM - PROJECT ESTIMATED QUANTITIES

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FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
81	791-99.04	GAS MAIN UTILITY AS-BUILTS (SEE SPECIAL PROVISION REGARDING UTILITY RECORD DRAWINGS)	LS	1	1	1		
				ESTIMATED GAS LINE (ATMOS ENERGY) RELOCATION QUANTITIES Subtotal:				

ESTIMATED WATER LINE (MILCROFTON UTILITY DISTRICT) RELOCATION QUANTITIES

FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
82	795-01.06	8" SLIP JOINT WATER LINE (CLASS 52) (PRICE INCLUDES COPPERHEAD 1230B-SF LOCATING WIRE)	L.F.	11	4,920	4,931		
82	795-02.03	4" HDPE WATER LINE (DR11) (PRICE INCLUDES COPPERHEAD 1230B-SF LOCATING WIRE)	L.F.	1,508	0	1,508		
83	795-05.55	HDD 3" FPVC CASING PIPE	L.F.	682	0	682		
82	795-05.92	4" FPVC CASING PIPE OPEN CUT (USE AS DIRECTED BY ENGINEER)	L.F.	50	0	50		
82	795-05.93	3" FPVC CASING PIPE OPEN CUT (USE AS DIRECTED BY ENGINEER)	L.F.	100	0	100		
84	795-06.05	CONNECT TO 8IN WATER LINE	EACH	1	4	5		
84	795-06.07	CONNECT TO 12IN WATER LINE	EACH	0	1	1		
	795-06.32	CUT AND CAP 4" WATER LINE	EACH	0	5	5		
	795-06.34	CUT AND CAP 8" WATER LINE	EACH	1	0	1		
	795-06.37	CUT AND CAP 12" WATER LINE	EACH	2	0	2		
85	795-08.05	8" GATE VALVE ASSEMBLY	EACH	1	4	5		
86	795-09.01	3/4" WATER SERVICE ASSEMBLY (MILCROFTON TO PROVIDE AND INSTALL METERS)	EACH	6	0	6		

BID FORM for COF Construction Contract No. 2024-0246

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FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
	795-09.51	DISCONNECT/RECONNECT EXISTING WATER METER	EACH	4	0	4		
82	795-09.60	3/4" PEXa SERVICE PIPE (QTY INCLUDES AN ADDITIONAL 450' TO RECONNEECT SERVICE AS APPROVED MUD) (PRICE INCLUDES COPPERHEAD 1230B-SF LOCATING WIRE)	L.F.	1,367	0	1,367		
82	795-09.62	1" PEXa SERVICE PIPE (QTY INCLUDES TEMPORARY SERVICE) (PRICE INCLUDES COPPERHEAD 1230B-SF LOCATING WIRE)	L.F.	630	0	630		
82	795-09.64	2" PEXa SERVICE PIPE (QTY INCLUDES TEMPORARY SERVICE) (PRICE INCLUDES COPPERHEAD 1230B-SF LOCATING WIRE)	L.F.	334	0	334		
86	795-10.03	1" COMBINATION AIR/VACUUM RELEASE VALVE ASSEMBLY	EACH	3	5	8		
86	795-11.01	BLOW OFF ASSEMBLY	EACH	1	0	1		
86	795-11.02	FIRE HYDRANT ASSEMBLY (INCLUDES ALL REQUIRED 6" RESTRAINED JOINT DIP AND VALVE)	EACH	4	0	4		
88	795-12.27	REMOVAL/DISPOSAL OF EXISTING 4" WATER MAIN TO ACCOMMODATE ROADWAY CONSTRUCTION (QTY INCLUDES AN ADDITIONAL 400' AS DIRECTED BY THE ENGINEER)	L.F.	455	0	455		
88	795-12.28	REMOVAL/DISPOSAL OF EXISTING 8" WATER MAIN TO ACCOMMODATE ROADWAY CONSTRUCTION	L.F.	42	0	42		
88	795-12.29	REMOVAL/DISPOSAL OF EXISTING 12" WATER MAIN TO ACCOMMODATE ROADWAY CONSTRUCTION (ATTACHED TO BRIDGE PARAPET)	L.F.	87	0	87		
	795-13.01	DI FITTINGS (INCLUDES FITTINGS, GLANDS AND RESTRAINT DEVICES DESCRIBED IN POUNDS)	LB.	520	2,690	3,210		
87	795-14.01	CONCRETE CAP (AS DIRECTED BY MUD)	L.F.	0	30	30		

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EXHIBIT A - PART 1 of 2 - BID FORM - PROJECT ESTIMATED QUANTITIES

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FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
89	795-30.26	OPEN CUT 3" CASING PIPE (SCH 40 PVC)	L.F.	133	0	133		
	795-99.05	POLYETHYLENE PIPE PROTECT - 8" (PER ANSI/AWWA C105/A21.5 - INSTALLED ON NEW MAINS AS DIRECTED BY MUD)	L.F.	0	600	600		
	795-99.06	WATER UTILITY AS-BUILTS (SEE SPECIAL PROVISION REGARDING UTILITY RECORD DRAWINGS)	LS	0	1	1		
		ESTIMATED WATER LINE (MILCROFTON UTILITY DISTRICT) RELOCATION QUANTITIES Subtotal:						

ESTIMATED SANITARY SEWER FORCE MAIN (CITY OF FRANKLIN) RELOCATION QUANTITIES								
FOOTNOTE(S)	**ITEM NO.**	**ITEM DESCRIPTION**	**UNIT**	**EST QTY (PART)**	**EST QTY (NON-PART)**	**EST QTY (TOTAL)**	**UNIT PRICE**	**EXT. AMOUNT**
90	797-01.02	6" FORCE MAIN (CLASS 350) (QTY INCLUDES 259 ADDITIONAL LF FOR TEMPORARY RELOCATIONS TO ACCOMMODATE PHASED CONSTRUCTION) (PRICE INCLUDES 14AWG, TYPE THHN SOLID COPPER DETECTION WIRE)	L.F.	0	5,002	5,002		
95	797-06.91	OPEN CUT 18" STEEL CASING PIPE	L.F.	0	80	80		
	797-08.01	DI FITTINGS (INCLUDES FITTINGS, GLANDS AND RESTRAINT DEVICES DESCRIBED IN POUNDS)	LB.	0	3,000	3,000		
92	797-08.62	6" GATE VALVE ASSEMBLY	L.F.	0	4	4		
92	797-08.68	6" INSERTION VALVE (INSTALLED WITH NO SYSTEM SHUT DOWN - AS DIRECTED BY THE ENGINEER FOR FLOW CONTROL)	EACH	0	2	2		
93	797-09.19	COMBINATION AIR/VACUUM RELEASE VALVE	EACH	0	2	2		
91	797-09.46	CUT AND CAP / PLUG 6" FORCE MAIN	EACH	0	12	12		

BID FORM for COF Construction Contract No. 2024-0246

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EXHIBIT A - PART 1 of 2 - BID FORM - PROJECT ESTIMATED QUANTITIES

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FOOTNOTE(S)	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY (PART)	EST QTY (NON-PART)	EST QTY (TOTAL)	UNIT PRICE	EXT. AMOUNT
91	797-10.17	CONNECT TO 6" FORCE MAIN	EACH	0	10	10		
96	797-11.46	CONCRETE CAP (CLASS A CONCRETE - AS DIRECTED BY THE ENGINEER)	L.F.	0	30	30		
97	797-99.01	POLYETHYLENE ENCASEMENT PER ANSI/AWWA C105/A21.5 (INSTALLED ON NEW MAINS AS DIRECTED BY COF INSPECTOR)	L.F.	0	4,435	4,435		
94	797-99.02	REMOVAL OF EXISTING FM AIR VALVE / MANHOLE	EACH	0	1	1		
94	797-99.03	REMOVAL OF EXISTING 6" FORCE MAIN TO ACCOMMODATE ROADWAY CONSTRUCTION (QTY INCLUDES AN ADDITIONAL 150' AS DIRECTED BY THE ENGINEER)	L.F.	0	1,122	1,122		
	797-99.04	FORCE MAIN UTILITY AS-BUILTS (SEE SPECIAL PROVISION REGARDING RECORD DRAWINGS)	LS	0	1	1		
		ESTIMATED SANITARY SEWER FORCE MAIN (CITY OF FRANKLIN) RELOCATION QUANTITIES Subtotal:						

TOTAL BID PRICE (*IN FIGURES*):	

TOTAL BID PRICE (*IN WORDS*):

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TOTAL BID PRICE (*IN FIGURES*):

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END - EXHIBIT A - Part 1 of 2 - BID FORM - PROJECT ESTIMATED QUANTITIES

BID FORM for COF Construction Contract No. 2024-0246

East McEwen Drive Phase 4 Improvements
(COF Project No. 2015-002 / TDOT PIN 125418.00)

EXHIBIT A – Part 2 of 2 – FOOTNOTES

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1. TO BE USED AS DIRECTED FOR ADDITIONAL TRENCH BACKFILL ON STORM DRAIN ROADWAY CROSSINGS, OR AS DIRECTED BY THE ENGINEER.
2. ITEM 209-08.02 & 740-11.03 MAY BE INTERCHANGED BASED ON CONSTRUCTION ACTIVITIES.
3. TO BE USED AT THE LIMIT OF CONSTRUCTION ON FRONTAGE ROAD NORTH, TO PROTECT STREAMS, OR AS DIRECTED BY THE ENGINEER.
4. TO BE USED FOR SLOPE STABALIZATION, AS APPROVED BY THE ENGINEER.
5. CURB IRON TO HAVE A SOLID BACK PER CITY OF FRANKLIN REQUIREMENTS.
6. SIGNS SHALL BE FIELD STAKED PRIOR TO INSTALLATION. A FIELD INSPECTION SHALL BE MADE BY THE ENGINEER AND ACCEPTED PRIOR TO INSTALLATION BY THE CONTRACTOR.
7. TO BE USED AS DIRECTED BY THE ENGINEER.
8. COORDINATE WITH ENGINEER PRIOR TO REMOVAL.
9. PRIOR TO REMOVAL OF VEGETATION THE CONTRACTOR SHALL SUBMIT A PLAN OF OPERATIONS FOR APPROVAL BY THE ENGINEER.
10. TO BE USED ON THE CONSTRUCTION ENTRANCE PROVIDING INGRESS/EGRESS TO THE SITE, FOR 6" SEDIMENT FILTER BAG BASE OR AS DIRECTED BY THE ENGINEER.
11. TO BE USED FOR DITCH STABALIZATION, AS APPROVED BY THE ENGINEER.
12. INCLUDES PERFORATED/KNOCKOUT SQUARE TUBE POST (COORDINATE WITH STD. DRAWING T-S-17).
13. UNIT COST IS FOR A COMPLETE SYSTEM, INCLUSIVE OF ALL EXCAVATION, BACKFILL, CASTINGS, BRICK WORK AND APPURTENANCES NECESSARY FOR A COMPLETE INSTALLATION.
14. TO BE USED FOR RETAINING WALL BACKFILL. COORDINATE WITH RETAINING WALL DETAILS.
15. FOR CONNECTIONS AT EXISTING ROADWAYS, DRIVEWAYS AND BUSINESS ENTRANCES. IF THE CONTRACTOR ELECTS TO SAW CUT FOR OTHER PURPOSES, PAYMENT SHALL BE DISALLOWED UNLESS PRE-APPROVED BY THE ENGINEER.
16. TO BE USED AS DIRECTED BY THE ENGINEER . UNIT PRICE INCLUDES ALL WORK NECESSARY TO PREPARE THE AREA FOR PAYING.
17. TO BE USED AS DIRECTED BY THE ENGINEER FOR TEMPORARY ASPHALT MAINTENANCE DURING CONSTRUCTION.
18. WORK TO BE DONE IN ACCORDANCE WITH SECTION 202-01 OF THE STANDARD SPECIFICATIONS, INCLUSIVE BUT NOT LIMITED TO ITEMS SUCH AS, CURBS (CONCRETE/ASPHALT), MAILBOXES AND ALL OTHER ITEMS WITHIN THE GRADING LIMITS UNLESS OTHERWISE NOTED TO REMAIN.
19. INCLUDES 618 C.Y. FOR CONSTRUCTION ENTRANCE.

EXHIBIT A – Part 2 of 2 – FOOTNOTES *(Continued)*

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20. UNIT PRICE BIDS INCLUDES RIPRAP CLASS A-3 BACKFILL OR APPROVED ALTERNATE.
21. INCLUDES 451 MG FOR EARTHEN EMBANKMENT.
22. AFTER THE INITIAL INSTALLATION ALL COST ASSOCIATED WITH REP AIR, MAINTENANCE AND REPLACEMENT DURING THE LIFE OF THIS CONTRACT SHALL BE AT THE CONTRACTORS EXPENSE.
23. INCLUDES ALL COST ASSOCIATED WITH INSTALLATION AND MAINTENANCE DURING THE LIFE OF THIS CONTRACT.
24. INCLUDES 5,500 TONS FOR MAINTENANCE OF TRAFFIC.
25. MINIMUM 6" CONCRETE THICKNESS W/ FIBER MESH. UNIT COST INCLUDES 4" MINIMUM AGGREGATE CLASS "A" GRADING "D" BASE.
26. TO BE USED FOR THE CONCRETE APPROACH APRON, EXTENDING TO THE RIGHT-OF-WAY LIMIT, MINIMUM 8" CONCRETE THICKNESS W/ FIBER MESH. UNIT COST INCLUDES 4" MINIMUM AGGREGATE CLASS "A" GRADING "D" BASE.
27. INCLUDES 1,785 L.F. TO BE USED IN CONJUNCTION WITH EROSION CONTROL FEATURES. UNIT PRICE BID INCLUDES COST OF ADJUSTMENTS, RELOCATIONS AND MAINTENANCE THROUGHOUT THE LIFE OF THE PROJECT AS CONSTRUCTION PHASES EVOLVE.
28. UNIT PRICE BID INCLUDES INSTALLATION AND REMOVAL COST OF ALL CONFLICTING PAVEMENT MARKINGS (TEMPORARY OR PERMANENT) INCLUSIVE OF TEMPORARY MARKINGS ON THE FINAL ASPHALT TOPPING.
29. ESTIMATED QUANTITY IS BASED ON PHASE WHICH REQUIRES HIGHEST QUANTITY. COORDINATE WITH TRAFFIC CONTROL TABULATION BLOCK.
30. 36" TO 42" HEIGHT. ESTIMATED QUANTITY IS BASED ON PHASE WHICH REQUIRES HIGHEST QUANTITY. COORDINATE WITH TRAFFIC CONTROL TABULATION BLOCK.
31. THIS WORK CONSISTS OF CLEARING, GRUBBING, REMOVING, AND DISPOSING OF ALL VEGETATION AND DEBRIS WITHIN THE DESIGNATED LIMITS, EXCEPT SUCH OBJECTS THAT ARE TO REMAIN OR ARE TO BE REMOVED ACCORDING TO OTHER ITEMS OF WORK. THIS WORK ALSO INCLUDES PRESERVING FROM INJURY OR DEFACEMENT ALL VEGETATION AND OBJECTS DESIGNATED TO REMAIN.
32. QUANTITY IS CALCULATED FROM FACE OF CURB TO FACE OF CURB.
33. INCLUDES LINE TYPES SSWL, SSYL, DSYL, SBYL & SBWL.
34. TO BE USED AS DIRECTED FOR ADDITIONAL TRENCH BACKFILL ON STORM DRAIN (1,979 CY) AND BOX/SLAB (42 CY) ROADWAY CROSSINGS, OR AS DIRECTED BY THE ENGINEER.
35. SOD TO BE INSTALLED ON TOPSOIL HAVING A MINIMUM DEPTH OF 6 INCHES.
36. UNIT PRICE BID INCLUDES TRENCH EXCAVATION, BACKFILL AND BEDDING OF THE PROPOSED PIPE CULVERT. COORDINATE WITH STANDARD DRAWING D-PB-1 AND D-PB-2.
37. CONTRACTOR MAY ELECT TO SUBSTITUTE PREFORMED PLASTIC FOR THERMOPLASTIC. PREFORMED PLASTIC SHALL BE PAID FOR AT THE SAME UNIT PRICE AS BID FOR THERMOPLASTIC.
38. TO BE USED FOR UNPROTECTED END CURB TRANSITION.

EXHIBIT A – Part 2 of 2 – FOOTNOTES *(Continued)*

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39. COORDINATE WITH DETAIL SHEETS FOR R.O.W. MONUMENT SPECIFICATIONS.
40. THIS WORK CONSISTS OF REMOVING, ENTIRELY OR PARTIALLY, AND DISPOSING OF ALL BUILDINGS, FENCES, STRUCTURES, OLD PAVEMENTS, ABANDONED PIPE LINES, AND OTHER OBSTRUCTIONS NOT DESIGNATED OR PERMITTED TO REMAIN, EXCEPT FOR OBSTRUCTIONS TO BE REMOVED AND DISPOSED OF UNDER OTHER CONTRACT ITEMS. THE WORK ALSO INCLUDES BACKFILLING THE RESULTING TRENCHES, HOLES, AND PITS, AND SALVAGING DESIGNATED MATERIALS.
41. THIS WORK CONSISTS OF REMOVING, ENTIRELY OR PARTIALLY, AND DISPOSING OF ALL SIGNS AND FOOTINGS UNLESS DESIGNATED ON THE PLANS TO REMAIN. THE WORK ALSO INCLUDES BACKFILLING THE RESULTING TRENCHES, HOLES, AND PITS, AND SALVAGING DESIGNATED MATERIALS.
42. HAY BALES TO BE USED FOR CONCRETE WASHOUTS ONLY.
43. INCLUDES COSTS FOR ROCK PAD FOR SKIMMER TO REST UPON.
44. FOR 6" SEDIMENT FILTER BAG BASE.
45. SEE SHEET 16C. TO BE INSTALLED JUST SOUTH OF KING RICHARDS CT.
46. INCLUDES ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY TO DRILL THE SOLDIER PILE FOUNDATIONS AND PROVIDE TEMPORARY SUPPORT FOR THE FOUNDATION PRIOR TO THE INSTALLATION OT THE SOLDIER PILE AND FOUNDATION CONCRETE. ALSO INCLUDES COST OF STRUCTURAL STEEL FOR THE SOLDIER PILE AND ALL STEEL CONNECTING HARDWARE AND GUIDE ANGLES. ALL STRUCTURAL STEEL FOR SOLDIER PILES SHALL BE ASTM A992 GRADE 50. ITEM ALSO INCLUDES COST OF GALVANIZING FOR ALL STRUCTURAL STEEL COMPONENTS, INCLUDING STEEL HARDWARE AND GUIDE ANGLES. GALVANIZATION SHALL MEET THE REQUIREMENTS OF ASTM A123 AND REPAIRED ACCORDING TO ASTM A780. ITEM ALSO INCLUDES ALL LABOR, EQUIPMENT, AND INCIDENTALS NECESSARY FOR THE INSTALLATION OF THE STEEL SOLDIER PILES AS DETAILED IN THE CONTRACT PLANS AND IN ACCORDANCE WITH SPECIAL PROVISION 624.
47. INCLUDES ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY TO STABILIZE EXCAVATIONS REQUIRED TO CONSTRUCT THE PROPOSED RETAINING WALL.
48. RETAINING WALLS B,C,D,ME,L,P 1,P2,&P3 ARE TO BE MSE CONCRETE PANEL TYPE WALL TO BE DESIGNED BY THE CONTRACTOR'S ENGINEER. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND CALCULATIONS FOR REVIEW IN ACCORDANCE WITH THE STANDARD TDOT SPECIFICATIONS (2015 EDITION) AND TDOT SPECIAL PROVISION 624.
49. SEE SHEET 18AG FOR STATION LOCATIONS.
50. APPLIED TEXTURE FINISH AND NON-SACRIFICAL ANTI-GRAFFITI COATING INCLUDED WITH THE COST OF THE RETAINING WALL.
51. EACH MOWING EVENT SHALL BE NEGOTIATED AS A PERCENT OF A FULL CYCLE.
52. ALL COSTS FOR UNIFORMED POLICE OFFICERS TO BE INCLUDED WITH ITEM NO. 712-02 "TRAFFIC CONTROL."
53. CHANGEABLE MESSAGE SIGN UNIT SHALL BECOME THE PROPERTY OF THE CITY OF FRANKLIN AT THE END OF THE PROJECT, SHALL BE IN LIKE-NEW CONDITION, AND WITH FULL MANUFACTURER WARRANTY.

EXHIBIT A – Part 2 of 2 – FOOTNOTES *(Continued)*

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54. COORDINATE WITH STRUCTURE DRAWINGS FOR ADDITIONAL FOOTNOTES.
55. COORDINATE WITH MTEMC GUIDELINES.
56. INCLUDES THE FOLLOWING: 1-POLE, 20AMP BREAKER (TUNNEL), 1 NEMA 3R LOAD CENTER, (PLAYERS MILL SIGNAGE); 10, 2-POLE, 30 AMP BREAKER (ROAD AND BIKE); LOAD CENTER, 125R, (PLAYERS MILL SIGNAGE), 1 3/4" X 611 GALVANIZED PENDANT NIPPLE, 1,950 LF OF #12 SOLID TYPE UF-B FOR LIGHT POST RISERS, 3,770 LF OF #12 COPPER, THHN OR THWN, GREEN GROUND/GROUNDING CONDUCTOR, 5,150 LF OF #10 COPPER, THHN OR THWN, INCLUDES TWO (2) CIRCUIT CONDUCTORS, 28,750 LF OF #8 COPPER, THHN OR THWN, INCLUDES TWO (2) CIRCUIT CONDUCTORS, BLACK, RED, OR BLUE, 250 LF OF #2 COPPER, THHN OR THWN, INCLUDES TWO (2) SERVICE CONDUCTORS, PERMITS, INSPECTION FEES, AS-BUILT DRAWINGS AND ANY OTHER ITEM OR ITEMS THE CONTRACTOR FEELS ARE NECESSARY FOR A COMPLETE LIGHTING SYSTEM. DAY/NIGHT CONTROL VIA PHOTO SENSOR SHOULD BE DONE AT MILLBANK PEDESTAL, NOT AT EACH INDIVIDUAL LIGHT.
57. RISER ASSEMBLY (3" SCHEDULE 80 PVC, WITH PULL TAPE, ELECTRICAL GRAY, SERVICE RISER, INCLUSIVE OF SCHEDULE 80 PVC MIN 24" LONG RADIUS ELBOW, AND 4 @ 22.5 DEGREE RIGID NON-METALLIC ELBOW, 3" PVC MALE, LOCKNUT & PLASTIC BUSHING, 3" PVC MALE, LOCKNUT & PLASTIC BUSHING).
58. POLE AND LUMINAIRE ARE TO BE RETURNED TO THE CITY OF FRANKLIN STREETS DEPARTMENT IN WORKING CONDITION FOR LATER USE.
59. PULL BOXES (SMALL PULL BOX, CDR#PA10-1324-18-0299, QUAZITE #PG2436Z510MT, HIGHLINE #PHA243618SE1-32, 94 OLDCASTLE #243618PB7021, 1/2" GRAVEL FOR BOX INSTALLATIONS).
60. PULL BOXES (LARGE PULL BOX, QUAZITE #PG2436Z510MT-B, HIGHLINE #PHA243618SE1-32, OLDCASTLE #243618PB7021, 1/2" GRAVEL FOR BOX INSTALLATIONS).
61. THHN OR THWN, GROUND/GROUNDING CONDUCTOR.
62. THHN OR THWN, NEUTRAL/GROUNDED CONDUCTOR.
63. 20 LF SOFT DRAWN COPPER FOR LIGHT POST GROUNDING AND 680 LF OF THHN OR THWN, WITH 2 SERVICE CONDUCTORS, BLACK, RED OR BLUE.
64. FOR SERVICE ENTRANCE GROUNDING.
65. THHN OR THWN, WHITE, FOR SERVICE GROUNDED CONDUCTOR.
66. STREETLIGHT (**LIGHT EMITTING DIODE "LED" ROADWAY LUMINAIRE**, BRAND - STREETWORKS/COOPER, SERIES – VST VENTUS LED, CCT – 3000K, HOUSING COLOR - BLACK, PRICE INCLUDES COST TO COORDINATE WITH MANUFACTURER, VENDOR, AND CITY TO ENSURE PROPER LIGHT SIZING TO MEET TDOT LIGHTINING REQUIREMENTS AND ANSI/IES RP-8-22: DESIGN OF ROADWAY FACILITY LIGHTING.) (**LIGHT STANDARD/POLE**, 30-FOOT HEIGHT, BRAND – HAPCO, SERIES – SQUARE STRAIGHT ALUMINUM "SSA", COLOR - BLACK)

EXHIBIT A – Part 2 of 2 – FOOTNOTES *(Continued)*

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67. STREETLIGHT (**LIGHT EMITTING DIODE "LED" ROADWAY LUMINAIRE**, BRAND - STREETWORKS/COOPER, SERIES – VST VENTUS LED, CCT – 3000K, HOUSING COLOR - BLACK, PRICE INCLUDES COST TO COORDINATE WITH MANUFACTURER, VENDOR, AND CITY TO ENSURE PROPER LIGHT SIZING TO MEET TDOT LIGHTINING REQUIREMENTS AND ANSI/IES RP-8-22: DESIGN OF ROADWAY FACILITY LIGHTING.) (**LIGHT STANDARD/POLE**, 25-FOOT HEIGHT, WALL/PARAPET-MOUNT, BRAND – HAPCO, SERIES – SQUARE STRAIGHT ALUMINUM "SSA", COLOR - BLACK)
68. STREETLIGHT (**LIGHT EMITTING DIODE "LED" DECORATIVE ROADWAY LUMINAIRE**, BRAND – HOLOPHANE/ACUITY, SERIES – GRANVILLE CLASSIC STANDARD LED3 "GVD3", CCT – 3000K, HOUSING COLOR – BLACK, FIELD ADJUSTABLE OUTPUT OPTION, PRICE INCLUDES HOUSE-SIDE SHIELDING IF NECESSARY) (**DECORATIVE LIGHT STANDARD/POLE**, 16-FOOT HEIGHT, BRAND – HOLOPHANE/ACUITY, SERIES – WADSWORTH ALUMINUM POLE (WDA), COLOR – BLACK)
69. STREETLIGHT (**LIGHT EMITTING DIODE "LED" TUNNEL LUMINAIRE**, BRAND – LUMARK/COOPER, SERIES – ROUND PARKING GARAGE & CANOPY (RPGC) LED, PRICE INCLUDES COORDINATION WITH MANUFACTURER, VENDOR, AND CITY TO ENSURE PROPER LIGHT SIZING TO MEET TDOT LIGHTING REQUIREMENTS AND ANSI/IES RP-8-22: DESIGN OF ROADWAY FACILITY LIGHTING, ALSO INCLUDES STEM MOUNT PHOTO CONTROL (PLAYERS MILL SIGNAGE), JUNCTION BOX, METAL, PAINTED, 24"X24"X6", 3R, RTSC NK).
70. THE CONTRACTOR IS TO INSTALL "FIELD HUB SWITCH" AS SUPPLIED BY THE CITY OF FRANKLIN.
71. INCLUDES SURGE PROTECTION (POE) DEVICE AND POE EXTENDER UNIT. ITEM ALSO INCLUDES 12 FOOT POWDER COATED BLACK EXTENSION ARM.
72. INCLUDES PULL STRING AND 14 AWG, TYPE THHN SOLID COPPER WIRE.
73. INCLUDES ALL MATERIALS INCLUDING SAND/STONE BEDDING, FLOWABLE FILL, TEMPORARY PAVEMENT IN OR OUT OF ROW, LABOR, EQUIPMENT FOR COMPLETE INSTALLATION OF PIPE INCLUDING BUT NOT LIMITED TO TRAFFIC CONTROL, EXCAVATION INCLUDING DIRT/ROCK, BACKFILLING, CREEK CROSSINGS PER SWPPP, COUPLINGS, FITTINGS, PIPE FUSION, APPURTENANCES, MAINTAINING THE TRENCH, PURGE POINT INSTALLATION, TESTING BY UTILITY SPECIFICATIONS TO INCLUDE BUT NOT LIMITED TO AIR, NITROGEN, HYDROSTATIC OR X-RAY, DEW POINT OR DRYING, AND ANY OTHER LABOR OR MATERIAL REQUIRED TO COMPLETE THE WORK AS SPECIFIED ON THE PLANS.
74. INCLUDES ALL MATERIALS, LABOR, EQUIPMENT, AND TRAFFIC CONTROL, INCLUDING BUT NOT LIMITED TO FLUID CONTAINMENT FOR COMPLETE HORIZONTAL DIRECTIONAL DRILLING INSTALLATION OF CASING PIPE OR UNCASED CARRIER PIPE IN BOTH UNCONSOLIDATED SOIL AND/OR ROCK. STEEL PIPE INCLUDES SPECIAL COATING AS SPECIFIED ON PLANS AND SPECS. IF CASING PIPE HAS CARRIER PIPE, THE CARRIER PIPE SHALL BE PAID AT THE OPEN CUT ITEM PRICE.
75. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT, NECESSARY FOR CONNECTING TO EXISTING GAS LINE, INCLUDING TRAFFIC CONTROL.

EXHIBIT A – Part 2 of 2 – FOOTNOTES *(Continued)*

Revised Per Addendum 1 on October 31, 2024

76. INCLUDES TRANSITION FITTINGS, VALVES, VALVE BOX, BOX ADJUSTMENT, VALVE BOX COLLAR, VALVE MARKER, EXCAVATION, BEDDING, BACKFILL, COUPLINGS, FUSION TEES, TAP OF EXISTING LINE, AND ALL OTHER NECESSARY MATERIALS AND LABOR FOR COMPLETE INSTALLATION OF ASSEMBLY, INCLUDING TRAFFIC CONTROL.
77. INCLUDES ALL MATERIALS, PARTS, LABOR, EQUIPMENT, MACHINERY, TOOLS, OR APPARATUS NECESSARY FOR INSTALLATION OF GAS SERVICE ASSEMBLIES AS DESCRIBED IN THE PLANS AND SPECS. INSTALLATION FOR LONG SIDE AND SHORT SIDE APPLICATIONS. SERVICE PIPE SHALL BE PAID PER LINEAR FOOT INSTALLED. REMOVE FARM TAPS AS REQUIRED.
78. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT FOR COMPLETE INSTALLATION OF INDIVIDUAL ITEM AS SPECIFIED ON BID FORM AND UTILITY SPECIFICATIONS. COST INCLUDES, GRAVEL PAD, STEEL BARRICADE, MINOR GRADING, REGULATING STATION, TESTING, ETC.
79. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT FOR REMOVAL OF ITEM.
80. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT FOR RETIREMENT OF ITEM INCLUDING STABILIZING THE ITEM OF PLANT PER UTILITY SPECIFICATIONS.
81. AS-BUILT DATA WILL BE COLLECTED USING LOCUSVIEW BY GAS SUBCONTRACTOR.
82. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT FOR COMPLETE INSTALLATION OF PIPE INCLUDING BUT NOT LIMITED TO TRAFFIC CONTROL, MATERIALS, EQUIPMENT, EXCAVATION IN BOTH UNCONSOLIDATED AND ROCK, REMOVAL AND REPLACEMENT OF UNSUITABLE SOIL, ENVELOPE/BEDDING MATERIAL, BACKFILLING, FLOWABLE FILL, THRUST BLOCKING CONCRETE DEADMAN, PIPE FUSION, TRACER WIRE, WARNING TAPE, APPURTENANCES, TEMPORARY/PERMANENT SHORING, MAINTAINING THE TRENCH, TESTING, FLUSHING, DISINFECTION, BACTERIOLOGICAL SAMPLING, TEMPORARY/PERMANENT SURFACE RESTORATION, AND ANY OTHER LABOR OR MATERIAL REQUIRED TO COMPLETE THE WORK AS SPECIFIED ON THE PLANS.
83. INCLUDES ALL MATERIALS, LABOR, EQUIPMENT, AND TRAFFIC CONTROL, INCLUDING BUT NOT LIMITED TO FLUID CONTAINMENT FOR COMPLETE HORIZONTAL DIRECTIONAL DRILLING INSTALLATION OF CASING PIPE OR UNCASED CARRIER PIPE IN BOTH UNCONSOLIDATED SOIL AND/OR ROCK. IF CASING PIPE HAS CARRIER PIPE, THE CARRIER PIPE SHALL BE PAID AT THE OPEN CUT ITEM.
84. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT NECESSARY FOR CONNECTING TO AN EXISTING WATER LINE INCLUDING TRAFFIC CONTROL.
85. INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT INCLUDING BUT NOT LIMITED TO FITTINGS, VALVES, VALVE STEM EXTENSIONS, VALVE BOX AND COVER, BOX ADJUSTMENT, VALVE BOX COLLAR, VALVE MARKER, EXCAVATION, BEDDING, BACKFILL, BLOCKING, AND TRAFFIC CONTROL.
86. INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT INCLUDING BUT NOT LIMITED TO MACHINERY, TOOLS OR APPARATUS NECESSARY FOR INSTALLATION OF ASSEMBLIES AS DESCRIBED IN THE PLANS AND SPECS EXCEPT FOR SERVICE LINE WHICH IS PAID SEPARATELY FOR EACH FOOT INSTALLED.
87. INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT FOR COMPLETE INSTALLATION OF UNIT OR LUMP SUM ITEM AS SPECIFIED IN THE BID FORM.

EXHIBIT A – Part 2 of 2 – FOOTNOTES *(Continued)*

Revised Per Addendum 1 on October 31, 2024

88. INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT FOR REMOVAL OF ITEM.
89. INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT INCLUDING BUT NOT LIMITED TO CASING PIPE, PIPE SPACERS, CASING END SEALS, FITTINGS, TRACER WIRE, WARNING TAPE, UTILITY LINE MARKERS AND TRAFFIC CONTROL. IF CASING PIPE HAS CARRIER PIPE, THE CARRIER PIPE SHALL BE PAID AT THE OPEN CUT ITEM.
90. INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT FOR COMPLETE EXCAVATION INCLUDING BUT NOT LIMITED TO BEDDING, BACKFILLING, THRUST BLOCKING, PIPE FUSION, APPURTENANCES, FLOWABLE FILL, MAINTAINING THE TRENCH, TESTING, CHECK DAMS, AND ANY OTHER LABOR OR MATERIAL REQUIRED TO COMPLETE THE GRAVITY SEWER LINES OR FORCE MAINS A SPECIFIED ON THE PLANS. ALL MATERIAL PER CITY OF FRANKLIN SPECIFICATIONS.
91. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT NECESSARY FOR CONNECTING TO AN EXISTING FORCE MAIN, SEWER LINE, PUMP STATION, OR MANHOLE AS SPECIFIED ON PLANS, INCLUDING TRAFFIC CONTROL.
92. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT, INCLUDING BUT NOT LIMITED TO VALVE, VALVE BOX, BOX ADJUSTMENT, VALVE BOX COLLAR, VALVE MARKER, EXCAVATION, BEDDING, BACKFILL, BLOCKING, AND TRAFFIC CONTROL.
93. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT, INCLUDING BUT NOT LIMITED TO MACHINERY, TOOLS, OR APPARATUS NECESSARY FOR INSTALLATION OF ASSEMBLIES AS DESCRIBED AND DETAILED IN THE PLANS AND SPECS.
94. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT, FOR RETIRE IN PLACE OR REMOVAL ITEMS AS SPECIFIED ON THE BID FORM INCLUDING TRAFFIC CONTROL.
95. INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT INCLUDING BUT NOT LIMITED TO CASING PIPE, PIPE SPACERS, CASING END SEALS, STONE BACKFILL, TEMPORARY PAVEMENT, AND ANY OTHER APPURTENANCE TO COMPLETE THE WORK AS SPECIFIED ON THE PLANS, AND TRAFFIC CONTROL.
96. CAST-IN-PLACE CONCRETE IS A PAY ITEM WHEN USED IN CONJUNCTION WITH CONCRETE ENCASEMENT, CONCRETE CAPS, AND CONCRETE ANCHORS. CAST-IN-PLACE CONCRETE IS NOT A PAY ITEM WHEN USED IN CONJUNCTION WITH CONCRETE THRUST BLOCKS.
97. PAYMENT SHALL BE FULL COMPENSATION FOR FURNISHING AND INSTALLING POLYETHYLENE ENCASEMENT PER FOOT. MEASUREMENT SHALL BE MADE ALONG THE CENTERLINE OF THE PIPE TO INCLUDE FIRE HYDRANT BRANCHES.

END of BID FORM – EXHIBIT A – Part 2 of 2 - FOOTNOTES

ATTACHMENT C - ADDENDUM 1

CITY OF FRANKLIN	YEAR 2023	SHEET NO. W1
FED. AID PROJ. NO. STP-M-9305(31)		

INDEX OF SHEETS

W1.....COVER SHEET
W2–W9.....WATER RELOCATION PLAN

CITY OF FRANKLIN, TN
EAST McEWEN DRIVE
FROM EAST OF COOL SPRINGS BLVD.
TO: WILSON PIKE (S.R. 253)
WATER MAIN RELOCATION

MILCROFTON UTILITY DISTRICT - WATER RELOCATION AND IMPROVEMENTS

FOOTNOTES	ITEM NO.	ITEM DESCRIPTION	UNIT	BETTERMENT EST QTY.	City EST QTY.	TOTAL EST QTY.
1	795-01.06	8" DIP SLIP JOINT WATER LINE (CLASS 52) (PRICE INCLUDES COPPERHEAD 1230B-SF LOCATING WIRE)	LF	4920	11	4931
1	795-02.03	4" HDPE WATER LINE (DR11) (PRICE INCLUDES COPPERHEAD 1230B-SF LOCATING WIRE)	LF	0	1508	1508
2	795-05.55	HDD 3" FPVC CASING PIPE - UNCLASSIFIED	LF	0	682	682
1	795-05.92	4" FPVC CASING PIPE OPEN CUT (USE AS DIRECTED BY ENGINEER)	LF	0	50	50
1	795-05.93	3" FPVC CASING PIPE OPEN CUT (USE AS DIRECTED BY ENGINEER)	LF	0	100	100
3	795-06.05	CONNECT TO 8IN WATER LINE	EACH	4	1	5
3	795-06.07	CONNECT TO 12IN WATER LINE	EACH	1	0	1
	795-06.32	CUT AND CAP 4" WATER LINE	EACH	5	0	5
	795-06.34	CUT AND CAP 8" WATER LINE	EACH	0	1	1
	795-06.37	CUT AND CAP 12" WATER LINE	EACH	0	2	2
5	795-08.05	8" GATE VALVE ASSEMBLY	EACH	4	1	5
6	795-09.01	3/4" WATER SERVICE METER ASSEMBLY (MILCROFTON TO PROVIDE AND INSTALL METERS)	EACH	0	6	6
	795-09.51	DISCONNECT/RECONNECT EXISTING WATER METER	EACH	0	4	4
1	795-09.60	3/4" PEXa SERVICE PIPE (QTY INCLUDES AN ADDITIONAL 450' TO RECONNECT SERVICE AS APPROVED BY MUD) (PRICE INCLUDES COPPERHEAD 1230B-SF LOCATING WIRE)	LF	0	1367	1367
1	795-09.62	1" PEXa SERVICE PIPE (QTY INCLUDES TEMPORARY SERVICE) (PRICE INCLUDES COPPERHEAD 1230B-SF LOCATING WIRE)	LF	0	630	630
1	795-09.64	2" PEXa SERVICE PIPE (QTY INCLUDES TEMPORARY SERVICE) (PRICE INCLUDES COPPERHEAD 1230B-SF LOCATING WIRE)	LF	0	334	334
6	795-10.03	1" COMBINATION AIR/VACUUM RELEASE VALVE ASSEMBLY	EACH	5	3	8
6	795-11.01	BLOW OFF ASSEMBLY	EACH	0	1	1
6	795-11.02	FIRE HYDRANT ASSEMBLY (INCLUDES ALL REQUIRED 6" RESTRAINED JOINT DIP AND VALVE)	EACH	0	4	4
9	795-12.27	REMOVAL/DISPOSAL OF EXISTING 4" WATER MAIN TO ACCOMMODATE ROADWAY CONSTRUCTION (QTY INCLUDES AN ADDITIONAL 400' AS DIRECTED BY THE ENGINEER)	LF	0	455	455
9	795-12.28	REMOVAL/DISPOSAL OF EXISTING 8" WATER MAIN TO ACCOMMODATE ROADWAY CONSTRUCTION	LF	0	42	42
9	795-12.29	REMOVAL/DISPOSAL OF EXISTING 12" WATER MAIN TO ACCOMMODATE ROADWAY CONSTRUCTION (ATTACHED TO BRIDGE PARAPET)	LF	0	87	87
	795-13.01	DI FITTINGS (INCLUDES FITTINGS, GLANDS AND RESTRAINT DEVICES DESCRIBED IN POUNDS)	LB.	2690	520	3210
8	795-14.01	CONCRETE CAP (AS DIRECTED BY MUD)	LF	30	0	30
10	795-30.26	OPEN CUT 3" CASING PIPE (SCH 40 PVC)	LF	0	133	133
	795-99.05	POLYETHYLENE PIPE PROTECT - 8" (PER ANSI/AWWA C105/A21.5 (INSTALLED ON NEW MAINS AS DIRECTED BY MUD))	LF	600	0	600
	795-99.06	WATER UTILITY AS-BUILTS (SEE SPECIAL PROVISION REGARDING UTILITY RECORD DRAWINGS)	LS	0.76	0.24	1

FOOTNOTE 1	INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT FOR COMPLETE INSTALLATION OF PIPE INCLUDING BUT NOT LIMITED TO TRAFFIC CONTROL, MATERIALS, EQUIPMENT, EXCAVATION IN BOTH UNCONSOLIDATED AND ROCK, REMOVAL AND REPLACEMENT OF UNSUITABLE SOIL, ENVELOPE/BEDDING MATERIAL, BACKFILLING, FLOWABLE FILL, THRUST BLOCKING CONCRETE DEADMAN, PIPE FUSION, TRACER WIRE, WARNING TAPE, APPURTENANCES, TEMPORARY/PERMANENT SHORING, MAINTAINING THE TRENCH, TESTING, FLUSHING, DISINFECTION, BACTERIOLOGICAL SAMPLING, TEMPORARY/PERMANENT SURFACE RESTORATION, AND ANY OTHER LABOR OR MATERIAL REQUIRED TO COMPLETE THE WORK AS SPECIFIED ON THE PLANS.
FOOTNOTE 2	INCLUDES ALL MATERIALS, LABOR, EQUIPMENT, AND TRAFFIC CONTROL, INCLUDING BUT NOT LIMITED TO FLUID CONTAINMENT FOR COMPLETE HORIZONTAL DIRECTIONAL DRILLING INSTALLATION OF CASING PIPE OR UNCASED CARRIER PIPE IN BOTH UNCONSOLIDATED SOIL OR ROCK. IF CASING PIPE HAS CARRIER PIPE, THE CARRIER PIPE SHALL BE PAID AT THE OPEN CUT ITEM.
FOOTNOTE 3	INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT NECESSARY FOR CONNECTING TO AN EXISTING WATER LINE INCLUDING TRAFFIC CONTROL.
FOOTNOTE 5	INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT INCLUDING BUT NOT LIMITED TO FITTINGS, VALVES, VALVE STEM EXTENSIONS, VALVE BOX AND COVER, BOX ADJUSTMENT, VALVE BOX COLLAR, VALVE MARKER, EXCAVATION, BEDDING, BACKFILL, BLOCKING, AND TRAFFIC CONTROL.
FOOTNOTE 6	INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT INCLUDING BUT NOT LIMITED TO MACHINERY, TOOLS OR APPARATUS NECESSARY FOR INSTALLATION OF ASSEMBLIES AS DESCRIBED IN THE PLANS AND SPECS EXCEPT FOR SERVICE LINE WHICH IS PAID SEPARATELY FOR EACH FOOT INSTALLED.
FOOTNOTE 8	INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT FOR COMPLETE INSTALLATION OF UNIT OR LUMP SUM ITEM AS SPECIFIED IN THE BID FORM.
FOOTNOTE 9	INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT FOR REMOVAL OF ITEM.
FOOTNOTE 10	INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT INCLUDING BUT NOT LIMITED TO CASING PIPE, PIPE SPACERS, CASING END SEALS, FITTINGS, TRACER WIRE, WARNING TAPE, UTILITY LINE MARKERS AND TRAFFIC CONTROL. IF CASING PIPE HAS CARRIER PIPE, THE CARRIER PIPE SHALL BE PAID AT THE OPEN CUT ITEM.

811

Know what's **below.**
Call before you dig.

PROPOSALS MAY BE REJECTED BY THE CITY OF FRANKLIN IF ANY OF THE UNIT PRICES CONTAINED THEREIN ARE OBVIOUSLY UNBALANCED, EITHER EXCESSIVE OR BELOW THE REASONABLE COST ANALYSIS VALUE.

THIS PROJECT TO BE CONSTRUCTED UNDER THE STANDARD SPECIFICATIONS OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION AND ADDITIONAL SPECIFICATIONS AND SPECIAL PROVISION CONTAINED IN THE PLANS AND IN THE PROPOSAL CONTRACT

CITY OF FRANKLIN ENGINEERING DEPARTMENT

PAUL P. HOLZEN P.E.
DIRECTOR OF ENGINEERING

PAUL P. HOLZEN — REGISTERED ENGINEER — AGRICULTURE — OWNERS — No. 113018 — STATE OF TENNESSEE
10/25/2024

UTILITY OWNERS

CITY OF FRANKLIN SANITARY SEWER
ATTN: COF PROJECT MANAGER (ENGINEERING DEPARTMENT)
PH (615) 791-3218

ATTN: BEN MCNEIL (WATER DEPARTMENT)
615-598-0171

CITY OF FRANKLIN FIBER OPTICS
ATTN: COF PROJECT MANAGER (ENGINEERING DEPARTMENT)
PH (615) 791-3218

ATTN: MIKE PROCTOR (IT DEPARTMENT)
PH (615)-550-6604

ATMOS ENERGY
ATTN:RYAN BATES
PH (615)-771-8311

MILCROFTON UTILITY DISTRICT
ATTN:MIKE JONES
ATTN:(615)-794-5947

CITY OF FRANKLIN	YEAR 2024	SHEET NO. S1
FED. AID PROJ. NO. STP-M-9305(31)		

INDEX OF SHEETS

S1.....COVER SHEET
S2–S7.....FORCE MAIN RELOCATION

CITY OF FRANKLIN, TN
EAST McEWEN DRIVE
FROM EAST OF COOL SPRINGS BLVD.
TO: WILSON PIKE (S.R. 253)
FORCE MAIN RELOCATION PLANS

811 Know what's **below.** **Call** before you dig.

PROPOSALS MAY BE REJECTED BY THE CITY OF FRANKLIN IF ANY OF THE UNIT PRICES CONTAINED THEREIN ARE OBVIOUSLY UNBALANCED, EITHER EXCESSIVE OR BELOW THE REASONABLE COST ANALYSIS VALUE.

THIS PROJECT TO BE CONSTRUCTED UNDER THE STANDARD SPECIFICATIONS OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION AND ADDITIONAL SPECIFICATIONS AND SPECIAL PROVISION CONTAINED IN THE PLANS AND IN THE PROPOSAL CONTRACT

CITY OF FRANKLIN ENGINEERING DEPARTMENT — PAUL P. HOLZEN P.E. DIRECTOR OF ENGINEERING

CITY OF FRANKLIN - FORCE MAIN RELOCATION

FOOTNOTES	ITEM NO.	ITEM DESCRIPTION	UNIT	TOTAL EST QTY.
1	797-01.02	6" DIP FORCE MAIN (CLASS 350) (QTY INCLUDES 335 ADDITIONAL LF FOR TEMPORARY RELOCATIONS TO ACCOMMODATE PHASED CONSTRUCTION) (PRICE INCLUDES 14AWG, TYPE THHN SOLID COPPER DETECTION WIRE) (1)	L.F.	5002
14	797-06.91	OPEN CUT 18" STEEL CASING PIPE	L.F.	80
	797-08.01	DI FITTINGS (INCLUDES FITTINGS, GLANDS AND RESTRAINT DEVICES DESCRIBED IN POUNDS)	LBS	3000
5	797-08.62	6" GATE VALVE ASSEMBLY	L.F.	4
5	797-08.68	6" INSERTION VALVE (INSTALLED WITH NO SYSTEM SHUT DOWN - AS DIRECTED BY THE ENGINEER FOR FLOW CONTROL)	EACH	2
6	797-09.19	COMBINATION AIR/VACUUM RELEASE VALVE	EACH	2
3	797-09.46	CUT AND CAP 6" FORCE MAIN	EACH	12
3	797-10.17	CONNECT TO 6" FORCE MAIN	EACH	10
15	797-11.46	CONCRETE CAP (CLASS A CONCRETE - AS DIRECTED BY THE ENGINEER)	L.F.	30
16	797-99.01	POLYETHYLENE ENCASEMENT PER ASNI/AWWA C105/A21.5 (INSTALLED ON NEW MAINS AS DIRECTED BY COF INSPECTOR)	L.F.	4435
9	797-99.02	REMOVAL OF EXISTING FM AIR VALVE / MANHOLE	EACH	1
9	797-99.03	REMOVAL OF EXISTING 6" FORCE MAIN TO ACCOMMODATE ROADWAY CONSTRUCTION (QTY INCLUDES AN ADDITIONAL 150' AS DIRECTED BY THE ENGINEER)	L.F.	1122
	797-99.04	FORCE MAIN UTILITY AS-BUILTS (SEE SPECIAL PROVISION REGARDING UTILITY RECORD DRAWINGS)	LS	1

FOOTNOTE 1	INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT FOR COMPLETE EXCAVATION INCLUDING BUT NOT LIMITED TO BEDDING, BACKFILLING, THRUST BLOCKING, PIPE FUSION, APPURTENANCES, FLOWABLE FILL, MAINTAINING THE TRENCH, TESTING, CHECK DAMS, AND ANY OTHER LABOR OR MATERIAL REQUIRED TO COMPLETE THE GRAVITY SEWER LINES OR FORCE MAINS A SPECIFIED ON THE PLANS. ALL MATERIAL PER CITY OF FRANKLIN SPECIFICATIONS.
FOOTNOTE 3	INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT NECESSARY FOR CONNECTING TO AN EXISTING FORCE MAIN, SEWER LINE, PUMP STATION, OR MANHOLE AS SPECIFIED ON PLANS, INCLUDING TRAFFIC CONTROL.
FOOTNOTE 5	INCLUDES ALL MATERIAL, LABOR AND EQUIPMENT, INCLUDING BUT NOT LIMITED TO VALVE, VALVE BOX, BOX ADJUSTMENT, VALVE BOX COLLAR, VALVE MARKER, EXCAVATION, BEDDING, BACKFILL, BLOCKING, AND TRAFFIC CONTROL
FOOTNOTE 6	INCLUDES ALL MATERIAL, LABOR AND EQUIPMENT, INCLUDING BUT NOT LIMITED TO MACHINERY, TOOLS, OR APPARATUS NECESSARY FOR INSTALLATION OF ASSEMBLIES AS DESCRIBED AND DETAILED IN THE PLANS AND SPECS.
FOOTNOTE 9	INCLUDES ALL MATERIAL, LABOR AND EQUIPMENT, FOR RETIRE IN PLACE OR REMOVAL ITEMS AS SPECIFIED ON THE BID FORM INCLUDING TRAFFIC CONTROL.
FOOTNOTE 14	INCLUDES ALL MATERIALS, LABOR AND EQUIPMENT INCLUDING BUT NOT LIMITED TO CASING PIPE, PIPE SPACERS, CASING END SEALS, STONE BACKFILL, TEMPORARY PAVEMENT, AND ANY OTHER APPURTENANCE TO COMPLETE THE WORK AS SPECIFIED ON THE PLANS, AND TRAFFIC CONTROL
FOOTNOTE 15	CAST-IN-PLACE CONCRETE IS A PAY ITEM WHEN USED IN CONJUNCTION WITH CONCRETE ENCASEMENT, CONCRETE CAPS, AND CONCRETE ANCHORS. CAST-IN-PLACE CONCRETE IS NOT A PAY ITEM WHEN USED IN CONJUNCTION WITH CONCRETE THRUST BLOCKS.
FOOTNOTE 16	PAYMENT SHALL BE FULL COMPENSATION FOR FURNISHING AND INSTALLING POLYETHYLENE ENCASEMENT PER FOOT. MEASUREMENT SHALL BE MADE ALONG THE CENTERLINE OF THE PIPE TO INCLUDE FIRE HYDRANT BRANCHES.

PAUL P. HOLZEN 07/16/2024

UTILITY OWNERS

CITY OF FRANKLIN SANITARY SEWER
ATTN: COF PROJECT MANAGER (ENGINEERING DEPARTMENT)
PH (615) 791–3218

ATTN: BEN MCNEIL (WATER DEPARTMENT)
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ATTN:(615)–794–5947

TYPE	YEAR	PROJECT NO.	SHEET NO.
	2024		G1

FED. AID PROJ. NO. STP-M-9305(31)

UTILITY SHEET INDEX

SHEET NUMBER	SHEET NAME
G-1	COVER – ESTIMATED QUANTITIES
G2-G8	OVERALL RELOCATION PLAN
G9	GENERAL NOTES
G10	GENERAL NOTES – MATERIALS
G11	GENERAL NOTES – OQ TASKS AND TIE IN & ABANDONMENT BULLETIN
G12-14	DETAILS

NOTE:

Contractor agrees to assume liability for, and agrees to indemnify, defend and save and keep TDOT, City of Franklin and the owner of any facilities being relocated by Contractor, their agents, employees and representatives, from and against, any and all liabilities, obligations, losses, damages, penalties, fines, amounts in settlement, claims, actions, proceedings, suits, judgements, costs, interest, expenses and disbursements of any kind and nature whatsoever arising under any theory, of legal liability (including attorneys fees and costs) (a "Claim") that may be imposed on, incurred by or asserted against the indemnified party, its agents, employees or representatives, in any way relating to, resulting from, based upon or arising out of Contractor's relocation of utility facilities or work or activities in connection therewith; provided, however, that Contractor is not required to indemnify the indemnified party, its agents, employees or representatives, for any Claim against an indemnities (unless attributed of imputed to such indemnities by reason of any act or omission of the Contractor, whether as agent for the Contractor or otherwise). "Theories of Legal Liability" include, but are not limited to, contract, tort, strict liability, breach of express or implied warranty and breach of implied covenant.

The obligation of a Contractor to defend TDOT, City of Franklin and the owner of any facilities being relocated by Contractor, their agents, employees or representatives, against any Claim is separate and distinct from the obligation of indemnity set forth in this Agreement. Contractor shall have the right and obligation to assume the defense of any Claim with counsel chosen by the indemnified party and reasonably acceptable to Contractor, provided that counsel to Contractor may participate in the defense of the Claim with counsel for the indemnified party, and such counsel shall remain at the cost and expense of the Contractor. Contractor will not have the right to assume the defense of a Claim made against both the indemnified party, its agents, representatives or employees, and Contractor if counsel for the Contractor or the indemnified party advises in writing that conflicts of interest would under applicable ethical principles preclude a single counsel or firm from defending both parties.

ATMOS ENERGY CORPORATION

CONTACT: TERI LABELLA
PHONE: 615-418-6699
TERI.LABELLA@ATMOSENERGY.COM

ATMOS ENERGY Corporation - GAS RELOCATION AND IMPROVEMENTS
COF Contract No. 2023-0096 - Exhibit A

FOOTNOTES	ITEM NO.	ITEM DESCRIPTION	UNIT	BETTERMENT EST QTY.	City EST QTY.	TOTAL EST QTY.
	707-01.11	CHAIN LINK FENCE (5-FOOT)	L.F.	140	0	140
	707-01.12	END & CORNER POST ASSEMBLY (CHAIN-LINK FENCE 5')	EACH	14	0	14
	707-01.13	GATE-CHAIN-LINK FENCE 5 FOOT (10' WIDE GATE)	EACH	1	0	1
1	791-01.04	4IN STEEL GAS MAIN	L.F.	95	0	95
1	791-01.06	8IN STEEL GAS MAIN	L.F.	0	6764	6764
1	791-01.09	4IN STEEL GAS MAIN (INSTALLED WITH AND ABOVE THE 8IN STEEL GAS MAIN)	L.F.	104	0	104
1	791-03.02	2IN PE GAS MAIN	L.F.	32	0	32
1	791-03.04	4IN PE GAS MAIN	L.F.	52	0	52
1	791-03.09	2IN PE GAS MAIN (INSTALLED WITH AND ABOVE THE 8IN STEEL GAS MAIN)	L.F.	1530	0	1530
1	791-03.10	4IN PE GAS MAIN (INSTALLED WITH AND ABOVE THE 8IN STEEL GAS MAIN)	L.F.	893	0	893
2	791-04.10	HDD 3/4IN PE SERVICE PIPE (DIRECTIONAL BORE TO BE USED ONLY IF NECESSARY)	L.F.	0	121	121
2	791-04.13	HDD 4IN STEEL GAS MAIN (DIRECTIONAL BORE TO BE USED ONLY IF NECESSARY)	L.F.	0	31	31
4	791-06.03	CONNECTION TO 4" EX PE GAS MAIN	EACH	2	0	2
4	791-06.09	CONNECT TO EX 3/4" GAS SERVICE LINE	EACH	0	5	5
4	791-06.34	CONNECT TO EX 8" STEEL GAS MAIN W/ STOPPER	EACH	0	4	4
4	791-06.38	CONNECT TO 8" EX STEEL MAIN W/ BOTTOM OUT STOPPER FITTING	EACH	0	1	1
5	791-07.09	2 IN STEEL GAS VALVE ASSEMBLY	EACH	1	0	1
5	791-07.10	4 IN STEEL GAS VALVE ASSEMBLY	EACH	5	0	5
5	791-07.12	8 IN STEEL GAS VALVE ASSEMBLY	EACH	0	1	1
6	791-08.07	3/4IN PE SERVICE PIPE (AN ADDITIONAL 300' OF QTY. HAS BEEN ADDED TO THIS ITEM FOR ADDITIONAL WORK AS DETERMINED BY THE ENGINEER)	L.F.	0	847	847
8	791-08.41	GAS MAIN REMOVAL (REMOVAL/DISPOSAL OF EXISTING 8" GAS MAIN TO ACCOMIDATE ROADWAY CONSTRUCTION (QTY INCLUDES AN ADDITIONAL 200' AS DIRECTED BY THE ENGINEER))	LF	0	1622	1622
7	791-09.02	3-WIRE CATHODIC PROTECTION STATION	EACH	2	0	2
7	791-09.04	4" REGULATING STATION (W/ OPTION #4 ENCLOSED - STD 10-002-05) (REGLUATING STATION SHALL BE PREFABRICATED BY APPROVED VENDOR)	EACH	0	2	2
8	791-09.08	REMOVAL REGULATING STATION (2' BELOW PROPOSED GRADE)	EACH	0	2	2
8	791-09.23	REMOVAL OF EXISTING FARM TAP (2' BELOW PROPOSED GRADE)	EACH	0	5	5
9	791-10.01	RETIRE IN PLACE 3/4 IN SERV CUT & PLUG	EACH	0	5	5
9	791-10.05	RETIRE IN PLACE 4" PE CUT & PLUG	EACH	0	1	1
9	791-10.07	RETIRE IN PLACE 8" STEEL GAS MAIN CUT & PLUG	EACH	0	15	15
	791-11.02	CONCRETE CAP (CLASS A)	LS	0	1	1
4	791-15.71	INSTALL TEMPORARY FARM TAP AS REQUIRED	EACH	0	2	2
1	791-99.03	SLUG TRAP (ATMOS ENERGY TO PROVIDE PREFABRICATED MATERIAL)	LS	1	0	1
11	791-99.04	GAS MAIN UTILITY ASBUILTS (SEE SPECIAL PROVISIONREGARDING UTILITY RECORD DRAWINGS)	LS	0.50	0.50	1

FOOTNOTE 1:	INCLUDES ALL MATERIALS INCLUDING SAND/STONE BEDDING, FLOWABLE FILL, TEMPORARY PAVEMENT IN OR OUT OF ROW, LABOR, EQUIPMENT FOR COMPLETE INSTALLATION OF PIPE INCLUDING BUT NOT LIMITED TO TRAFFIC CONTROL, EXCAVATION INCLUDING DIRT/ROCK, BACKFILLING, CREEK CROSSINGS PER SWPPP, COUPLINGS, FITTINGS, PIPE FUSION, APPURTENANCES, MAINTAINING THE TRENCH, PURGE POINT INSTALLATION, TESTING BY UTILITY SPECIFICATIONS TO INCLUDE BUT NOT LIMITED TO AIR, NITROGEN, HYDROSTATIC OR X-RAY, DEW POINT OR DRYING, AND ANY OTHER LABOR OR MATERIAL REQUIRED TO COMPLETE THE WORK AS SPECIFIED ON THE PLANS.
FOOTNOTE 2:	INCLUDES ALL MATERIALS, LABOR, EQUIPMENT, AND TRAFFIC CONTROL, INCLUDING BUT NOT LIMITED TO FLUID CONTAINMENT FOR COMPLETE HORIZONTAL DIRECTIONAL DRILLING INSTALLATION OF CASING PIPE OR UNCASED CARRIER PIPE IN BOTH UNCONSOLIDATED SOIL OR ROCK. STEEL PIPE INCLUDES SPECIAL COATING AS SPECIFIED ON PLANS AND SPECS. IF CASING PIPE HAS CARRIER PIPE, THE CARRIER PIPE SHALL BE PAID AT THE OPEN CUT ITEM PRICE.
FOOTNOTE 3:	INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT, NECESSARY FOR BORE & JACK OF GAS LINE CASING PIPE INCLUDING BUT NOT LIMITED TO ENTRY AND EXIT PITS, B & J EQUIPMENT AND TRAFFIC CONTROL. CARRIER PIPE SHALL BE PAID AT THE OPEN CUT ITEM PRICE.
FOOTNOTE 4:	INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT, NECESSARY FOR CONNECTING TO EXISTING GAS LINE, INCLUDING TRAFFIC CONTROL.
FOOTNOTE 5:	INCLUDES TRANSITION FITTINGS, VALVES, VALVE BOX, BOX ADJUSTMENT, VALVE BOX COLLAR, VALVE MARKER, EXCAVATION, BEDDING, BACKFILL, COUPLINGS, FUSION TEES, TAP OF EXISTING LINE, AND ALL OTHER NECESSARY MATERIALS AND LABOR FOR COMPLETE INSTALLATION OF ASSEMBLY, INCLUDING TRAFFIC CONTROL.
FOOTNOTE 6:	INCLUDES ALL MATERIALS, PARTS, LABOR, EQUIPMENT, MACHINERY, TOOLS, OR APPARATUS NECESSARY FOR INSTALLATION OF GAS SERVICE ASSEMBLIES AS DESCRIBED IN THE PLANS AND SPECS. INSTALLATION FOR LONG SIDE AND SHORT SIDE APPLICATIONS. SERVICE PIPE SHALL BE PAID PER LINEAR FOOT INSTALLED. REMOVE FARM TAPS AS REQUIRED.
FOOTNOTE 7:	INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT FOR COMPLETE INSTALLATION OF INDIVIDUAL ITEM AS SPECIFIED ON BID FORM AND UTILITY SPECIFICATIONS. COST INCLUDES, GRAVEL PAD, STEEL BARRICADE, MINOR GRADING, REGULATING STATION, TESTING, ETC.
FOOTNOTE 8:	INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT FOR REMOVAL OF ITEM.
FOOTNOTE 9:	INCLUDES ALL MATERIALS, LABOR, AND EQUIPMENT FOR RETIREMENT OF ITEM INCLUDING STABILIZING THE ITEM OF PLANT PER UTILITY SPECIFICATIONS.
FOOTNOTE 10:	PAYMENT FOR REMOVING AND BACKFILLING OF CATHODIC PROTECTION TEST STATIONS, ABANDONED SERVICES, MARKERS AND VALVES ARE NOT A PAY ITEM AND SHALL BE INCLUDED IN THE COST OF OTHER ITEMS.
FOOTNOTE 11:	AS-BUILT DATA WILL BE COLLECTED USING LOCUSVIEW BY GAS SUBCONTRACTOR

UTILITY PLANS NATURAL GAS

SEALED BY

PAUL P. HOLDEN
REGISTERED ENGINEER
AGRICULTURE
No. 113018
STATE OF TENNESSEE
10 MAY 2024

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

ATMOS ENERGY
GAS RELOCATION
COVER
Estimated Quantities
SCALE: None

ATTACHMENT F - ADDENDUM 1

DRAFT

Report of Geotechnical Exploration
McEwen Drive Extension – Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

PREPARED FOR:

Sullivan Engineering, Inc.
317 Main Street, Suite 201
Franklin, Tennessee 37064

PREPARED BY:

S&ME, Inc.
820 Fesslers Parkway, Suite 240
Nashville, TN 37210

July 25, 2018

DRAFT

July 25, 2018

Sullivan Engineering, Inc.
317 Main Street, Suite 201
Franklin, Tennessee 37064

Attention: Mr. Paul Collins

Reference: **Report of Geotechnical Exploration**
McEwen Drive Extension – Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

Dear Mr. Collins:

S&ME, Inc. (S&ME) is pleased to submit the following *Report of Geotechnical Exploration* performed for the planned McEwen Drive Extension project located on McEwen drive between Cool Springs Boulevard to Wilson Pike in Franklin, Tennessee. Our services were provided in general accordance with our Proposal No. 121400394 C02, dated March 16, 2018, as authorized by Mr. Paul Collins.

