

ADDENDUM NUMBER ONE
CITICO CREEK SUB-BASIN COMBINED SEWER SEPARATION PROJECT
FOR THE CITY OF CHATTANOOGA, TENNESSEE
Contract Number S-15-007-201

A Pre-Bid Meeting was held at the Development Resource Center, 1250 Market Street, Chattanooga, TN 37402 on September 11, 2018 at 10:00 A.M. Meeting minutes and sign-in sheet from the meeting is attached.

The following changes shall be made to the Contract Documents, Specifications, and Drawings:

1. Please replace the following sheets with the attached sheets.
 - a. C0.0
 - b. C0.5
 - c. C1.2
 - d. C2.0
 - e. C2.1
 - f. C3.0
 - g. C3.1
 - h. C3.7
 - i. C6.0
 - j. C7.0
 - k. Bid Schedule
 - l. Page 57 of the Hobas Pipe Specification, which had been previously omitted
 - m. Updated Soil Management Plan

NOTE- If you are having difficulties viewing the contract documents, please check the extensions on your viewing software. If problems persist, please contact the Purchasing Department to make arrangements.

September 13, 2018

/s/Justin C. Holland, Administrator
City Of Chattanooga
Department of Public Works

Pre-Bid Meeting Agenda
09/11/2018 @ 10:00 a.m.
DRC Room 2B

Owner:	City of Chattanooga
Engineering Project Manager:	Elizabeth Goss, PE (423.643-6191)
Project Engineer/Manager:	Elizabeth Goss, PE (423.643-6191)
Inspector:	TBD / Ragan-Smith RPR
Contractor:	TBD
Contractor’s Project Manager:	TBD
Superintendent:	TBD
Contract Amount:	TBD

Project Overview:

The overall project consists of separating the storm and sanitary sewers in drainage sub-basins 90004 through 90012 (west of the railroad) comprising approximately 260 acres which are now served by combined sewers. The new 84” diameter storm pipe will allow storm drainage to flow separately to a new discharge in Citico Creek near Riverside Drive. The new 36” diameter sanitary sewer pipe will allow sanitary sewage to flow to the existing Citico Creek Interceptor. These new pipes will allow the drainage basin to be separated in an orderly fashion in the future proceeding upstream. The project has been separated into 3 phases which begin at the downstream location of Citico Creek and terminate at the upstream location of Engel Stadium. Phase I will encompass the area of Citico Creek south to the Norfolk Southern Railroad property. FUTURE Phase II will begin at the end of Phase I and terminate near the intersection of Central Avenue and Blackford Street. FUTURE Phase III will be the remaining segment that terminates near Engel Stadium.

Project Scope:

This bid will consist of everything located in the Phase I region. Phase I will consist of the northernmost approximately 500 LF of 36” sanitary sewer and 84” storm drainage outfall pipes, including a structural support system to facilitate spanning over the existing Citico Creek Interceptor (without disturbance to that existing facility), as well as the terminal junction box, discharge structure with headwall, apron with energy dissipation features and stream bank armoring / reinforcement. A temporary terminus will be provided on the upstream end of each pipe (near the RR ROW) installed and the trenches excavated for Phase I will be re-filled with compacted material and brought to final grade as shown on the Plans to facilitate long-term use and stability over the limits of Phase I construction and to accommodate future construction of the proposed Central Avenue extension bridge over Citico Creek. There will be traffic control requirements in Phase I when the proposed new apartments on the One Riverside site are under

CITICO CREEK SUB-BASIN COMBINED SEWER SEPARATION PROJECT – PHASE 1

Pre-Bid Meeting Agenda
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construction and / or being occupied.

The scope of this project consists of the following major elements of construction including, but not limited to:

1. Establishing erosion & sediment control for the project.
2. Clearing & grubbing within construction limits.
3. Construct temporary construction road to maintain access to One Riverside apartment construction site during this project. This includes moving the TAWC fence per Plans.
4. Prepare laydown area and soil stockpile area on the Brown site north of Citico Creek.
5. Begin excavation for headwall and new manhole at downstream end.
6. Excavate ditch for both pipes; install bracing and/or trench boxes as required.
7. Classification and stockpiling of excavated soil is continuous during the excavation process.
8. Install storm & sanitary sewer lines with stone bedding and backfill.
9. Install crossing of 84” pipe over existing 42” RCP sewer interceptor line.
10. Backfilling of ditch.
11. Replace vegetation. Install new landscaping in Citico Creek buffer zone per Plans.

Notice to Proceed (NTP):	Expected 11/19/2018
Work Must Commence:	Within 10 days of NTP
Completion Date:	TBD 242 Calendar Days is contract length (8 months)
Contract Length:	TBD as part of the contractor’s bid
Liquidated Damages / Incentive Pay:	\$6,700 per day These LDs are real and based upon completion and expected occupancy of the One Riverside Apartments that are currently under construction.

Utilities:

Contractor shall coordinate all utility work. Contact utilities in advance of work.

AT&T:

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**Pre-Bid Meeting Agenda
09/11/2018 @ 10:00 a.m.
DRC Room 2B**

Tennessee American:

Chattanooga Gas:

Comcast:

EPB:

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09/11/2018 @ 10:00 a.m.
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Standard Work Week:

Regular working hours are Monday through Saturday from 7:00 am to 8:00 pm. **Contractor shall notify the owner 24 hours prior to working on Saturday and/or Sunday.** The contractor will not be unduly restricted to work on Saturday and Sundays.

Shop Drawings:

Pay Estimates:

To be submitted monthly, by the 25th of each month. 3 copies. Contractor shall submit a format for approval prior to first billing.

Progress Meetings:

Weekly – First weekly meeting to be (T.B.D) 10:00 a.m. on site. Utilities shall be present at meetings until their scheduled relocations and/or conflicts have been resolved.

Schedules and Reports:

Contractor shall submit within one week of award a detailed schedule showing the critical path to general construction operations, indicating the sequence of the work, the estimated dates of starting each task, and the estimated time of completion of each task.

Extra Work/Filing Claims:

Handling Disputes:

Any items of dispute shall immediately be brought to the City's attention.

Project Sign:

2 4'x8' signs per Section 0083. Locations to be determined

Traffic Control:

Traffic control plans are provided in the Project Plans. These measures should be coordinated and submitted through the City of Chattanooga Traffic Engineering Dept prior to any traffic control devices being put in place. Once traffic control devices are put in place, they will be reviewed periodically for conformance.

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09/11/2018 @ 10:00 a.m.
DRC Room 2B

Safety and Supervision:

Contractor's responsibility.

Funding:

City Funds (Stormwater & MBWWTP)

Subcontracting:

Submit a list of all subcontractors for approval, including minority status and value of subcontracts.

Erosion Control:

Adhere to the Erosion Control Plans set forth on the plans and/or refer to the Stormwater BMP Manual. City is responsible for applying for land disturbing and NPDES permits prior to beginning construction.

Permits:

Contractor's responsibility.

Field Office:

See specs. Can be placed in laydown area north of Citico Creek.

Surveying & Staking of Work:

Contractor shall be responsible for surveying and staking all work.

Project Closeout:

As-Built drawings shall be submitted within 30 day after substantial completion before retainage can be released.

Items Discussed:

Q. What permits are required?

A. Land Disturbing only.

Q. What work is the contractor expected to do at the secondary stockpile location (4301 Amicola Highway)?

A. The contractor is only required to knockdown the piles. No compaction is required.

Q. Do the stone bedding requirements change if the Owner chooses to take the alternate pipe type?

A. No, the bedding requirements do not change. Please refer to the construction drawings for trench section details.

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Pre-Bid Meeting Agenda

09/11/2018 @ 10:00 a.m.

DRC Room 2B

Q. How should excess foundry sand be handled if it cannot go back into the trench?

A. Foundry sand that cannot go back into the trench should be hauled away. No foundry sand is accepted at the secondary stockpile location or can remain on the temporary laydown property.

Q. What is the expected Notice of Award (NOA) date?

A. October 18, 2018

NOTE- Contractors must attach the Contractor Identification Form to the outside of the Bid Envelope for their bid to be accepted.

SIGN-IN SHEET

PROJECT: Citico Creek Sub Basin Combined Sewer Separation Project

	NAME	COMPANY	PHONE	EMAIL
1	Joe Tipton	Hobas Pipe	615-922-0445	jtipton@hobaspipe.com
2	Estan L. Fuller III	KLEENCO Construction	423-624-4111	estan.fuller@kleencoconstruction.com
3	Steve Ford	Carney Construction	615-714-6254	sford@carney.com
4	Cody Jett	Wright Brothers	423-790-8085	cjett@wbcci.com
5	Brian Charlesworth	Wright Brothers Construction	(423) 463-2974	BCharlesworth@wbcci.com
6	Dean Briggs	Wright Brothers Construction	(423) 336-2261	dbriggs@wbcci.com
7	Craig Wiley	Reynolds Construction		Craig.Wiley@reynolds.com
8	Rick Ryan	Reynolds Construction	615-390-9715	Rick.Ryan@reynolds.com
9	MICHAEL McBRAYER	THOMAS BROTHERS	423-842-6233	MIKE@TBOC.INC.NET
10	David Robbins	Hurst Excavating	865-389-6871	dauid@hurstexc.com
11	Darren Desautell	Rain For Rent	404-516-5566	dDesautell@rainforrent.com
12	Jay Floyd	Ryan Smith Assoc.	423-490-9400	JFloyd@ryansmith.com
13	Mark Seltzer	RSA	423-490-9460	mseltzer@ryansmith.com
14	Debbie Talley	COC	423-643-7230	dtalley@chattanooga.gov
15	Elizabeth Goss	COC	229-894-4591	egoss@chattanooga.gov
16	MIKE ROSE	TALLEY	706-866-0596	MIKE@TALLEYCONSTRUCTION.NET
17				
18				
19				
20				
21				
22				

CITY OF CHATTANOOGA, TENNESSEE

CONTRACT NO. S-15-007-201

CITICO CREEK SUB-BASIN COMBINED SEWER SEPARATION PROJECT - PHASE 1

RAGAN SMITH
 LAND PLANNERS • CIVIL ENGINEERS
 LANDSCAPE ARCHITECTS • SURVEYORS
 Chattanooga 423-490-9400
 Nashville 615-244-8891
 Murfreesboro 615-546-6050
 ragan@smith.com



MAYOR
ANDY BERKE
CITY COUNCIL MEMBERS

- DISTRICT 1 - CHIP HENDERSON
- DISTRICT 2 - JERRY MITCHELL
- DISTRICT 3 - KEN SMITH, CHAIRPERSON
- DISTRICT 4 - DARRIN LEDFORD
- DISTRICT 5 - RUSSELL GILBERT, SR.
- DISTRICT 6 - DR. CAROL B. BERZ
- DISTRICT 7 - ERSKINE OGLESBY, JR., VICE CHAIRPERSON
- DISTRICT 8 - ANTHONY BYRD
- DISTRICT 9 - DEMETRUS COONROD

UTILITY CONTACTS

CITY OF CHATTANOOGA
 WASTE RESOURCES DIVISION
 455 MOCCASIN BEND ROAD
 CHATTANOOGA, TN 37402
 (423)757-5026

CDOT (TRAFFIC SIGNALIZATION)
 TOMMY TROTTER
 1250 MARKET STREET, SUITE 3030
 CHATTANOOGA, TN 37402
 (423)643-5958
 TTROTTER@CHATTANOOGA.GOV

COMCAST CABLE TELEVISION CO.
 2030 EAST POLYMER DRIVE
 CHATTANOOGA, TN 37422
 ROGER SPAIN
 (423)296-2193
 ROGER_SPAIN@CABLE.COMCAST.COM

AT&T
 ANGEL GONZALEZ
 (423)320-8902
 AG741Q@ATT.COM

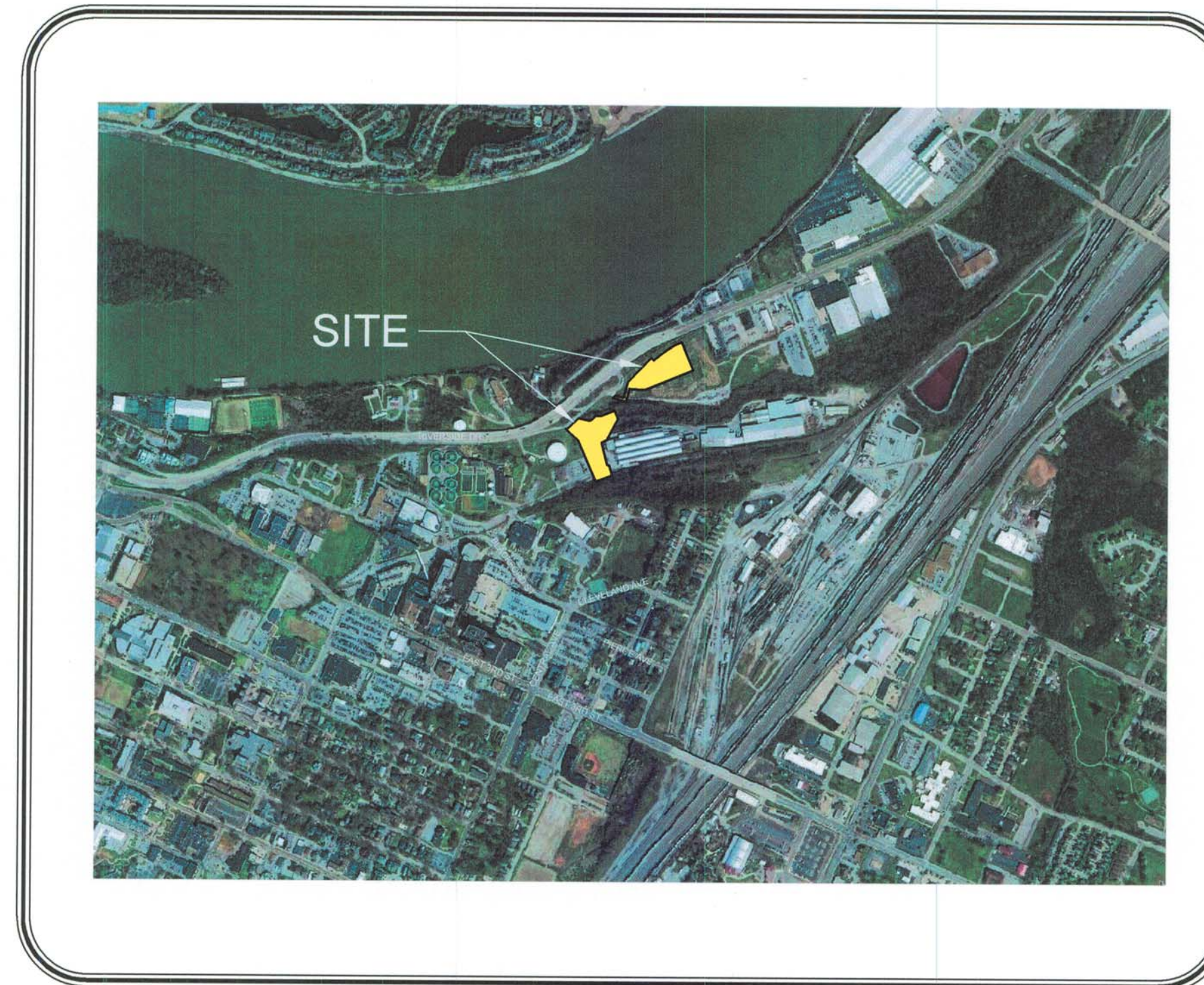
TENNESSEE AMERICAN WATER
 1500 RIVERSIDE DRIVE
 CHATTANOOGA, TN 37406
 GRADY STOUT
 (423)771-4713
 GRADY.STOUT@AMWATER.COM

CHATTANOOGA GAS COMPANY
 6125 PRESERVATION DRIVE
 CHATTANOOGA, TN 37416
 BENNIE KINSEY
 (423)490-4294

ELECTRIC POWER BOARD
 ENGINEERING DIVISION
 DAVID HENDERSON
 1400 OAK STREET
 CHATTANOOGA, TN 37422
 (423)648-3257

SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
C0.0	COVER SHEET
C0.1	CIVIL NOTES
C0.2	TRENCH NOTES AND TYPICAL SECTIONS
C0.3	EXISTING CONDITIONS
C0.4	BORING LOCATION MAP
C0.5	ESTIMATED QUANTITIES
C1.0	OVERALL SITE LAYOUT
C1.1	PHASE 1 EASEMENT DETAILS
C1.2	TEMPORARY CONSTRUCTION ACCESS LAYOUT
C2.0	PHASE 1 PHASING PLAN
C2.1	TRAFFIC CONTROL AND DETOUR PLAN PHASE 1
C3.0	INITIAL EROSION CONTROL
C3.1	FINAL EROSION CONTROL
C3.2	EROSION CONTROL DETAILS 1 OF 2
C3.3	EROSION CONTROL DETAILS 2 OF 2
C3.4	CITICO CREEK PLAN AND PROFILE
C3.5	CITICO CREEK CROSS SECTIONS STA. 0+25 TO 1+50
C3.6	CITICO CREEK CROSS SECTIONS STA. 1+75 TO 3+00
C3.7	TEMPORARY CONSTRUCTION ACCESS PLAN AND PROFILE
C4.0	LANDSCAPE PLAN
C4.1	LANDSCAPE NOTES & DETAILS
C5.0	STORM DRAIN PLAN AND PROFILE 1 OF 1
C5.1	STORM CROSS SECTIONS 0+50 TO 3+00
C5.2	STORM CROSS SECTIONS 3+50 TO 5+00
C6.0	SANITARY SEWER PLAN AND PROFILE 1 OF 1
C6.1	SANITARY CROSS SECTIONS 0+50 TO 2+00
C7.0	DETAILS 1 OF 2
C7.1	DETAILS 2 OF 2
C7.2	DETAILS 3 OF 3
C7.3	ALTERNATE DETAILS 1



LOCATION MAP
 1" = 1000'

Jay E. Floyd 8-3-18
 JAY FLOYD, P.E. DATE
 PROJECT ENGINEER
 TN STATE LICENSE NO. 19155

William C. Payne 08-28-18
 APPROVED FOR RELEASE DATE
 WILLIAM C. PAYNE, PE
 CITY ENGINEER

DEPARTMENT OF PUBLIC WORKS
 JUSTIN C. HOLLAND, ADMINISTRATOR

CITICO CREEK SUB-BASIN COMBINED SEWER SEPARATION PROJECT - PHASE 1
 FOR
 CITY OF CHATTANOOGA, TENNESSEE
 CHATTANOOGA, TN

JOB NO.	WK. ORDER	DESIGNED:	DRAWN:	SCALE:	DATE:	REVISIONS
11058	0176	MES	BLC	NONE	8-3-2018	

COVER SHEET

C0.0

PLANNING AND DESIGN SERVICES, INC. CHATTANOOGA, TN
 PRINTED BY MARK SCHOTT ON 8/28/18 10:08 AM LAST UPDATED BY MES ON 8/28/18 10:23 AM

ESTIMATED QUANTITIES

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY PHASE 1
105-01	CONSTRUCTION STAKES, LINES, AND GRADES (INCLUDING AS-BUILTS)	LS	1
201-01	CLEARING AND GRUBBING	LS	1
202-01.51	REMOVAL OF STRUCTURES AND OBSTRUCTIONS (PIPE ENDWALLS)	EA	1
202-01.52	REMOVAL OF STRUCTURES AND OBSTRUCTIONS (BOLLARDS)	EA	6
202-03.01	ASPHALT REMOVAL	SY	1470
203-01	DITCH AND ACCESS ROAD EXCAVATION (INCLUDING SHORING AND HAUL OFF TO CONTRACTOR SITE)	CY	23000
203-01.07	DISPOSAL OF CONTAMINATED (NON-HAZARDOUS) SOIL TO CLASS 1 PERMITTED LANDFILL	TON	200
203-01.08	EXCAVATION AND HAUL OFF TO CITY OWNED STOCKPILE (6" MAX. STONE SIZE AND NO DEBRIS)	CY	10000
203-01.29	ROCK EXCAVATION	CY	500
203-02.01	BACKFILL FOR UNDERCUT	CY	500
203-05	UNDERCUT EXCAVATION	CY	500
209-01.11	TEMPORARY CONSTRUCTION ENTRANCE/EXIT (COMPLETE-IN-PLACE)	EA	1
209-08.02*	SILT FENCE WITHOUT WIRE BACKING	LF	1300
209-10.20	TEMPORARY SEDIMENT TRAP	CY	530
209-40.33	CATCH BASIN PROTECTION (TYPE D) (EC-STR-19)	EA	2
303-01	MINERAL AGGREGATE, TYPE A BASE, GRADING D	TON	1400
303-10.01	MINERAL AGGREGATE (SIZE 57) (PIPE BACKFILL & MAINTENANCE STONE)	TON	1900
307-01.08	ASPHALT CONCRETE MIX (PG64-22) (BPMB-HM) GRADING B-M2 BINDER LAYER	TON	500
411-01.11	ACS MIX (PG64-22) GRADING E ROADWAY WEARING LAYER	TON	125
606-24.12	STEEL SHEET PILES (COMPLETE-IN-PLACE)	SF	5200
607-15.05	84" CONCRETE PIPE CULVERT (CLASS V)	LF	465
607-39.01	15" HDPE PIPE	LF	76
607-39.02	18" HDPE PIPE	LF	27
611-01.10	48" RISER STACK OUT > 28' (15' LENGTH)	EA	2
611-01.06	11'X12' BOX STRUCTURE 20-24' DEPTH (DROP MANHOLE)	EA	1
611-01.20	REMOVE NYLOPLAST DRAIN	EA	2
611-02.98	84" RCP x 8' SADDLE TEE PER DETAIL #RCP-030 ON SHEET C7.2	EA	1
611-02.99	84" RCP x 8' BEND PER DETAIL #RCP-040 ON SHEET C7.2	EA	1
611-07.54	18" ENDWALL (CROSS DRAIN) 3:1	EA	1
611-07.99	HEADWALL/WINGWALL	LS	1
611-42.01	32" X 32" NO. 42 CATCH BASIN PER TDOT STD. DWG. D-CB-425 (DEPTH ≤ 4') (COMPLETE-IN-PLACE)	EA	2
611-99.99	SANITARY SEWER CROSSING (INCLUDING 20' OF HORAS PIPE, CRADLE COLLAR, AND GRADE BEAM)	LS	-1
707-06.03*	REMOVE AND RESET FENCING (TAWC SECURITY FENCE)	LF	910
707-06.05*	REMOVAL OF 280' OF FENCE	LS	1
707-08.10*	TEMPORARY CONSTRUCTION FENCE (ONE RIVERSIDE APARTMENTS AND STAGING AREA)	LF	1800
707-08.11*	HIGH VISIBILITY FENCE FOR TREE PROTECTION BY THE ENGINEER	LF	610
709-05.09	MACHINED RIP-RAP (CLASS C) 42" THICK (COMPLETE-IN-PLACE)	CY	400
712-05.01	TYPE A WARNING LIGHTS	EA	2
712-06	TEMPORARY CONSTRUCTION SIGNS	EA	2
712-07.03	TYPE 3 BARRICADES (8' LENGTH FOR ROAD CLOSURE)	LF	8
717-01	MOBILIZATION, INCLUDING BID BOND, PERFORMANCE BOND, PAYMENT BOND, COORDINATION WITH NS RAILROAD, ETC.	LS	1
722-01.01	FIELD OFFICE (TYPE 1)	LS	1
740-10.03	GEOTEXTILE FABRIC (NON-WOVEN, AASHTO CLASS III)	SY	250
790-20.30	ELECTRIC POLE REPLACEMENT	EA	1
790-98.02	REMOVE UTILITY POLE	EA	3
795-01.06	8" DIP SLIP JOINT WATERLINE	LF	280
795-12.02	REMOVAL OF EXISTING WATERLINE	LF	280
797-05.94	36" CENTRIFUGALLY CAST POLYMER MORTAR PIPE (CCFRPM)	LF	490
797-07.30	72" MANHOLE 16-20' DEPTH	EA	1
797-07.33	72" MANHOLE >28' DEPTH	EA	2
797-07.38	84" DIAMETER 10-12' DEPTH DOGHOUSE MANHOLE (INCLUDES 108" DOGHOUSE MANHOLE BASE, PAD, BOOT AND GROUT)	EA	1
801-01	SEEDING (WITH MULCH)	UNIT	34
802-01.03	TREES (CERCIS CANADENSIS)	EA	3
802-01.04	TREES (ACER RUBRUM)	EA	1
802-01.05	TREES (BETULA NIGRA)	EA	1
802-01.11	TREES (LIRIODENDRON TULIPIFERA)	EA	5
802-01.12	TREES (NYSSA SYLVATICA)	EA	3
802-01.13	TREES (QUERCUS SHUMARDII)	EA	3
802-03.01	SHRUBS (CLETHRA ACUMINATA)	EA	75
802-03.02	SHRUBS (PANICUM VIRGATUM "NORTHWIND")	EA	239
802-13.04	SHRUBS (CORNUS AMOMUM)	EA	14
802-13.06	SHRUBS (HYDRANGEA QUERCIFOLIA)	EA	50
802-13.08	SHRUBS (ITEA VIRGINICA)	EA	52
802-13.09	SHRUBS (LINDERA BENZOIN)	EA	50
802-13.14	SHRUBS (CALLICARPA AMERICANA)	EA	58
805-12.06	SOIL REINFORCEMENT MATTING, AS MANUFACTURED BY (WITH SEED)	SY	475
920-08.18	TEMPORARY SHORING	LS	1
920-11.04	PIPE BOLLARD	EA	6

1

ALTERNATE A: 36" DIP SEWER PIPE IN LIEU OF 36" CCFRPM

ITEM NO.	ITEM DESCRIPTION	UNITS	QUANTITY PHASE 1
797-05.94	36" CENTRIFUGALLY CAST POLYMER MORTAR PIPE (CCFRPM)	LF	490
ALTERNATE A-1	36" DIP GRAVITY SEWER (CLASS 250) < 18' DEPTH	LF	50
ALTERNATE A-2	36" DIP GRAVITY SEWER (CLASS 350) > 18' DEPTH	LF	440

ALTERNATE B: 84" CCFRPM PIPE IN LIEU OF 84" RCP

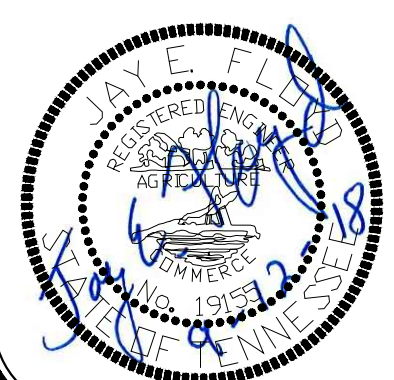
ITEM NO.	ITEM DESCRIPTION	UNITS	QUANTITY PHASE 1
607-15.05	84" CONCRETE PIPE CULVERT (CLASS V)	LF	465
611-01.10	48" RISER STACK OUT > 28'	EA	-2
611-01.06	11'X12' BOX STRUCTURE 20-24' DEPTH (DROP MANHOLE)	EA	-1
611-02.98	84" RCP x 8' SADDLE TEE PER DETAIL #RCP-030 ON SHEET C7.2	EA	-1
611-02.99	84" RCP x 8' BEND PER DETAIL #RCP-040 ON SHEET C7.2	EA	-1
ALTERNATE B-1	84" CENTRIFUGALLY CAST POLYMER MORTAR PIPE (CCFRPM)	LF	465
ALTERNATE B-2	60" FRP MANHOLE RISER PER DETAIL #7 ON SHEET C7.3	EA	1
ALTERNATE B-3	60" FRP DROP MANHOLE PER DETAILS #1 AND #2 ON SHEET C7.3	EA	1
ALTERNATE B-4	84" CENTRIFUGALLY CAST POLYMER MORTAR PIPE TEE (CCFRPM)	EA	1
ALTERNATE B-5	84" CENTRIFUGALLY CAST POLYMER MORTAR PIPE BEND (CCFRPM)	EA	1

ALTERNATE C: FILTER SOXX IN LIEU OF SILT FENCE

ITEM NO.	ITEM DESCRIPTION	UNITS	QUANTITY PHASE 1
209-08.02*	SILT FENCE WITHOUT WIRE BACKING	LF	-1300
ALTERNATE C-1*	12" FILTER SOCK (SILT SOXX SILT FENCE ALTERNATIVE, OR APPROVED EQUAL)	LF	1300

*NOTES

707-06.03, REMOVE AND RESET FENCE (TAWC SECURITY FENCE):	THE EXISTING SECURITY SYSTEM WILL BE ARMED 24/7 WITH EXCEPTION TO ONLY THE RELOCATION OF THE MONITORING SECURITY SYSTEM. THE DEACTIVATION AND REACTIVATION OF THE SECURITY SYSTEM FOR RELOCATION OF 360' OF FENCE TO THE TEMPORARY LOCATION, WILL BE WITHIN BUSINESS HOURS OF TAWC AND WILL BE REACTIVATED THAT SAME BUSINESS DAY. IF UNABLE TO ACCOMPLISH THIS, SECURITY PERSONNEL APPROVED BY TAWC WILL BE PROVIDED AT NO ADDITIONAL COST TO THE CONTRACT.
707-08.10, TEMPORARY CONSTRUCTION FENCE:	THE "SECOND" REMOVE AND RESET OF 550' OF THIS FENCE WILL BE INSTALLED INTO ITS PERMANENT LOCATION. THIS OPERATION MUST MAINTAIN SECURITY OF TAWC WITH DEACTIVATION AND REACTIVATION OF THE SECURITY SYSTEM WITHIN THE SAME BUSINESS DAY AS IDENTIFIED FOR THE "EXISTING SECURITY SYSTEM". THE CONTRACTOR MAY ELECT TO PROVIDE A "TEMPORARY FENCE" THAT MEETS THE "TYPE" AND CONDITIONS OF THE EXISTING FENCE, AND INSTALL "NEW" FENCE AT THE CONCLUSION OF CONSTRUCTION AT NO ADDITIONAL COST TO THE CONTRACT.
209-08.02, SILT FENCE WITHOUT WIRE BACKING ALTERNATE C-1, 12" FILTER SOCK (SILT SOXX SILT FENCE ALTERNATIVE, OR APPROVED EQUAL)	THIS PAY ITEM IS TO COVER THE FURNISH, INSTALL, AND REMOVAL OF THE TEMPORARY FENCE UPON COMPLETION OF CONSTRUCTION. TO INCLUDE (3) THREE TEMPORARY GATES AS SHOWN IN THE PLANS. THESE TWO ITEMS ARE INCLUDED FOR BID PURPOSES. THE UNIT PRICES FROM THE BID SCHEDULE SHALL BE USED IF A COMBINATION OF BOTH PRODUCTS ARE USED DURING CONSTRUCTION.



