February 12, 2025

ADDENDUM NO. 1

PROJECT: Eastgate Avenue- Division Street to LeCompte Road- 2023PW0068

Please be advised of the following:

CLARIFICATION ITEMS (for addendum)

1. There has been no addendum prior to this addendum.
2. The Prebid meeting Sign in sheet from the 2-11-25 meeting is attached
3. The Prebid meeting Minutes from the 2-11-25 are attached.
4. Prebid Agenda and Minutes
5. Revised Bid Form
6. Revised JSP #5 – "Required Contract Milestones"
7. Revised JSP #31 – "Removal of Trail Paving from project"
8. Revised JSP #32 – "CU Electric Street lighting"
9. Geotechnical Engineering Report- Palmerton and Parrish-Eastgate
10. Storm Water Pollution Prevention Plan (SWPPP plan)
11. Removal of retaining wall from the Eastgate project bid. Replaced by grading.

Prebid Question

J) A Question was asked if "Blasting is allowed on the Eastgate project?" The answer is YES blasting will be allowed on the Eastgate project, but the Springfield Underground will need to review and approve any and all blasting plans prior to commencement of blasting.

PLANS SHEETS

1. Revised Plan Sheet #2
2. Revised Plan Sheet #4- Typical Sections
3. Revised Plan Sheet #5 - Typical Sections
4. Revised Plan Sheet #22 – Roadway plan and profile
5. Revised Plan Sheet #39 – Storm plan and profile
6. Revised Plan Sheet #47 – Storm plan and profile
7. Revised Plan Sheet #50 – Removal of retaining wall
8. Revised Plan Sheet #53 – Erosion Control Plan
9. Revised Plan Sheet #59 – Division and Eastgate Signal Plan
10. Revised Plan Sheet #60 – Division and Eastgate Signal Plan
11. Revised Plan Sheet #61 – Division and Eastgate Signal Plan
12. Revised Plan Sheet #63 – Division and Eastgate Signal Plan
13. Revised Plan Sheet #75 – Eastgate Cross Sections
14. Revised Plan Sheet #76 – Eastgate Cross Sections

In order to have a valid bid proposal, this addendum must be acknowledged and returned with your bid proposal.

If you have any questions concerning this addendum, please feel free to contact King Coltrin at (417) 864-1917.

king coltrin

King Coltrin,PE
Public Works Department
City of Springfield, Missouri

Acknowledgement by Bidder:

_____ _____

Representative Date

_____Company

Eastgate Avenue Improvements- Division Street to LeComopte Road

BID OPENING

February 11, 2025

2023PW0057

PLEASE PRINT LEGIBLY!!

NAME	COMPANY/ORGANIZATION	TELEPHONE		E-MAIL
King Coltrin	City of Springfield	417-864-1917		King.Coltrin@springfieldmo.gov
Chris Carsten	RBE	816-964-0450		ccarsten@rbemidwest.com
GAREN McELROY	RBE	417-209-5435		gmcelroy@rbemidwest.com
Chris Burstadt	JD Wallace	(918) 250 1181		Chris@jdwallace.co
Dave Ewing	Midwest Traffic	417-827-1490		daveewing@midwesttss.com
MARK MAIS	CMT	417-429-7077		mmais@cmteng.com
Jason Clark	CMT	417-799-6255		jclark@cmteng.com
Kyle Roy	ESS	417-209-1641		kyle.roy@emerysapp.com
Jack Rowden	ESS	417-209-1641		jack.rowden@emerysapp.com
JIM FISHER	KCI	417-684-2179		JFISHER@KCICONSTRUCTION.com
JON CRAWFORD	HARTMAN & Co	417-830-7026		JONCRAWFORD@HARTMANCOMO.COM
Kyle Matthews	APAC	(417)429-3938		kylesmatthews@apac.com
Paula Brookshire	City of Springfield	417-864-1989		pbrookshire@springfieldmo.gov
Paul Moody	ESS	417-893-9333		Paul.Moody@emerysapp.com
Steve Eaff	D+E	4177255300		DEPLBG81@Yahoo.Com

AGENDA

1) Contacts
   a) Owner Contact(s):

      King Coltrin, P.E. – City of Springfield; Phone: (417) 864-1917
      King went through the agenda items item by item.