This report describes our understanding of the project and the subsurface conditions encountered and presents our conclusions and recommendations for the planned Retaining Wall P2 and pre-split rock walls in the vicinity of the new boring locations.

We appreciate the opportunity to serve as your geotechnical engineering consultant during this phase of the project. Please contact us with questions regarding this report, or if we may be of further assistance.

Sincerely,

S&ME, Inc.

Eric C. Conway, E.I.
Project Engineer

Phillip J. Collins, P.E.
Principal Engineer

7/25/18

Timothy S. Lawrence, P.E.
Senior Engineer

DRAFT

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1.0 Introduction

1.1 Purpose

The purpose of this geotechnical study was to explore subsurface conditions at the site pursuant to developing recommendations for Retaining Wall P2 and pre-split rock walls in the vicinity of the new boring locations. This report provides the following:

- Description of the site conditions, topography, drainage, and geologic setting.
- Description of field testing techniques.
- Description of subsurface soil and rock conditions, and the groundwater level.
- Comments concerning the presence of groundwater, soft soil, or other encountered conditions that may affect the slope and Wall P2 design and construction activities.
- Test Boring Records.
- Cut slope recommendations for the explored areas.
- Retaining Wall Sheets for reconfigured Wall P2 that include wall foundation commendations in the TDOT LRFD format.

1.2 Project Information

The McEwen Drive Extension Phase 4 project will include realigning part of the approximately 1.5 mile long roadway, and widening the existing two lane road to a four lane, divided highway from Cool Springs Boulevard to Wilson Pike in Franklin, Tennessee.

The following project information was provided to us on March 6 and 7, 2018 by Mr. Paul Collins of Sullivan Engineering via email:

- Report of Subsurface Exploration and Geotechnical Engineering Study, Proposed Widening and Improvements to McEwen Road, Franklin, Tennessee, prepared by AMEC Earth and Environmental, Inc. and dated April 2006;
- CAD drawing file titled "Phase 4 PLAN PROFILES.dwg", prepared by Sullivan Engineering, Inc. and dated 2005;
- CAD drawing files containing cross sections for McEwen Drive, Station 437+50 to 508+50, prepared by Sullivan Engineering and dated March 1, 2016;
- CAD drawing file showing planned centerline of reconfigured access to Road of the Round Table showing topography near McEwen Drive; and
- CAD drawing files containing cross sections for McEwen Drive, Station 461+00 to 465+00, extended left of centerline to include Road of the Round Table, prepared by Sullivan Engineering, date unknown.

In addition, we received information verbally in conversations with Mr. Collins. S&ME previously performed a subsurface exploration in 2016 for 11 retaining walls and a box culvert for this project, and issued a Report of Geotechnical Exploration on April 28, 2017. A second subsurface exploration for two additional retaining walls, a

new side road, and Tower Drive was also performed in 2016, and three separate reports were issued on December 19, 2016, December 20, 2016 and December 22, 2016 for the roadways and walls.

The current project includes a total of 18 additional requested borings. Six of the borings were requested left of centerline between Stations 437+50 and 471+00, where 2 Horizontal to 1 Vertical cut slopes overlying a near-vertical split rock face are planned. Additional borings were requested in this area to evaluate the suitability of the rock for a near-vertical split rock face. Additionally, six of the borings were requested for retaining wall P2, which is being reconfigured. Six of the borings were also requested in a cut slope area along the new alignment for Road of the Round Table where a near-vertical split rock face is planned. S&ME previously drilled in the area of retaining wall P2, and used the previous test boring results to estimate expected depths for the new borings planned in the area. Planned boring depths for the other two areas were based on the results of borings drilled by AMEC and provided in their April 2006 report.

Based on Google Earth street view and aerial images, the site has varying terrain with steep slopes. Currently, the site is heavily wooded, except for the new borings for Retaining Wall P2, which are in a grass covered portion of a residential property. We did not assess groundwater flow using water wells. However, based on the general topography of the site, water is expected to flow from the upper slopes on the north side of McEwen Drive southward. There is an existing storm water system running along portions of McEwen Drive. We anticipate both cut and fill activity at the site.

We request the project information and any assumptions listed herein be reviewed and confirmed by the appropriate team members. Modifications to our recommendations may be required if the planned development differs from our stated information and/or assumptions.

1.3 Scope of Study and Report Format

This geotechnical exploration included a site reconnaissance, field and laboratory testing, and engineering analysis. The following sections of this report present discussions of the field exploration, site conditions, and conclusions and recommendations. Following the text of this report, figures and boring logs are provided in the Appendix.

The scope of services did not include an environmental assessment for determining the presence or absence of wetlands, or hazardous or toxic materials in the soil, bedrock, air, surface water, or subsurface water. Any statements in this report or on the boring logs regarding odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes.

2.0 Exploration and Testing Programs

2.1 Field Exploration

2.1.1 General

The subsurface conditions were explored between 06/21/2018 and 07/12/2018 with eighteen (18) test borings located within the planned construction areas in general accordance with ASTM D1586, the *Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils and* ASTM D2488, the *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)*. Refer to the *Test Location Plan, Figure 2,* in the Appendix for the approximate boring locations. The borings were located and staked in the field by HFR Design (HFR). Ground surface elevations were also recorded on the stakes by HFR. The boring locations were confirmed by S&ME and coordinates were recorded using a hand-held GPS device. Some borings were offset a few feet for accessibility purposes.

2.1.2 Soil Test Borings

Borings were advanced by mechanically twisting 2¼-inch diameter hollow stem augers (HSA) into the ground with a subcontracted Diedrich D-50 truck mounted rig and a CME 550 ATV mounted rig. Soil samples were obtained with a standard 1.4-inch inside diameter (ID), 2-inch outside diameter (OD) split-spoon sampler at 2½-foot intervals to depths of 10 feet and at 5-foot intervals below depths of 10 feet. The sampler was first seated 6 inches and then driven an additional foot with blows of the 140-pound hammer falling 30 inches. The number of hammer blows required to drive the sampler the final foot, was recorded and is designated the "standard penetration resistance" (N-value) with units of blows per foot (bpf). The N-value provides a general indication of in-situ soil conditions and has been correlated with certain engineering properties of soils. An automatic trip drop hammer was used for the standard penetration resistance testing. The automatic hammer generally has a higher efficiency than a manual hammer, and may yield lower N values. The N values reported on our boring logs are the field values without any adjustments or "corrections".

The soil samples obtained during our field activities were visually classified by members of our engineering staff in general accordance with ASTM D2488, the *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)*. The resulting soil descriptions are shown on the Test Boring Records in the Appendix. Soil consistencies provided on the boring logs are based on correlations with N-values and visual/manual procedures.

Borings B-101 through B-113 were advanced beyond auger refusal using double barrel, wire-line diamond bit coring techniques generally following procedures outlined in AASHTO T225. Rock core samples were stored in cardboard core boxes and transported to our laboratory for further visual classification by members of our engineering staff. The boring logs include percentages for core recovery (REC) and Rock Quality Designation (RQD). Rock core recovery, REC, is the total length of core sample recovered, expressed as a percentage of the total length cored. RQD is defined as the total length of rock core segments recovered, which are greater than 4 inches in length discounting drilling breaks and clay seams, expressed as a percentage of the total length cored. RQD is preferred over percent core recovery as a measure of engineering characteristics of rock.

Subsurface water level readings were taken in each of the borings during drilling and upon completion of the soil drilling process. Upon completion of drilling and sampling, all of the boreholes, except P2-103, were backfilled with soil cuttings and a borehole closure device. Due to safety concerns, most of the boreholes were not left open for delayed subsurface water level measurements. However, a piezometer was installed at Boring P2-103 so that long term water level measurements could be performed.

2.2 Laboratory Test Program

Other than performing visual classifications, our scope did not include laboratory testing on the samples collected during this supplementary exploration.

3.0 Subsurface Conditions

3.1 Geologic Conditions

The Geologic Map of the Franklin Quadrangle, Tennessee (1963, Tennessee Division of Geology) indicates that the site where most of the borings were performed for this exploration is underlain by the Bigby-Cannon Limestone Formation. This formation is typically a medium to light gray, coarse-grained, medium-bedded limestone with occasional shale partings and brown phosphate pellets. The limestone weathers to produce a 5- to 15-foot thick layer of native soil (residuum) which is typically a brownish silty clay. The soil/rock interface can be highly irregular due to soil-filled slots extending deep into the rock mass and rock pinnacles protruding into the soil overburden layer.

The portion of the site where Boring B-113 was performed is underlain by the Leipers and Catheys Formations, mapped as a single unit. These formations are typically a knotty, fine- to coarse-grained, thin- to medium-bedded, medium gray argillaceous limestone with calcareous and phosphate zones. Interbedded layers of shale are common. This unit weathers to produce a thin soil layer (i.e. 5 to 7 feet) which is typically a brown silty clay.

Since the bedrock underlying the site consists of carbonate rock (i.e., limestone/dolomite), the site is susceptible to the typical carbonate hazards of irregular weathering, cave and cavern conditions, and overburden sinkholes. Carbonate rock, while appearing very hard and resistant, is soluble in slightly acidic water. This characteristic, plus differential weathering of the bedrock mass, is responsible for the hazards. Of these hazards, the occurrence of sinkholes is potentially the most damaging to overlying soil-supported structures.

In Middle Tennessee, sinkholes occur primarily due to differential weathering of the bedrock and flushing or raveling of overburden soils into cavities in the bedrock. The loss of solids creates a cavity or dome in the overburden. Growth of the dome over time or excavation over the dome can create a condition in which rapid, local subsidence or collapse of the roof of the dome occurs.

A certain degree of risk with respect to sinkhole formation and subsidence must be accepted at any site located within this geologic setting. While a rigorous effort to assess the potential for sinkhole development at this site was beyond our scope of services, we did not observe surficial signs of sinkhole activity in the immediate vicinity of the borings at the site. If desired, S&ME can perform additional exploration and assessment to better identify the risk associated with the karst geology.

S&ME also reviewed the U.S. Department of Agriculture Web Soil Survey for information about the site. Based on this review, Dellrose deposits are common at portions of the site, especially at areas east of the Road of the Round Table. Dellrose deposits are colluvial material, generally consisting of a gravelly silt loam. Colluvial soil (colluvium) deposits are soils that have been transported by gravity. These deposits can be the result of long term movement of soil down a slope, or by more sudden movement as is the case with landslides. Many of the landslides within Williamson-Davidson Counties of Middle Tennessee are associated with Dellrose deposits. See Section 3.2.4 of this report for more information related to colluvium.

3.2 Subsurface Conditions

3.2.1 Summary of Subsurface Conditions

The following is a general summary of the subsurface conditions encountered in the test borings.

Table 3-1: Summary of Borings

Boring No.	Station No.	Surface Cover	Material	SPT N-Values (blows per foot)	Refusal Depth (feet)
B-101	440+00 65′ L	1″ Topsoil	Fat Clay to 0.8′: (CH)	N/A	0.8 Rock cored from 0.8 to 20′ Rec: 8-100% RQD: 0-100%
B-102	442+00 63′ L	1″ Topsoil	Lean Clay to 4.8′: (CL)	15 (50/4 near AR)	4.8 Rock cored from 4.8 to 30′ Rec: 67-100% RQD: 52-100%
B-103	443+50 64′ L	1″ Topsoil	Lean Clay to 4′: (CL) Fat Clay to 5.8′: (CH)	19-24	5.8 Rock cored from 5 to 35′ Rec: 19-100% RQD: 11-96%
B-104	456+00 62′ L	1″ Topsoil	Fat Clay to 1′: (CH)	N/A	1.0 Rock cored from 1 to 20′ Rec: 40-98% RQD: 33-88%

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Boring No.	Station No.	Surface Cover	Material	SPT N-Values (blows per foot)	Refusal Depth (feet)
B-105	457+50 100′ L	1″ Topsoil	Lean Clay to 7′: (CL) Fat Clay to 17.2′: (CH)	11-17	17.2 Rock cored from 17.2 to 29.6′ Rec: 92-100% RQD: 79-90%
B-106	460+32 65′ L	1″ Topsoil	Lean Clay to 1.5′: (CL)	N/A	1.5 Rock cored from 1.5 to 24.5′ Rec: 20-100% RQD: 0-82%
B-107	460+50 95′ L	1″ Topsoil	Lean Clay to 1′: (CL)	N/A	1.0 Rock cored from 1 to 26′ Rec: 41-100% RQD: 26-90%
B-108	460+97 140′ L	1″ Topsoil	Lean Clay to 5′: (CL)	14 (50/2 near AR)	5.0 Rock cored from 5 to 35′ Rec: 44-100% RQD: 30-96%
B-109	461+50 152′ L	1″ Topsoil	Lean Clay to 5′: (CL)	15-31	5.0 Rock cored from 5 to 40′ Rec: 72-100% RQD: 64-85%
B-110	462+15 160′ L	1″ Topsoil	Lean Clay to 4.8′: (CL)	11 (50/3 near AR)	4.8 Rock cored from 4.8 to 34.8′ Rec: 71-100% RQD: 64-96%
B-111	462+80 168′ L	1″ Topsoil	Fat Clay to 2.2′: (CH)	50/2 near AR	2.2 Rock cored from 2.2 to 29.7′ Rec: 76-100% RQD: 38-97%
B-112	463+50 180′ L	-	N/A (limestone at surface)	N/A	0 Rock cored from 0 to 20.2′ Rec: 74-100% RQD: 56-90%

Boring No.	Station No.	Surface Cover	Material	SPT N-Values (blows per foot)	Refusal Depth (feet)
B-113	471+00 63' L	-	N/A (limestone at surface)	N/A	0 Rock cored from 0 to 24' Rec: 35-100% RQD: 16-86%
P2-101	0+00	2" Topsoil	Lean to Fat clay to 25.8': (CL, CH)	19-32 (50/5 near AR)	25.8
P2-102	0+25	1" Topsoil	Lean to Fat clay to 22.2': (CL, CH)	15-26	22.2
P2-103	0+50	2" Topsoil	Lean to Fat Clay to 28.5': (CL, CH)	10-26 (50/2 near AR)	28.5
P2-104	1+00	1" Topsoil	Lean Clay to 10.5': (CL)	21-28 (50/3 near AR)	10.5
P2-105	1+60.86	1" Topsoil	Lean to Fat Clay to 24.7': (CL, CH)	15-26 (50/2 near AR)	24.7

*NOTES: 1) Station numbers for B-101 through B-113 represent McEwen Drive station numbers. Station numbers for P2-101 through P2-105 represent Retaining Wall P2 station numbers. The station numbers should be considered approximate. 2) Topsoil depths ranged from 1 to 2 inches in the borings; please note that due to clearing activities to provide access to boring locations, some of the topsoil was removed; consequently, topsoil depth could vary significantly from our findings and should be expected to be greater within wooded areas due to root matting. 3) AR = auger refusal.

3.2.2 Subsurface Water

Subsurface water was not encountered during drilling in the test borings, except for drilling water. At Borings B-106 and B-113, the water level was 13 and 15 feet, respectively, after coring (attributed to water from coring operations). Post-drilling water levels were obtained by use of a piezometer in Boring P2-103 and are summarized in the table below.

Table 3-2: Piezometer Readings

Date	Groundwater Depth/Elevation (feet/feet msl)
July 13, 2018	28.5 / 870.1*
July 22, 2018	28.5 / 870.1*

*Based on the piezometer measurements, the water level was at the soil/rock interface and are likely due to surface water traveling along the soil to rock interface and collecting in the piezometer and not the true groundwater level.

It should be noted that groundwater levels fluctuate with seasonal and cyclical temperature and precipitation, and may be higher or lower at other times of the year. Also, it is not uncommon for perched water to be encountered within the soil overburden or for water to flow along the soil/rock interface during wetter weather. Depending on

the time of year construction takes place and other environmental conditions, groundwater may be encountered during earthwork and/or excavation activities.

3.2.3 Test Boring Refusal

Auger refusal was encountered in all 18 of the borings. In Borings B-101 through B-104 and B-106 through B-113, auger refusal was encountered at depths of 0 to 5 feet. In Boring B-105, auger refusal was encountered at about 17 feet. Borings were terminated at refusal depths ranging from about 10.5 to 28.5 feet for Borings P2-101 through P2-105. Rock coring was performed to the approximate planned termination depths after auger refusal in Borings B-101 through B-113.

3.2.4 Colluvium

As previously noted, Dellrose deposits are common at portions of the site, especially at areas east of the Road of the Round Table. Dellrose deposits are colluvial material, generally consisting of a gravelly silt loam. These deposits often include soft and/or loose material that is prone to settlement or lateral movement, especially if water moves through the material. Many of the landslides within Williamson-Davidson Counties of Middle Tennessee are associated with Dellrose deposits. Borings B-101 through B-113 for this exploration were NOT located within the mapped Dellrose deposits. However, Borings P2-101 through P2-105 are near the border of the mapped Dellrose deposits. In general, the portions of the McEwen Drive expansion project that will be within Dellrose deposits include approximate Station 477+00 to approximate Station 486+00. The split spoon samples from Borings P2-101 through P2-105 did not appear to be colluvial in nature. However, given the small amount of material sampled relative to the area and the location of these borings on the border of the mapped Dellrose deposits, we recommend that considerations for colluvial deposits be taken for the borderline area that includes Wall P2.

3.2.5 General

The subsurface descriptions above are of a generalized nature to highlight the major subsurface stratification features and material characteristics. The boring logs included in the Appendix should be reviewed for specific information at individual test locations. The depth and thickness of the subsurface strata indicated on the boring logs were generalized from and estimated between boring locations. The transition between materials may be more gradual than indicated on the boring logs. Information on actual subsurface conditions exists only at the specific boring locations and is relevant to the time the exploration was performed. Variations may occur and should be expected between boring locations.

4.0 Conclusions and Recommendations

4.1 General

The conclusions and recommendations presented in this report are based on the preceding project information, and the results of this exploration. Actual subsurface conditions may vary between the boring locations. If it becomes apparent during construction that encountered conditions vary substantially from those presented herein, this office should be notified at once. At that time, the conditions can be evaluated and the

recommendations of this report modified, in written form, if necessary. Also, if the scope of the project should change significantly from that described herein, we should be notified and these recommendations should be re-evaluated.

4.2 Retaining Wall P2 Recommendations

On the basis of this geotechnical exploration, we conclude that this site is adaptable for construction of the planned retaining wall. However, a few items should be addressed during the planning, design, and construction phases of the project.

Wall P2 will be a combination cut/fill wall. The borings generally encountered auger refusal at depths below the planned bottom of wall elevation. Based on the boring results, significant rock excavation is not anticipated for Wall P2. However, it should be noted that a variable top of rock profile may exist, and therefore, some rock excavation may be required.

We understand that Wall P2 will be designed as an MSE wall. Therefore, recommendations for these wall types are provided below. If alternative wall types are selected, we should be notified so that recommendations for applicable wall types can be provided. Typically, MSE walls will be the least expensive, but in areas with shallow rock, concrete cantilever or gravity walls could be less expensive options due to the amount of rock required to be removed to install the reinforcement. It should be noted that constructing these types of walls at the base of a cut can be risky due to slope instability. These wall systems will require the excavation to be benched or sloped to a stable configuration in accordance with OSHA requirements.

Test borings drilled in the Wall P2 area indicate the wall may be supported using shallow spread footings bearing a minimum of two feet below the ground surface at the front face of the wall with some additional foundation area preparation. Deeper embedment may be needed if there is a slope below the wall toe, to resist sliding, and to satisfy design standards. Although computed footing dimensions may be less, we recommend that continuous wall footings be a minimum of 2 feet wide. Auger refusal was encountered at depths of about 10.5 to 28.5 feet below the existing ground surface in all of the Wall P2 borings. Based on the refusal depths in the borings, rock excavation will not generally be required to adequately embed spread footing foundations for Wall P2.

Wall P2 will require the placement of a minimum of 5 feet of graded solid rock (GSR) below the foundation embedment depth and use of a clean graded select aggregate backfill such as ASTM D448, No. 57 to achieve an adequate bearing capacity. The undercut should extend laterally at least five feet beyond the wall edges below sloping before sloping in accordance with the recommendations provided in Section 5.4 of this report. Our engineering analyses discussed in Section 4.4 for Wall P2 are based on undercutting five feet of soil below the reinforced earth zone and wall foundation and replacing the undercut soil with GSR (TDOT Standard Specifications for Road and Bridge Construction, Section 203.02(B), January 2015). Additionally, a select backfill with a lighter unit weight was required to reduce the required undercut depth and achieve an acceptable bearing capacity to demand ratio.

There is the potential, both soil and bedrock may be exposed at the foundation bearing elevation. If this occurs, in an effort to avoid differential settlement and decrease the likelihood of cracking of rigid wall facing, rock exposed in foundation excavations should be removed to depth of at least two feet below bearing elevation and backfilled with soil fill or approved aggregate fill to the foundation bearing elevation.

4.3 Wall Design Parameters

4.3.1 Earth Pressure

The retaining walls should be designed to withstand the lateral earth pressures induced on them. Retaining walls that are free to deflect at the top should be designed using an active lateral earth pressure coefficient, Ka. Ka varies, depending on the angle of internal friction of the retained material and the inclination of the ground surface behind the retaining wall.

The provided roadway cross sections indicate the ground surface behind the walls will be essentially flat (an approximately 2.5% slope for drainage) to potentially up to 3.5H:1V and the wedge of material behind the reinforced zone will be new compacted fill. We have assumed Ka values for new retained fill as presented below in Table 4-1. We have also included Ka values if clean-graded No. 57 aggregate is used as retained fill and Ka values for colluvium.

Passive earth pressure should not be used with MSE walls. Values for the passive lateral earth pressure coefficient, Kp, for foundations bearing in residual soil or colluvial soil are provided in Table 4-2. If there is a likelihood of future excavation at the wall toe, we recommend passive earth pressure not be relied on for sliding resistance.

Table 4-1: Active Earth Pressure Coefficients

Ground Surface Slope Behind Retaining Wall	Active Earth Pressure Coefficient, Ka for No. 57 Stone and DGA	Active Earth Pressure Coefficient, Ka for New Fill Soils	Active Earth Pressure Coefficient, Ka for Colluvial Soils
3.5H:1V	0.31	0.41	0.65
4H:1V	0.31	0.40	0.60
6H:1V	0.29	0.37	0.53
Flat	0.28	0.35	0.49

Table 4-2: Passive Earth Pressure Coefficients

Ground Surface Slope Behind Retaining Wall	Passive Earth Pressure Coefficient, Kp for Residual Soils	Passive Earth Pressure Coefficient, Kp for Colluvial Soils
3.5H:1V	2.42	1.54
4H:1V	2.53	1.66
6H:1V	2.72	1.87
Flat	2.88	2.04

The Ka values presented in Table 4-1 for No. 57 Stone and DGA (dense graded aggregate) apply only when the following backfill requirements are incorporated into the design and construction. Backfill retaining walls with

uniformly-sized, free-draining crushed stone such as ASTM D 448 size No. 57, 67, or 78 or dense graded aggregate. Place the stone backfill from the base of the wall to two feet below final grades and extend back from the wall at least one-half the height of the wall as measured at the top of the wall. The stone should be placed in lifts not exceeding 8 inches and densified. Do not operate heavy compaction equipment near the wall. Brace unsupported walls during backfilling operations to prevent damage to the wall. Design and install a water collection system at the base of the wall to mitigate the buildup of hydrostatic pressures. A cap of compacted clay should be placed over the stone backfill to limit migration of surface water into the backfill.

Surcharge loads or any loads that will be placed near the top of the wall should also be considered. Surcharge loads can include, but are not limited to, vehicle traffic, equipment loads, etc. The Tennessee Department of Transportation typically uses a vehicular traffic load of 250 pounds per square foot (psf). Apply appropriate factors of safety to these loads before designing the wall structure.

4.3.2 Friction Factor

Friction factors used to calculate sliding resistance between the wall foundations and bearing material are provided In Table 4-3. Note that the values provided in Table 4-3 apply only to concrete poured on these materials, and not formed concrete (such as pre-cast MSE wall facing) bearing on the interface material.

Table 4-3: Friction Factors

Interface Material	Friction Factor
Aggregate base or concrete on approved soil	0.35
Aggregate base on competent rock	0.50
Concrete on graded solid rock or clean shot rock	0.60
Concrete on clean, sound bedrock	0.70

4.3.3 Shear Strength Parameters

Shear strength parameters that will be needed to perform global wall stability analyses are presented below in Table 4-4. The shear strength parameters are based on laboratory testing, published data, and our experience in the area.

Table 4-4: Material Shear Strength Parameters

Material Type	Unit Weight γ (pcf)	Total Stress Cohesion C (psf)	Total Stress Friction Angle ϕ (degrees)	Effective Stress Cohesion C′ (psf)	Effective Stress Friction Angle ϕ′ (degrees)
Residual Soil	125	1,000	0	100	29
Colluvial Soil	125	0 (1,000)*	20 (0)*	0	20
New Fill	120	1,000	0	30	0
ASTM D 448 No. 57 Stone	100	---	---	0	34
Dense Graded Aggregate	135	---	---	0	34
Shot Rock Fill (clean)	135	---	---	0	35
Graded Solid Rock	110	---	---	0	35
Bedrock	140	50,000	50	50,000	50

*For the wall global stability analysis we used an average undrained shear strength of 1,000 psf for the colluvium.

4.4 Engineering Analyses of Retaining Wall P2

Conceptual sliding, global stability and settlement analyses of the proposed retaining wall were performed. A cross section at approximately Wall P2 Station 1+10 was chosen for our external stability analyses. This appeared to be the highest wall section at approximately 21 feet. The proposed slopes behind and in front of the wall at this section were basically flat. The length of reinforced earth zone used in our analyses was approximately 85 percent of the wall height. The wall was embedded two feet below the ground surface in front of the wall. Note that the estimated reinforcement length in our conceptual analysis may not provide adequate resistance for other wall sections. The wall bears on a new pad of GSR at least 5 feet thick. The GSR pad extended laterally at least 5 feet beyond the MSE wall edges. A discussion of the analyses methods and results are presented in the following paragraphs.

4.4.1 Bearing Capacity

We performed an evaluation of the bearing capacity of the soils supporting Wall P2. The analyses were performed using LRFD criteria assuming an MSE wall will be the selected wall system. The results of the analysis indicated undercutting the in situ soils was required and supporting the wall on a pad of GSR at least 5 feet thick was required to achieve adequate bearing capacity. With the wall section supported on a 5-foot thick pad of GSR we calculated a nominal bearing capacity of 6,500 psf and a Capacity to Demand Ratio (CDR) of 1.04.

4.4.2 *Sliding – Wall P2*

We performed a sliding stability analysis for Wall P2 using LRFD criteria assuming an MSE wall will be constructed. The results of the analysis indicate a CDR of 1.5, or the factored driving forces are less than the factored resisting forces for the wall bearing on GSR.

4.4.3 *Global Stability – Wall P2*

A cross section at Wall P2 Station 1+10 was chosen for global stability analysis of the wall based on the wall height and/or the slope height above the wall (what we believe to be the likely least favorable wall geometry). The material properties used in the analysis are based on the values provided in Table 4-4.

The soil profile was based on the boring data in the Wall P2 area. Groundwater was modeled a few feet above the soil/rock interface (about 5 to 6 feet above the soil/rock interface in the vicinity of the wall). The MSE wall modeled with infinite strength in the global stability analysis (that is failure surfaces were required to extend beneath the wall. The slope stability analyses were modeled with an estimated traffic load of 250 psf in the cul-de-sac.

The stability of the selected cross sections was assessed using a two-dimensional modeling technique which simplifies the failure or "slip" surfaces by dividing the slope into vertical "slices" and fitting line segments or arcs of various radii and centers, or plain slip surfaces, to the slope. Various surfaces are then checked to determine the slope surface with the smallest ratio of resisting forces to driving forces. The summation of the resisting forces divided by the summation of the driving forces acting on the slices is the factor of safety for the slope section analyzed. For this study, the Spencer Method of Slices was used.

The computer program SLIDE v2018 8.015 was used to perform the analyses. A summary of the safety factors from the analyses is presented in the following table.

Table 4-5: Global Stability Results

Wall Station Number	Approximate Depth of Retained Soil (feet)	Wall Embedment Depth (feet)	Wall Foundation Bearing Condition	MSE Wall Reinforced Fill	Estimated Factor of Safety	
					Undrained	**Effective Stress**
1+10	21	2	Bear on new pad of GSR at least 5 feet thick	Clean Graded No. 57 Aggregate	1.8	1.3

A safety factor of 1.3 or greater is required by TDOT, AASHTO and FHWA. The sample results of our global wall slope stability analyses are included in Appendix III.

4.4.4 Settlement

Given the wall will bear on a pad of GSR overlying a relatively thin interval of in situ soil, we anticipate that settlement of the retaining wall will be within tolerable limits (settlement magnitudes up to about an inch

4.5 Engineering Analyses of Soil/Rock Cuts

4.5.1 Slope Stability

Two cross sections at Stations 457+50 and 461+00 were chosen for slope stability analysis at proposed rock cuts in the vicinity of the additional borings. The rock cut and soil depth/slope at these locations are what we estimate to be the least favorable rock cut conditions. The material properties used in the analysis are based on the values provided in Table 4-4. Groundwater was modeled 2 to 3 feet above the soil/rock interface.

The stability of the selected cross sections was assessed using a two-dimensional modeling technique and computer program discussed in Section 4.4. A summary of the safety factors from the analyses is presented in the following table.

Table 4-6: Slope Stability Results

McEwen Drive Extension Station Number	Estimated Factor of Safety
	Effective Stress
457+50	1.6
461+00	1.8

A safety factor of 1.3 or greater is required by TDOT, AASHTO and FHWA. The sample results of our slope stability analyses are included in Appendix III.

5.0 Construction Considerations

5.1 Site Preparation

5.1.1 General

Initially, asphalt, gravel, vegetation, and topsoil should be stripped from the wall foundation construction areas (including the reinforced zone if MSE walls are constructed) and disposed of off-site. Stripping in wall construction areas should include the complete removal of tree root balls, and should extend a minimum of 5 feet beyond the construction area. The depth of the topsoil encountered in the borings ranged from about 1 to 2 inches. However, the topsoil interval may be greater in unexplored areas.

After clearing, stripping, and grubbing is complete, cut areas should be excavated to grade. The stability of the exposed subgrade soils should be assessed by a member of our engineering staff after excavation in cut areas and prior to placement of new fill in fill areas. This assessment can include, but not be limited to observing a proofroll consisting of repeated passes of a loaded tandem-axle dump truck or similar piece of heavy, pneumatic-tired equipment through the subject area along with random probing with a small diameter steel rod. Any areas noted to pump, rut, or deflect excessively under the applied loading should generally be undercut to suitable soils and replaced with properly compacted structural fill. If necessary, our personnel can provide recommendations for remedial actions at the time of the evaluation.

5.1.2 Excavation

As previously noted, auger refusal was encountered in all 18 of the borings. Rock cuts are anticipated in the areas of Borings B-101 through B-113. It is noted that in Borings B-101 through B-104 and B-106 through B-113, auger refusal was encountered at depths of 0 to 5 feet. In Boring B-105, auger refusal was encountered at about 17 feet. The Retaining Wall P2 borings encountered refusal at depths ranging from about 10.5 to 28.5 feet. Although some rock excavation may be required in this area, significant rock excavation is not anticipated, based on the results of our borings.

In confined excavations such as foundations, removal of weathered rock typically requires the use of hoe rams or blasting. The difficulty of excavation will depend on the composition of the rock, the location and orientation of discontinuities and bedding, and the skill of the equipment operator. Mass rock removal will require blasting. If blasting will take place close to existing buildings, the Tennessee Blasting Regulations should be consulted for guidance. A pre-blast survey of the existing structures should be conducted and the blasts monitored to determine maximum particle velocities. Excavation for temporary or permanent conditions should comply with Occupational Safety and Health Administration (OSHA) requirements. Safety is solely the responsibility of the contractor.

5.2 Fill Placement and Compaction

5.2.1 Soil Fill

Fill operations should not begin until representative samples of proposed fill soils are collected and tested. We recommend allowing 3 to 5 days to complete sampling and testing in advance of fill placement activities. The test results will be used to evaluate whether the proposed fill soils meet appropriate specifications and for quality control during grading.

We recommend structural soil fill be defined as inorganic, natural soil with maximum particle sizes of 4 inches, maximum gravel content of 20 percent, and plasticity index (PI) of 30 and less. Structural soil fill should be placed in loose, horizontal lifts not exceeding 8 inches in thickness. Each lift should be compacted to at least 95 percent of the maximum dry density (MDD) as determined by the standard Proctor method (ASTM D 698). The upper one foot below final soil subgrade should be compacted to a minimum of 98 percent of the maximum dry density. Further, we recommend the materials have a minimum MDD of 95 pcf as determined by the standard Proctor method. The moisture content should be controlled to within 3 percentage points of optimum moisture content. Wetting or drying of the soils may be required, depending on the time of year site grading is performed. In

confined areas such as foundation excavations, portable compaction equipment and thin lifts of 3 to 4 inches may be required to achieve specified degrees of compaction.

The edge of the compacted fill should extend at least 5 feet beyond the outside edge of wall construction areas before sloping. In addition to meeting the compaction requirement, fill material should be stable under movement of the construction equipment and should not exhibit rutting or pumping.

The fill should be uniformly well compacted. Accordingly, fill placement should be observed by a qualified field technician working under the direction of our geotechnical engineer. In addition to this visual evaluation, the technician should perform in-place field density tests to confirm whether the contractor's means and methods are capable of achieving the recommended compaction. Any areas that do not meet the compaction specification should be re-compacted to achieve compliance.

5.2.2 Shot Rock Fill

Shot rock is a widely used and locally available material in the Middle Tennessee area. Shot-rock fill is often used due to the fact that it can be placed in inclement weather and it does not degrade and rut under construction traffic.

Material considered suitable for use as shot-rock fill should include rock fragments that are smaller than 18 inches in any one dimension or two-thirds the lift thickness, whichever is smaller. The rock fill should contain no more than 20 percent of soil particles or fines by volume, which equates to enough fines to "choke" the shot rock, but not prevent point to point contact.

During placement, the rock pieces should lie flat and not overlap each other. Lift thickness should not exceed 36 inches, loose. The fill lifts should be placed and compacted by making multiple, perpendicular passes with a D-8 size or larger bulldozer and a smooth-drum roller. Smaller sized dozers will not provide the compactive effort required for the stiffness needed. The number of passes should be sufficient to demonstrate the material is densified and stable. S&ME personnel should observe the shot-rock fill placement to document the fill constituents, lift thickness, and compaction efforts and the performance of the material under load.

Please note that foundations excavated into shot-rock fill tend to be larger than similar excavations into clay soil. Greater quantities of concrete may be necessary to backfill these excavations into shot-rock fill, unless they are formed.

5.3 Drainage and Runoff Concerns

In Middle Tennessee, frequent and sometimes substantial rainfalls occur from November through May. These rainy months can greatly influence the cost and schedule of construction projects, particularly earthwork and work in confined excavations. The soils present at the site will be difficult to work in periods of wet weather. Construction traffic repeatedly crossing exposed wet soil subgrades can damage the subgrades to the point that over-excavation may be required.

The contractor should be prepared to provide adequate methods to control the infiltration of surface water into open excavations. We recommend subgrades be sufficiently sloped to provide rapid drainage. Water that collects in excavations should be removed as soon as possible to prevent softening the subgrade soils.

Maintenance of the exposed subgrade surface will be important to achieve moisture control and to prevent softening of the surface soils due to rainwater infiltration. We recommend keeping the ground surface free from depressions or ruts that would hold water, and sealing the surface using rubber tired equipment to reduce water infiltration.

5.4 Temporary Slopes

Temporary construction slopes less than 20 feet in height should be excavated at a maximum 1.5H:1V inclination when working with softer soils. Steeper inclinations can be used with approved soil materials or rock – see OSHA regulations for more information on temporary slopes. A geotechnical engineer should be on-site to observe cut slopes at the time of excavation. If downslope dipping, springs, seeps, or slickensided zones are observed, flattening of the slope will be required.

Temporary slopes should not be left open any longer than necessary to construct the wall, or the excavation should be braced. The contractor should be responsible for excavating slopes in accordance with OSHA requirements. Temporary slopes should be inspected frequently for signs of instability. If the slope is or becomes unstable, temporary shoring will be required. Excavated or construction material should not be placed within 15 feet of the crest of temporary slopes. Also, surface runoff should be diverted away from the slope crest to reduce the likelihood of sloughing.

6.0 Follow-Up Services

Our services should not end with the submission of this geotechnical report. S&ME should be kept involved throughout the design and construction process to maintain continuity and to determine if our recommendations are properly interpreted and implemented. To achieve this, we should be retained to review project plans and specifications with the designers to see that our recommendations are fully incorporated and have not been misinterpreted. We also should be retained by the owner to monitor and test the site preparation and foundation construction.

S&ME's familiarity with the site and foundation recommendations makes us a valuable part of your construction quality assurance team. S&ME recommends that we be retained by the owner on a full time basis to observe earthwork and retaining wall construction. Our personnel are uniquely qualified to recognize unanticipated ground conditions and can offer responsive remedial recommendations should these unanticipated conditions occur.

7.0 Limitations

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions and recommendations contained in this report are based upon applicable standards of our practice in this geographic area at the time this report was prepared. No other representation or warranty either expressed or implied, is made.

We relied on project information given to us to develop our conclusions and recommendations. If project information described in this report is not accurate, or if it changes during project development, we should be notified of the changes so that we can modify our recommendations based on this additional information, if necessary.

Our conclusions and recommendations are based on limited data from a field exploration program. Subsurface conditions can vary widely between explored areas. Some variations may not become evident until construction. If conditions are encountered which appear different than those described in our report, we should be notified. This report should not be construed to represent subsurface conditions for the entire site.

Unless specifically noted otherwise, our field exploration program did not include an assessment of regulatory compliance, environmental conditions or pollutants or presence of any biological materials (mold, fungi, and bacteria). If there is a concern about these items, other studies should be performed. S&ME can provide a proposal and perform these services if requested. S&ME should be provided the opportunity to review the final plans and specifications to confirm that earthwork, foundation, and other recommendations are properly interpreted and implemented. The recommendations in this report are contingent on S&ME's review of final plans and specifications followed by observation and monitoring of earthwork and foundation construction activities.

The recommendations in this report are only applicable to areas within the vicinity of our exploration and should not be used for other areas or for structures not specifically addressed in this report.

DRAFT

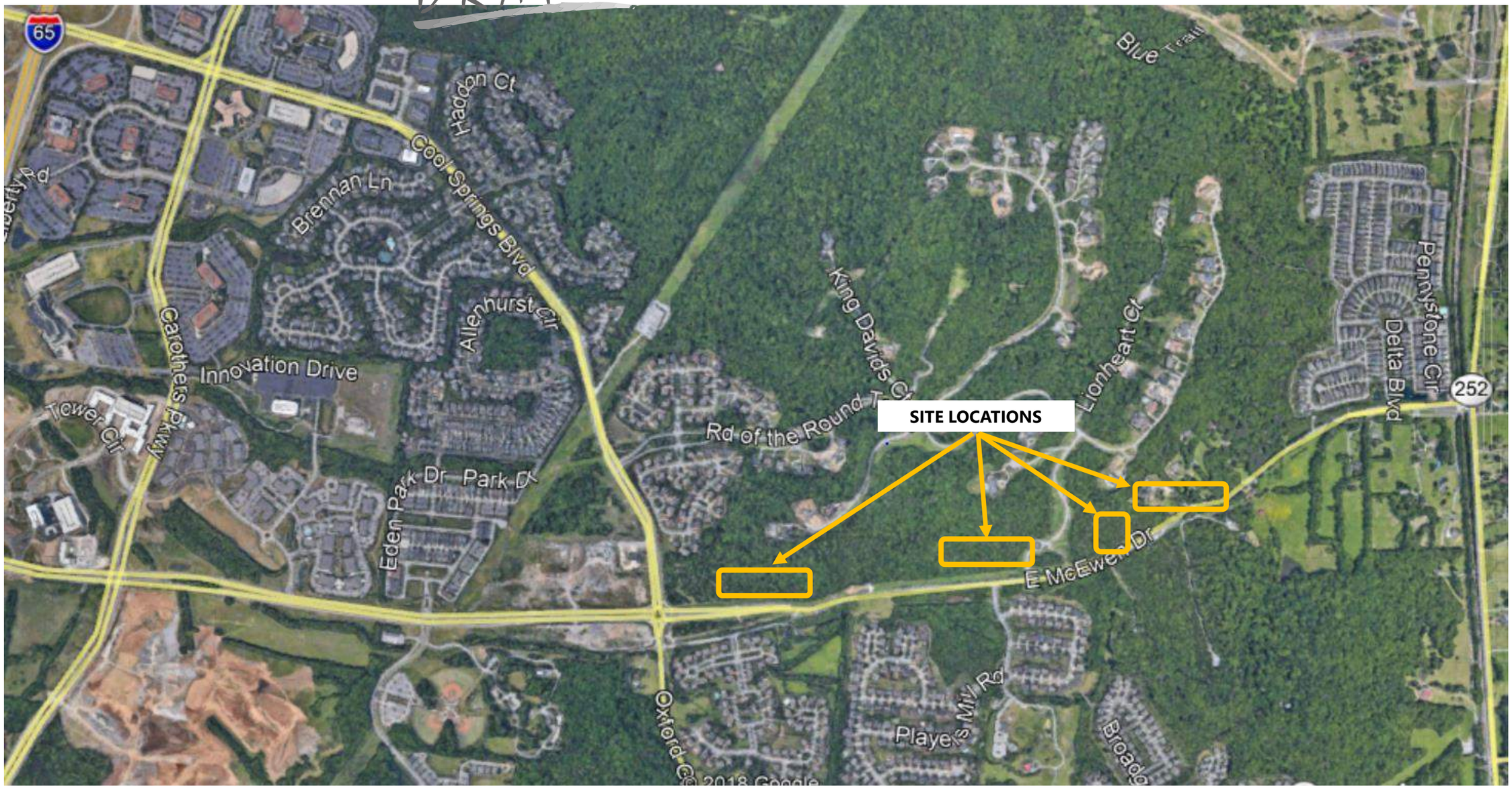
Appendices

DRAFT

Appendix I – Figures

DRAFT

REFERENCE:
GOOGLE EARTH PRO AERIAL PHOTOGRAPH



ATTACHMENT F - ADDENDUM 1

DRAWING / PLAN FOR ILLUSTRATION PURPOSES ONLY

SITE LOCATION PLAN

MCEWEN DRIVE EXTENSION PHASE 4
FRANKLIN, TENNESSEE

SCALE:
AS SHOWN

DATE:
7/24/2018

PROJECT NUMBER
1247-15-066B

FIGURE NO.
1

DRAFT

REFERENCE:
GOOGLE EARTH PRO AERIAL PHOTOGRAPH

LEGEND

2018 S&ME Soil Test Borings (B-XX)

ATTACHMENT F - ADDENDUM 1

DRAWING / PLAN FOR ILLUSTRATION PURPOSES ONLY

BORING LOCATION PLAN

MCEWEN DRIVE EXTENSION PHASE 4
FRANKLIN, TENNESSEE

SCALE:
AS SHOWN

DATE:
7/24/2018

PROJECT NUMBER
1247-15-066B

FIGURE NO.
2

DRAFT

REFERENCE:
GOOGLE EARTH PRO AERIAL PHOTOGRAPH

LEGEND

2018 S&ME Soil Test Borings (B-XX)

ATTACHMENT F - ADDENDUM 1

DRAWING / PLAN FOR ILLUSTRATION PURPOSES ONLY

BORING LOCATION PLAN

MCEWEN DRIVE EXTENSION PHASE 4
FRANKLIN, TENNESSEE

SCALE:
AS SHOWN

DATE:
7/24/2018

PROJECT NUMBER
1247-15-066B

FIGURE NO.
2A

DRAFT

REFERENCE:
GOOGLE EARTH PRO AERIAL PHOTOGRAPH

LEGEND

2018 S&ME Soil Test Borings (B-XX)

ATTACHMENT F - ADDENDUM 1

DRAWING / PLAN FOR ILLUSTRATION PURPOSES ONLY

BORING LOCATION PLAN

MCEWEN DRIVE EXTENSION PHASE 4
FRANKLIN, TENNESSEE

SCALE:
AS SHOWN

DATE:
7/24/2018

PROJECT NUMBER
1247-15-066B

FIGURE NO.
2B

DRAFT

REFERENCE:
GOOGLE EARTH PRO AERIAL PHOTOGRAPH

LEGEND

2018 S&ME Soil Test Borings (B-XX)

ATTACHMENT F - ADDENDUM 1

DRAWING / PLAN FOR ILLUSTRATION PURPOSES ONLY

BORING LOCATION PLAN

MCEWEN DRIVE EXTENSION PHASE 4
FRANKLIN, TENNESSEE

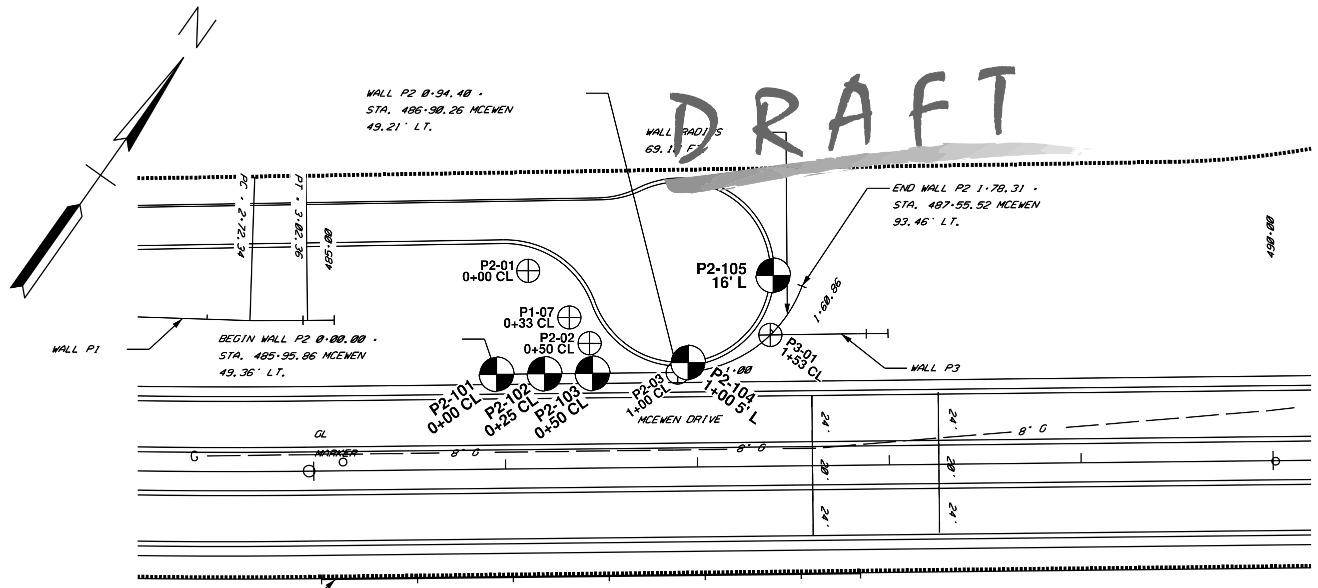
SCALE:
AS SHOWN

DATE:
7/24/2018

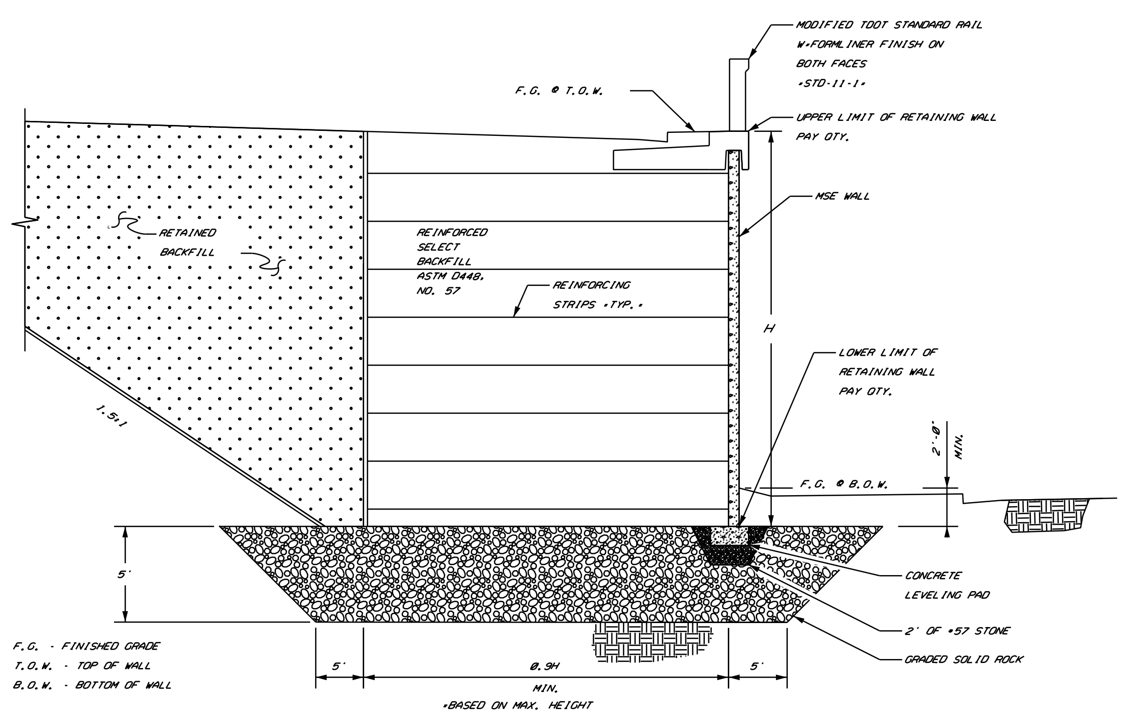
PROJECT NUMBER
1247-15-066B

FIGURE NO.
2C

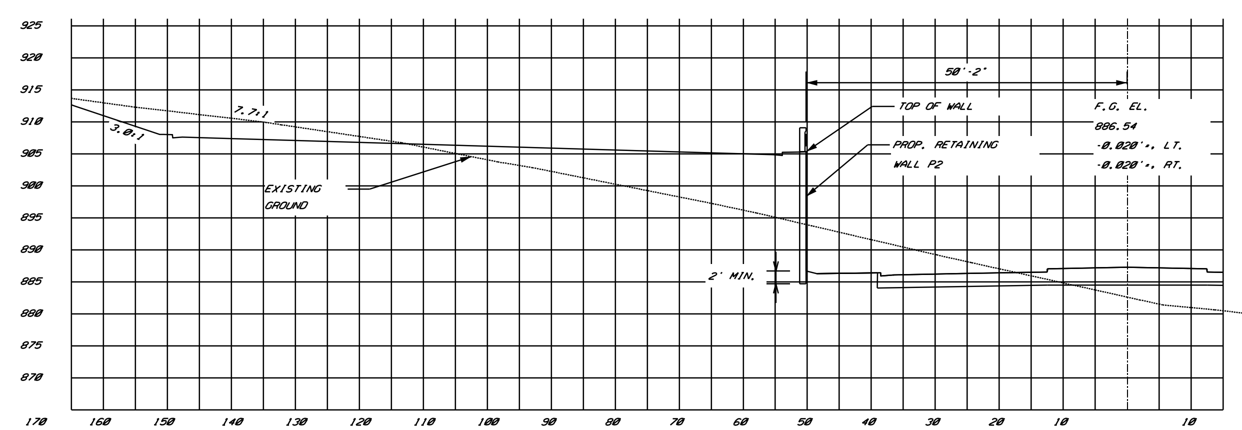
TYPE	YEAR	PROJECT NO.	SHEET NO.
WALLS	17	16015044	18-1820



PLAN VIEW - RETAINING WALL P2



TYPICAL SECTION



TYPICAL SECTION
STA. 487+00.00 MCEWEN =
1+09.80 WALL P2

HISTORIC FRANKLIN TENNESSEE

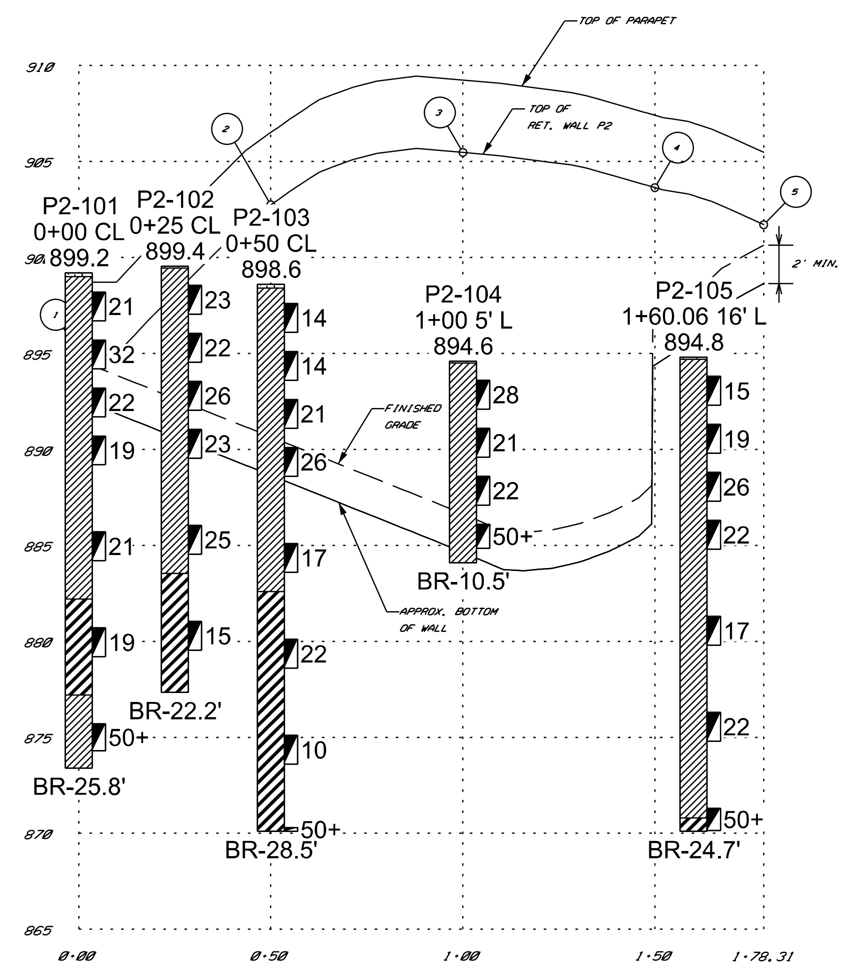
benesch
BENESCH
8 CADILLAC DRIVE
BRENTWOOD, TN 37027

RETAINING WALL P2
CONCEPTUAL DRAWING
MCEWEN DRIVE
FROM: EAST OF
COOL SPRINGS BLVD
TO: WILSON PIKE
WILLIAMSON COUNTY

ATTACHMENT F - ADDENDUM 1

TYPE	YEAR	PROJECT NO.	SHEET NO.
WALLS	17	16015044	18-1820

DRAFT



LEGEND: BORING PROFILE SYMBOLS

BORING I.D. → B-332
STATION & OFFSET FROM CENTERLINE → 2+25 5' R
703.71 ← BOREHOLE ELEVATION (FT MSL)
WATER LEVEL AT TIME OF DRILLING → ∇
DELAYED WATER READING → ▼
4 ← SPT N-VALUE
11 ← SPT SYMBOL
LITHOLOGY GRAPHIC →
66/100 ← RQD/REC
TERMINATION → BR-9.8'
BR=AUGER REFUSAL

TOPSOIL (TYPE A) CULTIVATED SOIL
FILL (TYPE A)
SILTY CLAY (CL) (TYPE A)
SILTY CLAY (CH) (TYPE A)

SEE GEOTECHNICAL NOTES AND ESTIMATED QUANTITIES SHEET FOR DEFINITION OF TERMS USED FOR EARTHWORK GRADING CALCULATIONS.

ATTACHMENT F - ADDENDUM 1

HISTORIC FRANKLIN TENNESSEE

benesch BENESCH
8 CADILLAC DRIVE
BRENTWOOD, TN 37027

RETAINING WALL P2
CONCEPTUAL DRAWING
MCEWEN DRIVE
FROM: EAST OF
COOL SPRINGS BLVD
TO: WILSON PIKE
WILLIAMSON COUNTY

$$$$SYTIME$$$$$$$
$$$$DGNSPEC$$$

TYPE	YEAR	PROJECT NO.	SHEET NO.

ACCEPTABLE WALL TYPES

MECHANICALLY STABILIZED EARTH (MSE) WALL - SEGMENTAL PRECAST
MECHANICALLY STABILIZED EARTH (MSE) WALL - MODULAR BLOCK

DRAFT

THE RETAINING WALL(S) SHALL BE ONE OF THE WALL TYPE(S) AS LISTED ABOVE OR ON FORTHCOMING "RETAINING WALL DETAIL-GEOMETRIC LAYOUT" SHEET(S). ANY PROPRIETARY RETAINING WALL SYSTEM SHALL BE LISTED AS PRE-APPROVED IN QPL 38.

RETAINING WALL DESIGN NOTES

UNLESS SPECIFICALLY STATED OTHERWISE IN THE CONTRACT PLANS, THE BIDDING FOR, THE DESIGN OF AND THE CONSTRUCTION OF RETAINING WALLS SHOWN IN THE PLANS SHALL BE GOVERNED BY THE TENNESSEE DEPARTMENT OF TRANSPORTATION SPECIAL PROVISION 624 REGARDING RETAINING WALLS. THIS SPECIAL PROVISION SHALL BE CONSIDERED AS ONE OF THOSE DOCUMENTS WHICH THE BIDDER/CONTRACTOR HAS EXAMINED AND MADE HIMSELF FAMILIAR WITH AS DESCRIBED IN SECTION 102.04 - EXAMINATION OF THE SITE, THE WORK, THE PLANS, AND THE SPECIFICATIONS IN THE TDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

EXCAVATION FOR THE WALL AND/OR ITS FOOTING SHALL NOT BE ACCOMPLISHED UNTIL THE CONTRACTOR HAS SUBMITTED WALL DESIGNS AND CALCULATIONS AND HAS BEEN ISSUED AN APPROVED SET OF WALL PLANS AND HAS LABOR AND MATERIAL RESOURCES AVAILABLE TO BEGIN AND CONTINUE WALL CONSTRUCTION IMMEDIATELY AFTER EXCAVATION.