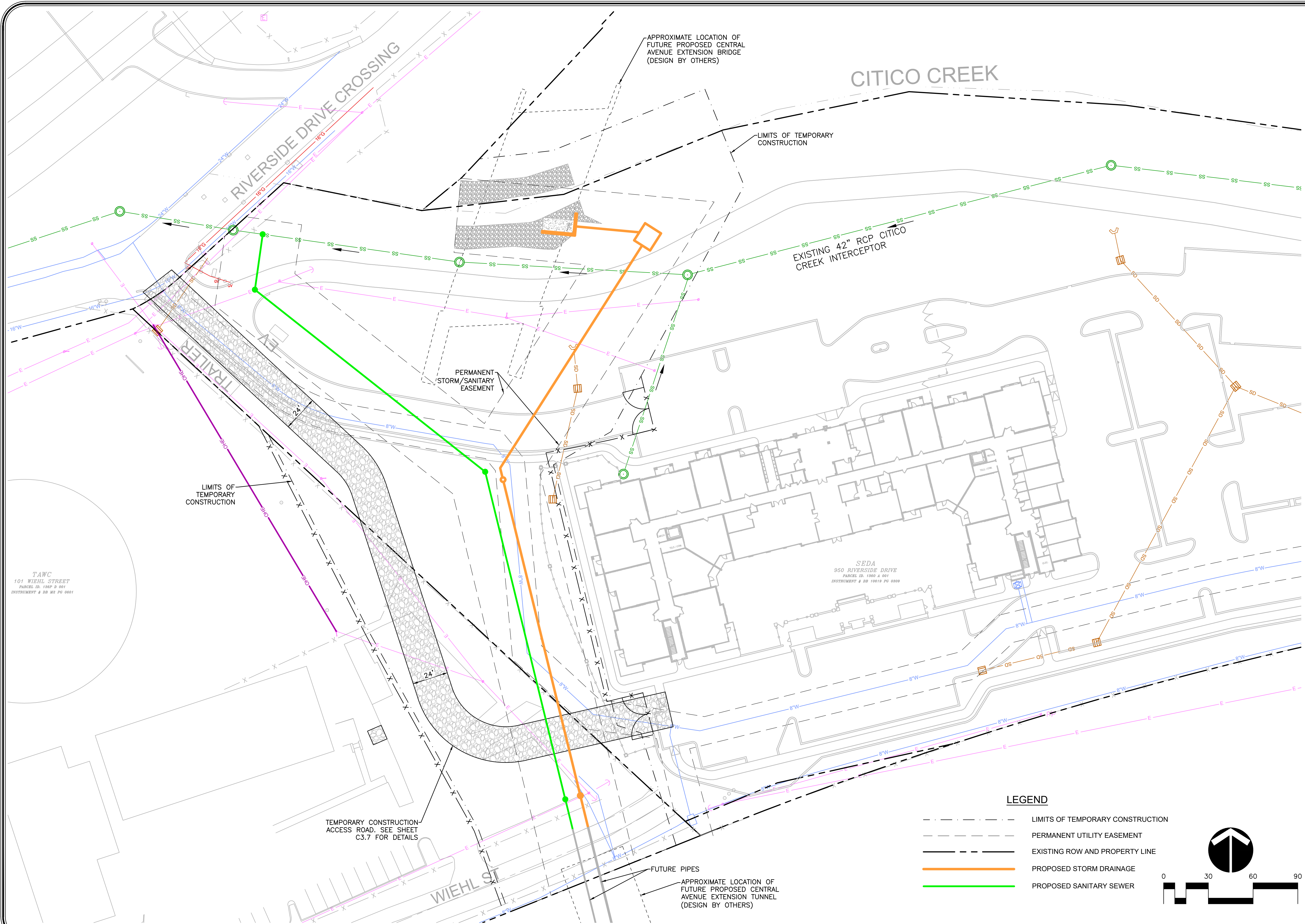
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SEWER SEPARATION PROJECT - PHASE 1
FOR
CITY OF CHATTANOOGA, TENNESSEE
CHATTANOOGA, TN

JOB NO.	11058	DESIGNED:	MES	DRAWN:	BLC	SCALE:	1" = 100'	DATE:	8-3-2018	
WK. ORDER	0176								REV.	
									09-12-18 (EDK) Rev.	
									ADDITIONAL 1	
									REVISIONS	

ESTIMATED QUANTITIES

C0.5

I:\CHATT PROJECTS\11058\11058-01\DWG\CIVIL\ENGINEERING\AN\ESTIMATED QUANTITIES.DWG
 PLOTTED BY BRUNEN KORN ON 9/4/2018 11:59 AM LAST UPDATED BY BK ON 9/4/2018 11:57 AM



TAWC
101 WIEHL STREET
PARCEL ID. 1380 & 001
INSTRUMENT # DB M2 PG 0601

APPROXIMATE LOCATION OF
FUTURE PROPOSED CENTRAL
AVENUE EXTENSION BRIDGE
(DESIGN BY OTHERS)

LIMITS OF TEMPORARY
CONSTRUCTION

EXISTING 42" RCP CITICO
CREEK INTERCEPTOR

PERMANENT
STORM/SANITARY
EASEMENT

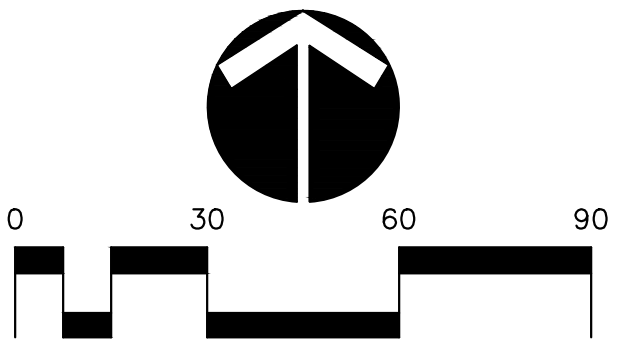
LIMITS OF
TEMPORARY
CONSTRUCTION

TEMPORARY CONSTRUCTION
ACCESS ROAD. SEE SHEET
C3.7 FOR DETAILS

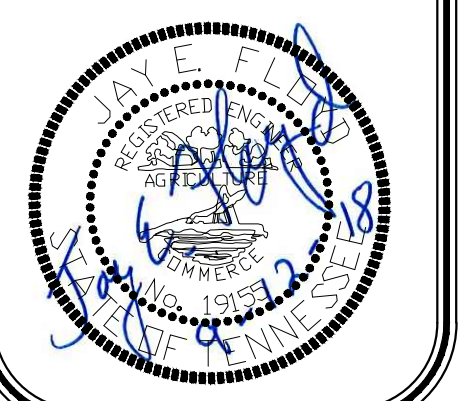
FUTURE PIPES
APPROXIMATE LOCATION OF
FUTURE PROPOSED CENTRAL
AVENUE EXTENSION TUNNEL
(DESIGN BY OTHERS)

LEGEND

- LIMITS OF TEMPORARY CONSTRUCTION
- PERMANENT UTILITY EASEMENT
- EXISTING ROW AND PROPERTY LINE
- PROPOSED STORM DRAINAGE
- PROPOSED SANITARY SEWER



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**CITICO CREEK SUB-BASIN COMBINED
SEWER SEPARATION PROJECT - PHASE 1**
 FOR
CITY OF CHATTANOOGA, TENNESSEE
 CHATTANOOGA, TN

JOB NO.	11058	DESIGNED:	MES	DRAWN:	BLC	SCALE:	1" = 30'	DATE:	8-3-2018
WK. ORDER	0176	ADDENDUM	1	REVISIONS					

**TEMPORARY
CONSTRUCTION
ACCESS LAYOUT**

C1.2

11-CITICO PROJECTS 11058 (1) CIVIL ENGINEERS PLAN SHEETS TO ACCESS ROAD LAYOUT DWG
 PLOTTED BY BRUNEN KORN ON 8/3/2018 3:50 PM. LAST UPDATED BY BK ON 8/3/2018 4:58 PM

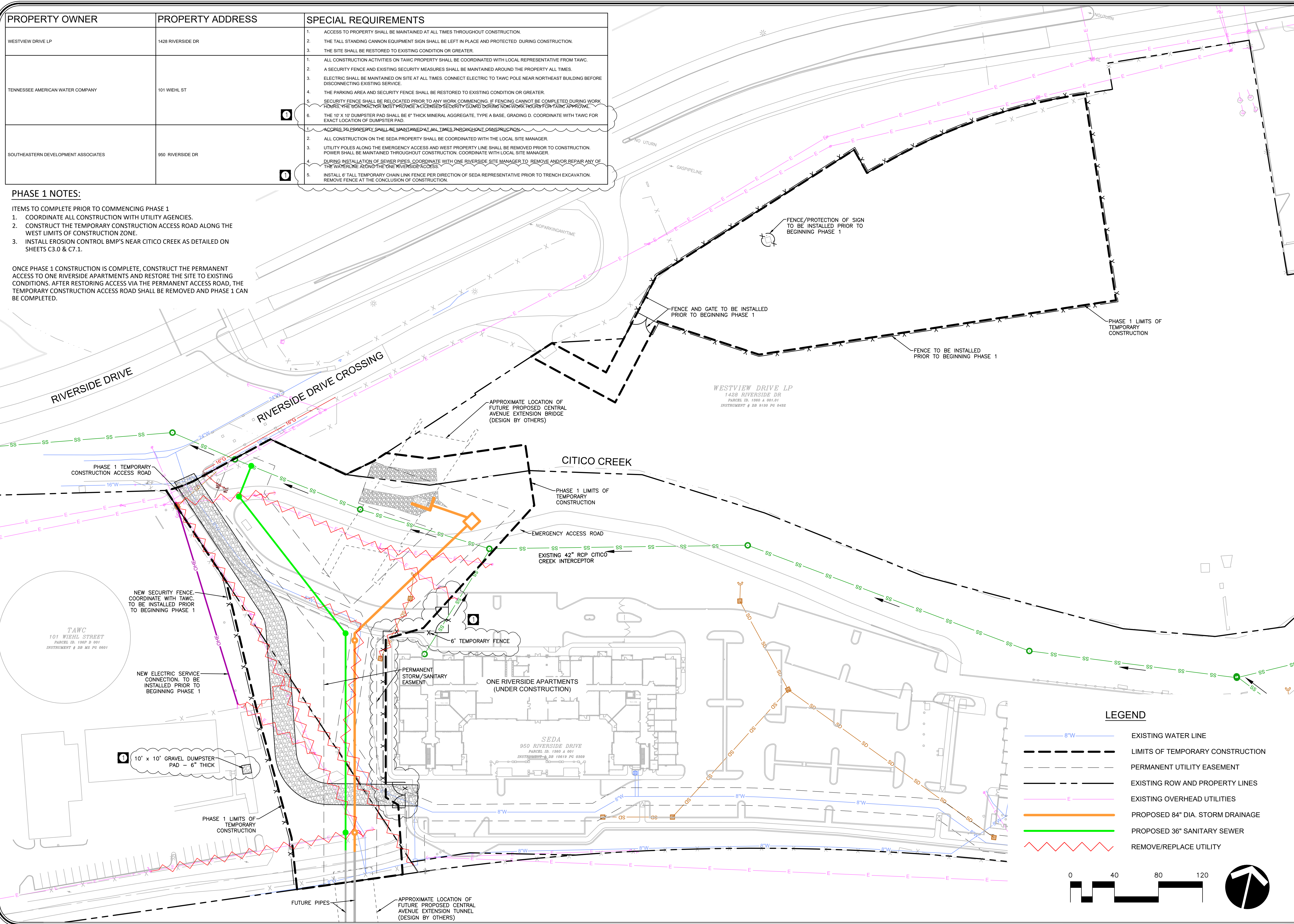
PROPERTY OWNER	PROPERTY ADDRESS	SPECIAL REQUIREMENTS
WESTVIEW DRIVE LP	1428 RIVERSIDE DR	<ol style="list-style-type: none"> ACCESS TO PROPERTY SHALL BE MAINTAINED AT ALL TIMES THROUGHOUT CONSTRUCTION. THE TALL STANDING CANNON EQUIPMENT SIGN SHALL BE LEFT IN PLACE AND PROTECTED DURING CONSTRUCTION. THE SITE SHALL BE RESTORED TO EXISTING CONDITION OR GREATER.
TENNESSEE AMERICAN WATER COMPANY	101 WIEHL ST	<ol style="list-style-type: none"> ALL CONSTRUCTION ACTIVITIES ON TAWC PROPERTY SHALL BE COORDINATED WITH LOCAL REPRESENTATIVE FROM TAWC. A SECURITY FENCE AND EXISTING SECURITY MEASURES SHALL BE MAINTAINED AROUND THE PROPERTY ALL TIMES. ELECTRIC SHALL BE MAINTAINED ON SITE AT ALL TIMES. CONNECT ELECTRIC TO TAWC POLE NEAR NORTHEAST BUILDING BEFORE DISCONNECTING EXISTING SERVICE. THE PARKING AREA AND SECURITY FENCE SHALL BE RESTORED TO EXISTING CONDITION OR GREATER. SECURITY FENCE SHALL BE RELOCATED PRIOR TO ANY WORK COMMENCING. IF FENCING CANNOT BE COMPLETED DURING WORK HOURS, THE CONTRACTOR MUST PROVIDE A LICENSED SECURITY GUARD DURING NON-WORK HOURS FOR TAWC APPROVAL. THE 10' X 10' DUMPSTER PAD SHALL BE 6" THICK MINERAL AGGREGATE, TYPE A BASE, GRADING D. COORDINATE WITH TAWC FOR EXACT LOCATION OF DUMPSTER PAD.
SOUTHEASTERN DEVELOPMENT ASSOCIATES	950 RIVERSIDE DR	<ol style="list-style-type: none"> ACCESS TO PROPERTY SHALL BE MAINTAINED AT ALL TIMES THROUGHOUT CONSTRUCTION. ALL CONSTRUCTION ON THE SEDA PROPERTY SHALL BE COORDINATED WITH THE LOCAL SITE MANAGER. UTILITY POLES ALONG THE EMERGENCY ACCESS AND WEST PROPERTY LINE SHALL BE REMOVED PRIOR TO CONSTRUCTION. POWER SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION. COORDINATE WITH LOCAL SITE MANAGER. DURING INSTALLATION OF SEWER PIPES, COORDINATE WITH ONE RIVERSIDE SITE MANAGER TO REMOVE AND/OR REPAIR ANY OF THE WATERLINE ALONG THE ONE RIVERSIDE ACCESS. INSTALL 6' TALL TEMPORARY CHAIN LINK FENCE PER DIRECTION OF SEDA REPRESENTATIVE PRIOR TO TRENCH EXCAVATION. REMOVE FENCE AT THE CONCLUSION OF CONSTRUCTION.

PHASE 1 NOTES:

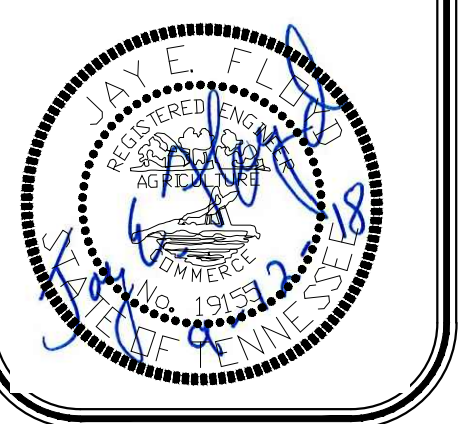
ITEMS TO COMPLETE PRIOR TO COMMENCING PHASE 1

- COORDINATE ALL CONSTRUCTION WITH UTILITY AGENCIES.
- CONSTRUCT THE TEMPORARY CONSTRUCTION ACCESS ROAD ALONG THE WEST LIMITS OF CONSTRUCTION ZONE.
- INSTALL EROSION CONTROL BMP'S NEAR CITICO CREEK AS DETAILED ON SHEETS C3.0 & C7.1.

ONCE PHASE 1 CONSTRUCTION IS COMPLETE, CONSTRUCT THE PERMANENT ACCESS TO ONE RIVERSIDE APARTMENTS AND RESTORE THE SITE TO EXISTING CONDITIONS. AFTER RESTORING ACCESS VIA THE PERMANENT ACCESS ROAD, THE TEMPORARY CONSTRUCTION ACCESS ROAD SHALL BE REMOVED AND PHASE 1 CAN BE COMPLETED.



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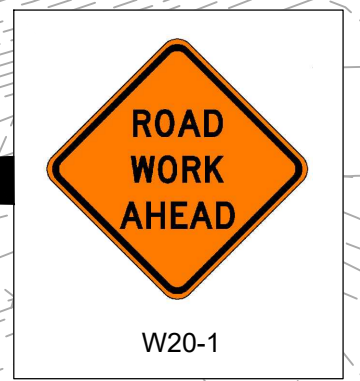
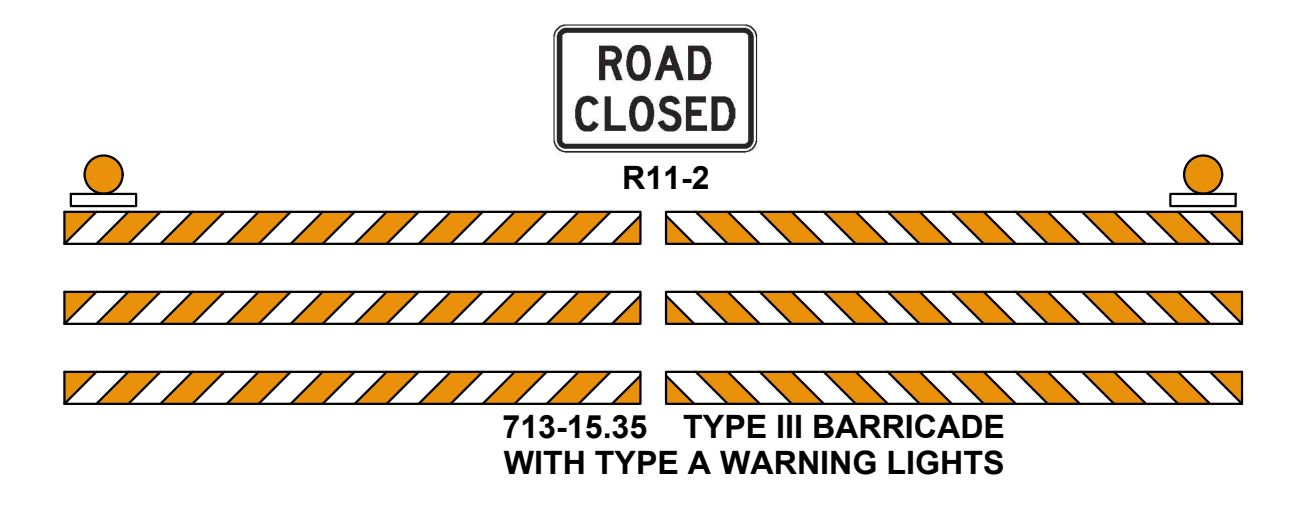
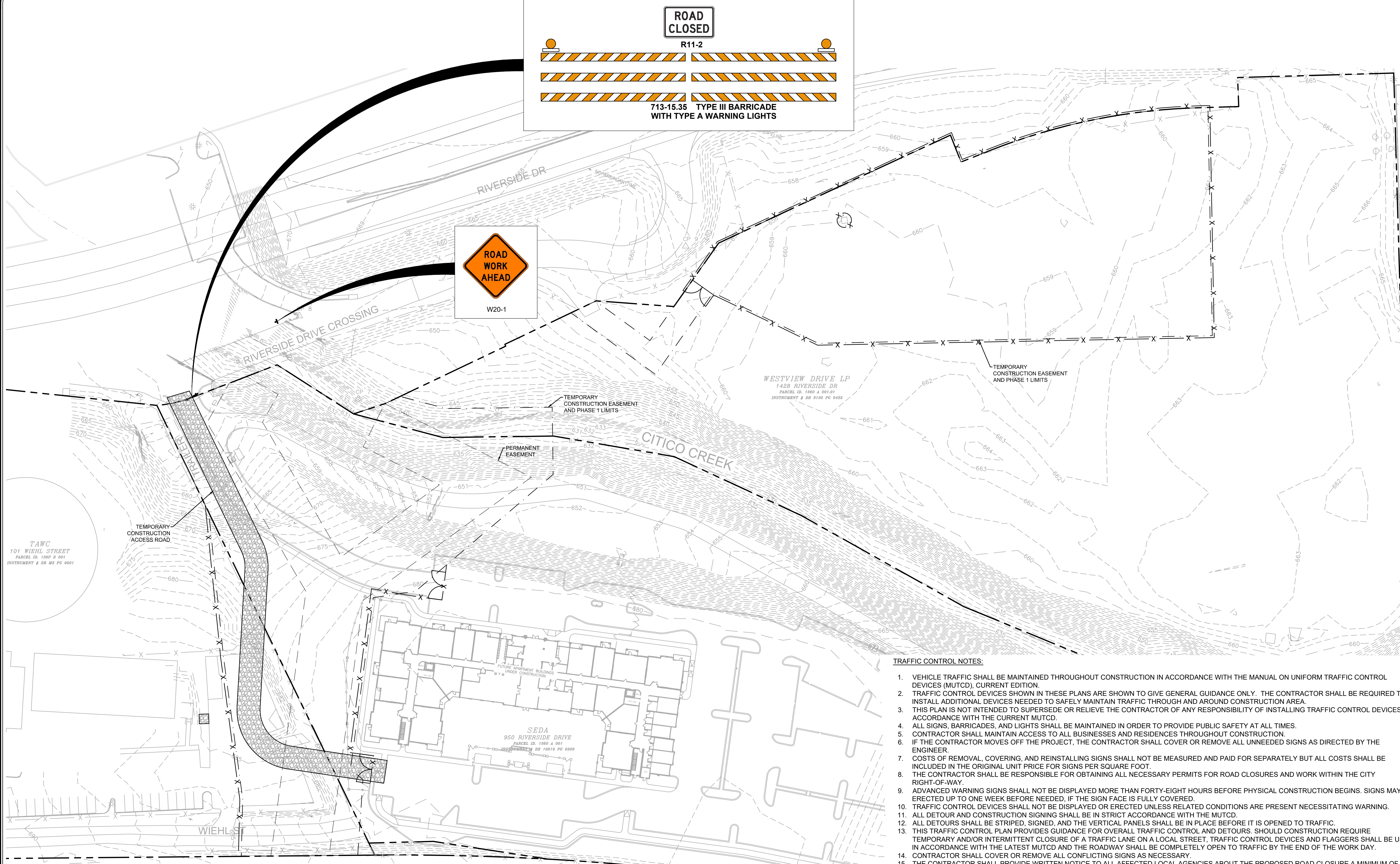
**CITICO CREEK SUB-BASIN COMBINED
 SEWER SEPARATION PROJECT - PHASE 1**
 FOR
 CITY OF CHATTANOOGA, TENNESSEE
 CHATTANOOGA, TN

WK. ORDER	0176
DESIGNED:	MES
DRAWN:	BLC
SCALE:	1" = 40'
DATE:	8-3-2018

PHASE 1 PHASING PLAN

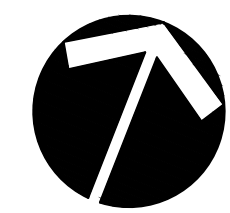
C2.0

11-CHATT PROJECTS 110810176 CIVIL ENGINEERING PHASING PLAN PHASE 1.DWG
 PLOTTED BY BRUNNEN K00N ON 08/29/2018 2:01 PM
 LAST UPDATED BY BK ON 08/29/2018 1:58 PM

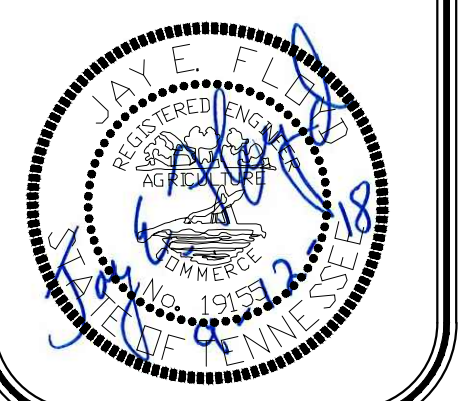


TRAFFIC CONTROL NOTES:

1. VEHICLE TRAFFIC SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), CURRENT EDITION.
2. TRAFFIC CONTROL DEVICES SHOWN IN THESE PLANS ARE SHOWN TO GIVE GENERAL GUIDANCE ONLY. THE CONTRACTOR SHALL BE REQUIRED TO INSTALL ADDITIONAL DEVICES NEEDED TO SAFELY MAINTAIN TRAFFIC THROUGH AND AROUND CONSTRUCTION AREA.
3. THIS PLAN IS NOT INTENDED TO SUPERSEDE OR RELIEVE THE CONTRACTOR OF ANY RESPONSIBILITY OF INSTALLING TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH THE CURRENT MUTCD.
4. ALL SIGNS, BARRICADES, AND LIGHTS SHALL BE MAINTAINED IN ORDER TO PROVIDE PUBLIC SAFETY AT ALL TIMES.
5. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL BUSINESSES AND RESIDENCES THROUGHOUT CONSTRUCTION.
6. IF THE CONTRACTOR MOVES OFF THE PROJECT, THE CONTRACTOR SHALL COVER OR REMOVE ALL UNNEEDED SIGNS AS DIRECTED BY THE ENGINEER.
7. COSTS OF REMOVAL, COVERING, AND REINSTALLING SIGNS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY BUT ALL COSTS SHALL BE INCLUDED IN THE ORIGINAL UNIT PRICE FOR SIGNS PER SQUARE FOOT.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FOR ROAD CLOSURES AND WORK WITHIN THE CITY RIGHT-OF-WAY.
9. ADVANCED WARNING SIGNS SHALL NOT BE DISPLAYED MORE THAN FORTY-EIGHT HOURS BEFORE PHYSICAL CONSTRUCTION BEGINS. SIGNS MAY BE ERECTED UP TO ONE WEEK BEFORE NEEDED, IF THE SIGN FACE IS FULLY COVERED.
10. TRAFFIC CONTROL DEVICES SHALL NOT BE DISPLAYED OR ERECTED UNLESS RELATED CONDITIONS ARE PRESENT NECESSITATING WARNING.
11. ALL DETOUR AND CONSTRUCTION SIGNING SHALL BE IN STRICT ACCORDANCE WITH THE MUTCD.
12. ALL DETOURS SHALL BE STRIPED, SIGNED, AND THE VERTICAL PANELS SHALL BE IN PLACE BEFORE IT IS OPENED TO TRAFFIC.
13. THIS TRAFFIC CONTROL PLAN PROVIDES GUIDANCE FOR OVERALL TRAFFIC CONTROL AND DETOURS. SHOULD CONSTRUCTION REQUIRE TEMPORARY AND/OR INTERMITTENT CLOSURE OF A TRAFFIC LANE ON A LOCAL STREET, TRAFFIC CONTROL DEVICES AND FLAGGERS SHALL BE USED IN ACCORDANCE WITH THE LATEST MUTCD AND THE ROADWAY SHALL BE COMPLETELY OPEN TO TRAFFIC BY THE END OF THE WORK DAY.
14. CONTRACTOR SHALL COVER OR REMOVE ALL CONFLICTING SIGNS AS NECESSARY.
15. THE CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO ALL AFFECTED LOCAL AGENCIES ABOUT THE PROPOSED ROAD CLOSURE A MINIMUM OF 14 DAYS PRIOR TO CLOSING THE ROAD TO THROUGH TRAFFIC. THOSE TO BE CONTACTED SHALL INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING: EMS SERVICES, FIRE DEPARTMENT, POLICE DEPARTMENT, SHERIFF'S DEPARTMENT, POST OFFICE, CITY TRAFFIC ENGINEERS OFFICE, AND THE BOARD OF EDUCATION.



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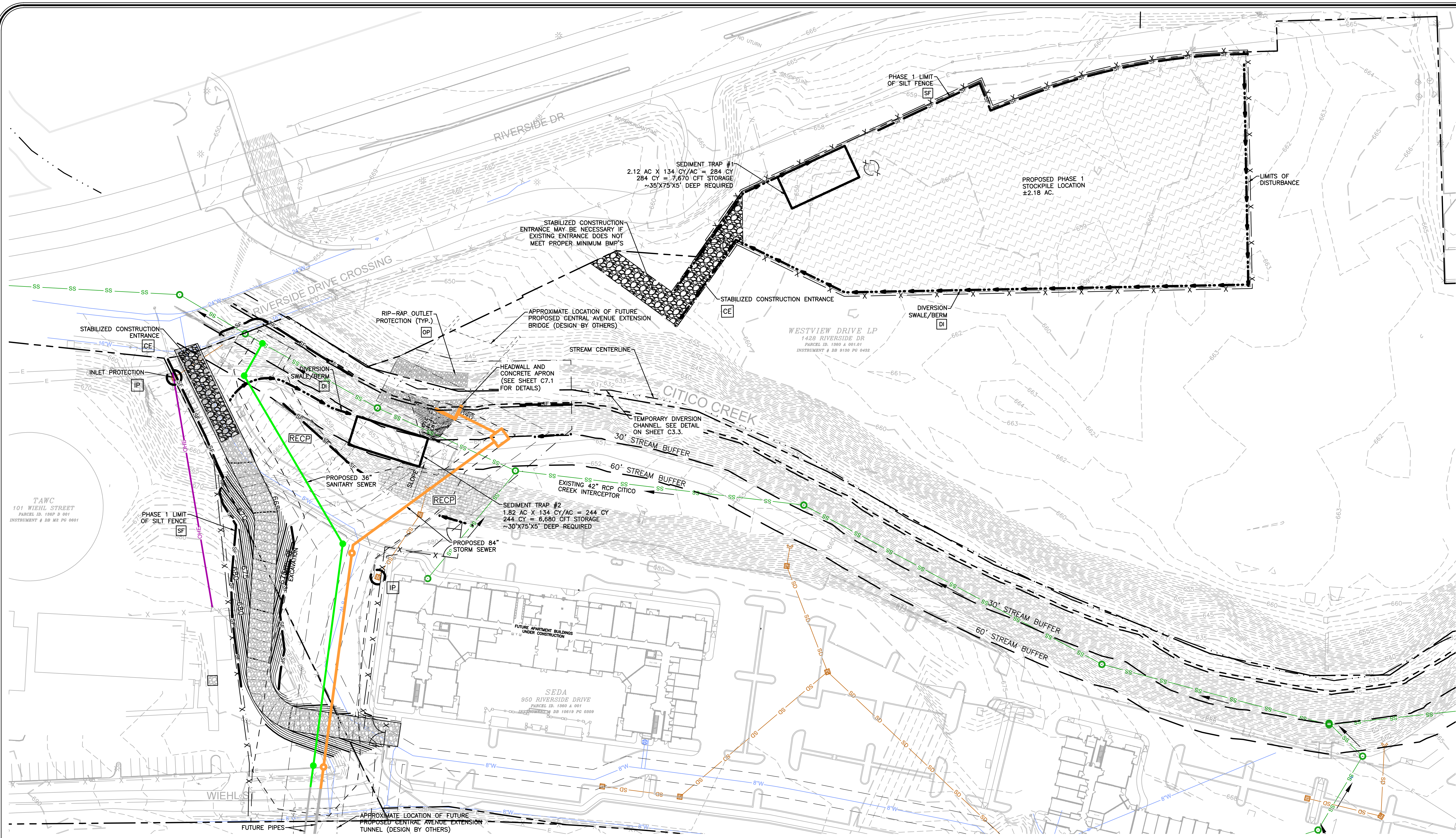
**CITICO CREEK SUB-BASIN COMBINED
 SEWER SEPARATION PROJECT - PHASE 1**
 FOR
CITY OF CHATTANOOGA, TENNESSEE
 CHATTANOOGA, TN

JOB NO.	11058	DESIGNED:	MES	DRAWN:	BLC	SCALE:	1" = 40'	DATE:	8-3-2018
WK. ORDER	0176								
ADDENDUM 1 REVISIONS 09-12-18 (EDK) Rev.									

**TRAFFIC CONTROL
 AND DETOUR
 PLAN PHASE 1**

C2.1

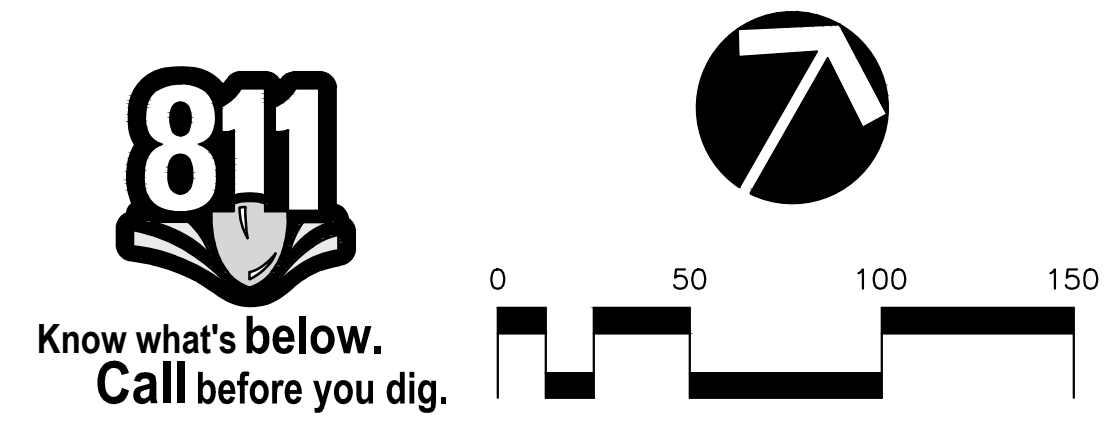
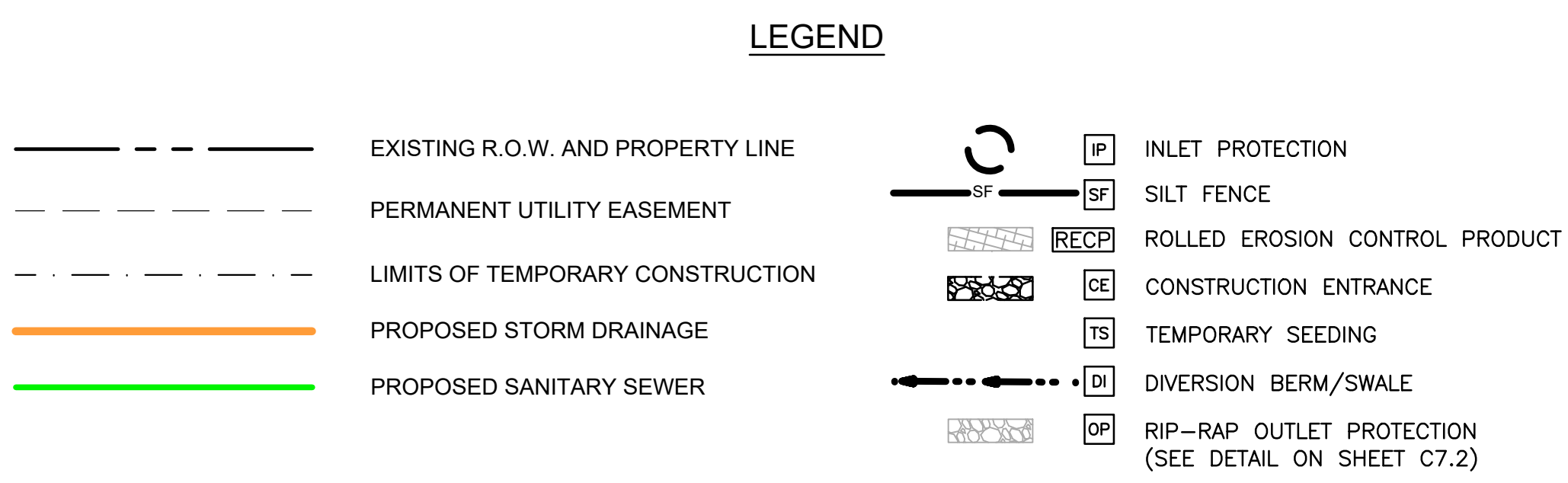
11/CHATT PROJECTS/11058/0176/CIVIL ENGINEERING/PHASE 1/TRAFFIC CONTROL AND DETOUR PLAN PHASE 1.DWG
 PLOTTED BY BRENDEN KOON ON 10/25/2018 4:48 PM
 LAST UPDATED BY BK ON 10/25/2018 4:42 PM



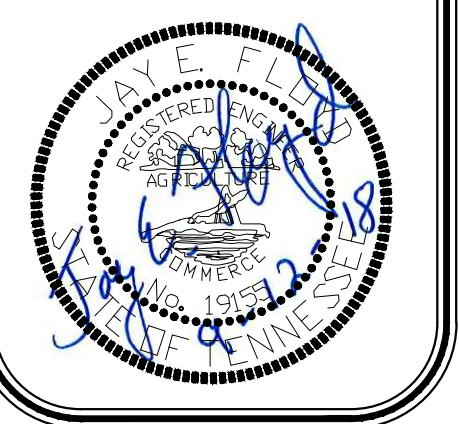
NOTES:

PRIOR TO ANY STORM EVENT, DURING EXCAVATION AND PIPE INSTALLATION, CONSTRUCT A TRENCH CHECK DAM UPSTREAM OF THE INSTALLED PIPE AND PUMP STORM WATER THROUGH THE 84\"/>

BMP'S SHALL BE CONSISTENT WITH THE REQUIREMENTS AND RECOMMENDATIONS CONTAINED IN THE CURRENT EDITION OF THE TENNESSEE EROSION AND SEDIMENT CONTROL HANDBOOK



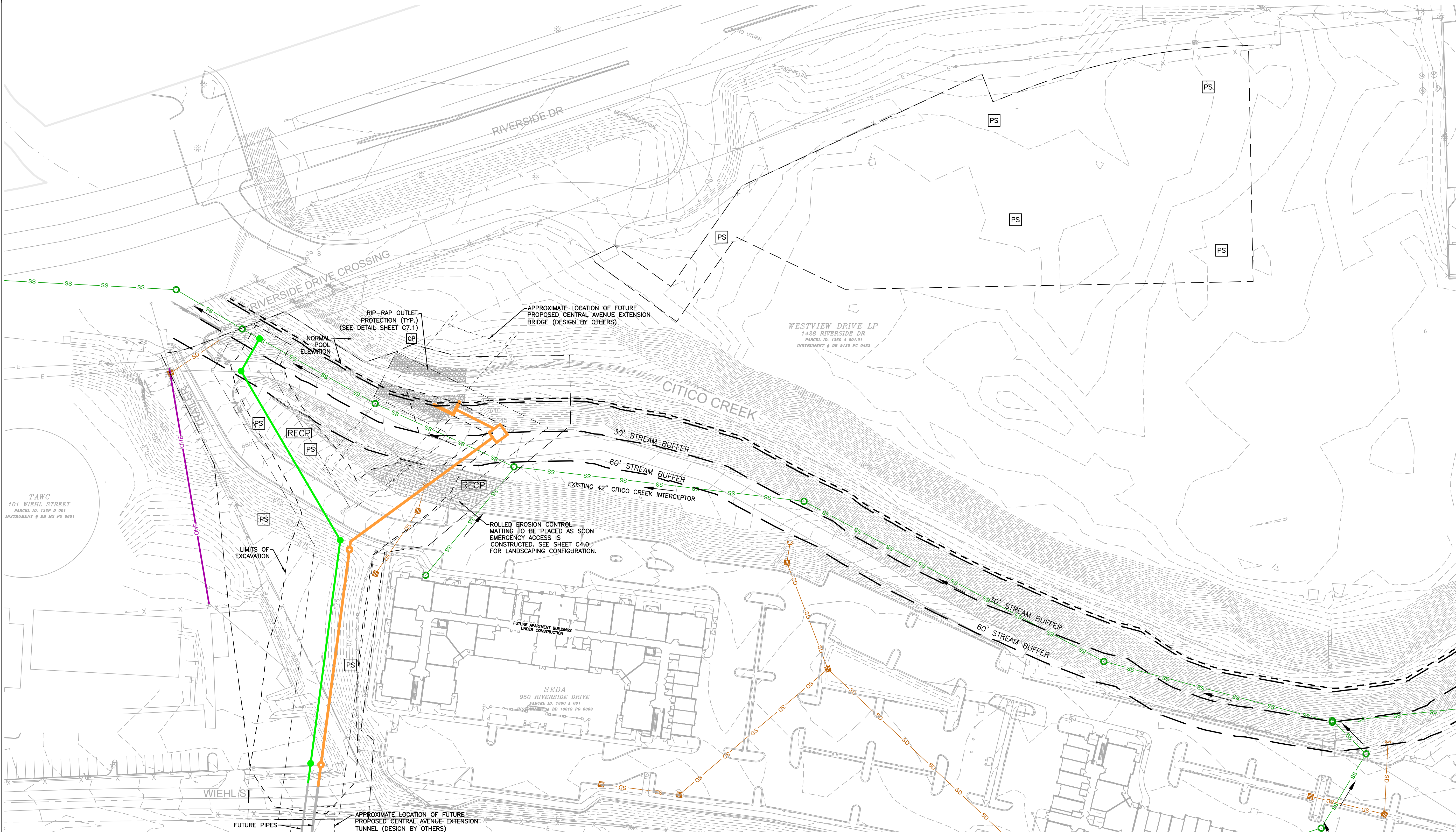
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**CITICO CREEK SUB-BASIN COMBINED
 SEWER SEPARATION PROJECT - PHASE 1**
 FOR
 CITY OF CHATTANOOGA, TENNESSEE
 CHATTANOOGA, TN

JOB NO.	11058	DESIGNED:	MES	DRAWN:	BLC	SCALE:	1" = 50'	DATE:	8-3-2018
WK. ORDER	0176	ADDENDUM	1	REVISIONS					
INITIAL EROSION CONTROL									
C3.0									

11/14/2018 11:05 AM RAGAN SMITH CIVIL ENGINEERS/PLANNERS ARCHITECTS SURVEYORS
 PLOTTED BY: BRENDA KORN ON: 8/3/2018 11:05 AM
 LAST UPDATED BY: BAK ON: 10/27/18 2:28 PM



NOTES:

*DISTURBED AREAS IN THE BUFFER SHALL BE RESTORED TO EXISTING CONDITIONS AND PLANTED WITH NATIVE PLANTS. SEE PLANTING SCHEDULE ON C4.0.

**RIP-RAP OUTLET PROTECTION; SEE SHEET C7.1 FOR DETAILS (SEEDING MIX CHART IS LOCATED ON DETAIL SHEET C3.2.)

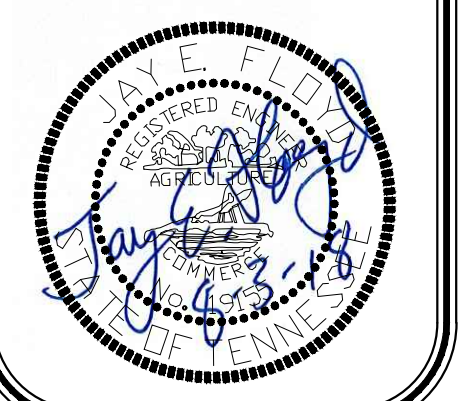
BMP'S SHALL BE CONSISTENT WITH THE REQUIREMENTS AND RECOMMENDATIONS CONTAINED IN THE CURRENT EDITION OF THE TENNESSEE EROSION AND SEDIMENT CONTROL HANDBOOK

APARTMENT GRADES SHOWN ARE FINAL. COORDINATE WITH ONE RIVERSIDE CONTRACTOR TO ENSURE THAT PONDING DOESN'T OCCUR.

- LEGEND**
- — — — — EXISTING R.O.W. AND PROPERTY LINE
 - - - - - PERMANENT UTILITY EASEMENT
 - - - - - LIMITS OF TEMPORARY CONSTRUCTION
 - — — — — PROPOSED STORM DRAINAGE
 - — — — — PROPOSED SANITARY SEWER
 - OP OUTLET PROTECTION**
 - PS PERMANENT SEEDING
 - RECP ROLLED EROSION CONTROL PRODUCT



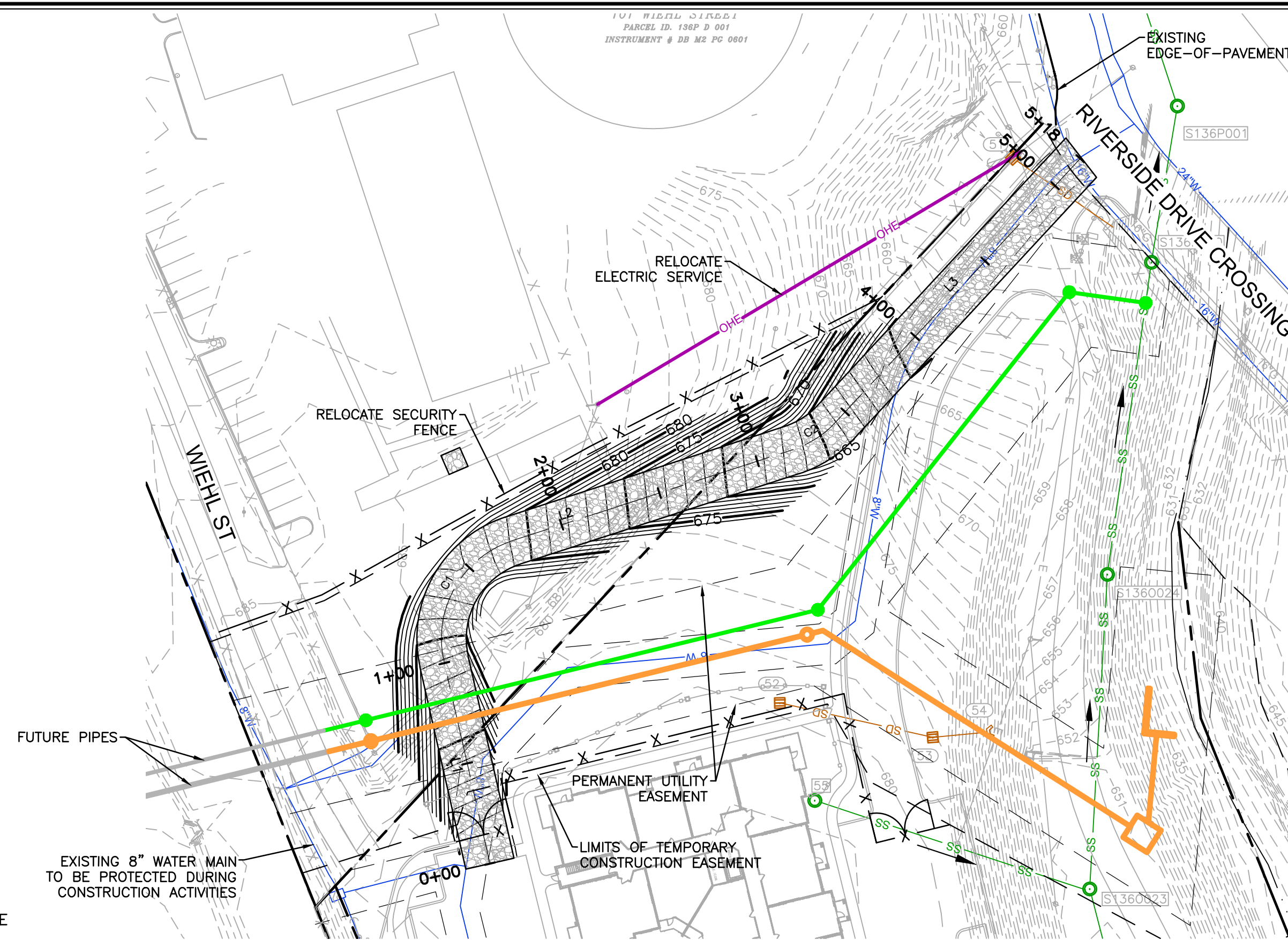
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**CITICO CREEK SUB-BASIN COMBINED
 SEWER SEPARATION PROJECT - PHASE 1**
 FOR
 CITY OF CHATTANOOGA, TENNESSEE
 CHATTANOOGA, TN

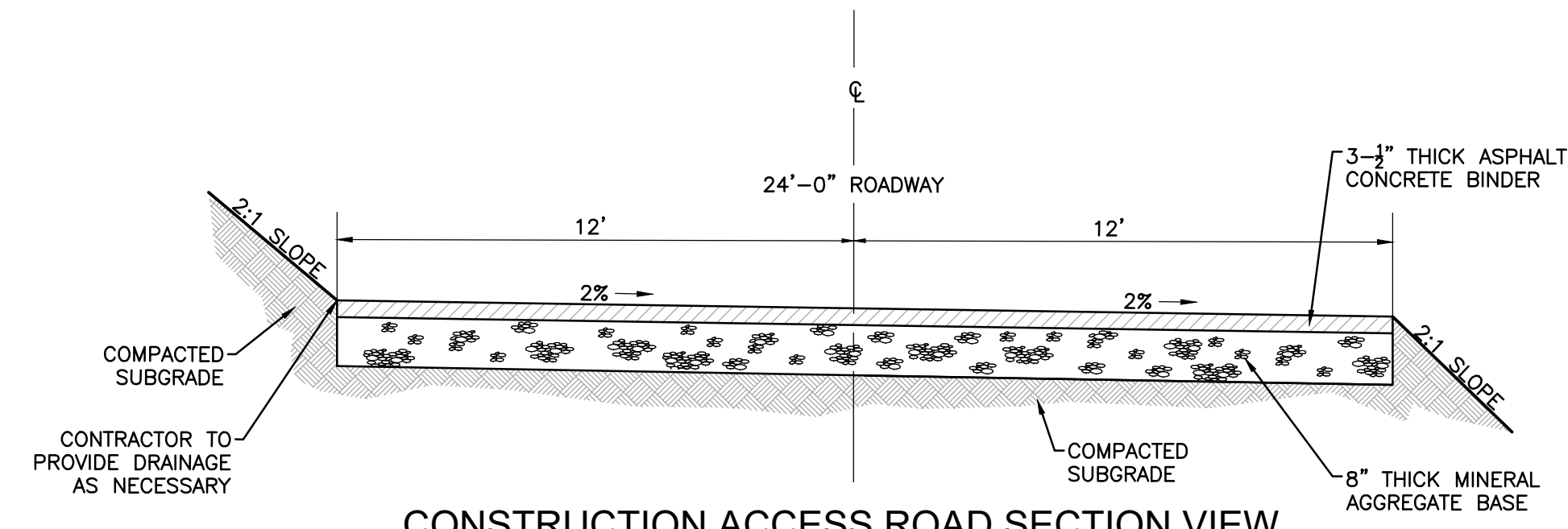
WK. ORDER	0176	DESIGNED:	MES	DRAWN:	BLC	SCALE:	1"=60'	DATE:	8-3-2018
JOB NO.	11058								REVISIONS
FINAL EROSION CONTROL									
C3.1									

11-CITICO PROJECTS 11058-0176 CIVIL ENGINEERS PLAN SHEET C3.1 FINAL EROSION CONTROL DWG
 PLOTTED BY BRENNAN KOON ON 8/20/2018 5:53 PM
 LAST UPDATED BY BAK ON 8/20/2018 5:53 PM



TEMPORARY CONSTRUCTION ACCESS PLAN VIEW

NOTES:
 SEE PHASE 1 PLANS FOR MORE DETAIL AND INSTRUCTIONS. TEMPORARY ROAD SHALL BE IN USE UNTIL ONE RIVERSIDE APARTMENT ACCESS IS OBTAINED FROM THE NORTH SIDE OF THE APARTMENTS. ACCESS TO ONE RIVERSIDE SHALL BE MAINTAINED AT ALL TIMES.

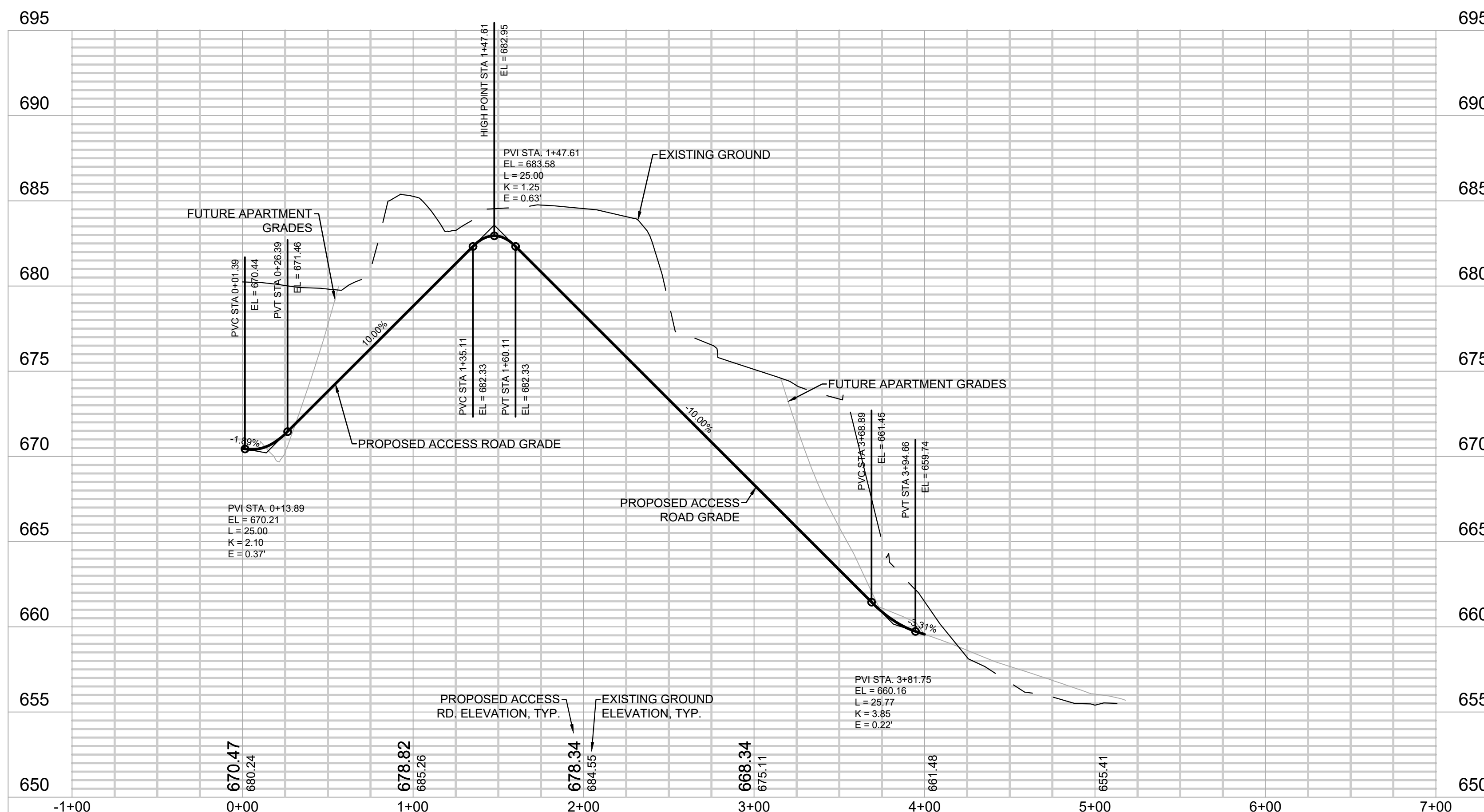


CONSTRUCTION ACCESS ROAD SECTION VIEW
 NOT TO SCALE

TEMPORARY ACCESS ROAD ALIGNMENT LINE DATA				
LINE #	LENGTH	BEARING	START POINT	END POINT
L1	100.94'	S77° 12' 10\"/>		

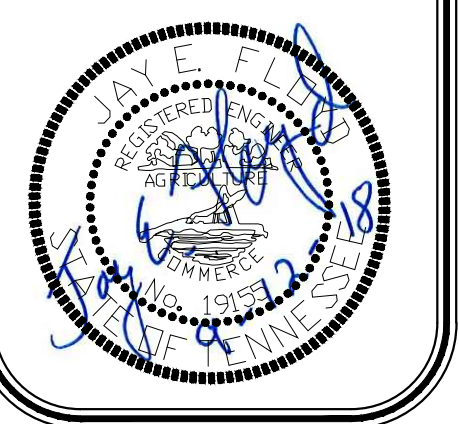
TEMPORARY ACCESS ROAD ALIGNMENT CURVE DATA						
CURVE #	PI STATION	DELTA	TANGENT	RADIUS	LENGTH	CHORD BRG
C1	1+46.60	84°48'19\"/>				

SCALES:
 PLAN VIEW 1" = 50'
 PROFILE VIEW 1" = 50' HORIZONTAL
 1" = 5' VERTICAL



TEMPORARY CONSTRUCTION ACCESS PROFILE VIEW

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**CITICO CREEK SUB-BASIN COMBINED
 SEWER SEPARATION PROJECT - PHASE 1**
 FOR
CITY OF CHATTANOOGA, TENNESSEE
 CHATTANOOGA, TN

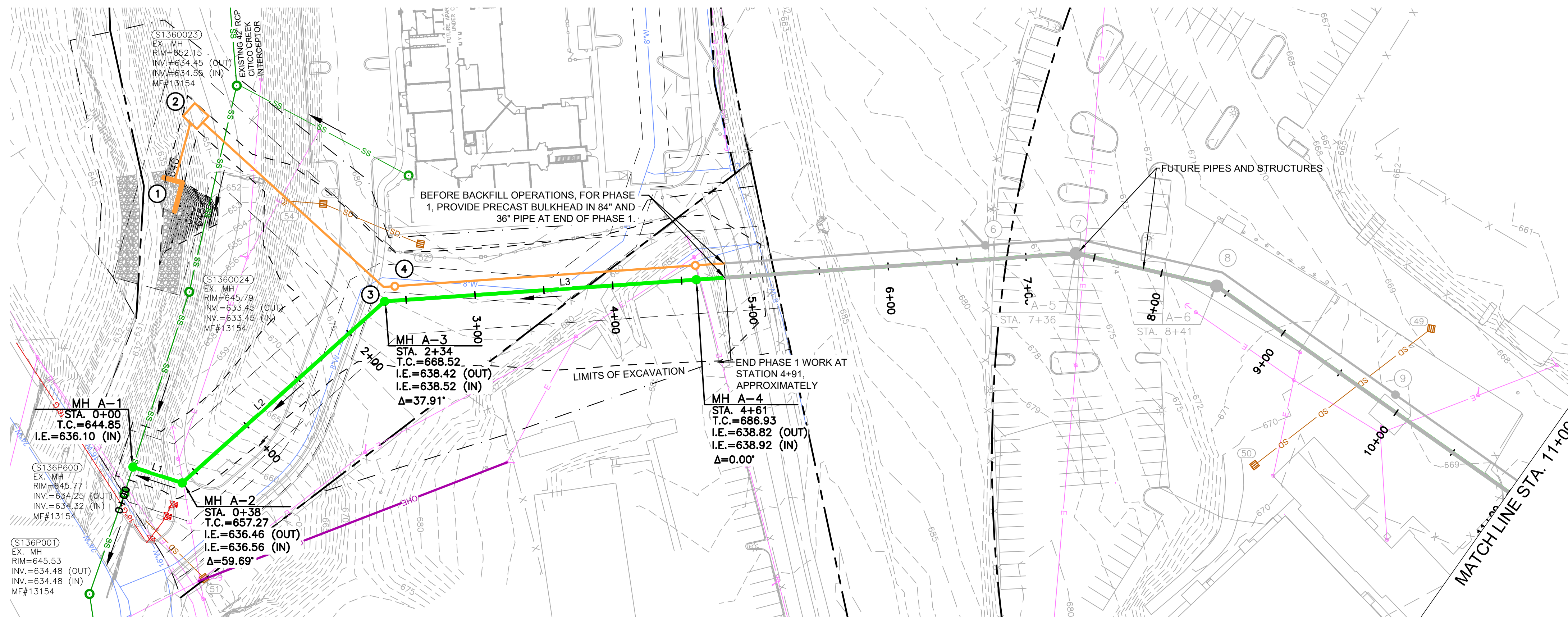
REVISIONS	
0	ADDENDUM 1

JOB NO.	11058	DESIGNED:	MES	DRAWN:	BLC	SCALE:	AS SHOWN	DATE:	8-3-2018
WK. ORDER	0176								

TEMPORARY CONSTRUCTION ACCESS PLAN AND PROFILE

C3.7

11-CHATT PROJECTS 11058.DWG CIVIL ENGINEERING AN INSTRUMENTED SURVEYING CONSTRUCTION ACCESS ROAD DWG
 PLOTTED BY BRENDEN MOON ON 8/20/2018 3:50 PM
 LAST UPDATED BY BK ON 8/20/2018 3:52 PM



LINE #	LENGTH	DIRECTION	START POINT	END POINT
L1	37.512	S08° 01' 56.16"W	(2181914.9014,262613.9838)	(2181909.6598,262576.8398)
L2	196.926	S51° 39' 29.53"E	(2181909.6598,262576.8398)	(2182064.1133,262454.6767)
L3	200.373	S13° 44' 44.07"E	(2182064.1133,262454.6767)	(2182111.7242,262260.0420)

LINE "A"

LEGEND:

- PROPERTY LINE
- PERMANENT UTILITY EASEMENT
- TEMP. CONSTRUCTION EASEMENT
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER

NOTE

SANITARY SEWER NETWORK SHOWN AS HOBAS OPTION. USE DIP FOR ALTERNATIVE OPTION. CONTRACTOR TO LOCATE ALL UTILITIES AND SERVICE SHALL BE MAINTAINED / RETURNED PRIOR TO COMPLETING CONSTRUCTION. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES IN THE PROXIMITY OF THE CONSTRUCTION AREA AND REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE PRIOR TO BEGINNING WORK.