THIS WALL SHALL BE DESIGNED IN ACCORDANCE WITH LRFD DESIGN PROCEDURES AND REQUIREMENTS AS DESCRIBED IN:

- AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 2017
- PUBLICATION FHWA-NHI-10-024/FHWA GEC 011, DESIGN AND CONSTRUCTION OF MECHANICALLY STABILIZED EARTH WALLS AND REINFORCED SOIL SLOPES, NOVEMBER 2009 FOR MSE WALLS

FOR PROPRIETARY WALL SYSTEMS THAT HAVE BEEN APPROVED AS SHOWN IN QPL 38, THE WALL DESIGNER SHALL BE RESPONSIBLE FOR PROVIDING WALL DESIGNS INCORPORATING MATERIALS AND COMPONENTS (I.E. REINFORCEMENT CONNECTION DEVICES, SPECIFIC MANUFACTURER AND PROPERTIES OF GEOGRID) AS WAS ORIGINALLY SUBMITTED AND APPROVED BY TDOT. IF A MATERIAL AND/OR COMPONENT OF THE WALL SYSTEM HAVE BEEN MODIFIED FROM THE ORIGINALLY APPROVED SYSTEM, A WALL DESIGN AND SET OF PLANS AND CALCULATIONS FOR THIS WALL SYSTEM CANNOT BE SUBMITTED FOR REVIEW AND APPROVAL UNTIL THE WALL SYSTEM DESIGNER WHO ORIGINALLY SUBMITTED THE WALL SYSTEM FOR APPROVAL BY TDOT SUBMITS A REQUEST FOR RE-APPROVAL UTILIZING THE MODIFIED ELEMENTS OF THE WALL. THIS SUBMITTAL DOES NOT GUARANTEE APPROVAL OF THE MODIFIED SYSTEM. IF THIS RE-APPROVAL PROCESS DOES NOT MEET THE CONTRACTOR'S SCHEDULE OR IF THE MODIFIED SYSTEM IS NOT APPROVED, THE CONTRACTOR/WALL DESIGNER SHALL PROVIDE A WALL DESIGN FOR ONE OF THE APPROVED SYSTEMS AT NO CHANGE IN CONTRACT PRICE FOR THE RETAINING WALL AND NO CHANGE IN PROJECT SCHEDULE REQUIREMENTS WILL BE ALLOWED.

THE WALL DESIGNER SHALL PROVIDE RETAINING WALL PLANS, DETAILS AND CALCULATIONS AS REQUIRED BY SPECIAL PROVISION 624 AND AS REQUIRED HEREIN.

- THE WALL DESIGNER SHALL UTILIZE THE GEOTECHNICAL PARAMETERS AND RESISTANCE FACTORS AS PROVIDED FOR EACH PROJECT RETAINING WALL ON THE "RETAINING WALL DETAIL" SHEET(S) TO PREPARE AND SUBMIT DESIGN CALCULATIONS. LOAD FACTORS AND OTHER PERTINENT DESIGN REQUIREMENTS PROVIDED IN AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 2017 AND INTERIMS SHALL BE USED FOR NON-MSE WALLS AND PUBLICATION FHWA-NHI-10-024/FHWA GEC 011, DESIGN AND CONSTRUCTION OF MECHANICALLY STABILIZED EARTH WALLS AND REINFORCED SOIL SLOPES, NOVEMBER 2009 FOR MSE WALLS.

- CALCULATIONS FOR BOTH INTERNAL AND EXTERNAL STABILITY (SLIDING, ECCENTRICITY, AND BEARING CAPACITY-GLOBAL STABILITY AND SETTLEMENT BEING THE EXCEPTIONS) SHALL BE PROVIDED FOR EACH CRITICAL WALL SECTION WHICH DEMONSTRATES THE REQUIRED CAPACITY TO DEMAND RATIO OF 1.0 IS MET UTILIZING THE DESIGN PARAMETERS PROVIDED. FOR MSE WALLS, THE WALL DESIGNER MUST ADJUST THE REINFORCEMENT LENGTHS BEYOND THOSE MINIMUM REQUIRED LENGTHS, IF REQUIRED, TO MEET BOTH INTERNAL AND EXTERNAL REQUIREMENTS. THE WALL DESIGNER/CONTRACTOR PLANS MUST INCLUDE ANY FOUNDATION IMPROVEMENTS AS REQUIRED HEREIN ON THE WALL DESIGNER/CONTRACTOR'S WALL ELEVATION VIEWS AND ANY CROSS-SECTIONAL DETAIL DRAWINGS.

- UNLESS OTHERWISE STATED, THE WALL DESIGNER CAN ASSUME THAT MINIMUM GLOBAL STABILITY AND SETTLEMENT CRITERIA IS ACHIEVED WITH A WALL DESIGN MEETING OTHER MINIMUM EXTERNAL STABILITY REQUIREMENTS AND ASSUMING WALL FOUNDATION BEARING IMPROVEMENTS ARE MET. WHILE THE WALL DESIGNER'S DESIGN MUST DEMONSTRATE COMPLIANCE WITH EXTERNAL STABILITY REQUIREMENTS AS DISCUSSED ABOVE, THE WALL DESIGNER PROVIDES CERTIFICATION (BY SIGNING AND STAMPING BY PROFESSIONAL ENGINEER REGISTERED IN STATE OF TENNESSEE) OF THE WALLS, PLANS, AND CALCULATIONS "FOR INTERNAL STABILITY ONLY".

- LOAD COMBINATIONS STRENGTH I, EXTREME EVENT I, AND EXTREME EVENT II SHALL BE EVALUATED AS GIVEN IN AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 2017 AND INTERIMS.
  FOR MSE WALLS, LOAD COMBINATIONS STRENGTH I, EXTREME EVENT I, AND EXTREME EVENT II AS GIVEN IN TABLE 4-1 OF PUBLICATION FHWA-NHI-10-024/FHWA GEC 011, DESIGN AND CONSTRUCTION OF MECHANICALLY STABILIZED EARTH WALLS AND REINFORCED SOIL SLOPES, NOVEMBER 2009 FOR MSE WALLS SHALL BE EVALUATED.

NOTE REGARDING CONSTRUCTION SLOPES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING THE EXCAVATION IN ACCORDANCE WITH OSHA AND OTHER APPLICABLE STATE AND LOCAL REGULATIONS REGARDING CONSTRUCTION SLOPES AND TRENCHES. IN ADDITION TO FOLLOWING APPLICABLE REGULATORY REQUIREMENTS, AS A MINIMUM REQUIREMENT, ALL TEMPORARY CONSTRUCTION SLOPES SHALL BE PLACED AT A MAXIMUM OF A1:1 SLOPE IN SOIL AND SHALL NOT BE LEFT OPEN WITHOUT SHORING FOR ANY LONGER THAN ABSOLUTELY NECESSARY. THE CONTRACTOR BUILDING THE WALL SHALL ENSURE THAT THESE TEMPORARY BACK SLOPES ARE NOT AND DO NOT BECOME UNSTABLE. IF SLOPE IS UNSTABLE, BECOMES UNSTABLE, IS CUT STEEPER THAN A1:1 SLOPE OR IS UNACCEPTABLE FOR ANOTHER REASON, THEN TEMPORARY SHORING SHALL BE USED. ANY UNUSUAL SOIL CONDITIONS OTHER THAN THOSE ASSUMED SHOULD BE REPORTED TO THE PROJECT ENGINEER.

TABLE 1-DESIGN REQUIREMENTS AND PARAMETERS

DESCRIPTION	MSE WALLS	NOTE
DESIGN LIFE	75 YEARS	
SEISMIC ACCELERATION COEFFICIENTS		
A_S	*	
S_{DS}	*	
S_{D1}	*	
EFFECTIVE (DRAINED) FRICTION ANGLE		
RETAINED BACKFILL-UNCLASSIFIED SITE OR BORROW SOIL	30°	
RETAINED BACKFILL-SELECT BACKFILL	34° TO MAX 40°	1
REINFORCED BACKFILL	34° TO MAX 40°	1
UNIT WEIGHT		
UNCLASSIFIED SITE OR BORROW SOIL	120 POUNDS PER CUBIC FOOT	
SELECT BACKFILL MATERIAL	VARIES	1A
DESIGN BASIS		
COEFFICIENT OF SLIDING FRICTION	SEE TABLE 2	3
NOMINAL BEARING RESISTANCE	SEE TABLE 2	3
MINIMUM LENGTH OF SOIL REINFORCEMENT, L	GREATER OF 8-FT OR 0.7H OR AS SPECIFIED ON THE PLANS	2,2A,2B
LIMITING ECCENTRICITY	L/4 (SOIL), 3L/8 (ROCK)	
RESISTANCE FACTORS		
SLIDING-STATIC	1.0	4
SLIDING-COMBINED STATIC+EARTHQUAKE	1.0	4
BEARING-STATIC	0.65	5
BEARING-COMBINED STATIC+EARTHQUAKE	0.9	5
PULLOUT RESISTANCE		
STATIC	0.90	6
COMBINED STATIC/EARTHQUAKE	1.20	6
TENSILE RESISTANCE OF METALLIC REINFORCEMENTS AND CONNECTORS		
STATIC -STRIP REINFORCEMENT -GRID REINFORCEMENT	 0.75 0.65	 7 7,8
COMBINED STATIC/EARTHQUAKE -STRIP REINFORCEMENT -GRID REINFORCEMENT	 1.00 0.85	 7 7,8
TENSILE RESISTANCE OF GEOSYNTHETIC REINFORCEMENTS AND CONNECTORS		
STATIC	0.90	
COMBINED STATIC/EARTHQUAKE	1.20	

NOTES FOR TABLE 1

NO.	NOTE
1	A MAXIMUM FRICTION ANGLE OF 34 DEGREES CAN BE ASSUMED FOR MATERIAL MEETING SPECIFICATIONS IN SECTION F, PART 1. MATERIALS OF TENNESSEE DEPARTMENT OF TRANSPORTATION SPECIAL PROVISION 624 REGARDING RETAINING WALLS. A HIGHER FRICTION ANGLE THAN 34 DEGREES CAN BE UTILIZED IF THE CONTRACTOR SUBMITS INDEPENDENT TESTING AND IT IS VERIFIED BY TDOT. HOWEVER, IN NO CASE SHALL THE FRICTION ANGLE FOR ANALYSIS EXCEED 40-DEGREES. INDEPENDENT TESTING MUST BE VERIFIED ANNUALLY.
1A	SELECT BACKFILL UNIT WEIGHT TO BE DETERMINED BY CONTRACTOR/DESIGNER DEPENDING ON ACTUAL BACKFILL MATERIAL USED. SELECT BACKFILL IS DEFINED AS MATERIAL MEETING SPECIFICATIONS IN SECTION F, PART 1. MATERIALS OF TENNESSEE DEPARTMENT OF TRANSPORTATION SPECIAL PROVISION 624 REGARDING RETAINING WALLS. IN ORDER TO UTILIZE Φ FOR SELECT BACKFILL DESIGN, SELECT BACKFILL MUST BE PLACED FOR A MINIMUM ZONE FORMED BY A 1:1 SLOPE FROM 2 FEET BEHIND THE BOTTOM OF BACK OF WALL FOOTING OR REINFORCED SOIL ZONE FOR MSE WALLS UP TO FINISHED GRADE.
2	H IS DESIGN HEIGHT OF THE WALL AND IS DEFINED AS THE DIFFERENCE IN ELEVATION BETWEEN THE FINISHED GRADE AT THE TOP OF THE WALL AND THE TOP OF LEVELING PAD OR BOTTOM OF FOOTING FOR NON-MSE WALLS. THE TOP OF THE LEVELING PAD SHALL ALWAYS BE BELOW THE MINIMUM EMBEDMENT REFERENCE LINE AS INDICATED ON THE PLANS FOR THAT LOCATION. THE LENGTH OF THE SOIL REINFORCEMENT, L, IS MEASURED FROM THE BACKFACE OF THE WALL FACING UNIT. IN CASE OF GRID TYPE REINFORCEMENTS THE LENGTH OF THE SOIL REINFORCEMENT IS MEASURED FROM THE BACKFACE OF THE WALL FACING UNIT TO THE LAST FULL TRANSVERSE MEMBER. FOR MODULAR BLOCKFACING UNITS, THE TOTAL LENGTH OF THE REINFORCEMENT, B_r AS MEASURED FROM THE FRONT FACE OF THE WALL IS THE LENGTH L AS DEFINED ABOVE PLUS THE WIDTH OF THE MODULAR BLOCK UNIT (THE HORIZONTAL DIMENSION OF THE BLOCK UNIT MEASURED PERPENDICULAR TO THE WALL FACE).
2A	WALL DESIGNER MUST ADJUST THE REINFORCEMENT LENGTHS BEYOND THOSE MINIMUM REQUIRED LENGTHS, IF REQUIRED, TO MEET BOTH INTERNAL AND EXTERNAL STABILITY REQUIREMENTS. MINIMUM REINFORCEMENT LENGTHS MAY BE REQUIRED FOR GLOBAL STABILITY. THIS REQUIREMENT WILL BE SHOWN IN THE PLANS.
2B	ALL DESIGN SECTION REINFORCEMENT LENGTHS SHALL BE EQUAL.
3	THESE VALUES WILL BE PROVIDED IN TABLES 2 AND/OR 3
4	PASSIVE RESISTANCE SHALL NOT BE CONSIDERED IN EVALUATION OF SLIDING RESISTANCE. NO SHEAR KEYS NOR DOWELS WILL BE PERMITTED. FOR CAST-IN-PLACE CONCRETE CANTILEVER WALLS, THE FOOTING SHALL BE UNIFORM IN THICKNESS THROUGHOUT THE DESIGN SECTION.
5	FOR ALL LIMIT STATES, THE DESIGN LOADING FOR THE MSE RETAINING WALL SYSTEM SHALL NOT EXCEED THE FACTORED GENERAL AND LOCAL BEARING RESISTANCE SPECIFIED IN TABLES 2 OR 3.
6	LIVE LOAD DUE TO VEHICULAR TRAFFIC SHALL BE INCLUDED IN THE COMPUTATIONS TO DETERMINE THE MAXIMUM TENSILE FORCES IN REINFORCEMENT LAYERS, BUT SHALL BE NEGLECTED IN THE COMPUTATIONS FOR PULLOUT RESISTANCE.
7	APPLY TO GROSS CROSS-SECTION LESS SACRIFICIAL AREA. FOR SECTIONS WITH HOLES, REDUCE GROSS AREA IN ACCORDANCE WITH ARTICLE 6.8.3 OF AASHTO (2017) AND APPLY TO NET SECTION LESS SACRIFICIAL AREA.
8	APPLIES TO GRID REINFORCEMENTS CONNECTED TO A RIGID FACING ELEMENT, E.G., A CONCRETE PANEL OR BLOCK. FOR GRID REINFORCEMENTS CONNECTED TO A FLEXIBLE FACING MAT OR WHICH ARE CONTINUOUS WITH THE FACING MAT, USE THE RESISTANCE FACTOR FOR STRIP REINFORCEMENTS.

* *

THIS BOX IS TO BE REMOVED AFTER STRUCTURES DIVISION INSERTS SEISMIC VALUES, REVISES THE ACCEPTABLE WALL TYPES TO SATISFY THE FASCIA REQUIREMENTS, AND INSERTS THE DEFLECTION VALUES (IF APPLICABLE).

SEISMIC
WALL DESIGN IS TO INCLUDE EXTREME EVENT I STATE LOADS. THE TDOT STRUCTURES DIVISION WILL PROVIDE GROUND MOTION VALUES (As, SDS, AND SD1) FOR THE SITE.

WALL FASCIA REQUIREMENTS
THE ACCEPTABLE WALL TYPES LISTED ARE FOR GEOTECHNICAL RECOMMENDATIONS ONLY. AESTHETIC REQUIREMENTS MAY NECESSITATE A REEVALUATION OF THE ACCEPTABLE WALL TYPES. FASCIA REQUIREMENTS SHALL BE DETERMINED BY THE TDOT STRUCTURES DIVISION.

DEFLECTION
TDOT STRUCTURES DIVISION SHALL DETERMINE THE ALLOWABLE LATERAL DEFLECTION OF PILE SUPPORTED WALLS, MEASURED AT THE PILE HEAD, AND INSERT THE REQUIREMENT IN THE "OTHER DESIGN REQUIREMENTS" NOTES.

TABLE 2-FOUNDATION PARAMETERS AND REQUIREMENTS FOR MSE WALLS

STATION LIMITS	FOUNDATION (REINFORCED ZONE) BEARING CONDITION REQUIREMENT	NOMINAL BEARING RESISTANCE (psf)	COEFFICIENT OF SLIDING FRICTION
0+00 TO 1+60.86	UNDERCUT 5 FEET BELOW PROPOSED FOOTING ELEVATION AND REPLACE WITH GRADED SOLID ROCK	6,500	0.5 (NO. 57 AGGREGATE ON GRADED SOLID ROCK)

OTHER DESIGN REQUIREMENTS

THE WALL SHALL HAVE A DRAINAGE GUTTER AT THE TOP DESIGNED TO CARRY SURFACE RUNOFF TO EITHER OR BOTH ENDS OF WALLS. DETAILS OF THIS DRAINAGE FEATURE SHALL BE PROVIDED IN WALL DESIGNER/CONTRACTOR'S WALL DESIGN PLANS AND COSTS SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE WALL.

ALL WALL ELEMENTS SHALL BE WITHIN ROW.

ALL CONSTRUCTION MUST STAY WITHIN ROW, SLOPE EASEMENT, AND CONSTRUCTION EASEMENT.

IF A STEEPER THAN 1:1 BACKSLOPE IS REQUIRED BEHIND RETAINING WALL OR TEMPORARY SHORING, THE EFFECTIVE FRICTION ANGLE FOR SELECT BACKFILL WILL NOT BE ALLOWABLE FOR DESIGN AND THE EFFECTIVE FRICTION ANGLE FOR UNCLASSIFIED SITE OR BORROW SITE SHALL BE REQUIRED.

THE CONTACTOR SHALL COORDINATE AND PERFORM ALL UTILITY RELOCATION SO THAT IT DOES NOT INTERFERE WITH THE RETAINING WALL INSTALLATION.

FOR FOUNDATION IMPROVEMENT AND EXCAVATION ZONE DETAILS, SEE TYPICAL SECTION FOR UNDERCUTTING AND BACKFILLING DETAIL ON RETAINING WALL P2 CONCEPTUAL DRAWING MCEWEN DRIVE FROM: EAST OF COOL SPRINGS BLVD TO: WILSON PIKE WILLIAMSON COUNTY.

EXTERNAL BEARING CAPACITY, SLIDING AND GLOBAL STABILITY ANALYSES FOR CONCEPTUAL DESIGN SECTION ASSUMED ASTM D448, NO. 57 AGGREGATE FOR REINFORCED SELECT BACKFILL WITH A UNIT WEIGHT OF 100 PCF.

WHERE A PROPOSED RETAINING WALL MEETS AN EXISTING RETAINING WALL OR ANOTHER STRUCTURE, THE INTERFACE SHOULD BE ONE VERTICAL JOINT. THIS INTERFACE SHOULD BE DESIGNED TO PREVENT LOSS OF FINES AND ALLOW FOR DIFFERENTIAL SETTLEMENT. DETAILS OF THIS JOINT SHALL BE PROVIDED IN WALL DESIGNER/CONTRACTOR'S WALL DESIGN PLANS AND COSTS SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE WALL.

FOR MSE WALLS, A MINIMUM HORIZONTAL BENCH 4 FEET WIDE AS MEASURED FROM THE FACE SHALL BE PROVIDED IN FRONT OF WALLS FOUNDED ON SLOPES. THE BENCH MAY BE FORMED OR THE SLOPE CONTINUED ABOVE THAT LEVEL. SEE ARTICLE 11.10.2.2, AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 2014 AND INTERIMS. ALTERNATIVELY, THE EMBEDMENT DEPTH MAY BE INCREASED TO SATISFY THE REQUIREMENTS.

ATTACHMENT F - ADDENDUM 1

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

RETAINING WALL
(R)
GEOTECHNICAL DESIGN NOTES & REQUIREMENTS

$$$$SYTIME$$$$$$
$$$$DGNSPEC$$$

DRAFT

Appendix II – Field Exploration

TEST BORING RECORD LEGEND

ATTACHMENT F - ADDENDUM 1

FINE AND COARSE GRAINED SOIL INFORMATION

DRAFT

COARSE GRAINED SOILS (SANDS & GRAVELS)

N	Relative Density
0-4	Very Loose
5-10	Loose
11-30	Medium Dense
31-50	Dense
Over 50	Very Dense

FINE GRAINED SOILS (SILTS & CLAYS)

N	Consistency	Qu, KSF Estimated
0-1	Very Soft	0-0.5
2-4	Soft	0.5-1
5-8	Firm	1-2
9-15	Stiff	2-4
16-30	Very Stiff	4-8
Over 30	Hard	8+

PARTICLE SIZE

Boulders	Greater than 300 mm (12 in)
Cobbles	75 mm to 300 mm (3 to 12 in)
Gravel	4.74 mm to 75 mm (3/16 to 3 in)
Coarse Sand	2 mm to 4.75 mm
Medium Sand	0.425 mm to 2 mm
Fine Sand	0.075 mm to 0.425 mm
Silts & Clays	Less than 0.075 mm

The **STANDARD PENETRATION TEST** as defined by ASTM D 1586 is a method to obtain a disturbed soil sample for examination and testing and to obtain relative density and consistency information. A standard 1.4-inch I.D./2-inch O.D. split-barrel sampler is driven three 6-inch increments with a 140 lb. hammer falling 30 inches. The hammer can either be of a trip, free-fall design, or actuated by a rope and cathead. The blow counts required to drive the sampler the final two 6-inch increments are added together and designate the N-value defined in the above tables.

ROCK PROPERTIES

ROCK QUALITY DESIGNATION (RQD)

Percent RQD	Quality
0-25	Very Poor
25-50	Poor
50-75	Fair
75-90	Good
90-100	Excellent

ROCK HARDNESS

Very Hard:	Rock can be broken by heavy hammer blows
Hard:	Rock cannot be broken by thumb pressure, but can be broken by moderate hammer blows.
Moderately Hard:	Small pieces can be broken off along sharp edges by considerable hard thumb pressure; can be broken with light hammer blows.
Soft:	Rock is coherent but breaks very easily with thumb pressure at sharp edges and crumbles with firm hand pressure.
Very Soft:	Rock disintegrates or easily compresses when touched; can be hard to very hard soil.

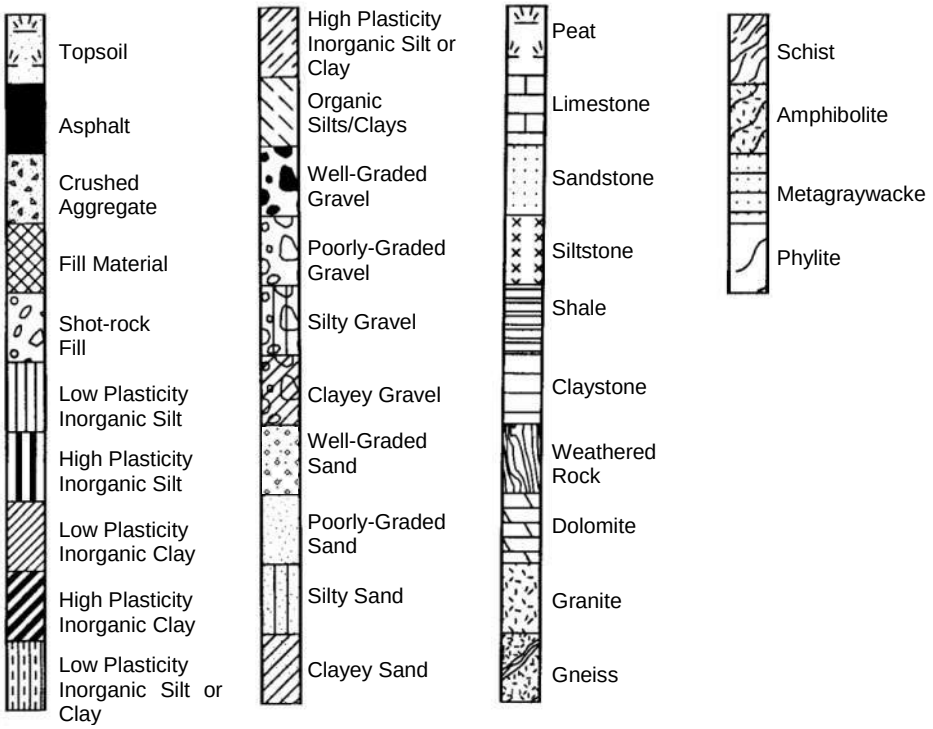
$$\text{RQD} = \frac{\text{Sum of 4 in. and longer Rock Pieces Recovered}}{\text{Length of Core Run}} \times 100 = \text{RQD}$$

$$\text{Recovery} = \frac{\text{Length of Rock Core Recovered}}{\text{Length of Core Run}} \times 100 = \text{NQ or REC}$$

Core Diameter	Inches
BQ	1-7/16
NQ	1-7/8
HQ	2-1/2

SYMBOLS

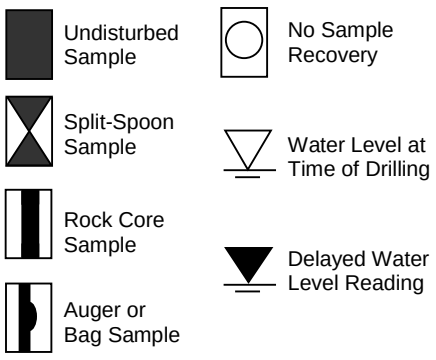
KEY TO MATERIAL TYPES



SOIL PROPERTY SYMBOLS

N:	Standard Penetration, BPF
M:	Moisture Content, %
LL:	Liquid Limit, %
PI:	Plasticity Index, %
Qp:	Pocket Penetrometer Value, TSF
Qu:	Unconfined Compressive Strength Estimated Qu, TSF
γ_D:	Dry Unit Weight, PCF
F:	Fines Content

SAMPLING SYMBOLS



ATTACHMENT F - ADDENDUM 1

PROJECT: **McEwen Drive Extension - Phase 4**
Franklin, Tennessee
S&ME Project No. 1247-15-066B

BORING LOG B-101

DRAFT

CLIENT: **Sullivan Engineering, Inc.**
ELEVATION: **854.3 ft**
DATE DRILLED: **6/22/18**
BORING DEPTH: **20.0 ft**
DRILL RIG: **CME ATV 550**
WATER LEVEL: **dry before coring**
DRILLER: **Tri-State Drilling LLC**
CAVE-IN DEPTH: **N/A**
HAMMER TYPE: **Automatic**
LOGGED BY: **Eric Conway, E.I.**
SAMPLING METHOD: **Rock Core**
DRILLING METHOD: **2 1/4 inch Hollow Stem Auger**

NOTES: Approximate Station 440+00 - 65' LT
Boring offset approximately 12' SE
Elevation based on survey by others; Elevation should be considered approximate due to offset.

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN#	2nd 6in / REC	3rd 6in / RQD	SPT N-Value (bpf) ● / FINES % ▲ PL NM LL 10 20 30 40 50 60 70 80 90	Pocket Pen (tsf)	N VALUE
		TOPSOIL - 1 inch										
		RESIDUUM: FAT CLAY (CH) - stiff, tannish brown, moist - - - Refusal, begin NQ coring at 1 feet			1			8%	0%			
5		**LIMESTONE** - light gray		849.3								
		Clay seam 1.3 to 8.0 feet			2			40%	30%			
		LIMESTONE - light gray to dark gray, fine grained, hard, medium bedded, coarse-grained below 13.0 feet										
10				844.3	3			100%	100%			
15				839.3	4			100%	96%			
20				834.3								
		Refusal at 0.8 feet Boring terminated at 20 feet										

S&ME BORING LOG - SPT AND PPQ NM MCEWEN DRIVE BORING LOGS.GPJ GINT STD US LAB.GDT 7/24/18

NOTES:

1. ***THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.***
2. ***BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.***
3. ***STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.***
4. ***WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.***

B-101 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 1 of 2, Runs 1 and 2, Depth: 1.0 foot – 10.0 feet

Box 2 of 2, Runs 3 and 4, Depth: 10.0 feet – 20.0 feet

PROJECT: **McEwen Drive Extension - Phase 4**
Franklin, Tennessee
S&ME Project No. 1247-15-066B

BORING LOG B-102

DRAFT

NOTES: Approximate Station 442+00 - 63' LT
Boring offset approximately 4' SW
Elevation based on survey by others; Elevation should be considered approximate due to offset.

CLIENT: **Sullivan Engineering, Inc.**	ELEVATION: **869.7 ft**
DATE DRILLED: **6/21/18 - 6/22/18**	BORING DEPTH: **30.0 ft**
DRILL RIG: **CME ATV 550**	WATER LEVEL: **dry before coring**
DRILLER: **Tri-State Drilling LLC**	CAVE-IN DEPTH: **N/A**
HAMMER TYPE: **Automatic**	LOGGED BY: **Eric Conway, E.I.**
SAMPLING METHOD: **Rock Core, Split spoon**	
DRILLING METHOD: **2 1/4 inch Hollow Stem Auger**	

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN#	2nd 6in / REC	3rd 6in / RQD	SPT N-Value (bpf) / FINES % (PL NM LL)	Pocket Pen (tsf)	N VALUE
	TOPSOIL - 1 inch		1		6	7	8		4.5+	15
	RESIDUUM: LEAN CLAY (CL) - very stiff to stiff, brown with black, moist		2		3	9	50/4		4.5+	50/4
5	- - - Refusal, begin NQ coring at 4.8 feet	864.7								
	LIMESTONE - light gray with dark gray, hard, medium bedded to thin bedded, fine-grained, with some coarse-grained and crystalline		3			73%	52%			
10	- - - Clay seam 5.3 to 6.7 feet	859.7								
	- - - Clay seam 11.4 to 12.0 feet		4			67%	57%			
	- - - Clay seam 12.7 to 12.9 feet									
15		854.7	5			100%	83%			
20		849.7	6			100%	92%			
25		844.7	7			100%	90%			
30		839.7	8			100%	100%			
	Refusal at 4.8 feet Boring terminated at 30 feet									

S&ME BORING LOG - SPT AND PPQ NM MCEWEN DRIVE BORING LOGS.GPJ GINT STD US LAB.GDT 7/24/18

NOTES:

1. ***THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.***
2. ***BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.***
3. ***STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.***
4. ***WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.***

B-102 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 1 of 3, Runs 1 and 2, Depth: 4.8 feet – 14.8 feet

Box 2 of 3, Runs 3 and 4, Depth: 14.8 feet – 24.8 feet

B-102 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 3 of 3, Runs 5 and 6, Depth: 24.8 feet – 30.8 feet

PROJECT: **McEwen Drive Extension - Phase 4**
Franklin, Tennessee
S&ME Project No. 1247-15-066B

BORING LOG B-103

DRAFT

CLIENT: **Sullivan Engineering, Inc.**
ELEVATION: **878.1 ft**
DATE DRILLED: **6/21/18**
BORING DEPTH: **35.0 ft**
DRILL RIG: **CME ATV 550**
WATER LEVEL: **dry before coring**
DRILLER: **Tri-State Drilling LLC**
CAVE-IN DEPTH: **N/A**
HAMMER TYPE: **Automatic**
LOGGED BY: **Eric Conway, E.I.**
SAMPLING METHOD: **Rock Core, Split spoon**
DRILLING METHOD: **2 1/4 inch Hollow Stem Auger**

NOTES: Approximate Station 443+50 - 64' LT
Boring offset approximately 18' S
Elevation based on survey by others; Elevation should be considered approximate due to offset.

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLE NO.	1st 6in / RUN#	2nd 6in / REC	3rd 6in / RQD	Pocket Pen (tsf)	N VALUE
	TOPSOIL - 1 inch							
	RESIDUUM: LEAN CLAY (CL) - very stiff, brown with black, with chert gravel, moist		1	7	9	10	4.5+	19
5	**FAT CLAY (CH)** - very stiff, brown with black, moist	873.1	2	5	8	16	4.5+	24
	- - - Refusal, begin NQ coring at 5.8 feet		3		64%	18%		
10	**LIMESTONE** - light gray with dark gray, hard, thin to medium bedded, fine-grained, coarse-grained below 25 feet	868.1	4		90%	47%		
	- - - Clay seam 11.2 to 11.9 feet							
15	- - - Clay seam 14.0 to 17.0 feet	863.1	5		19%	11%		
20	- - - Clay seam 19.3 to 19.5 feet	858.1	6		56%	48%		
	- - - Clay seam 21.0 to 21.5 feet							
25		853.1	7		100%	94%		
30		848.1	8		100%	96%		
35		843.1	9		100%	83%		
	Refusal at 5 feet Boring terminated at 35 feet							

SPT N-Value (bpf) ●
FINES % ▲
PL NM LL
10 20 30 40 50 60 70 80 90

S&ME BORING LOG - SPT AND PPQ NM MCEWEN DRIVE BORING LOGS.GPJ GINT STD US LAB.GDT 7/24/18

NOTES:

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2. ***BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.***
3. ***STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.***
4. ***WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.***

B-103 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 1 of 4, Runs 1 and 2, Depth: 5.1 feet – 13.0 feet

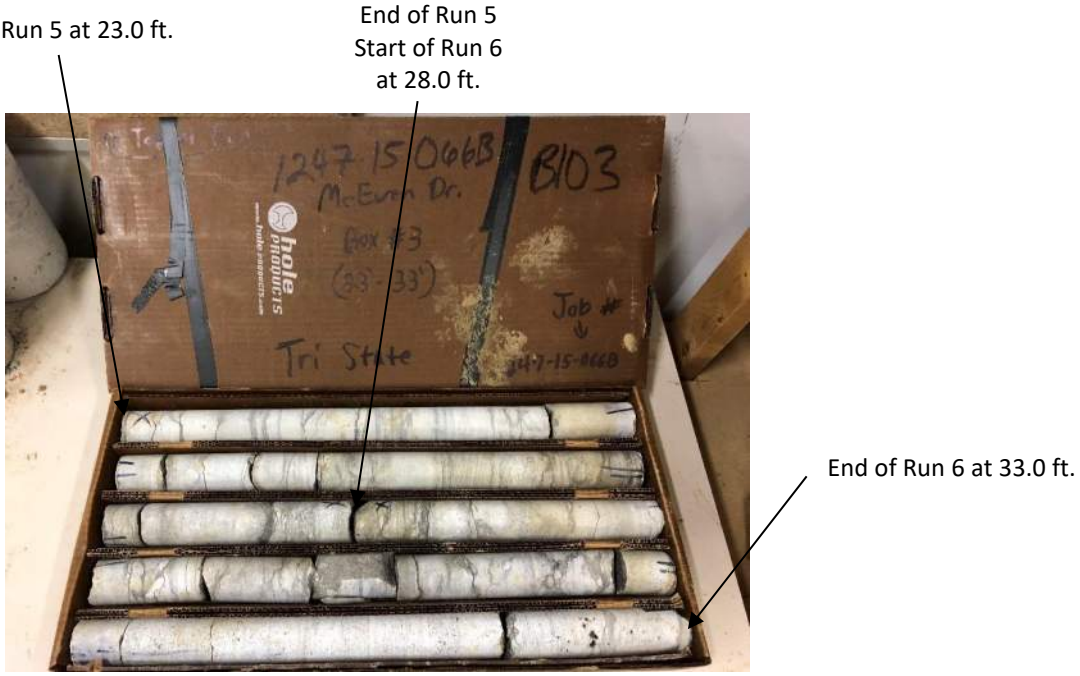
Box 2 of 4, Runs 3 and 4, Depth: 13.0 feet – 23.0 feet

B-103 Rock Core Photograph

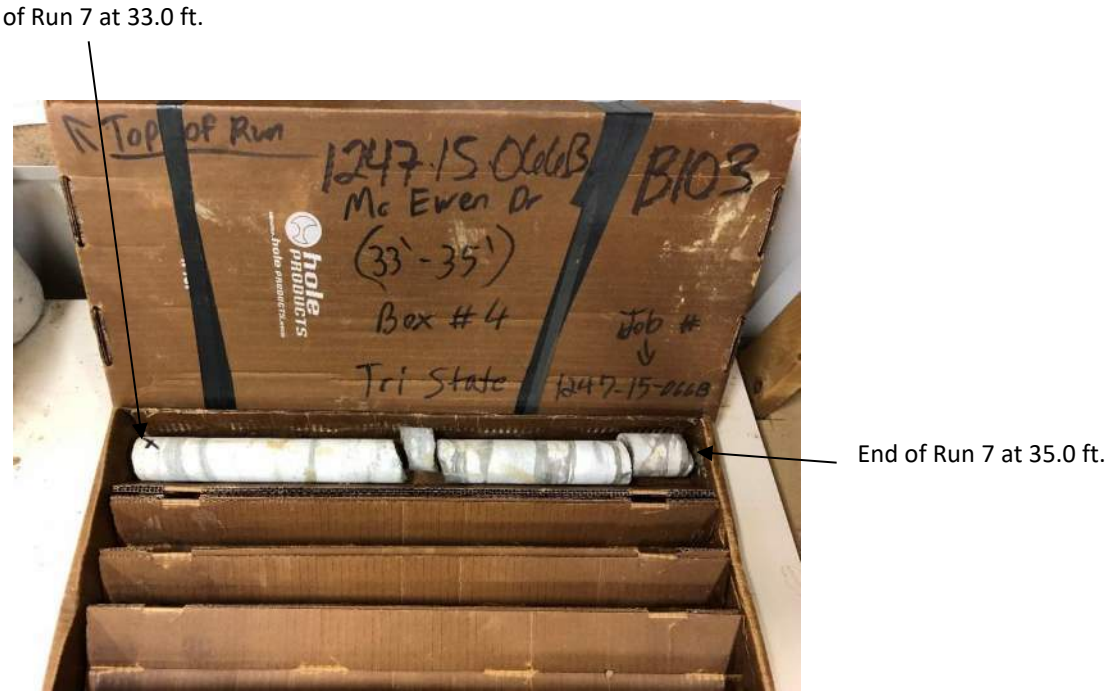
McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 3 of 4, Runs 5 and 6, Depth: 23.0 feet – 33.0 feet



Box 4 of 4, Run 7, Depth: 33.0 feet – 35.0 feet



PROJECT: **McEwen Drive Extension - Phase 4**
Franklin, Tennessee
S&ME Project No. 1247-15-066B

BORING LOG B-104

DRAFT

CLIENT: **Sullivan Engineering, Inc.**	ELEVATION: **889.2 ft**
DATE DRILLED: **6/22/18**	BORING DEPTH: **20.0 ft**
DRILL RIG: **CME ATV 550**	WATER LEVEL: **dry before coring**
DRILLER: **Tri-State Drilling LLC**	CAVE-IN DEPTH: **N/A**
HAMMER TYPE: **Automatic**	LOGGED BY: **Eric Conway, E.I.**
SAMPLING METHOD: **Rock Core**	
DRILLING METHOD: **2 1/4 inch Hollow Stem Auger**	

NOTES: Approximate Station 456+00 - 62' LT
Boring offset approximately 30' E
Elevation based on survey by others; Elevation should be considered approximate due to offset.

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLE NO.	1st 6in / RUN#	2nd 6in / REC	3rd 6in / RQD	SPT N-Value (bpf) / FINES % (PL NM LL)	Pocket Pen (tsf)	N VALUE
0	**TOPSOIL** - 1 inch								
	RESIDUUM: FAT CLAY (CH) - stiff, brown with black, with chert gravel, moist		1		40%	33%			
	- - - Refusal, begin NQ coring at 1.0 feet	884.2							
5	**LIMESTONE** - light gray with dark gray, fine grained, hard, medium bedded, with occasional shale laminae		2		84%	60%			
	- - - Clay seam 2.7 to 5.0 feet	879.2							
10	- - - Light gray, porous, coarse-grained limestone from 5.0 to 11.2 feet		3		61%	36%			
	- - - Clay seam 10.3 to 10.9 feet								
	- - - Clay seam 11.2 to 11.8 feet								
15	- - - Clay seam 12.5 to 13.2 feet	874.2	4		98%	88%			
20	Refusal at 1 feet	869.2							
	Boring terminated at 20 feet								

SPT N-Value (bpf) ●
FINES % ▲
PL NM LL
10 20 30 40 50 60 70 80 90

S&ME BORING LOG - SPT AND PPQ NM MCEWEN DRIVE BORING LOGS.GPJ GINT STD US LAB.GDT 7/24/18

NOTES:

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3. ***STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.***
4. ***WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.***

B-104 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 1 of 2, Runs 1 and 2, Depth: 1.0 foot – 10.0 feet

Box 2 of 2, Runs 3 and 4, Depth: 10.0 feet – 20.0 feet

PROJECT: **McEwen Drive Extension - Phase 4**
Franklin, Tennessee
S&ME Project No. 1247-15-066B

BORING LOG B-105

DRAFT

CLIENT: **Sullivan Engineering, Inc.**
ELEVATION: **908.1 ft**
DATE DRILLED: **6/26/18**
BORING DEPTH: **29.6 ft**
DRILL RIG: **CME ATV 550**
WATER LEVEL: **dry before coring**
DRILLER: **Tri-State Drilling LLC**
CAVE-IN DEPTH: **N/A**
HAMMER TYPE: **Automatic**
LOGGED BY: **Eric Conway, E.I.**
SAMPLING METHOD: **Rock Core, Split spoon**
DRILLING METHOD: **2 1/4 inch Hollow Stem Auger**

NOTES: Approximate Station 457+50 - 100' LT
Boring offset approximately 9' W
Elevation based on survey by others; Elevation should be considered approximate due to offset.

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN#	2nd 6in / REC	3rd 6in / RQD	Pocket Pen (tsf)	N VALUE
	TOPSOIL - 1 inch								
	RESIDUUM: LEAN CLAY (CL) - stiff to very stiff, tannish brown with black, with chert gravel, moist		1		10	7	9	4.5+	16
5		903.1	2		7	6	9	4.0	15
			3		7	7	10	4.0	17
	FAT CLAY (CH) - stiff to very stiff, brown with black, with chert gravel, moist		4		5	5	6	2.5	11
10		898.1							
			5		5	5	8	2.5	13
15		893.1							
	- - - Refusal, begin NQ coring at 17.2 feet		6			92%	79%		
	LIMESTONE - light gray with dark gray, coarse grained, hard, medium bedded, with occaisonal shale laminae	888.1	7			95%	82%		
20									
		883.1	8			100%	90%		
25									
	Refusal at 17.2 feet Boring terminated at 29.6 feet								

SPT N-Value (bpf) ●
FINES % ▲
PL NM LL
10 20 30 40 50 60 70 80 90

S&ME BORING LOG - SPT AND PPQ NM MCEWEN DRIVE BORING LOGS.GPJ GINT STD US LAB.GDT 7/24/18

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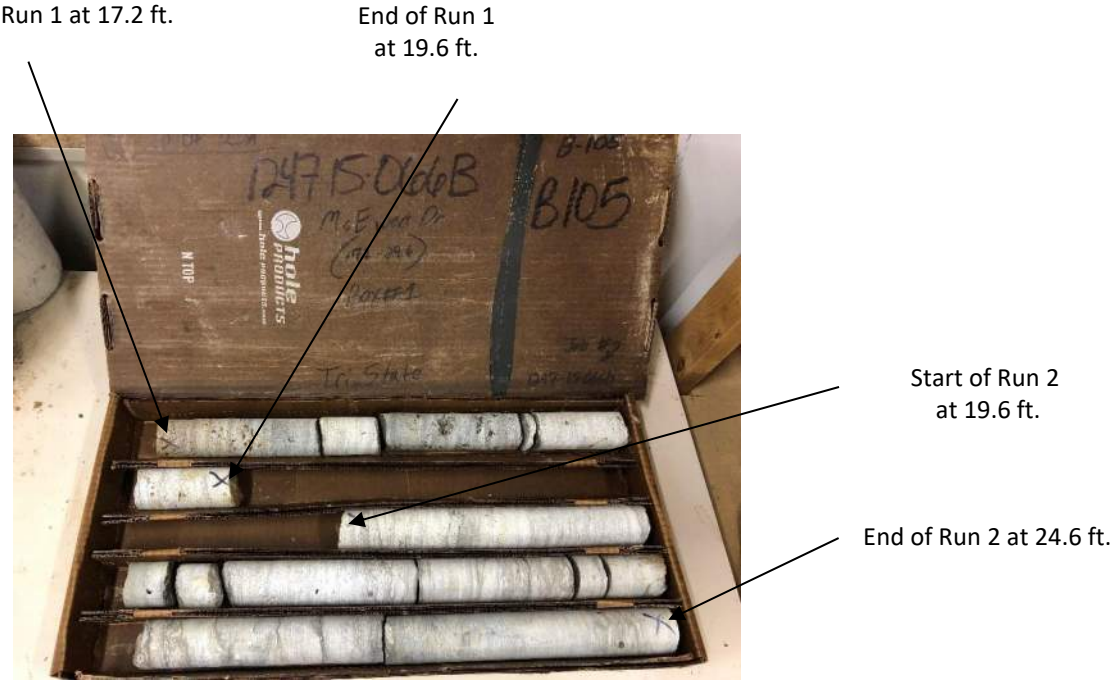
4. ***WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.***

B-105 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 1 of 2, Runs 1 and 2, Depth: 17.2 feet – 24.6 feet



Box 2 of 2, Run 3, Depth: 24.6 feet – 29.6 feet

PROJECT: **McEwen Drive Extension - Phase 4**
Franklin, Tennessee
S&ME Project No. 1247-15-066B

BORING LOG B-106

DRAFT

CLIENT: **Sullivan Engineering, Inc.**
ELEVATION: **913.0 ft**
DATE DRILLED: **7/12/18**
BORING DEPTH: **24.5 ft**
DRILL RIG: **CME ATV 550**
WATER LEVEL: **13.0 feet after coring**
DRILLER: **Tri-State Drilling LLC**
CAVE-IN DEPTH: **N/A**
HAMMER TYPE: **Automatic**
LOGGED BY: **Eric Conway, E.I.**
SAMPLING METHOD: **Rock Core**
DRILLING METHOD: **2 1/4 inch Hollow Stem Auger**

NOTES: Approximate Station 460+32 - 65' LT
Boring offset approximately 10' N
Elevation based on survey by others; Elevation should be considered approximate due to offset.

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN#	2nd 6in / REC	3rd 6in / RQD	SPT N-Value (bpf) / FINES % / PL NM LL (10 20 30 40 50 60 70 80 90)	Pocket Pen (tsf)	N VALUE
		TOPSOIL - 1 inch										
		RESIDUUM: LEAN CLAY (CL) - stiff, brown with black, moist - - - Refusal, begin NQ coring at 1.5 feet										
5		**LIMESTONE** - light gray with dark gray, fine grained, hard, thin to thick bedded - - - Clay seam 1.8 to 3.7 feet		908.0	1			20%	0%			
					2			28%	28%			
10		- - - Clay seam 9.5 to 12.7 feet		903.0	3			100%	82%			
15		- - - Clay seam 13.6 to 14.0 feet		898.0	4			100%	68%			
20				893.0	5			92%	66%			
		Refusal at 1.5 feet Boring terminated at 24.5 feet										

S&ME BORING LOG - SPT AND PPQ NM MCEWEN DRIVE BORING LOGS.GPJ GINT STD US LAB.GDT 7/24/18

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B-106 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 1 of 3, Runs 1 and 2, Depth: 1.5 feet – 9.5 feet

Start of Run 1 at 1.5 ft.

End of Run 1
Start of Run 2
at 4.5 ft.

End of Run 2 at 9.5 ft.

Box 2 of 3, Runs 3 and 4, Depth: 9.5 feet – 19.5 feet

Start of Run 3 at 9.5 ft.

End of Run 3
Start of Run 4
at 14.5 ft.

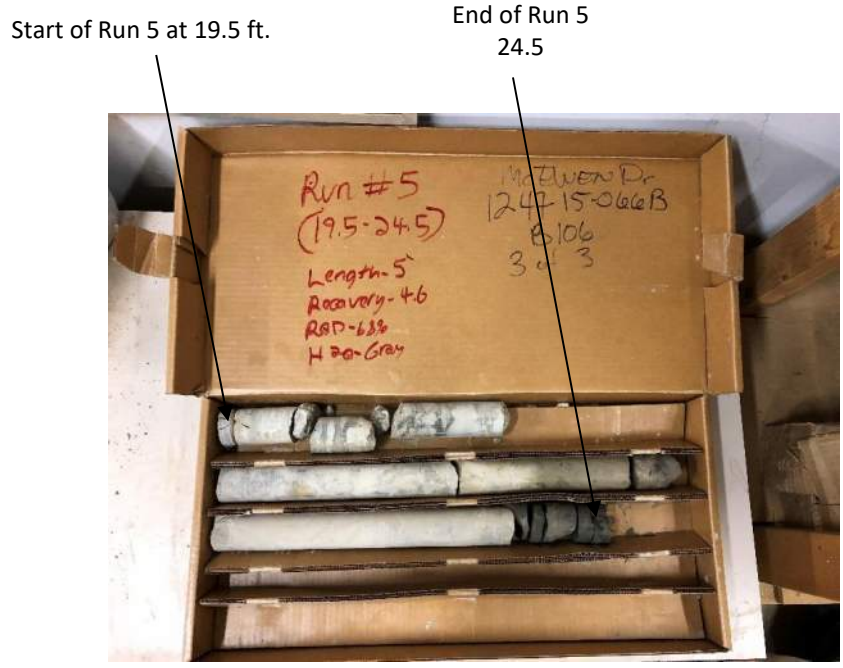
End of Run 4 at 19.5 ft.

B-106 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 3 of 3, Run 5, Depth: 19.5 feet – 24.5 feet



PROJECT: **McEwen Drive Extension - Phase 4**
Franklin, Tennessee
S&ME Project No. 1247-15-066B

BORING LOG B-107

DRAFT

CLIENT: **Sullivan Engineering, Inc.**
ELEVATION: **919.1 ft**
DATE DRILLED: **7/2/18**
BORING DEPTH: **26.0 ft**
DRILL RIG: **CME ATV 550**
WATER LEVEL: **dry before coring**
DRILLER: **Tri-State Drilling LLC**
CAVE-IN DEPTH: **N/A**
HAMMER TYPE: **Automatic**
LOGGED BY: **Eric Conway, E.I.**
SAMPLING METHOD: **Rock Core**
DRILLING METHOD: **2 1/4 inch Hollow Stem Auger**

NOTES: Approximate Station 460+50 - 95' LT
Boring offset approximately 10' N
Elevation based on survey by others; Elevation should be considered approximate due to offset.

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN#	2nd 6in / REC	3rd 6in / RQD	SPT N-Value (bpf) / FINES % (PL NM LL)	Pocket Pen (tsf)	N VALUE
		TOPSOIL - 1 inch										
		RESIDUUM: LEAN CLAY (CL) - stiff, brown with black, moist										
		- - - Refusal, begin NQ coring at 1 feet										
5		**LIMESTONE** - light gray with dark gray, fine grained, hard, medium bedded, light gray and coarse grained from 9.5 to 17.0 feet		914.1	1			50%	46%			
		- - - Clay seam 1.5 to 3.8 feet			2			41%	26%			
10		- - - Clay seam 7.0 to 9.5 feet		909.1								
					3			100%	90%			
15				904.1								
					4			100%	80%			
20				899.1								
					5			100%	82%			
25				894.1								
		Refusal at 1 feet										
		Boring terminated at 26 feet										

SPT N-Value (bpf) ●
FINES % ▲
PL NM LL
10 20 30 40 50 60 70 80 90

S&ME BORING LOG - SPT AND PPQ NM MCEWEN DRIVE BORING LOGS.GPJ GINT STD US LAB.GDT 7/24/18

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B-107 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 1 of 3, Runs 1 and 2, Depth: 1.0 foot – 11.0 feet

Start of Run 1 at 1.0 ft.

End of Run 1
Start of Run 2
at 6.0 ft.

End of Run 2 at 11.0 ft.

Box 2 of 3, Runs 3 and 4, Depth: 11.0 feet – 21.0 feet

Start of Run 3 at 11.0 ft.

End of Run 3
Start of Run 4
at 16.0 ft.

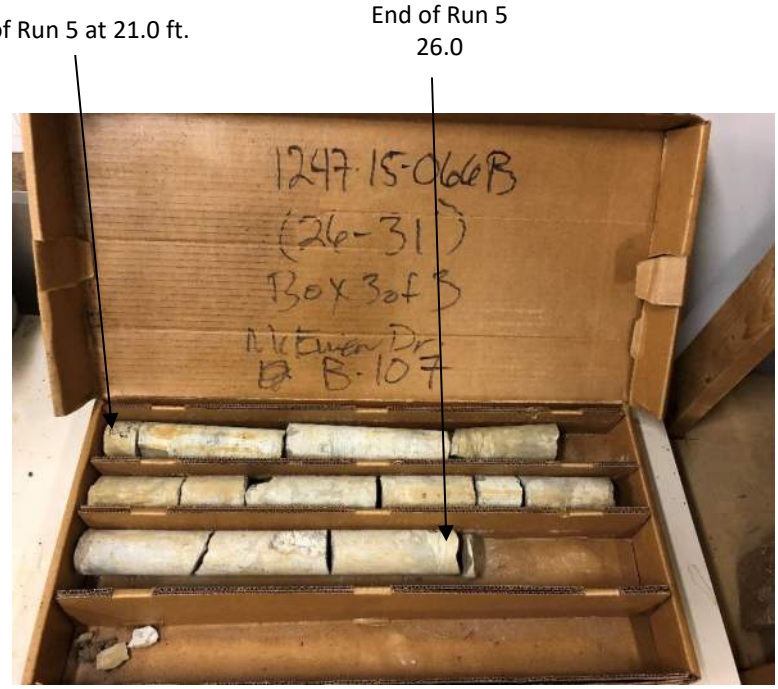
End of Run 4 at 21.0 ft.

B-107 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 3 of 3, Run 5, Depth: 21.0 feet – 26.0 feet



PROJECT: **McEwen Drive Extension - Phase 4**
Franklin, Tennessee
S&ME Project No. 1247-15-066B

BORING LOG B-108

DRAFT

CLIENT: **Sullivan Engineering, Inc.**	ELEVATION: **929.5 ft**
DATE DRILLED: **7/2/18**	BORING DEPTH: **35.0 ft**
DRILL RIG: **CME ATV 550**	WATER LEVEL: **dry before coring**
DRILLER: **Tri-State Drilling LLC**	CAVE-IN DEPTH: **N/A**
HAMMER TYPE: **Automatic**	LOGGED BY: **Eric Conway, E.I.**
SAMPLING METHOD: **Rock Core, Split spoon**	
DRILLING METHOD: **2 1/4 inch Hollow Stem Auger**	

NOTES: Approximate Station 460+97 - 140' LT
Boring offset approximately 5' N
Elevation based on survey by others; Elevation should be considered approximate due to offset.

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN#	2nd 6in / REC	3rd 6in / RQD	SPT N-Value (bpf) / FINES % (PL NM LL)	Pocket Pen (tsf)	N VALUE
	TOPSOIL - 1 inch									
	RESIDUUM: LEAN CLAY (CL) - stiff, brown with black, with chert gravel, moist		1		5	6	8		4.5	14
			2		5	50/2			4.0	50/2
5	- - - Refusal, begin NQ coring at 5.0 feet	924.5								
	LIMESTONE - light gray with dark gray, fine grained, hard, medium bedded, coarse grained and porous from 15.0 to 26.0 feet		3			44%	30%			
10	- - - Clay seam 6.0 to 7.6 feet	919.5								
			4			90%	62%			
15	- - - Clay seam 13.4 to 13.9 feet	914.5								
			5			100%	78%			
20		909.5								
			6			100%	94%			
25		904.5								
			7			100%	94%			
30		899.5								
			8			100%	96%			
35	Refusal at 5 feet Boring terminated at 35 feet	894.5								

S&ME BORING LOG - SPT AND PPQ NM MCEWEN DRIVE BORING LOGS.GPJ GINT STD US LAB.GDT 7/24/18

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B-108 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 1 of 3, Runs 1 and 2, Depth: 5.0 foot – 15.0 feet

Box 2 of 3, Runs 3 and 4, Depth: 15.0 feet – 25.0 feet

B-108 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 3 of 3, Run 5 and 6, Depth: 25.0 feet – 35.0 feet

ATTACHMENT F - ADDENDUM 1

PROJECT: **McEwen Drive Extension - Phase 4** **Franklin, Tennessee** **S&ME Project No. 1247-15-066B**	**BORING LOG B-109**
CLIENT: **Sullivan Engineering, Inc.**	ELEVATION: **933.1 ft**
DATE DRILLED: **7/2/18 - 7/11/18**	BORING DEPTH: **40.0 ft**
DRILL RIG: **CME ATV 550**	WATER LEVEL: **dry before coring**
DRILLER: **Tri-State Drilling LLC**	CAVE-IN DEPTH: **N/A**
HAMMER TYPE: **Automatic**	LOGGED BY: **Eric Conway, E.I.**
SAMPLING METHOD: **Rock Core, Split spoon**	
DRILLING METHOD: **2 1/4 inch Hollow Stem Auger**	

DRAFT

NOTES: Approximate Station 461+50 - 152' LT
Boring offset approximately 6' N
Elevation based on survey by others; Elevation should be considered approximate due to offset.

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLE NO.	1st 6in / RUN#	2nd 6in / REC	3rd 6in / RQD	Pocket Pen (tsf)	N VALUE
0	**TOPSOIL** - 1 inch							
	RESIDUUM: LEAN CLAY (CL) - stiff to hard, tannish brown with black, with chert gravel, moist		1	6	7	8	4.5+	15
			2	7	8	23	4.5+	31
5	- - - Refusal, begin NQ coring at 5.0 feet	928.1						
	LIMESTONE - light gray with dark gray, coarse grained, hard, medium to thin bedded		3		72%	65%		
	- - - Clay seam 7.6 to 8.0 feet							
10	- - - Clay seam 9.0 to 9.2 feet	923.1	4		76%	76%		
	- - - Clay seam 11.5 to 12.0 feet							
15	- - - Clay seam 14.2 to 14.6 feet	918.1	5		100%	85%		
20		913.1	6		100%	76%		
25		908.1	7		100%	64%		
30		903.1	8		100%	64%		
35		898.1	9		100%	85%		
40	Refusal at 5 feet Boring terminated at 40 feet	893.1						

SPT N-Value (bpf) ●
FINES % ▲
PL NM LL
10 20 30 40 50 60 70 80 90

S&ME BORING LOG - SPT AND PPQ NM MCEWEN DRIVE BORING LOGS.GPJ GINT STD US LAB.GDT 7/24/18

NOTES:

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B-109 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 1 of 4, Runs 1 and 2, Depth: 5.0 feet – 15.0 feet

Box 2 of 4, Runs 3 and 4, Depth: 15.0 feet – 25.0 feet

B-109 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 3 of 4, Runs 5 and 6, Depth: 25.0 feet – 35.0 feet

Box 4 of 4, Run 7, Depth: 35.0 feet – 40.0 feet

PROJECT: **McEwen Drive Extension - Phase 4**
Franklin, Tennessee
S&ME Project No. 1247-15-066B

BORING LOG B-110

DRAFT

CLIENT: **Sullivan Engineering, Inc.**	ELEVATION: **934.6 ft**
DATE DRILLED: **6/27/18**	BORING DEPTH: **34.8 ft**
DRILL RIG: **CME ATV 550**	WATER LEVEL: **dry before coring**
DRILLER: **Tri-State Drilling LLC**	CAVE-IN DEPTH: **N/A**
HAMMER TYPE: **Automatic**	LOGGED BY: **Eric Conway, E.I.**
SAMPLING METHOD: **Rock Core, Split spoon**	
DRILLING METHOD: **2 1/4 inch Hollow Stem Auger**	

NOTES: Approximate Station 462+15 - 160' LT
Boring offset approximately 10' N
Elevation based on survey by others; Elevation should be considered approximate due to offset.