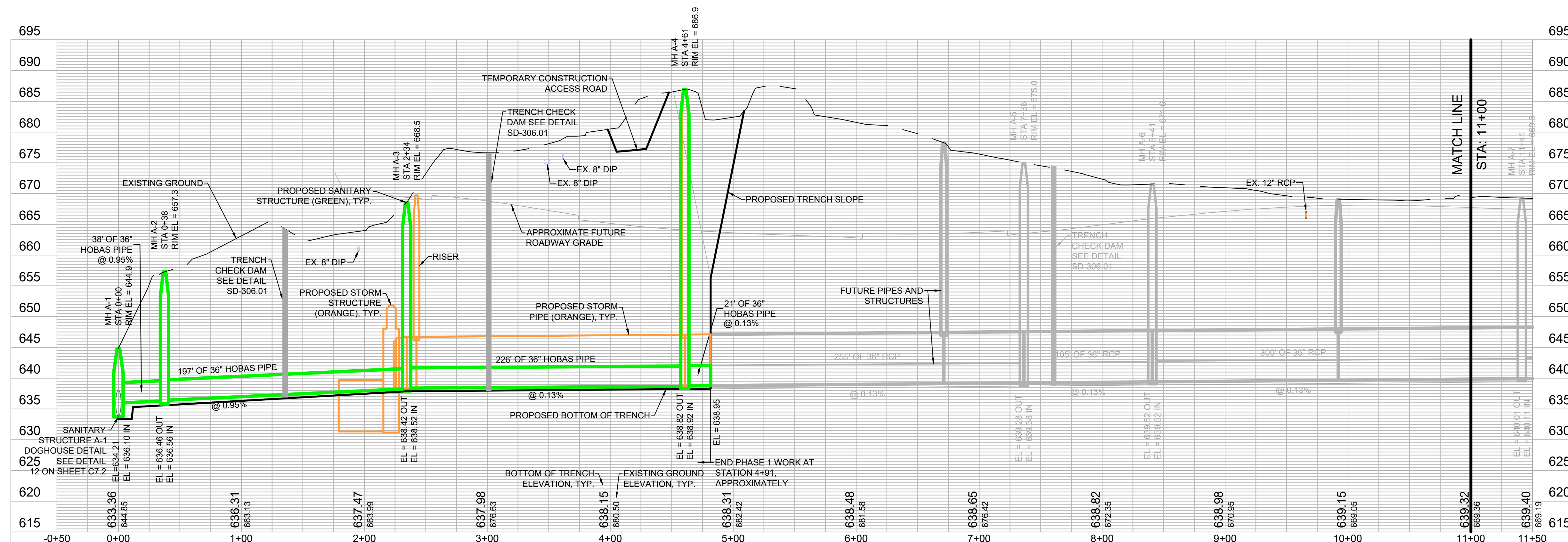
CONTRACTOR TO DISPOSE OF EXCESS MATERIAL AT CITY LANDFILL LOCATED AT 4301 AMNICOLA HIGHWAY OR CONTRACTOR APPROVED LOCATION.

SCALES:

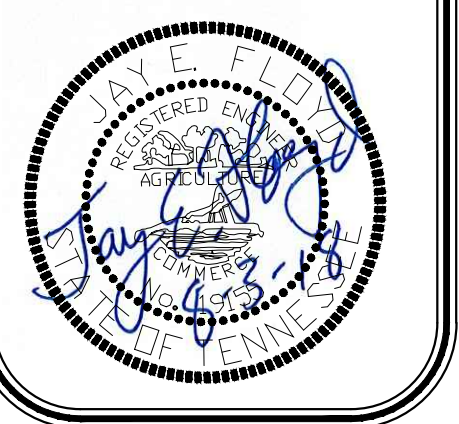
- PLAN VIEW 1" = 50'
- PROFILE VIEW 1" = 50' HORIZONTAL
1" = 10' VERTICAL



Know what's below.
Call before you dig.



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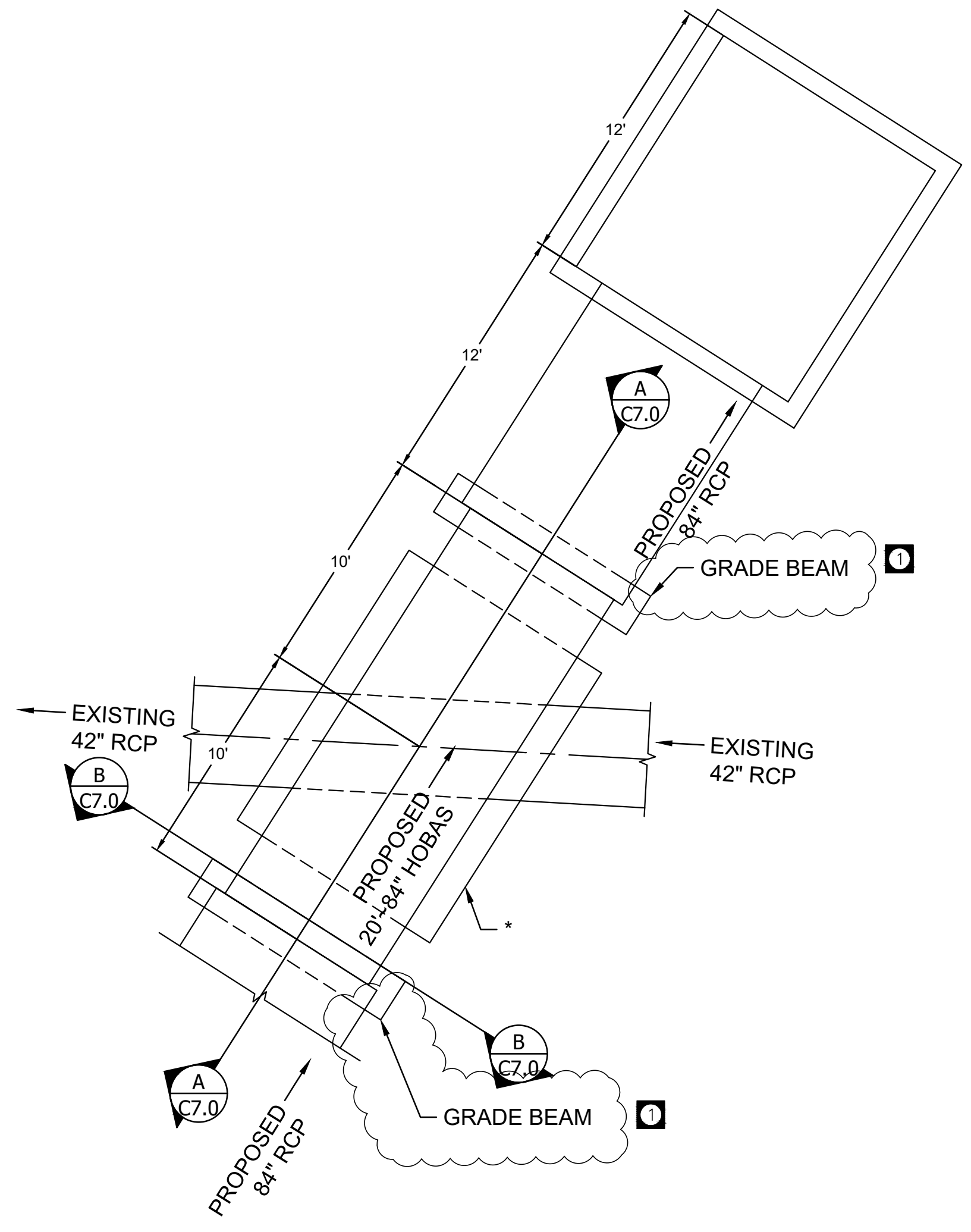
**CITICO CREEK SUB-BASIN COMBINED
 SEWER SEPARATION PROJECT - PHASE 1**
 FOR
CITY OF CHATTANOOGA, TENNESSEE
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WK. ORDER	0176
DESIGNED:	MES
DRAWN:	BLC
SCALE:	AS SHOWN
DATE:	8-3-2018

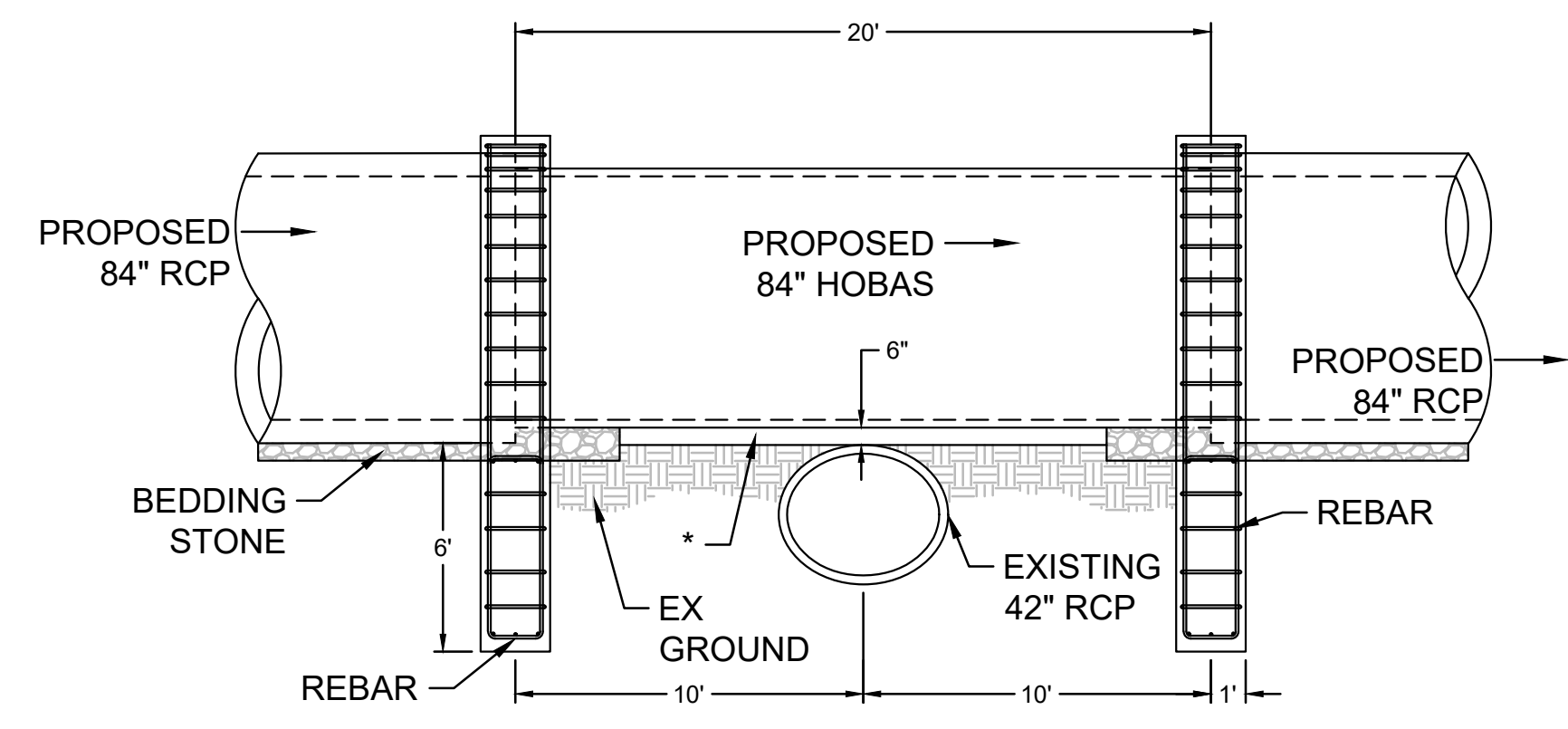
**SANITARY SEWER
 PLAN AND
 PROFILE 1 OF 1**

C6.0

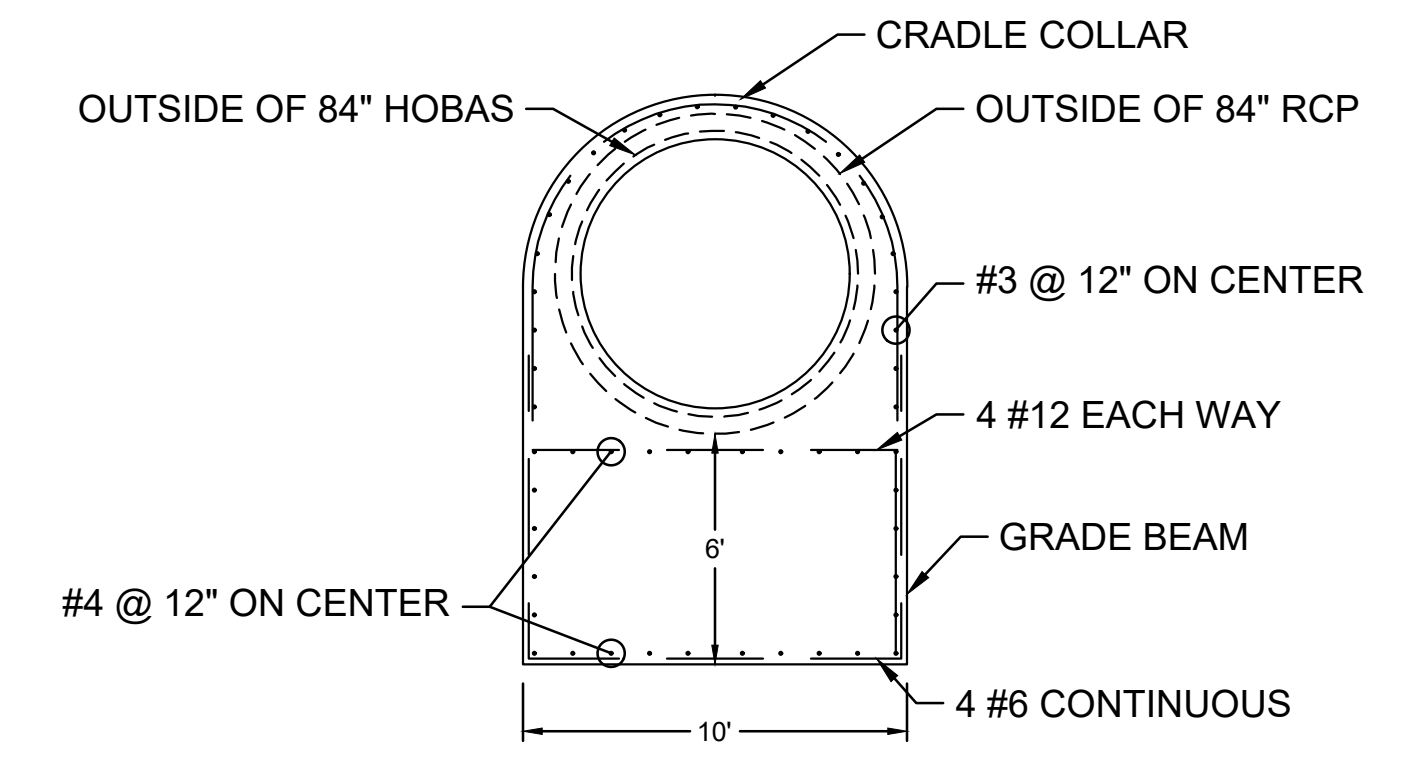
11:CHATT PROJECTS\10810761\CIVIL\ENGINEERING\AN\SUBSTATIONS - SANITARY SEWER ALIGNMENT - (1) - (1) DWG
 PLOTTED BY BRUNNEN KORN ON 10/20/2018 2:00 PM
 LAST UPDATED BY MES ON 10/20/2018 11:40 AM



1 42" RCP INTERCEPTOR CROSSING DETAIL
SCALE: 1:5

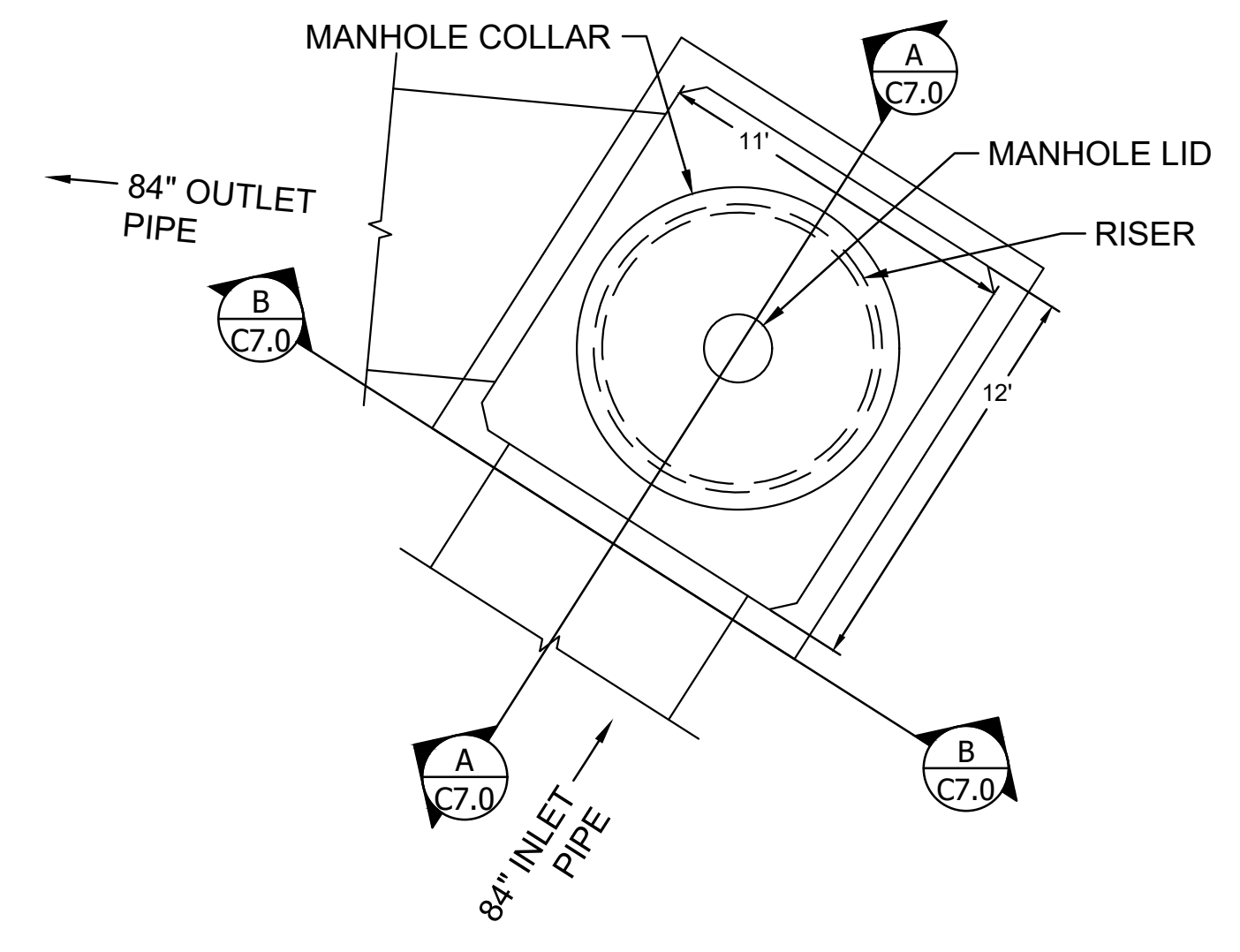


2 42" RCP INTERCEPTOR CROSSING SECTION A-A
SCALE: 1:5

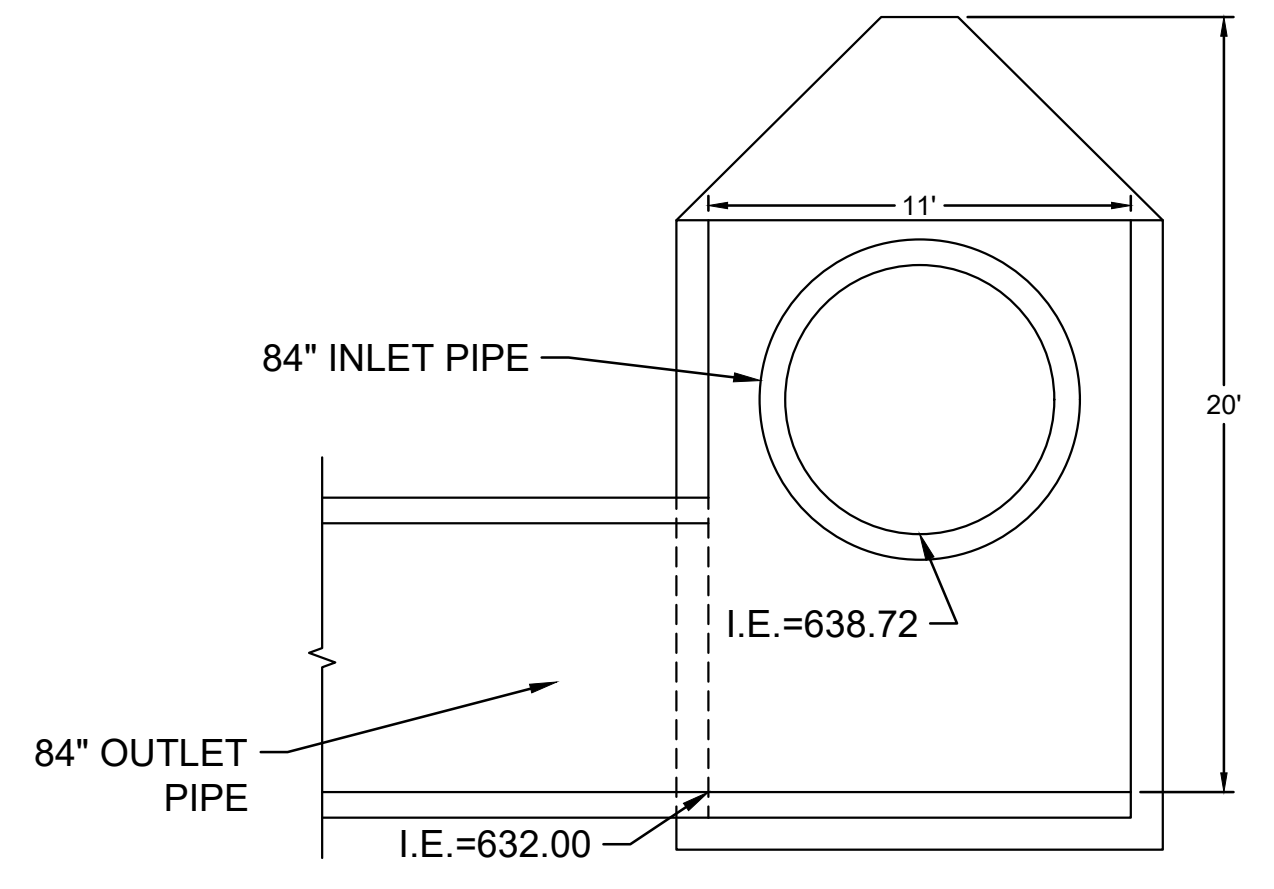


3 42" RCP INTERCEPTOR CROSSING SECTION B-B
SCALE: 1:5

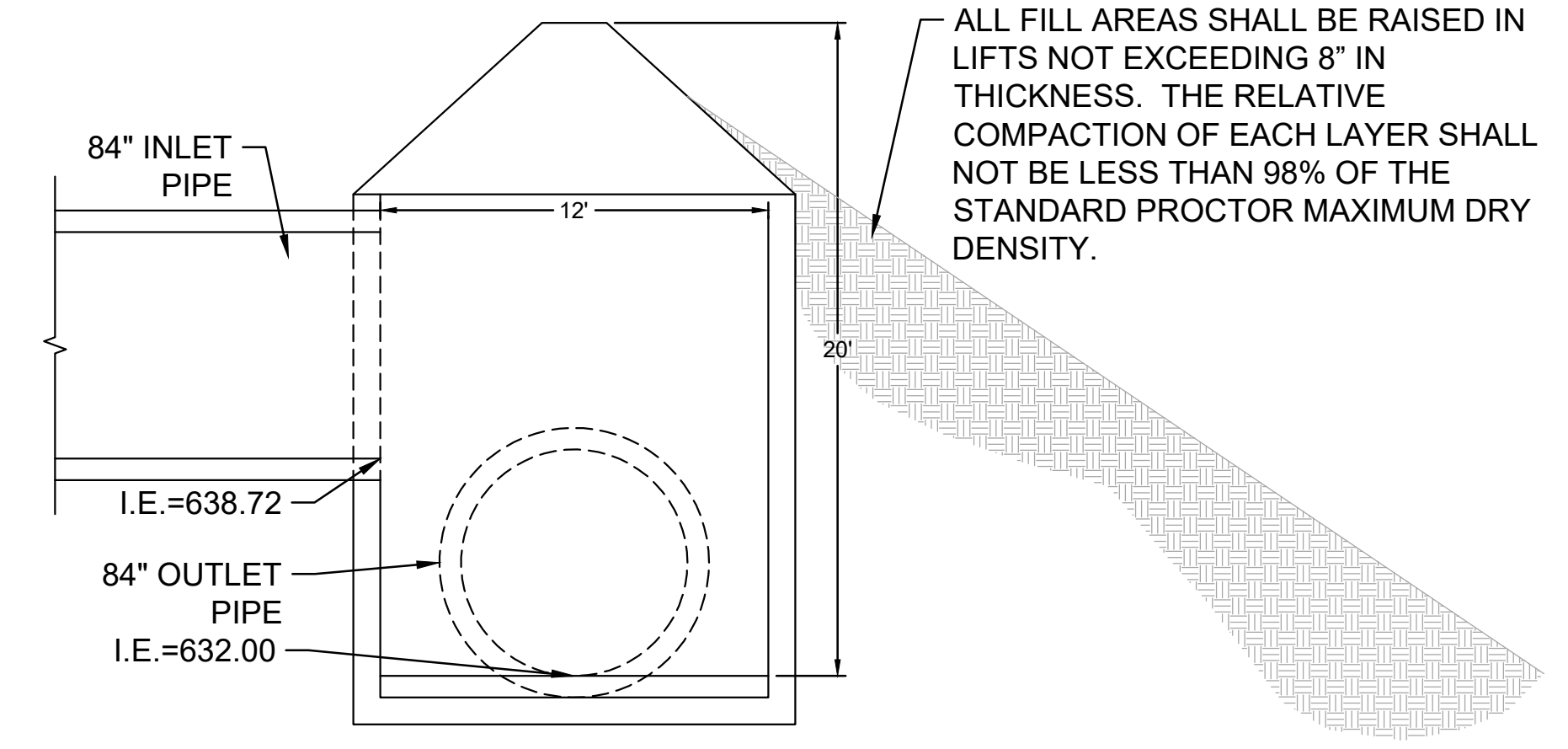
- NOTES:**
- * PROVIDE A COMPRESSIVE PAD BETWEEN THE HOBAS PIPE & THE EXISTING 42" RCP INTERCEPTOR.
 - 1. CARE WILL BE NEEDED BY THE CONTRACTOR NOT TO UNDERMINE THE EXISTING CITICO CREEK INTERCEPTOR WHEN EXCAVATING FOR THE CROSSING, VERTICAL SHAFT, DISCHARGE PIPE, HEADWALL, WINGWALL AND APRON, ETC.



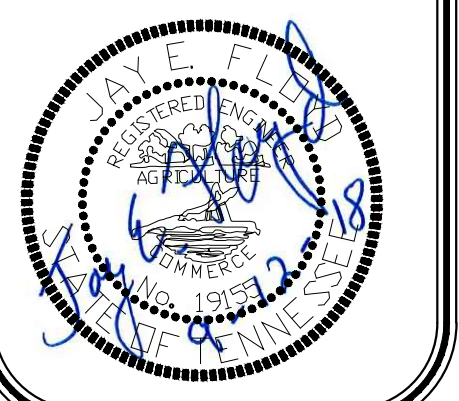
4 STRUCTURE 2
SCALE: 1:5



5 STRUCTURE 2 SECTION A-A
SCALE: 1:5



6 STRUCTURE 2 SECTION B-B
SCALE: 1:5



**CITICO CREEK SUB-BASIN COMBINED
 SEWER SEPARATION PROJECT - PHASE 1**
 FOR
CITY OF CHATTANOOGA, TENNESSEE
 CHATTANOOGA, TN

JOB NO.	11058	DESIGNED:	MES	DRAWN:	BLC	SCALE:	1" = 5'	DATE:	8-3-2018
WK. ORDER	0176	ADDENDUM	1	REVISIONS					

DETAILS 1 OF 3

C7.0

Contractor: _____
 Date: _____

Project #: 11058-0176

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY PHASE 1	BID UNIT PRICE PHASE 1	EXTENDED BID UNIT PRICE PHASE 1
105-01	CONSTRUCTION STAKES, LINES, AND GRADES (INCLUDING AS-BUILTS)	LS	1		\$ -
201-01	CLEARING AND GRUBBING	LS	1		\$ -
202-01.51	REMOVAL OF STRUCTURES AND OBSTRUCTIONS (PIPE ENDWALLS)	EA	1		\$ -
202-01.52	REMOVAL OF STRUCTURES AND OBSTRUCTIONS (BOLLARDS)	EA	6		\$ -
202-03.01	ASPHALT REMOVAL	SY	1470		\$ -
203-01	DITCH AND ACCESS ROAD EXCAVATION (INCLUDING SHORING AND HAUL OFF TO CONTRACTOR SITE)	CY	23000		\$ -
203-01.07	DISPOSAL OF CONTAMINATED (NON-HAZARDOUS) SOIL TO CLASS 1 PERMITTED LANDFILL	TON	200		\$ -
203-01.08	EXCAVATION AND HAUL OFF TO CITY OWNED STOCKPILE (6" MAX. STONE SIZE AND NO DEBRIS)	CY	10000		\$ -
203-01.29	ROCK EXCAVATION	CY	500		\$ -
203-02.01	BACKFILL FOR UNDERCUT	CY	500		\$ -
203-05	UNDERCUT EXCAVATION	CY	500		\$ -
209-01.11	TEMPORARY CONSTRUCTION ENTRANCE/EXIT (COMPLETE-IN-PLACE)	EA	1		\$ -
209-08.02*	SILT FENCE WITHOUT WIRE BACKING	LF	1300		\$ -
209-10.20	TEMPORARY SEDIMENT TRAP	CY	530		\$ -
209-40.33	CATCH BASIN PROTECTION (TYPE D) (EC-STR-19)	EA	2		\$ -
303-01	MINERAL AGGREGATE, TYPE A BASE, GRADING D	TON	1400		\$ -
303-10.01	MINERAL AGGREGATE (SIZE 57) (PIPE BACKFILL & MAINTENANCE STONE)	TON	1900		\$ -
307-01.08	ASPHALT CONCRETE MIX (PG64-22) (BPMB-HM) GRADING B-M2 BINDER LAYER	TON	500		\$ -
411-01.11	ACS MIX (PG64-22) GRADING E ROADWAY WEARING LAYER	TON	125		\$ -
606-24.12	STEEL SHEET PILES (COMPLETE-IN-PLACE)	SF	5200		\$ -
607-15.05	84" CONCRETE PIPE CULVERT (CLASS V)	LF	465		\$ -
607-39.01	15" HDPE PIPE	LF	76		\$ -
607-39.02	18" HDPE PIPE	LF	27		\$ -
611-01.10	48" RISER STACK OUT > 28' (15' LENGTH)	EA	2		\$ -
611-01.06	11'X12' BOX STRUCTURE 20-24" DEPTH (DROP MANHOLE)	EA	1		\$ -
611-01.20	REMOVE NYLOPLAST DRAIN	EA	2		\$ -
611-02.98	84" RCP x 8" SADDLE TEE PER DETAIL #RCP-030 ON SHEET C7.2	EA	1		\$ -
611-02.99	84" RCP x 8" BEND PER DETAIL #RCP-040 ON SHEET C7.2	EA	1		\$ -
611-07.54	18" ENDWALL (CROSS DRAIN) 3:1	EA	1		\$ -
611-07.99	HEADWALL/WINGWALL	LS	1		\$ -
611-42.01	32" X 32" NO. 42 CATCH BASIN PER TDOT STD. DWG. D-CB-425 (DEPTH ≤ 4') (COMPLETE-IN-PLACE)	EA	2		\$ -
611-99.99	SANITARY SEWER CROSSING (INCLUDING 20' OF HOBAS PIPE, CRADLE COLLAR, AND GRADE BEAM)	LS	1		\$ -
707-01.11*	FURNISH AND INSTALL NEW CHAIN-LINK FENCE (COMPLETE-IN-PLACE, INCLUDES STAGING AREA FENCE)	LF	910		\$ -
707-06.03*	REMOVE AND RESET FENCING (TAWC SECURITY FENCE)	LF	280		\$ -
707-06.05*	REMOVAL OF 280' OF FENCE	LS	1		\$ -
707-08.10	TEMPORARY CONSTRUCTION FENCE (ONE RIVERSIDE APARTMENTS AND STAGING AREA)	LF	610		\$ -
709-05.09	MACHINED RIP-RAP (CLASS C) 42" THICK (COMPLETE-IN-PLACE)	CY	400		\$ -
712-05.01	TYPE A WARNING LIGHTS	EA	2		\$ -
712-06	TEMPORARY CONSTRUCTION SIGNS	EA	2		\$ -
712-07.03	TYPE 3 BARRICADES (8' LENGTH FOR ROAD CLOSURE)	LF	8		\$ -
717-01	MOBILIZATION, INCLUDING BID BOND, PERFORMANCE BOND, PAYMENT BOND, COORDINATION WITH NS RAILROAD, ETC.	LS	1		\$ -
722-01.01	FIELD OFFICE (TYPE 1)	LS	1		\$ -
740-10.03	GEOTEXTILE FABRIC (NON-WOVEN, AASHTO CLASS III)	SY	250		\$ -
790-20.30	ELECTRIC POLE REPLACEMENT	EA	1		\$ -
790-98.02	REMOVE UTILITY POLE	EA	3		\$ -
795-01.06	8" DIP SLIP JOINT WATERLINE	LF	280		\$ -
795-12.02	REMOVAL OF EXISTING WATERLINE	LF	280		\$ -
797-05.94	36" CENTRIFUGALLY CAST POLYMER MORTAR PIPE (CCFRPM)	LF	490		\$ -
797-07.30	72" MANHOLE 16-20' DEPTH	EA	1		\$ -
797-07.33	72" MANHOLE >28' DEPTH	EA	2		\$ -
797-07.38	84" DIAMETER 10-12' DEPTH DOGHOUSE MANHOLE (INCLUDES 108" DOGHOUSE MANHOLE BASE, PAD, BOOT AND GROUT)	EA	1		\$ -
801-01	SEEDING (WITH MULCH)	UNIT	34		\$ -
802-01.03	TREES (CERCIS CANADENSIS)	EA	3		\$ -
802-01.04	TREES (ACER RUBRUM)	EA	1		\$ -
802-01.05	TREES (BETULA NIGRA)	EA	1		\$ -
802-01.11	TREES (LIRIODENDRON TULIPIFERA)	EA	5		\$ -
802-01.12	TREES (NYSSA SYLVATICA)	EA	3		\$ -
802-01.13	TREES (QUERCUS SHUMARDII)	EA	3		\$ -
802-03.01	SHRUBS (CLETHRA ACUMINATA)	EA	75		\$ -
802-03.02	SHRUBS (PANICUM VIRGATUM "NORTHWIND")	EA	239		\$ -
802-13.04	SHRUBS (CORNUS AMOMUM)	EA	14		\$ -
802-13.06	SHRUBS (HYDRANGEA QUERCIFOLIA)	EA	50		\$ -
802-13.08	SHRUBS (ITEA VIRGINICA)	EA	52		\$ -
802-13.09	SHRUBS (LINDERA BENZOIN)	EA	50		\$ -
802-13.14	SHRUBS (CALLICARPA AMERICANA)	EA	58		\$ -
805-12.06	SOIL REINFORCEMENT MATTING, AS MANUFACTURED BY (WITH SEED)	SY	475		\$ -
920-08.18	TEMPORARY SHORING	LS	1		\$ -
920-11.04	PIPE BOLLARD	EA	6		\$ -
TOTAL BASE BID =					\$ -

ALTERNATE A: 36" DIP SEWER PIPE IN LIEU OF 36" CCFRPM

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY PHASE 1	BID UNIT PRICE PHASE 1	EXTENDED BID UNIT PRICE PHASE 1
797-05.94	36" CENTRIFUGALLY CAST POLYMER MORTAR PIPE (CCFRPM)	LF	-490	\$ -	\$ -
ALTERNATE A-1	36" DIP GRAVITY SEWER (CLASS 250) < 18' DEPTH	LF	50		\$ -
ALTERNATE A-2	36" DIP GRAVITY SEWER (CLASS 350) > 18' DEPTH	LF	440		\$ -
ALTERNATE A TOTAL=					\$ -

ALTERNATE B: 84" CCFRPM PIPE IN LIEU OF 84" RCP

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY PHASE 1	BID UNIT PRICE PHASE 1	EXTENDED BID UNIT PRICE PHASE 1
607-15.05	84" CONCRETE PIPE CULVERT (CLASS V)	LF	-465	\$ -	\$ -
611-01.10	48" RISER STACK OUT > 28'	EA	-2	\$ -	\$ -
611-01.06	11'X12' BOX STRUCTURE 20-24" DEPTH (DROP MANHOLE)	EA	-1	\$ -	\$ -
611-02.98	84" RCP x 8" SADDLE TEE PER DETAIL #RCP-030 ON SHEET C7.2	EA	-1	\$ -	\$ -
611-02.99	84" RCP x 8" BEND PER DETAIL #RCP-040 ON SHEET C7.2	EA	-1	\$ -	\$ -
ALTERNATE B-1	84" CENTRIFUGALLY CAST POLYMER MORTAR PIPE (CCFRPM)	LF	465		\$ -
ALTERNATE B-2	60" FRP MANHOLE RISER PER DETAIL #7 ON SHEET C7.3	EA	1		\$ -
ALTERNATE B-3	60" FRP DROP MANHOLE PER DETAILS #1 AND #2 ON SHEET C7.3	EA	1		\$ -
ALTERNATE B-4	84" CENTRIFUGALLY CAST POLYMER MORTAR PIPE TEE (CCFRPM)	EA	1		\$ -
ALTERNATE B-5	84" CENTRIFUGALLY CAST POLYMER MORTAR PIPE BEND (CCFRPM)	EA	1		\$ -
ALTERNATE B TOTAL=					\$ -

ALTERNATE C: FILTER SOXX

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY PHASE 1	BID UNIT PRICE PHASE 1	EXTENDED BID UNIT PRICE PHASE 1
209-08.02*	SILT FENCE WITHOUT WIRE BACKING	LF	-1300	\$ -	\$ -
ALTERNATE C-1*	12" FILTER SOCK (SILT SOXX SILT FENCE ALTERNATIVE, OR APPROVED EQUAL)	LF	1300		\$ -
ALTERNATE C TOTAL=					\$ -

***NOTES:**

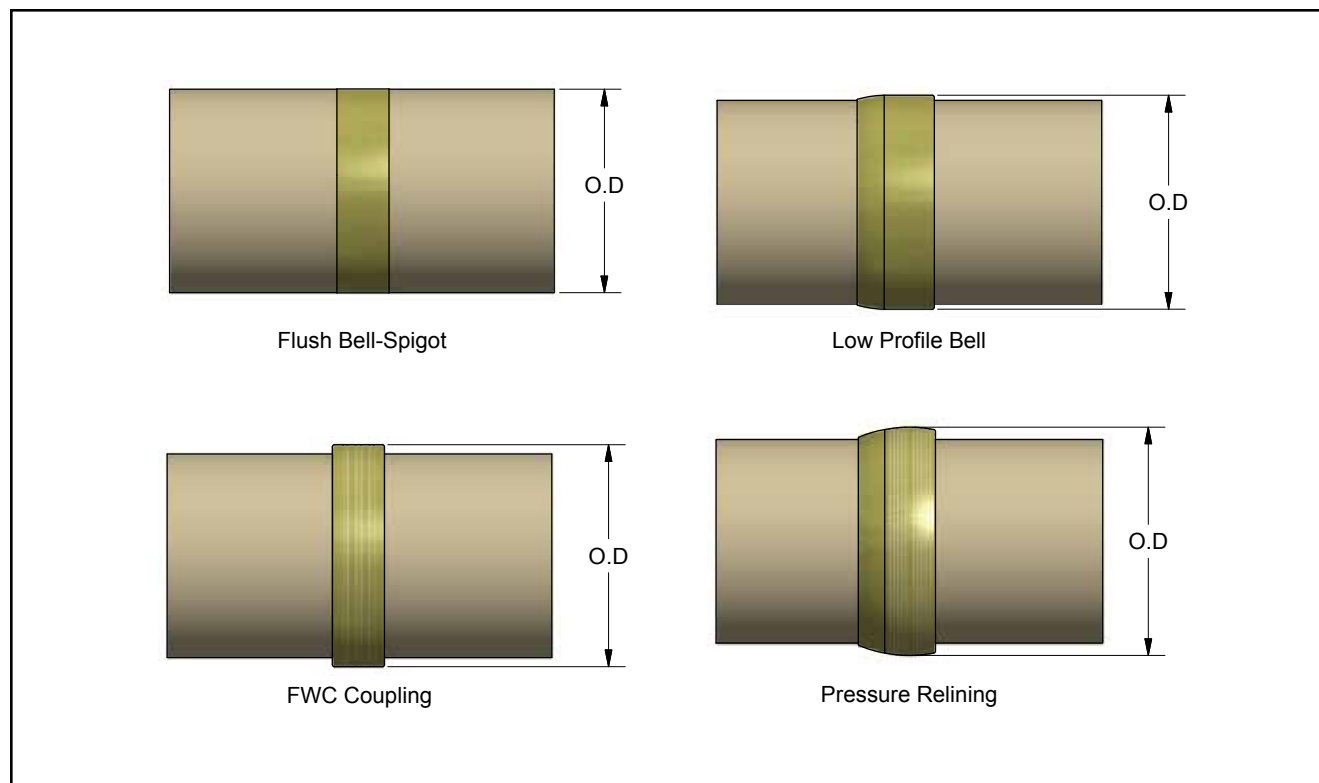
707-06.03, REMOVE AND RESET FENCE (TAWC SECURITY FENCE):	The existing security system will be armed 24/7 with exception to only the relocation of the monitoring security system. The deactivation and reactivation of the security system for relocation of 360' of fence to the temporary location, will be within business hours of TAWC and will be reactivated that same business day. If unable to accomplish this, security personnel approved by TAWC will be provided at no additional cost to the contract. The "second" remove and reset of 550' of this fence will be installed into its permanent location. This operation must maintain security of TAWC with deactivation and reactivation of the security system within the same business day as identified for the "Existing security system". The contractor may elect to provide a "Temporary Fence" that meets the "type" and conditions of the existing fence, and install "new" fence at the conclusion of construction at no additional cost to the contract.
707-08.10, TEMPORARY CONSTRUCTION FENCE:	This pay item is to cover the furnish, install, and removal of the temporary fence upon completion of construction. To include (3) three temporary gates as shown in the plans.
209-08.02, SILT FENCE WITHOUT WIRE BACKING ALTERNATE C-1, 12" FILTER SOCK (SILT SOXX SILT FENCE ALTERNATIVE, OR APPROVED EQUAL)	These two items are included for bid purposes. The unit prices from the bid schedule shall be used if a combination of both products are used during construction.

Appendix C

Joint Dimensions & Weights

Nominal Pipe Size (in.)	Nominal Outside Diameter, OD (in.)							Pressure Relining
	FWC Coupling					Low Profile Bell	Flush Bell-Spigot	
	PN 25 PN 50	PN 100	PN 150	PN 200	PN 250			
18	21.3	21.3	21.3	21.3	21.4	20.4	19.5	FWC
20	23.4	23.4	23.4	23.4	23.6	22.5	21.6	
24	27.6	27.6	27.6	27.7	27.9	26.8	25.8	
27	29.8	29.8	29.8	30.0	30.2	29.0	28.0	
28	31.9	31.9	32.0	32.1	32.3	31.0	30.0	
30	33.9	33.9	34.0	34.2	34.4	33.0	32.0	
33	35.9	35.9	36.1	36.3		35.0	34.0	
36	40.2	40.2	40.4	40.6		39.3	38.3	
41	44.9	44.9	45.2	45.5		44.0	42.9	
42	46.5	46.5	46.8	47.2		45.6	44.5	
44	47.9	47.9	48.2	48.6		47.0	45.9	
45	49.7	49.7	50.0	50.4		48.8	47.7	
48	52.8	52.9	53.2	53.6		51.9	50.8	
51	56.0	56.1	56.5	56.8		55.0	53.9	
54	59.2	59.4	59.8	60.1		58.2	57.1	
57	62.2	62.5	62.8			61.2	60.0	
60	65.2	65.5	65.9			64.1	62.9	
63	68.3	68.7	69.1			67.2	66.0	
66	71.6	72.0	72.4			70.4	69.2	
69	74.9	75.4	75.8			73.8	72.5	
72	77.9	78.3				76.7	75.4	
78	84.2	84.7				82.9	81.6	
84	89.6	90.2				88.4	87.0	
85	91.4	92.0				90.0	88.6	
90	97.1	97.8				95.7	94.3	
96	102.5	103.1				101.0	99.5	
104	111.1					109.5	108.0	
110	117.2					115.5	114.0	
120	129.3					127.5	126.0	
126	135.8					134.0	132.5	

O.D.'s Plus
0.4





September 04, 2018

Ragan-Smith Associates, Inc.
1410 Cowart Street, Suite 200
Chattanooga, TN 37408

Attn: Jay E. Floyd, P.E., *Project Manager*
JFloyd@ragansmith.com

Re: **Soil Management Plan**
Central Avenue Storm Drain Separation Project – DOR#33-776
City of Chattanooga Contract No. S-15-007-102
GEOservices Project No. 41-16337
Ragan-Smith Project No. 11058-0176

Dear Mr. Floyd:

GEOservices, LLC (GEOservices) has prepared this Soil Management Plan (SMP) for the above referenced subject property. This SMP was developed to identify the contaminants found in the project area and provide recommendations for handling these contaminants. GEOservices appreciates the opportunity to provide these services for this project. If you have any questions, please contact me at (615) 428-1316.

Sincerely,
GEOservices, LLC

Michael J. Kendall, P.G.
Executive Director

**SOIL MANAGEMENT PLAN
FOR
CENTRAL AVENUE STORM DRAIN SEPARATION PROJECT
DOR#33-776
CHATTANOOGA, HAMILTON COUNTY, TENNESSEE**

Prepared For:

City of Chattanooga
Public Works Department
1250 Market Street
Chattanooga, Tennessee 37402

Prepared by:



GEOservices, LLC
5559 North Lee Highway
Cleveland, Tennessee 37323

September 04, 2018

GEOservices Project No. 41-16337

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APPENDIX C.....	LAB RESULTS

1.0 PROJECT BACKGROUND

The Central Avenue Storm Drain Separation Project (Project) consists of the installation of a sanitary sewage connection to the Citico Creek Interceptor gravity sanitary sewer and a parallel stormwater pipe (part of the overall goal of separation of storm and sanitary waters in Chattanooga). The Project will commence at the intersection of Blackford Street and Central Avenue then head north-northeast to Citico Creek. The Project will require large and deep excavations in order to reach the planned burial depth of the new sanitary sewer and storm-sewer piping at approximately 45 feet below existing grade.

1.1 Information Sources

This Soil Management Plan (SMP) is based on the following sources of information:

Information regarding the environmental conditions of the Project is based on:

- (i) Historical research conducted by GEOServices in June of 2017
 - a. Historical aerial maps collection and review
 - b. Historical topographical maps collection and review
 - c. Historical fire insurance maps collection and review
 - d. Regulatory database search and review
 - e. Research Report: Lincoln Park in Chattanooga, Tennessee – Author: Sarah Calise December 9, 2015
 - f. Chattanooga Regional Planning Agency report “3rd to Riverside” – 2015
 - g. Chattanooga and its Historic Suburbs – July 18, 2012 by Chuck Hamilton
- (ii) Preliminary Engineering Report by Ragan-Smith dated August 2015
- (iii) Report of Geotechnical Exploration by GEOServices dated September 13, 2017
- (iv) Phase II Environmental Site Assessment by GEOServices dated September 13, 2017
- (v) Citico Creek sediment sampling conducted by GEOServices January 16, 2018

1.2 Site Description and History

The project area is a mix of private and public land. Current land owners and the City of Chattanooga have agreements to construct new sewer lines in the route described above. Historically, this area was occupied by residential homes along Central Avenue (historically East End Avenue) from East 3rd Street (formerly Harrison Avenue); and past the Blackford/Cleveland Avenue (formerly Shallow Ford Road) intersection for approximately one (1) block (Circa 1917). The homes north of Blackford were demolished for the development of South Lincoln Park (this area is now parking and storage for Erlanger Hospital). To the north of this section is a rail crossing (currently abandoned and overgrown) followed by the Tennessee American Water Company and One Riverside Apartments on the former Cannon site (a current Brownfield Development) and terminating in (and later roadway crossing over) the Citico Creek. Also, the Westview property to the North of Citico Creek will be used for stockpile and staging area for Phase I. As with many areas in the City of Chattanooga, this area has miscellaneous areas of foundry sand present.

1.3 Project Description

The new sanitary sewer and stormwater corridor will be excavated to depths up to approximately 45 feet. This depth will create very wide excavations with “benched areas” providing a number of options to place any contaminated soil (predominantly foundry sand). In addition, this Project plan includes a new future Central Avenue extension from its current endpoint at Blackford and continuing it to Riverside Drive, placement of any contaminated material will need to take into account material meeting or exceeding a 95%

to 98% soil proctor to prevent settlement. The Project will be divided into two (2) Phases with Phase I being north of the railroad corridor and Phase II being south of and including the railroad corridor (see Appendix A – drawings C1.0, C5.0, and C5.1).

1.4 Assumptions

- There will be a Brownfield Voluntary Agreement in place and regulatory approvals pertinent to this construction prior to any construction activity.
- Construction activity will consist of excavations and installations per the Engineering plans produced and sealed by Ragan-Smith. Any deviations from these plans will be documented and shared with all relevant parties prior to implementation.

The recommendations given in this SMP are based on the previous assessment activities conducted by GEOServices, LLC and others.

2.0 SUMMARY OF PREVIOUS ASSESSMENT

The sampling programs referenced in Section 1.1. Information Sources included multiple soil samples. The Phase II sampling activities (soil and/or groundwater) were conducted to reduce uncertainties associated with the potential occurrence of areas of concern specifically as it related to the construction and future development of the area. These uncertainties are primarily associated with the potential soil and/or groundwater contact to site workers or future workers. During the investigation activities, the only concern noted from the boring placements was foundry sand. No evidence of other contamination was noted by visual and/or positive readings being obtained on a Photoionization Detector (PID) capable of detecting volatile organic compounds. Representative soil samples were subsequently analyzed for Resource Conservation and Recovery Act (RCRA) list of toxic metals (RCRA 8). Groundwater was not encountered.

In addition, a discussion with the Tennessee Department of Environment and Conservation (TDEC) determined that there were historical releases of Polychlorinated Biphenyl's (PCB's) that had occurred in the Citico Creek area. GEOServices developed a soil sampling program and collected soil samples in a 25-foot grid in the area where the storm sewer will connect with Citico Creek.

The data regarding environmental conditions is based on reports identified in Section 1.1 (collectively, the "Environmental Reports"), all of which have been provided to the TDEC Department of Remediation (DoR). All environmental conditions set forth in the Environmental Reports are incorporated herein by reference. In summary, the Environmental Reports indicate that the environmental conditions at the Project include; the presence of foundry sand (contaminated with metals) and PCB's resulting from historical land uses.

The analytical data (from these sources) is tabled and provided in Appendix C, the sample locations are presented on one comprehensive figure (Boring Location Plan) and a detail of the PCB sampling area presented on drawing C3.4, both in Appendix B. The samples have revealed that Arsenic levels (ranging from 3.03 to 18.3) are above USEPA Region 4 Residential Soil and Risk Based screening levels in all foundry sand samples collected and analyzed. Lead was encountered in one sample above Residential Soil Criteria and Mercury (in all foundry sand samples) was encountered above Risk Based Soil Screening Level's.

Soil gas sampling and analysis was not considered due to the historical findings of previous studies (no vapor sources were identified) and the analysis of soil samples from the borings (no VOC's detected) conducted in the corridor. Additionally, no buildings or structures will be placed as this is a planned roadway corridor.

2.1 Regulatory Benchmarks for Soil Screening

The results of the previous investigations and testing have narrowed the chemicals of concern. These contaminants are from the foundry sand (randomly across the corridor) that exhibit elevated levels of Arsenic, Lead, and Mercury; and PCB's in some of the sediments of Citico Creek.

Since foundry sand is apparent visually, the contractors, including GEOServices materials testing personnel will be informed and trained of its potential presence (random in our borings) so that the material can be identified and moved to a designated staging area (the exact location has not been determined for Phase II as of this writing).

3.0 REMEDIAL MEASURES

Based on the results of the assessments, GEOS recommends that TDEC consider allowing commercial development of the site with the following statements:

1. Soil containing Arsenic, Lead and Mercury above the residential standard shall be removed and properly disposed off-site or reused on-site with a minimum of two (2) feet of cover and/or under asphalt or concrete to prevent future physical (direct) contact. Any placement/reuse will be documented and summarized in a final closure report following construction activity.
2. Vapor mitigation is not a planned requirement for this Project, as no evidence of volatile organic vapors have been encountered during the various investigations and no buildings or structures are planned for this work.
3. Utility trenches will be over excavated to remove foundry sands, if present. Clean soil will replace the foundry soils removed. This will allow for future access to underground utilities without workers encountering contaminated foundry sands. Areas where contaminated foundry sand is finally placed will be clearly identifiable due to color of soil and through documentation of location and depth documented by accurate land survey(s).
4. A qualified environmental professional will be on site during excavation and other intrusive activities to monitor for the presence of foundry sand or other potential contaminants. If other suspicious material is observed that has not previously been sampled, work will stop immediately in the impacted area and the material will be sampled. If results exceed residential standards, proper off-site disposal and/or segregated placement for reuse will be necessary.

3.1 Recommended Soil Management Practices

The nature of soil contamination noted above indicates potential risks for the inhalation, ingestion and dermal contact exposure pathways during construction activities. Based on the detected concentrations reported, the types of soil contaminants identified do not appear to pose a vapor intrusion risk for outdoor air quality (as long as dust is controlled). Site development activities present a potential exposure pathway to site workers during construction. Additionally, excavation, and placement of foundry sand, foundry sand commingled with soil and other-impacted soil presents a potential off-site "migration" issue if proper stormwater

management practices are not implemented. Because of these potential exposure pathways, certain site management practices must be implemented to be protective of potential receptors. During staging activity, the material will be protected from storm events through best management practices and controls. Provided that the foundry sand is placed in non-occupied areas on-site below a minimum of two (2) feet of clean fill or a sufficient impervious layer, then direct exposure to potential future receptors should be significantly reduced/prevented.

If foundry sand is removed from the site, it will be treated as special waste and disposed of accordingly.

Based on the potential risk associated with soil at this site, the following soil management practices will be implemented by the project team. However, given that the foundry sand is common, and the extents are not known, the site management practices below have been developed to provide proper care (and prevent exposures) during construction.

1. Notification to TDEC-DoR prior to beginning any construction or demolition activities at the site which are intrusive in nature.
2. Site workers who are reasonably expected to be exposed to foundry sand and/or other-impacted soil during construction or demolition activities will be trained and alerted to the potential constituents of concern (and proper safety precautions) associated with the foundry sand and impacted soil at the site.
3. Site workers who are reasonably expected to be exposed to foundry sand and/or other impacted soil will be trained to become familiar with these site management practices prior to implementing the work.
4. An Environmental Professional or Environmental Technician qualified to identify impacted materials will be on site during intrusive activities.
5. The contractor(s) will be required to follow Best Management Practices (BMPs) to limit spreading of the metal laden foundry sands. For dust control, misting/wetting of the material at the site will be required. There will be a controlled entry/egress inspection control point to clean any visible debris from transport trucks/equipment and prevent access to pedestrians and non-qualified personnel. Loose materials must remain on the site. Trucks will be required to use a cover to prevent blowing of special wastes during transportation.
6. In the event that unexpected subsurface conditions (i.e. unanticipated risk, a new management approach is needed, including but not limited to free product, unknowns, elevated vapors, etc.) are encountered, construction activities will be halted and TDEC-DoR will be notified. The item(s) encountered would include potential sampling for characterization and/or revisions to management approach. In the case of contamination, if the volume of the material is limited, such that temporary stockpiling is feasible, the stockpiled material will be properly bermed and covered until characterization and disposal options are established.
7. Proper sediment and erosion controls must be established prior to construction and/or demolition activities to prevent the inadvertent off-site transport of foundry sand and/or any other impacted soil from the site. The controls will be established in accordance with the TDEC erosion and sediment control handbook. These controls must be periodically inspected and adequately maintained throughout the duration of the construction and/or demolition activities to prevent the off-site transport of foundry sand from the site. Only after the site is adequately stabilized, can the sediment and erosion controls be removed.

8. Utility trenches excavated in areas where foundry sand or other-impacted soil is present will be backfilled with clean fill material (testing may occur if the source of clean material is not from a certified borrow facility). Any foundry sand placed into the trench will be clearly marked so that future workers will be able to identify the material if encountered. The intent is to prevent future utility workers from coming into contact with contaminated foundry sands and/or other-impacted soils.
9. Where the site alterations and/or improvements will accommodate fill soil, soil and foundry sand or other-impacted soil at the site may be relocated to any non-occupied area (other than utility trench backfill) of the site, provided the material will be placed under pavement or a high visibility textile fabric/liner followed by a minimum of two (2) feet of clean clay cap. This is not likely due to the project design but is included as an option in the event of compaction needs dictating such placement.
10. Foundry sand and other-impacted soils that are removed from the site must be disposed as a Special Waste at a permitted Class I landfill. Formal Special Waste Approval must be obtained from the Tennessee Department of Environment and Conservation (TDEC) and the intended receiving landfill, prior to the off-site disposal of any soil containing foundry sand and/or other-impacted soil from the site.
11. Final site conditions must provide a sufficient impervious layer (asphalt, concrete, or pavement) or a minimum of two (2) feet of top soil and sod (or landscape), over areas where foundry sand and/or other-impacted soils are present. The permanent soil cover must be stabilized within 15 days of being placed. All cover material, permanent soil cover or impervious layer must be permanently maintained to ensure that foundry sand and/or other-impacted soils are not exposed.
12. An as-built drawing and a close-out report will be prepared and submitted following completion of the project to document final conditions to TDEC-DoR.

GEOServices will provide an environmental professional who is familiar with the findings of the previous environmental investigations and the conditions of the Brownfield Agreement and Site Redevelopment and SMP to provide on-site observation, consulting and support documentation during site development. GEOServices environmental personnel assigned to field support for this project will have completed OSHA 1910.120 40-hour HAZWOPER training and will have experience with similar projects.

3.2 Vapor Mitigation

Since no indications of volatile organic chemicals have been identified during the investigations and buildings are not a part of the planned development, vapor samples were not collected and are not expected to occur in the corridor.

3.3 Groundwater

Groundwater was not encountered (only moist soil conditions) during the investigations in this corridor.

4.0 HEALTH AND SAFETY

A Site-Specific Health and Safety Plan will be prepared and followed by all personnel working on the site.

GEOS will supervise, direct, control or have authority over or be responsible for Contractor’s means, methods, techniques, sequences or procedures. As such, GEOS will issue, if warranted, any “stop-work” notifications to the Contractor if conditions of the work order are not met, and work will not commence until the conditions have been rectified. GEOS is in a position to direct or control the work of the Contractor, especially in dealing with unexpected conditions or foundry sand is encountered. GEOS is responsible for supervision of truck loading operations performed by the Contractor or the contractor's work is resulting in an uncontrolled release of contaminated materials (i.e. tracking contamination to clean areas, off site). The Contractor remains responsible for handling excavated material in accordance with applicable local, state, and federal regulations and cleanup of any off site spills while in route to the disposal area.

5.0 LIMITATIONS

This report has been prepared in accordance with generally accepted 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 warranty, expressed or implied, is made.

GEOS should be provided the opportunity to review the final plans and specifications in order that recommendations are properly interpreted and implemented. The recommendations in this report are contingent on GEOS’s observation and monitoring of site redevelopment activities.