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLE NO.	1st 6in / RUN#	2nd 6in / REC	3rd 6in / RQD	Pocket Pen (tsf)	N VALUE
	TOPSOIL - 1 inch							
	RESIDUUM: LEAN CLAY (CL) - stiff to very stiff, brown with black, with chert gravel, dry		1	4	6	5	4.5+	11
			2	8	17	50/3	4.5+	50/3
5	- - - Refusal, begin NQ coring at 4.8 feet	929.6						
	LIMESTONE - light gray with dark gray, hard, medium bedded, fine-grained, coarse-grained below 15 feet		3		95%	82%		
10		924.6						
	- - - Clay seam 11.4 to 11.6 feet		4		71%	64%		
	- - - Clay seam 12.8 to 13.6 feet	919.6						
15			5		96%	73%		
20		914.6						
			6		100%	96%		
25		909.6						
			7		100%	93%		
30		904.6						
			8		100%	90%		
	Refusal at 4.8 feet Boring terminated at 34.8 feet							

SPT N-Value (bpf) ● FINES % ▲ PL NM LL
10 20 30 40 50 60 70 80 90

S&ME BORING LOG - SPT AND PPQ NM MCEWEN DRIVE BORING LOGS.GPJ GINT STD US LAB.GDT 7/24/18

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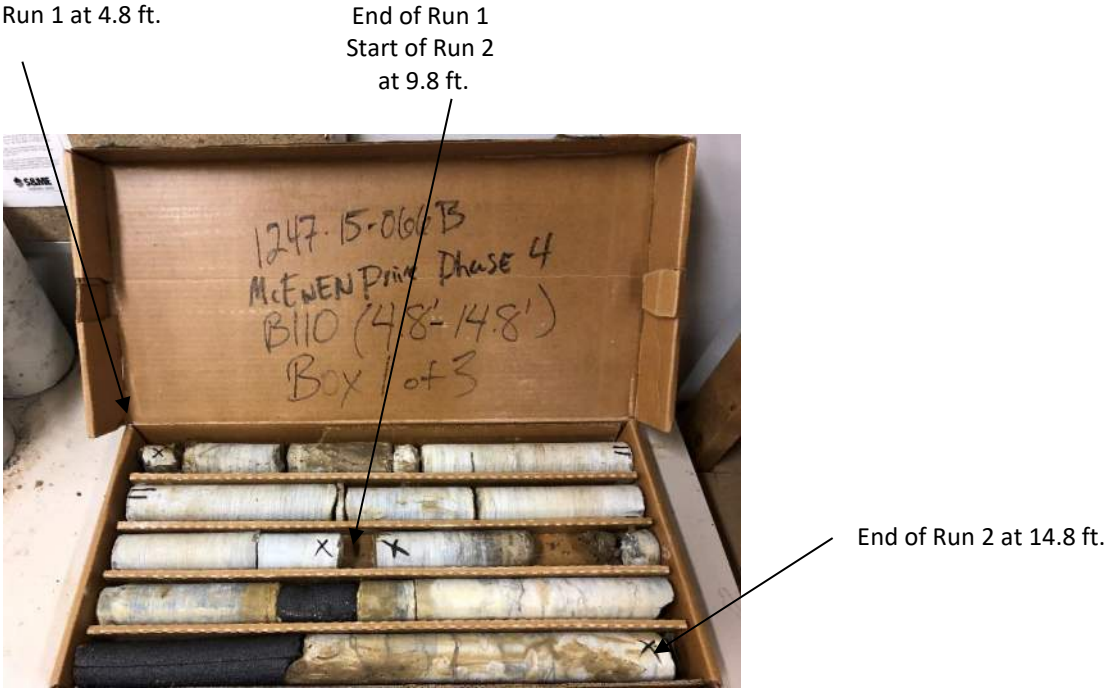
4. ***WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.***

B-110 Rock Core Photograph

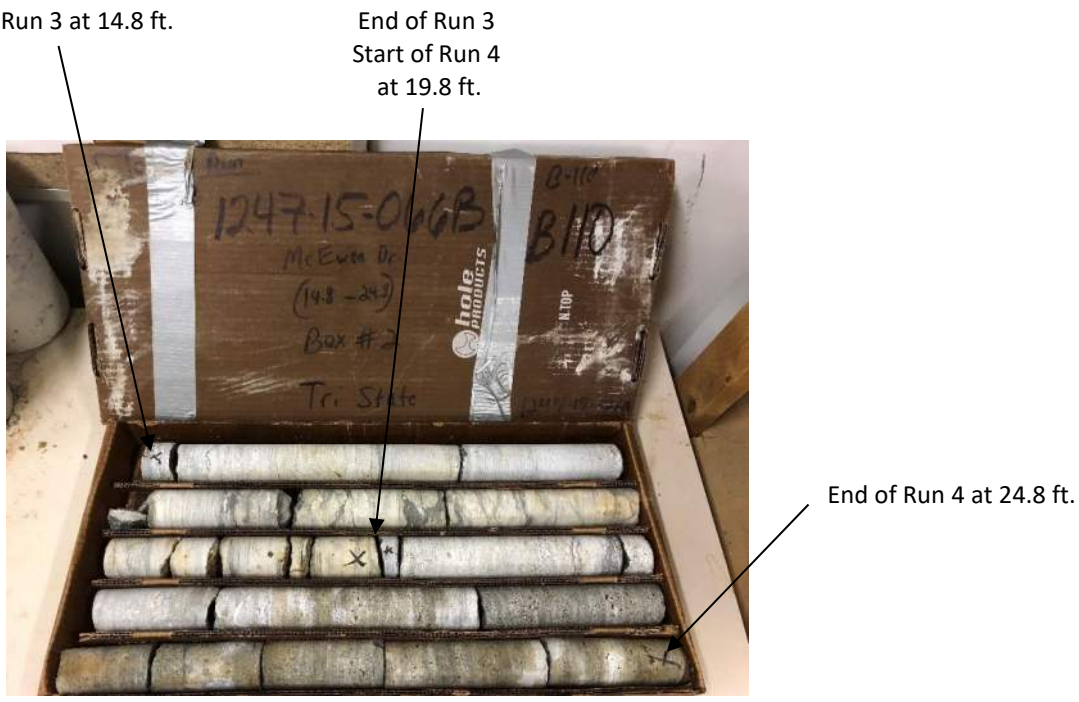
McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 1 of 3, Runs 1 and 2, Depth: 4.8 feet – 14.8 feet



Box 2 of 3, Runs 3 and 4, Depth: 14.8 feet – 24.8 feet



B-110 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 3 of 3, Runs 5 and 6, Depth: 24.8 feet – 34.8 feet

PROJECT: **McEwen Drive Extension - Phase 4**
Franklin, Tennessee
S&ME Project No. 1247-15-066B

BORING LOG B-111

DRAFT

CLIENT: **Sullivan Engineering, Inc.**
ELEVATION: **934.3 ft**
DATE DRILLED: **6/27/18**
BORING DEPTH: **29.7 ft**
DRILL RIG: **CME ATV 550**
WATER LEVEL: **dry before coring**
DRILLER: **Tri-State Drilling LLC**
CAVE-IN DEPTH: **N/A**
HAMMER TYPE: **Automatic**
LOGGED BY: **Eric Conway, E.I.**
SAMPLING METHOD: **Rock Core, Split spoon**
DRILLING METHOD: **2 1/4 inch Hollow Stem Auger**

NOTES: Approximate Station 462+80 - 168' LT
Boring offset approximately 15' NE
Elevation based on survey by others; Elevation should be considered approximate due to offset.

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN#	2nd 6in / REC	3rd 6in / RQD	SPT N-Value (bpf) / FINES % (PL NM LL; 10 20 30 40 50 60 70 80 90)	Pocket Pen (tsf)	N VALUE
		TOPSOIL - 1 inch			1		4	50/2				50/2
		RESIDUUM: FAT CLAY (CH) - stiff, brown with black, moist - - - Refusal, begin NQ coring at 2.2 feet			2			76%	76%			
5		**LIMESTONE** - light gray with dark gray, hard, medium bedded, coarse-grained and porous from 16.3 to 21.2 feet - - - Clay seam 3.5 to 4.1 feet - - - Clay seam 7.1 to 7.4 feet		929.3	3			86%	77%			
10				924.3	4			96%	96%			
15		- - - Clay seam 16.9 to 17.6 feet		919.3	5			80%	38%			
20				914.3	6			100%	97%			
25				909.3	7			98%	76%			
		Refusal at 2.2 feet Boring terminated at 29.7 feet										

S&ME BORING LOG - SPT AND PPQ NM MCEWEN DRIVE BORING LOGS.GPJ GINT STD US LAB.GDT 7/24/18

NOTES:

1. ***THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.***
2. ***BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.***
3. ***STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.***
4. ***WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.***

B-111 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 1 of 3, Runs 1 and 2, Depth: 2.2 feet – 9.7 feet

Box 2 of 3, Runs 3 and 4, Depth: 9.7 feet – 19.7 feet

B-111 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 3 of 3, Runs 5 and 6, Depth: 19.7 feet – 29.7 feet

ATTACHMENT F - ADDENDUM 1

PROJECT: **McEwen Drive Extension - Phase 4**
Franklin, Tennessee
S&ME Project No. 1247-15-066B

BORING LOG B-112

DRAFT

CLIENT: **Sullivan Engineering, Inc.**
ELEVATION: **933.5 ft**
DATE DRILLED: **6/26/18**
BORING DEPTH: **20.2 ft**
DRILL RIG: **CME ATV 550**
WATER LEVEL: **dry before coring**
DRILLER: **Tri-State Drilling LLC**
CAVE-IN DEPTH: **N/A**
HAMMER TYPE: **Automatic**
LOGGED BY: **Eric Conway, E.I.**
SAMPLING METHOD: **Rock Core**
DRILLING METHOD: **2 1/4 inch Hollow Stem Auger**

NOTES: Approximate Station 463+50 - 180' LT
Boring offset approximately 16' NW
Elevation based on survey by others; Elevation should be considered approximate due to offset.

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN#	2nd 6in / REC	3rd 6in / RQD	SPT N-Value (bpf) / FINES % (PL NM LL; 10 20 30 40 50 60 70 80 90)	Pocket Pen (tsf)	N VALUE
0		**LIMESTONE** - light gray with dark gray, fine grained, hard, medium bedded, with occasional shale laminae, coarse-grained from 13.0 to 20.2 feet			1			100%	85%			
		- - - Begin NQ coring at 0.0 feet		928.5	2			74%	56%			
5		- - - Clay seam 4.9 to 5.1 feet										
		- - - Clay seam 5.6 to 6.6 feet			3			100%	90%			
10				923.5								
					4			100%	82%			
15				918.5								
					5			100%	81%			
20		Refusal at 0 feet Boring terminated at 20.2 feet		913.5								

S&ME BORING LOG - SPT AND PPQ NM MCEWEN DRIVE BORING LOGS.GPJ GINT STD US LAB.GDT 7/24/18

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2. ***BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.***
3. ***STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.***
4. ***WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.***

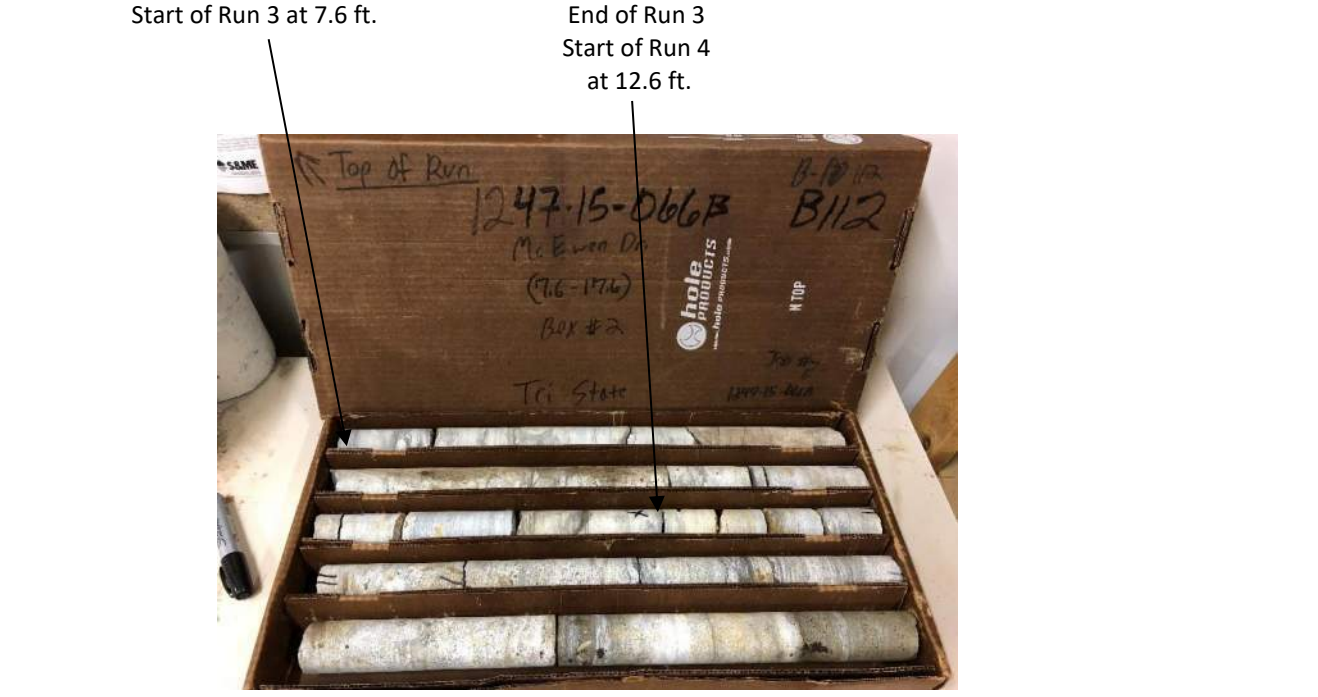
B-112 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 1 of 3, Runs 1 and 2, Depth: 0.0 feet – 7.6 feet

Box 2 of 3, Runs 3 and 4, Depth: 7.6 feet – 17.6 feet



B-112 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 3 of 3, Runs 5 and 6, Depth: 17.6 feet – 20.2 feet

Start of Run 5 at 19.7 ft.

End of Run 5 at 24.7 ft.

End of Run 4 at 17.6 ft.

PROJECT: **McEwen Drive Extension - Phase 4**
Franklin, Tennessee
S&ME Project No. 1247-15-066B

BORING LOG B-113

DRAFT

CLIENT: **Sullivan Engineering, Inc.**
ELEVATION: **978.6 ft**
DATE DRILLED: **7/12/18**
BORING DEPTH: **24.0 ft**
DRILL RIG: **CME ATV 550**
WATER LEVEL: **15.0 feet after coring**
DRILLER: **Tri-State Drilling LLC**
CAVE-IN DEPTH: **N/A**
HAMMER TYPE: **Automatic**
LOGGED BY: **Eric Conway, E.I.**
SAMPLING METHOD: **Rock Core**
DRILLING METHOD: **2 1/4 inch Hollow Stem Auger**

NOTES: Approximate Station 471+00 - 63' LT
Boring offset approximately 15' NW
Elevation based on survey by others; Elevation should be considered approximate due to offset.

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN#	2nd 6in / REC	3rd 6in / RQD	SPT N-Value (bpf) / FINES % (PL NM LL)	Pocket Pen (tsf)	N VALUE
		LIMESTONE - light gray, very weathered - - - Begin NQ coring at 0.0 feet			1			35%	16%			
5		**LIMESTONE** - light gray with dark gray, hard, thin bedded, fine-grained with some coarse-grained		973.6	2			92%	35%			
10				968.6	3			96%	71%			
15		- - - Clay seam 14.7 to 15.0 feet - - - Brown stained and weathered 15.5 to 15.8 feet		963.6	4			78%	35%			
20		- - - Shale layer 18.7 to 18.8 feet		958.6	5			100%	86%			
		Refusal at 0 feet Boring terminated at 24 feet										

S&ME BORING LOG - SPT AND PPQ NM MCEWEN DRIVE BORING LOGS.GPJ GINT STD US LAB.GDT 7/24/18

NOTES:

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2. ***BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.***
3. ***STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.***
4. ***WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.***

B-113 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 1 of 3, Runs 1 and 2, Depth: 0.0 feet – 9.0 feet

Start of Run 1 at 0.0 ft.

End of Run 1
Start of Run 2
at 4.0 ft.

End of Run 2 at 9.0 ft.

Box 2 of 3, Runs 3 and 4, Depth: 9.0 feet – 19.0 feet

Start of Run 3 at 9.0 ft.

End of Run 3
Start of Run 4
at 14.0 ft.

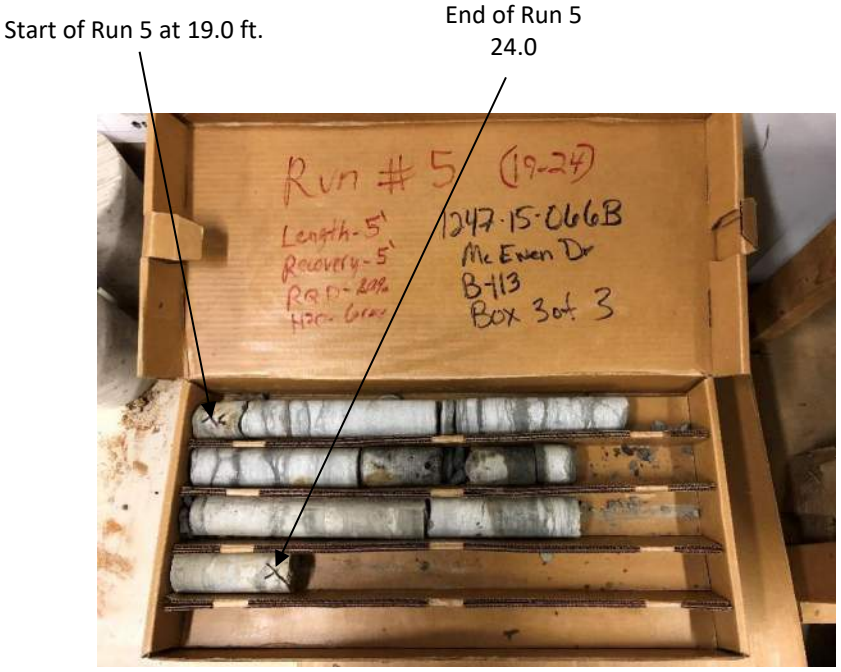
End of Run 4 at 19.0 ft.

B-113 Rock Core Photograph

McEwen Drive Extension Phase 4
Franklin, Tennessee
S&ME Project No. 1247-15-066B

DRAFT

Box 3 of 3, Run 5, Depth: 19.0 feet – 24.0 feet



PROJECT: **McEwen Drive Extension - Phase 4**
Franklin, Tennessee
S&ME Project No. 1247-15-066B

BORING LOG P2-101

DRAFT

NOTES: Approximate Wall P2 Station 0+00
Elevation based on survey by others.

CLIENT: **Sullivan Engineering, Inc.**	ELEVATION: **899.2 ft**
DATE DRILLED: **6/20/18**	BORING DEPTH: **25.8 ft**
DRILL RIG: **Diedrich D-50**	WATER LEVEL: **dry**
DRILLER: **Tri-State Drilling LLC**	CAVE-IN DEPTH: **N/A**
HAMMER TYPE: **Automatic**	LOGGED BY: **Eric Conway, E.I.**
SAMPLING METHOD: **Split spoon**	
DRILLING METHOD: **2 1/4 inch Hollow Stem Auger**	

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN#	2nd 6in / REC	3rd 6in / RQD	Pocket Pen (tsf)	N VALUE
	TOPSOIL - 2 inches								
	RESIDUUM: LEAN CLAY (CL) - very stiff, tannish brown with black, some chert gravel, moist, dry in upper 5 feet		1	SS	10	10	11	4.5+	21
		894.2	2	SS	15	14	18	4.5+	32
			3	SS	8	11	11	4.5+	22
		889.2	4	SS	8	8	11	3.5	19
		884.2	5	SS	8	10	11	3.5	21
	FAT CLAY (CH) - very stiff, tannish brown with black, some chert gravel, moist	879.2	6	SS	6	8	11	3.0	19
	LEAN CLAY (CL) - soft, black tan and gray, with weathered limestone, very moist, sandy, with relict bedding	874.2	7	SS	2	2	50/5	0.5	50/5
	Refusal at 25.8 feet Boring terminated at 25.8 feet								

SPT N-Value (bpf) ● — FINES % ▲ — PL, NM, LL — 10 20 30 40 50 60 70 80 90

S&ME BORING LOG - SPT AND PPQ NM MCEWEN DRIVE BORING LOGS.GPJ GINT STD US LAB.GDT 7/24/18

NOTES:

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2. *BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.*
3. *STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.*
4. *WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.*

PROJECT: **McEwen Drive Extension - Phase 4**
Franklin, Tennessee
S&ME Project No. 1247-15-066B

BORING LOG P2-102

DRAFT

NOTES: Approximate Wall P2 Station 0+25
Elevation based on survey by others.

CLIENT: **Sullivan Engineering, Inc.**	ELEVATION: **899.4 ft**
DATE DRILLED: **6/20/18**	BORING DEPTH: **22.2 ft**
DRILL RIG: **Diedrich D-50**	WATER LEVEL: **dry**
DRILLER: **Tri-State Drilling LLC**	CAVE-IN DEPTH: **N/A**
HAMMER TYPE: **Automatic**	LOGGED BY: **Eric Conway, E.I.**
SAMPLING METHOD: **Split spoon**	
DRILLING METHOD: **2 1/4 inch Hollow Stem Auger**	

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN#	2nd 6in / REC	3rd 6in / RQD	SPT N-Value (bpf) / FINES % (PL NM LL)	Pocket Pen (tsf)	N VALUE
0	**TOPSOIL** - 1 inch									
	RESIDUUM: LEAN CLAY (CL) - very stiff, tannish brown with black, with chert gravel, moist, dry in upper 5 feet		1		9	11	12		4.5+	23
		894.4	2		6	8	14		4.5+	22
5			3		6	10	16		4.5+	26
		889.4	4		6	9	14		4.5+	23
10										
		884.4	5		8	12	13		4.5+	25
15	**FAT CLAY (CH)** - stiff, reddish brown with black, with chert gravel, moist									
		879.4	6		4	6	9		4.0	15
20	Refusal at 22.2 feet Boring terminated at 22.2 feet									

S&ME BORING LOG - SPT AND PPQ NM MCEWEN DRIVE BORING LOGS.GPJ GINT STD US LAB.GDT 7/24/18

NOTES:

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2. ***BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.***
3. ***STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.***
4. ***WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.***

PROJECT: **McEwen Drive Extension - Phase 4**
Franklin, Tennessee
S&ME Project No. 1247-15-066B

BORING LOG P2-103

DRAFT

CLIENT: **Sullivan Engineering, Inc.**
ELEVATION: **898.6 ft**
DATE DRILLED: **6/20/18**
BORING DEPTH: **28.5 ft**
DRILL RIG: **Diedrich D-50**
WATER LEVEL: **dry**
DRILLER: **Tri-State Drilling LLC**
CAVE-IN DEPTH: **N/A**
HAMMER TYPE: **Automatic**
LOGGED BY: **Eric Conway, E.I.**
SAMPLING METHOD: **Split spoon**
DRILLING METHOD: **2 1/4 inch Hollow Stem Auger**

NOTES: Approximate Wall P2 Station 0+50
Elevation based on survey by others.
Installed piezometer

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN#	2nd 6in / REC	3rd 6in / RQD	SPT N-Value (bpf) / FINES % (PL NM LL)	Pocket Pen (tsf)	N VALUE
0	**TOPSOIL** - 2 inches									
	RESIDUUM: LEAN CLAY (CL) - very stiff to stiff, tannish brown with black, with chert gravel, moist, dry in upper 5 feet		1		5	7	7		4.5+	14
5		893.6	2		7	6	8		4.5+	14
			3		6	12	9		4.5+	21
10		888.6	4		5	9	17		4.5+	26
15		883.6	5		6	7	10		4.5+	17
	FAT CLAY (CH) - very stiff to stiff, brown with black, with chert gravel, with sand, moist									
20		878.6	6		6	10	12		2.5	22
25		873.6	7		4	4	6		2.0	10
	FAT CLAY (CH) - very stiff, brown, with weathered limestone, moist		8		50/2					50/2
	Refusal at 28.5 feet Boring terminated at 28.5 feet									

S&ME BORING LOG - SPT AND PPQ NM MCEWEN DRIVE BORING LOGS.GPJ GINT STD US LAB.GDT 7/24/18

NOTES:

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2. ***BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.***
3. ***STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.***
4. ***WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.***

PROJECT: **McEwen Drive Extension - Phase 4**
Franklin, Tennessee
S&ME Project No. 1247-15-066B

BORING LOG P2-104

DRAFT

CLIENT: **Sullivan Engineering, Inc.**
ELEVATION: **894.6 ft**
DATE DRILLED: **6/20/18**
BORING DEPTH: **10.5 ft**
DRILL RIG: **Diedrich D-50**
WATER LEVEL: **dry**
DRILLER: **Tri-State Drilling LLC**
CAVE-IN DEPTH: **N/A**
HAMMER TYPE: **Automatic**
LOGGED BY: **Eric Conway, E. I.**
SAMPLING METHOD: **Split spoon**
DRILLING METHOD: **2 1/4 inch Hollow Stem Auger**

NOTES: Approximate Wall P2 Station 1+00
Boring offset approximately 5' N
Elevation based on survey by others; Elevation should be considered approximate due to offset.

DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION	WATER LEVEL	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN#	2nd 6in / REC	3rd 6in / RQD	SPT N-Value (bpf) / FINES % (PL NM LL; 10 20 30 40 50 60 70 80 90)	Pocket Pen (tsf)	N VALUE
		TOPSOIL - 1 inch										
		RESIDUUM: LEAN CLAY (CL) - very stiff, tannish brown with black, with chert gravel, with weathered limestone, dry			1		9	21	7		4.5+	28
5				889.6	2		7	7	14		4.5+	21
					3		9	10	12		4.5+	22
10				884.6	4		7	11	50/3		4.5+	50/3
		Refusal at 10.5 feet Boring terminated at 10.5 feet										

S&ME BORING LOG - SPT AND PPQ NM MCEWEN DRIVE BORING LOGS.GPJ GINT STD US LAB.GDT 7/24/18

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3. ***STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.***
4. ***WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.***

PROJECT: **McEwen Drive Extension - Phase 4**
Franklin, Tennessee
S&ME Project No. 1247-15-066B

BORING LOG P2-105

DRAFT

NOTES: Approximate Wall P2 Station 1+60.86
Boring offset approximately 16' NW
Elevation based on survey by others; Elevation should be considered approximate due to offset.

CLIENT: **Sullivan Engineering, Inc.**	ELEVATION: **894.8 ft**
DATE DRILLED: **6/20/18**	BORING DEPTH: **24.7 ft**
DRILL RIG: **Diedrich D-50**	WATER LEVEL: **dry**
DRILLER: **Tri-State Drilling LLC**	CAVE-IN DEPTH: **N/A**
HAMMER TYPE: **Automatic**	LOGGED BY: **Eric Conway, E. I.**
SAMPLING METHOD: **Split spoon**	
DRILLING METHOD: **2 1/4 inch Hollow Stem Auger**	

DEPTH (feet)	MATERIAL DESCRIPTION	ELEVATION (feet)	SAMPLE NO.	SAMPLE TYPE	BLOW COUNT / CORE DATA 1st 6in / RUN#	2nd 6in / REC	3rd 6in / RQD	SPT N-Value (bpf) / FINES % (PL NM LL)	Pocket Pen (tsf)	N VALUE
0	**TOPSOIL** - 1 inch									
	RESIDUUM: LEAN CLAY (CL) - very stiff to stiff, tannish brown with black, with chert gravel, dry		1		6	8	7		4.5+	15
		889.8	2		8	10	9		4.5+	19
5			3		9	12	14		4.5+	26
		884.8	4		7	9	13		4.5+	22
10										
		879.8	5		6	8	9		4.0	17
15										
		874.8	6		8	10	12		4.5+	22
20										
			7		6	7	50/2		4.5+	50/2
	FAT CLAY (CH) - stiff, tannish brown to gray and black, moist									
	Refusal at 24.7 feet Boring terminated at 24.7 feet									

S&ME BORING LOG - SPT AND PPQ NM MCEWEN DRIVE BORING LOGS.GPJ GINT STD US LAB.GDT 7/24/18

NOTES:

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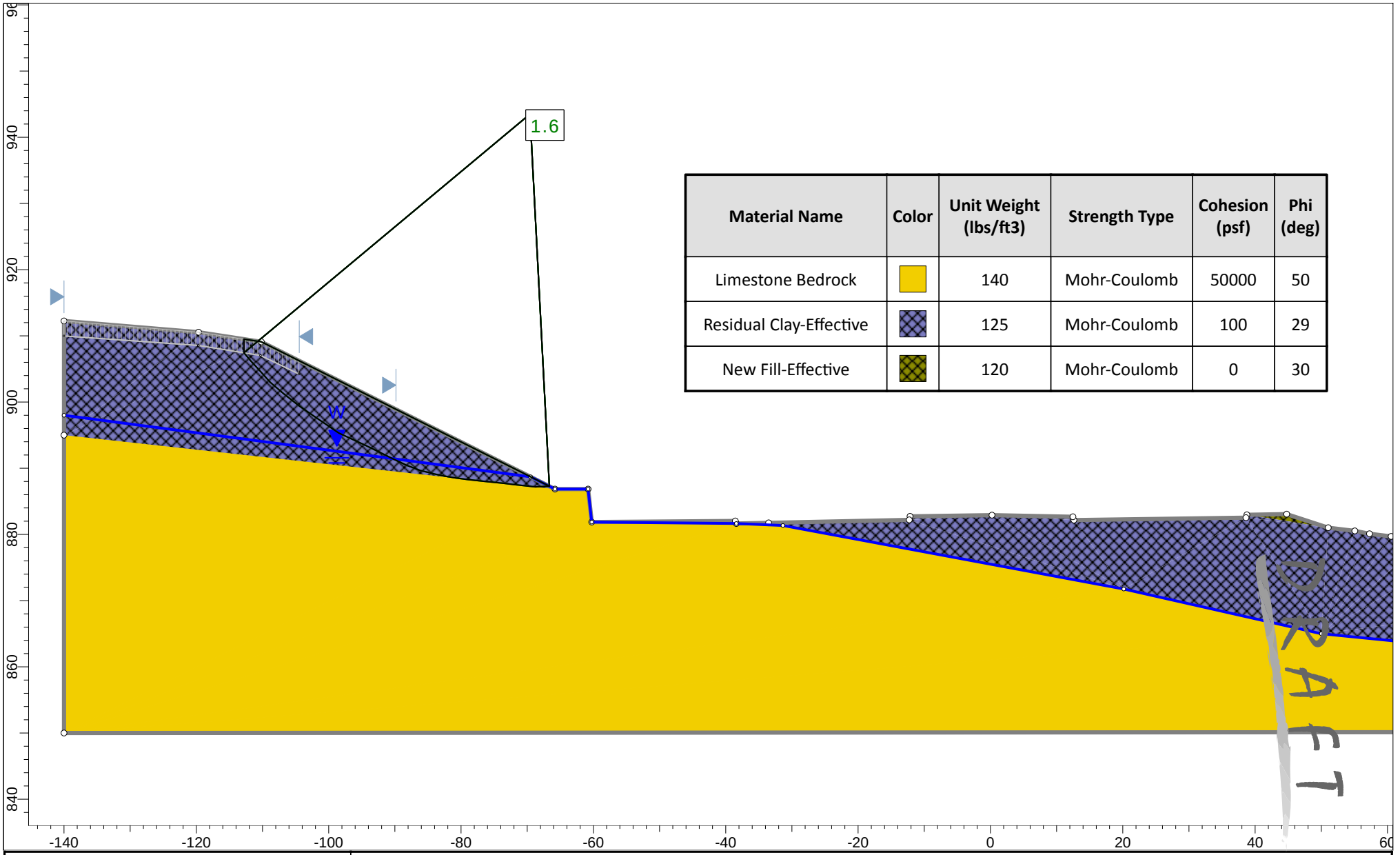
3. ***STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.***
4. ***WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.***

DRAFT

Appendix III – Slope Stability Analyses

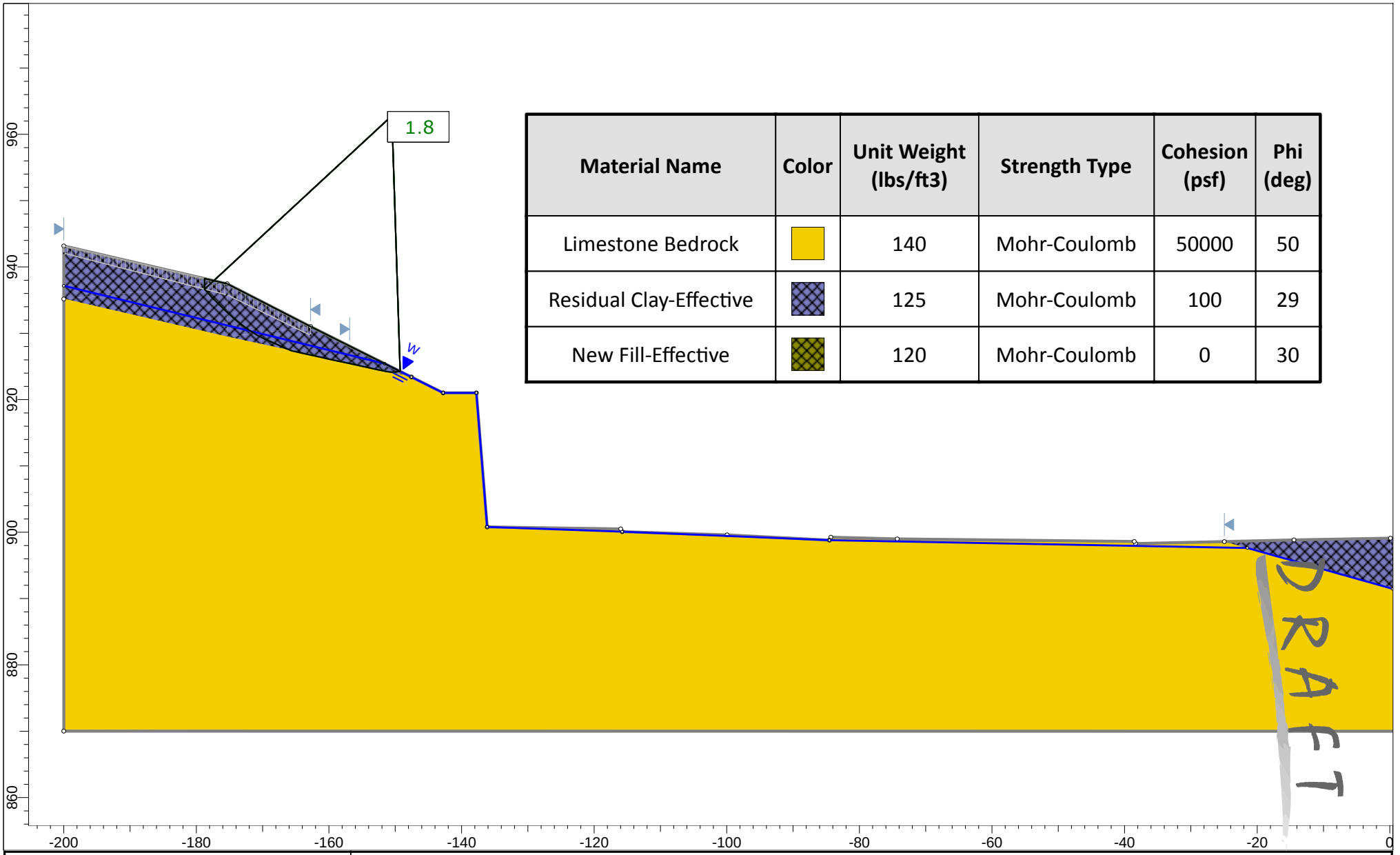
ATTACHMENT F - ADDENDUM 1



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Limestone Bedrock		140	Mohr-Coulomb	50000	50
Residual Clay-Effective		125	Mohr-Coulomb	100	29
New Fill-Effective		120	Mohr-Coulomb	0	30

SLIDEINTERPRET 8.015

Project	McEwen Drive Extension - Phase 4		
Analysis Description	McEwen Drive Sta. 457+50 Effective NonCircular		
Drawn By	T. Lawrence	Scale 1:240	Company S&ME, Inc
Date	7/20/2018, 7:37:03 PM		File Name McEwen Sta 457+50 Effective NonCircular.slim

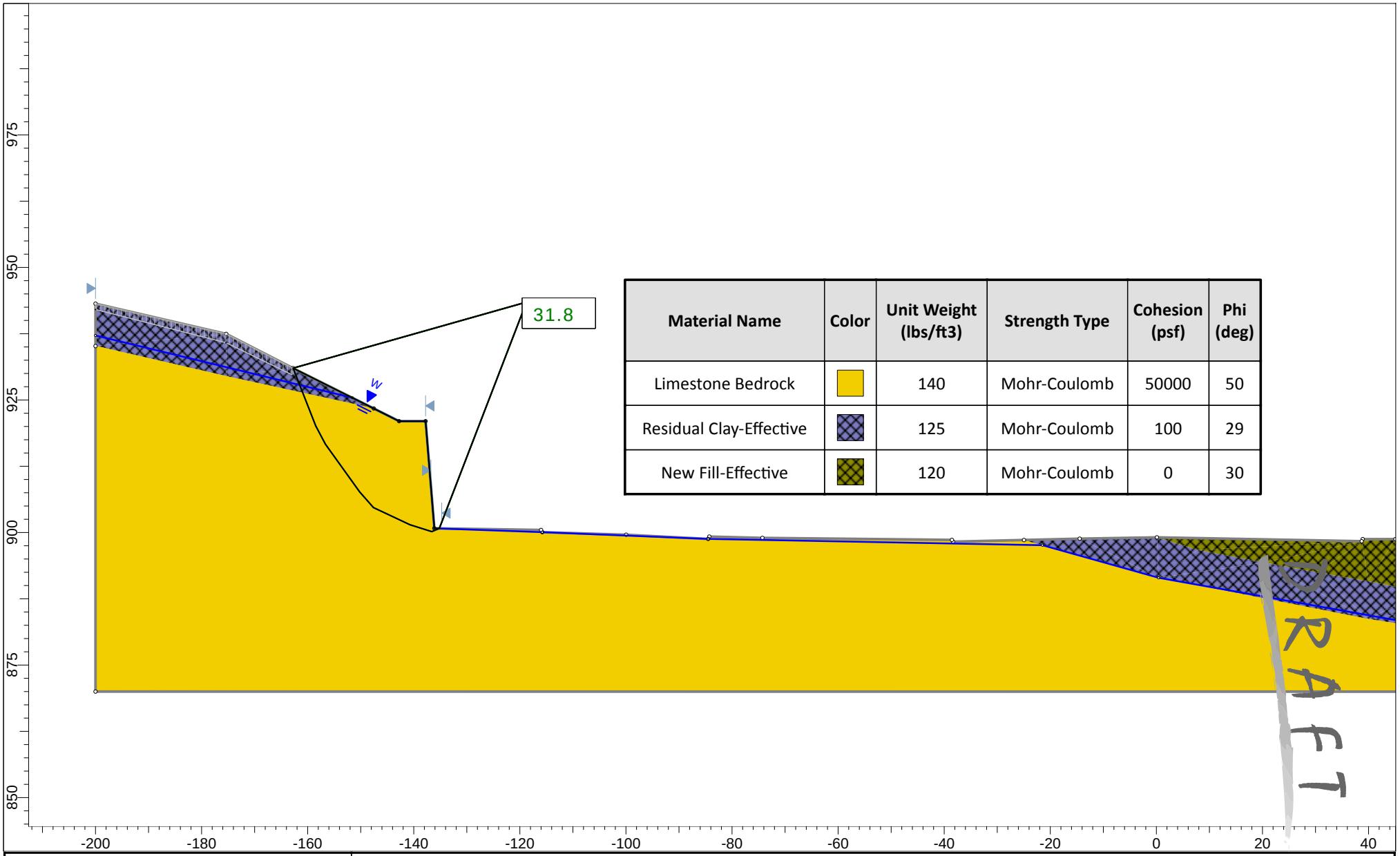


Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Limestone Bedrock		140	Mohr-Coulomb	50000	50
Residual Clay-Effective		125	Mohr-Coulomb	100	29
New Fill-Effective		120	Mohr-Coulomb	0	30

Project	McEwen Drive Extension - Phase 4		
Analysis Description	McEwen Drive Sta. 461+00 Effective NonCircular		
Drawn By	T. Lawrence	Scale 1:240	Company S&ME
Date	7/21/2018		File Name McEwen Sta 461+00 Effective NonCircular.slim

SLIDEINTERPRET 8.015

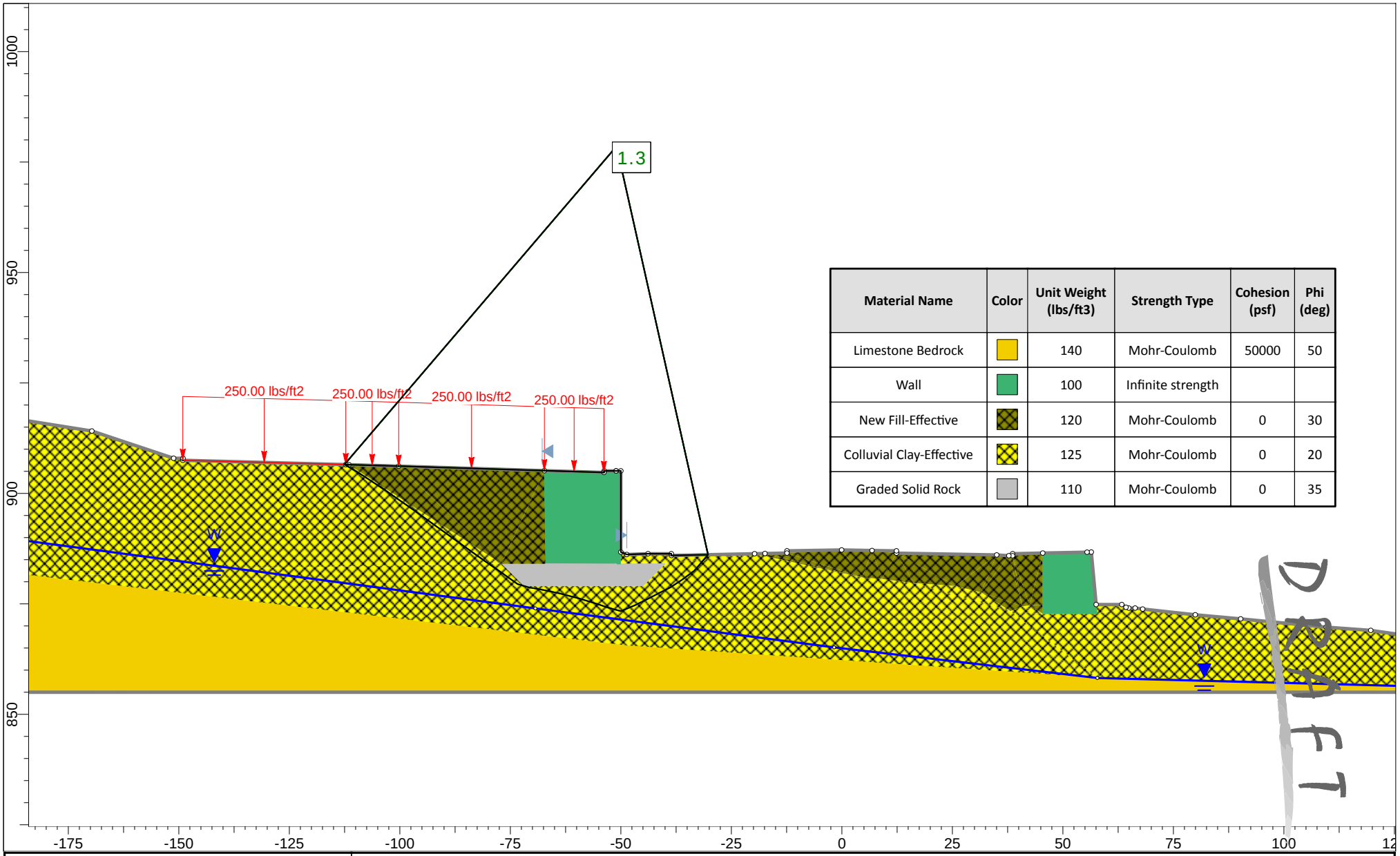
ATTACHMENT F - ADDENDUM 1



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Limestone Bedrock		140	Mohr-Coulomb	50000	50
Residual Clay-Effective		125	Mohr-Coulomb	100	29
New Fill-Effective		120	Mohr-Coulomb	0	30

SLIDEINTERPRET 8.015

Project	McEwen Drive Extension - Phase 4		
Analysis Description	McEwen Drive Sta. 461+00 Effective NonCircular		
Drawn By	T. Lawrence	Scale 1:300	Company S&ME
Date	7/21/2018		File Name McEwen Sta 461+00 Effective NonCircular1.slim

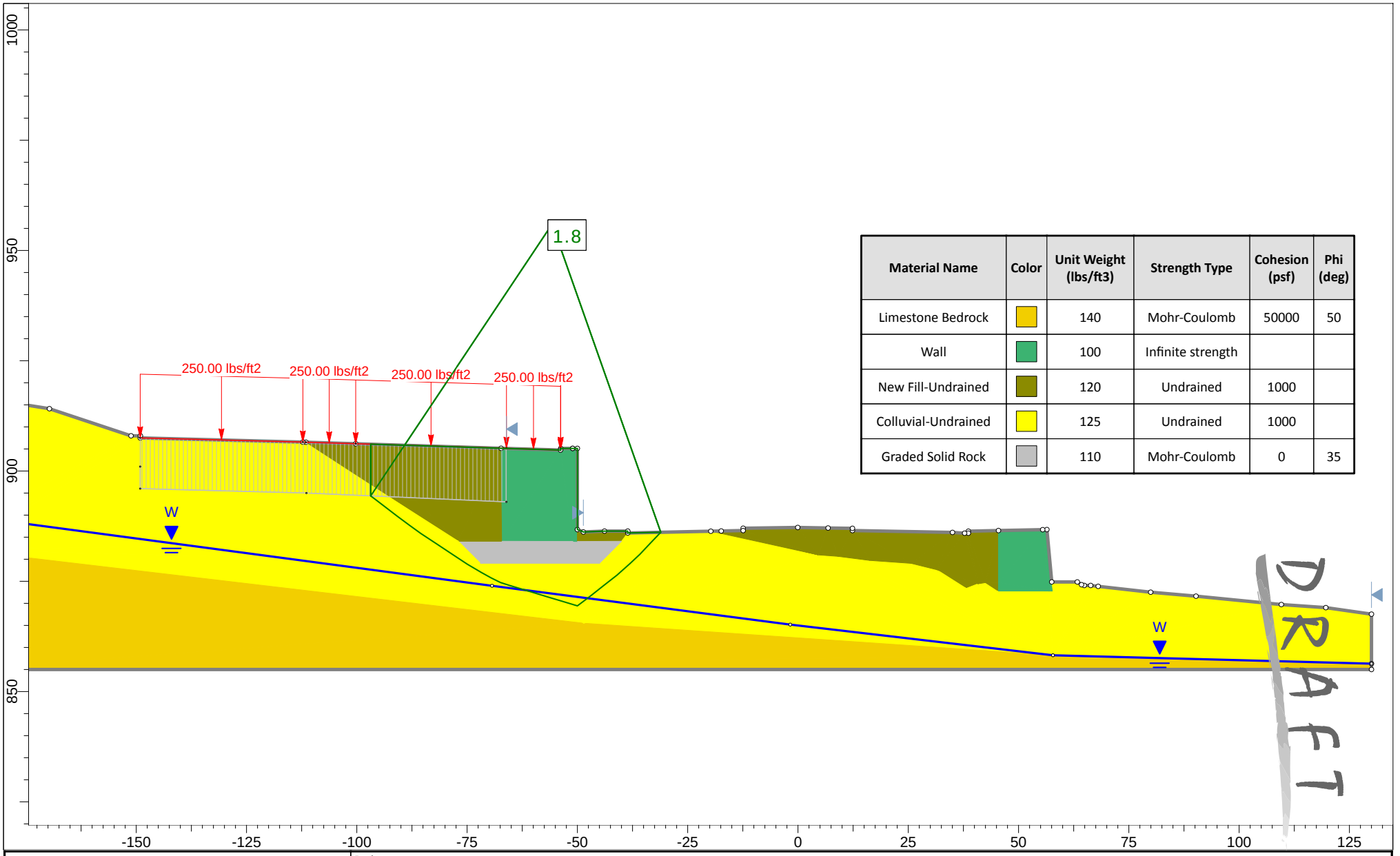


Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Limestone Bedrock		140	Mohr-Coulomb	50000	50
Wall		100	Infinite strength		
New Fill-Effective		120	Mohr-Coulomb	0	30
Colluvial Clay-Effective		125	Mohr-Coulomb	0	20
Graded Solid Rock		110	Mohr-Coulomb	0	35

SLIDEINTERPRET 8.015

Project	McEwen Drive Extension - Phase 4		
Analysis Description	McEwen Drive Sta. ~487+00; Wall P2 Sta. ~1+10 Effective		
Drawn By	T. Lawrence	Scale 1:360	Company S&ME, Inc.
Date	7/19/2018, 7:12:03 PM		File Name McEwen Wall P2 Sta Sta 487+00.slmd

ATTACHMENT F - ADDENDUM 1



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Limestone Bedrock		140	Mohr-Coulomb	50000	50
Wall		100	Infinite strength		
New Fill-Undrained		120	Undrained	1000	
Colluvial-Undrained		125	Undrained	1000	
Graded Solid Rock		110	Mohr-Coulomb	0	35

rocscience

SLIDEINTERPRET 8.015

Project	McEwen Drive Extension - Phase 4			
Analysis Description	McEwen Drive Sta. ~487+00; Wall P2 Sta. ~1+10 Undrained			
Drawn By	T. Lawrence	Scale	1:360	Company S&ME, Inc.
Date	7/19/2018, 7:12:03 PM			File Name McEwen Wall P2 Sta Sta 487+00.slmd

DRAFT

Appendix IV – Important Information about Your Geotechnical Engineering Report

DRAFT

Important Information About Your Geotechnical Engineering Report

Variations in subsurface conditions can be a principal cause of construction delays, cost overruns and claims. The following information is provided to assist you in understanding and managing the risk of these variations.

Geotechnical Findings Are Professional Opinions

Geotechnical engineers cannot specify material properties as other design engineers do. Geotechnical material properties have a far broader range on a given site than any manufactured construction material, and some geotechnical material properties may change over time because of exposure to air and water, or human activity.

Site exploration identifies subsurface conditions at the time of exploration and only at the points where subsurface tests are performed or samples obtained. Geotechnical engineers review field and laboratory data and then apply their judgment to render professional opinions about site subsurface conditions. Their recommendations rely upon these professional opinions. Variations in the vertical and lateral extent of subsurface materials may be encountered during construction that significantly impact construction schedules, methods and material volumes. While higher levels of subsurface exploration can mitigate the risk of encountering unanticipated subsurface conditions, no level of subsurface exploration can eliminate this risk.

Scope of Geotechnical Services

Professional geotechnical engineering judgment is required to develop a geotechnical exploration scope to obtain information necessary to support design and construction. A number of unique project factors are considered in developing the scope of geotechnical services, such as the exploration objective; the location, type, size and weight of the proposed structure; proposed site grades and improvements; the construction schedule and sequence; and the site geology.

Geotechnical engineers apply their experience with construction methods, subsurface conditions and exploration methods to develop the exploration scope. The scope of each exploration is unique based on available project and site information. Incomplete project information or constraints on the scope of exploration increases the risk of variations in subsurface conditions not being identified and addressed in the geotechnical report.

Services Are Performed for Specific Projects

Because the scope of each geotechnical exploration is unique, each geotechnical report is unique. Subsurface conditions are explored and recommendations are made for a specific project. Subsurface information and recommendations may not be adequate for other uses. Changes in a proposed structure location, foundation loads, grades, schedule, etc. may require additional geotechnical exploration, analyses, and consultation. The geotechnical engineer should be consulted to determine if additional services are required in response to changes in proposed construction, location, loads, grades, schedule, etc.

Geo-Environmental Issues

The equipment, techniques, and personnel used to perform a geo-environmental study differ significantly from those used for a geotechnical exploration. Indications of environmental contamination may be encountered incidental to performance of a geotechnical exploration but go unrecognized. Determination of the presence, type or extent of environmental contamination is beyond the scope of a geotechnical exploration.

Geotechnical Recommendations Are Not Final

Recommendations are developed based on the geotechnical engineer's understanding of the proposed construction and professional opinion of site subsurface conditions. Observations and tests must be performed during construction to confirm subsurface conditions exposed by construction excavations are consistent with those assumed in development of recommendations. It is advisable to retain the geotechnical engineer that performed the exploration and developed the geotechnical recommendations to conduct tests and observations during construction. This may reduce the risk that variations in subsurface conditions will not be addressed as recommended in the geotechnical report.

REPORT OF SUBSURFACE EXPLORATION
AND
GEOTECHNICAL ENGINEERING STUDY
PROPOSED WIDENING & IMPROVEMENTS
TO
McEWEN ROAD
FRANKLIN, TENNESSEE

Submitted to:

Sullivan Engineering, Inc.
Brentwood, Tennessee

Submitted by:

AMEC Earth & Environmental, Inc.
Nashville, Tennessee

April 2006

AMEC File No. 3-518-40000

17 April 2006

Mr. Paul Collins
Sullivan Engineering, Inc.
1722B Gen. George Patton Drive
Suite 400
Brentwood, TN 37027

RE: Report of Subsurface Exploration and Geotechnical Engineering Study for Proposed Widening and Improvements to McEwen Road
Franklin, Tennessee
AMEC File No. 3-518-40000

Dear Mr. Collins:

Per your authorization, AMEC Earth & Environmental, Inc. (AMEC) has completed a geotechnical engineering study at the above-referenced site. The purpose of the study was to characterize general subsurface conditions and provide geotechnical engineering comments and recommendations concerning site preparation, grading, foundations, and pavement design for a proposed roadway widening and improvements. Our scope of work also includes the design of a proposed bridge across the CSXT Railroad ROW. That portion of our assignment is currently on hold; the bridge design will proceed once we are given notice to resume that work.

The ASFE organization has prepared important information regarding studies of the type performed, and this is attached at the end of the text for your review. An assessment of the environmental aspects of the site is beyond the scope of this study.

We appreciate this opportunity to be of continuing service to Sullivan Engineering, Inc. and the City of Franklin. At your convenience, we are available to discuss the details of this report.

Sincerely,

AMEC

Douglas E. Tate, P. E.
Geotechnical Engineer

James W. Richardson, Jr., P.E.
Senior Engineer

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3800 Ezell Road, Suite 100
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www.amec.com

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CD-ROM includes PDF of text and appendices

1.0 INTRODUCTION

The geotechnical study for the McEwen Road project includes two phases (Phases III and IV); Phase III extends from eastbound Station 200+00 to 216+28/ westbound Station 300+00 to 316+31 and Station 398+50 to Station 428+51.80, at Cool Springs Boulevard Rotary. Phase IV extends from the Cool Springs Blvd Rotary west to Wilson Pike at Station 510+23.98. Additionally, Wilson Pike will be widened for turn lanes extending approximately 1,200 feet north and 1,200 feet south from the intersection.

2.0 PROJECT LOCATION AND DESCRIPTION

The site is located in Franklin, Tennessee, south of Nashville. Specifically, the site is located between I-65 and Wilson Pike, northeast of downtown Franklin (see Figure 1). We understand that the proposed new road is planned to run eastward from the planned intersection of McEwen Road and Carothers Parkway (about 0.30 miles east of I-65) to the intersection of McEwen Road and Wilson Pike. The new road will be approximately 2.6 miles in length.

Figure 1 Area Map

Based upon the current plans, the improved McEwen Road will consist of a divided, 4-lane (two lanes each way) roadway that generally coincides with the current alignment. However, the proposed alignment diverges from the current road for a segment extending about 2,000 feet east and 2,000 feet west of its intersection with the proposed Cool Springs Boulevard. Immediately west of the intersection of McEwen Road and Wilson Pike, the alignment crosses the CSXT railroad right-of-way (ROW). The railroad is situated in an approximately 35 feet deep cut ('gulch') at this location. The shoulders of the cut, within the ROW limits, are overgrown with brush and old, abandoned bridge abutments are visible in the gulch.

Currently, the area of the alignment is primarily an undeveloped area of private residential properties, farms, and former large farmsteads that were purchased by developers. The large, developer owned farmsteads are being actively developed in anticipation of this project.

3.0 SITE EXPLORATION AND LABORATORY TESTING

Site exploration was performed using a combination of backhoe excavated test pits and conventional geotechnical borings from September 12, through October 14, 2005. Fifty-seven geotechnical borings were drilled and 14 test pits were excavated at the locations shown by the Plan in Appendix 4. We had planned an additional 18 borings and five test pits along the proposed alignment but the current land owner(s) denied permission to enter and explore. Of the borings that were drilled, four of the borings were positioned at accessible locations near the proposed bridge abutments. The remaining borings were positioned at accessible locations, or at locations where access was prepared, along the proposed roadway alignment. The boring locations were established in the field by measuring from centerline survey stakes provided by Hart Freeland Roberts, Inc.; elevations were estimated from the profile and cross sections provided by Sullivan Engineering. As such, the boring locations and elevations shown on the Drawings in Appendix 3 should be considered approximate.

The borings were accomplished using rotary, flight augers and basic rock coring techniques in general accordance with soil sampling methods (ASTM D 1586), which were applied within the soil interval of the borings. NQ wire line rock coring was conducted at 29 selected locations where bedrock was encountered. Test pits were excavated using a rubber-tired backhoe.

Members of our professional staff were on-site to direct the explorations and log the materials encountered within the borings and test pits. Soil samples were visually classified in the field with respect to color, consistency, and material type. The bedrock cores were logged for rock type, lithology, and discontinuities. Typed logs are provided in Appendix 3 and graphic logs of the borings are included on the Drawings in Appendix 4. Recovered soil samples and rock cores are stored at our Nashville, Tennessee laboratory where they will be retained for approximately 60 days and will then be discarded, unless you direct us otherwise.

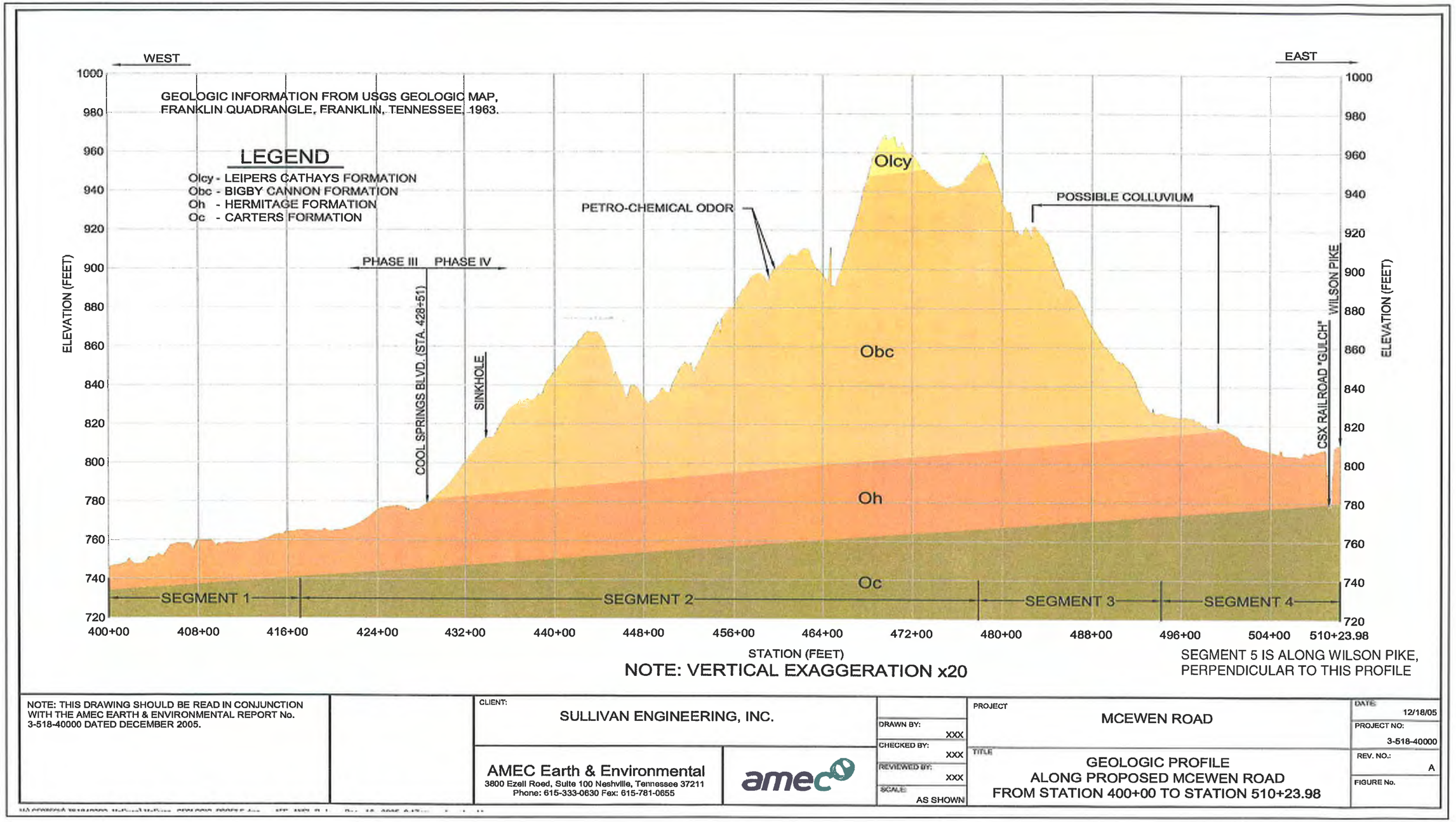
Laboratory testing was performed to characterize the soil exposed in the borings and to evaluate the existing soil's moisture condition. Specifically, selected soil samples were tested for natural moisture content and plasticity characteristics. In addition, one bedrock sample was tested for unconfined compressive strength. The results of laboratory tests are included in Appendix 2.

4.0 GEOLOGIC SETTING

Published geological literature indicates that three geologic formations are present along the proposed McEwen Road alignment. The *Geologic Map of the Franklin Quadrangle, Tennessee, 1963*, indicates these formations, from oldest to youngest, are the Hermitage Formation, Bigby-Cannon Limestone, and the lower limits of the Leipers and Catheys Formation, which are all Ordovician Age (438-million to 505-million-years before present) formations. The bottom of the CSXT railroad cut may also penetrate to the top of the Carters Formation, but that formation is unlikely to affect the proposed construction.

The bedrock formations that underlie the proposed alignment, from west to east, include the Hermitage Formation along Wilson Pike and west along McEwen Road to approximately Station 500+00. Bigby-Cannon Limestone is mapped from approximately Station 500+00, west to approximately Station 479+00; from Station 478+00 to Station 473+00; and from Station 466+00, west to about Station 429+50. The Leipers and Catheys Formation is mapped from about Station 479+00 to Station 478+00 and from about Station 473+00 to Station 466+00.

ATTACHMENT G - ADDENDUM 1



NOTE: THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE AMEC EARTH & ENVIRONMENTAL REPORT No. 3-518-40000 DATED DECEMBER 2005.

CLIENT: SULLIVAN ENGINEERING, INC.

DRAWN BY: XXX
CHECKED BY: XXX
REVIEWED BY: XXX
SCALE: AS SHOWN

PROJECT: MCEWEN ROAD

DATE: 12/18/05
PROJECT NO: 3-518-40000
REV. NO.: A
FIGURE No.

TITLE: GEOLOGIC PROFILE
ALONG PROPOSED MCEWEN ROAD
FROM STATION 400+00 TO STATION 510+23.98

AMEC Earth & Environmental
3800 Ezell Road, Suite 100 Nashville, Tennessee 37211
Phone: 615-333-0630 Fax: 615-781-0655

Figure 2 Geologic profile

The Hermitage Formation is again mapped west of about Station 429+50 to the west end of the project. The approximate geologic section is superimposed on the profile of the proposed road as shown on Figure 2. This geologic section illustrates our interpretation of the published geologic information as it applies to this project; however, contacts between formations are approximate and, in most cases, have not been confirmed by the borings.

4.1 The Hermitage Formation

The Hermitage Formation consists of a Coquina facies, laminated argillaceous limestone facies and Curdsville Limestone Member. The Coquina facies (uppermost facies) is limestone (thickness range from 10 to 20 feet) with disseminated silt and shale partings, medium gray to brownish-gray, medium-bedded, and characterized by numerous brachiopod shells. The laminated argillaceous limestone facies (middle facies) is silty to sandy, medium-gray to dark gray (weathering to pale to dark yellowish-brown), very fine to medium grained, laminated to thin–bedded with thin shale partings (thickness range from 40 to 75 feet). The Curdsville Limestone Member (at the base) is medium to dark-gray, fine to medium grained, thin-bedded with thin shale partings and is fossiliferous (thickness range from zero to five feet). The Hermitage ranges from 50 to 100 feet in total thickness.

4.2 The Bigby-Cannon Limestone

Atop the Hermitage Formation is the Bigby-Cannon Limestone, which consists of three facies in the Franklin quadrangle; the Cannon limestone facies, Dove-colored limestone facies, and Bigby limestone facies, which replace each other laterally and vertically. The Bigby comprises the upper and lower parts of the formation, whereas the middle part includes all three facies.

The Cannon limestone facies is medium dark-gray to brownish-black, microcrystalline to medium-grained, thin to medium-bedded, evenly bedded (composite thickness 10 to 40 feet). The Dove-colored limestone facies is medium light gray to medium gray, weathering to a characteristic light gray surface. The limestone is cryptocrystalline, medium and evenly bedded, brittle, breaking with pronounced conchoidal fractures (concave curved surfaces), and contains specks and stringers of clear calcite (composite thickness five to 30 feet). The Bigby limestone facies is calcarenite (formed of calcareous particles), medium light gray to brownish-gray, coarse-grained, medium-bedded, cross-bedded, containing brown phosphate pellets and weathers to a brown phosphatic clayey residuum (composite thickness 60 to 100 feet). The Bigby-Cannon ranges from 70 to 130 feet in total thickness.

4.3 The Leipers and Catheys Formation

Overlying the Bigby-Cannon Limestone is the Leipers and Catheys Formation. The Leipers and Catheys Formation is characterized by limestone that is argillaceous, nodular and shaley, medium dark-gray to brownish-gray, fine-grained, thin-bedded, and fossiliferous. The dark-gray limestone weathers to pale yellowish-brown and is fine grained, thin-to medium-bedded. The calcarenite is medium light gray to brownish-gray, coarse-grained, medium-bedded, cross-bedded, phosphatic, weathering to brown phosphatic clayey residuum. Thin zones of limestone, clayey, medium-gray, weathers to light gray surface are crypto crystalline, medium-bedded, breaking with conchoidal fracture. At the base, the formation is shaley limestone or calcareous shale, olive-gray to yellowish-brown, fine-grained, typically containing large numbers of bryozoans. The Leipers and Catheys ranges from 20 to 300 feet in total thickness.

5.0 SURFACE AND SUBSURFACE CONDITIONS

The subsurface conditions for the proposed McEwen Road alignment and Wilson Pike can be divided into five distinct segments with unique characteristics. For this reason, surface and subsurface descriptions of each segment will be discussed together in the following sub-sections. The limits of the segments are shown on Figure 2.

5.1 Segment 1

Segment 1 is within Phase III, which extends from the intersection of Carothers Parkway at about Station 200+00 (eastbound lanes) / 300+00 (Westbound lanes), east to Stations 221+28.14 / 321+35.10, respectively. Those Stations match the next portion of the alignment at Station 398+50 and extend to about Station 417+00. This segment straddles the existing roadway for the first 3,350 feet and is then generally located north of the existing roadway for the remaining 650 feet of the segment. A natural gas pipeline is situated along the northern edge of the existing roadway throughout this segment. A high tension power line crosses the alignment at about Station 408+00.

Segment 1 was explored using test pit excavations. Specifically, eleven Test Pits, III-83 through III-91, are located in Segment 1. Portions of this segment were not explored because the current land owners denied AMEC permission to perform excavations within their property. These areas include the area west and south of the South Prong of Spencer Creek, and west of Station 402+00, south of the existing pavement.

5.1.1 Surface Conditions

The ground surface generally consists of bottom land with weeds, brush, and small trees. Most of the land in this segment has been tilled, graded, or similarly disturbed. Shot rock fill is present at the surface beneath the high tension lines and westward to the new entrance drive to Liberty Park at about Station 406+50. The ground surface appears to have been stripped of topsoil east of the high tension lines (north of the old pavement), and may have been a borrow source in the recent past. The South Prong of Spencer Creek crosses the proposed westbound lane alignment at about Station 303+00, runs between the east- and west-bound lanes for about 700 feet, and then crosses the eastbound lane at about Station 210+00; water flow in the creek is from east to west, but the creek was dry during our field activities.

The Natural Resources Conservation Service (NRCS formerly SCS) has mapped several of the soil types in Segment 1 as 'alluvium' and/or 'colluvium.' Section 7.1.2 of this report should be reviewed regarding those soils.

5.1.2 Subsurface Conditions

Due to the recent geologic history and previous land uses of this portion of the alignment, the subsurface conditions are somewhat chaotic throughout the interval. Four of the test pits had no 'topsoil' interval because of previous grading or the presence of a fill interval at the ground's surface. In general, where topsoil is present, there is a three to six inch thick interval that averages five inches in thickness. Six of the test pits (III-84, 85, 87, 88, 89, & 91) encountered an interval of fill, either at the ground surface or beneath the surface topsoil interval. The fill extended to depths of between one-half feet to four feet below the existing ground surface where it was detected. One test pit (III-88) encountered refusal within an interval of shot rock fill. Two of the test pits (III-84 and 87) detected an interval of topsoil buried beneath a fill interval. Three test pits (III-83, 84, & 85) encountered an interval of recent alluvium beneath the topsoil interval.

Underlying the upper various fill, alluvium, or topsoil intervals, undisturbed, silty clay soil (either residuum or derived from ancient colluvium or ancient alluvium) extends to test pit termination depths or to test pit refusal depths. In addition to the test pit that refused in the shot-rock fill, four test pits (III-83, 85, 87, & 91) encountered refusal upon limestone bedrock.

Localized areas within this segment were not explored, especially beneath the existing roadway subgrade and near the natural gas transmission pipeline, and those areas are expected to contain intervals of fill (possibly uncontrolled).

5.1.3 Groundwater

Groundwater was not encountered in the explorations within Segment 1. Based on the topographic setting and our experience, we believe that the true groundwater table occurs below the depths explored. As such, groundwater influence on the proposed construction should be minimal. However, it is possible that groundwater levels may be higher at other times of the year or after prolonged periods of precipitation. Furthermore, perched water could be encountered within the soil interval, depending on the weather at the time the work is performed as well as the specific composition of the soil material.

5.2 Segment 2

Segment 2 extends from about Station 417+00, east to Station 478+00. Segment 2 is predominantly within Phase IV, but it includes a portion of Phase III from Station 417+00 east to about Station 428+51.80, which is the center of the rotary at the Cool Springs Boulevard intersection and the end of Phase III. This segment is generally located north of the existing roadway. Thirty-one borings and five test pits are located within Segment 2.

5.2.1 Surface Conditions

The ground surface generally consists of a thin interval of topsoil interspersed with bedrock ledges. Four ruins and several debris piles are present within the proposed ROW (See Photo 2, Appendix 1). A natural gas pipeline is situated generally south of the proposed centerline (north of the existing pavement) for most of the segment. Several drainage features, which apparently transport surface drainage from north to south, transect the proposed alignment.

A surficial expression of a karst feature (sinkhole) was observed 20 feet right of the centerline near Station 434+40 at about elevation 820±. The dropout was approximately 20 feet in diameter and approximately eight feet in depth. The soils within Segment 2 are mapped by the NRCS as 'rockland' or identified as soil derived from phosphatic limestone and including abundant rock. Section 7.1.2 of this report should be reviewed regarding those soils.

5.2.2 Subsurface Conditions

In general, Segment 2 may be characterized as having a thin to absent interval of topsoil (average five inches in thickness) that overlies a thin to absent interval of decomposed rock fragments mixed with silty clay residuum. Twenty-nine of the 31 borings and four of the five test pits in Segment 2 encountered refusal; two borings (IV-20 and 21) and one test pit (IV-2) were terminated with no refusal. The borings were extended to refusal, either at the ground surface (at five locations) or through the residuum/ decomposed rock that, at the boring locations, varied from 0.0 feet to 16.1 feet below the existing ground surface. Boring refusal depths averaged about 2.8 feet below the existing ground surface. Localized areas within this segment, especially portions of the existing roadway subgrade and the backfill for the natural gas pipeline, apparently consists of shot rock fill. One boring (IV-38) refused within an interval of shot rock fill and was not cored.

Twenty-three of the borings within this segment were cored to evaluate the quality and consistency of the refusal material and to evaluate the grading and slope requirements for the proposed road cuts. Generally, the sandy, silty, limestone bedrock is weathered to an average depth of about 15 feet below the existing ground surface and the rock quality designation (RQD[1]) values within the weathered interval ranged from 0% to 110%, and averaged 53% (Fair). Below a depth of about 15 feet below the existing ground surface, RQD values ranged from 40% to 104% and averaged 88% (Good) at the locations explored.

Borings IV-24 (Station 459+50, 55 feet left) and IV-25 (Station 461+00, 55 feet left) encountered an interval of porous, fossiliferous limestone that apparently contains some petrol-chemical like, odoriferous material at depths ranging from about nine feet to 16 feet below the existing ground surface within the bedrock interval. The odoriferous rock was found between five- and nine-feet beneath the top of bedrock, but within the proposed cut at that location. The odor could be detected up to 70 feet away during drilling. Upon completing each of those borings, they were immediately grouted with *Sure Gel* Bentonite. Portions of the odoriferous core were crushed and submitted for environmental tests in accordance with the guidance provided by the environmental consultant, Mr. Monte McDonald of The McDonald Company. Reports and test results resulting from the environmental aspects of the project, if any, will be provided by Mr. McDonald under separate a cover.

5.2.3 Groundwater

No groundwater was detected during the drilling within Segment 2. However, water was used as a drilling fluid to core the bedrock where required. Water return during coring was monitored and water losses (depth and percent lost) are noted on the boring logs where experienced; likewise, drill water return and the depth that the drill water pooled after completing the boring was recorded, where experienced. While water (probably residual drilling fluid) remained within several of the borings of Segment 2 upon completion of those borings, we believe that no permanent groundwater layer was penetrated.

5.3 Segment 3

Segment 3 runs from approximately Station 478+00, east to approximately Station 494+00 and contains the frontage road. Within this portion of the alignment, Segment 3 generally straddles, or is north of, the existing roadway. Utilities within this segment include a natural gas transmission line and four inch diameter PVC waterline to Station 488+00 and a two-inch water line to Station 478+00 that services three homes; the underground utilities are all north of the existing pavement. Overhead electrical and telephone lines to the north and south of the existing roadway also service the homes.

Seven borings are located within Segment 3; four of the seven borings were drilled to refusal and two were cored. Boring IV-52 was terminated when it hit a miss-located water line. Mr. Mark R. Davis and Mr. William Johnson, Jr. refused access to their property for drilling purposes from Station 483+00 to Station 487+50 along the proposed ROW as well as for the frontage road.

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[1] RQD is a measure of bedrock continuity and degree of fracturing. It is the ratio of the sum of the core sections 10-cm or longer divided by the total length of the core run. RQD is expressed as a percentage. 0 to 25%= Very Poor; 26% to 50%= Poor; 51% to 75%= Fair; 76% to 90%= Good; 91% to 100%= Excellent.

5.3.1 Surface Conditions

Vegetation within Segment 3 is predominantly grass covered lawns, but includes several stands of trees, especially at the toe of the existing roadway embankment slope at the eastern end of the segment. South of the existing roadway, the ground surface is generally brush covered. Numerous 'floaters' (boulder fragments separated from the bedrock) were visible at the surface along the alignment in Segment 3.

The soils within Segment 3 are mapped by the NRCS as Dellrose and Armour series soils and identified as 'old colluvium' and/or 'old alluvium;' Section 7.1.2 of this report should be reviewed regarding those soils.

5.3.2 Subsurface Conditions

In general, the materials encountered at these boring locations consist of about 1two inches of topsoil. Underlying the topsoil, soil in four of the borings is identified as colluvium, which varies from depths of 4.5 to 18.5 feet below the existing ground surface at those locations. However, we note that the colluvial soil's consistencies are quite good (typically medium stiff to very stiff), even discounting the exaggeration due to the abundant rock fragments. Eight to 10 feet high, near vertical cut slopes in this colluvium are present along the existing road that has existed for 40 or more years. Underlying the topsoil or colluvium, where it is present, residual silty, sandy clay is present to boring termination or refusal depths. The depth to refusal within this segment was highly variable. Two boring (IV-41 and 43) refused at less than seven feet below the existing ground surface while three boring (IV-46, 51, & AR-75) extended to planned boring termination depths of 20, 15, and 10 feet, respectively, with no refusal. One boring (IV-42) refused at about 19 feet below the existing ground surface.

Two of the borings that encountered refusal were cored. The core obtained indicates that bedrock weathering within this segment extends to approximately 15 feet below the existing ground surface. The RQD values within the weathered interval ranged from 8% (very poor) to 78% (good) and averaged 41% (poor). Beneath the weathered bedrock interval, RQD values generally averaged 95% (excellent).

5.3.3 Groundwater

Groundwater was not encountered in the explorations within Segment 3. Based on the topographic setting and our experience, we believe that the true groundwater table occurs below the depth explored. As such, groundwater influence on the proposed construction should be minimal. However, it is possible that groundwater levels may be higher at other times of the year or after prolonged periods of precipitation. Furthermore, perched water could be encountered within the soil interval; depending on the weather at the time the work is performed as well as the specific composition of the soil material.

5.4 Segment 4

Segment 4 extends from approximately Station 494+00, east to the intersection of McEwen Road and Wilson Pike (east of the bridge over the CSXT railroad) at approximately Station 510+23. The existing roadway pavement and roadbed is generally north of the proposed centerline, but within the proposed west bound lanes. Utilities along this segment include overhead electrical and phone lines and buried water, natural gas, electric, and telephone service lines. A pipe is attached to the northern edge of the existing bridge and is present in the vicinity of the west abutment of the proposed bridge.

Ten borings were drilled within Segment 4, including the four borings for the proposed westbound bridge over the CSXT railroad cut. Nine of the ten borings encountered refusal and four were cored.

5.4.1 Surface Conditions

East of approximately Station 494+00, and extending to the existing bridge area, the surface is generally grass covered with several paved driveways. The area north of the existing road is under construction (a housing/apartment type of development). The area is mapped by the NRCS as alluvial bottomland.

5.4.2 Subsurface Conditions

Topsoil ranges from about one foot thick to about five feet thick, but averages about 1.5 feet in thickness. Below the surficial topsoil interval, residual, medium stiff to very stiff silty, sandy clay with varying amounts of rock fragments was encountered. Refusal depths within Segment 4 ranged from 6.0 feet to 13.7 feet and averaged 10.3 feet below the existing ground surface.

Bedrock core obtained from the four bridge borings consisted of variably sandy, silty limestone from the Hermitage Limestone. RQD values of the cored holes in the area of the western abutment indicate a fairly deep weathering horizon, estimated to extend to about 3two feet below the existing ground surface, with RQD values between 24% (very poor) and 76% (good) and averaging 54% (fair). Beneath the weathered bedrock horizon on the west abutment, the RQD values generally exceed 96% (excellent). The bedrock core in the east abutment appears to be only slightly weathered, with RQD values along the east abutment ranging from 72% (fair) to 100% (excellent) and averaging 89% (good).

5.4.3 Groundwater

Newmark Homes has begun construction along the northern edge of the proposed alignment. As a consequence, the ponds present on previous surveys appear to have been drained and modified to serve as storm water detention areas. The pond that was present about 100 feet left of Station 503+50 to about Station 506+00 has been drained and reportedly contains an active spring that continues to fill the detention basin. Continual water inflow within that basin was observed during our site exploration.

Water was encountered within one boring (IV-55) at auger refusal, about nine feet below the existing ground surface, on completion of the boring. The evidence of the spring north of the proposed alignment and the creek to the south indicates that groundwater or perched water conditions may be relatively shallow in Segment 4. However, we expect that groundwater influence on the proposed construction should be minimal. We note that careful design of the proposed bridge's abutments will be required in order to provide adequate drainage and to prevent long term water seepage concerns.

It is possible that groundwater levels within this segment may be higher at other times of the year or after prolonged periods of precipitation. Furthermore, perched water could be encountered within the soil interval, depending on the weather at the time the work is performed as well as the specific composition of the soil material.

5.5 Segment 5

Segment 5 extends along Wilson Pike approximately 2,200 feet from Station 600+00 north to Station 622+00, and is generally centered on the McEwen Road Bridge at about Station 611+70. Segment 5 is located just east of and parallel to the CSXT railroad cut. East of the

existing alignment, several residences front along the existing roadway. Overhead utilities; buried water and power lines; existing fences, and trees line the proposed widening project.

5.5.1 Surface Conditions

The eastern edge of the existing road is occupied by grassed lawn, with occasional trees, shrubs, and fences. The western edge is primarily weeds and scrub brush along the shoulder of the CSXT railroad cut. Eight borings were competed in Segment 5. None of the borings in Segment 5 were cored. The NRCS maps indicate that the soil in Segment 5 is predominantly Armour series (old colluvium/alluvium) with some Lindside series soils to the south.

5.5.2 Subsurface Conditions

Topsoil thickness within Segment 5 ranged from 1.0 foot to 2.5 feet, and averaged 1.8 feet thick. Below the surficial topsoil interval, silty, sandy, clay with varying amounts of rock fragments is present to auger refusal or boring termination depths. Borings WP-65 and WP-66 encountered refusal upon bedrock at 9.5 and 8.5 feet, respectively.

5.5.3 Groundwater

Groundwater was not encountered in the explorations within Segment 5. Based on the topographic setting and our experience, we believe that the true groundwater table occurs below the depth explored. As such, groundwater influence on the proposed construction should be minimal. However, as is the case along the entire alignment, it is possible that groundwater levels may be higher at other times of the year or after prolonged periods of precipitation. Furthermore, perched water could be encountered within the soil interval, depending on the weather at the time the work is performed as well as the specific composition of the soil material.

6.0 DESIGN CONSIDERATIONS

The proposed project includes a divided four-lane roadway extending from the intersection of McEwen Road with the proposed extension of Carothers Parkway (approximately 1,800 feet east of I-65) to Wilson Pike. The proposed road crosses the CSXT Railroad ROW about 2,500 feet north of CSXT Mile Post OBA-203, in the CSXT *S&NA North* Subdivision at McEwen Road Station 509+00 and connects to Wilson Pike. The single track CSXT ROW is situated in an approximately 35± feet deep cut. Photo 1 shows the exposed west face of the existing rock cut as viewed from atop the east side of the CSXT ROW.

Photo 1 - Existing McEwen Road, 2-lane Bridge

Based on traffic information provided by you, we understand that the proposed roadway will be initially subjected to an average, two-way, daily traffic (ADT) volume of 28,210 vehicles and will ultimately be subjected to an ADT of 42,910 vehicles after 20 years. Of that number, an estimated 6% will be trucks, and the remainder will be light vehicles.

We understand that the design speed limit along McEwen Road will be 45 miles per hour. We understand that the proposed bridge will consist of a single span, pre-cast and cast-in-place concrete structure, approximately 80 to 85 feet long. The structure will parallel the existing bridge and include two lanes of one way traffic and integral guard rails. The structure will be supported upon new abutments that bear upon the weathered bedrock on either side of an approximately 35 feet deep railroad ROW cut. The bridge is to be designed based upon HS-20 live loading. Based upon that loading, we understand that each abutment will support a total of about 520 kips (dead + live load).

The comments and recommendations that follow are predicated upon our experience in similar geologic settings, the design considerations stated above, and the data obtained during the current study. If the actual design criteria differ significantly from that stated above, we must have the opportunity to review our recommendations in light of the differences and offer appropriate revisions, as warranted.

7.0 COMMENTS AND RECOMMENDATIONS

7.1 Geologic Hazards

7.1.1 Seismic Considerations

Franklin, Tennessee, is located within a relatively stable seismographic area. The subject site is located at approximately Latitude 35.93177°N, Longitude 86.79160°W (Datum WGS84/ NAD83) on the *USGS Franklin, TN 7-1/2 minute quadrangle sheet*. Table 1 lists probabilistic ground motion values based upon a 2% probability of exceeding the Maximum Creditable Earthquake (MCE) in 50 years at the project site. Based on information contained in the 2003 International Building Code (IBC), Part 1615.1.1, the soil test borings, and our observations, we judge that the site generally meets the minimum requirements for Site Class B and, therefore, the seismic design information in Table 1 is applicable.

Table 1 Probabilistic Ground Motion Values

	Short Duration	**1 Sec Duration**
Period	0.2 Second	1. 0 Second
Spectral Accelerations at the site	S_s = 30.5% g	S_1 = 14.2% g
Site Class (IBC 2003, Table 1615.1.1)	B: rock	
Soil Factor for Site Class	F_A = 1.00,	F_V = 1.00
Maximum Creditable Earthquake Spectral Acceleration	$S_{MS} = F_A S_S$	$S_{M1} = F_v S_1$
	S_{MS} = 30.5% g,	S_{M1} = 14.2% g
Design Spectral Acceleration	$S_{DS} = 2/3 S_{MS}$	$S_{D1} = 2/3 S_{M1}$
	S_{DS} = 20.3% g,	S_{D1} = 9.5% g

The site is characterized by a relatively thin deposit of clay soil overlying weathered, moderately hard bedrock. The above classification and general subsurface conditions at the site indicate that soil liquefaction is very unlikely at this site.

7.1.2 Colluvium / Alluvium

Published soil data[2] indicates that several of the soils along localized portions the proposed alignment include intervals of colluvium (gravity deposited) and/or alluvium (water deposited) material. Colluvium and recent alluvium may be found in an unconsolidated state and can be prone to excessive settlement when loaded, or to sliding if graded to inclinations steeper than their current slope inclination. Some of the mapped soil units, such as the Culleoka silt loam, are known to have a surface interval of 'creep,' where the overburden soil creeps, *en mass,* down the slopes. Some portions of the site soils are mapped as Dellrose cherty silt loam, which consist of thick intervals of old colluvium (Stations 478+00 to 486+00). The slopes below the Dellrose cherty silt loam (Stations 486+00 to 489+50) are mapped as Armour silt loam, which consist of colluvium on upland toe slopes. The boring samples confirm that the site soils generally match the mapped soil types. Some portions of the proposed alignment are located within creek basins or bottom lands and have surface intervals of recent alluvium. The Armour, Huntington, Egan, and Dunning soils are typical alluvial soils. Soil Maps for Phase III and Phase IV are shown on Figure 3 and Figure 4, respectively. Descriptions of the various soil types shown in Figures 3 and 4 are included in Table 2.

Table 2 Soil Survey Soil Descriptions

Symbol	Name	Description[2]
ArB	Armour silt loam 2% to 5% slopes	Well drained soils in **old alluvium or colluvium** on upland toe slopes, fans, and stream terraces. Underlain by limestone.
ArB2	Armour silt loam 2% to 5% slopes eroded	
ArC2	Armour silt loam 5% to 12% slopes eroded	
BrC2	Braxton cherty silt loam 5% to 12% slopes eroded	Well drained cherty soils formed by phosphatic limestone in uplands; phosphatic limestone bedrock contains varying amounts of chert; few outcrops.
CkD3	Culleoka silt loam 12% to 20% slopes severely eroded	Well drained, mostly steep soils in **creep** material from soil derived from phosphatic, sandy limestone. **Creep** generally overlies phosphatic, sandy limestone interbedded with shale.
DeD	Dellrose cherty silt loam 12% to 20% slopes	Well drained, steep, cherty soil in **old colluvium** overlying clayey, phosphatic limestone.
DeE	Dellrose cherty silt loam 20% to 30% slopes	
DnB2	Donerail silt loam 2% to 5% slopes eroded	Moderately well drained to well drained soils with a fragipan and underlain by phosphatic limestone. Formed by phosphatic limestone on uplands.
Du	Dunning silt loam phosphatic	Poorly drained to somewhat poorly drained black soil on bottomlands; formed in **recent alluvium** washed from soils derived mainly from phosphatic limestone; underlain by limestone.
Eg	Egan silt loam phosphatic	Moderately well drained soils on bottom land in 16 to 30 inches of brown well drained **recent alluvium** that overlies dark, poorly drained, clayey alluvium. Underlain by limestone.
Hu	Huntington silt loam phosphatic	Deep, well drained **alluvial** soils on bottom land. In some places contains strata of gravel, sand, silt and clay in lower profile. Underlain by phosphatic limestone.
HbC2	Hampshire silt loam 5% to 12% slopes eroded	Shallow to deep well drained clayey soils on uplands or just below the transition zone between the inner and outer central basin; outcrops of limestone common.
HbD2	Hampshire silt loam 12% to 20% slopes eroded	
Lp	Lindside silt loam, phosphatic	Moderately deep to deep, moderately well drained soil in depressions along small drains and on first bottoms; underlain by limestone.

[2] *Soil Survey, Williamson County Tennessee*, USDA, TAES Series 1961, N0 5, August 1964, ppg 82-103.

Symbol	Name	Description[2]
MbC2	Maury silt loam 5% to 12% slopes eroded	Deep well drained soils on uplands of the outer central basin. Formed by phosphatic limestone. Underlain by phosphatic limestone.
MoD	Mimosa and Ashwood very rocky soil 5% to 20% slopes	Soils with outcrops of phosphatic limestone covering from 10% to 50% of the surface; soil material between outcrops ranges from a few inches to several feet in thickness and is mostly clay.
Rc	Rockland	Outcrops of rock occupy 50% to more than 90% of the surface. Rocks are mostly limestone but areas of shale and cherty limestone are included.
StC2	Stiversville silt loam 5% to 12% slopes eroded	Deep to moderately deep well drained soils on uplands of the outer central basin; formed from phosphatic, sandy limestone interbedded with shale. Sandy fragments on surface and throughout profile generally increase in size and amount with depth. Underlain by interbedded sandy limestone and shale.
StD2	Stiversville silt loam 12% to 20% slopes eroded	

Bottom lands with alluvial deposits are found in relatively large areas from about Stations 202+00 to 216+00, Stations 398+00 to 417+00, Stations 448+00 to 453+00, and Stations 494+00 to the end at Wilson Pike, as well as minor extents where streams cross the proposed alignment (Stations 422+00 and 465+00).

7.1.3 Karst/ Sinkholes

The published geologic literature indicates that the site is underlain by limestone formations that can potentially form sinkholes, caves, and underground water courses. Generally, limestone weathers to form a cohesive clay soil interval overlying an irregular bedrock surface. Further, it is not unusual to find voids within the bedrock system and at the soil-bedrock interface. None of the borings encountered very soft, residual soil that would indicate loss of ground and none of the borings encountered voids.

One closed topographic depressions was identified as a sinkhole within the site (near Station 434+40, 20 feet right) by our geologist (see Photo 1 in Appendix 1). No other signs of karst related distress were observed. However, removal of the upper layers of overburden during site grading often exposes discontinuities and highly permeable zones within the soil profile. Consequently, the rate of surface water infiltration can increase and, in turn, may increase the potential for sinkhole formation. However, we believe the risk of future sinkhole development is not any greater than at similar sites in the middle Tennessee region. These risks can be reduced by prudent design and construction methods, but they cannot be eliminated.

7.2 Site Preparation

7.2.1 General

Segments 1, 4, and 5 are predominantly areas that require fill to achieve finished grade. Segments 2 and 3 are currently situated as 'side hill' types of alignments that will require both cut and fill to achieve finished grades. Furthermore, some portions of the alignment within Segments 2 and 3 cross minor side valleys, and therefore, those portions will be primarily fill embankments. Portions of Segment 2 are located in areas of shallow bedrock, so the cuts within that segment will generate shot rock and shot rock mixed with soil. The borings indicate that the overburden thickness within Segment 3 is highly variable. Furthermore, the NRCS mapping indicates, and the borings confirm, that colluvial soil is present in significant thicknesses within portions of the proposed alignment.

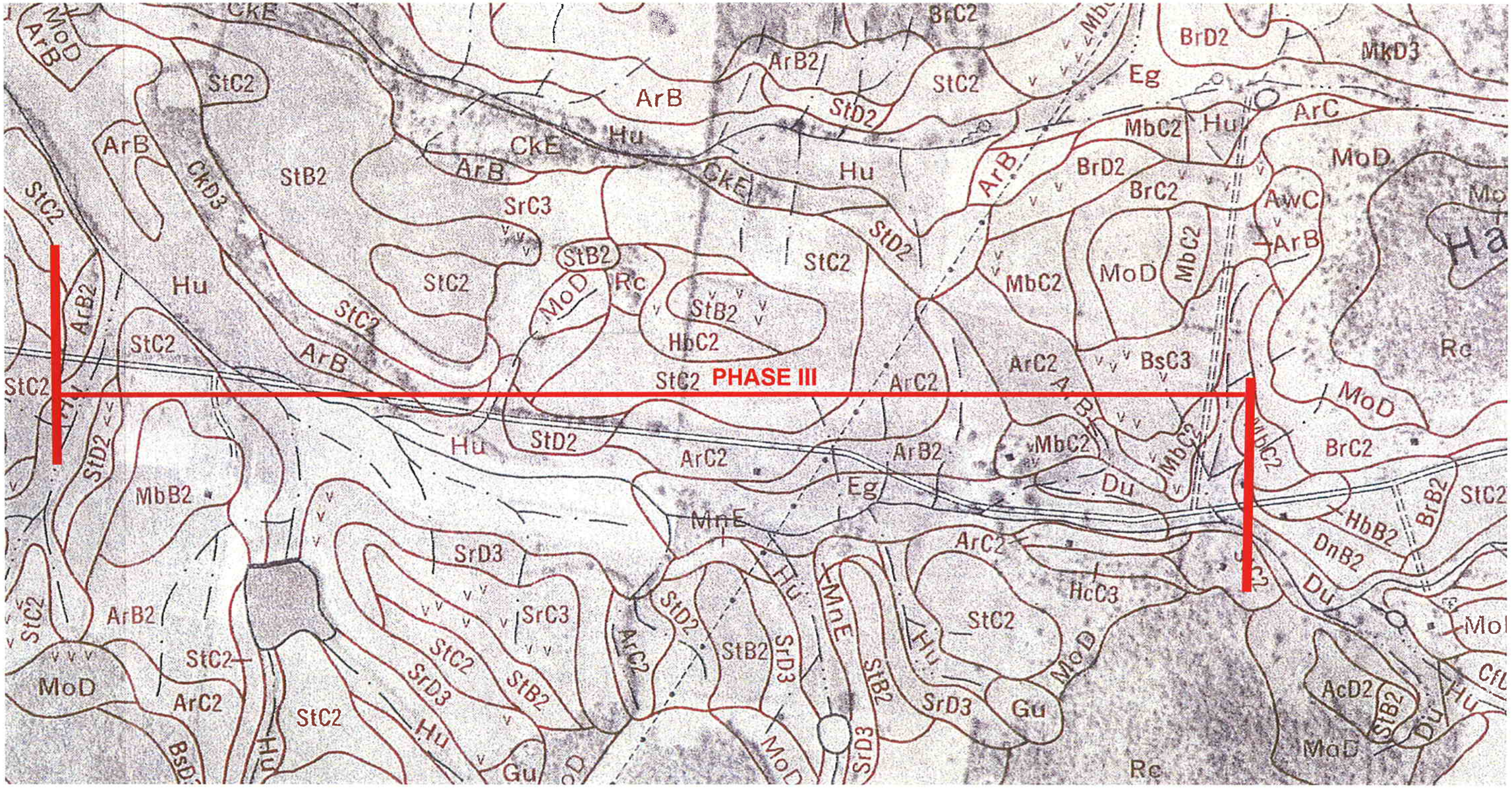

Figure 3 Soil Map of West Half (Phase III) of McEwen Road

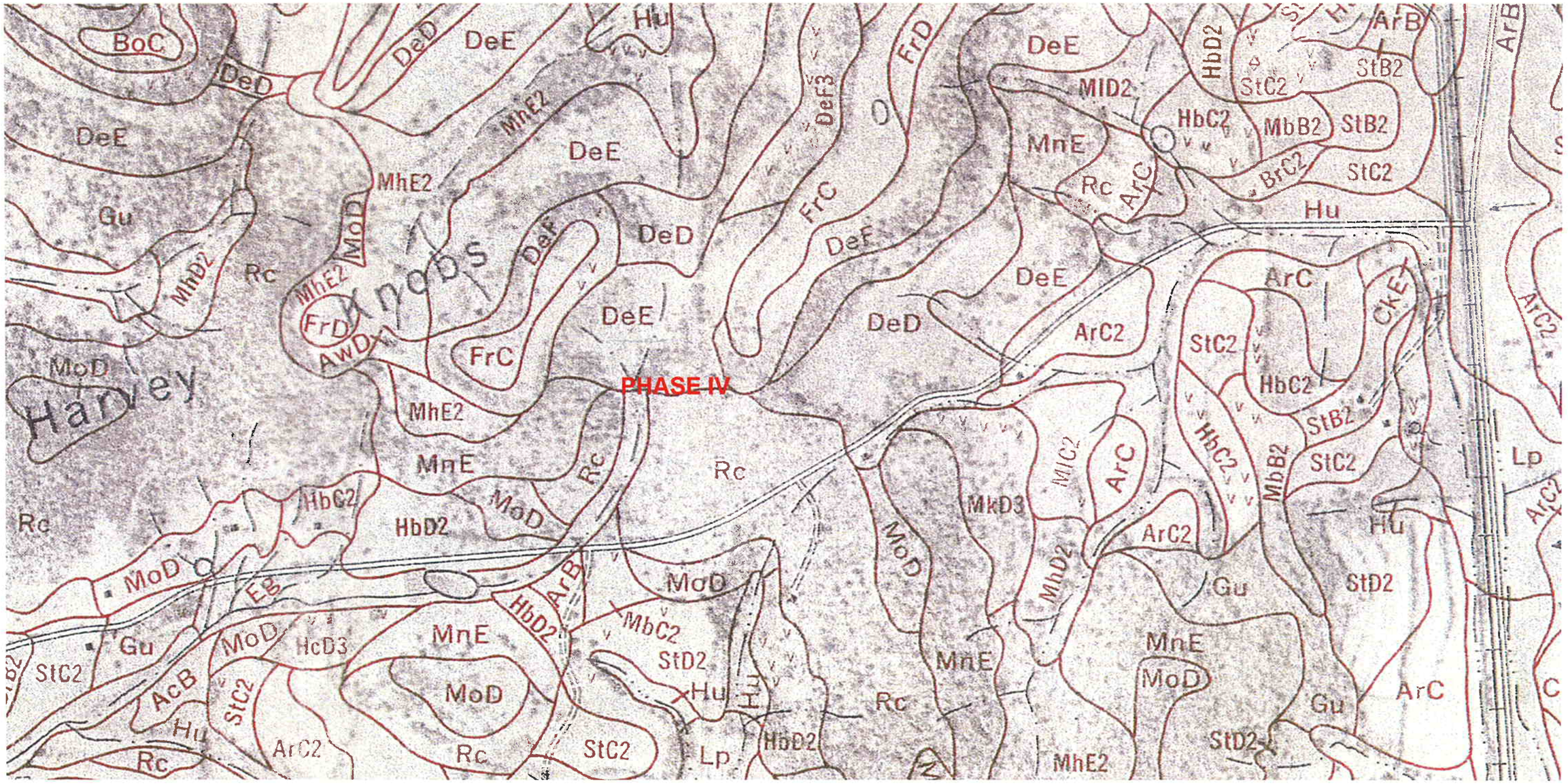

Figure 4 Soil Map of East Half (Phase IV) McEwen Road

Due to the variation in refusal depths, we expect that the majority of the material generated in cuts within Segment 3 will consist of soil with varying amounts of rock and boulders. The soil generated from the cuts should be suitable for reuse as engineered fill, however, boulders and rock fragments larger than about one feet (longest dimension) should be separated and either broken up with a hoe-ram and added to shot-rock fill from other segments or disposed of off site.

7.2.2 Stripping and Grubbing

Within proposed paved roadways, topsoil and organic material, including tree root balls, must be removed from an area extending at least five feet beyond the limits of construction. The soil subgrade must be proofrolled and, if necessary, repaired in the manner described in Section 7.2.3. In general, the data indicate that the subgrade will be sufficiently stable to support the roadway and fill placed to achieve finished grade. However, we anticipate that there will be areas, such as stream crossings and bottomlands, and other isolated spots where pockets of loose or soft soil could be encountered that require undercutting. In addition, the need for undercutting will undoubtedly increase if the work is performed during wetter seasons of the year.

7.2.3 Undercutting

Based upon the boring information, the presence of soft soil is indicated in the eastern portions of the project within isolated areas that are east of about Station 501+00 (Borings IV-58, 60, & BR-63). Some soft soils were also noted in the borings along Wilson Pike at Boring locations WP-65 to 68 and Boring WP-74. A few of those borings (Borings IV-57, 60, and WP-65) show soft soil that is well below the existing ground surface and within areas proposed to receive fill. Those areas should consolidate during construction and not affect construction activities, except for possible utility excavations and the like. However, many of the soft soil intervals (at Borings BR-63, WP-66, 67, 68, & 74) were found to be near the existing ground surface and will likely require undercutting or stabilization prior to placing engineered fill atop them. Additionally, there are likely to be other areas of soft surface soil within areas not yet explored, such as the areas from Station 200+00 to 221+28±, south of the existing McEwen Road and from Station 482+50 to Station 489+00, including Access Road A.

In lieu of undercutting excessive quantities of soft soils to great depths, unstable areas that are detected during grading operations can be stabilized by using engineering fabric in combination with dense graded aggregate base (DGA) to achieve subgrade stability. Based on our experience, we expect that a geotextile, similar to Mirafi 500X, placed over the unstable area and covered with a minimum one foot thick interval of DGA base, will produce a sufficiently stable subgrade upon which the engineered soil fill can be placed and compacted. Where such a treatment is required, the geotextile and stone treatment should extend at least five-feet beyond the limits of the unstable soil.

7.2.4 Engineered Soil Fill

Engineered soil fill placed within the proposed paved areas to repair undercuts or to achieve the required subgrade elevation should be compacted to at least 95% of the soil's maximum dry density as per ASTM D698 (standard *Proctor*), except for the top 1two inches which should be densified to 98% of that same index. Cut areas in soil should be scarified at least six inches deep and recompacted to 98% of the standard *Proctor*.

Organic-free soil that is derived from on-site excavations and that contains no debris, rocks larger than 12 inches in maximum dimension, and other objectionable material will be suitable

for use as engineered fill. However, prospective grading contractors should be made aware of the fact that some of the on-site soils are highly plastic and may require greater than normal effort in order to facilitate the placement and compaction processes. If off-site, soil borrow is required to achieve the required subgrade elevation, it should consist of soils having a liquid limit (LL) of less than 40 and a plasticity index (PI) of less than 25. Further, the soil must be free of vegetation, roots, debris, rocks larger than six inches in maximum dimension, and other objectionable material. All soil used as engineered fill should be moisture conditioned to within ± 2% of the soil's optimum moisture content. All borrow sources must be tested and approved by the geotechnical engineer before that soil can be used as fill.

7.2.5 Engineered Shot Rock Fill

Shot rock fill should consist of well-graded shot rock having a maximum fragment size of 24 inch. Occasional large fragments (boulders) may be worked into the fill provided that they are spaced far enough apart to adequately compact fill between them. Shot rock fill must be reasonably free of soil and should generally include a range of particle sizes from 24 inch downward to one inch in the maximum dimension. The shot rock fill should have no more than 10% material finer than ¼ inch, including soil, or as determined by the engineer. Shot rock fill should be placed in maximum 36 inch thick lifts and systematically bladed and worked by heavy tracked equipment until stable.

Each lift of shot rock fill must be compacted with heavy, steel-wheeled vibratory compaction equipment or heavy tracked equipment. Conventional compaction testing is generally not appropriate for shot rock fill. Therefore, the amount of compactive effort (i.e., number of passes) required must be determined in the field by the engineer. In any event, a sufficient number of passes should be made to densify the material and produce a stable, uniform mass; we recommend that at least five complete passes with the compactor be required.

7.2.6 Sinkhole Repair

During the field work, one suspected sinkhole was observed near Station 434+40. Because the feature is located in a proposed cut area, it is likely that it may be significantly altered by the proposed excavation. We expect that the cut will include the bedrock surrounding and extending several feet beneath the sinkhole's throat. Depending upon the condition of the feature after excavation, we suspect that repair efforts will need to include cleaning the throat of loose soil, rock fragments, and debris and then backfilling with clean gravel or cobbles of a size sufficient to choke off loss of fine particles while still allowing water to flow. Subsequently, finer gradations of gravel and geotextile filter material may be necessary to complete a filter. In any case, the sinkhole must be remediated in accordance with the Tennessee Department of Environment & Conservation (TDEC) regulations. More specifically, such remediation would follow requirements and might include installation of a reverse filter in accordance with a Class V Underground Injection Well Permit. Such a filter would likely consist of open graded gravel packed into the exposed opening with a geotextile filter fabric covering the opening and surrounding area.

7.3 Slopes

In general, the permanent fill and/or cut slopes in soil should be no steeper than 2.5 horizontal to 1-vertical (2.5:1). If slopes are to be routinely maintained (mowing, etc.), a flatter slope, such as 4:1, or flatter, is desirable. Fill slopes constructed of clean, well graded shot rock fill (not including a veneer or cover) can be as steep as 1.5:1. These slope inclinations are based upon a factor of safety of at least 1.5 with respect to effective stress soil strength parameters.

However, portions of the alignment will include slopes in bedrock as well as slopes in colluvial soil. Those conditions require special considerations as noted hereinafter.

7.3.1 Temporary Slopes

Vertical cuts in soil are usually unstable and present a significant hazard because they can fail without warning. Therefore, temporary construction slopes in soil up to 15 feet high should not be inclined steeper than 1.5 horizontal to 1.0 vertical (1.5H: 1V), or they should be braced, and excavated material should not be placed within 15 feet of the crest of any excavated slope. If the Contractor wishes to use temporary slopes for cuts deeper than 15 feet with inclinations steeper than indicated herein, per OSHA regulations, they must designed and sealed by a licensed, professional engineer.

Unbraced excavations may experience some minor localized instability (i.e., sloughing). To mitigate sloughing, all excavated slopes should be covered with polyethylene for protection from rainfall and moisture changes. Also, runoff should be diverted away from the crest of excavated slopes to prevent erosion and sloughing. Trench excavations and slope construction should proceed with caution and the stability of trenches and slopes during construction should be the responsibility of the contractor. The contractor should comply with all aspects of 29 CFR Part 1926, *OSHA Standards - Excavations; Final Rule* to protect workers.

7.3.2 Cut Slopes in Rock

Cut slopes in rock may be line drilled and pre-split to provide a clean, aesthetic appearance and to reduce spalling and exfoliation that may be caused by over-break during blasting (see Photo 3, Appendix 1). However, much of the upper portions of the bedrock will likely include weathered joints and soil seams, thus requiring scaling of loose rock fragments and unstable hanging boulders. Therefore, we suggest that a rock cut inclination of ½ (horizontal) to 1 (vertical) may provide better long term control and maintenance of fractured, weathered bedrock than a near vertical (0.1:1) rock cut.

The larger joints should be cleaned of excessive soil and may be dressed with properly designed, reinforced shotcrete facings or cut stone masonry facades. The design of such facades must include installation of adequate drainage appurtenances and structural anchors for the facade. The overburden soil above the rock cuts must be cleared a minimum of 10 feet from the edge of the cut face to prevent erosion and soil sloughing over the shoulder of the cut. Ideally, drainage from above the cut should be collected and directed laterally above the cut face. The soil overburden above the cut slope should be sloped no steeper than 2:1 or should be supported with retaining walls (such as gabion walls). Near vertical cut slopes in bedrock must be provided with a rock fall catchment area at the toe of the cut. Tennessee Department of Transportation (TDOT) guidelines indicate the minimum catchment of 18 feet wide (measured from the edge of pavement to the toe of the cut) is appropriate for all of the rock cut in this project.

7.3.3 Cut Slopes in Colluvial Soil

Cutting colluvial soil to create a permanent slope steeper than the natural slope inclination is not recommended because such soils can collapse suddenly or creep over extended time periods due to their weak internal structure. Typically, colluvial soil must be supported by retaining walls or reworked to densify the soil. Several areas within the proposed alignment are identified by both the explorations and by published information as containing intervals of colluvium up to depths of 18 ½ feet. Specifically, three borings within Segment 3 at Station 479+00, 55 feet left; Station 482+00, 47 feet left; and Station 489+50, 10 feet left (all north of the existing pavement),

contain soil identified as colluvium. We suspect that the portion of the alignment from Stations 483+00 to 489+00, as well as the frontage road (Stations 3+20 to 9+75), also includes a significant interval of colluvium, but the property owners there did not allow us to perform explorations on their property. We recommend that, once access to that portion of the ROW is available, additional explorations be performed to evaluate whether or not colluvium is indeed a concern for that part of the site.

Typical methods of remediating colluvium vary depending upon the depth of the problem soil. Shallow intervals (three feet or less) of colluvium can be economically removed and/or reworked to a denser, more stable configuration. We have not yet identified an area with a shallow interval of colluvium within the portions of the site explored so far.

Intermediate thicknesses of colluvium (from three to about 15 feet thick) within cuts can be supported with retaining walls, provided the foundation soils are strong enough to support the retaining system. Areas with an intermediate thickness of colluvium were noted near Station 479+00, 55 feet left (Boring IV-42) and Station 489+00, 10 feet left (Boring IV-51).

Deep intervals of colluvium (over 15 feet thick) may require deeply founded retaining systems with tie back anchors into bedrock. Deep intervals of colluvium were noted at boring locations IV-46 (Station 482+00, 47 feet left) and AR-75 (Station 481+80, 160 feet left).

Based upon the explorations performed to date, it appears that the colluvial deposits of concern are located primarily in Segment 3, on the east facing slope of Seward Hills (approximately Stations 480+00 to 495+00).

Colluvium that underlies fill portions of the alignment is also subject to bearing capacity failures and excessive settlement. Such intervals, if they are deep, can be surcharged to densify them prior to final grading or, if they are relatively thin, they can be undercut and recompacted. Other methods such as stone columns, dynamic compaction, etc. are also possible remedial methods.

7.4 Retaining Walls

7.4.1 Retaining Walls to Diminish Slope Cuts and Fills

We recommend that you consider supporting some portions of the alignment slopes using retaining walls to reduce the volume of cut and fill and the excessive run-out of slopes (i. e., terminating a fill slope by crossing the bottom of a valley or a cut slope by cutting past the crest of the hill). For example, a fill wall can be used on the right side between approximately Stations 470+00 to 476+50 (650-linear feet). The maximum exposed height of the fill wall is estimated to be about 4three feet (depending upon the final alignment of the road and wall). Also, a cut wall can be used on the left side between approximately Stations 471+50 to 474+50 (300-linear feet) because the bedrock conditions on the left side (as indicated by the borings) appear to degrade. Both the depth to rock increases and the rock quality diminishes east of approximately Station 471+50. The final location of the cut wall depends upon actual bedrock conditions. The maximum estimated exposed height of the cut wall would be about 25 feet.

7.4.2 Retaining Walls in Colluvial Areas

Our experience in Williamson County, is that colluvial soils rarely exceed soil strength parameters with an effective cohesion (c`) of 0 psf and an effective angle of internal friction ($\phi$`) of 18°. A ϕ` angle of 18° is an approximately 3:1 angle-of-repose (factor of safety of about 1.0). To achieve a recommended minimum factor of safety of 1.5 with $\phi$` = 18°, a slope inclination of about 5:1 is required. For retaining wall design, an effective angle of friction of about 18°

indicates an active earth pressure coefficient (k_a) of 0.50, an at-rest earth pressure coefficient (k_o) of 0.70, and a passive earth pressure coefficient (k_p) of 1.90.

Similar to the situation above to reduce the volume of cut and fill, we recommend that you consider supporting excavations in the areas of colluvial soils using cut walls. These cut walls are recommended because the colluvium cannot be expected to remain stable if the slope inclination is increased. Specifically, based upon the currently available information, the walls may be located between approximately Station 477+50 to Station 480+50 (300-linear feet) on the right side and from approximately Station 476+50 and Station 491+50 (1,500-linear feet) on the left side. The maximum exposed height of the proposed cut walls are estimated to be about 17 feet on both the right and left (depending upon the final alignment of the road and wall). At those locations, the colluvium is estimated to be on the order of about 20 feet thick with bedrock presumed to be between 15 and 25 feet below the existing ground surface. The estimated colluvium depth is based on the closest available borings and is subject to verification once access to previously unexplored areas is available.

7.4.3 Fill Walls (Non-colluvium areas)

In general, conventionally designed, cast-in-place, concrete, cantilever retaining walls are most economical when used in areas that require filling to achieve grade. Conversely, conventional cantilever retaining walls tend to become uneconomical when the height of the wall exceeds about 30 feet. Therefore, due to the estimated height of the proposed wall, the fill wall on the right side at approximately Station 470+00 to Station 476+50 should probably consist of a mechanically stabilized earth (MSE) wall (e. g., Reinforced Earth® - see Photo 2, or similar brand). The wall may be tiered or a single face. The design of major retaining walls for this project is beyond our current scope of work.

Photo 2 - Ashlar Stone Reinforced Earth Wall

The backfill used within the reinforced zone of MSE walls must, generally, be composed of free draining granular soil with a relatively high angle of internal friction ($\phi > 28°$) and low cohesion ($c < 50$ psf); clean sand and gravel are fill is generally considered ideal.

7.4.4 Wing Walls

Wing wall constructed as fill walls may be designed using conventional spread footings. We assess the allowable bearing capacity of the existing, on-site soil at the proposed wall location to be at least 2.5 kips per square feet (KSF). A minimum footing width of 24 inches should be specified for all foundations, regardless of loading, in order to accommodate minor subgrade inconsistency. Footings should bear at least 12 inches below finished exterior grade for confinement and for frost protection.

Freestanding walls are not restrained from moving at the top; therefore, the walls may be designed for an 'active' earth pressure condition. Provided that a zone of free draining crushed stone, as shown in Figure 5, is provided behind the wall, the walls can be designed for an active earth pressure coefficient K_a of 0.33 and a unit weight of 110 pcf for the free draining granular backfill.

The passive earth pressure developed against the face of the foundation opposes lateral loads exerted against the foundation system. If the retaining wall foundation is embedded in soil and concrete is cast 'neat' against the unformed sides of the excavation, passive earth pressure can be used to resist sliding. Passive resistance can be computed based on a passive earth pressure coefficient (K_p) of 1.90 and a unit weight of 125 pcf for the clay soil at the toe of the wall. However, if there is a chance that the soil restraining the toe (footing) may be excavated at some time in the future, passive resistance of the toe should not be used for design; a keyway may then be necessary. We assess the adhesion of the clay to the footing as 60% of effective cohesion; we recommend using a value of no more than 2.0 psi (288 psf). Additionally, lateral loads on the retaining wall will be opposed by sliding friction between the concrete and soil. A friction factor of 0.30 may be used to compute friction resistance between the concrete and the clay soil. Factors of safety of at least 1.5 and 2.0 should be included in the design analysis for horizontal sliding failure and overturning failure, respectively.

We recommend that backfill placed against below-grade and retaining walls consist of compacted, free-draining, uniformly sized stone, such as size No. 57 (as per ASTM D-448). The stone should be compacted with vibratory sled compactors and be placed in lift thicknesses not exceeding 20 inches. This wedge of stone should extend the entire height of the wall except that the upper two feet of the backfill should consist of a relatively impervious soil (see Figure 5) or pavement. The upper interval of impervious soil should be separated from the underlying stone with a geosynthetic filter fabric.

The stone backfill should be positively drained by a pipe or an outlet at the base of the wall. The

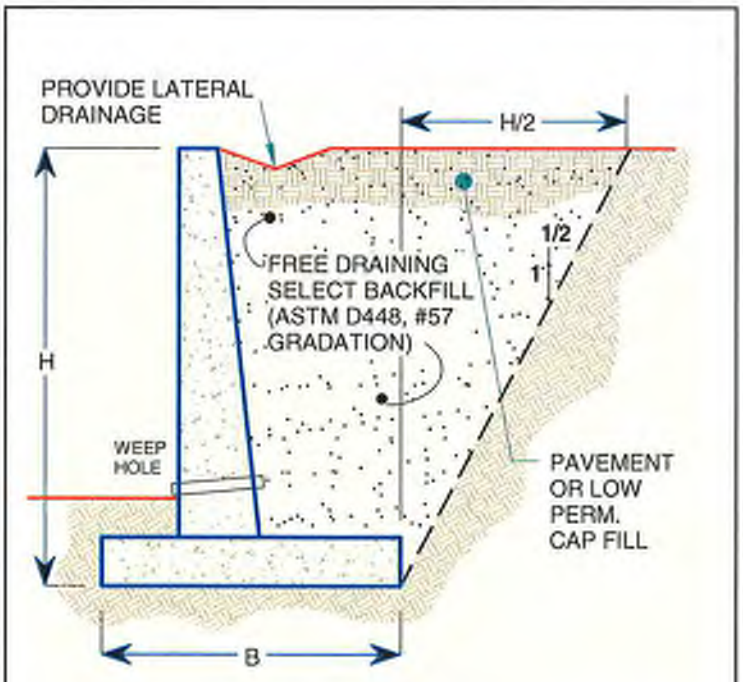

Figure 5 Retaining Wall Backfill Diagram

top of the wedge should extend outward from the wall at least equal to one-half the height of the wall. The free-draining stone is estimated to have a moist unit weight of 110 pcf. It should be noted that cohesive soil backfill, hydrostatic loads, sloping grades behind the walls, concentrated point loads, or other surcharge loads behind the wall will increase the magnitude of lateral load on the wall. Specific loading conditions should be addressed on a case-by-case basis.

7.4.5 Cut Walls

We recommend that the proposed cut walls between approximately Stations 471+50 to 474+50 on the left side, approximately Station 477+50 to Station 480+50 on the right side and from approximately Station 476+50 to Station 491+50 on the left side should consist of tied back soldier pile and lagging walls. The site conditions, which include relatively shallow bedrock and moderately tall walls (based upon the current roadway configuration), should permit installation of relatively high capacity tie back anchors. The 'lagging' can consist of textured surface, reinforced concrete, that matches the Ashlar Stone in Photo 2 (or any other texture see Photo 3) of the fill walls and covers (hides) the anchor heads. Cut walls should be designed with a bench above the wall to provide lateral drainage and access for maintenance.

Photo 3 - Raw & Faced Soldier Pile Wall

Rock Anchors

We anticipate that rock anchors will be installed at an angle, however, because the necessity for and geometry of possible walls is not well defined at this point in the design, the choice between a bar anchor system or a strand type anchors system is premature. If anchors are used, post tensioning will serve to minimize the effects of changing stresses on the wall(s).

We recommend that the permanent anchors have triple corrosion protection incorporated into their design. Anchors should be designed, installed, and tested in accordance with Post Tensioning Institute's "*Recommendations for Prestressed Rock and Soil Anchors*," 2006 edition. An allowable grout to ground bond strength of 150 PSI can be used for anchor design, subject to verification testing. A unit weight of 140 PCF should be used for the intact bedrock.

7.4.6 Drainage

Retaining walls should be provided with adequate drainage to prevent hydrostatic pressure buildup. Drainage may be provided by an interval of granular fill behind a conventional

cantilever retaining wall, weep holes, lateral drains, in-plane drainage panels, or combinations of those systems.

7.5 Bridge Foundation Design

Based upon the results of the exploration, we recommend that the foundations consist of conventional spread footings bearing at the surface of the weathered bedrock on either side of the railroad cut. We assess the allowable bearing capacity of the weathered bedrock surface to be at least 15 kips per square foot (KSF), which includes a factor of safety of 3.0 against general shear failure. We expect that adequate bearing material will be present between elevation 796 and 794 feet (between 12 and 14 feet below the existing ground surface) on both the east and west abutments. It is very important that AMEC be provided an opportunity to observe the proposed bearing surface once they are exposed and before any weathered rock is removed. Failure of the Contractor to obtain satisfactory observations by AMEC could result in unnecessary, costly foundation preparation.

We recommend that the face of the abutments be located at least three feet horizontally away from the exposed face of the rock cut at the design bearing elevation. Usually, it is necessary to provide the abutments with cast-in-place concrete leveling pads that are suitably benched into the bedrock. The leveling pad may need to extend several feet below the design bearing level, depending upon the weathering patterns of the bedrock surface.

Due to the layered/ laminated nature of the bedrock and the presence of some minor weaknesses in the upper weathered bedrock, we recommend that dowels be installed beneath the bearing surface of the abutments to key the bedrock together and anchor the abutments. The abutment dowels should consist, at a minimum, #8, Grade 60 reinforcing steel. The dowels should be installed at least eight feet into the foundation bedrock using high-strength, non-shrink grout. The dowels should be adequately anchored into the concrete of the abutment using overlaps or splices, as specified by the bridge designer, and spaced no more than three feet apart along the length of the abutment.

Because the foundation members for the proposed structure will be founded on bedrock, we expect that foundation settlement will be negligible. Specifically, we estimate that both total and differential settlement between the bridge abutments will not exceed ¼ inch.

7.6 Pavement Design

Based on the subsurface information, it appears that most, if not all, of the roadway subgrade will expose bedrock, or shot rock fill, at the finished subgrade elevation. However, some portions of the roadway subgrade may expose soil. Based on our examination of the samples derived from the exploration, we expect that portions of the roadway that expose soil will exhibit support capabilities approximately equal to a California Bearing Ratio (CBR) of 5 when compacted in accordance with the recommendation noted in Section 7.2. Portions of the roadway subgrade that expose rock, or shot rock, will exhibit support capabilities in excess of that value.

Based on a CBR of 5 as a limiting value for subgrade support, the traffic frequencies provided by you, and theoretical design lives of 10 years and 20 years, Structural Numbers of 4.79 and 5.27 were computed for the design pavement sections, respectively. Based on those values, we offer the flexible pavement sections shown in Table 3 and Table 4 for your consideration. All elements of the pavement construction should conform to the latest requirements of the

Tennessee Department of Transportation's *Standard Specifications for Road and Bridge Construction,* except as modified in the tables.

Immediately prior to installation of the mineral aggregate base course, the pavement subgrade should be proofrolled in order to detect unstable areas; any unstable areas should be repaired as previously described. To prevent the aggregate base course from being saturated, and thereby reducing the support capabilities of the subgrade, we recommend that the soil subgrade be graded to provide positive drainage away from the paved areas.

If possible, we recommend that the aggregate base course be 'day lighted' at the pavement edges. During construction of the aggregate base, in-place density tests and thickness checks should be performed to evaluate compliance with project specifications. If a significant delay occurs between installation of the aggregate base and the bituminous elements above, the base should again be proofrolled in order to confirm that no loss in stability has occurred. Ultimately, it is essential that the bituminous pavement element(s) be installed on a uniformly stable aggregate base.

Table 3 Automobiles with approximately 6% Trucks (10-Year Design Life)

Material	Compacted Thickness (Inches)	
	Option 1	Option 2
Asphalt Surface Course (Hot Mix)	1.25	1.25
Asphalt Binder Course (Hot Mix)	4.00	3.00
Asphalt Base Course	4.00	4.00
Mineral Aggregate Base Course(1)	8.00	11.00
Total	17.25	19.25

(1) Compacted to at least 98% of its maximum modified *Proctor* (ASTM D 1557) dry density.