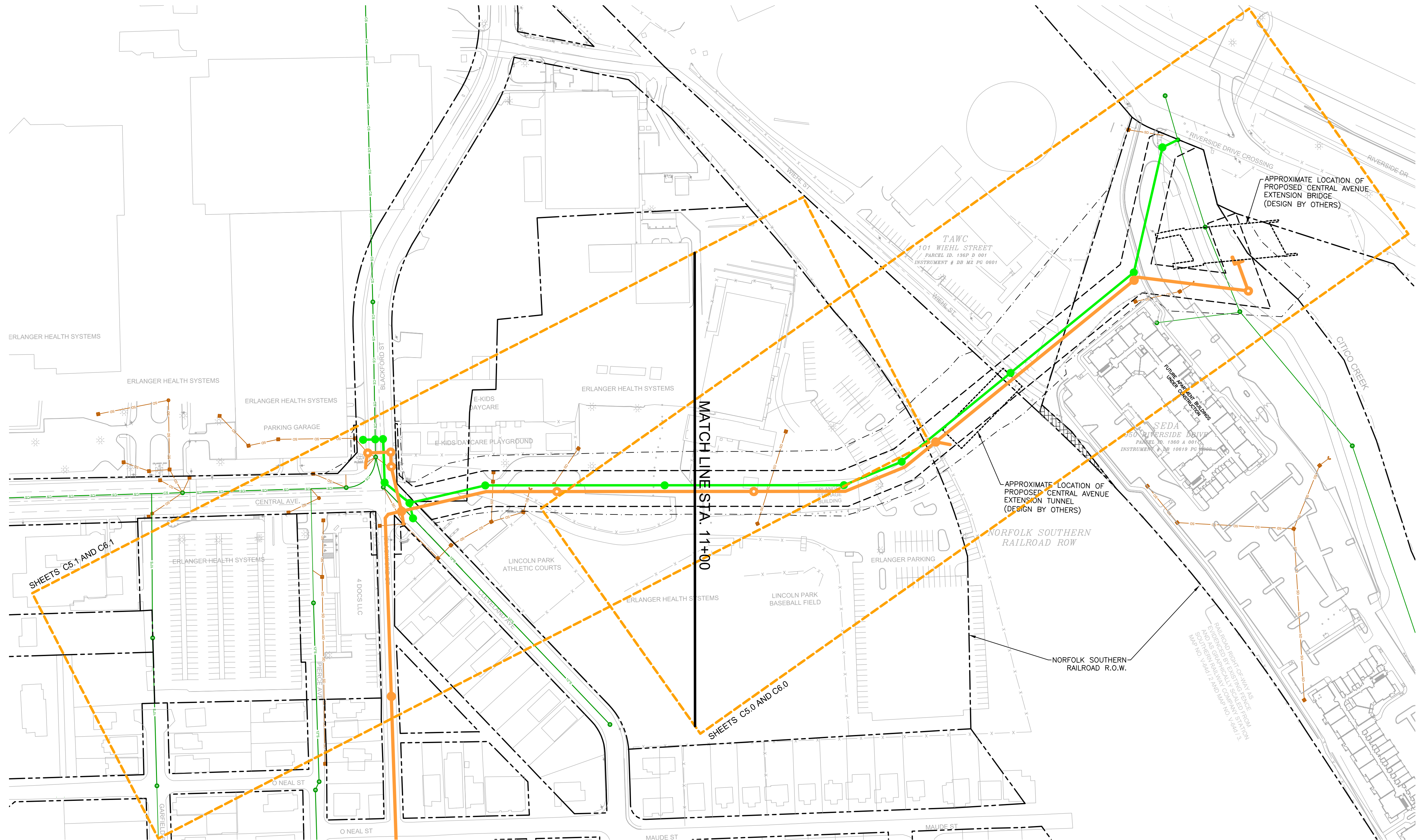
6.0 ACKNOWLEDGMENT

By signing below, the site contractor acknowledges that he/she has read the SMP and understands and will adhere to the requirements contained within.

Contractor: _____

Authorized Signature Date: _____

APPENDIX A
ENGINEERING DRAWINGS (C1.0, C5.0, and C5.1)

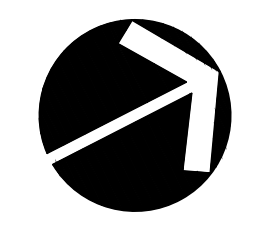
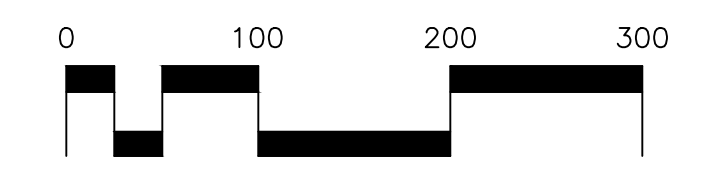


11-CENTRAL AVENUE STORM DRAIN SEPARATION PROJECT - OVERALL SITE LAYOUT.DWG
 PLOTTED BY MARK SCHMIDT ON 11/15/2017 9:16 AM - LAST UPDATED BY MES ON 11/15/2017 8:14 AM

NOTE:
 SEE EXISTING CONDITIONS ON SHEETS
 C0.3 AND C0.4 FOR LOCATIONS OF
 UTILITIES.

LEGEND

- LIMITS OF TEMPORARY CONSTRUCTION
- PERMANENT SANITARY /STORM EASMENT
- EXISTING R.O.W.
- 8" S EXISTING SANITARY SEWER
- SD EXISTING STORM DRAINAGE
- CS EXISTING COMBINED SEWER
- PROPOSED 84" DIA. STORM DRAINAGE
- PROPOSED 36" SANITARY SEWER



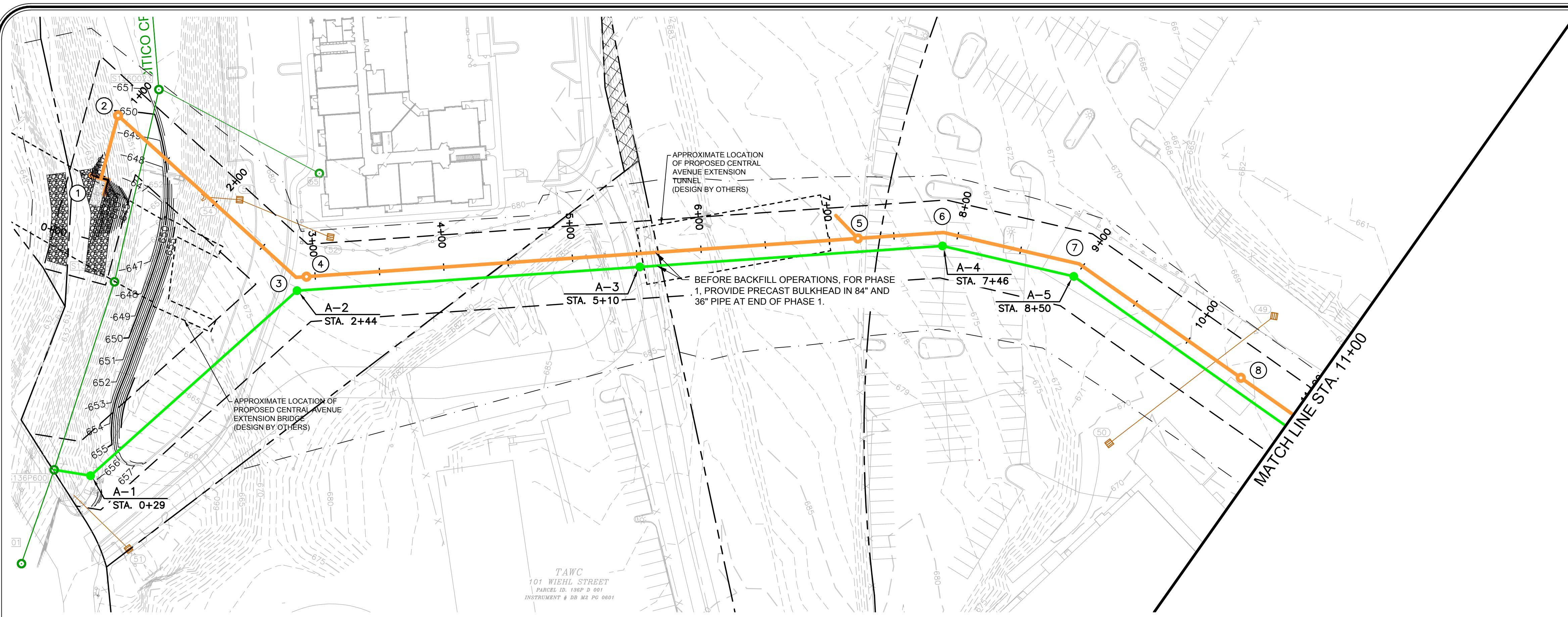
**CENTRAL AVENUE STORM DRAIN
 SEPARATION PROJECT**
 FOR
 CITY OF CHATTANOOGA, TENNESSEE
 CHATTANOOGA, TN

RAGAN SMITH
 LAND PLANNERS • CIVIL ENGINEERS
 LANDSCAPE ARCHITECTS • SURVEYORS
 CHATTANOOGA
 1410 COWARD STREET
 NASHVILLE, TN 37206
 (615) 244-0251
 www.ragan-smith.com

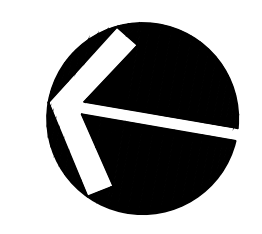
JOB NO.	11058	DESIGNED:	MES	DRAWN:	BLC	SCALE:	1" = 100'	DATE:	11-1-2017	REVISIONS
WK. ORDER	0176									

OVERALL SITE LAYOUT

C1.0



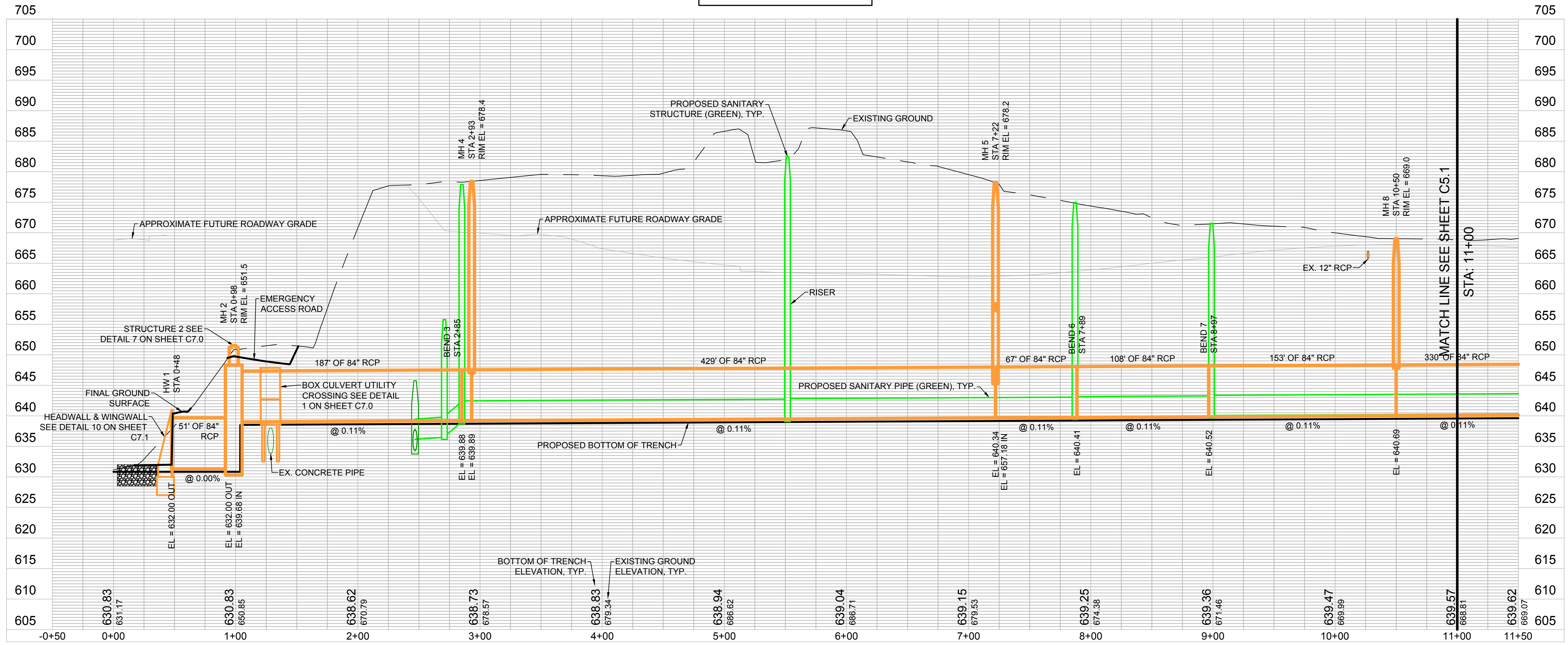
LINE "A"



NOTE
 STORM NETWORK SHOWN AS RCP OPTION. USE HOBAS FOR ALTERNATIVE OPTION. CONTRACTOR TO LOCATE ALL UTILITIES AND SERVICE SHALL BE MAINTAINED / RETURNED PRIOR TO COMPLETING CONSTRUCTION. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES IN THE PROXIMITY OF THE CONSTRUCTION AREA AND REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE PRIOR TO BEGINNING WORK.

- LEGEND:**
- PROPERTY LINE
 - - - SEWER AND STORM EASEMENT
 - - - CONSTRUCTION EASEMENT
 - PROPOSED SANITARY SEWER
 - PROPOSED STORM SEWER

SCALES:
 PLAN VIEW 1" = 50'
 PROFILE VIEW 1" = 50' HORIZONTAL, 1" = 10' VERTICAL



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 NASHVILLE, TN 37206
 (615) 244-0251 • www.ragan-smith.com • (423) 462-0460

CENTRAL AVENUE STORM DRAIN SEPARATION PROJECT FOR CITY OF CHATTANOOGA, TENNESSEE

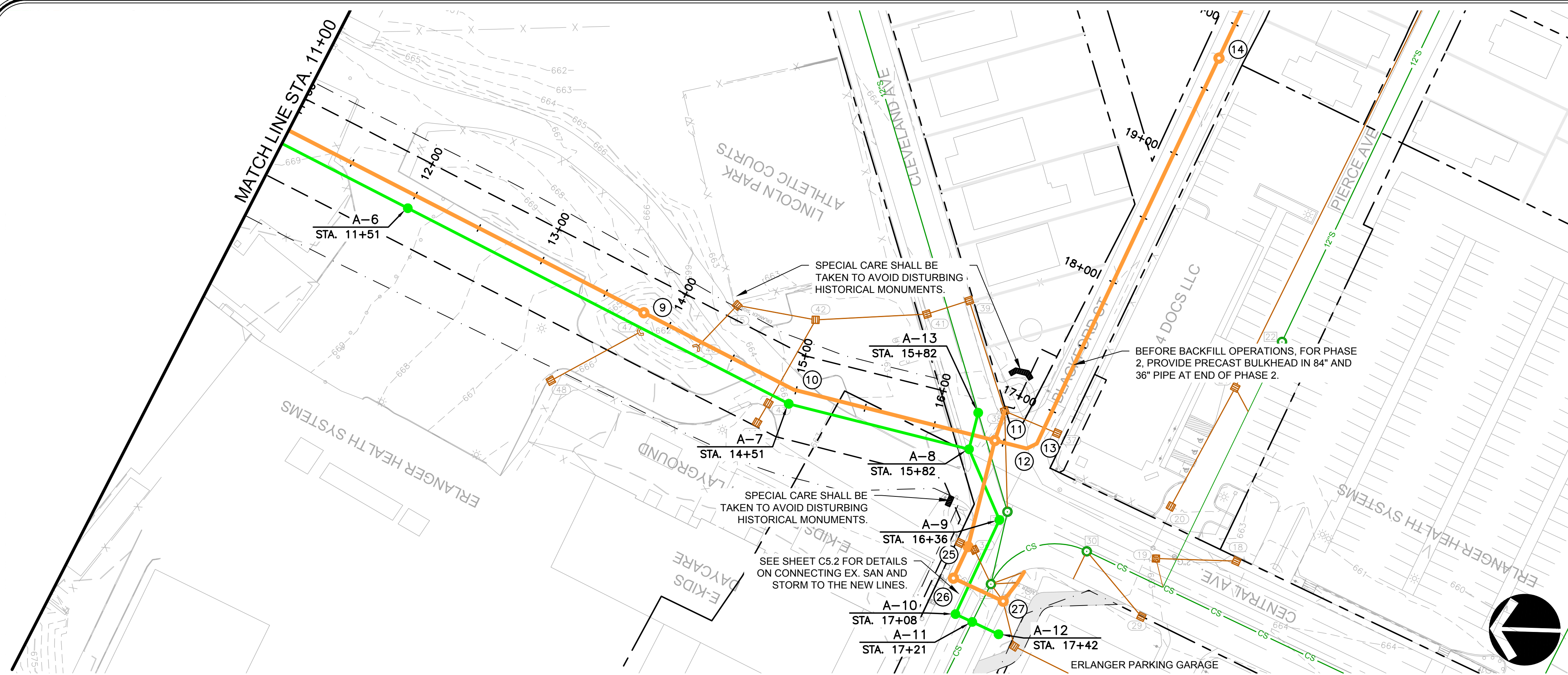
WK. ORDER	0176	DESIGNED:	MES	DRAWN:	BLC	SCALE:	AS SHOWN	DATE:	11-1-2017	REVISIONS
JOB NO.	11058									

STORM DRAIN PLAN AND PROFILE 1 OF 2

C5.0



11/11/17 CHATT PROJECTS 1058701 CIVIL ENGINEERING AND SURVEYING - PROPOSED STORM DRAIN ALIGNMENT - 11-11-17.DWG
 PLOTTED BY MARK SCHMIDT ON 11/20/17 AT 4:42 PM. LAST UPDATED BY MES ON 11/20/17 AT 4:42 PM



LINE "A"

NOTE

STORM NETWORK SHOWN AS RCP OPTION. USE HOBAS FOR ALTERNATIVE OPTION. CONTRACTOR TO LOCATE ALL UTILITIES AND SERVICE SHALL BE MAINTAINED / RETURNED PRIOR TO COMPLETING CONSTRUCTION. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES IN THE PROXIMITY OF THE CONSTRUCTION AREA AND REPORT ANY DISCREPANCIES TO THE OWNER'S REPRESENTATIVE PRIOR TO BEGINNING WORK.

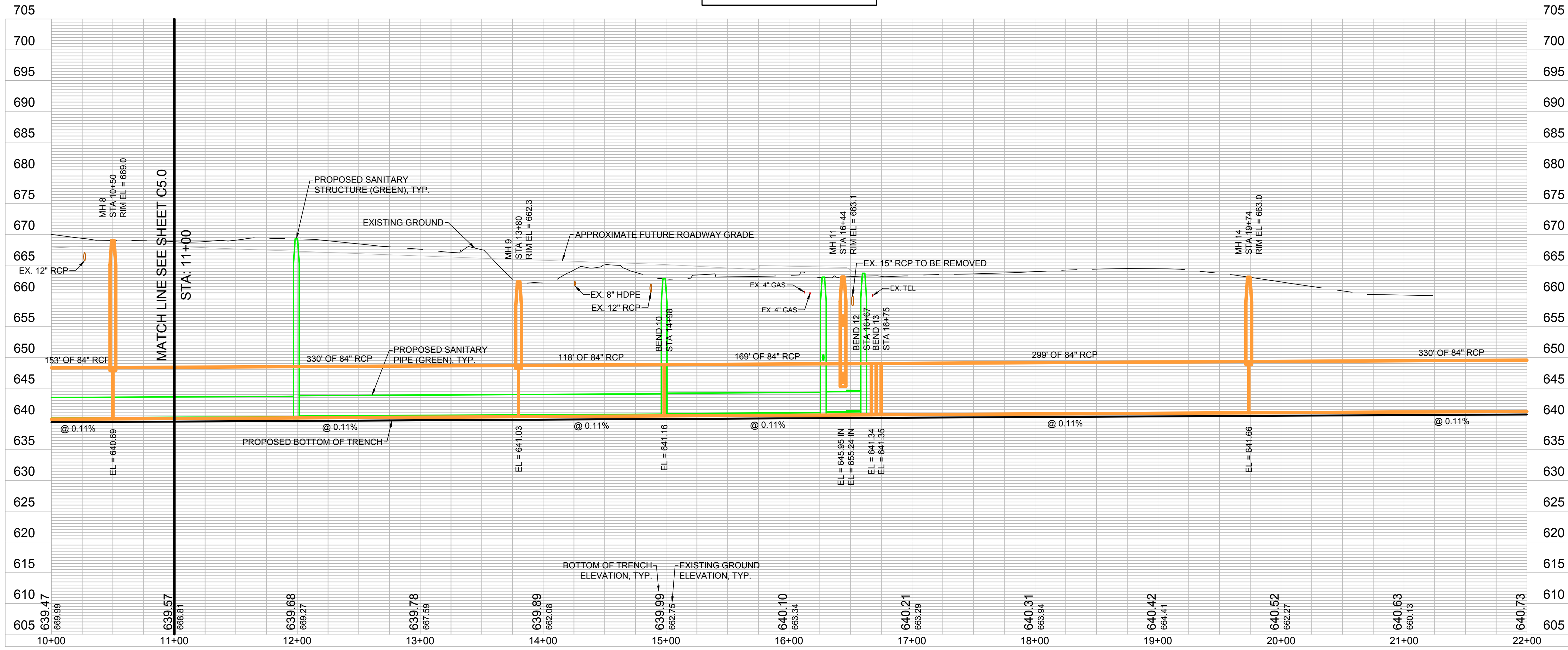
SEE SHEET C5.2 FOR ENLARGED PLAN AT INTERSECTION OF CENTRAL AVENUE AND BLACKFORD ST.

LEGEND:

- PROPERTY LINE
- SEWER AND STORM EASEMENT
- CONSTRUCTION EASEMENT
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER

SCALES:

- PLAN VIEW 1" = 50'
- PROFILE VIEW 1" = 50' HORIZONTAL, 1" = 10' VERTICAL



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CENTRAL AVENUE STORM DRAIN SEPARATION PROJECT
 FOR
 CITY OF CHATTANOOGA, TENNESSEE
 CHATTANOOGA, TN

JOB NO.	11058	DESIGNED:	MES	DRAWN:	BLC	SCALE:	AS SHOWN	DATE:	11-1-2017	REVISIONS
WK. ORDER	0176									

STORM DRAIN PLAN AND PROFILE 2 OF 2

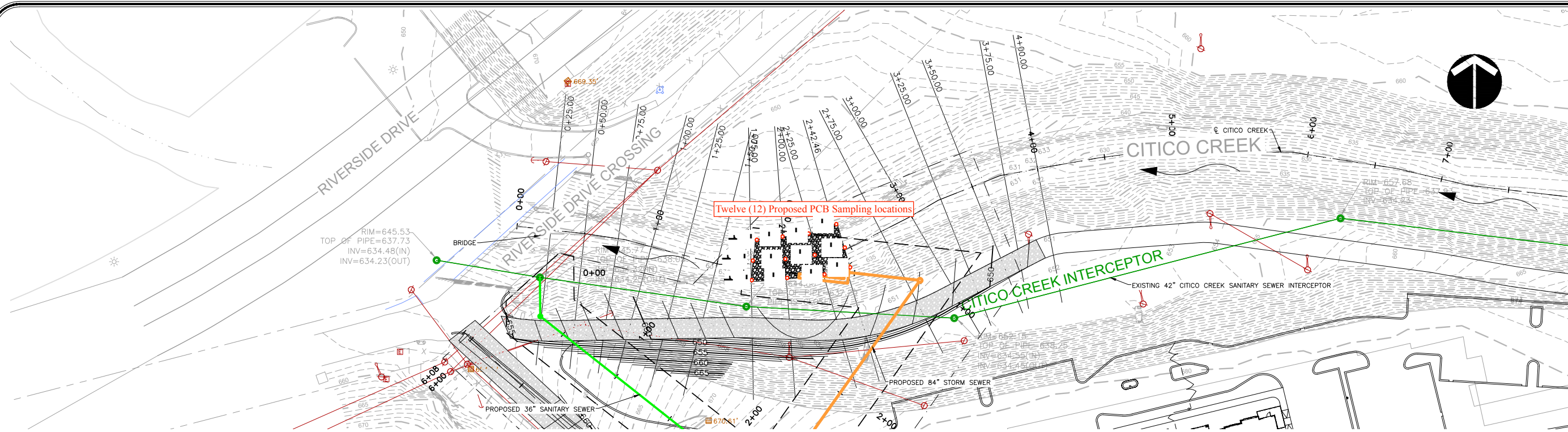
C5.1



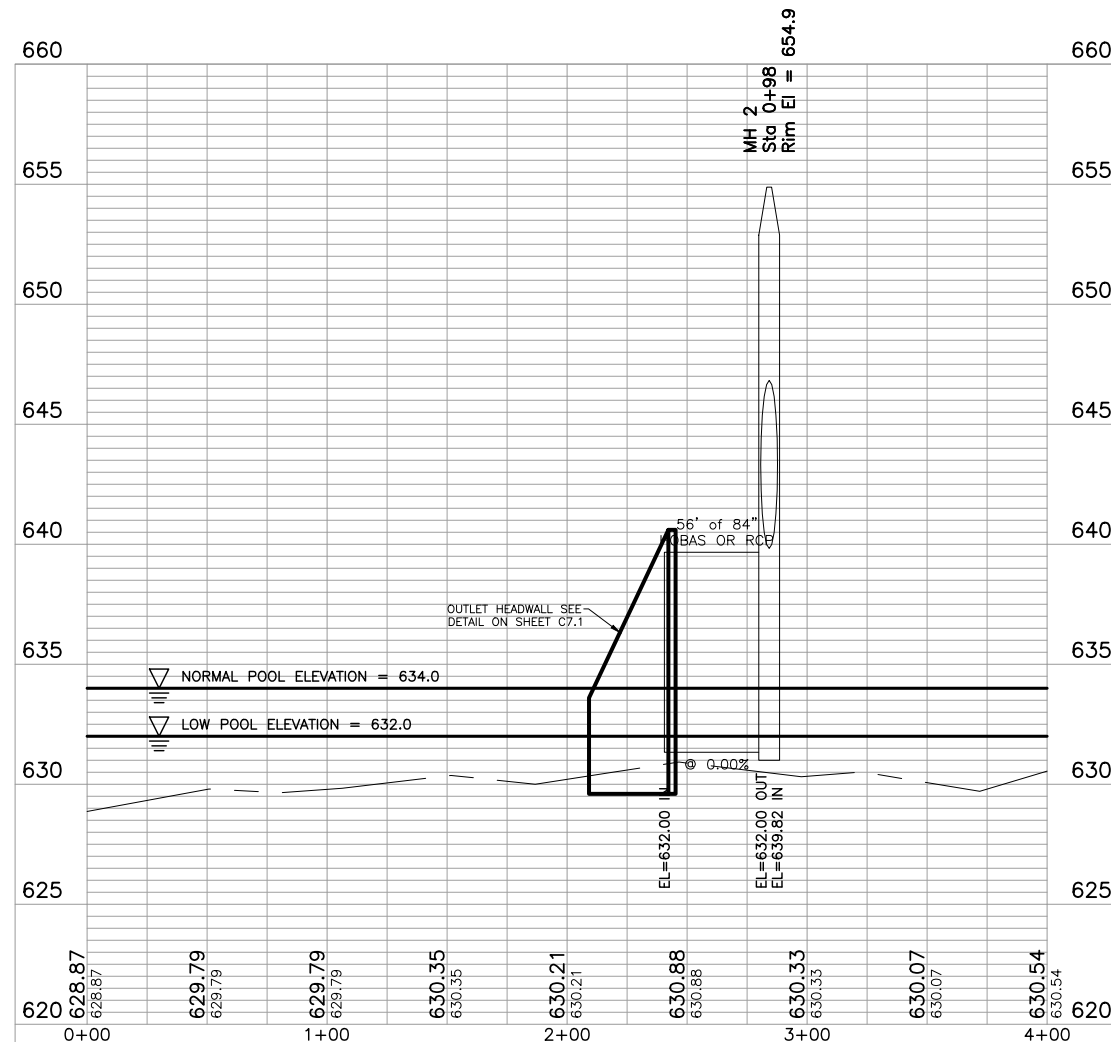
11-CENT PROJECT INFORMATION - CIVIL ENGINEERING AND SURVEYING - PROPOSED STORM CENTERLINE ALIGNMENT - (1)-11.DWG
 PLOTTED BY MARK SCHULTZ ON 11/01/2017 4:42 PM. LAST UPDATED BY MES ON 10/20/18 4:59 PM

APPENDIX B

Figure 1: Boring Location Plan



CENTERLINE OF CITICO CREEK



NOTES:
SEE CROSS SECTIONS ON SHEETS C3.4 THROUGH C3.6



Know what's below.
Call before you dig.

SCALES:

PLAN VIEW PROFILE VIEW
1" = 40' 1" = 40' HORIZONTAL
1" = 4' VERTICAL

LEGEND
FLOW DIRECTION

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**CENTRAL AVENUE STORM DRAIN
SEPARATION PROJECT
FOR
CITY OF CHATTANOOGA, TENNESSEE**

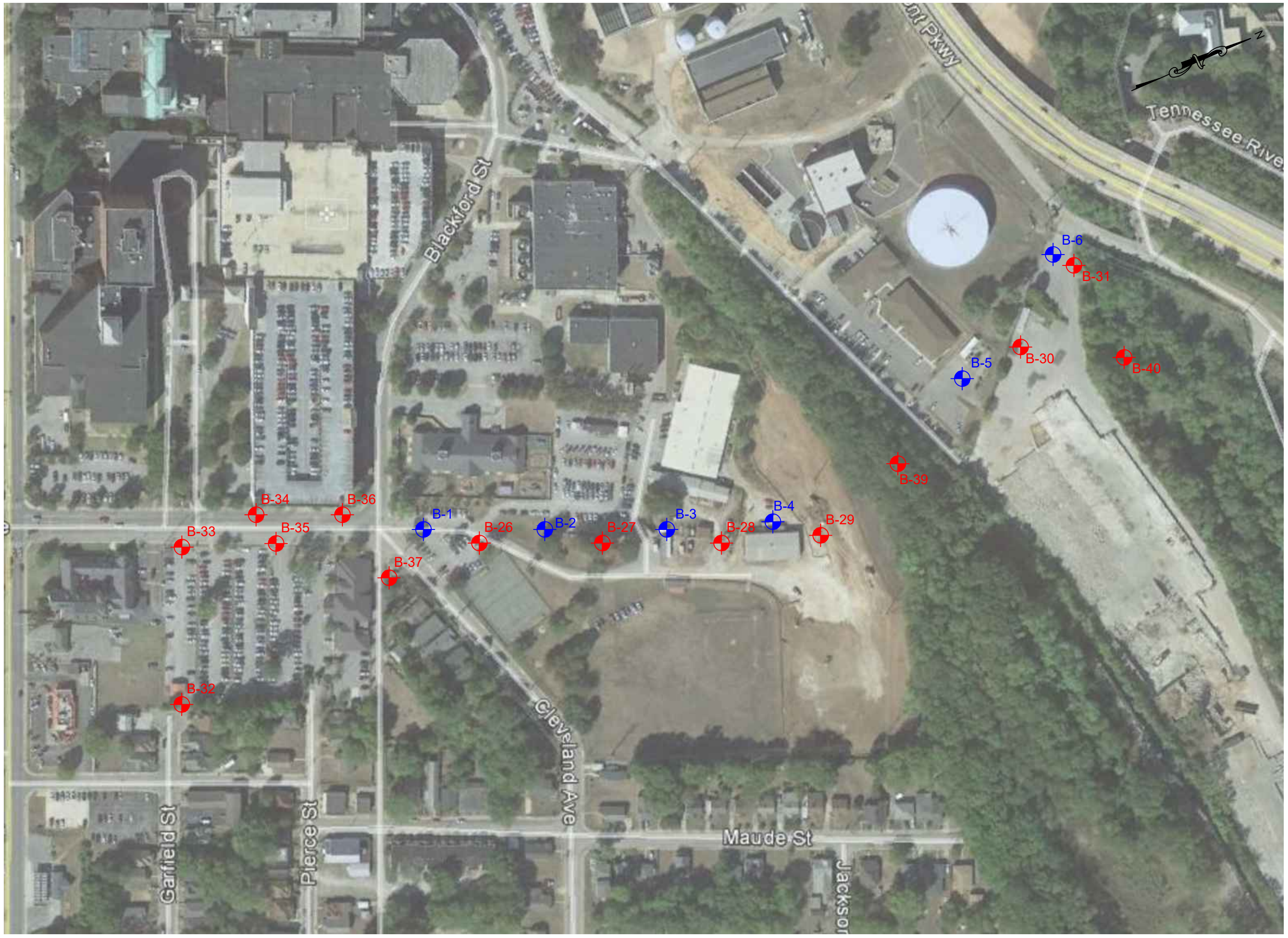
CHATTANOOGA, TN

JOB NO.	11058	DESIGNED:	MES	DRAWN:	BLC	SCALE:	AS SHOWN	DATE:	11-1-2017	REVISIONS
WK. ORDER	0176									

CITICO CREEK
PLAN AND PROFILE

C3.4

G:\1058\DATA\CAD\ENGINEERING\AN\BSETS\DWG\CITICO_CREEK.DWG
PLOTTED BY: RMC CAMPBELL ON 11/01/17 10:48 AM - LAST UPDATED BY: MES ON 11/01/17 2:58 PM



NOTES:

- 1.) BORING LOCATIONS ARE SHOWN IN GENERAL ARRANGEMENT ONLY.
- 2.) DO NOT USE BORING LOCATIONS FOR DETERMINATIONS OF DISTANCES OR QUANTITIES.
- 3.) BASE MAP PROVIDED BY GOOGLE EARTH.