Table 4 Automobiles with approximately 6% Trucks (20-Year Design Life)

Material	Compacted Thickness (Inches)	
	Option 1	Option 2
Asphalt Surface Course (Hot Mix)	1.25	1.25
Asphalt Binder Course (Hot Mix)	4.00	3.50
Asphalt Base Course	4.00	4.00
Mineral Aggregate Base Course(1)	11.00	13.00
Total	20.25	21.75

(1) Compacted to at least 98% of its maximum modified *Proctor* (ASTM D 1557) dry density.

8.0 CONSTRUCTION MONITORING

The satisfactory, long-term performance of cut or fill slopes, embankments, and pavements depend upon the quality of construction, especially as they relate to the geotechnical engineering aspects of the project. You should recognize that unanticipated or changed conditions might be encountered during any site grading and/or foundation installation effort.

Because AMEC is best qualified to recognize and deal with conditions that differ from those anticipated, and as a necessary continuation of our role as geotechnical engineer of record for this project, we strongly recommend that AMEC be retained during the site preparation and foundation installation phases of the construction. Specifically, we recommend that AMEC provide observation and testing, on essentially a full-time basis, until completion of the geotechnical engineering related aspects of the project. Naturally, we will also be available to provide other, normally specified, construction observation and testing services, should you so desire.

In the event that you elect to employ another firm to provide observations and testing during the geotechnical engineering related portions of the construction, please be aware that the field decisions made by that firm could detrimentally impact the cost of the construction as well as the performance of the proposed improvements. Accordingly, AMEC will accept no responsibility for work performed by another firm or for the subsequent performance of the improvements resulting from that firm's work.

9.0 CLOSURE

This report was prepared by AMEC for the exclusive use of Sullivan Engineering, Inc. and the City of Franklin, for the stipulated project.

AMEC appreciates this opportunity to be of service to Sullivan Engineering, Inc. and the City of Franklin. At your convenience, we are available to discuss the details of this report and any questions you may have.

Important Information About Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

The following information is provided to help you manage your risks.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you ASFE-member geotechnical engineer for more information.

ASFE
The Best People on Earth

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APPENDIX 1 PHOTOGRAPHS

APPENDIX 1
Proposed McEwen Road, Franklin, Tennessee
AMEC File No. 3-518-40000

1) Suspected Sinkhole near STA 434+40, 20-ft right

2) Old home place ruin near STA 436+00

3) Pre-split rock cut near STA 463+00. Note the stained rock with a small solution cavity in the middle to left of center.

4) Debris near STA 468+00

5) Ruin of shed near STA 469+00

6) Coring setup on side slope near STA 473+00

APPENDIX 1
Proposed McEwen Road, Franklin, Tennessee
AMEC File No. 3-518-40000

7) View west along existing McEwen Road near Station 505+00

8) Old Bridge west abutment foundations at CSXT Railroad from Wilson Pike near STA 610+00

AMEC GEOTECHNICAL AND CONSTRUCTION MATERIALS LABORATORY

5211 Linbar Drive, Suite 513, Nashville, Tennessee 37211

Telephone: 615/831-9202 Fax: 615/831-9516

SUMMARY OF LABORATORY TEST RESULTS

PROJECT: McEwen Road PROJECT NO.: 3-518-40000 Phase 0001 DATE: 25 October 2005

BORING NUMBER	SAMPLE NUMBER	SAMPLE TYPE	DEPTH (FT.)	NATURAL MOISTURE (%)	UNIT WEIGHT (PCF)	POCKET PENETROMETER Qu (TSF)	ATTERBERG LIMITS			UNIFIED SOIL CLASSIFICATION	SPECIFIC GRAVITY	PERCENT FINER THAN 0.42mm (#40)	PERCENT FINER THAN 0.0075mm (#200)	OTHER TESTS **	SOIL DESCRIPTION
							LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX						
IV-04	SS-1	SS	1.0'-2.5'	26.4											Clay, silty, sandy, reddish-brown
IV-04	SS-2	SS	3.5'-5.0'	53.8											Clay, silty, sandy, reddish-brown
IV-14	SS-1	SS	1.0'-2.5'	28.0											Clay, silty, sandy, yellowish-brown
IV-14	SS-2	SS	3.5'-5.0'	26.9											Clay, silty, sandy, yellowish-brown
IV-16	---	CORE	19-19.6											U	LIMESTONE, q_u = 6,750 psi
IV-21	SS-1	SS	1.0'-2.5'	27.9											Clay, silty, sandy, yellowish-brown
IV-21	SS-2	SS	3.5'-5.0'				62.7	18.6	44.1	CH			82		Clay, silty, light brown
IV-21	SS-3	SS	6.0'-7.5'	30.5											Clay, silty, sandy, yellowish-brown
IV-21	SS-4	SS	8.5'-10.0'	30.0											Clay, silty, sandy, yellowish-brown
IV-22	SS-1	SS	1.0'-2.5'	14.4											Clay, silty, sandy, brown
IV-22	SS-2	SS	3.5'-5.0'	24.9											Clay, silty, sandy, brown
IV-22	SS-3	SS	6.0'-7.5'	26.5											Clay, silty, sandy, brown
IV-22	SS-4	SS	8.5'-10.0'	25.0											Clay, silty, sandy, brown
IV-42	SS-1	SS	3.5'-5.0'	21.1											Clay, silty, reddish-brown
IV-42	SS-2	SS	6.0'-7.5'	23.3			44.6	22.9	21.7	CL			65		Clay, silty, reddish-brown
IV-42	SS-3	SS	8.5'-10.0'	24.9											Clay, silty, yellowish-brown
IV-42	SS-4	SS	13.5'-15.0'	23.5											Clay, silty, yellowish-brown
IV-42	SS-5	SS	18.5'-19.1'	22.5											Clay, silty, yellowish-brown
IV-46	SS-3	SS	3.5'-5.0'	14.8			36.3	20.4	15.9	CL		67	62	S	Clay, silty, sandy, light reddish-brown
IV-46	SS-4	SS	6.0'-7.2	15.7											Clay, silty, sandy, light reddish-brown
IV-46	SS-6	SS	16.0'-17.2'	26.4											Clay, silty, sandy, light reddish-brown
IV-51	SS-1	SS	1.0'-2.5'	14.9											Clay, silty, light bown

PROJECT: McEwen Road **PROJECT NO.:** 3-518-40000 Phase 0001 **DATE:** 25 October 2005

BORING NUMBER	SAMPLE NUMBER	SAMPLE TYPE	DEPTH (FT.)	NATURAL MOISTURE (%)	UNIT WEIGHT (PCF)	POCKET PENETROMETER Qu (TSF)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	UNIFIED SOIL CLASSIFICATION	SPECIFIC GRAVITY	PERCENT FINER THAN 0.42mm (#40)	PERCENT FINER THAN 0.0075mm (#200)	OTHER TESTS **	SOIL DESCRIPTION
IV-51	SS-2	SS	3.5'-5.0'	22.7			45.7	22.1	23.6	CL			82		Clay, silty, light bown
IV-51	SS-3	SS	6.0'-7.5'	28.3											Clay, silty, light bown
IV-51	SS-4	SS	8.5'-10.0'	30.9											Clay, silty, light bown
IV-51	SS-5	SS	13.5'-15.0'	27.7											Clay, silty, light bown
WP-65	SS-1	SS	1.0'-2.5'	21.8											Topsoil
WP-65	SS-2	SS	6.0'-7.5'	26.5											Clay, silty, dark brown
WP-70	SS-1	SS	1.0'-1.4'	21.3											Clay, silty, yellowish-brown
WP-70	SS-2	SS	3.5'-5.0'	22.1											Clay, silty, yellowish-brown
AR-75	SS-1	SS	1.0'-2.5'	13.5											Clay, silty, yellowish-brown
AR-75	SS-2	SS	3.5'-5.0'	16.8											Clay, silty, yellowish-brown
AR-75	SS-3	SS	6.0'-7.5'	10.7											Clay, silty, yellowish-brown
AR-75	SS-4	SS	8.5'-10.0'	21.4											Clay, silty, yellowish-brown

* ST-SHELBY TUBE, SS-SPLIT SPOON / SPLIT-BARREL SAMPLER, B-BAG / BULK, C-CORE

** CBR-California Bearing Ratio; H-Hydrometer; S-Sieve or Grain Size Analysis

C- Consolidation Test; P-Proctor; SL-Shrinkage Limits

D-Direct Shear; pH-Acidity; T-Triaxial Compression Test

G-Specific Gravity; R-Relative Density; U-Unconfined Compression Test

Notes: _____

DATA CHECKED BY *D. E. Tate*

AMEC GEOTECHNICAL AND CONSTRUCTION MATERIALS LABORATORY
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Telephone: 615/831-9202 Fax: 615/831-9516

MOISTURE DETERMINATIONS

CLIENT: Sullivan Engineering **PROJECT NO.:** 3-5184-0000-0001

PROJECT NAME: McEwen Lane **DATE:** November 14, 2005

DATE SAMPLE(S) RECEIVED: November 2, 2005

Hole No.	IV-51	IV-51	IV-51	IV-51	IV-51	IV-46	IV-46	IV-46	IV-4
Sample No.	1'-2.5'	3.5'-5.0'	6'-7.5'	8.5'-10'	13.5'-15'	3.5'-5'	6.0'-7.2'	16'-17.2'	1'-2.5'
Container No.	1	C	2	3	4	14	Y	5	6
Weight of Container	0.41	138.01	0.42	0.41	0.43	138.10	113.57	0.41	0.42
Container + Wet Soil	90.04	818.30	100.31	88.45	75.74	889.89	891.38	89.30	98.73
Container + Dry Soil	78.42	692.65	78.25	67.67	59.39	793.16	785.65	70.74	78.18
Weight of Water	11.62	125.65	22.06	20.78	16.35	96.73	105.73	18.56	20.55
Container + Dry Soil	78.42	692.65	78.25	67.67	59.39	793.16	785.65	70.74	78.18
Weight of Dry Soil	78.01	554.64	77.83	67.26	58.96	655.06	672.08	70.33	77.76
Percent Water	14.9%	22.7%	28.3%	30.9%	27.7%	14.8%	15.7%	26.4%	26.4%

Hole No.	IV-4	IV-42	IV-42	IV-42	IV-42	IV-42	AR-75	AR-75	AR-75
Sample No.	3.5'-5'	3.5'-5'	6.0'-7.5'	8.5'-10.0'	13.5'-15.0'	18.5'-19.1'	1.0'-1.4'	3.5'-5.0'	6.0'-7.5'
Container No.	7	8	16	19	20	21	22	25	23
Weight of Container	0.42	0.42	138.15	0.40	0.43	0.42	0.42	0.43	0.44
Container + Wet Soil	97.63	92.23	1141.43	91.95	123.35	75.42	82.90	94.72	93.33
Container + Dry Soil	63.63	76.24	951.56	73.70	99.98	61.62	73.06	81.18	84.37
Weight of Water	34.00	15.99	189.87	18.25	23.37	13.80	9.84	13.54	8.96
Container + Dry Soil	63.63	76.24	951.56	73.70	99.98	61.62	73.06	81.18	84.37
Weight of Dry Soil	63.21	75.82	813.41	73.30	99.55	61.20	72.64	80.75	83.93
Percent Water	53.8%	21.1%	23.3%	24.9%	23.5%	22.5%	13.5%	16.8%	10.7%

NOTE: Test results shown were derived from tests performed in accordance with the applicable test method(s), unless otherwise noted

LABORATORY SUPERVISOR

AMEC GEOTECHNICAL AND CONSTRUCTION MATERIALS LABORATORY

5211 Linbar Drive, Suite 513, Nashville, Tennessee 37211
Telephone: 615/831-9202 Fax: 615/831-9516

MOISTURE DETERMINATIONS

CLIENT: Sullivan Engineering **PROJECT NO.:** 3-5184-0000-0001

PROJECT NAME: McEwen Lane **DATE:** November 14, 2005

DATE SAMPLE(S) RECEIVED: November 2, 2005

Hole No.	AR-75	LV-21	LV-21	LV-21	LV-21	WP-70	WP-70	WP-65	WP-65
Sample No.	8.5'-10.0'	1.0'-2.5'	3.5'-5.0'	6.0'-7.5'	8.5'-10.0'	1.0'-2.5'	3.5'-5.0'	1.0'-2.5'	6.0'-7.5'
Container No.	24	26	27	28	29	9	10	11	12
Weight of Container	0.42	0.42	0.42	0.41	0.41	0.41	0.41	0.42	0.42
Container + Wet Soil	76.01	93.18	no sample	90.58	69.75	86.91	90.56	72.85	77.56
Container + Dry Soil	62.67	72.95		69.48	53.73	71.73	74.23	59.90	61.41
Weight of Water	13.34	20.23		21.10	16.02	15.18	16.33	12.95	16.15
Container + Dry Soil	62.67	72.95		69.48	53.73	71.73	74.23	59.90	61.41
Weight of Dry Soil	62.25	72.53		69.07	53.32	71.32	73.82	59.48	60.99
Percent Water	21.4%	27.9%		30.5%	30.0%	21.3%	22.1%	21.8%	26.5%

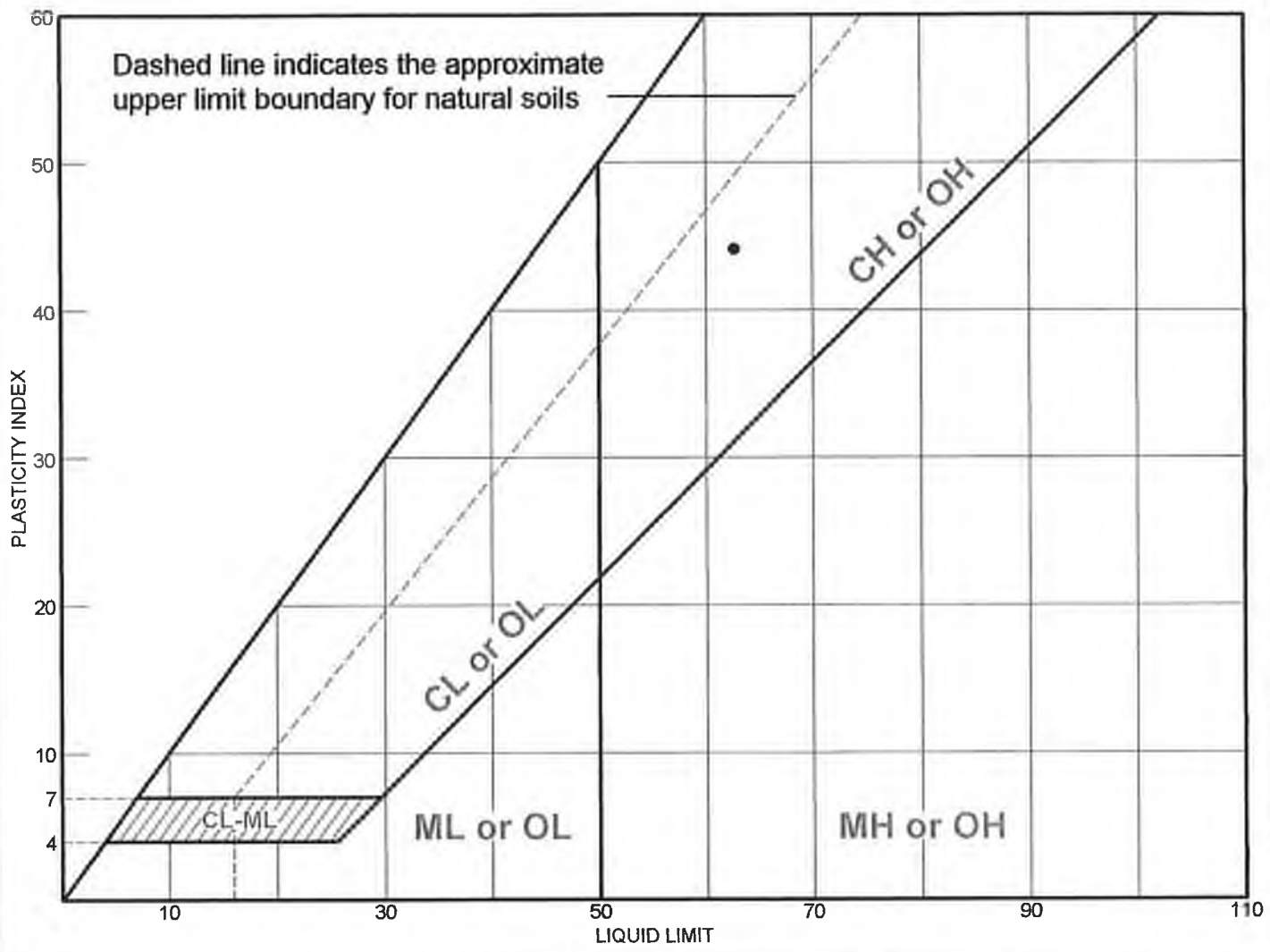
Hole No.	IV-22	IV-22	IV-22	IV-22	IV-14	IV-14			
Sample No.	1.0'-2.5'	3.5'-5.0'	6.0'-7.5'	8.5'-10.0'	1.0'-2.5'	3.5'-3.6'			
Container No.	13	14	15	16	17	18			
Weight of Container	0.41	0.41	0.42	0.42	0.42	0.42			
Container + Wet Soil	69.71	74.34	80.63	107.35	74.74	83.42			
Container + Dry Soil	60.98	59.60	63.82	85.95	58.48	65.85			
Weight of Water	8.73	14.74	16.81	21.40	16.26	17.57			
Container + Dry Soil	60.98	59.60	63.82	85.95	58.48	65.85			
Weight of Dry Soil	60.57	59.19	63.40	85.53	58.06	65.43			
Percent Water	14.4%	24.9%	26.5%	25.0%	28.0%	26.9%			

NOTE: Test results shown were derived from tests performed in accordance with the applicable test method(s), unless otherwise noted

LABORATORY SUPERVISOR

amec

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Clay, silty,light brown	62.7	18.6	44.1		82	

Project No. 3-5184- **Client:** Sullivan Engineering

Project: McEwen Lane

● **Source:** IV-2 I **Sample No.:** S-2 **Elev./Depth:** 3.5'-5.0'

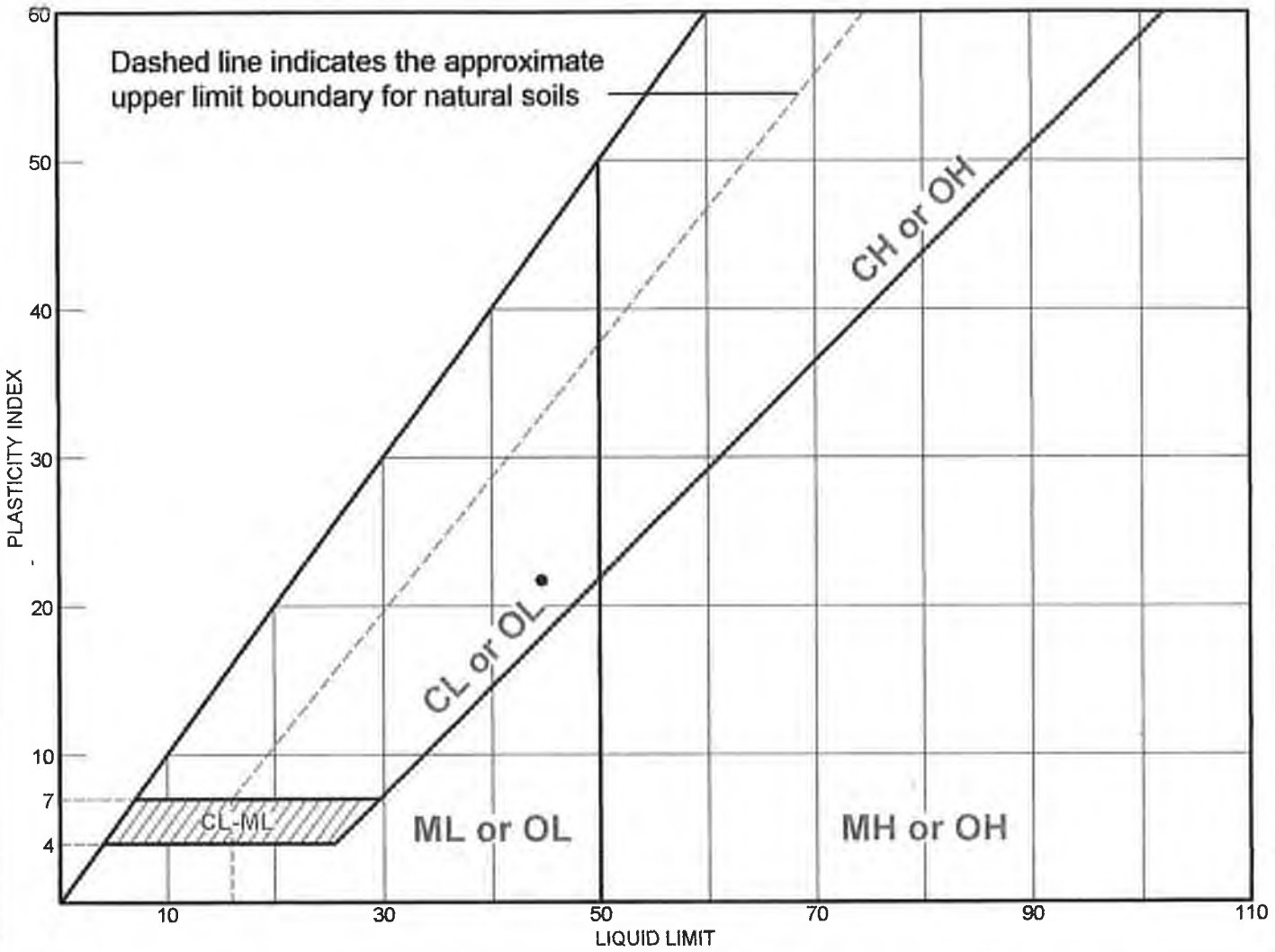
Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT
AMEC GEOTECHNICAL AND CONSTRUCTION MATERIALS LABORATORY

Figure no. IV-21, S-2

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Clay, silty, reddish-brown	44.6	22.9	21.7		65	

Project No. 3-5184- **Client:** Sullivan Engineering

Project: McEwen Lane

● **Source:** IV-42 **Sample No.:** S-2 **Elev./Depth:** 6.0'-7.5'

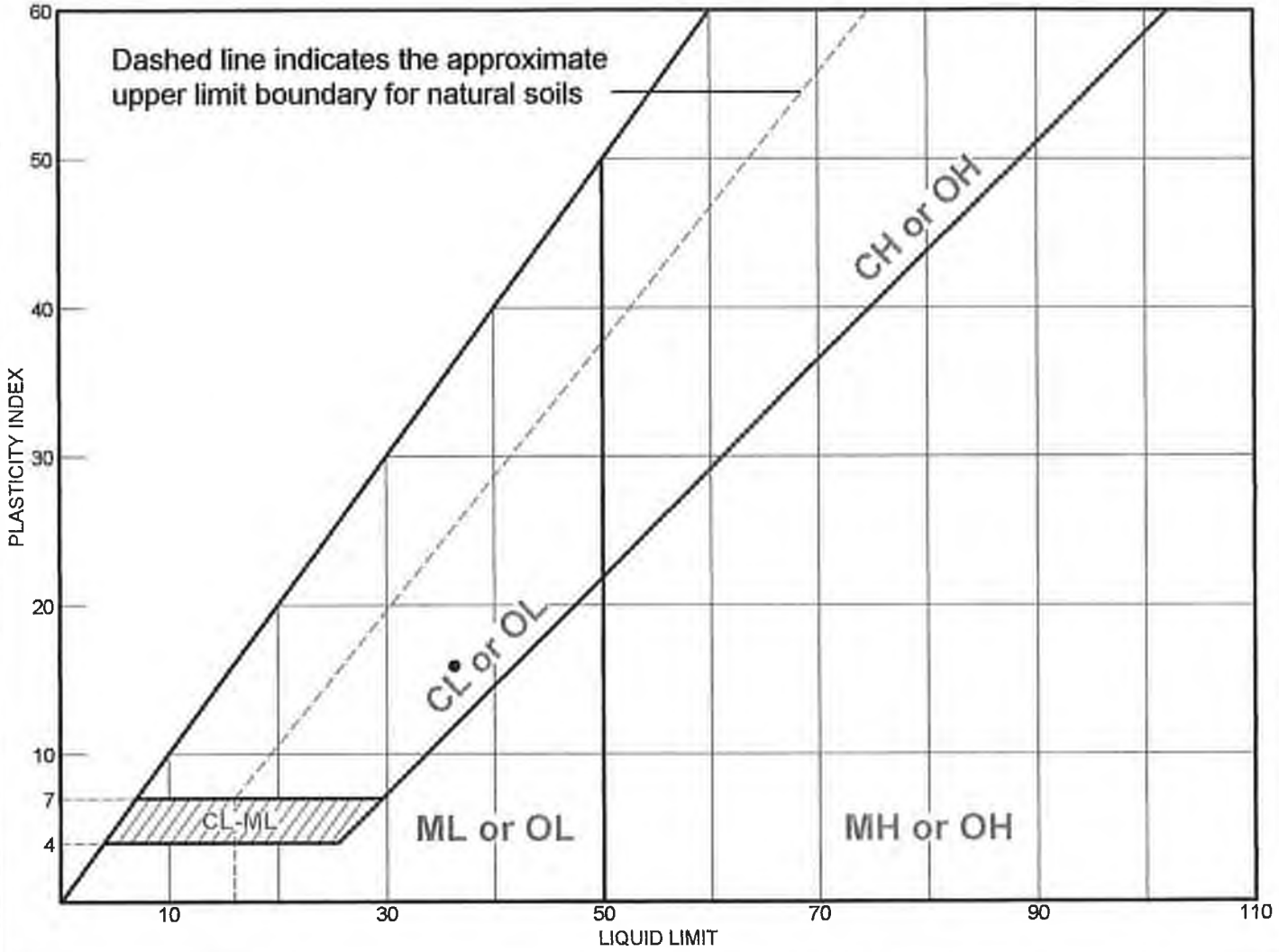
Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT
AMEC GEOTECHNICAL AND CONSTRUCTION MATERIALS LABORATORY

Figure no. IV-42, S-2

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Clay, silty, light reddish-brown	36.3	20.4	15.9	67	62	CL

Project No. 3-5184- **Client:** Sullivan Engineering

Project: McEwen Lane

● **Source:** IV-46 **Sample No.:** S-2 **Elev./Depth:** 3.5'-5.0'

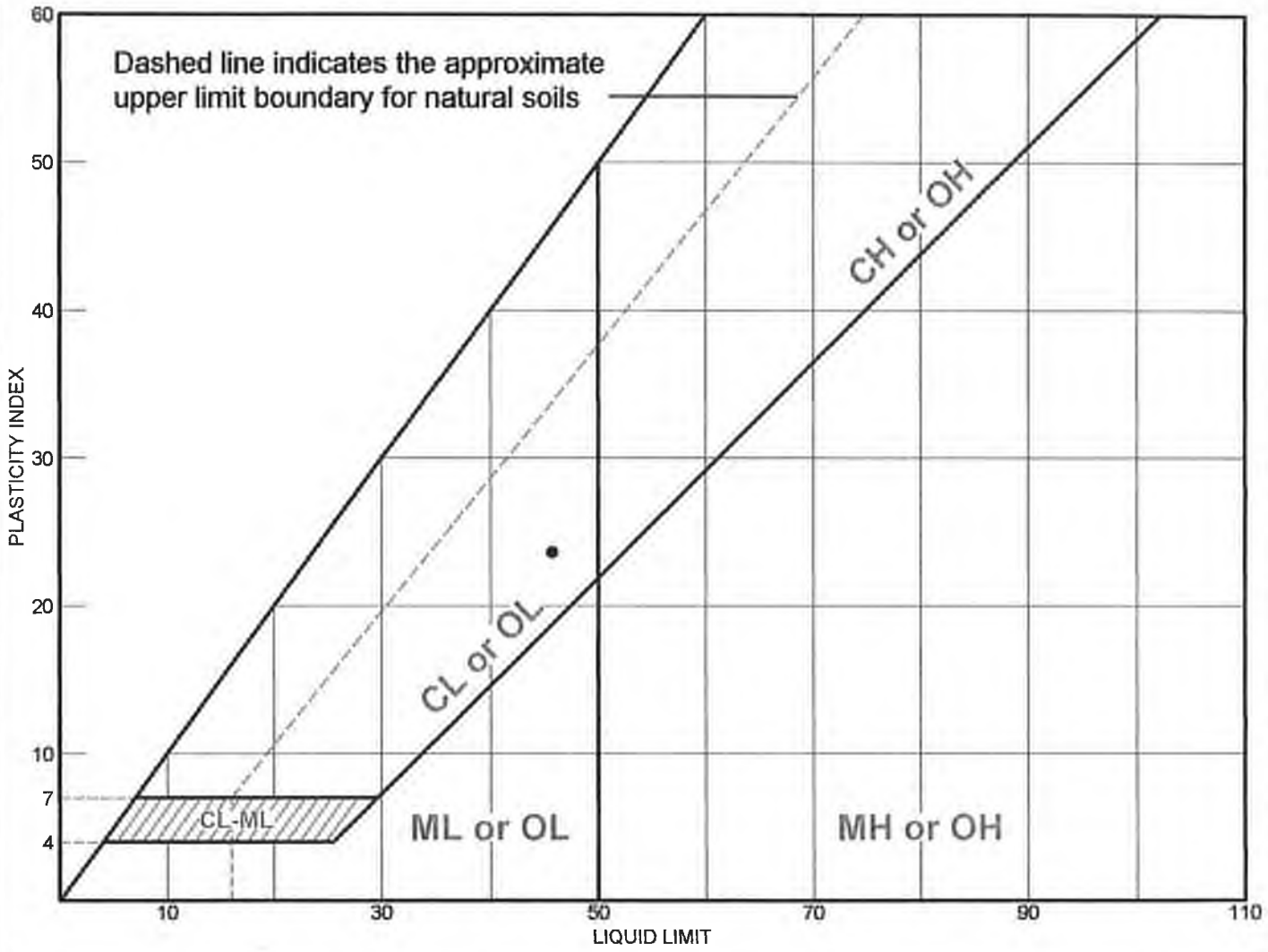
Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT
AMEC GEOTECHNICAL AND CONSTRUCTION MATERIALS LABORATORY

Figure no. IV-46 S-2

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Clay, silty with limestone gravel, light brown	45.7	22.1	23.6		82	

Project No. 3-5184- **Client:** Sullivan Engineering

Project: McEwen Lane

● **Source:** IV-51 **Sample No.:** S-2 **Elev./Depth:** 2.5'-4.0'

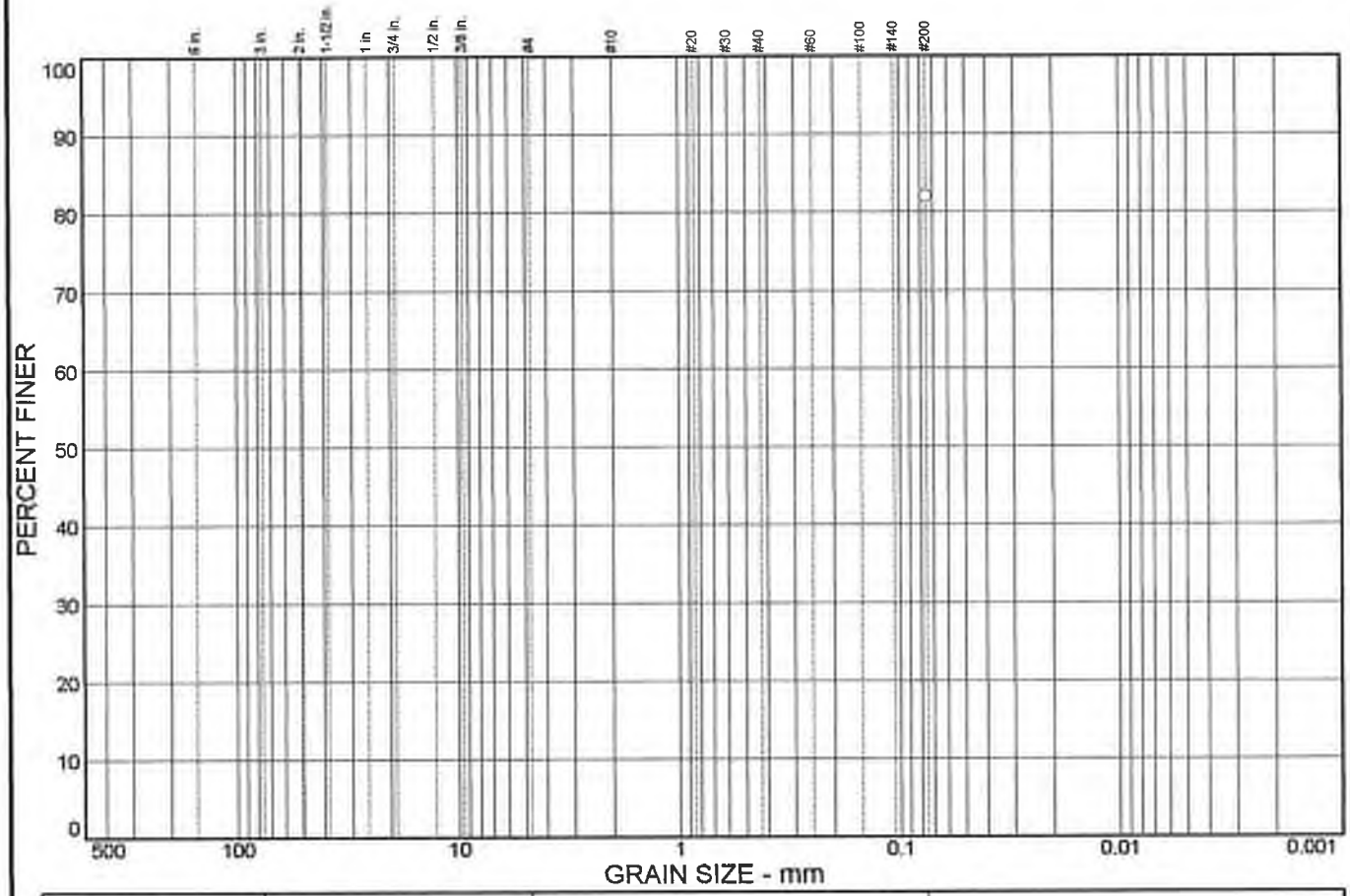
Remarks:

●

LIQUID AND PLASTIC LIMITS TEST REPORT
AMEC GEOTECHNICAL AND CONSTRUCTION MATERIALS LABORATORY

Figure no. IV-51, S-2

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
						82	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	82		

* (no specification provided)

Soil Description

Clay, silty,light brown

Atterberg Limits

PL= 18.6 LL= 62.7 PI= 44.1

Coefficients

D_{85}= D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO= A-7-6(38)

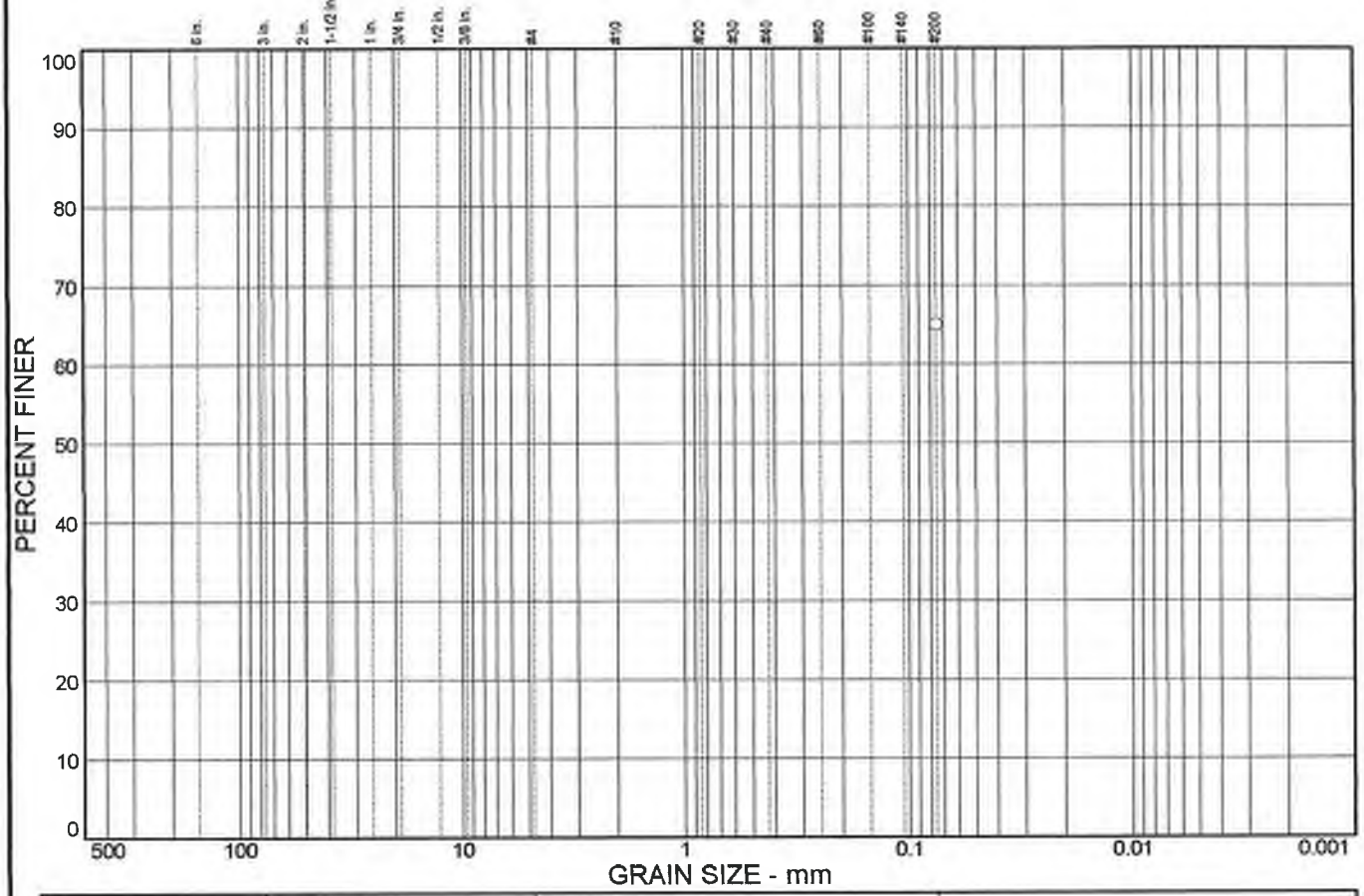
Remarks

Sample No.: S-2 **Source of Sample:** IV-21 **Date:**
Location: **Elev./Depth:** 3.5'-5.0'

AMEC GEOTECHNICAL AND CONSTRUCTION MATERIALS LABORATORY

Client: Sullivan Engineering
Project: McEwen Lane
Project No: 3-5184-0000-0001 **Figure no.** IV-21, S-2

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
						65	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	65		

* (no specification provided)

Soil Description

Clay, silty, reddish-brown

Atterberg Limits

PL= 22.9 LL= 44.6 PI= 21.7

Coefficients

D_{85}= D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO= A-7-6(13)

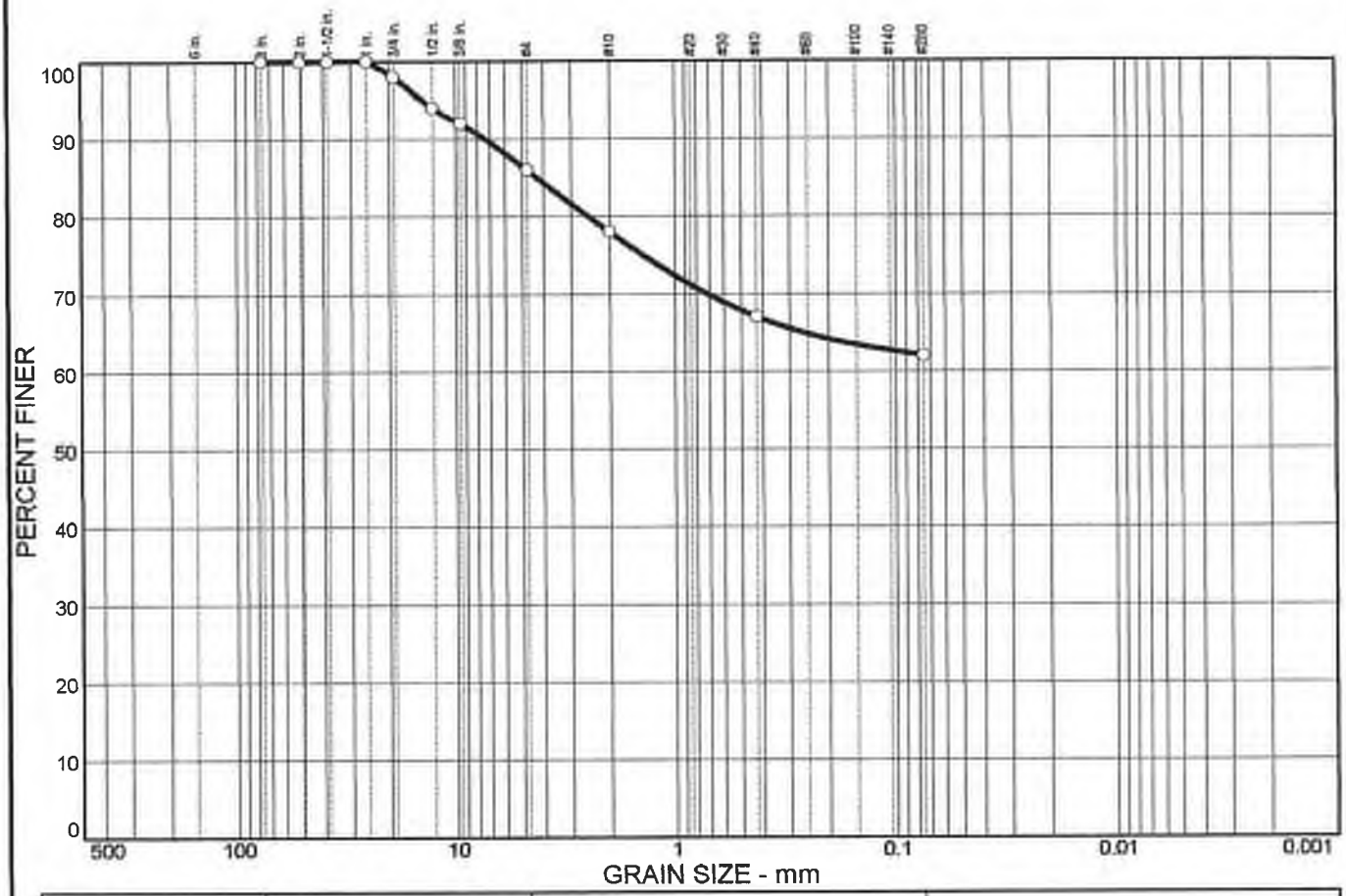
Remarks

Sample No.: S-2 **Source of Sample:** IV-42 **Date:**
Location: **Elev./Depth:** 6.0'-7.5'

AMEC GEOTECHNICAL AND CONSTRUCTION MATERIALS LABORATORY

Client: Sullivan Engineering
Project: McEwen Lane
Project No: 3-5184-0000-0001 **Figure no.** IV-42, S-2

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	2	12	8	11	5	62	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3 in.	100		
2 in.	100		
1.5 in.	100		
1 in.	100		
.75 in.	98		
.50 in.	94		
.375 in.	92		
#4	86		
#10	78		
#40	67		
#200	62		

* (no specification provided)

Soil Description

Clay, silty, light reddish-brown

Atterberg Limits

PL= 20.4 LL= 36.3 PI= 15.9

Coefficients

D_{85}= 4.28 D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO= A-6(8)

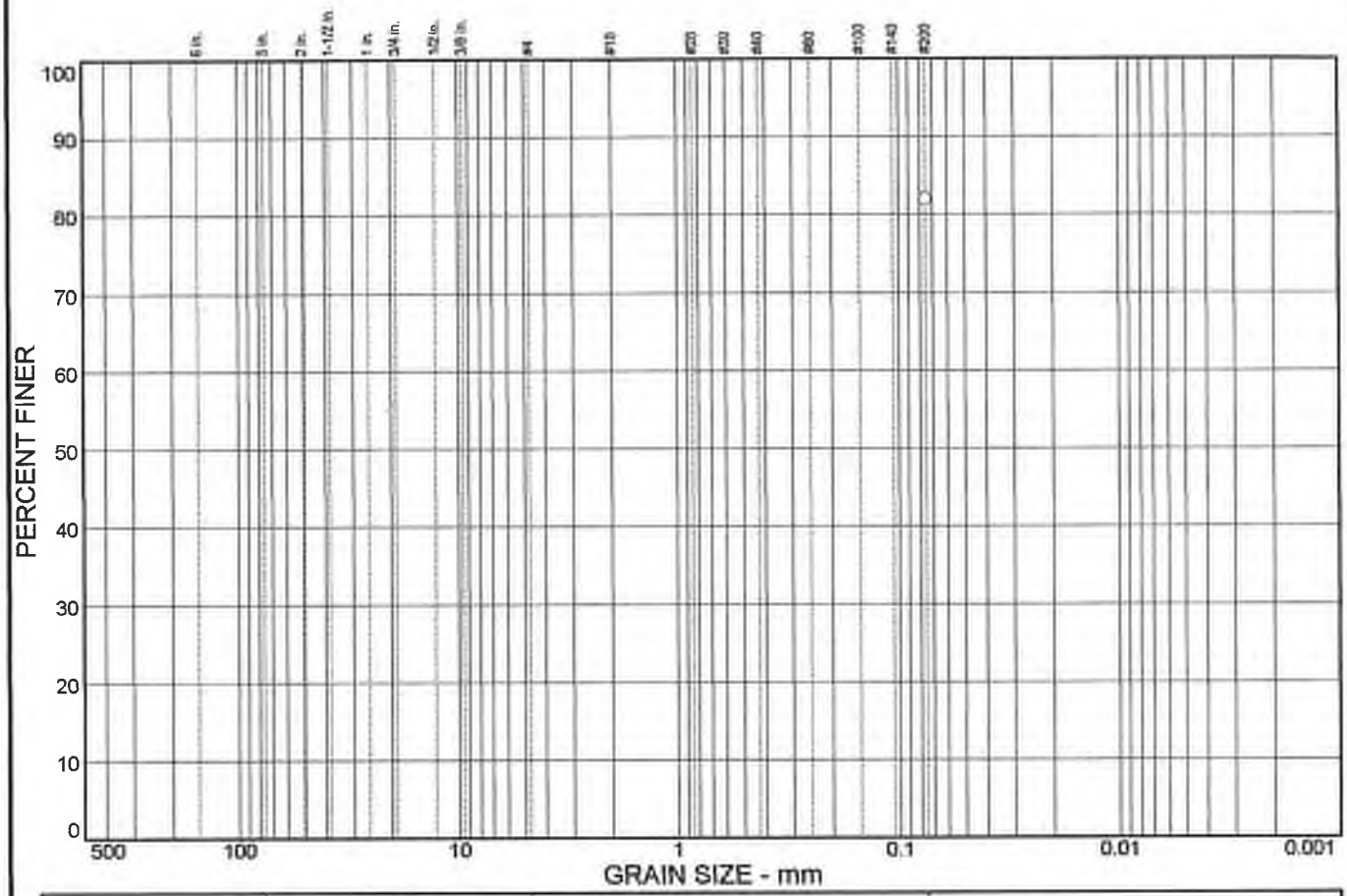
Remarks

Sample No.: S-3 **Source of Sample:** IV-46 **Date:**
Location: **Elev./Depth:** 6.0'-7.5'

AMEC GEOTECHNICAL AND CONSTRUCTION MATERIALS LABORATORY

Client: Sullivan Engineering
Project: McEwen Lane
Project No: 3-5184-0000-0001 **Figure no.** IV-46, S-3

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
						82	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#200	82		

* (no specification provided)

Soil Description

Clay, silty with limestone gravel, light brown

Atterberg Limits

PL= 22.1 LL= 45.7 PI= 23.6

Coefficients

D_{85}= D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Sample No.: S-2 **Source of Sample:** IV-51 **Date:**
Location: **Elev./Depth:** 2.5'-4.0'

AMEC GEOTECHNICAL AND CONSTRUCTION MATERIALS LABORATORY

Client: Sullivan Engineering
Project: McEwen Lane
Project No: 3-5184-0000-0001 **Figure no.** IV-51, S-2

AMEC GEOTECHNICAL AND CONSTRUCTION MATERIALS LABORATORY
5211 Linbar Drive, Suite 513, Nashville, Tennessee 37211
Telephone: 615/831-9202 Fax: 615/831-9516

UNCONFINED COMPRESSIVE STRENGTH OF INTACT ROCK CORE
ASTM D 2938

CLIENT: Sullivan Engineering
PROJECT NO.: 3-5184-0000-0001
PROJECT NAME: McEwen Lane
DATE: November 4, 2005
LOCATION: Franklin, TN
DATE SAMPLED:
DATE TESTED: November 4, 2005
DATE RECEIVED: October 14, 2005

HOLE OR SAMPLE NO.	DEPTH (FT.)	LITHOLOGIC DESCRIPTION OF ROCK	LOAD DIRECTION*	MOISTURE CONDITION	DIA. (IN.)	LENGTH (IN.)	AREA (SQ.IN.)	L / D RATIO	LOAD RATE (LB./MIN.)	LOAD (LBS.)	MEASURED COMPRESS. STRENGTH (PSI)
IV-16	19.0'-19.6'	limestone	vertical	as received	1.85	3.99	2.69	2.16	600	18,135	6,747

* NOTE: Loading direction given with respect to lithology.

REMARKS:

NOTE: Test results shown were derived from tests performed in accordance with the applicable test method(s), unless otherwise noted

LABORATORY SUPERVISOR

amec

Form No. L-48

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF TEST PIT: IV-01
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 14 October 2005 — SHEET 1 OF 1
BORING NO. / LOCATION: STATION 429+15, OFFSET 25 ft, R — SUBCONTRACTOR: Civil Constructors
ON-SITE REP: DET
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	781.1	FT. (estimated)
BOTTOM OF HOLE:	2.5	FT.	778.6	FT.
REFUSAL:	2.5	FT.	778.6	FT.
TOP OF ROCK:	2.5	FT.	778.6	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	2.5	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: -POWER AUGERING -WASHBORING TEST PIT -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	781.1	0.0	0.5		TEST PIT						TOPSOIL & ROOTS
		0.5			TEST PIT						CLAY, SLTY, LT BRN, DRY,STIFF
			2.5								
2.5	778.6	2.5									Hoe Refusal @ 2.5 FT.
5.0	776.1										
7.5	773.6										
10.0	771.1										
12.5	768.6										
15.0	766.1										
17.5	763.6										
20.0	761.1										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road

LOG OF TEST PIT: IV-02

PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 14 October 2005

SHEET 1 OF 1

BORING NO. / LOCATION: STATION 431+95, OFFSET 10 ft, L

SUBCONTRACTOR: Civil Constructors

ON-SITE REP: DET

DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	801.0	FT. (estimated)
BOTTOM OF HOLE:	7.0	FT.	794.0	FT.
REFUSAL:	NA	FT.	NA	FT.
TOP OF ROCK:	NA	FT.	NA	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	7.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: -POWER AUGERING -WASHBORING TEST PIT -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	801.0	0.0	0.5		TEST PIT						TOPSOIL & ROOTS
		0.5			TEST PIT						CLAY, SLTY, LT BRN, HARD, DRY WITH ROCK FRAGMENTS
2.5	798.5										OCCASIONAL 1" ROOTS TO 2.0'
5.0	796.0		6.0								
		6.0	7.0		TEST PIT						CLAY, SLTY, YELLISH BRN, V HARD, DRY
		7.0									No Refusal @ 7.0 FT.
7.5	793.5										
10.0	791.0										
12.5	788.5										
15.0	786.0										
17.5	783.5										
20.0	781.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road

PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 13 October 2005

BORING NO. / LOCATION: STATION 432+50, OFFSET 55 ft, Left

LOG OF BORING: IV-04

SHEET 1 OF 1

SUBCONTRACTOR: Tri-State

ON-SITE REP: WDS

DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	807.0	FT. (estimated)
BOTTOM OF HOLE:	17.0	FT.	790.0	FT.
REFUSAL:	5.0	FT.	802.0	FT.
TOP OF ROCK:	5.0	FT.	802.0	FT.
BEGAN CORING:	5.0	FT.	802.0	FT.
FOOTAGE SAMPLED:	5.0	CORED:	12.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	13.0	794.0	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	9.0	798.0	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	807.0	0.0	1.0		AUGER						Topsoil/Vegetation
		1.0	2.5	S-1	SS	18	2	2	4	6	Clay, silty, sandy, reddish-brown (Medium Stiff)
2.5	804.5	2.5	3.5		AUGER						
		3.5	5.0	S-2	SS	18	5	8	8	16	DO 1, mottled black, (Very Stiff)(Moist)
5.0	802.0	5.0	10.0	RUN 1	RAN 5.0 REC 4.7 RQD= 74						Begin NQ Coring @ 5.0', 100% DWR Auger Refusal @ 5.0 FT. Limestone, sandy, silty, light gray, variably stained, leached, weathered
7.5	799.5										open cavity @ 7.5'-7.8'
											Limestone, sandy, silty, light gray, variably stained, leached, weathered
10.0	797.0										100% DWL @ 9.0'
		10.0	15.0	RUN 2	RAN 5.0 REC 4.3 RQD= 74						Rod Check 10.0'
12.5	794.5										open cavity @ 11.6'-11.9', Limestone, sandy, silty, light gray open cavity @ 12.2' - 12.6' Limestone, sandy, silty, light gray
15.0	792.0	15.0	17.0	RUN 3	RAN 2.0 REC 2.0 RQD= 100						Rod Check 15.0' 100% DWL
17.5	789.5	17.0									Core Terminated @ 17.0 FT.
20.0	787.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF BORING: IV-05

PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 13 October 2005 — SHEET 1 OF 1

BORING NO. / LOCATION: STATION 433+75, OFFSET 10 ft, Left — SUBCONTRACTOR: Tri-State

ON-SITE REP: WDS

DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	813.5	FT. (estimated)
BOTTOM OF HOLE:	20.0	FT.	793.5	FT.
REFUSAL:	3.3	FT.	810.2	FT.
TOP OF ROCK:	3.3	FT.	810.2	FT.
BEGAN CORING:	3.3	FT.	810.2	FT.
FOOTAGE SAMPLED:	3.3	CORED:	16.7	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	19.0	794.5	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	13.5	800.0	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC SOIL (in) ROCK (ft)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	813.5	0.0	1.0		AUGER						Topsoil/Vegetation
		1.0	3.3		AUGER						Clay, silty, brown with rock fragments
2.5	811.0										
		3.3	6.6			RUN 1 RAN 3.3 loss 0.6 REC 2.4 RQD= 0					Auger Refusal @ 3.3 FT. Limestone, sandy, silty, gray, with open, stained, leached bedding planes
5.0	808.5										
		6.6	10.0			RUN 2 RAN 3.4 gain 0.1 REC 3.5 RQD= 54					Clay seam 6.0' - 6.7' Limestone, sandy, silty, gray with open, stained, leached bedding planes
7.5	806.0										
10.0	803.5					RUN 3					
		10.0	11.6			RAN 1.6 gain 0.5 REC 2.1 RQD=100					
		11.6	16.6			RUN 4 RAN 5.0 loss 0.6 REC 4.2 RQD= 84					100% DWL @ 13.5'
12.5	801.0										
15.0	798.5										
		16.6	20.0			RUN 5 RAN 3.4 gain 0.6 REC 4.0 RQD= 100					Core Terminated @ 20.0 FT.
17.5	796.0										
20.0	793.5										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road — LOG OF BORING: IV-09
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 12 October 2005 — SHEET 1 OF 2
BORING NO. / LOCATION: STATION 436+50, OFFSET 55 ft, Left — SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	835.1	FT. (estimated)
BOTTOM OF HOLE:	24.0	FT.	811.1	FT.
REFUSAL:	0.8	FT.	834.3	FT.
TOP OF ROCK:	0.8	FT.	834.3	FT.
BEGAN CORING:	0.8	FT.	834.3	FT.
FOOTAGE SAMPLED:	0.8	CORED:	23.2	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	20.5	814.6	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	835.1	0.0	0.8		AUGER						Topsoil/Vegetation Begin NQ Coring @ 0.8'
2.5	832.6	0.8	5.1			RUN 1 RAN 4.3 REC 4.3 RQD= 86					Auger Refusal @ 0.8 FT. Limestone, sandy, light gray, variably stained, leached with numerous vugs and open fractures
5.0	830.1										
7.5	827.6	5.1	10.0			RUN 2 RAN 4.9 REC 4.9 RQD= 50					
10.0	825.1										
12.5	822.6	10.0	15.0			RUN 3 RAN 5.0 REC 4.9 RQD= 92					
15.0	820.1										
17.5	817.6	15.0	20.0			RUN 4 RAN 5.0 REC 5.0 RQD= 92					
20.0	815.1										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 12 October 2005
BORING NO. / LOCATION: STATION 436+50, OFFSET 55 ft, Left

LOG OF BORING: IV-09
SHEET 2 OF 2
DRILLER: Tri-State
ON-SITE REP: WDS
DRY ON COMPLETION ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	835.1	FT. (estimated)
BOTTOM OF HOLE:	24.0	FT.	811.1	FT.
REFUSAL:	0.8	FT.	834.3	FT.
TOP OF ROCK:	0.8	FT.	834.3	FT.
BEGAN CORING:	0.8	FT.	834.3	FT.
FOOTAGE SAMPLED:	0.8	CORED:	23.2	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	20.5	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV. FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
20.0	815.1	20.0				RUN 5 RAN 4.0 REC 3.8 RQD= 58					Limestone, sandy, gray, variably open, stained, leached 100% DWL @ 20.5'
22.5	812.6		24.0								100% DWL
		24.0									Core Terminated @ 24.0 FT.
25.0	810.1										
27.5	807.6										
30.0	805.1										
32.5	802.6										
35.0	800.1										
37.5	797.6										
40.0	795.1										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 12 October 2005
BORING NO. / LOCATION: STATION 438+00, OFFSET 55 ft, Left

LOG OF BORING: IV-10
SHEET 1 OF 1
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	841.0	FT. (estimated)
BOTTOM OF HOLE:	20.1	FT.	820.9	FT.
REFUSAL:	0.0	FT.	841.0	FT.
TOP OF ROCK:	0.0	FT.	841.0	FT.
BEGAN CORING:	0.0	FT.	841.0	FT.
FOOTAGE SAMPLED:	0.0	CORED:	20.1	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	8.5	832.5	FT.
AFTER 24 HRS.	NA	NA	FT.
LOW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	841.0	0.0	5.0			RUN 1 RAN 5.0 loss 0.1 REC 4.9 RQD= 57					Auger Refusal @ 0.0 FT. Limestone, sandy, silty, mottled gray with large calcite crystals, variably stained, leached with open, stained, bedding planes
5.0	836.0	5.0	10.0			RUN 2 RAN 5.0 REC 5.0 RQD= 100					
10.0	831.0	10.0	15.0			RUN 3 RAN 5.0 gain 0.1 REC 5.1 RQD= 100					
15.0	826.0	15.0	20.1			RUN 4 RAN 5.1 REC 5.1 RQD= 100					100% DWR Core Terminated @ 20.1 FT.
20.0	821.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF BORING: IV-11
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 11 October 2005 — SHEET 1 OF 2
BORING NO. / LOCATION: STATION 439+00, OFFSET 55 ft, Left — SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	845.0	FT. (estimated)
BOTTOM OF HOLE:	24.9	FT.	820.1	FT.
REFUSAL:	0.0	FT.	845.0	FT.
TOP OF ROCK:	0.0	FT.	845.0	FT.
BEGAN CORING:	0.0	FT.	845.0	FT.
FOOTAGE SAMPLED:	0.0	CORED:	24.9	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	13.5	831.5	FT.
AFTER 24 HRS.	24.9	820.1	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	845.0	0.0	4.9			RUN 1 RAN 4.9 loss 0.1 REC 4.8 RQD= 88					Auger Refusal @ 0.0 FT. Limestone, sandy, silty, light gray mottled gray with open, stained, bedding planes
5.0	840.0	4.9	9.9			RUN 2 REC 5.0 gain 0.1 REC 5.1 RQD= 100					
10.0	835.0	9.9	14.9			RUN 3 RAN 5.0 REC 4.9 RQD= 88					Limestone, sandy, silty, light gray mottled gray with large calcite crystals, variably fossiliferous
15.0	830.0	14.9	19.9			RUN 4 RAN 5.0 REC 5.1 RQD= 100					
20.0	825.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 11 October 2005
BORING NO. / LOCATION: STATION 439+00, OFFSET 55 ft, Left

LOG OF BORING: IV-11
SHEET 2 OF 2
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	845.0	FT. (estimated)
BOTTOM OF HOLE:	24.9	FT.	820.1	FT.
REFUSAL:	0.0	FT.	845.0	FT.
TOP OF ROCK:	0.0	FT.	845.0	FT.
BEGAN CORING:	0.0	FT.	845.0	FT.
FOOTAGE SAMPLED:	0.0	CORED:	24.9	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING (1):	DRY	NA	FT.
@ COMPLETION:	13.5	831.5	FT.
AFTER 24 HRS.	24.9	820.1	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV. FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
20.0	825.0	19.9				RUN 5 RAN 5.0 REC 5.0 RQD= 98					Limestone, sandy, silty, light gray to mottled dark gray
22.5	822.5										
			24.9								100% DWR
25.0	820.0	24.9									Core Terminated @ 24.9 FT.
27.5	817.5										
30.0	815.0										
32.5	812.5										
35.0	810.0										
37.5	807.5										
40.0	805.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

(1) Before coring

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 11 October 2005
BORING NO. / LOCATION: STATION 441+00, OFFSET 55 ft, Left

LOG OF BORING: IV-12
SHEET 1 OF 2
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	860.1	FT. (estimated)
BOTTOM OF HOLE:	24.0	FT.	836.1	FT.
REFUSAL:	0.0	FT.	860.1	FT.
TOP OF ROCK:	0.0	FT.	860.1	FT.
BEGAN CORING:	0.0	FT.	860.1	FT.
FOOTAGE SAMPLED:	0.0	CORED:	24.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING (1):	DRY	NA	FT.
@ COMPLETION:	10.5	849.6	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	9.0	851.1	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	860.1	0.0	3.7			RUN 1 RAN 3.7 REC 1.6 RQD= 0					Auger Refusal @ 0.0 FT.
2.5	857.6										Limestone, sandy, silty, light gray , variably stained, leached, weathered with numerous soil seams
		3.7	5.0			RUN 2 RAN 1.3 REC 1.0 RQD= 77					
5.0	855.1	5.0	10.0			RUN 3 RAN 5.0 REC 2.8 RQD= 14					
7.5	852.6										100% DWL @ 9.0'
10.0	850.1	10.0	15.0			RUN 4 RAN 5.0 REC 4.3 RQD= 84					clay seam 10.0'-10.7'
12.5	847.6										Limestone, sandy, silty, mottled gray
15.0	845.1	15.0	20.0			RUN 5 RAN 5.0 REC 5.0 RQD= 100					
17.5	842.6										
20.0	840.1										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

(1) Before coring

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 11 October 2005
BORING NO. / LOCATION: STATION 441+00, OFFSET 55 ft, Left

LOG OF BORING: IV-12
SHEET 2 OF 2
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	860.1	FT. (estimated)
BOTTOM OF HOLE:	24.0	FT.	836.1	FT.
REFUSAL:	0.0	FT.	860.1	FT.
TOP OF ROCK:	0.0	FT.	860.1	FT.
BEGAN CORING:	0.0	FT.	860.1	FT.
FOOTAGE SAMPLED:	0.0	CORED:	24.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING (1):	DRY	NA	FT.
@ COMPLETION:	10.5	849.6	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	9.0	851.1	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV. FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
20.0	840.1	20.0	24.0			RUN 6 RAN 4.0 REC 4.0 RQD= 100					Limestone, sandy, silty, mottled gray, siliceous
22.5	837.6										
		24.0									Core Terminated @ 24.0 FT.
25.0	835.1										
27.5	832.6										
30.0	830.1										
32.5	827.6										
35.0	825.1										
37.5	822.6										
40.0	820.1										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

(1) Before coring

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF BORING: IV-13
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 11 October 2005 — SHEET 1 OF 1
BORING NO. / LOCATION: STATION 443+00, OFFSET 55 ft, Right — SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	859.0	FT. (estimated)
BOTTOM OF HOLE:	0.0	FT.	859.0	FT.
REFUSAL:	0.0	FT.	859.0	FT.
TOP OF ROCK:	0.0	FT.	859.0	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	0.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING (1):	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	859.0	0.0									Auger Refusal @ 0.0 FT.
											Rock @ Ground Surface
											No core/ no sampling
2.5	856.5										
5.0	854.0										
7.5	851.5										
10.0	849.0										
12.5	846.5										
15.0	844.0										
17.5	841.5										
20.0	839.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

(1) Before coring

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 11 October 2005
BORING NO. / LOCATION: STATION 443+00, OFFSET 0 ft, Center

LOG OF BORING: IV-14
SHEET 1 OF 1
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	867.7	FT. (estimated)
BOTTOM OF HOLE:	19.0	FT.	848.7	FT.
REFUSAL:	3.8	FT.	863.9	FT.
TOP OF ROCK:	3.8	FT.	863.9	FT.
BEGAN CORING:	3.8	FT.	863.9	FT.
FOOTAGE SAMPLED:	3.8	CORED:	15.2	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING (1):	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	867.7	0.0	1.0		AUGER						Topsoil
2.5	865.2	1.0	2.5	S-1	SS	18	3	5	6	11	Clay, silty, yellowish-brown mottled reddish-brown /gray with roots (Stiff)
		2.5	3.5		AUGER						
		3.5	3.8	S-2	SS		50/.1			50/0.1	Begin NQ Coring @ 3.8', 100% DWR
5.0	862.7	3.8	7.0			RUN 1 RAN 3.2 REC 2.9 RQD= 69					Auger Refusal @ 3.8 FT. Limestone, sandy, silty, mottled gray with open, stained bedding planes
7.5	860.2	7.0	10.0			RUN 2 RAN 3.0 REC 2.7 RQD= 30					
10.0	857.7	10.0	15.0			RUN 3 RAN 5.0 REC 3.0 RQD= 44					soft clay filled cavity 13.0'-16.5'
12.5	855.2										
15.0	852.7	15.0	19.0			RUN 4 RAN 4.0 REC 3.0 RQD= 40					Limestone, sandy, silty, light gray to gray, numerous open, stained, bedding planes
17.5	850.2										100% DWR
20.0	847.7	19.0									TERMINATED @ 19 FT.

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

(1) Before coring

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 11 October 2005
BORING NO. / LOCATION: STATION 443+00, OFFSET 55 ft, Left

LOG OF BORING: IV-15
SHEET 1 OF 2
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	874.2	FT. (estimated)
BOTTOM OF HOLE:	28.0	FT.	846.2	FT.
REFUSAL:	3.9	FT.	870.3	FT.
TOP OF ROCK:	3.9	FT.	870.3	FT.
BEGAN CORING:	3.9	FT.	870.3	FT.
FOOTAGE SAMPLED:	3.9	CORED:	24.1	

WATER LEVEL DATA	DEPTH	ELEVATION	
DURING DRILLING (1):	DRY	NA	FT.
@ COMPLETION:	20.0	854.2	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	20.0	854.2	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	874.2	0.0	1.0		AUGER						Topsoil
2.5	871.7	1.0	2.5	S-1	SS	18	9	14	38	52	Clay, very silty, yellowish-brown with numerous rock fragments (Hard)
		2.5	3.9		AUGER						Begin NQ Coring @ 3.9'
5.0	869.2	3.9	8.9			RUN 1 RAN 5.0 loss 0.1 REC 4.4 RQD= 37					Auger Refusal @ 3.9 FT. Limestone, sandy, silty, mottled gray with numerous open, stained, bedding planes, and clay seams, variably stained, leached
7.5	866.7										
10.0	864.2	8.9	10.0			RUN 2 RAN 1.1 gain 0.1 REC 1.2 RQD= 50					
12.5	861.7	10.0	15.0			RUN 3 RAN 5.0 REC 4.9 RQD= 66					
15.0	859.2	15.0	20.0			RUN 4 RAN 5.0 loss 0.1 REC 4.9 RQD= 100					
17.5	856.7										
20.0	854.2										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

(1) Before coring

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 11 October 2005
BORING NO. / LOCATION: STATION 443+00, OFFSET 55 ft, Left

LOG OF BORING: IV-15
SHEET 2 OF 2
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	874.2	FT. (estimated)
BOTTOM OF HOLE:	28.0	FT.	846.2	FT.
REFUSAL:	3.9	FT.	870.3	FT.
TOP OF ROCK:	3.9	FT.	870.3	FT.
BEGAN CORING:	3.9	FT.	870.3	FT.
FOOTAGE SAMPLED:	3.9	CORED:	24.1	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING (1):	DRY	NA	FT.
@ COMPLETION:	20.0	854.2	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	20.0	854.2	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV. FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
20.0	854.2	20.0				RUN 5					100% DWL @ 20.0'
						RAN 5.0					Limestone, silty, light gray mottled green with open,
						gain 0.1					stained, bedding planes and shale parting
						REC 5.1					
22.5	851.7					RQD= 100					
			25.0								
25.0	849.2	25.0				RUN 6					
						RAN 3.0					
						REC 3.0					
						RQD= 100					
27.5	846.7		28.0								100% DWL
		28.0									Core Terminated @ 28.0 FT.
30.0	844.2										
32.5	841.7										
35.0	839.2										
37.5	836.7										
40.0	834.2										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification (1) Before coring

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road
LOG OF BORING: IV-16
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 10 October 2005
SHEET 1 OF 2
BORING NO. / LOCATION: STATION 443+50, OFFSET 55 ft, Left
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	876.0	FT. (estimated)
BOTTOM OF HOLE:	28.0	FT.	848.0	FT.
REFUSAL:	0.0	FT.	876.0	FT.
TOP OF ROCK:	0.0	FT.	876.0	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	0.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION
DURING DRILLING (1):	DRY	NA FT.
@ COMPLETION:	0.0	876.0 FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	876.0	0.0				RUN 1 RAN 5.0 REC 3.3 RQD= 0					Auger Refusal @ 0.0 FT. Limestone, sandy, silty, mottled gray, variably stained, leached, weathered, with numerous solution features
2.5	873.5										soft clay filled cavity 2.9'-4.6'
			5.0								Limestone, sandy, silty, mottled gray, partially healed vertical fracture clay filled cavity 5.0'-6.0',
5.0	871.0	5.0	6.0			RUN 2, RAN 1.0 REC 0.5, RQD= 0					
		6.0									Limestone, sandy, silty, gray variably stained, leached
7.5	868.5					RUN 3 RAN 4.0 REC 4.0 RQD= 73					
10.0	866.0		10.0								
		10.0				RUN 4 RAN 5.0 REC 4.5 RQD= 34					numerous clay seams 10.3'-13.0'
12.5	863.5										
			15.0								Limestone, sandy, silty, gray
15.0	861.0	15.0				RUN 5 RAN 5.0 REC 5.0 RQD= 100					
17.5	858.5										
			20.0								
20.0	856.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification (1) Before coring

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 10 October 2005
BORING NO. / LOCATION: STATION 443+50, OFFSET 55 ft, Left

LOG OF BORING: IV-16
SHEET 2 OF 2
DRILLER: Tri-State
ON-SITE REP: WDS
DRY ON COMPLETION ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	876.0	FT. (estimated)
BOTTOM OF HOLE:	28.0	FT.	848.0	FT.
REFUSAL:	0.0	FT.	876.0	FT
TOP OF ROCK:	0.0	FT.	876.0	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	0.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION
DURING DRILLING (1):	DRY	NA FT.
@ COMPLETION:	0.0	876.0 FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV. FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
20.0	856.0					RUN 6 RAN 5.0 REC 5.0 RQD= 100					Limestone, sandy, silty, gray
22.5	853.5										
25.0	851.0		25.0								
		25.0				RUN 7 RAN 3.0 REC 3.0 RQD= 100					
27.5	848.5		28.0								100% DWR
		28.0									Core Terminated @ 28.0 FT.
30.0	846.0										
32.5	843.5										
35.0	841.0										
37.5	838.5										
40.0	836.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

(1) Before coring

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF BORING: IV-17

PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 10 October 2005 — SHEET 1 OF 1

BORING NO. / LOCATION: STATION 444+50, OFFSET 55 ft, Left — SUBCONTRACTOR: Tri-State

ON-SITE REP: WDS

DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	867.1	FT. (estimated)
BOTTOM OF HOLE:	15.0	FT.	852.1	FT.
REFUSAL:	0.0	FT.	867.1	FT.
TOP OF ROCK:	0.0	FT.	867.1	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	0.0	CORED:	0.0	

WATER LEVEL DATA	DEPTH	ELEVATION	
DURING DRILLING (1):	DRY	NA	FT.
@ COMPLETION:	0.0	867.1	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	867.1	0.0				RUN 1 RAN 5.0 REC 3.1 RQD= 60					Auger Refusal @ 0.0 FT.
											Limestone, sandy, silty, mottled gray with shale partings
2.5	864.6										
											soft clay filled cavity 3.1' to 9.0'
5.0	862.1		5.0								
		5.0				RUN 2 RAN 4.0 REC 1.0 RQD= 0					
7.5	859.6										
			9.0								
		9.0				RUN 3 RAN 1.0					Limestone, sandy, variably stained, leached, fossiliferous (Porous), with soft shale
10.0	857.1		10.0								
		10.0				REC 1.0 RQD= 0					partings and solution vugs
						RUN 4 RAN 5.0 REC 4.8 RQD= 82					
12.5	854.8										
			15.0								100% DWR
15.0	852.1	15.0									Core Terminated @ 15.0 FT.
17.5	849.6										
20.0	847.1										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

(1) Before coring

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF BORING: IV-20
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 07 October 2005 — SHEET 1 OF 1
BORING NO. / LOCATION: STATION 451+00, OFFSET 0 ft, Center — SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	846.0	FT. (estimated)
BOTTOM OF HOLE:	10.0	FT.	836.0	FT.
REFUSAL:	NA	FT.	NA	FT.
TOP OF ROCK:	NA	FT.	NA	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	10.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION
DURING DRILLING (1):	DRY	NA FT.
@ COMPLETION:	DRY	NA FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	846.0	0.0	1.0		AUGER						Topsoil/Vegetation
		1.0		S-1	SS	18	5	7	8	15	Clay, silty, slightly sandy, reddish-brown (Stiff)
2.5	843.5	2.5			AUGER						
		3.5		S-2	SS	18	11	14	12	26	DO 1 with rock fragments (very Stiff)
5.0	841.0	5.0	6.0		AUGER						
		6.0		S-3	SS	18	5	9	13	22	DO 2
7.5	838.5	7.5			AUGER						
		8.5		S-4	SS	18	6	9	9	18	DO 2
10.0	836.0	10.0									No Refusal @ 10.0 FT.
12.5	833.5										
15.0	831.0										
17.5	828.5										
20.0	826.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

(1) Before coring

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF BORING: IV-21

PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 07 October 2005 — SHEET 1 OF 1

BORING NO. / LOCATION: STATION 453+00, OFFSET 0 ft, Center — SUBCONTRACTOR: Tri-State

ON-SITE REP: WDS

DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	853.3	FT. (estimated)
BOTTOM OF HOLE:	10.0	FT.	843.3	FT
REFUSAL:	NA	FT.	NA	FT.
TOP OF ROCK:	NA	FT.	NA	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	10.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	853.3	0.0	1.0		AUGER						Topsoil/ vegetation
		1.0		S-1	SS	18	7	7	6	13	Clay, silty, sandy, yellowish-brown with rock fragments (Stiff)
2.5	850.8	2.5			AUGER						
		3.5		S-2	SS	18	4	6	6	12	DO 1
5.0	848.3	5.0			AUGER						
		6.0		S-3	SS	18	4	6	12	18	DO 1 (very stiff)
7.5	845.8	7.5			AUGER						
		8.5		S-4	SS	18	6	8	12	20	DO 3 w/ rock fragments
10.0	843.3	10.0									No Refusal @ 10.0 FT.
12.5	840.8										
15.0	838.3										
17.5	835.8										
20.0	833.3										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 06 October 2005
BORING NO. / LOCATION: STATION 455+00, OFFSET 0 ft, Center

LOG OF BORING: IV-22
SHEET 1 OF 1
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	875.5	FT. (estimated)
BOTTOM OF HOLE:	19.0	FT.	856.5	FT.
REFUSAL:	9.0	FT.	866.5	FT.
TOP OF ROCK:	9.0	FT.	866.5	FT.
BEGAN CORING:	9.0	FT.	866.5	FT.
FOOTAGE SAMPLED:	9.0	CORED:	10.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	0.0	875.5	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	875.5	0.0	1.0		AUGER						Topsoil
		1.0	2.5	S-1	SS	18	5	5	6	11	Clay, silty, brown with numerous roots (Stiff)
2.5	873.0	2.5	3.5		AUGER						
		3.5	5.0	S-2	SS	18	6	9	9	18	DO 1 (very stiff)
5.0	870.5	5.0	6.0		AUGER						
		6.0	7.5	S-3	SS	18	7	8	10	18	DO 2
7.5	868.0	7.5	8.0		AUGER						
		8.0	9.0	S-4	SS	12	11	15	50/.0	65/0.5	DO 2, reddish-brown/gray with rock fragments Begin NQ Coring @ 9.0', 100% DWR
10.0	865.5	9.0	14.0			RUN 1 RAN 5.0 REC 4.4 RQD= 62					Auger Refusal @ 9.0 FT. Limestone, silty, sandy, mottled gray with several clay filled cavities, with soft shale bedding planes and open, stained bedding plane
12.5	863.0										
15.0	860.5	14.0	19.0			RUN 2 RAN 5.0 REC 5.0 RQD= 94					
17.5	858.0										
20.0	855.5	19.0									Core Terminated @ 19.0 FT.

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 06 October 2005
BORING NO. / LOCATION: STATION 457+00, OFFSET 55 ft, Left

LOG OF BORING: IV-23
SHEET 1 OF 2
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	899.6	FT. (estimated)
BOTTOM OF HOLE:	27.0	FT.	872.6	FT.
REFUSAL:	16.1	FT.	883.5	FT.
TOP OF ROCK:	16.1	FT.	883.5	FT.
BEGAN CORING:	16.1	FT.	883.5	FT.
FOOTAGE SAMPLED:	16.1	CORED:	10.9	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	17.0	882.6	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	899.6	0.0	1.0		AUGER						Topsoil
		1.0		S-1	SS	18	12	7	8	15	Clay, slightly silty, yellowish-brown (Stiff)
2.5	897.1	2.5			AUGER						
		3.5		S-2	SS	18	6	9	13	22	DO 1 (very stiff)
5.0	894.6	5.0			AUGER						
		6.0		S-3	SS	18	6	7	10	17	DO 2 mottled gray with rock fragments
7.5	892.1	7.5			AUGER						
		8.5		S-4	SS	18	8	11	12	23	DO 2 w/ roots
10.0	889.6	10.0			AUGER						
12.5	887.1										
		13.5		S-5	SS	18	11	20	22	42	DO 2 (Hard)
15.0	884.6	15.0			AUGER						
		16.1									Begin NQ Coring @ 16.1', 100% DWR
17.5	882.1	16.1				RUN 1 RAN 3.9 REC 3.5 RQD= 72					Auger Refusal @ 16.1 FT. 100% DWL @ 17.0' Limestone, silty, sandy, mottled gray, variably stained leached with open, stained horizontal and diagonal fractures
20.0	879.6		20.0								100% DWR @ 20.0'

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 06 October 2005
BORING NO. / LOCATION: STATION 457+00, OFFSET 55 ft, Left

LOG OF BORING: IV-23
SHEET 2 OF 2
DRILLER: Tri-State
ON-SITE REP: WDS
DRY ON COMPLETION ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	899.6	FT. (estimated)
BOTTOM OF HOLE:	27.0	FT.	872.6	FT.
REFUSAL:	16.1	FT.	883.5	FT.
TOP OF ROCK:	16.1	FT.	883.5	FT.
BEGAN CORING:	16.1	FT.	883.5	FT.
FOOTAGE SAMPLED:	16.1	CORED:	10.9	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	17	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV. FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
20.0	879.6	20.0				RUN 2 RAN 5.0 REC 4.6 RQD= 90					Limestone, silty, sandy, mottled gray with partially healed vertical fractures
22.5	877.1										
25.0	874.6		25.0								
		25.0				RUN 3 RAN 2.0 REC 2.0 RQD= 100					
			27.0								100% DWR
27.5	872.1	27.0									Core Terminated @ 27.0 FT.
30.0	869.6										
32.5	867.1										
35.0	864.6										
37.5	862.1										
40.0	859.6										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 06 October 2005
BORING NO. / LOCATION: STATION 459+50, OFFSET 55 ft, Left

LOG OF BORING: IV-24
SHEET 1 OF 2
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	912.5	FT. (estimated)
BOTTOM OF HOLE:	30.0	FT.	882.5	FT.
REFUSAL:	3.0	FT.	909.5	FT.
TOP OF ROCK:	3.0	FT.	909.5	FT.
BEGAN CORING:	3.0	FT.	909.5	FT.
FOOTAGE SAMPLED:	3.0	CORED:	27.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	13.5	899.0	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	7.0	905.5	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	912.5	0.0			AUGER						Soil/Rock mixture
2.5	910.0		3.0								Begin NQ Coring @ 3.0', 100% DWR
		3.0				RUN 1 RAN 5.0 REC 2.2 RQD= 40					Auger Refusal @ 3.0 FT. Limestone, sandy, silty, light gray, variably stained, leached
5.0	907.5										clay seam 5.0'-8.0'
7.5	905.0		8.0								100% DWL @ 7.0'
		8.0				RUN 2 RAN 2.0 REC 1.8 RQD= 55					Limestone, sandy, silty, light gray, variably stained, leached (porous)
10.0	902.5		10.0								
		10.0				RUN 3 RAN 5.0 REC 4.2 RQD= 60					partial clay filled cavity 10.4'-12.2'
12.5	900.0										Limestone, sandy, silty, mottled gray, variably stained, leached, (Porous) petrol-chemical odor within porous zone 13'-16'
15.0	897.5		15.0								
		15.0				RUN 4 RAN 5.0 REC 5.0 RQD= 100					Limestone, silty, sandy, mottled gray, with shale bands
17.5	895.0										
20.0	892.5		20.0								100% DWR @ 20.0'

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS: Petrol-chemical odor within porous bedrock core from 13 to 16 feet below ground surface. Boring grouted with sure jell bentonite on completion.

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
LOG OF BORING: IV-24
PROJECT NO.: 3-518-40000 PHASE 0001
DATE: 06 October 2005
SHEET 2 OF 2
BORING NO. / LOCATION: STATION 459+50, OFFSET 55 ft, Left
DRILLER: Tri-State
ON-SITE REP: WDS
DRY ON COMPLETION ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	912.5	FT. (estimated)
BOTTOM OF HOLE:	30.0	FT.	882.5	FT.
REFUSAL:	3.0	FT.	909.5	FT.
TOP OF ROCK:	3.0	FT.	909.5	FT.
BEGAN CORING:	3.0	FT.	909.5	FT.
FOOTAGE SAMPLED:	3.0	CORED:	27.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	13.5	899.0	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	7.0	905.5	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV. FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
20.0	892.5					RUN 5 RAN 5.0 loss 0.2 REC 4.8 RQD= 98					Limestone, silty, sandy, mottled gray, with shale bands
22.5	890.0										
25.0	887.5		25.0								
		25.0				RUN 6 RAN 5.0 gain 0.2 REC 5.2 RQD= 100					
27.5	885.0										
30.0	882.5		30.0								100% DWR
		30.0									Core Terminated @ 30.0 FT.
32.5	880.0										
35.0	877.5										
37.5	875.0										
40.0	872.5										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF BORING: IV-25
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 06 October 2005 — SHEET 1 OF 2
BORING NO. / LOCATION: STATION 461+00, OFFSET 55 ft, Left — SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	919.0	T. (estimated)
BOTTOM OF HOLE:	30.0	FT.	889.0	FT.
REFUSAL:	4.0	FT.	915.0	FT.
TOP OF ROCK:	4.0	FT.	915.0	FT.
BEGAN CORING:	4.0	FT.	915.0	FT.
FOOTAGE SAMPLED:	4.0	CORED:	26.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	0.0	919.0	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	20.0	899.0	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	919.0	0.0	1.0		AUGER						Topsoil/Roots
2.5	916.5	1.0	4.0		AUGER						Soil/Rock mixture Begin NQ Coring @ 4.0', 100% DWR
5.0	914.0	4.0	9.0			RUN 1 RAN 5.0 REC 4.8 RQD= 40					Auger Refusal @ 4.0 FT. Limestone, sandy, silty, mottled gray, variably stained, leached, weathered (decomposed rock 4.7'-7.5') porous
10.0	909.0	9.0	10.0			RUN 2 RAN 1.0					Limestone, sandy, variably stained, leached (porous) with petrol-chemical odor
12.5	906.5	10.0	15.0			REC 1.1 RQD=110 RUN 3 RAN 5.0 REC 5.1 RQD= 102					
15.0	904.0	15.0	20.0			RUN 4 RAN 5.0 REC 4.8 RQD 96					Limestone, silty, sandy, light gray mottled gray crystal filled vugs (Quartz, Calcite) LDW 100% DWL @ 20.0'
17.5	901.5										
20.0	899.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS: Petrol-chemical odor within porous bedrock 9.0 feet to 16.0 feet. Boring grouted with sure gel Bentonite on completion.

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 06 October 2005
BORING NO. / LOCATION: STATION 461+00, OFFSET 55 ft, Left

LOG OF BORING: IV-25
SHEET 2 OF 2
DRILLER: Tri-State
ON-SITE REP: WDS
DRY ON COMPLETION ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	919.0	T. (estimated)
BOTTOM OF HOLE:	30.0	FT.	889.0	FT.
REFUSAL:	4.0	FT.	915.0	FT.
TOP OF ROCK:	4.0	FT.	915.0	FT.
BEGAN CORING:	4.0	FT.	915.0	FT.
FOOTAGE SAMPLED:	4.0	CORED:	26.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	0.0	919.0	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	20.0	899.0	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV. FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
20.0	899.0	20.0	25.0			RUN 5 RAN 5.0 REC 4.9 RQD= 98					Limestone, silty, sandy, light gray mottled gray crystal filled vugs (Quartz, Calcite) 100% DWR @ 25.0'
25.0	894.0	25.0	30.0			RUN 6 RAN 5.0 REC 5.1 RQD= 102					Limestone, silty, sandy, mottled gray
30.0	889.0	30.0									Core Terminated @ 30.0 FT.
35.0	884.0										
40.0	879.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 06 October 2005
BORING NO. / LOCATION: STATION 463+00, OFFSET 35 ft, Right

LOG OF BORING: IV-26
SHEET 1 OF 1
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	900.1	FT. (estimated)
BOTTOM OF HOLE:	17.0	FT.	883.1	FT.
REFUSAL:	7.8	FT.	892.3	FT.
TOP OF ROCK:	7.8	FT.	892.3	FT.
BEGAN CORING:	7.8	FT.	892.3	FT.
FOOTAGE SAMPLED:	7.8	CORED:	9.2	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	7.5	892.6	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	900.1	0.0	1.0		AUGER						Topsoil
2.5	897.6	1.0	2.5	S-1	SS	18	2	2	4	6	Clay, slightly silty, yellowish-brown (Medium Stiff)
		2.5	3.5		AUGER						
		3.5	5.0	S-2	SS	18	3	5	6	11	DO 1, sandy, (stiff)
5.0	895.1	5.0	6.0		AUGER						
		6.0	7.5	S-3	SS	18	4	6	7	13	DO 2, and mottled black/tan
7.5	892.6	7.5	7.8		AUGER						
10.0	890.1	7.8	12.8			RUN 1 RAN 5.0 loss 0.2 REC 4.8 RQD= 90					Auger Refusal @ 7.8 FT. Limestone, silty, sandy, light gray mottled gray variably stained, leached with open stained bedding planes and soft shale partings (petrol-chemical odor during drilling)
12.5	887.6										
15.0	885.1	12.8	17.0			RUN 2 RAN 4.2 gain 0.2 REC 4.4 RQD= 100					100% DWR
17.5	882.6	17.0									Core Terminated @ 17.0 FT.
20.0	880.1										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS: Petrol-chemical odor reported by drillers. Boring was grouted with sure gel bentonite 24 hours after completion.

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 05 October 2005
BORING NO. / LOCATION: STATION 464+00, OFFSET 0 ft, Center

LOG OF BORING: IV-27
SHEET 1 OF 1
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	897.1	FT. (estimated)
BOTTOM OF HOLE:	0.0	FT.	897.1	FT.
REFUSAL:	0.0	FT.	897.1	FT.
TOP OF ROCK:	0.0	FT.	897.1	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	0.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	897.1	0.0									Auger Refusal @ 0.0 FT.
											BEDROCK EXPOSED AT SURFACE
2.5	894.6										
5.0	892.1										
7.5	889.6										
10.0	887.1										
12.5	884.6										
15.0	882.1										
17.5	879.6										
20.0	877.1										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 05 October 2005
BORING NO. / LOCATION: STATION 465+00, OFFSET 0 ft, Center

LOG OF BORING: IV-28
SHEET 1 OF 1
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	891.0	FT. (estimated)
BOTTOM OF HOLE:	0.0	FT.	891.0	FT.
REFUSAL:	0.0	FT.	891.0	FT.
TOP OF ROCK:	0.0	FT.	891.0	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	0.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	891.0	0.0									Auger Refusal @ 0.0 FT.
											BEDROCK EXPOSED AT SURFACE
2.5	888.5										
5.0	886.0										
7.5	883.5										
10.0	881.0										
12.5	878.5										
15.0	876.0										
17.5	873.5										
20.0	871.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 05 October 2005
BORING NO. / LOCATION: STATION 466+00, OFFSET 0 ft, Center

LOG OF BORING: IV-29
SHEET 1 OF 1
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	907.0	FT. (estimated)
BOTTOM OF HOLE:	0.0	FT.	907.0	FT.
REFUSAL:	0.0	FT.	907.0	FT.
TOP OF ROCK:	0.0	FT.	907.0	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	0.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	907.0	0.0									Auger Refusal @ 0.0 FT.
											BEDROCK EXPOSED AT SURFACE
2.5	904.5										
5.0	902.0										
7.5	899.5										
10.0	897.0										
12.5	894.5										
15.0	892.0										
17.5	889.5										
20.0	887.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF BORING: IV-30
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 05 October 2005 — SHEET 1 OF 1
BORING NO. / LOCATION: STATION 467+00, OFFSET 0 ft, Center — SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	926.0	FT. (estimated)
BOTTOM OF HOLE:	0.0	FT.	926.0	FT.
REFUSAL:	0.0	FT.	926.0	FT.
TOP OF ROCK:	0.0	FT.	926.0	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	0.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	926.0	0.0									Auger Refusal @ 0.0 FT.
											BEDROCK EXPOSED AT SURFACE
2.5	923.5										
5.0	921.0										
7.5	918.5										
10.0	916.0										
12.5	913.5										
15.0	911.0										
17.5	908.5										
20.0	906.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 30 September 2005
BORING NO. / LOCATION: STATION 468+15, OFFSET 10 ft, Right

LOG OF BORING: IV-31
SHEET 1 OF 1
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	949.0	FT. (estimated)
BOTTOM OF HOLE:	10.0	FT.	939.0	FT.
REFUSAL:	0.0	FT.	949.0	FT.
TOP OF ROCK:	0.0	FT.	949.0	FT.
BEGAN CORING:	0.0	FT.	949.0	FT.
FOOTAGE SAMPLED:	0.0	CORED:	10.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	6.0	943.0	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	949.0	0.0	5.0			RUN 1 RAN 5.0 REC 5.0 RQD= 30					Auger Refusal @ 0.0 FT. Begin NQ core @ 0.0, 100% DWR Limestone, variably sandy, silty, light gray mottled gray, variably siliceous, fossiliferous, variably stained, leached, weathered
5.0	944.0	5.0	10.0			RUN 2 RAN 5.0 REC 5.0 RQD= 52					100% DWR
10.0	939.0	10.0									Core Terminated @ 10.0 FT.
15.0	934.0										
17.5	931.5										
20.0	929.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 03 October 2005
BORING NO. / LOCATION: STATION 469+80, OFFSET 50 ft, Left

LOG OF BORING: IV-32
SHEET 1 OF 2
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	975.2	FT. (estimated)
BOTTOM OF HOLE:	29.0	FT.	946.2	FT.
REFUSAL:	0.5	FT.	974.7	FT.
TOP OF ROCK:	0.5	FT.	974.7	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	0.5	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	10.0	965.2	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	975.2		0.5								Gravel/ Rock/ Soil Begin NQ Core @ 0.5 FT
		0.5	4.7			RUN 1 RAN 4.2 REC 2.8 RQD= 0					Auger Refusal @ 0.5 FT. 100% DWR Limestone, sandy, silty, gray, variably stained, leached, weathered with numerous clay seams
5.0	970.2	4.7	10.0			RUN 2 RAN 5.3 REC 4.6 RQD= 60					... with open, stained bedding planes
10.0	965.2	10.0	15.0			RUN 3 RAN 5.0 REC 4.9 RQD= 64					... with several healed verticla fractures
15.0	960.2	15.0	20.0			RUN 4 RAN 5.0 REC 5.0 RQD= 74					... oily sheen/stain on face of high angle open joint
20.0	955.2										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF BORING: IV-32
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 03 October 2005 — SHEET 2 OF 2
BORING NO. / LOCATION: STATION 469+80, OFFSET 50 ft, Left — DRILLER: Tri-State
ON-SITE REP: WDS

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	975.2	FT. (estimated)
BOTTOM OF HOLE:	29.0	FT.	946.2	FT.
REFUSAL:	0.5	FT.	974.7	FT.
TOP OF ROCK:	0.5	FT.	974.7	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	0.5	CORED:	0.0	

DRY ON COMPLETION ? YES

WATER LEVEL DATA

	DEPTH	ELEVATION
DURING DRILLING:	DRY	NA FT.
@ COMPLETION:	10.0	965.2 FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV. FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
20.0	955.2					RUN 5 RAN 5.0 REC 4.8 RQD= 92					Limestone, sandy, silty, gray mottled dark gray with several shale partings and partially healed vertical fracture.
22.5	952.7										
25.0	950.2		25.0								
		25.0				RUN 6 RAN 4.0 REC 3.9 RQD= 85					
27.5	947.7		29.0								100% DWR
		29.0									Core Terminated @ 29.0 FT.
30.0	945.2										
32.5	942.7										
35.0	940.2										
37.5	937.7										
40.0	935.2										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 03 October 2005
BORING NO. / LOCATION: STATION 469+80, OFFSET 0 ft, Center

LOG OF BORING: IV-33
SHEET 1 OF 1
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	966.8	FT. (estimated)
BOTTOM OF HOLE:	19.0	FT.	947.8	FT.
REFUSAL:	2.4	FT.	964.4	FT.
TOP OF ROCK:	2.4	FT.	964.4	FT.
BEGAN CORING:	2.4	FT.	964.4	FT.
FOOTAGE SAMPLED:	2.4	CORED:	16.6	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	8.0	958.8	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: -POWER AUGERING X -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	966.8	0.0	2.0		WASH						Weathered rock with soil
2.0											
2.5	984.3	2.0	2.4		WASH						Begin NQ Coring at 2.4, 100% DWR
		2.4	6.3			RUN 1 RAN 3.9 REC 3.9 RQD 18					Auger Refusal @ 2.4 FT. Limestone, sandy, silty, light gray mottled gray, variably stained, leached weathered with numerous clay seams and solution cavities
5.0	961.8										
7.5	959.3	6.3	10.0			RUN 2 RAN 3.7 REC 3.7 RQD 24					
10.0	956.8	10.0	15.0			RUN 3 RAN 5.0 REC 4.8 RQD 76					
12.5	954.3										
15.0	951.8	15.0	19.0			RUN 4 RAN 4.0 REC 3.9 RQD 85					100% DWR
17.5	949.3										
20.0	946.8	19.0									Core Terminated @ 19.0 FT.

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 04 October 2005
BORING NO. / LOCATION: STATION 469+80, OFFSET 30 ft, Right

LOG OF BORING: IV-34
SHEET 1 OF 1
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	957.5	FT. (estimated)
BOTTOM OF HOLE:	8.6	FT.	948.9	FT.
REFUSAL:	2.2	FT.	955.3	FT.
TOP OF ROCK:	2.2	FT.	955.3	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	2.2	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	6.0	951.5	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	957.5	0.0	2.2		AUGER						Rock and soil mix Begin NQ coring at 2.2 FT 100% DWR
2.5	955.0	2.2	5.8			RUN 1 RAN 3.6 REC 2.8 RQD 19					Auger Refusal @ 2.2 FT. Limestone Sandy, silty, mottled light gray/ gray variably stained, leached. Weathered
5.0	952.5										
7.5	950.0	5.8	8.6			RUN 2 RAN 2.8 REC 2.8 RQD 72					100% DWR
10.0	947.5	8.6									Core Terminated @ 8.6 FT.
12.5	945.0										
15.0	942.5										
17.5	940.0										
20.0	937.5										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF BORING: IV-35
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 04 October 2005 — SHEET 1 OF 2
BORING NO. / LOCATION: STATION 471+00, OFFSET 55 ft, Left — SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

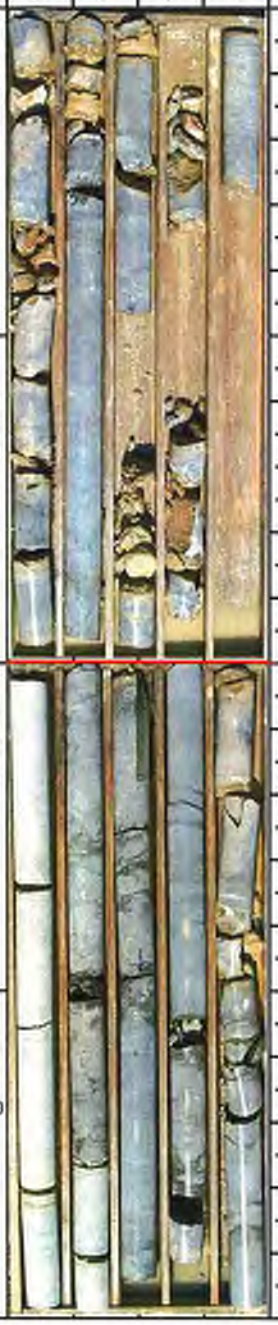
	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	992.0	FT. (estimated)
BOTTOM OF HOLE:	30.0	FT.	962.0	FT.
REFUSAL:	0.0	FT.	992.0	FT.
TOP OF ROCK:	0.0	FT.	992.0	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	0.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	12.0	980.0	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	0.5	991.5	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	992.0	0.0	5.0			RUN 1 RAN 5.0 REC 2.5 RQD 26					Auger Refusal @ 0.0 FT. 100% DWL 0.5 FT Limestone, silty, sandy, mottled gray, with numerous open, stained bedding planes, cavities and clay seams, and soft shale seams
5.0	987.0	5.0	10.0			RUN 2 RAN 5.0 REC 4.6 RQD= 30					
10.0	982.0	10.0	15.0			RUN 3 RAN 5.0 REC 5.0 RQD= 64					
15.0	977.0	15.0	20.0			RUN 4 RAN 5.0 REC 5.1 RQD= 100					
20.0	972.0										



WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 04 October 2005
BORING NO. / LOCATION: STATION 471+00, OFFSET 55 ft, Left

LOG OF BORING: IV-35
SHEET 2 OF 2
DRILLER: Tri-State
ON-SITE REP: WDS
DRY ON COMPLETION ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	992.0	FT. (estimated)
BOTTOM OF HOLE:	30.0	FT.	962.0	FT.
REFUSAL:	0.0	FT.	992.0	FT.
TOP OF ROCK:	0.0	FT.	992.0	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	0.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	12.0	980.0	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	0.5	991.5	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV. FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
20.0	972.0					RUN 5 RAN 5.0 REC 4.7 RQD= 92					Limestone, silty, sandy, light gray to mottled gray with soft shale band
22.5	969.5										
25.0	967.0		25.0								
		25.0				RUN 6 RAN 5.0 REC 5.0 RQD= 100					
27.5	964.5										
30.0	962.0		30.0								Rod Check 29.7' 100% LDW
		30.0									Core Terminated @ 30.0 FT.
32.5	959.5										
35.0	957.0										
37.5	954.5										
40.0	952.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 04 October 2005
BORING NO. / LOCATION: STATION 472+30, OFFSET 30 ft, Left

LOG OF BORING: IV-36
SHEET 1 OF 2
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	966.0	FT. (estimated)
BOTTOM OF HOLE:	25.1	FT.	940.9	FT.
REFUSAL:	1.7	FT.	964.3	FT.
TOP OF ROCK:	1.7	FT.	964.3	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	1.7	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	16.5	949.5	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	966.0	0.0			AUGER						Weathered rock & Soil
			1.7								Begin NQ Coring @ 1.7', 100% DWR
		1.7				RUN 1 RAN 5.0 REC 4.4 RQD= 8					Auger Refusal @ 1.7 FT.
2.5	963.5										Limestone, sandy, silty, mottled gray, variably stained, leached, weathered with numerous stained, leached, bedding planes and clay seams
5.0	961.0		6.7								
		6.7				RUN 2 RAN 3.3 REC 2.6 RQD= 24					
7.5	958.5										
10.0	956.0		10.0								
		10.0				RUN 3 RAN 5.0 REC 4.1 RQD= 44					
12.5	953.5										
15.0	951.0		15.0								
		15.0				RUN 4 RAN 5.0 REC 4.3 RQD= 54					
17.5	948.5										
20.0	946.0		20.0								

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF BORING: IV-36
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 04 October 2005 — SHEET 2 OF 2
BORING NO. / LOCATION: STATION 472+30, OFFSET 30 ft, Left — DRILLER: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	966.0	FT. (estimated)
BOTTOM OF HOLE:	25.1	FT.	940.9	FT.
REFUSAL:	1.7	FT.	964.3	FT.
TOP OF ROCK:	1.7	FT.	964.3	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	1.7	CORED:	0.0	

WATER LEVEL DATA	DEPTH	ELEVATION
DURING DRILLING:	DRY	NA FT.
@ COMPLETION:	16.5	NA FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV. FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
20.0	946.0	20.0				RUN 5 RAN 5.1 REC 5.1 RQD= 96					Limestone, sandy, silty, mottled gray with calcite crystals
22.5	943.5										
25.0	941.0		25.1								
		25.1									Core Terminated @ 25.1 FT.
27.5	938.5										
30.0	936.0										
32.5	933.5										
35.0	931.0										
37.5	928.5										
40.0	926.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road
LOG OF BORING: IV-38
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 30 September 2005
SHEET 1 OF 1
BORING NO. / LOCATION: STATION 474+80, OFFSET 100 ft, Right
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	917.5	FT. (estimated)
BOTTOM OF HOLE:	6.5	FT.	911.0	FT.
REFUSAL:	6.5	FT.	911.0	FT.
TOP OF ROCK:	6.5	FT.	911.0	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	6.5	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	917.5	0.0			AUGER						Shot Rock Fill
2.5	915.0										
5.0	912.5		6.5								
		6.5									Auger Refusal @ 6.5 FT.
7.5	910.0										
10.0	907.5										
12.5	905.0										
15.0	902.5										
17.5	900.0										
20.0	897.5										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 29 September 2005
BORING NO. / LOCATION: STATION 477+50, OFFSET 28 ft, Right

LOG OF BORING: IV-39
SHEET 1 OF 1
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	955.2	FT. (estimated)
BOTTOM OF HOLE:	18.9	FT.	936.3	FT.
REFUSAL:	8.9	FT.	946.3	FT.
TOP OF ROCK:	8.9	FT.	946.3	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	8.9	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	0.0	955.2	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	955.2	0.0	1.0		AUGER						Topsoil
		1.0	2.5	S-1	SS	18	2	7	9	16	Clay, slightly silty, yellowish-brown with rock fragments (Very Stiff)
2.5	952.7	2.5	3.5		AUGER						
		3.5	5.0	S-2	SS	18	5	10	8	18	DO #1 (Very Stiff)
5.0	950.2	5.0	6.0		AUGER						
		6.0	7.1	S-3	SS	13	18	38	50/.1	88/0.6	Clay, silty, yellowish-brown with numerous rock fragments (Hard)
7.5	947.7	7.1	8.9		AUGER						Auger thru Rock to 8.9'
											Begin NQ Coring @ 8.9', 100% DWR
		8.9				RUN 1 RAN 5.0 REC 4.7 RQD= 52					Auger Refusal @ 8.9 FT.
10.0	945.2										Limestone, sandy, silty, gray with several soft shale partings, variably stained, leached, weathered
12.5	942.7										
						RUN 2 RAN 1.1 REC 1.1 RQD= 55					
15.0	940.2										
						RUN 3 RAN 3.9 REC 3.9 RQD= 95					
17.5	937.7		18.9								100% DWR
		18.9									Core Terminated @ 18.9 FT.
20.0	935.2										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 13 October 2005
BORING NO. / LOCATION: STATION 478+00, OFFSET 55 ft, Left

LOG OF BORING: IV-40
SHEET 1 OF 1
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	962.4	FT. (estimated)
BOTTOM OF HOLE:	20.0	FT.	942.4	FT.
REFUSAL:	5.0	FT.	957.4	FT.
TOP OF ROCK:	5.0	FT.	957.4	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	5.0	CORED:	0.0	

WATER LEVEL DATA	DEPTH	ELEVATION
DURING DRILLING:	DRY	NA FT.
@ COMPLETION:	DRY	NA FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	962.4	0.0	1.0		AUGER						Topsoil/Vegetation
2.5	959.9	1.0	5.0		AUGER						Clay, silty, yellowish-brown with numerous rock fragments
5.0	957.4										Begin NQ Coring @ 5.0', 100% DWR
7.5	954.9	5.0	10.0			RUN 1 RAN 5.0 REC 2.0 RQD= 8					Auger Refusal @ 5.0 FT. Limestone, sandy, silty, gray, variably stained, leached, weathered with several clay seams
10.0	952.4	10.0	15.0			RUN 2 RAN 5.0 RQD= 0					
12.5	949.9										
15.0	947.4	15.0	20.0			RUN 3 RAN 5.0 REC 5.1 RQD= 78					... with soft shale partings, solution vugs, and open, stained, diagonal fractures
17.5	944.9										100% DWR
20.0	942.4										Core Terminated @ 20.0 FT.

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS: Landowner excavated rock in order to plant trees. Boring backfilled on completion

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF BORING: IV-41
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 30 September 2005 — SHEET 1 OF 1
BORING NO. / LOCATION: STATION 479+00, OFFSET 44 ft, Right — SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	955.0	FT. (estimated)
BOTTOM OF HOLE:	16.4	FT.	938.6	FT.
REFUSAL:	6.9	FT.	948.1	FT.
TOP OF ROCK:	6.9	FT.	948.1	FT.
BEGAN CORING:	6.9	FT.	948.1	FT.
FOOTAGE SAMPLED:	6.9	CORED:	9.5	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	12.0	943.0	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	955.0	0.0	1.0		AUGER						Topsoil & roots
		1.0		S-1	SS	18	5	5	7	12	Clay, slightly silty, brown with rock fragments (Stiff)
2.5	952.5	2.5	3.5	S-2	SS	18	4	8	18	26	DO 1 reddish-brown, very stiff
5.0	950.0	5.0	6.0	S-3	SS	7	6	50/.1		50/0.1	DO 2 yellowish-brown with rock frag and large Bryozoans fossil frag (Stiff)
7.5	947.5	6.9				RUN 1 RAN 4.5 REC 3.6 RQD= 36					Auger Refusal @ 6.9 FT. Begin NQ Coring @ 6.9' Limestone, silty, sandy, gray, fossiliferous, variably stained, leached weathered with numerous clay seams and shale partings
10.0	945.0		11.4								
12.5	942.5	11.4				RUN 2 RAN 5.0 REC 4.9 RQD= 94					
15.0	940.0		16.4								Rod Check 16.2'
17.5	937.5	16.4									Core Terminated @ 16.4 FT.
20.0	935.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road — LOG OF BORING: IV-42
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 14 October 2005 — SHEET 1 OF 1
BORING NO. / LOCATION: STATION 479+00, OFFSET 55 ft, Left — SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	957.0	FT (estimated)
BOTTOM OF HOLE:	19.1	FT.	937.9	FT.
REFUSAL:	19.1	FT.	937.9	FT.
TOP OF ROCK:	19.1	FT.	937.9	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	19.1	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	957.0	0.0	0.8		AUGER						Topsoil/Vegetation/Rock
		0.8	2.0		AUGER						Rock (poss fill/ colluvium)
2.5	954.5	2.0	3.5		AUGER						Clay, sandy, silty, reddish-brown (colluvium)
		3.5		S-1	SS	18	1	1	5	6	Clay, silty, sandy, yellowish-brown with numerous rock fragments (Colluvium to 4.5') (Medium Stiff)
5.0	952.0	5.0	6.0	S-2	SS	18	7	10	16	26	Clay, silty, slightly sandy, yellowish-brown with rock fragments (very stiff)
7.5	949.5	7.5	8.5	S-3	SS	18	7	11	16	27	DO 2
10.0	947.0	10.0	13.5	S-4	AUGER SS	18	7	8	12	20	DO 2 moist
12.5	944.5										
15.0	942.0	15.0	18.5	S-5	AUGER SS	7	6	50/.1		50/0.1	DO 4 with sandstone, fossils
17.5	939.5										
20.0	937.0	19.1									Auger Refusal @ 19.1 FT.

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road — LOG OF BORING: IV-43
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 29 September 2005 — SHEET 1 OF 1
BORING NO. / LOCATION: STATION 479+00, OFFSET 10 ft, Right — SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	953.2	FT. (estimated)
BOTTOM OF HOLE:	20.0	FT.	933.2	FT.
REFUSAL:	5.1	FT.	948.1	FT.
TOP OF ROCK:	5.1	FT.	948.1	FT.
BEGAN CORING:	5.1	FT.	948.1	FT.
FOOTAGE SAMPLED:	5.1	CORED:	14.9	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	0.0	953.2	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	953.2	0.0	1.0		AUGER						Topsoil
		1.0	2.5	S-1	SS	18	2	3	4	7	Clay, slightly silty, yellowish-brown (Moist) (Medium Stiff)
2.5	950.7	2.5	3.5		AUGER						
		3.5	5.1	S-2	SS	18	3	4	5	9	DO 1 (Stiff)
5.0	948.2										Begin NQ Coring @ 5.1' 100% DWR
		5.1	10.0			RUN 1 RAN 4.9 REC 2.2 RQD= 8					Auger Refusal @ 5.1 FT. Limestone, sandy, silty, light gray, with numerous clay seams
7.5	945.7										
10.0	943.2										
		10.0	15.0			RUN 2 RAN 5.0 REC 4.9 RQD= 78					... shale partings and open, stained bedding planes
12.5	940.7										
15.0	938.2										
		15.0	20.0			RUN 3 RAN 5.0 REC 4.9 RQD= 98					Rod check 19.9', 100% DWR Core Terminated @ 20.0 FT.
17.5	935.7										
20.0	933.2										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF BORING: IV-46
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 14 October 2005 — SHEET 1 OF 1
BORING NO. / LOCATION: STATION 482+00, OFFSET 47 ft, Left — SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	927.0	FT. (estimated)
BOTTOM OF HOLE:	20.0	FT.	907.0	FT.
REFUSAL:	NA	FT.	NA	FT.
TOP OF ROCK:	NA	FT.	NA	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	20.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION
DURING DRILLING:	DRY	NA FT.
@ COMPLETION:	DRY	NA FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	927.0	0.0	1.0		AUGER						Topsoil/Vegetation
		1.0	2.5	S-1	SS	18	7	7	9	16	* Clay, silty, yellowish-brown with roots/rock fragments (medium stiff) (Colluvium) dry
2.5	924.5	2.5	3.5		AUGER						
		3.5	5.0	S-2	SS	18	15	16	16	32	* Clay, silty, sandy, yellowish-brown with numerous rock fragments (Colluvium) (stiff) dry
5.0	922.0	5.0	6.0		AUGER						
		6.0	7.2	S-3	SS	14	12	24	50/.2	74/0.7	* DO 2
7.5	919.5	7.2	8.0		AUGER						
		8.0	8.5		AUGER						rock fragments (Colluvium) dry
		8.5		S-4	SS	8	14	50/.2		50/0.2	* DO 2
10.0	917.0										
12.5	914.5										
		13.5	15.0	S-5	SS	18	10	18	27	45	* DO 2
15.0	912.0	15.0			AUGER						
17.5	909.5		18.5								
		18.5	20.0	S-6	SS	18	16	17	24	41	* Clay, silty, sandy, yellowish-brown with rock fragments residuum (very stiff) No Refusal @ 20.0 FT.
20.0	907.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS: * N-value exaggerated due to rock fragments

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 14 October 2005
BORING NO. / LOCATION: STATION 489+50, OFFSET 10 ft, Left

LOG OF BORING: IV-51
SHEET 1 OF 1
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	860.0	FT. (estimated)
BOTTOM OF HOLE:	15.0	FT.	845.0	FT.
REFUSAL:	NA	FT.	NA	FT.
TOP OF ROCK:	NA	FT.	NA	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	15.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LOW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	860.0	0.0	1.0		AUGER						Topsoil/Vegetation/Rock
		1.0	2.5	S-1	SS	18	11	12	14	26	Clay, silty, sandy, yellowish-brown (very stiff)(Fill)
2.5	857.5	2.5			AUGER						
		3.5	5.0	S-2	SS	18	6	7	10	17	* Clay, variably silty, yellowish-brown with rock fragments (Possible Colluvium)(stiff)
5.0	855.0	5.0	6.0	S-3	SS	18	4	8	11	19	* DO 2
7.5	852.5	7.5			AUGER						
		8.5	10.0	S-4	SS	18	6	9	10	19	* Clay, slightly silty, slightly sandy, yellowish-brown with rock fragments (stiff)
10.0	850.0	10.0			AUGER						
12.5	847.5	13.5	15.0	S-5	SS	18	3	4	5	9	* DO 4 rock fragments to sand (Moist)(Soft)
15.0	845.0	15.0									No Refusal @ 15.0 FT.
17.5	842.5										
20.0	840.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS: * N-value exaggerated due to rock fragments

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 14 October 2005
BORING NO. / LOCATION: STATION 491+00, OFFSET 20 ft, Left

LOG OF BORING: IV-52
SHEET 1 OF 1
SUBCONTRACTOR: Tri-State
ON-SITE REP: WOS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	851.5	FT. (estimated)
BOTTOM OF HOLE:	3.0	FT.	848.5	FT.
REFUSAL:	NA	FT.	NA	FT.
TOP OF ROCK:	NA	FT.	NA	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	3.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	851.5	0.0	1.0		AUGER						Topsoil/Vegetation/Rock
		1.0		S-1	SS	18	5	9	6	15	Clay, silty, reddish-brown with organics stiff (fill)
2.5	849.0	2.5	3.0		AUGER						
		3.0									No Refusal @ 3.0 FT. Hit 4 inch Water Line @ 3.0'
5.0	846.5										
7.5	844.0										
10.0	841.5										
12.5	839.0										
15.0	836.5										
17.5	834.0										
20.0	831.5										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF BORING: IV-55
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 15 September 2005 — SHEET 1 OF 1
BORING NO. / LOCATION: STATION 497+75, OFFSET 60 ft, Left — SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? NO

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	824.3	FT. (estimated)
BOTTOM OF HOLE:	9.0	FT.	815.3	FT.
REFUSAL:	9.0	FT.	815.3	FT.
TOP OF ROCK:	9.0	FT.	815.3	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	9.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	9.0	815.3	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	824.3	0.0	1.0		AUGER						Topsoil
		1.0	2.5	S-1	SS		4	5	7	12	Clay, silty, slightly sandy, brown with black nodules and rock fragments (Stiff)(Moist) (poss fill)
2.5	821.8	2.5	3.5		AUGER						
		3.5	5.0	S-2	SS		2	3	4	7	Clay, silty, slightly sandy, yellowish-brown mottled gray with rock fragments (Medium Stiff)(Moist)
5.0	819.3	5.0	6.0		AUGER						
		6.0	7.5	S-3	SS		2	3	4	7	DO 2
7.5	816.8	7.5	8.5		AUGER						
		8.5	9.0	S-4	SS		2	50/.4		50/0.4	DO 2 with rock frag
		9.0									Auger Refusal @ 9.0 FT.
10.0	814.3										
12.5	811.8										
15.0	809.3										
17.5	806.8										
20.0	804.3										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 15 September 2005
BORING NO. / LOCATION: STATION 500+10, OFFSET 20 ft, Right

LOG OF BORING: IV-56
SHEET 1 OF 1
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	809.0	FT. (estimated)
BOTTOM OF HOLE:	6.0	FT.	803.0	FT.
REFUSAL:	6.0	FT.	803.0	FT.
TOP OF ROCK:	6.0	FT.	803.0	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	6.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	809.0	0.0	1.0		AUGER						Topsoil
		1.0	2.5	S-1	SS	18	3	4	6	10	Clay, silty, sandy, yellowish-brown, (stiff) (moist)
2.5	806.5	2.5	3.5		AUGER						
		3.5	5.0	S-2	SS	18	3	5	5	10	DO 1
5.0	804.0	5.0	6.0		AUGER						
		6.0									Auger Refusal @ 6.0 FT.
7.5	801.5										
10.0	799.0										
12.5	796.5										
15.0	794.0										
17.5	791.5										
20.0	789.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road — LOG OF BORING: IV-57
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 15 September 2005 — SHEET 1 OF 1
BORING NO. / LOCATION: STATION 502+00, OFFSET 65 ft, Left — SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	811.7	FT. (estimated)
BOTTOM OF HOLE:	9.2	FT.	802.5	FT.
REFUSAL:	9.2	FT.	802.5	FT.
TOP OF ROCK:	9.2	FT.	802.5	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	9.2	CORED:	0.0	

WATER LEVEL DATA	DEPTH	ELEVATION
DURING DRILLING:	DRY	NA FT.
@ COMPLETION:	DRY	NA FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	811.7	0.0	1.0		AUGER						Topsoil
		1.0	2.5	S-1	SS	18	4	3	3	6	Clay. Silty, reddish-brown with rock frag, (firm)(moist)
2.5	809.2	2.5	3.5		AUGER						
		3.5	5.0	S-2	SS	18	1	2	2	4	DO 1 (soft)
5.0	806.7	5.0	6.0		AUGER						
		6.0	7.5	S-3	SS	18	2	4	5	9	DO 1, very sandy, (stiff)
7.5	804.2	7.5	8.5		AUGER						
		8.5	9.2	S-4	SS	8	2	50/.2		50/0.2	DO 3 (soft)
		9.2									Auger Refusal @ 9.2 FT.
10.0	801.7										
12.5	799.2										
15.0	796.7										
17.5	794.2										
20.0	791.7										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF BORING: IV-58
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 15 September 2005 — SHEET 1 OF 1
BORING NO. / LOCATION: STATION 503+50, OFFSET 20 ft, Right — SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	807.8	FT. (estimated)
BOTTOM OF HOLE:	8.0	FT.	799.8	FT.
REFUSAL:	8.0	FT.	799.8	FT.
TOP OF ROCK:	8.0	FT.	799.8	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	8.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION
DURING DRILLING:	DRY	NA FT.
@ COMPLETION:	DRY	NA FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	807.8	0.0	1.0		AUGER						Topsoil
		1.0	2.5	S-1	SS	18	4	8	9	17	Clay, silty, reddish-brown, (very stiff)(moist)
2.5	805.3	2.5	3.5		AUGER						
		3.5	5.0	S-2	SS	18	6	8	16	24	DO 1, sandy, mottled black
5.0	802.8	5.0	6.0		AUGER						
		6.0	7.1	S-3	SS	13	4	3	50/.1	53/0.6	DO 2, rock fragments
7.5	800.3	7.1	8.0		AUGER						
		8.0									Auger Refusal @ 8.0 FT.
10.0	797.8										
12.5	795.3										
15.0	792.8										
17.5	790.3										
20.0	787.8										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road
LOG OF BORING: IV-59
PROJECT NO.: 3-518-40000 PHASE 0001
DATE: 15 September 2005
SHEET 1 OF 1
BORING NO. / LOCATION: STATION 505+50, OFFSET 15 ft, Right
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	805.0	FT. (estimated)
BOTTOM OF HOLE:	8.9	FT.	796.1	FT.
REFUSAL:	8.9	FT.	796.1	FT.
TOP OF ROCK:	8.9	FT.	796.1	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	8.9	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	805.0	0.0	1.0		AUGER						Topsoil
		1.0	2.5	S-1	SS	18	4	6	9	15	Clay, silty, sandy, yellowish brown, (stiff) (moist)
2.5	802.5	2.5	3.5		AUGER						
		3.5	5.0	S-2	SS	18	2	4	5	9	DO 1 mottled gray, with rock fragments
5.0	800.0	5.0	6.0		AUGER						
		6.0	7.5	S-3	SS	18	4	5	7	12	DO 2
7.5	797.5	7.5	8.5		AUGER						
		8.5	8.9	S-4	SS	3	50/0.4			50/0.4	DO 2
		8.9									Auger Refusal @ 8.9 FT.
10.0	795.0										
12.5	792.5										
15.0	790.0										
17.5	787.5										
20.0	785.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 15 September 2005
BORING NO. / LOCATION: STATION 507+50, OFFSET 20 ft, Right

LOG OF BORING: IV-60
SHEET 1 OF 1
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	805.0	FT. (estimated)
BOTTOM OF HOLE:	10.0	FT.	795.0	FT.
REFUSAL:	NA	FT.	NA	FT.
TOP OF ROCK:	NA	FT.	NA	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	10.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION
DURING DRILLING:	DRY	NA FT.
@ COMPLETION:	DRY	NA FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	805.0	0.0	1.0		AUGER						
		1.0	2.5	S-1	SS	18	13	9	8	17	Clay, silty, brown (very stiff)(moist) (topsoil / poss fill / poss alluvium)
2.5	802.5	2.5	3.5		AUGER						
		3.5	5.0	S-2	SS	18	2	2	2	4	DO 1, with limestone fragments (soft)
5.0	800.0	5.0	6.0		AUGER						
		6.0	7.5	S-3	SS	18	WT	1	1	2	Clay, silty, dark brown (soft)(moist)
7.5	797.5	7.5	8.0		AUGER						
		8.0	10.0	S-4	SS	18	3	6	7	13	DO 3, yellowish-brown (stiff)(wet)
10.0	795.0	10.0									No Refusal @ 10.0 FT.
12.5	792.5										
15.0	790.0										
17.5	787.5										
20.0	785.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 15 September 2005
BORING NO. / LOCATION: STATION 508+55, OFFSET 5 ft, Right

LOG OF BORING: BR-61
SHEET 1 OF 2
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	806.5	FT. (estimated)
BOTTOM OF HOLE:	23.7	FT.	782.8	FT.
REFUSAL:	13.7	FT.	792.8	FT.
TOP OF ROCK:	13.7	FT.	792.8	FT.
BEGAN CORING:	13.7	FT.	792.8	FT.
FOOTAGE SAMPLED:	13.7	CORED:	10.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	0.0	806.5	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	806.5	0.0	1.0		AUGER						Topsoil
		1.0	2.5	S-1	SS	18	3	7	10	17	Clay, silty, slightly sandy, dark brown with gravel (Moist)(Very Stiff)(Fill)
2.5	804.0	2.5			AUGER						
		3.5	5.0	S-2	SS	18	5	4	5	9	Clay, silty, slightly sandy, dark brown mottled gray (Moist)(Stiff)
5.0	801.5	5.0	6.0		AUGER						
		6.0	7.5	S-3	SS	18	8	8	8	16	DO 2 (Moist)(Very Stiff)
7.5	799.0	7.5			AUGER						
		8.5	10.0	S-4	SS	18	7	3	3	6	DO 3 (Wet)(Medium Stiff)
10.0	796.5	10.0			AUGER						
12.5	794.0	13.5	13.7	S-5	SS	4	50\0.3			50\0.3	DO 4 with num rock fragments
		13.7				RUN 1 RAN 5.0 REC 5.0 RQD= 76					Auger Refusal @ 13.7 FT. Begin NQ Coring @ 13.7', 100% DWR Limestone, sandy, silty, mottled gray with shale
15.0	791.5										partings, and open, stained, bedding planes
17.5	789.0		18.8			RUN 2 RAN 5.0 REC 4.6 RQD= 68					
		18.8	20.0								
20.0	786.5										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 15 September 2005
BORING NO. / LOCATION: STATION 508+55, OFFSET 5 ft, Right

LOG OF BORING: BR-61
SHEET 2 OF 2
DRILLER: Tri-State
ON-SITE REP: WDS
DRY ON COMPLETION ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	806.5	FT. (estimated)
BOTTOM OF HOLE:	23.7	FT.	782.8	FT.
REFUSAL:	13.7	FT.	792.8	FT.
TOP OF ROCK:	13.7	FT.	792.8	FT.
BEGAN CORING:	13.7	FT.	792.8	FT.
FOOTAGE SAMPLED:	13.7	CORED:	10.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	0.0	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV. FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
20.0	786.5										Limestone, sandy, silty, mottled gray, variably, stained, leached with open, stained, bedding planes
22.5	784.0		23.7								100% DWR
		23.7									Core Terminated @ 23.7 FT.
25.0	781.5										
27.5	779.0										
30.0	776.5										
32.5	774.0										
35.0	771.5										
37.5	769.0										
40.0	766.5										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road

LOG OF BORING: BR-62

PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 15 September 2005

SHEET 1 OF 2

BORING NO. / LOCATION: STATION 508+55, OFFSET 65 ft, Right

SUBCONTRACTOR: Tri-State

ON-SITE REP: WDS

DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	803.9	FT. (estimated)
BOTTOM OF HOLE:	40.0	FT.	763.9	FT.
REFUSAL:	11.8	FT.	792.1	FT.
TOP OF ROCK:	11.8	FT.	792.1	FT.
BEGAN CORING:	11.8	FT.	792.1	FT.
FOOTAGE SAMPLED:	11.8	CORED:	28.2	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	0.0	803.9	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC SOIL (IN) ROCK (FT)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	803.9	0.0	1.0		AUGER						Topsoil
		1.0	2.5	S-1	SS	18	4	3	3	6	Clay, silty, sandy, dark brown mottled light brown with gravel (Moist)(Medium Stiff)(Fill)
2.5	801.4	2.5	3.5		AUGER						
		3.5	5.0	S-2	SS	18	4	4	4	8	DO #1 (Moist)(Medium Stiff)(Fill)
5.0	798.9	5.0			AUGER						
		6.0	7.5	S-3	SS	18	5	8	12	20	Clay, sandy, slightly silty, brown mottled gray (Mosit)(Very Stiff)
7.5	796.4	7.5	8.5		AUGER						
		8.5	10.0	S-4	SS	18	4	3	2	5	DO 3 (Wet)(Medium Stiff)
10.0	793.9	10.0	11.8		AUGER						
12.5	791.4	11.8	16.8			RUN 1 RAN 5.0 REC 3.5 RQD=38					Auger Refusal @ 11.8 FT. Limestone, sandy, silty, gray cavity 12.3' to 12.6', Limestone, sandy, silty, gray cavity 13.3'-14.1' Limestone, sandy, silty, gray, variably stained, leached, weathered
15.0	788.9										
17.5	786.4	16.8	20.0			RUN 2 RAN 5.0 REC 5.0 RQD=72					
20.0	783.9										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 15 September 2005
BORING NO. / LOCATION: STATION 508+55, OFFSET 65 ft, Right

LOG OF BORING: BR-62
SHEET 2 OF 2
DRILLER: Tri-State
ON-SITE REP: WDS
DRY ON COMPLETION ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	803.9	FT. (estimated)
BOTTOM OF HOLE:	40.0	FT.	763.9	FT.
REFUSAL:	11.8	FT.	792.1	FT.
TOP OF ROCK:	11.8	FT.	792.1	FT.
BEGAN CORING:	11.8	FT.	792.1	FT.
FOOTAGE SAMPLED:	11.8	CORED:	28.2	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	0.0	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LOW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV. FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC SOIL (IN) ROCK (FT)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
20.0	783.9	20.0	21.8								Limestone, sandy, silty, gray, variably stained leached
22.5	781.4	21.8	26.8			RUN 3 RAN 5.0 REC 4.3 RQD=24					clay seam 22.9'-23.8'
25.0	778.9										Limestone, sandy, silty, gray, variably stained leached weathered with numerous shale partings
27.5	776.4	26.8	31.8			RUN 4 RAN 5.0 loss 0.3 REC 4.2 RQD=51					
30.0	773.9										
32.5	771.4	31.8	36.8			RUN 5 RAN 5.0 loss 0.1 REC 4.9 RQD=98					
35.0	768.9										
37.5	766.4	36.8	40.0			RUN 6 RAN 3.2 gain 0.4 REC 3.6 RQD=100					
40.0	763.9	40.0	40.0								100% DWR Core Terminated @ 40.0 FT.