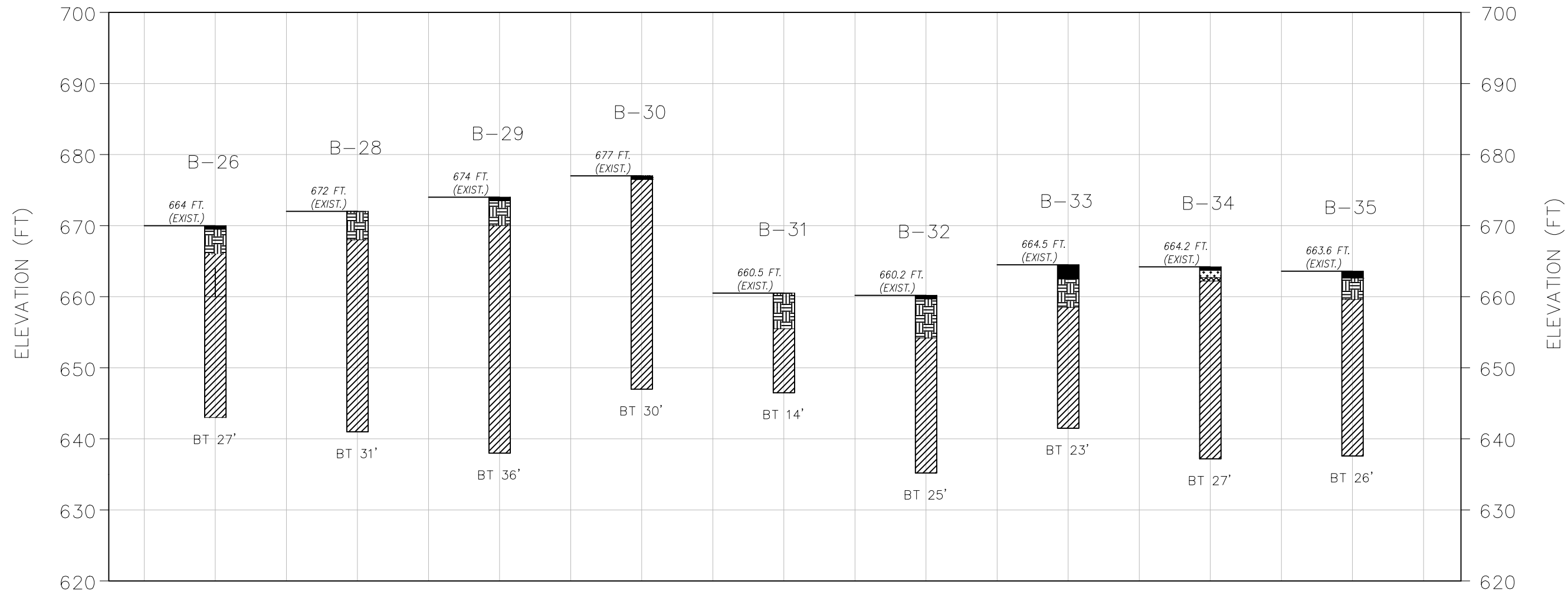
BORING LOCATION PLAN
Central Avenue Extension
 Chattanooga, Tennessee

DRAWN BY:	PLS
APPROVED BY:	DKK
SCALE:	NTS
JOB NO.:	41-16337
DATE:	8/25/2017

GEOS
 Geotechnical and Materials Engineers
 Phone: (423) 614-6471
 Fax: (423) 614-6479
 5559 North Lee Highway
 Cleveland, Tennessee 37312

FIGURE 1

SOIL TEST BORING PROFILES



LEGEND:

- | | | | |
|---------|---------------|----------|--------------|
| TOPSOIL | ASPHALT/STONE | ROCK | SAND |
| FILL | RESIDUUM | ALLUVIUM | FOUNDRY SAND |

NOTES:
 1.) BORING LOCATIONS ARE SHOWN IN GENERAL ARRANGMENT ONLY.
 2.) DO NOT USE BORING LOCATIONS FOR DETERMINATIONS OF DISTANCES OR QUANTITIES.
 3.) BORING ELEVATIONS WERE NOT AVAILABLE THEREFORE AN ASSUMED DATUM OF 0 FEET WAS SET AS THE EXISTING GROUND SURFACE.

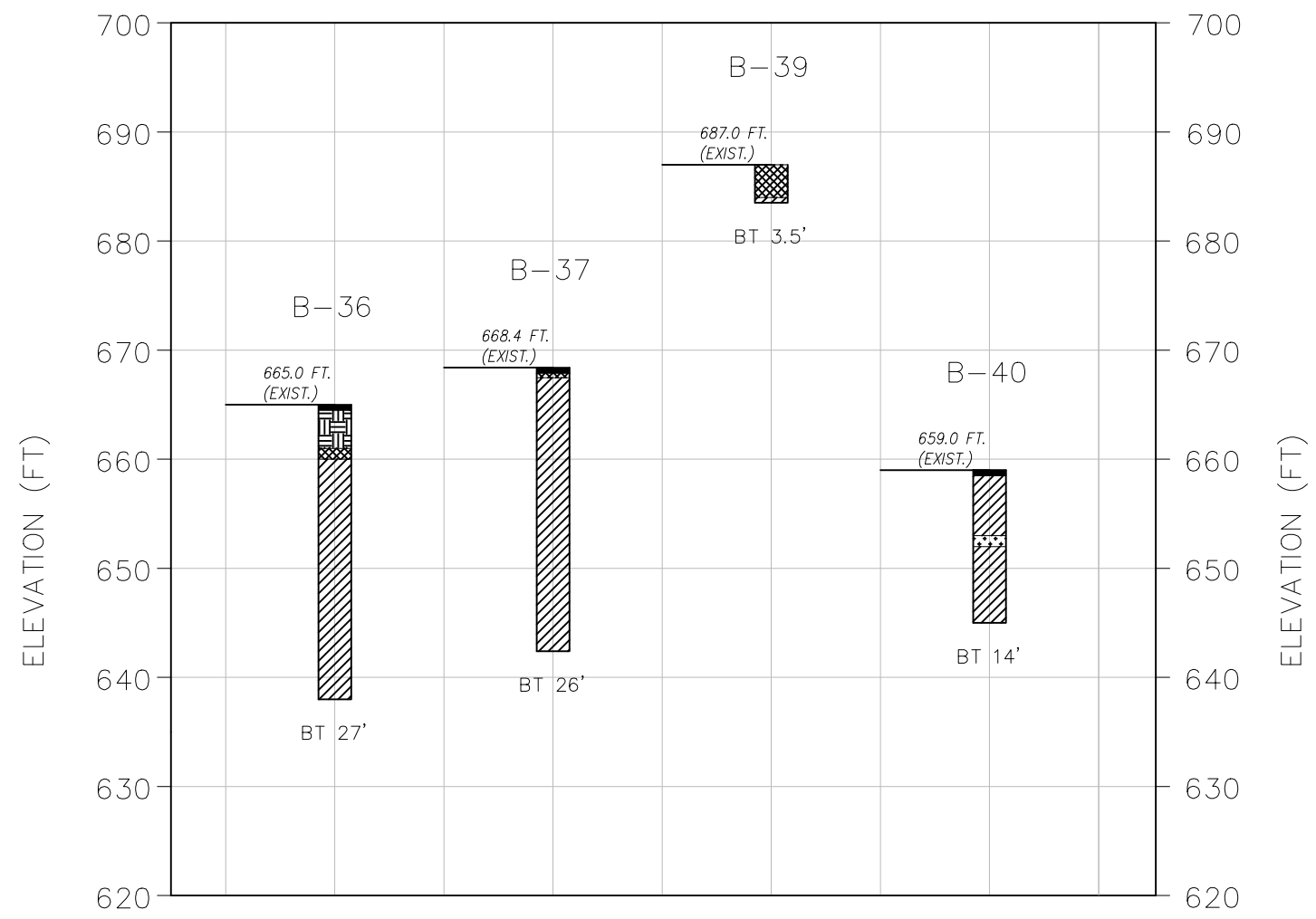
BORING CROSS SECTIONS Central Avenue Extension Chattanooga, Tennessee

DRAWN BY: PLS
 APPROVED BY: DKK
 SCALE: NTS
 JOB NO.: 41-16337
 DATE: 8/25/2017

GEOLOGICAL ENGINEERING SERVICES, LLC
 5559 North Lee Highway
 Cleveland, Tennessee 37312
 Phone: (423) 614-6471
 Fax: (423) 614-6479

FIGURE 2

SOIL TEST BORING PROFILES



LEGEND:

- | | | | |
|---------|---------------|----------|--------------|
| TOPSOIL | ASPHALT/STONE | ROCK | SAND |
| FILL | RESIDUUM | ALLUVIUM | FOUNDRY SAND |

NOTES:
 1.) BORING LOCATIONS ARE SHOWN IN GENERAL ARRANGMENT ONLY.
 2.) DO NOT USE BORING LOCATIONS FOR DETERMINATIONS OF DISTANCES OR QUANTITIES.
 3.) BORING ELEVATIONS WERE NOT AVAILABLE THEREFORE AN ASSUMED DATUM OF 0 FEET WAS SET AS THE EXISTING GROUND SURFACE.

BORING CROSS SECTIONS
Central Avenue Extension
 Chattanooga, Tennessee

DRAWN BY:	PLS
APPROVED BY:	DKK
SCALE:	NTS
JOB NO.:	41-16337
DATE:	8/25/2017

GEOS
 Geotechnical and Materials Engineers
 Phone: (423) 614-6471
 Fax: (423) 614-6479
 5559 North Lee Highway
 Cleveland, Tennessee 37312

FIGURE 3

APPENDIX C
Laboratory Results
(Tables and Laboratory Reports)

Foundry Sand Table

Lab Sample ID			L9221 09-01	L92210 9-02	L9221 09-03	L9221 09-04	L9221 09-05	L922109- 05	L922109- 05		
Client Sample ID			B-40 S- 4	B-26 S- 1	B-37 S- 1	B-36 S- 3	B-34 S- 1	S-1 0.5'	S-2 2.5'		
Date Collected			07/11/ 2017	07/12/2 017	07/12/ 2017	07/12/ 2017	07/12/ 2017	7/20/17	7/20/17		
Method	Analyte	Units	Result	Result	Result	Result	Result	Result	Result	Region 4 Residential Soil 12/09	Region 4 Risk Based SSL 12/09
6010B	ARSENIC	mg/kg	3.03	5.5	7.27	16.5	18.3	10.6	9.79	0.39	0.0013
6010B	BARIUM	mg/kg	231	112	204	209	289	153	172	15000	300
6010B	CADMIUM	mg/kg	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	1.09	70	1.4
6010B	CHROMIUM	mg/kg	3.59	17.5	14.6	21.8	28.3	6.64	9.83		
6010B	LEAD	mg/kg	<2.5	128	181	27.7	713	36.8	134	400	
6010B	SELENIUM	mg/kg	<2	<2	<2	<2	<2	<2	<2	390	0.95
6010B	SILVER	mg/kg	<1	<1	<1	<1	<1	<1	<1	390	1.6
7471A	MERCURY	mg/kg	<0.02	0.0893	0.191	0.131	0.443	0.0549	0.0369	5.6	0.03

River Sediment Table

Lab Sample ID			L96462 1-01	L96462 1-02	L96462 1-03	L96462 1-04	L96462 1-05	L96462 1-06	L96462 1-07	L96462 1-08	L96462 1-09	L96462 1-10	L96462 1-11	L96462 1-12		
Client Sample ID			S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-10	S-11	S-12		
Date Collected			01/16/2 018	01/16/2 018	01/16/2 018	01/16/2 018	01/16/2 018	01/16/2 018	01/16/2 018	01/16/2 018	01/16/2 018	01/16/2 018	01/16/2 018	01/16/2 018		
Method	Analyte	Units	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Region 4 Residential Soil 12/09	Region 4 Risk Based SSL 12/09
8082	PCB 1016	mg/kg	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	3.9	0.092
8082	PCB 1221	mg/kg	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	0.14	0.00012
8082	PCB 1232	mg/kg	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	0.14	0.00012
8082	PCB 1242	mg/kg	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	0.22	0.0053
8082	PCB 1248	mg/kg	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	0.22	0.0052
8082	PCB 1254	mg/kg	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017	0.22	0.0088
8082	PCB 1260	mg/kg	0.0622	<0.017	0.0411	<0.017	<0.017	0.0224	<0.017	<0.017	0.0568	<0.017	<0.017	0.0373	0.22	0.024
8082	DECACHL OROBIPHE NYL	% Rec	65.4	59.7	40	95.6	99.4	62.4	42.9	45.8	76.4	122	119	60.1		
8082	TETRACHL ORO-M- XYLENE	% Rec	70	75.6	62.9	105	71.7	75.4	54.1	45.4	81.2	93.3	93.6	61		

July 17, 2017

GEOServices, LLC - Cleveland, TN

Sample Delivery Group: L922109
Samples Received: 07/13/2017
Project Number: 41-16337
Description: Central Avenue

Report To: Mike Kendall
5559 N Lee Highway
Cleveland, TN 37312










Entire Report Reviewed By:



Mark W. Beasley
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



Cp: Cover Page	1	
Tc: Table of Contents	2	
Ss: Sample Summary	3	
Cn: Case Narrative	4	
Sr: Sample Results	5	
B-40 S-4 L922109-01	5	
B-26 S-1 L922109-02	6	
B-37 S-1 L922109-03	7	
B-36 S-3 L922109-04	8	
B-34 S-1 L922109-05	9	
Qc: Quality Control Summary	10	
Mercury by Method 7471A	10	
Metals (ICP) by Method 6010B	11	
Gl: Glossary of Terms	12	
Al: Accreditations & Locations	13	
Sc: Chain of Custody	14	

SAMPLE SUMMARY



B-40 S-4 L922109-01 Solid

Collected by
Cory Waddell Collected date/time
07/11/17 11:10 Received date/time
07/13/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7471A	WG998606	1	07/13/17 17:12	07/14/17 16:05	TRB
Metals (ICP) by Method 6010B	WG998621	1	07/13/17 16:35	07/14/17 10:44	RDS
Metals (ICP) by Method 6010B	WG998621	5	07/13/17 16:35	07/14/17 13:52	NJB



B-26 S-1 L922109-02 Solid

Collected by
Cory Waddell Collected date/time
07/12/17 11:10 Received date/time
07/13/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7471A	WG998606	1	07/13/17 17:12	07/14/17 15:44	TRB
Metals (ICP) by Method 6010B	WG998621	1	07/13/17 16:35	07/14/17 09:25	NJB

B-37 S-1 L922109-03 Solid

Collected by
Cory Waddell Collected date/time
07/12/17 12:38 Received date/time
07/13/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7471A	WG998606	1	07/13/17 17:12	07/14/17 16:08	TRB
Metals (ICP) by Method 6010B	WG998621	1	07/13/17 16:35	07/14/17 10:47	NJB

B-36 S-3 L922109-04 Solid

Collected by
Cory Waddell Collected date/time
07/12/17 13:33 Received date/time
07/13/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7471A	WG998606	1	07/13/17 17:12	07/14/17 16:10	TRB
Metals (ICP) by Method 6010B	WG998621	1	07/13/17 16:35	07/14/17 10:49	NJB

B-34 S-1 L922109-05 Solid

Collected by
Cory Waddell Collected date/time
07/12/17 14:50 Received date/time
07/13/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7471A	WG998606	1	07/13/17 17:12	07/14/17 16:12	TRB
Metals (ICP) by Method 6010B	WG998621	1	07/13/17 16:35	07/14/17 10:52	NJB



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley
Technical Service Representative

- ¹ Cp
- ² Tc
- ³ Ss
- ⁴ Cn
- ⁵ Sr
- ⁶ Qc
- ⁷ Gl
- ⁸ Al
- ⁹ Sc



Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0200	1	07/14/2017 16:05	WG998606

¹ Cp

² Tc

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	3.03		2.00	1	07/14/2017 10:44	WG998621
Barium	231		0.500	1	07/14/2017 10:44	WG998621
Cadmium	ND		0.500	1	07/14/2017 10:44	WG998621
Chromium	3.59		1.00	1	07/14/2017 10:44	WG998621
Lead	ND		2.50	5	07/14/2017 13:52	WG998621
Selenium	ND		2.00	1	07/14/2017 10:44	WG998621
Silver	ND		1.00	1	07/14/2017 10:44	WG998621

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	0.0893		0.0200	1	07/14/2017 15:44	WG998606

¹ Cp

² Tc

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	5.50		2.00	1	07/14/2017 09:25	WG998621
Barium	112	<u>O1</u>	0.500	1	07/14/2017 09:25	WG998621
Cadmium	0.600		0.500	1	07/14/2017 09:25	WG998621
Chromium	17.5	<u>O1</u>	1.00	1	07/14/2017 09:25	WG998621
Lead	128		0.500	1	07/14/2017 09:25	WG998621
Selenium	ND		2.00	1	07/14/2017 09:25	WG998621
Silver	ND		1.00	1	07/14/2017 09:25	WG998621

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	0.191		0.0200	1	07/14/2017 16:08	WG998606

1 Cp

2 Tc

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	7.27		2.00	1	07/14/2017 10:47	WG998621
Barium	204		0.500	1	07/14/2017 10:47	WG998621
Cadmium	ND		0.500	1	07/14/2017 10:47	WG998621
Chromium	14.6		1.00	1	07/14/2017 10:47	WG998621
Lead	181		0.500	1	07/14/2017 10:47	WG998621
Selenium	ND		2.00	1	07/14/2017 10:47	WG998621
Silver	ND		1.00	1	07/14/2017 10:47	WG998621

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	0.131		0.0200	1	07/14/2017 16:10	WG998606

1 Cp

2 Tc

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	16.5		2.00	1	07/14/2017 10:49	WG998621
Barium	209		0.500	1	07/14/2017 10:49	WG998621
Cadmium	ND		0.500	1	07/14/2017 10:49	WG998621
Chromium	21.8		1.00	1	07/14/2017 10:49	WG998621
Lead	27.7		0.500	1	07/14/2017 10:49	WG998621
Selenium	ND		2.00	1	07/14/2017 10:49	WG998621
Silver	ND		1.00	1	07/14/2017 10:49	WG998621

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	0.443		0.0200	1	07/14/2017 16:12	WG998606

1 Cp

2 Tc

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	18.3		2.00	1	07/14/2017 10:52	WG998621
Barium	289		0.500	1	07/14/2017 10:52	WG998621
Cadmium	ND		0.500	1	07/14/2017 10:52	WG998621
Chromium	28.3		1.00	1	07/14/2017 10:52	WG998621
Lead	713		0.500	1	07/14/2017 10:52	WG998621
Selenium	ND		2.00	1	07/14/2017 10:52	WG998621
Silver	ND		1.00	1	07/14/2017 10:52	WG998621

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3233407-1 07/14/17 15:37

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Mercury	U		0.0028	0.0200

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3233407-2 07/14/17 15:39 • (LCSD) R3233407-3 07/14/17 15:42

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Mercury	0.300	0.283	0.297	94	99	80-120			5	20

L922109-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L922109-02 07/14/17 15:44 • (MS) R3233407-4 07/14/17 15:46 • (MSD) R3233407-5 07/14/17 16:00

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Mercury	0.300	0.0893	0.370	0.361	93	91	1	75-125			2	20

⁷ Gl

⁸ Al

⁹ Sc



Method Blank (MB)

(MB) R3233274-1 07/14/17 09:17

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
Arsenic	U		0.65	2.00
Barium	U		0.17	0.500
Cadmium	U		0.07	0.500
Chromium	U		0.14	1.00
Lead	U		0.19	0.500
Selenium	U		0.74	2.00
Silver	U		0.28	1.00

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3233274-2 07/14/17 09:20 • (LCSD) R3233274-3 07/14/17 09:22

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Arsenic	100	110	104	110	104	80-120			5	20
Barium	100	105	107	105	107	80-120			1	20
Cadmium	100	107	104	107	104	80-120			3	20
Chromium	100	111	105	111	105	80-120			5	20
Lead	100	109	105	109	105	80-120			3	20
Selenium	100	112	106	112	106	80-120			5	20
Silver	20.0	20.1	19.0	100	95	80-120			5	20

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

L922109-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L922109-02 07/14/17 09:25 • (MS) R3233274-6 07/14/17 09:33 • (MSD) R3233274-7 07/14/17 09:51

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Arsenic	100	5.50	107	104	101	98	1	75-125			3	20
Barium	100	112	216	204	104	92	1	75-125			6	20
Cadmium	100	0.600	103	99.0	102	98	1	75-125			4	20
Chromium	100	17.5	116	111	98	93	1	75-125			4	20
Lead	100	128	237	222	109	94	1	75-125			7	20
Selenium	100	ND	101	99.1	101	99	1	75-125			2	20
Silver	20.0	ND	19.3	18.5	96	93	1	75-125			4	20



Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Rec.	Recovery.

Qualifier	Description
-----------	-------------

O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
----	---

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE**.
 * Not all certifications held by the laboratory are applicable to the results reported in the attached report.

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina ¹	DW21704
Florida	E87487	North Carolina ²	41
Georgia	NELAP	North Dakota	R-140
Georgia ¹	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky ¹	90010	South Dakota	n/a
Kentucky ²	16	Tennessee ¹⁴	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

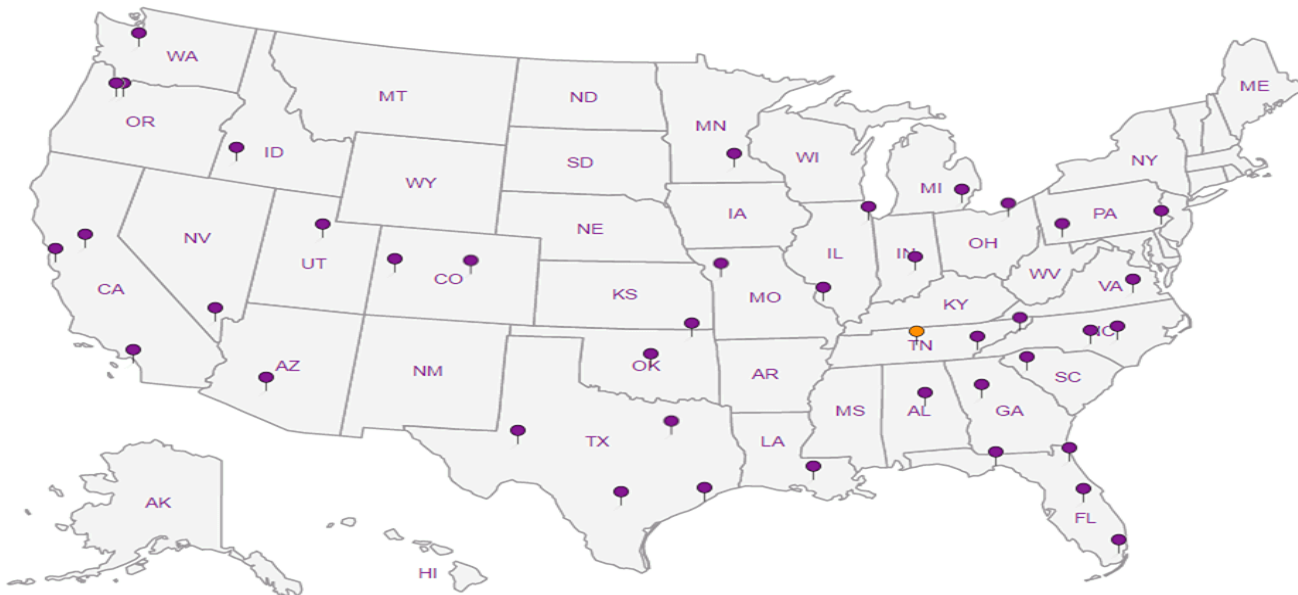
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ^{n/a} Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



GEOServices, LLC - Cleveland, TN

5559 N Lee Highway
Cleveland, TN 37312

Billing Information:

Accounts Payable
5559 N Lee Highway
Cleveland, TN 37312

Pres. Chk

Report to: *Mike Kendall*

Email To: *mKendall@geoservicesllc.com*

Project Description: *Central Avenue*

City/State Collected:

Phone: **423-614-6471**
Fax:

Client Project #
41-16337

Lab Project #

Collected by (print):
Cory Waddell

Site/Facility ID #

P.O. #

Collected by (signature):
Cory A. Waddell

Rush? (Lab MUST Be Notified)

Same Day Five Day
 Next Day 5 Day (Rad Only)
 Two Day 10 Day (Rad Only)
 Three Day

Quote #

Date Results Needed

Immediately Packed on Ice

No. of Cntrs

RCRA 8

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs																	
<i>B-40 S-4</i>			<i>6'</i>	<i>7-11-17</i>	<i>11:10</i>	<i>1</i>	<input checked="" type="checkbox"/>																
<i>B-26 S-1</i>			<i>1'</i>	<i>7-12-17</i>	<i>11:10</i>	<i>1</i>	<input checked="" type="checkbox"/>																
<i>B-37 S-1</i>			<i>1'</i>	<i>7-12-17</i>	<i>12:38</i>	<i>1</i>	<input checked="" type="checkbox"/>																
<i>B-36 S-3</i>			<i>5'</i>	<i>7-12-17</i>	<i>13:33</i>	<i>1</i>	<input checked="" type="checkbox"/>																
<i>B-3A S-1</i>			<i>1.5'</i>	<i>7-12-17</i>	<i>14:50</i>	<i>1</i>	<input checked="" type="checkbox"/>																

Chain of Custody Page ___ of ___



ESC
L · A · B · S · C · I · E · N · C · E · S

YOUR LAB OF CHOICE

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859



L# *Gr 109*
C027

Acctnum: **GEOSERCTN**
Template:
Prelogin:
TSR: **134 - Mark W. Beasley**
PB:

Shipped Via:

Remarks	Sample # (lab only)
	<i>01</i>
	<i>02</i>
	<i>07</i>
	<i>04</i>
	<i>08</i>
	<i>from</i>

- * Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other _____

Remarks:

Samples returned via:
 UPS FedEx Courier _____

Tracking # *6777 0004 8803*

pH _____ Temp _____
Flow _____ Other _____

Sample Receipt Checklist

COC Seal Present/intact:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
COC Signed/Accurate:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Bottles arrive intact:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Correct bottles used:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Sufficient volume sent:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
if Applicable	
VOA Zero Headspace:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Preservation Correct/Checked:	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N

Relinquished by: (Signature)
Cory A. Waddell

Date: *7-12-17* Time: *17:35*

Received by: (Signature) Trip Blank Received: Yes/No
[Signature] HCL/MeOH TBR

Relinquished by: (Signature)

Date: _____ Time: _____

Received by: (Signature) Temp: _____ °C Bottles Received: *5*

Relinquished by: (Signature)

Date: _____ Time: _____

Received for lab by: (Signature) Date: *7/13/17* Time: *0845*

If preservation required by Login: Date/Time
Hold: _____ Condition: *NCF / 08*

July 19, 2017

GEOServices, LLC - Cleveland, TN

Sample Delivery Group: L922969
Samples Received: 07/18/2017
Project Number: 41-16337
Description: Central Avenue

Report To: Mike Kendall
5559 N Lee Highway
Cleveland, TN 37312










Entire Report Reviewed By:



Mark W. Beasley
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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SAMPLE SUMMARY



S-1 0.5' L922969-01 Solid

Collected by Cory Waddell
 Collected date/time 07/17/17 14:30
 Received date/time 07/18/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7471A	WG999968	1	07/18/17 13:57	07/19/17 13:43	EL
Metals (ICP) by Method 6010B	WG1000082	1	07/18/17 17:16	07/19/17 03:19	CCE

¹ Cp

² Tc

³ Ss

S-2 2.5' L922969-02 Solid

Collected by Cory Waddell
 Collected date/time 07/17/17 14:50
 Received date/time 07/18/17 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Mercury by Method 7471A	WG999968	1	07/18/17 13:57	07/19/17 13:50	EL
Metals (ICP) by Method 6010B	WG1000082	1	07/18/17 17:16	07/19/17 03:22	CCE

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley
Technical Service Representative

- ¹ Cp
- ² Tc
- ³ Ss
- ⁴ Cn
- ⁵ Sr
- ⁶ Qc
- ⁷ Gl
- ⁸ Al
- ⁹ Sc



Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	0.0549		0.0200	1	07/19/2017 13:43	WG999968

1 Cp

2 Tc

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	10.6		2.00	1	07/19/2017 03:19	WG1000082
Barium	153		0.500	1	07/19/2017 03:19	WG1000082
Cadmium	ND		0.500	1	07/19/2017 03:19	WG1000082
Chromium	6.64		1.00	1	07/19/2017 03:19	WG1000082
Lead	36.8		0.500	1	07/19/2017 03:19	WG1000082
Selenium	ND		2.00	1	07/19/2017 03:19	WG1000082
Silver	ND		1.00	1	07/19/2017 03:19	WG1000082

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Mercury by Method 7471A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	0.0369		0.0200	1	07/19/2017 13:50	WG999968

¹ Cp

² Tc

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Arsenic	9.79		2.00	1	07/19/2017 03:22	WG1000082
Barium	172		0.500	1	07/19/2017 03:22	WG1000082
Cadmium	1.09		0.500	1	07/19/2017 03:22	WG1000082
Chromium	9.93		1.00	1	07/19/2017 03:22	WG1000082
Lead	134		0.500	1	07/19/2017 03:22	WG1000082
Selenium	ND		2.00	1	07/19/2017 03:22	WG1000082
Silver	ND		1.00	1	07/19/2017 03:22	WG1000082

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Method Blank (MB)

(MB) R3234478-8 07/19/17 12:58

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
Mercury	U		0.0028	0.0200

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3234478-9 07/19/17 13:01 • (LCSD) R3234478-10 07/19/17 13:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Mercury	0.300	0.277	0.266	92	89	80-120			4	20

L922860-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L922860-01 07/19/17 13:05 • (MS) R3234478-13 07/19/17 13:08 • (MSD) R3234478-14 07/19/17 13:10

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Mercury	0.300	ND	0.245	0.253	80	83	1	75-125			3	20

⁷ Gl

⁸ Al

⁹ Sc



Method Blank (MB)

(MB) R3234260-1 07/19/17 02:15

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Arsenic	U		0.65	2.00
Barium	U		0.17	0.500
Cadmium	U		0.07	0.500
Chromium	U		0.14	1.00
Lead	U		0.19	0.500
Selenium	U		0.74	2.00
Silver	U		0.28	1.00

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3234260-2 07/19/17 02:17 • (LCSD) R3234260-3 07/19/17 02:20

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Arsenic	100	102	105	102	105	80-120			3	20
Barium	100	100	102	100	102	80-120			1	20
Cadmium	100	103	105	103	105	80-120			2	20
Chromium	100	107	110	107	110	80-120			3	20
Lead	100	104	106	104	106	80-120			2	20
Selenium	100	107	111	107	111	80-120			4	20
Silver	20.0	19.2	19.8	96	99	80-120			3	20

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

L923035-26 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L923035-26 07/19/17 02:23 • (MS) R3234260-6 07/19/17 02:31 • (MSD) R3234260-7 07/19/17 02:33

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	100	2.37	95.1	93.8	93	91	1	75-125			1	20
Barium	100	118	220	215	102	97	1	75-125			2	20
Cadmium	100	ND	96.0	95.1	96	95	1	75-125			1	20
Chromium	100	13.8	109	109	95	95	1	75-125			0	20
Lead	100	14.3	118	116	103	102	1	75-125			1	20
Selenium	100	ND	97.1	95.7	97	96	1	75-125			1	20
Silver	20.0	ND	17.1	17.0	86	85	1	75-125			1	20



Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Rec.	Recovery.