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 14 September 2005
BORING NO. / LOCATION: STATION 509+85, OFFSET 12 ft, Right

LOG OF BORING: BR-63
SHEET 1 OF 2
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	809.0	FT. (estimated)
BOTTOM OF HOLE:	22.7	FT.	786.3	FT.
REFUSAL:	12.7	FT.	796.3	FT.
TOP OF ROCK:	12.7	FT.	796.3	FT.
BEGAN CORING:	12.7	FT.	796.3	FT.
FOOTAGE SAMPLED:	12.7	CORED:	10.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	0.0	809.0	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC SOIL (IN) ROCK (FT)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	809.0	0.0	1.0		AUGER						
		1.0	2.5	S1	SS	18	2	2	2	4	Topsoil, clay, silty, brown (Soft)
2.5	806.5	2.5	3.5		AUGER						
		3.5	5.0	S2	SS	18	4	4	5	9	Clay, silty, slightly sandy, reddish-brown (Stiff)(Moist)
5.0	804.0	5.0	6.0		AUGER						
		6.0	7.5	S3	SS	18	5	6	5	11	DO 2 with rock fragments
7.5	801.5	7.5	8.5		AUGER						
		8.5	10.0	S4	SS	18	6	7	9	16	DO 3, mottled reddish-brown/ yellowish-brown (Very Stiff)
10.0	799.0	10.0	12.7		AUGER						BEGIN NQ CORING @ 12.7-FT
12.5	796.5	12.7	17.8			RUN 1 RAN 5.1 REC 5.1 RQD 78					Auger Refusal @ 12.7 FT. 100% DWR Limestone, variably sandy, gray to dark gray with open, stained bedding planes and soft shale bands
15.0	794.0										
17.5	791.5	17.8	20.0			RUN 2 RAN 4.9 REC 4.9 RQD 92					
20.0	789.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 14 September 2005
BORING NO. / LOCATION: STATION 509+85, OFFSET 12 lt, Right

LOG OF BORING: BR-63
SHEET 2 OF 2
DRILLER: Tri-State
ON-SITE REP: WDS
DRY ON COMPLETION ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	809.0	FT. (estimated)
BOTTOM OF HOLE:	22.7	FT.	786.3	FT.
REFUSAL:	12.7	FT.	796.3	FT.
TOP OF ROCK:	12.7	FT.	796.3	FT.
BEGAN CORING:	12.7	FT.	796.3	FT.
FOOTAGE SAMPLED:	12.7	CORED:	10.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	0.0	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV. FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC SOIL (IN) ROCK (FT)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
20.0	789.0	20.0									Limestone, variably sandy, gray to dark gray with soft shale partings
			22.7								
22.5	786.5	22.7									Core Terminated @ 22.7 FT. 100% DWR
25.0	784.0										
27.5	781.5										
30.0	779.0										
32.5	776.5										
35.0	774.0										
37.5	771.5										
40.0	769.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
LOG OF BORING: BR-64
PROJECT NO.: 3-518-40000 PHASE 0001
DATE: 14 September 2005
SHEET 1 OF 3
BORING NO. / LOCATION: STATION 509+75, OFFSET 85 ft, Right
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	806.5	FT. (estimated)
BOTTOM OF HOLE:	45.3	FT.	761.2	FT.
REFUSAL:	13.1	FT.	793.4	FT.
TOP OF ROCK:	13.1	FT.	793.4	FT.
BEGAN CORING:	13.1	FT.	793.4	FT.
FOOTAGE SAMPLED:	13.1	CORED:	32.2	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	0.0	806.5	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC SOIL (IN) ROCK (FT)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	806.5	0.0	0.1		AUGER						Asphalt
		0.1	1.0		AUGER						Base
		1.0	2.5	S-1	SS	18	2	2	3	5	Clay, very silty, brown (Moist)(Medium Stiff)
2.5	804.0	2.5	3.5		AUGER						
		3.5	5.0	S-2	SS	18	2	4	6	10	DO 1, slightly sandy, reddish-brown (Stiff)
5.0	801.5	5.0	6.0		AUGER						
		6.0	7.5	S-3	SS	18	6	4	5	9	Clay, sandy, mottled reddish-brown/yellowish-brown with rock fragments (stiff)
7.5	799.0	7.5	8.5		AUGER						
		8.5	10.0	S-4	SS	18	5	12	9	21	Clay, very sandy, mottled brown (very stiff)
10.0	796.5	10.0	13.1		AUGER						BEGIN NQ CORING @ 13.1-FT
12.5	794.0	13.1				RUN 1 RAN 5.0 loss 0.2 REC 4.5 RQD=83					Auger Refusal @ 13.1 FT. Limestone, sandy, silty, mottled gray cavity 13.6-13.9 Limestone, sandy, silty, mottled gray, w/ soft shale band, partially healed vertical fracture
15.0	791.5										
17.5	789.0	18.1				RUN 2 RAN 5.0 gain 0.2 REC 5.2 RQD=100					Rod check- 18.0'
20.0	786.5	20.0									

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 14 September 2005
BORING NO. / LOCATION: STATION 509+75, OFFSET 85 ft, Right

LOG OF BORING: BR-64
SHEET 2 OF 3
DRILLER: Tri-State
ON-SITE REP: WDS
DRY ON COMPLETION ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	806.5	FT. (estimated)
BOTTOM OF HOLE:	45.3	FT.	761.2	FT.
REFUSAL:	13.1	FT.	793.4	FT.
TOP OF ROCK:	13.1	FT.	793.4	FT.
BEGAN CORING:	13.1	FT.	793.4	FT.
FOOTAGE SAMPLED:	13.1	CORED:	32.2	

WATER LEVEL DATA	DEPTH	ELEVATION
DURING DRILLING:	DRY	NA FT.
@ COMPLETION:	0.0	NA FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV. FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC SOIL (IN) ROCK (FT)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
20.0	786.5										Limestone, sandy, silty, mottled gray, with clay seams, partially healed vertical and diagonal fractures, and soft shale partings
22.5	784.0		23.1								
		23.1				RUN 3 RAN 5.0 loss 0.1 REC 4.9 RQD=100					
25.0	781.5										
27.5	779.0		28.1								
		28.1				RUN 4 RAN 5.0 gain 0.1 REC 5.1 RQD=100					
30.0	776.5										
32.5	774.0		33.1								
		33.1				RUN 5 RAN 5.0 REC 5.0 RQD=80					
35.0	771.5										
37.5	769.0		38.1								
		38.1				RUN 6 RAN 5.0 REC 5.0 RQD=92					
40.0	766.5		40.0								

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 14 September 2005
BORING NO. / LOCATION: STATION 509+75, OFFSET 85 ft, Right

LOG OF BORING: BR-64
SHEET 3 OF 3
DRILLER: Tri-State
ON-SITE REP: WDS
DRY ON COMPLETION ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	806.5	FT. (estimated)
BOTTOM OF HOLE:	45.3	FT.	761.2	FT.
REFUSAL:	13.1	FT.	793.4	FT.
TOP OF ROCK:	13.1	FT.	793.4	FT.
BEGAN CORING:	13.1	FT.	793.4	FT.
FOOTAGE SAMPLED:	13.1	CORED:	32.2	

WATER LEVEL DATA	DEPTH	ELEVATION
DURING DRILLING:	DRY	NA FT.
@ COMPLETION:	0.0	NA FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV. FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC SOIL (IN) ROCK (FT)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
40.0	766.5										Limestone, sandy, silty, mottled gray with soft shale partings
42.5	764.0		43.1								
		43.1				RUN 7 RAN 2.2 REC 2.2 ROD=73					
45.0	761.5		45.3								
		45.3									Core Terminated @ 45.3 FT. 100% DWR
47.5	759.0										
50.0	756.5										
52.5	754.0										
55.0	751.5										
57.5	749.0										
60.0	746.5										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 28 September 2005
BORING NO. / LOCATION: STATION 600+40, OFFSET 25 ft. Right

LOG OF BORING: WP-65
SHEET 1 OF 1
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	789.0	FT. (estimated)
BOTTOM OF HOLE:	9.5	FT.	779.5	FT.
REFUSAL:	9.5	FT.	779.5	FT.
TOP OF ROCK:	9.5	FT.	779.5	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	9.5	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC SOIL (IN) ROCK (FT)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	789.0	0.0	1.0		AUGER						Topsoil
		1.0		S-1	SS	18	2	4	5	9	Clay, silty, dark brown with roots (Topsoil) (Stiff)
2.5	786.5	2.5	3.5	S-2	AUGER SS	18	5	6	7	13	Clay, silty, sandy, mottled dark brown/yellowish-brown with numerous rock fragments (Stiff)
5.0	784.0	5.0	6.0	S-3	AUGER SS	18	1	1	1	2	DO #2 (Soft)(Saturated)
7.5	781.5	7.5	8.5	S-4	SS AUGER	18		1/1.0	50/.0	50/0.0	Silt, sandy, brown with numerous rock fragments to rock at tip (Very Soft)(Saturated)
10.0	779.0	9.5									Auger Refusal @ 9.5 FT.
12.5	776.5										
15.0	774.0										
17.5	771.5										
20.0	769.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road — LOG OF BORING: WP-66
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 28 September 2005 — SHEET 1 OF 1
BORING NO. / LOCATION: STATION 602+40, OFFSET 45 ft, Right — SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	791.6	FT (estimated)
BOTTOM OF HOLE:	8.5	FT.	783.1	FT
REFUSAL:	8.5	FT.	783.1	FT.
TOP OF ROCK:	8.5	FT.	783.1	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	8.5	CORED:	0.0	

WATER LEVEL DATA	DEPTH	ELEVATION
DURING DRILLING:	DRY	NA FT.
@ COMPLETION:	DRY	NA FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	791.6	0.0	1.0		AUGER						
		1.0		S-1	SS		1	1	1	2	Clay, very silty, brown with roots (Topsoil) (Soft)
2.5	789.1	2.5			AUGER						
		3.5	5.0	S-2	SS		2	4	15	19	Clay, silty, sandy, yellowish-brown with numerous rock fragments @ tip (Soft)
5.0	786.6	5.0	6.0		AUGER						Auger thru rock 5.0'-5.5'
		6.0		S-3	SS		9	5	5	10	Sand (M), variably clayey with numerous sandy limestone fragments (Very Moist)(loose)
7.5	784.1	7.5	8.5		AUGER						
		8.5									Auger Refusal @ 8.5 FT.
10.0	781.6										
12.5	779.1										
15.0	776.6										
17.5	774.1										
20.0	771.6										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS: * N-Value exaggerated due to rock fragments

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 16 September 2005
BORING NO. / LOCATION: STATION 604+40, OFFSET 15 ft, Right

LOG OF BORING: WP-67
SHEET 1 OF 1
SUBCONTRACTOR: Tri-State
ON-SITE REP: MG
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	795.1	FT. (estimated)
BOTTOM OF HOLE:	10.0	FT.	785.1	FT.
REFUSAL:	NA	FT.	NA	FT.
TOP OF ROCK:	NA	FT.	NA	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	10.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	795.1	0.0	1.0		AUGER						
		1.0		S-1	SS	18	1	2	1	3	Clay, very silty, dark brown with roots (Topsoil)(Soft)(Moist)
2.5	792.6	2.5	3.5		AUGER						
		3.5	5.0	S-2	SS	18	3	8	19	27	Clay, silty, sandy, yellowish-brown mottled gray with black nodules and rock fragments (Very Stiff)(Moist)
5.0	790.1	5.0	6.0		AUGER						
		6.0		S-3	SS	18	5	6	5	11	DO #2 (Stiff)(Moist)
7.5	787.6	7.5	8.5		AUGER						
		8.5	10.0	S-4	SS	18	4	4	5	9	Clay, slightly silty, sandy, gray mottled yellowish-brown with black nodules (Stiff)(Moist)
10.0	785.1	10.0									No Refusal @ 10.0 FT.
12.5	782.6										
15.0	780.1										
17.5	777.6										
20.0	775.1										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road

LOG OF BORING: WP-68

PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 16 September 2005

SHEET 1 OF 1

BORING NO. / LOCATION: STATION 606+60, OFFSET 10 ft, Right

SUBCONTRACTOR: Tri-State

ON-SITE REP: MG

DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	802.0	FT (estimated)
BOTTOM OF HOLE:	10.0	FT.	792.0	FT.
REFUSAL:	NA	FT.	NA	FT.
TOP OF ROCK:	NA	FT.	NA	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	10.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION
DURING DRILLING:	DRY	NA FT.
@ COMPLETION:	DRY	NA FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC SOIL (IN) ROCK (FT)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	802.0	0.0	1.0		AUGER						
		1.0	2.5	S-1	SS	18	1	1	2	3	Clay, very silty, slightly sandy, dark brown (Topsoil)(Soft)
2.5	799.5	2.5	3.5		AUGER						
		3.5	5.0	S-2	SS	18	3	4	5	9	Clay, silty, slightly sandy, yellowish-brown with rock fragments (Stiff)(Moist)
5.0	797.0	5.0	6.0		AUGER						
		6.0	7.5	S-3	SS	18	WT	WT	1	WT	DO 2, with rock fragments (Very Soft)(Wet)
7.5	794.5	7.5	8.5		AUGER						
		8.5	10.0	S-4	SS	18	2	4	5	9	Clay, sandy, silty, gray with numerous rock fragments (Stiff)(Moist)
10.0	792.0	10.0									No Refusal @ 10.0 FT.
12.5	789.5										
15.0	787.0										
17.5	784.5										
20.0	782.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF BORING: WP-70
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 28 September 2005 — SHEET 1 OF 1
BORING NO. / LOCATION: STATION 613+00, OFFSET 23 ft, Right — SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	812.7	FT. (estimated)
BOTTOM OF HOLE:	10.0	FT.	802.7	FT.
REFUSAL:	NA	FT.	NA	FT.
TOP OF ROCK:	NA	FT.	NA	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	10.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION
DURING DRILLING:	DRY	NA FT.
@ COMPLETION:	DRY	NA FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	812.7	0.0	1.0		AUGER						Topsoil
		1.0	2.5	S-1	SS	18	1	3	5	8	Clay, silty, reddish-brown (Medium Stiff)
2.5	810.2	2.5			AUGER						
		3.5	5.0	S-2	SS	18	4	6	9	15	DO 1, sandy, yellowish-brown (Stiff)
5.0	807.7	5.0	6.0		AUGER						
		6.0	7.5	S-3	SS	18	5	6	9	15	DO 2
7.5	805.2	7.5			AUGER						
		8.5	10.0	S-4	SS	18	3	4	4	8	Sand (M), clayey, with numerous sandy limestone fragments (Very Moist)(Loose)
10.0	802.7	10.0									No Refusal @ 10.0 FT.
12.5	800.2										
15.0	797.7										
17.5	795.2										
20.0	792.7										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road

LOG OF BORING: WP-71

PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 28 September 2005

SHEET 1 OF 1

BORING NO. / LOCATION: STATION 615+25, OFFSET 45 ft, Left

SUBCONTRACTOR: Tri-State

ON-SITE REP: WDS

DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	807.5	FT. (estimated)
BOTTOM OF HOLE:	10.0	FT.	797.5	FT.
REFUSAL:	NA	FT.	NA	FT.
TOP OF ROCK:	NA	FT.	NA	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	10.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION
DURING DRILLING:	DRY	NA FT.
@ COMPLETION:	DRY	NA FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	807.5	0.0	1.0		AUGER						Topsoil
2.5	805.0	1.0	2.5	S-1	SS	18	1	3	4	7	Clay, very silty, yellowish-brown with rock fragments at tip (Medium Stiff)
		2.5			AUGER						
5.0	802.5	3.5	5.0	S-2	SS	18	4	7	9	16	Sand (F), variably clayey, silty, yellowish-brown (Medium Dense)
7.5	800.0	5.0	6.0	S-3	AUGER SS	18	3	6	4	10	DO 2 (Moist)(Loose)
		7.5			AUGER						
10.0	797.5	8.5	10.0	S-4	SS	18	3	4	4	8	Clay, variably sandy, silty, yellowish-brown (Variably Soft)(Saturated)
12.5	795.0	10.0									No Refusal @ 10.0 FT.
15.0	792.5										
17.5	790.0										
20.0	787.5										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road

LOG OF BORING: WP-73

PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 28 September 2005

SHEET 1 OF 1

BORING NO. / LOCATION: STATION 620+00, OFFSET 30 ft, Right

SUBCONTRACTOR: Tri-State

ON-SITE REP: WDS

DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	808.5	FT. (estimated)
BOTTOM OF HOLE:	10.0	FT.	798.5	FT.
REFUSAL:	NA	FT.	NA	FT.
TOP OF ROCK:	NA	FT.	NA	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	10.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION
DURING DRILLING:	DRY	NA FT.
@ COMPLETION:	DRY	NA FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	808.5	0.0	1.0		AUGER						
		1.0		S-1	SS	18	2	3	4	7	Clay, silty, brown with roots (Topsoil) (Medium Stiff)
2.5	806.0	2.5	3.5	S-2	AUGER SS	18	3	5	5	10	Clay, very silty, brown (Stiff)
5.0	803.5	5.0	6.0		AUGER						
7.5	801.0	6.0	7.5	S-3	SS	18	5	8	10	18	Clay, silty, sandy, reddish-brown mottled tan (Very Stiff)
		7.5	8.5		AUGER						
		8.5	10.0	S-4	SS	18	5	9	9	18	DO 3 with rock fragments
10.0	798.5	10.0									No Refusal @ 10.0 FT.
12.5	796.0										
15.0	793.5										
17.5	791.0										
20.0	788.5										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 28 September 2005
BORING NO. / LOCATION: STATION 621+40, OFFSET 30 ft, Right

LOG OF BORING: WP-74
SHEET 1 OF 1
SUBCONTRACTOR: Tri-State
ON-SITE REP: WDS
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	808.5	FT. (estimated)
BOTTOM OF HOLE:	10.0	FT.	798.5	FT.
REFUSAL:	NA	FT.	NA	FT.
TOP OF ROCK:	NA	FT.	NA	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	10.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	808.5	0.0	1.0		AUGER						
		1.0		S-1	SS	18	1	2	2	4	Clay, silty, brown (Topsoil) (Soft)
2.5	806.0	2.5	3.5		AUGER						
		3.5	5.0	S-2	SS	18	2	2	4	6	Clay, silty, sandy, reddish-brown (Medium Stiff)
5.0	803.5	5.0	6.0		AUGER						
		6.0	7.5	S-3	SS	18	2	4	5	9	DO 2 mottled tan with rock fragments (Stiff)
7.5	801.0	7.5	8.5		AUGER						
		8.5	10.0	S-4	SS	18	1	1	1	2	Clay, sandy, silty, reddish-brown with numerous sandstone fragments (Soft)(Moist)
10.0	798.5	10.0									No Refusal @ 10.0 FT.
12.5	796.0										
15.0	793.5										
17.5	791.0										
20.0	788.5										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF BORING: AR-75

PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 14 October 2005 — SHEET 1 OF 1

BORING NO. / LOCATION: STATION 2+15, OFFSET 0 ft, Center — SUBCONTRACTOR: Tri-State

ON-SITE REP: WDS

DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	946.8	FT (estimated)
BOTTOM OF HOLE:	10.0	FT.	936.8	FT.
REFUSAL:	NA	FT.	NA	FT.
TOP OF ROCK:	NA	FT.	NA	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	10.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: X -POWER AUGERING -WASHBORING -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	946.8	0.0	1.0		AUGER						Topsoil/Vegetation/Rock
		1.0	1.4	S-1	SS	5	50/.4			50/0.4	* Clay, silty, yellowish-brown with rock fragments (stiff) (colluvium)
		1.4	2.0		AUGER						
2.5	944.3	2.0			AUGER						Rock fragments (Colluvium)
			3.5								
		3.5		S-2	AUGER SS	18	9	17	23	40	* DO 1, with numerous rock frags
5.0	941.8		5.0								
		5.0	6.0		AUGER						
		6.0		S-3	AUGER SS	18	9	33	34	67	* DO 2
7.5	939.3		7.5								
		7.5			AUGER						
			8.5								
		8.5		S-4	AUGER SS	18	11	15	22	37	* DO 1
10.0	936.8		10.0								
		10.0									No Refusal @ 10.0 FT.
12.5	934.3										
15.0	931.8										
17.5	929.3										
20.0	926.8										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS: * N-Values exaggerated due to rock fragments

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF TEST PIT: III-83
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 14 October 2005 — SHEET 1 OF 1
BORING NO. / LOCATION: STATION 304+00, OFFSET 50 ft, L — SUBCONTRACTOR: Civil Constructors
ON-SITE REP: DET
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	712.7	FT. (estimated)
BOTTOM OF HOLE:	8.0	FT.	704.7	FT.
REFUSAL:	8.0	FT.	704.7	FT.
TOP OF ROCK:	8.0	FT.	704.7	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	8.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: -POWER AUGERING -WASHBORING TEST PIT -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	712.7	0.0	0.5		TEST PIT						Topsoil & roots
		0.5			TEST PIT						Clay, Silty dark brown firm, moist (poss alluvium)
2.5	710.2		4.0								
		4.0			TEST PIT						Clay, silty yellow brown & gray mottled, very stiff, moist
5.0	707.7										
7.5	705.2		8.0								Limestone Bedrock
		8.0									Refusal @ 8.0 FT.
10.0	702.7										
12.5	700.2										
15.0	697.7										
17.5	695.2										
20.0	692.7										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF TEST PIT: III-84

PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 14 October 2005 — SHEET 1 OF 1

BORING NO. / LOCATION: STATION 310+50, OFFSET 40 ft, L — SUBCONTRACTOR: Civil Constructors

ON-SITE REP: DET

DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	723.5	FT. (estimated)
BOTTOM OF HOLE:	8.5	FT.	715.0	FT.
REFUSAL:	NA	FT.	NA	FT.
TOP OF ROCK:	NA	FT.	NA	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	8.5	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION
DURING DRILLING:	DRY	NA FT.
@ COMPLETION:	DRY	NA FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: -POWER AUGERING -WASHBORING TEST PIT -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	723.5	0.0	0.3		TEST PIT						Topsoil & roots
		0.3	1.0		TEST PIT						Clay, silty, brown, stiff, dry
		1.0			TEST PIT						With gravel (fill)
2.5	721.0		4.0								Clay, silty, lt brown, stiff, moist (poss fill / alluvium)
		4.0			TEST PIT						Clay, silty, gray brown, stiff
5.0	718.5		6.5								(poss org stain/ buried topsoil / alluvium)
		6.5			TEST PIT						Clay, silty, brown, very stiff, moist
7.5	716.0		8.5								
		8.5									No Refusal @ 8.5 FT.
10.0	713.5										
12.5	711.0										
15.0	708.5										
17.5	706.0										
20.0	703.5										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road
LOG OF TEST PIT: III-85
PROJECT NO.: 3-518-40000 PHASE 0001
DATE: 14 October 2005
SHEET 1 OF 1
BORING NO. / LOCATION: STATION 313+00, OFFSET 40 ft, L
SUBCONTRACTOR: Civil Constructors
ON-SITE REP: DET
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	733.3	FT. (estimated)
BOTTOM OF HOLE:	3.0	FT.	730.3	FT.
REFUSAL:	3.0	FT.	730.3	FT.
TOP OF ROCK:	3.0	FT.	730.3	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	3.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION
DURING DRILLING:	DRY	NA FT.
@ COMPLETION:	DRY	NA FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: -POWER AUGERING -WASHBORING TEST PIT -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	733.3	0.0	0.5		TEST PIT						Topsoil & roots
		0.5	2.0		TEST PIT						Clay, silty, brown, with rock frag, With wood frag, dry, firm (fill) (poss alluvium)
2.5	730.8	2.0	3.0		TEST PIT						Clay, silty, brown, stiff, moist
		3.0									Refusal @ 3.0 FT.
5.0	728.3										
7.5	725.8										
10.0	723.3										
12.5	720.8										
15.0	718.3										
17.5	715.8										
20.0	713.3										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road — LOG OF TEST PIT: III-86

PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 14 October 2005 — SHEET 1 OF 1

BORING NO. / LOCATION: STATION 403+10, OFFSET 5 ft, R — SUBCONTRACTOR: Civil Constructors

ON-SITE REP: DET

DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	748.5	FT. (estimated)
BOTTOM OF HOLE:	7.0	FT.	741.5	FT.
REFUSAL:	NA	FT.	NA	FT.
TOP OF ROCK:	NA	FT.	NA	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	7.0	CORED:	0.0	

WATER LEVEL DATA	DEPTH	ELEVATION
DURING DRILLING:	DRY	NA FT.
@ COMPLETION:	DRY	NA FT.
AFTER 24 HRS.	NA	NA FT.
LDW AT:	NA	NA FT.

BORING ADVANCED BY: -POWER AUGERING -WASHBORING TEST PIT -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	748.5	0.0	0.3		TEST PIT						Topsoil & roots
		0.3			TEST PIT						Clay, silty, lt brown, very stiff to Hard, occasional roots to 1', Occasional rock frag, moist
2.5	746.0										
5.0	743.5		6.0								
		6.0	7.0		TEST PIT						Clay, silty, yellow-brown, hard, Moist, occasional rock frag
7.5	741.0	7.0									No Refusal @ 7.0 FT.
10.0	738.5										
12.5	736.0										
15.0	733.5										
17.5	731.0										
20.0	728.5										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 14 October 2005
BORING NO. / LOCATION: STATION 405+00, OFFSET 50 ft, R

LOG OF TEST PIT: III-87
SHEET 1 OF 1
SUBCONTRACTOR: Civil Constructors
ON-SITE REP: DET
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	751.1	FT. (estimated)
BOTTOM OF HOLE:	9.5	FT.	741.6	FT.
REFUSAL:	9.5	FT.	741.6	FT.
TOP OF ROCK:	9.5	FT.	741.6	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	9.5	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: -POWER AUGERING -WASHBORING TEST PIT -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	751.1	0.0	2.0		TEST PIT						Clay, silty, lt brown, with rock frag Firm, (fill)
2.5	748.6	2.0	3.3		TEST PIT						Clay, silty, org stain, roots, Soft, moist (topsoil)
		3.3			TEST PIT						Clay, silty, red-brown, stiff, Moist
5.0	746.1										
7.5	743.6		8.0								
		8.0	9.5		TEST PIT						CLAY, SLTY, GRAYISH RED-BRN, STIFF, MOIST
		9.5									Refusal @ 9.5 FT.
10.0	741.1										
12.5	738.8										
15.0	736.1										
17.5	733.6										
20.0	731.1										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF TEST PIT: III-88

PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 14 October 2005 — SHEET 1 OF 1

BORING NO. / LOCATION: STATION 408+00, OFFSET 50 ft, R — SUBCONTRACTOR: Civil Constructors

ON-SITE REP: DET

DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	759.1	FT. (estimated)
BOTTOM OF HOLE:	3.0	FT.	756.1	FT.
REFUSAL:	3.0	FT.	756.1	FT.
TOP OF ROCK:	3.0	FT.	756.1	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	3.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: -POWER AUGERING -WASHBORING TEST PIT -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	759.1	0.0			TEST PIT						Cobbles, rock frag, boulders, and Clay,silty, brown, very dense (shot rock fill)
2.5	756.6		3.0								Shot rock fill
		3.0									Refusal @ 3.0 FT.
5.0	754.1										
7.5	751.6										
10.0	749.1										
12.5	746.6										
15.0	744.1										
17.5	741.6										
20.0	739.1										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road
LOG OF TEST PIT: III-89
PROJECT NO.: 3-518-40000 PHASE 0001
DATE: 14 October 2005
SHEET 1 OF 1
BORING NO. / LOCATION: STATION 410+05, OFFSET 5 ft, R
SUBCONTRACTOR: Civil Constructors
ON-SITE REP: DET
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	758.1	FT. (estimated)
BOTTOM OF HOLE:	8.0	FT.	750.1	FT.
REFUSAL:	NA	FT.	NA	FT.
TOP OF ROCK:	NA	FT.	NA	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	8.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: -POWER AUGERING -WASHBORING TEST PIT -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	758.1	0.0	1.5		TEST PIT						Shot rock fill with clay, silty, brown (fill)
2.5	755.6	1.5	8.0		TEST PIT						Clay, silty, brown, to reddish-brown, Firm to stiff, moist
5.0	753.1										
7.5	750.6										
10.0	748.1	8.0									No Refusal @ 8.0 FT.
12.5	745.6										
15.0	743.1										
17.5	740.6										
20.0	738.1										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF TEST PIT: III-90

PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 14 October 2005 — SHEET 1 OF 1

BORING NO. / LOCATION: STATION 414+00, OFFSET 50 ft, R — SUBCONTRACTOR: Civil Constructors

ON-SITE REP: DET

DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	757.5	FT. (estimated)
BOTTOM OF HOLE:	10.0	FT.	747.5	FT.
REFUSAL:	NA	FT.	NA	FT.
TOP OF ROCK:	NA	FT.	NA	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	10.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: -POWER AUGERING -WASHBORING TEST PIT -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	757.5	0.0	0.5		TEST PIT						Topsoil & roots
		0.5	1.5		TEST PIT						Clay, silty, brown, firm, moist
2.5	755.0	1.5			TEST PIT						Clay, silty, lt brown, stiff, moist
5.0	752.5										
7.5	750.0										
10.0	747.5		10.0								
		10.0									No Refusal @ 10.0 FT.
12.5	745.0										
15.0	742.5										
17.5	740.0										
20.0	737.5										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF TEST PIT: III-91

PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 14 October 2005 — SHEET 1 OF 1

BORING NO. / LOCATION: STATION 417+00, OFFSET 50 ft, L — SUBCONTRACTOR: Civil Constructors

ON-SITE REP: DET

DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	766.7	FT. (estimated)
BOTTOM OF HOLE:	9.0	FT.	757.7	FT.
REFUSAL:	9.0	FT.	757.7	FT.
TOP OF ROCK:	9.0	FT.	757.7	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	9.0	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: -POWER AUGERING -WASHBORING TEST PIT -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	766.7	0.0	0.5		TEST PIT						Clay, silty, brown (fill)
		0.5			TEST PIT						Clay, silty, lt brown, moist to dry, Stiff
2.5	764.2										
5.0	761.7										
7.5	759.2		9.0								Limestone Bedrock
		9.0									Refusal @ 9.0 FT.
10.0	756.7										
12.5	754.2										
15.0	751.7										
17.5	749.2										
20.0	746.7										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road — LOG OF TEST PIT: III-92
PROJECT NO.: 3-518-40000 PHASE 0001 — DATE: 14 October 2005 — SHEET 1 OF 1
BORING NO. / LOCATION: STATION 420+00, OFFSET 10 ft, R — SUBCONTRACTOR: Civil Constructors
ON-SITE REP: DET
DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	764.0	FT. (estimated)
BOTTOM OF HOLE:	6.5	FT.	757.5	FT.
REFUSAL:	6.5	FT.	757.5	FT.
TOP OF ROCK:	6.5	FT.	757.5	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	6.5	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: -POWER AUGERING -WASHBORING TEST PIT -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	764.0	0.0	0.5		TEST PIT						Topsoil & roots
		0.5			TEST PIT						Clay, silty, lt brown, stiff, Moist
2.5	761.5										---becomes reddish brown
5.0	759.0		6.5								Limestone Bedrock
		6.5									Refusal @ 6.5 FT.
7.5	756.5										
10.0	754.0										
12.5	751.5										
15.0	749.0										
17.5	746.5										
20.0	744.0										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT G - ADDENDUM 1

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

PROJECT: McEwen Road
PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 14 October 2005
BORING NO. / LOCATION: STATION 423+00, OFFSET 8 ft, R

LOG OF TEST PIT: III-93
SHEET 1 OF 1
SUBCONTRACTOR: Civil Constructors
ON-SITE REP: DET
DRY @ TERM/ REF ?: YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	770.8	FT. (estimated)
BOTTOM OF HOLE:	9.5	FT.	761.3	FT.
REFUSAL:	9.5	FT.	761.3	FT.
TOP OF ROCK:	9.5	FT.	761.3	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	9.5	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: -POWER AUGERING -WASHBORING TEST PIT -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	770.8	0.0	0.5		TEST PIT						Topsoil & roots
		0.5			TEST PIT						Clay, silty, reddish-brown, very stiff, Moist
2.5	768.3										--- 2.0' bedrock pinnacle at edge Of test pit, very solid
5.0	765.8										
7.5	763.3		9.5								Limestone Bedrock
		9.5									Refusal @ 9.5 FT.
10.0	760.8										
12.5	758.3										
15.0	755.8										
17.5	753.3										
20.0	750.8										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

AMEC E & E GEOTECHNICAL UNIT
NASHVILLE, TENNESSEE

amec

PROJECT: McEwen Road

LOG OF TEST PIT: III-94

PROJECT NO.: 3-518-40000 PHASE 0001 DATE: 03 April 1900

SHEET 1 OF 1

BORING NO. / LOCATION: STATION 425+50, OFFSET 10 ft, R

SUBCONTRACTOR: Civil Constructors

ON-SITE REP: DET

DRY @ TERM/ REF ? YES

	DEPTH		ELEVATION	
SURFACE:	0.0	FT.	777.3	FT. (estimated)
BOTTOM OF HOLE:	5.5	FT.	771.8	FT.
REFUSAL:	5.5	FT.	771.8	FT.
TOP OF ROCK:	5.5	FT.	771.8	FT.
BEGAN CORING:	NA	FT.	NA	FT.
FOOTAGE SAMPLED:	5.5	CORED:	0.0	

WATER LEVEL DATA

	DEPTH	ELEVATION	
DURING DRILLING:	DRY	NA	FT.
@ COMPLETION:	DRY	NA	FT.
AFTER 24 HRS.	NA	NA	FT.
LDW AT:	NA	NA	FT.

BORING ADVANCED BY: -POWER AUGERING -WASHBORING TEST PIT -OTHER

STRATUM DEPTH FT.	STRATUM ELEV FT.	SAMPLE DEPTH FROM FT.	SAMPLE DEPTH TO FT.	SAMPLE OR RUN NO.	SAMPLE TYPE	REC (INCHES)	SPT VALUES 6"	6"	6"	N	STRATUM DESCRIPTION
0.0	777.3	0.0	1.0		TEST PIT						Topsoil & roots
		1.0	2.0		TEST PIT						Clay, silty, lt brown, dry, stiff
2.5	774.8	2.0			TEST PIT						Clay, silty, dark gray-brown, with occ Rock frag. hard, dry
5.0	772.3		5.5								Limestone bedrock
		5.5									Refusal @ 5.5 FT.
7.5	769.8										
10.0	767.3										
12.5	764.8										
15.0	762.3										
17.5	759.8										
20.0	757.3										

WT = Weight of Tools, N-Value = Blows per foot, USC = Unified Soil Classification

REMARKS:

ATTACHMENT H - ADDENDUM 1

TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.	17	SEI 15-003 C.O.F. 2015-0052	–
CONST.	23	STP-M-9305(31)	2A

10-24-24: ADDENDUM 1= REMOVED ITEMS 202-04.01, 604-02.03, 604-03.09, 604-04.01, 604-04.10, 604-05.31, 617-02, 620-05.01, AND 707-07.01 FROM THE ESTIMATED ROADWAY QUANTITIES TABLE. REVISED QUANTITY FOR ITEM 706-03. ADDED ITEM 604-04.10 TO THE CSX BRIDGE WIDENING ESTIMATED QUANTITIES TABLE.

ESTIMATED ROADWAY QUANTITIES (COORDINATE WITH TABULATED DATA FOR ADDITIONAL NOTES)

FOOTNOTES	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY. (PARTICIPATING, STATE/FEDERAL)	EST QTY. (NON-PARTICIPATING, CITY)	TOTAL EST QTY.
	105-01	CONSTRUCTION STAKES, LINES AND GRADES	LS	1	0	1
9, 31	201-01	CLEARING AND GRUBBING	LS	1	0	1
18, 40	202-01	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LS	1	0	1
19	203-01	ROAD & DRAINAGE EXCAVATION (UNCLASSIFIED)	C.Y.	164,567	0	164,567
14	203-02.01	BORROW EXCAVATION (GRADED SOLID ROCK)	TON	93,033	0	93,033
	203-03	BORROW EXCAVATION (UNCLASSIFIED)	C.Y.	25,289	0	25,289
	203-04	PLACING AND SPREADING TOPSOIL	C.Y.	3,032	0	3,032
20	203-05	UNDERCUTTING	C.Y	16,394	0	16,394
21	203-06	WATER	M.G.	5,732	0	5,732
	203-07	FURNISHING & SPREADING TOPSOIL	C.Y.	15,375	0	15,375
1	204-07	BEDDING MATERIAL (PIPE) CLASS B	C.Y.	1,743	0	1,743
	204-08	FOUNDATION FILL MATERIAL	C.Y.	14	0	14
34	204-08.01	BACKFILL MATERIAL (FLOWABLE FILL)	C.Y.	42	1,979	2,021
4	209-03.53	STREAM MITIGATION - ARTICULATED CONCRETE MAT	S.Y.	1,500	0	1,500
	209-05	SEDIMENT REMOVAL	C.Y.	1,062	0	1,062
42	209-06.05	BALED HAY	BALE	48	0	48
2, 22	209-08.02	TEMPORARY SILT FENCE (WITH WIRE BACKING)	L.F.	12,600	0	12,600
7, 22	209-08.07	ROCK CHECK DAMS	EACH	5	0	5
7, 22	209-08.08	ENHANCED ROCK CHECK DAMS	EACH	28	0	28
7	209-09.04	SEDIMENT FILTER BAG (15'X10')	EACH	6	0	6
7, 22	209-09.43	CURB INLET PROTECTION (TYPE 4)	EACH	1	0	1
7, 23, 43	209-10.02	8 IN SKIMMER W/6 IN HEAD	EACH	4	0	4
23	209-11.01	SEDIMENT BASIN RISER(48", STRUCTURE B5)	EACH	1	0	1
23	209-11.02	SEDIMENT BASIN RISER(48", STRUCTURE F9)	EACH	1	0	1
23	209-11.03	SEDIMENT BASIN RISER(48", STRUCTURE K7)	EACH	1	0	1
23	209-11.04	SEDIMENT BASIN RISER(48", STRUCTURE J34)	EACH	1	0	1
23	209-11.05	SEDIMENT BASIN RISER(48", STRUCTURE J7)	EACH	1	0	1
23	209-11.06	SEDIMENT BASIN RISER(48", STRUCTURE X2)	EACH	1	0	1
23	209-11.07	SEDIMENT BASIN RISER(48", STRUCTURE X4)	EACH	1	0	1
	209-11.20	SEDIMENT BASIN BAFFLES	L.F.	760	0	760
7, 23	209-40.41	CATCH BASIN FILTER ASSEMBLY(TYPE 1)	EACH	13	0	13
7, 23	209-40.42	CATCH BASIN FILTER ASSEMBLY(TYPE 2)	EACH	48	0	48
7, 23	209-40.43	CATCH BASIN FILTER ASSEMBLY(TYPE 3)	EACH	10	0	10
7, 23	209-40.44	CATCH BASIN FILTER ASSEMBLY(TYPE 4)	EACH	4	0	4
7, 23	209-40.45	CATCH BASIN FILTER ASSEMBLY(TYPE 5)	EACH	11	0	11
7, 23	209-40.46	CATCH BASIN FILTER ASSEMBLY(TYPE 6)	EACH	135	0	135
7, 23	209-40.47	CATCH BASIN FILTER ASSEMBLY(TYPE 7)	EACH	31	0	31
	209-65.04	TEMPORARY INSTREAM DIVERSION	L.F.	30	0	30
24	303-01	MINERAL AGGREGATE, TYPE A BASE, GRADING D	TON	63,598	0	63,598
	303-01.02	GRANULAR BACKFILL (BRIDGES)	TON	268	0	268
44	303-10.01	MINERAL AGGREGATE (SIZE 57)	TON	12	0	12
	307-01.21	ASP. CONC. MIX(PG70-22) (BPMB-HM) GR. A-S	TON	8,509	0	8,509
	307-02.01	ASPHALT CONCRETE MIX (PG70-22) (BPMB-HM) GRADING A	TON	16,130	0	16,130
	307-02.08	ASPHALT CONCRETE MIX (PG70-22) (BPMB-HM) GRADING B-M2	TON	9,523	0	9,523
17	308-01.10	COLD IN-PLACE RECYCLED BITUMINOUS PAVEMENT	TON	2,500	0	2,500
	402-01	BITUMINOUS MATERIAL FOR PRIME COAT (PC)	TON	169	0	169
	402-02	AGGREGATE FOR COVER MATERIAL (PC)	TON	671	0	671
	403-02.01	TRACKLESS TACK COAT	TON	52	0	52
7, 15	407-20.05	SAW CUTTING ASPHALT PAVEMENT	L.F.	3,313	0	3,313
	411-01.11	ACS MIX(PG64-22) GRADING "E" ROADWAY	TON	1,677	0	1,677
	411-02.10	ACS MIX(PG70-22) GRADING D	TON	3,750	0	3,750
17	411-50.02	ASPHALT CONCRETE MAINTENANCE MIX (PG64-22) GRADING D (PLACED)	TON	1,250	0	1,250
16	415-01.02	COLD PLANING BITUMINOUS PAVEMENT	S.Y.	21,710	0	21,710
7, 15	502-04.01	SAWING CONCRETE PAVEMENT (FULL DEPTH)	L.F.	100	0	100
	604-01.20	BOX TUBE SAFETY RAIL	L.F.	1,021	0	1,021
	604-02.01	CLASS A CONCRETE (BOX BRIDGES)	C.Y.	118	0	118
	604-02.02	STEEL BAR REINFORCEMENT (BOX BRIDGES)	LB.	21,022	0	21,022
48, 50	604-07.01	RETAINING WALL B	S.F.	3,401	0	3,401
48, 50	604-07.02	RETAINING WALL C	S.F.	2,872	0	2,872
48, 50	604-07.03	RETAINING WALL D	S.F.	2,872	0	2,872
48, 50	604-07.04	RETAINING WALL ME	S.F.	15,310	0	15,310
50	604-07.05	RETAINING WALL GI	S.F.	1,473	0	1,473
50	604-07.06	RETAINING WALL H1	S.F.	4,098	0	4,098
46, 50	604-07.08	RETAINING WALL K1	S.F.	1,444	0	1,444
48, 50	604-07.09	RETAINING WALL L	S.F.	3,823	0	3,823
48, 50	604-07.10	RETAINING WALL P1	S.F.	1,750	0	1,750
48, 50	604-07.11	RETAINING WALL P2	S.F.	2,481	0	2,481
48, 50	604-07.12	RETAINING WALL P3	S.F.	516	0	516
36	607-03.02	18" CONCRETE PIPE CULVERT (CLASS III)	L.F.	10,640	0	10,640
36	607-05.02	24" CONCRETE PIPE CULVERT (CLASS III)	L.F.	2,584	0	2,584
36	607-06.02	30" CONCRETE PIPE CULVERT (CLASS III)	L.F.	496	0	496
36	607-07.02	36" CONCRETE PIPE CULVERT (CLASS III)	L.F.	404	0	404
36	607-09.02	48" CONCRETE PIPE CULVERT (CLASS III)	L.F.	35	0	35
	611-07.01	CLASS A CONCRETE (PIPE ENDWALLS)	C.Y.	16	0	16
	611-07.02	STEEL BAR REINFORCEMENT (PIPE ENDWALLS)	LB.	292	0	292
	611-07.54	18IN ENDWALL (CROSS DRAIN) 3:1	EACH	12	0	12
	611-07.57	24IN ENDWALL (CROSS DRAIN) 3:1	EACH	6	0	6
	611-07.60	30IN ENDWALL (CROSS DRAIN) 3:1	EACH	2	0	2
5, 13	611-12.02	CATCH BASINS, TYPE 12, > 4' - 8' DEPTH	EACH	181	0	181
5, 13	611-12.03	CATCH BASINS, TYPE 12, > 8' - 12' DEPTH	EACH	11	0	11
5, 13	611-12.04	CATCH BASINS, TYPE 12, > 12' - 16' DEPTH	EACH	4	0	4
5, 13	611-12.05	CATCH BASINS, TYPE 12, > 16' - 20' DEPTH	EACH	2	0	2
5, 13	611-14.02	CATCH BASINS, TYPE 14, > 4' - 8' DEPTH	EACH	21	0	21
5, 13	611-14.03	CATCH BASINS, TYPE 14, > 8' - 12' DEPTH	EACH	7	0	7
5, 13	611-14.04	CATCH BASINS, TYPE 14, > 12' - 16' DEPTH	EACH	1	0	1
5, 13	611-14.05	CATCH BASINS, TYPE 14, > 16' - 20' DEPTH	EACH	1	0	1
13	611-42.01	CATCH BASINS, TYPE 42, 0' - 4' DEPTH	EACH	3	0	3
13	611-42.02	CATCH BASINS, TYPE 42, > 4' - 8' DEPTH	EACH	11	0	11
13	611-42.02	CATCH BASINS, TYPE 42, > 8' -12' DEPTH	EACH	2	0	2
	620-06	CONCRETE RAILING	L.F.	1,973	0	1,973
47	621-05.02	TEMPORARY SHORING	L.S.	1	0	1
	701-01.01	CONCRETE SIDEWALK (4")	S.F.	60,852	0	60,852
25	701-02	CONCRETE DRIVEWAY	S.F.	6,373	0	6,373
26	701-02.02	CONCRETE DRIVEWAY (8")	S.F.	1,357	0	1,357
	701-02.03	CONCRETE CURB RAMP	S.F.	925	0	925
	702-01.01	EXTRUDED SLOPING CURB	L.F.	1,018	0	1,018
38	702-01.02	CONCRETE CURB	L.F.	40	0	40
38	702-03	CONCRETE COMBINED CURB & GUTTER	C.Y.	2,543	0	2,543
	705-01.04	METAL BEAM GUARD FENCE	L.F.	438	0	438
	706-06.03	RADIUS RAIL	L.F.	325	0	325
	705-06.10	GUARDRAIL TERMINAL TRAILING END (TYPE 13) MASH TL3	EACH	1	0	1
	705-06.11	GUARDRAIL TERMINAL (IN-LINE) MASH TL3	EACH	3	0	3
	705-06.20	TANGENT ENERGY ABSORBING TERMINAL MASH TL3	EACH	2	0	2
	705-06.25	THRIE BEAM BRIDGE TRANSITION MASH TL3	EACH	5	0	5
	705-06.30	GUARDRAIL TERMINAL (ENERGY ABSORBING) MASH TL2	EACH	6	0	6

ESTIMATED ROADWAY QUANTITIES (COORDINATE WITH TABULATED DATA FOR ADDITIONAL NOTES)

FOOTNOTES	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY. (PARTICIPATING, STATE/FEDERAL)	EST QTY. (NON-PARTICIPATING, CITY)	TOTAL EST QTY.
	706-10.26	ROUNDED END ELEMENT	EACH	1	0	1
	706-10.80	MICHIGAN AND MODIFIED MICHIGAN END SHOE	EACH	5	0	5
8	706-01	GUARDRAIL REMOVED	L.F.	2,060	0	2,060
3, 27	707-08.11	HIGH-VISIBILITY CONSTRUCTION FENCE	L.F	2,400	0	2,400
39	708-02.02	MARKERS (CONCRETE R.O.W. POSTS)	EACH	48	0	48
10	709-05.05	MACHINED RIP-RAP (CLASS A-3)	TON	410	0	410
	709-05.06	MACHINED RIP-RAP (CLASS A-1)	TON	886	0	886
	709-05.08	MACHINED RIP-RAP (CLASS B)	TON	34	0	34
	710-02	AGGREGATE UNDERDRAINS (WITH PIPE)	L.F.	32,979	0	32,979
28	712-01	TRAFFIC CONTROL	LS	1	0	1
29	712-02.02	INTERCONNECTED PORTABLE BARRIER RAIL	L.F.	7,600	0	7,600
	712-02.47	BRIDGE MOUNTED INTERCONNECTED PORTABLE BARRIER RAIL	L.F.	72	0	72
29	712-04.01	FLEXIBLE DRUMS (CHANNELIZING)	EACH	174	0	174
30	712-04.10	TEMPORARY FLEXIBLE TUBULAR DELINEATOR	EACH	60	0	60
	712-04.50	BARRIER RAIL DELINEATOR	EACH	760	0	760
29	712-06	SIGNS (CONSTRUCTION)	S.F.	939	0	939
29	712-07.03	TEMPORARY BARRICADES (TYPE III)	L.F.	567	0	567
7, 52	712-08.01	UNIFORMED POLICE OFFICER	DOLL	50,000	0	50,000
7	712-08.03	ARROW BOARD (TYPE C)	EACH	1	0	1
	712-09.08	REMOVABLE PAVEMENT MARKING (6" LINE)	L.F.	2,500	0	2,500
	713-02.15	FLEXIBLE DELINEATOR (YELLOW)	EACH	4	0	4
	713-02.21	SIGN POST DELINEATION ENHANCEMENT	L.F.	203	0	203
41	713-15	REMOVAL OF SIGNS, POSTS AND FOOTINGS	LS	1	0	1
45	713-15.35	METAL BARRICADE (TYPE III)	EACH	24	0	24
53	713-16.04	CHANGEABLE MESSAGE SIGN UNIT	EACH	4	0	4
6, 12	713-16.20	SIGNS (STOP, R1-1, 30"x 30")	EACH	5	0	5
6, 12	713-16.21	SIGNS (SPEED LIMIT, R2-1, 24"x 30")	EACH	7	0	7
6, 12	713-16.22	SIGNS (DEAD END, W14-1, 30"x 30")	EACH	2	0	2
6, 12	713-16.23	SIGNS (KEEP RIGHT, R4-7, 24"x 30")	EACH	7	0	7
6, 12	713-16.24	SIGNS (OBJECT MARKER, OM1-1, 18"x 18")	EACH	7	0	7
6, 12	713-16.25	SIGNS (NO MOTOR VEHICLES, R5-3, 24"x 24")	EACH	4	0	4
6, 12	713-16.26	SIGNS (ADA ACCESSIBLE ROUTE, R4-4 (MOD), 36"x 30"))	EACH	2	0	2
6, 12	713-16.27	SIGNS (ADVANCE INTERSECTION LANE CONTROL, R3-8, 30"x 48")	EACH	1	0	1
6, 12	713-16.28	SIGNS (STREET NAME, D3-1, 36"x 8")	EACH	10	0	10
6, 12	713-16.29	SIGNS (STOP AHEAD, W3-1A, 36"x 36")	EACH	2	0	2
6, 12	713-16.30	SIGNS (SIDEWALK CLOSED), R9-9, 12"x 24")	EACH	2	0	2
37	716-02.04	PLASTIC PAVEMENT MARKING(CHANNELIZATION STRIPING)	S.Y.	1,432	0	1,432
37	716-02.05	PLASTIC PAVEMENT MARKING (STOP LINE)	L.F.	152	0	152
37	716-02.06	PLASTIC PAVEMENT MARKING (TURN LANE ARROW)	EACH	4	0	4
32, 37	716-02.09	PLASTIC PAVEMENT MARKING (LONGITUDINAL CROSS-WALK)	L.F.	30	0	30
37	716-04.05	PLASTIC PAVEMENT MARKING (STRAIGHT ARROW)	EACH	2	0	2
37	716-04.15	PLASTIC PAVEMENT MARKING-BIKE SYMBOL/ARROW SHARED	EACH	5	3	8
33	716-05.01	PAINTED PAVEMENT MARKING (4" LINE)	L.M.	28	0	28
	716-05.05	PAINTED PAVEMENT MARKING (STOP LINE)	L.F.	156	0	156
	716-05.06	PAINTED PAVEMENT MARKING (TURN LANE ARROW)	EACH	10	0	10
	716-05.20	PAINTED PAVEMENT MARKING (6" LINE)	L.M.	5	0	5
33	716-12.01	ENHANCED FLATLINE THERMO PVMT MRKNG (4IN LINE)	L.M.	9	0	9
	716-12.04	ENHANCED FLATLINE THERMO PVMT MRKNG (4IN DOTTED LINE)	L.F.	400	0	400
	717-01	MOBILIZATION	LS	1	0	1
	730-02.48	SIGNAL HEAD MODIFICATION (RELOCATION)	EACH	1	0	1
7, 10	740-10.03	GEOTEXTILE (TYPE III)(EROSION CONTROL)	S.Y.	2,700	0	2,700
2, 7	740-11.03	TEMPORARY SEDIMENT TUBE 18IN	L.F.	11,150	0	11,150
	801-01.07	TEMPORARY SEEDING (WITH MULCH)	UNIT	650	0	650
	801-01.38	NATIVE SEED MIX FINAL STABILIZATION OF SLOPES	UNIT	31	0	31
7	801-02	SEEDING (WITHOUT MULCH)	UNIT	650	0	650
	801-03	WATER (SEEDING & SODDING)	M.G.	787	0	787
35	803-01	SODDING (NEW SOD)	S.Y.	72,179	0	72,179
11	805-01.03	TURF REINFORCEMENT MAT (CLASS III)	S.Y.	217	0	217
4	805-12.02	EROSION CONTROL BLANKET (TYPE II)	S.Y.	60,500	0	60,500
4,45	805-12.04	EROSION CONTROL BLANKET (TYPE IV)	S.Y.	2,635	0	2,635
51	806-02.03	PROJECT MOWING	CYCL	12	0	12
49	920-11	CONCRETE PARAPET RAIL WITH MOMENT SLAB	L.F.	1,471	0	1,471

CSX BRIDGE WIDENING ESTIMATED QUANTITIES

FOOTNOTES	ITEM NO.	ITEM DESCRIPTION	UNIT	EST QTY. (PARTICIPATING, STATE/FEDERAL)	EST QTY. (NON-PARTICIPATING, CITY)	TOTAL EST QTY.
1	202-04.01	REMOVAL OF STRUCTURES (CANTILEVER AND RAILING)	L.S.	1	0	1
1	604-02.03	EPOXY COATED REINFORCING STEEL	LBS.	3850	0	3,850
1	604-03.09	CLASS "D" CONCRETE (BRIDGE DECK)	C.Y.	13	0	13
1	604-04.01	APPLIED TEXTURE FINISH (NEW STRUCTURE)	S.Y.	94	0	94
1	604-04.10	GRAFFITI PROTECTION SYSTEM (NON-SACRIFICIAL)	S.Y.	94	0	94
1	604-05.31	BRIDGE DECK GROOVING (MECHANICAL)	S.Y.	28	0	28
1	617-02	BRIDGE DECK CRACK SEALING	LF	72	0	72
1	620-05.01	CONCRETE PARAPET SINGLE SLOPE (STD-1-15S)	LF	72	0	72
1	707-07.01	CHAIN LINK FENCE (BRIDGES)	SF	740	0	740

CSX BRIDGE WIDENING FOOTNOTES:

(1) COORDINATE WITH STRUCTURE DRAWINGS FOR ADDITIONAL FOOTNOTES

NOTE: SEE SHEET 2A-1 FOR FOOTNOTES

NOTE: SEE SHEET 2B FOR LIGHTING QUANTITIES

NOTE: SEE UTILITY PLANS FOR UTILITY QUANTITIES.

HISTORIC FRANKLIN TENNESSEE

SULLIVAN ENGINEERING, INC.
P.O. BOX 1708
BRENTWOOD, TN. 37024

EAST McEWEN DRIVE
PHASE 4 IMPROVEMENTS

ESTIMATED QUANTITIES (ROADWAY/BRIDGE)

RICHARD D. SULLIVAN — REGISTERED ENGINEER — NO. 021617 — STATE OF TENNESSEE

10-24-24