Qualifier Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE**.
 * Not all certifications held by the laboratory are applicable to the results reported in the attached report.



State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina ¹	DW21704
Florida	E87487	North Carolina ²	41
Georgia	NELAP	North Dakota	R-140
Georgia ¹	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky ¹	90010	South Dakota	n/a
Kentucky ²	16	Tennessee ¹⁴	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

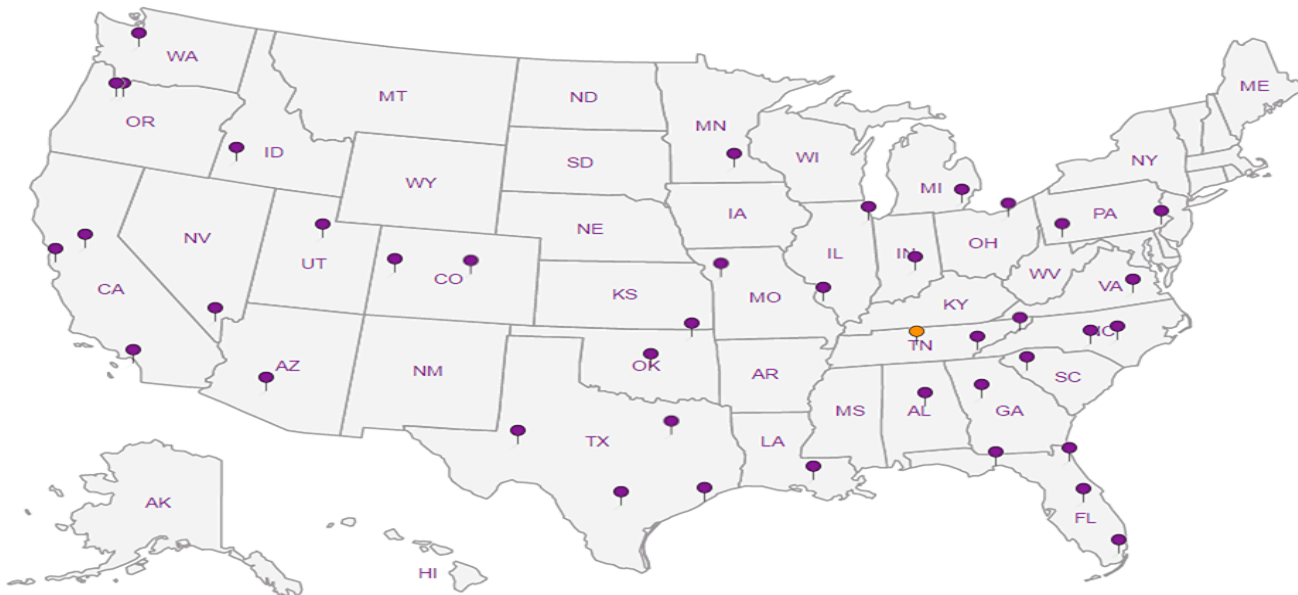
Third Party & Federal Accreditations



A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ^{n/a} Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



GEOservices, LLC - Cleveland, TN 5559 N Lee Highway Cleveland, TN 37312		Billing Information & Quote Number: Accounts Payable 5559 N Lee Highway Cleveland, TN 37312		Analysis / Container / Preservative								Chain of Custody Page ___ of ___  YOUR LAB OF CHOICE 12065 Lebanon Rd Mount Juliet, TN 37122 Phone: 615-758-5858 Phone: 800-767-5859 Fax: 615-758-5859 																	
Report to: <i>Mike Kendall</i>		Email To: <i>mKendall@geoservicesllc.com</i>		[Blank columns for analysis results]								L# <i>1922969</i> B066																	
Project Description: <i>Central Avenue</i>		City/State Collected:										Client Project # <i>41-16337</i>		Lab Project #		Acctnum: GEOSERCTN		Template:											
Phone: 423-614-6471 Fax:		Site/Facility ID #										P.O. #		Collected by (print): <i>Cory Waddell</i>		Prelogin:		TSR: 134 - Mark W. Beasley											
Collected by (signature): <i>Cory Waddell</i>		Rush? (Lab MUST Be Notified) <input type="checkbox"/> Same Day200% <input type="checkbox"/> Next Day100% <input type="checkbox"/> Two Day50% <input type="checkbox"/> Three Day25%										Date Results Needed <i>7-20-17 C.O.B.</i>		Email? <input type="checkbox"/> No <input type="checkbox"/> Yes FAX? <input type="checkbox"/> No <input type="checkbox"/> Yes		No. of Cntrs		PB:											
Immediately Packed on Ice N ___ Y ___		Sample ID										Comp/Grab		Matrix *		Depth		Date		Time		No. of Cntrs		Shipped Via:		Rem./Contaminant		Sample # (lab only)	
		<i>S-1 0.5'</i>												<i>SS</i>		<i>0.5'</i>		<i>7-17-17</i>		<i>11:30</i>		<i>1</i>		<i>X</i>		<i>-01</i>			
		<i>S-2 2.5'</i>				<i>SS</i>		<i>2.5'</i>		<i>7-17-17</i>		<i>11:50</i>		<i>1</i>		<i>X</i>		<i>02</i>											

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other _____

Remarks:				pH _____ Temp _____ Flow _____ Other _____				Hold # _____					
Relinquished by: (Signature) <i>Cory A. Waddell</i>		Date: <i>7-17-17</i>	Time: <i>11:45</i>	Received by: (Signature) <i>7176 9008 2227</i>		Samples returned via: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> Courier <input type="checkbox"/> _____		Condition: (lab use only) <i>a</i>					
Relinquished by: (Signature)		Date:	Time:	Received by: (Signature)		Temp: _____ °C <i>lab</i>		Bottles Received: <i>2402</i>		COC Seal Intact: ___ Y ___ N ___ NA			
Relinquished by: (Signature)		Date:	Time:	Received for lab by: (Signature) <i>Marina Melore</i>		Date: <i>7-18-17</i>		Time: <i>0845</i>		pH Checked:		NCF:	

ESC LAB SCIENCES Cooler Receipt Form

Client: <u>GEOSBCTN</u>	SDG#	<u>1922969</u>
Cooler Received/Opened On: <u>7/18/2017</u>	Temperature:	<u>AMB</u>
Received By: <u>Marina Malone</u>		
Signature: <u>Marina Malone</u>		

Receipt Check List	NP	Yes	No
COC Seal Present / Intact?			
COC Signed / Accurate?			
Bottles arrive intact?			
Correct bottles used?			
Sufficient volume sent?			
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?			

January 23, 2018

GEOServices, LLC - Cleveland, TN

Sample Delivery Group: L964621
Samples Received: 01/22/2018
Project Number: 41-16337
Description: Central Avenue

Report To: Mike Kendall
5559 N Lee Highway
Cleveland, TN 37312










Entire Report Reviewed By:



Mark W. Beasley
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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SAMPLE SUMMARY



S-1 L964621-01 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Polychlorinated Biphenyls (GC) by Method 8082	WG1065000	1	01/22/18 11:11	01/22/18 15:58	JNS

Collected by Mike Kendall	Collected date/time 01/16/18 08:00	Received date/time 01/22/18 08:00
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1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc

S-2 L964621-02 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Polychlorinated Biphenyls (GC) by Method 8082	WG1065000	1	01/22/18 11:11	01/22/18 16:12	JNS

Collected by Mike Kendall	Collected date/time 01/16/18 08:10	Received date/time 01/22/18 08:00
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S-3 L964621-03 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Polychlorinated Biphenyls (GC) by Method 8082	WG1065000	1	01/22/18 11:11	01/22/18 16:25	JNS

Collected by Mike Kendall	Collected date/time 01/16/18 08:15	Received date/time 01/22/18 08:00
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S-4 L964621-04 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Polychlorinated Biphenyls (GC) by Method 8082	WG1065000	1	01/22/18 11:11	01/22/18 16:39	JNS

Collected by Mike Kendall	Collected date/time 01/16/18 08:20	Received date/time 01/22/18 08:00
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S-5 L964621-05 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Polychlorinated Biphenyls (GC) by Method 8082	WG1065000	1	01/22/18 11:11	01/22/18 16:53	JNS

Collected by Mike Kendall	Collected date/time 01/16/18 08:25	Received date/time 01/22/18 08:00
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S-6 L964621-06 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Polychlorinated Biphenyls (GC) by Method 8082	WG1065000	1	01/22/18 11:11	01/22/18 17:07	JNS

Collected by Mike Kendall	Collected date/time 01/16/18 08:30	Received date/time 01/22/18 08:00
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S-7 L964621-07 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Polychlorinated Biphenyls (GC) by Method 8082	WG1065000	1	01/22/18 11:11	01/22/18 17:21	JNS

Collected by Mike Kendall	Collected date/time 01/16/18 08:40	Received date/time 01/22/18 08:00
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S-8 L964621-08 Solid

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Polychlorinated Biphenyls (GC) by Method 8082	WG1065000	1	01/22/18 11:11	01/22/18 17:34	JNS

Collected by Mike Kendall	Collected date/time 01/16/18 08:50	Received date/time 01/22/18 08:00
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SAMPLE SUMMARY



S-9 L964621-09 Solid

Collected by
Mike Kendall
Collected date/time
01/16/18 09:30
Received date/time
01/22/18 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Polychlorinated Biphenyls (GC) by Method 8082	WG1065000	1	01/22/18 11:11	01/22/18 17:48	JNS

¹Cp

²Tc

³Ss

S-10 L964621-10 Solid

Collected by
Mike Kendall
Collected date/time
01/16/18 09:45
Received date/time
01/22/18 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Polychlorinated Biphenyls (GC) by Method 8082	WG1065000	1	01/22/18 11:11	01/22/18 18:02	JNS

⁴Cn

⁵Sr

S-11 L964621-11 Solid

Collected by
Mike Kendall
Collected date/time
01/16/18 10:00
Received date/time
01/22/18 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Polychlorinated Biphenyls (GC) by Method 8082	WG1065000	1	01/22/18 11:11	01/22/18 18:16	JNS

⁶Qc

⁷Gl

S-12 L964621-12 Solid

Collected by
Mike Kendall
Collected date/time
01/16/18 10:15
Received date/time
01/22/18 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Polychlorinated Biphenyls (GC) by Method 8082	WG1065000	1	01/22/18 11:11	01/22/18 18:29	JNS

⁸Al

⁹Sc



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley
Technical Service Representative

- ¹ Cp
- ² Tc
- ³ Ss
- ⁴ Cn
- ⁵ Sr
- ⁶ Qc
- ⁷ Gl
- ⁸ Al
- ⁹ Sc



Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.0170	1	01/22/2018 15:58	WG1065000
PCB 1221	ND		0.0170	1	01/22/2018 15:58	WG1065000
PCB 1232	ND		0.0170	1	01/22/2018 15:58	WG1065000
PCB 1242	ND		0.0170	1	01/22/2018 15:58	WG1065000
PCB 1248	ND		0.0170	1	01/22/2018 15:58	WG1065000
PCB 1254	ND		0.0170	1	01/22/2018 15:58	WG1065000
PCB 1260	0.0622		0.0170	1	01/22/2018 15:58	WG1065000
(S) Decachlorobiphenyl	65.4		10.0-148		01/22/2018 15:58	WG1065000
(S) Tetrachloro-m-xylene	70.0		21.0-146		01/22/2018 15:58	WG1065000

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.0170	1	01/22/2018 16:12	WG1065000
PCB 1221	ND		0.0170	1	01/22/2018 16:12	WG1065000
PCB 1232	ND		0.0170	1	01/22/2018 16:12	WG1065000
PCB 1242	ND		0.0170	1	01/22/2018 16:12	WG1065000
PCB 1248	ND		0.0170	1	01/22/2018 16:12	WG1065000
PCB 1254	ND		0.0170	1	01/22/2018 16:12	WG1065000
PCB 1260	ND		0.0170	1	01/22/2018 16:12	WG1065000
(S) Decachlorobiphenyl	59.7		10.0-148		01/22/2018 16:12	WG1065000
(S) Tetrachloro-m-xylene	75.6		21.0-146		01/22/2018 16:12	WG1065000

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.0170	1	01/22/2018 16:25	WG1065000
PCB 1221	ND		0.0170	1	01/22/2018 16:25	WG1065000
PCB 1232	ND		0.0170	1	01/22/2018 16:25	WG1065000
PCB 1242	ND		0.0170	1	01/22/2018 16:25	WG1065000
PCB 1248	ND		0.0170	1	01/22/2018 16:25	WG1065000
PCB 1254	ND		0.0170	1	01/22/2018 16:25	WG1065000
PCB 1260	0.0411		0.0170	1	01/22/2018 16:25	WG1065000
(S) Decachlorobiphenyl	40.0		10.0-148		01/22/2018 16:25	WG1065000
(S) Tetrachloro-m-xylene	62.9		21.0-146		01/22/2018 16:25	WG1065000

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.0170	1	01/22/2018 16:39	WG1065000
PCB 1221	ND		0.0170	1	01/22/2018 16:39	WG1065000
PCB 1232	ND		0.0170	1	01/22/2018 16:39	WG1065000
PCB 1242	ND		0.0170	1	01/22/2018 16:39	WG1065000
PCB 1248	ND		0.0170	1	01/22/2018 16:39	WG1065000
PCB 1254	ND		0.0170	1	01/22/2018 16:39	WG1065000
PCB 1260	ND		0.0170	1	01/22/2018 16:39	WG1065000
(S) Decachlorobiphenyl	95.6		10.0-148		01/22/2018 16:39	WG1065000
(S) Tetrachloro-m-xylene	105		21.0-146		01/22/2018 16:39	WG1065000

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.0170	1	01/22/2018 16:53	WG1065000
PCB 1221	ND		0.0170	1	01/22/2018 16:53	WG1065000
PCB 1232	ND		0.0170	1	01/22/2018 16:53	WG1065000
PCB 1242	ND		0.0170	1	01/22/2018 16:53	WG1065000
PCB 1248	ND		0.0170	1	01/22/2018 16:53	WG1065000
PCB 1254	ND		0.0170	1	01/22/2018 16:53	WG1065000
PCB 1260	ND		0.0170	1	01/22/2018 16:53	WG1065000
(S) Decachlorobiphenyl	99.4		10.0-148		01/22/2018 16:53	WG1065000
(S) Tetrachloro-m-xylene	71.7		21.0-146		01/22/2018 16:53	WG1065000

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.0170	1	01/22/2018 17:07	WG1065000
PCB 1221	ND		0.0170	1	01/22/2018 17:07	WG1065000
PCB 1232	ND		0.0170	1	01/22/2018 17:07	WG1065000
PCB 1242	ND		0.0170	1	01/22/2018 17:07	WG1065000
PCB 1248	ND		0.0170	1	01/22/2018 17:07	WG1065000
PCB 1254	ND		0.0170	1	01/22/2018 17:07	WG1065000
PCB 1260	0.0224		0.0170	1	01/22/2018 17:07	WG1065000
(S) Decachlorobiphenyl	62.4		10.0-148		01/22/2018 17:07	WG1065000
(S) Tetrachloro-m-xylene	75.4		21.0-146		01/22/2018 17:07	WG1065000

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.0170	1	01/22/2018 17:21	WG1065000
PCB 1221	ND		0.0170	1	01/22/2018 17:21	WG1065000
PCB 1232	ND		0.0170	1	01/22/2018 17:21	WG1065000
PCB 1242	ND		0.0170	1	01/22/2018 17:21	WG1065000
PCB 1248	ND		0.0170	1	01/22/2018 17:21	WG1065000
PCB 1254	ND		0.0170	1	01/22/2018 17:21	WG1065000
PCB 1260	ND		0.0170	1	01/22/2018 17:21	WG1065000
(S) Decachlorobiphenyl	42.9		10.0-148		01/22/2018 17:21	WG1065000
(S) Tetrachloro-m-xylene	54.1		21.0-146		01/22/2018 17:21	WG1065000

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.0170	1	01/22/2018 17:34	WG1065000
PCB 1221	ND		0.0170	1	01/22/2018 17:34	WG1065000
PCB 1232	ND		0.0170	1	01/22/2018 17:34	WG1065000
PCB 1242	ND		0.0170	1	01/22/2018 17:34	WG1065000
PCB 1248	ND		0.0170	1	01/22/2018 17:34	WG1065000
PCB 1254	ND		0.0170	1	01/22/2018 17:34	WG1065000
PCB 1260	ND		0.0170	1	01/22/2018 17:34	WG1065000
(S) Decachlorobiphenyl	45.8		10.0-148		01/22/2018 17:34	WG1065000
(S) Tetrachloro-m-xylene	45.4		21.0-146		01/22/2018 17:34	WG1065000

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.0170	1	01/22/2018 17:48	WG1065000
PCB 1221	ND		0.0170	1	01/22/2018 17:48	WG1065000
PCB 1232	ND		0.0170	1	01/22/2018 17:48	WG1065000
PCB 1242	ND		0.0170	1	01/22/2018 17:48	WG1065000
PCB 1248	ND		0.0170	1	01/22/2018 17:48	WG1065000
PCB 1254	ND		0.0170	1	01/22/2018 17:48	WG1065000
PCB 1260	0.0568		0.0170	1	01/22/2018 17:48	WG1065000
(S) Decachlorobiphenyl	76.4		10.0-148		01/22/2018 17:48	WG1065000
(S) Tetrachloro-m-xylene	81.2		21.0-146		01/22/2018 17:48	WG1065000

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.0170	1	01/22/2018 18:02	WG1065000
PCB 1221	ND		0.0170	1	01/22/2018 18:02	WG1065000
PCB 1232	ND		0.0170	1	01/22/2018 18:02	WG1065000
PCB 1242	ND		0.0170	1	01/22/2018 18:02	WG1065000
PCB 1248	ND		0.0170	1	01/22/2018 18:02	WG1065000
PCB 1254	ND		0.0170	1	01/22/2018 18:02	WG1065000
PCB 1260	ND		0.0170	1	01/22/2018 18:02	WG1065000
(S) Decachlorobiphenyl	122		10.0-148		01/22/2018 18:02	WG1065000
(S) Tetrachloro-m-xylene	93.3		21.0-146		01/22/2018 18:02	WG1065000

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.0170	1	01/22/2018 18:16	WG1065000
PCB 1221	ND		0.0170	1	01/22/2018 18:16	WG1065000
PCB 1232	ND		0.0170	1	01/22/2018 18:16	WG1065000
PCB 1242	ND		0.0170	1	01/22/2018 18:16	WG1065000
PCB 1248	ND		0.0170	1	01/22/2018 18:16	WG1065000
PCB 1254	ND		0.0170	1	01/22/2018 18:16	WG1065000
PCB 1260	ND		0.0170	1	01/22/2018 18:16	WG1065000
(S) Decachlorobiphenyl	119		10.0-148		01/22/2018 18:16	WG1065000
(S) Tetrachloro-m-xylene	93.6		21.0-146		01/22/2018 18:16	WG1065000

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Polychlorinated Biphenyls (GC) by Method 8082

Analyte	Result mg/kg	Qualifier	RDL mg/kg	Dilution	Analysis date / time	Batch
PCB 1016	ND		0.0170	1	01/22/2018 18:29	WG1065000
PCB 1221	ND		0.0170	1	01/22/2018 18:29	WG1065000
PCB 1232	ND		0.0170	1	01/22/2018 18:29	WG1065000
PCB 1242	ND		0.0170	1	01/22/2018 18:29	WG1065000
PCB 1248	ND		0.0170	1	01/22/2018 18:29	WG1065000
PCB 1254	ND		0.0170	1	01/22/2018 18:29	WG1065000
PCB 1260	0.0373		0.0170	1	01/22/2018 18:29	WG1065000
(S) Decachlorobiphenyl	60.1		10.0-148		01/22/2018 18:29	WG1065000
(S) Tetrachloro-m-xylene	61.0		21.0-146		01/22/2018 18:29	WG1065000

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3281024-3 01/22/18 15:44

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
PCB 1016	U		0.00350	0.0170
PCB 1221	U		0.00537	0.0170
PCB 1232	U		0.00417	0.0170
PCB 1242	U		0.00318	0.0170
PCB 1248	U		0.00315	0.0170
PCB 1254	U		0.00472	0.0170
PCB 1260	U		0.00494	0.0170
(S) Decachlorobiphenyl	73.8			10.0-148
(S) Tetrachloro-m-xylene	75.2			21.0-146

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3281024-1 01/22/18 15:16 • (LCSD) R3281024-2 01/22/18 15:30

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
PCB 1260	0.167	0.138	0.135	82.5	80.8	37.0-145			2.05	37
PCB 1016	0.167	0.158	0.147	94.5	88.2	36.0-141			6.87	35
(S) Decachlorobiphenyl				72.1	79.5	10.0-148				
(S) Tetrachloro-m-xylene				77.6	77.8	21.0-146				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
 * Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey-NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina ¹	DW21704
Florida	E87487	North Carolina ²	41
Georgia	NELAP	North Dakota	R-140
Georgia ¹	923	Ohio-VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky ¹	90010	South Dakota	n/a
Kentucky ²	16	Tennessee ^{1,4}	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

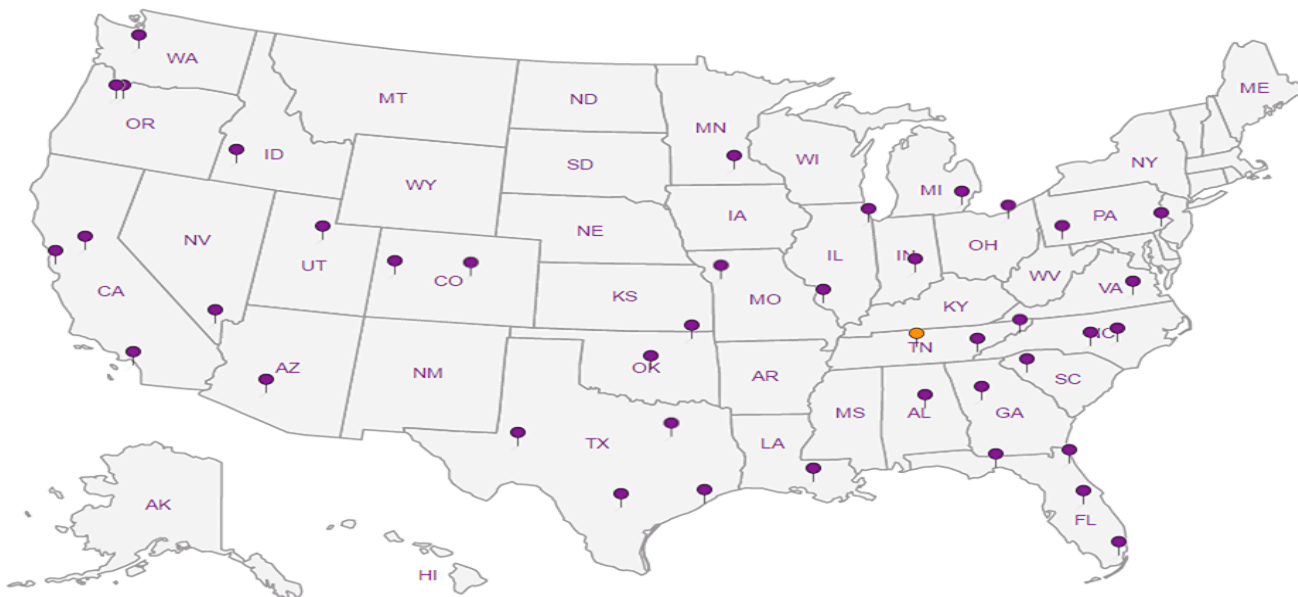
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA-Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold n/a Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.





Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Qualifier Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

GEOservices, LLC - Cleveland, TN
 5559 N Lee Highway
 Cleveland, TN 37312

Billing Information:
Accounts Payable
 5559 N Lee Highway
 Cleveland, TN 37312

Pres
 Chk

Analysis / Container / Preservative

Chain of Custody Page 1 of 2



YOUR LAB OF CHOICE
 12065 Lebanon Rd
 Mount Juliet, TN 37122
 Phone: 615-758-5858
 Phone: 800-767-5859
 Fax: 615-758-5859



Report to: **MIKE KENDALL**

Email To: **Mkendall@geoservicesllc.com**

Project Description: **CENTRAL AVE. Extension**

City/State Collected: **Clatsburg, TN**

Phone: **423-614-6471**
 Fax:

Client Project #
41-16337

Lab Project #

Collected by (print):
MIKE KENDALL

Site/Facility ID #
N/A

P.O. #
41-16337

Collected by (signature):
 Immediately
 Packed on Ice N ___ Y ___

Rush? (Lab MUST Be Notified)
 ___ Same Day ___ Five Day
 ___ Next Day ___ 5 Day (Rad Only)
 ___ Two Day ___ 10 Day (Rad Only)
 ___ Three Day

Quote #
 Date Results Needed
1/24/2018 AM

No. of
 Cntrs

R.B.'S

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs
S-1	Grab	SS	0-1	1/16	8:00	X
S-2					8:10	X
S-3					8:15	X
S-4					8:20	X
S-5					8:25	X
S-6					8:30	X
S-7					8:40	X
S-8					8:50	X
S-9					9:30	X
S-10					9:45	X

L# **964621**
E068
 Acctnum: **GEOERCTN**
 Template:
 Prelogin:
 TSR: **134 - Mark W. Beasley**
 PB:
 Shipped Via:

* Matrix:
 SS - Soil AIR - Air F - Filter
 GW - Groundwater B - Bioassay
 WW - WasteWater
 DW - Drinking Water
 OT - Other

Remarks:
 pH _____ Temp _____
 Flow _____ Other _____
 Samples returned via:
 ___ UPS ___ FedEx ___ Courier _____ Tracking #

Sample Receipt Checklist
 COC Seal Present/Intact: Y N
 COC Signed/Accurate: Y N
 Bottles arrive intact: Y N
 Correct bottles used: Y N
 Sufficient volume sent: Y N
 if Applicable
 VOA Zero Headspace: Y N
 Preservation Correct/Checked: Y N

Relinquished by: (Signature)
Michael Kendall
 Date: **1/16/2016**

Date: _____
 Time: _____

Received by: (Signature)
 Received by: (Signature)
 Received for lab by: (Signature)

Trip Blank Received: Yes / No
 HCL / MeOH
 TBR
 Temp: **4.2** °C
 Bottles Received: **12/1/18**
 Date: **1-22-18** Time: **Other**

If preservation required by Login: Date/Time
 Hold:
 Condition:
 NCF / **OK**

GEOservices, LLC - Cleveland, TN

5559 N Lee Highway
Cleveland, TN 37312

Billing Information:

Accounts Payable
5559 N Lee Highway
Cleveland, TN 37312

Pres
Chk

Analysis / Container / Preservative

ESC
L.A.B S.C.I.E.N.C.E.S

YOUR LAB OF CHOICE

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859



Report to:

Email To:

Project Description: **SEE PAGE 1**

City/State Collected:

Phone: 423-614-6471
Fax:

Client Project #

Lab Project #

Collected by (print):

Site/Facility ID #

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)

Quote #

- ___ Same Day ___ Five Day
- ___ Next Day ___ 5 Day (Rad Only)
- ___ Two Day ___ 10 Day (Rad Only)
- ___ Three Day

Date Results Needed

1/24/18 AM

Immediately Packed on Ice N ___ Y ___

No. of
Cnts

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cnts	Analysis / Container / Preservative	Remarks	Sample # (lab only)
S-11	GRAB	SS	0.1	1/16	10:00	X			11
S-12	↓	SS	0.1	1/16	10:15	X			12

- * Matrix:
- SS - Soil AIR - Air F - Filter
- GW - Groundwater B - Bioassay
- WW - WasteWater
- DW - Drinking Water
- OT - Other

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
 ___ UPS ___ FedEx ___ Courier _____

Tracking #

Sample Receipt Checklist

COC Seal Present/Intact: Y N

COC Signed/Accurate: Y N

Bottles arrive intact: Y N

Correct bottles used: Y N

Sufficient volume sent: Y N

If Applicable

VOA Zero HeadSpace: Y N

Preservation Correct/Checked: Y N

Relinquished by: (Signature) <i>[Signature]</i>	Date: 1/16/2018	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeOH TBR
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: 4.2 °C Bottles Received: 12/42
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature) <i>[Signature]</i>	Date: 1-22-18 Time: 10:00
Hold:				Condition: NCF / OK