      – Construction Inspection, City of Springfield; Phone: (417)

   b) Consultant Contact(s):

      Jason Clark, CMT

2) Project Schedules

a)	Bid Opening:	February 18, 2025 at 10:00 AM 840 N Boonville (**2 East** – Busch Building) 841 It was noted that the bid opening is in 2 East
b)	Anticipated Notice to Proceed:	April, 2025
c)	Time Allotted for Project:	180 Calendar Days- Review JSP-02
d)	Liquidated Damages:	Review JSP-02 $3,800 per each calendar day

3) Bidding and Contract Requirements
   a) The Contractor shall seal their bid in an envelope and clearly mark the outside with the name of the Project and company name/letterhead.
   b) Required with each bid:
      i) Bid Proposal
      ii) Bid Bond (5%)
      iii) Subcontractors List & Disclosure Forms
      iv) Anti-Collusion Statement
      v) Statement of Bidders Qualifications
      vi) Acknowledgement of Addendums
   c) Date for last addendum to be issued will be Friday, February 14, 2025. All questions should be asked in writing, and submitted before 5:00 p.m. Thursday, February 13th, 2025.
   d) Project is exempt from Sales Tax
      i) Tax exemption certificate will be furnished to the General Contractor.
      ii) It is the General Contractor's responsibility to ensure that copies of the certificate are provided to other necessary parties, as outlined in RSMo 144.062.3
   e) Prevailing Wages
      i) Prevailing Wage – Wage Order 31
      ii) Prevailing Wage rates have been included.
      iii) Payrolls shall be submitted weekly for the project. Payrolls may be submitted electronically with approved electronic signature. Instructions for email and/or paper submittals of payrolls will be given at the pre-construction meeting.

f) Weather Delays.
   i) In general, there will be no extension of Contract time due to weather.
g) Review what is needed at the time contracts is signed, such as Payment Bond (100% of base bid) and a Labor & Materials Bond (100% of base bid), Insurance with endorsements, OSHA 10-hr, E-Verify & MOU, Conflicts of Interest, Anti-Discrimination Against Israel Act.
   i) Insurance – NO OCP REQUIRED

4) Project Description – Project consists of construction of curb and gutter, three-lane roadway and pavement, storm water collection and conveyance, signalized intersection improvements at Division Street. Construction will be in accordance with the set of plans prepared by the City of Springfield.

5) Special Provisions
   a) Use of Site
      i) Maximum area to be occupied by contractor shall be within street right-of-way and any easements given by property owners.
      ii) Maintain access to properties
   b) Street/lane/sidewalk closures
      i) Anticipated.
         (1) Sidewalk closure is anticipated, and contractor shall have adequate traffic control devices in place to reroute pedestrians to other sidewalks.
         (2) Refer to JSP-03 for additional information.
   c) Submittals and Samples
      i) Any submittals shall be provided and approved prior to start of construction.
   d) Temporary erosion control and sediment control.
      i) BMP's shall be in place prior to excavation and pass an initial BMP inspection
      ii) Spenser Morrissey will conduct weekly inspection of the site's BMPs.
         (1) If corrective actions are needed, a report will be sent to the PM.
            (a) Unless egregious, you will have 7 calendar days to address any corrective action.
      iii) Keep in mind, the work site is in a highly visible area
         (1) Stay on top of track-out
         (2) Assure all BMPs are functioning properly
      iv) Tree Removal – Tree removal and tree protection fencing are needed as shown on the plans.
      v) Contractor will be responsible for providing **CLEAN RUNOFF**.
   e) Progress Schedule
      i) Schedule will be required to be submitted at the pre-construction meeting and updated every two weeks. Please refer to JSP-05. Project schedule must have written acceptance by the City before any work may begin.
         (a) Anticipated NTP: April 2025
         (b) 180 Calendar days for Construction
   f) Construction Staking – Provided by Contractor.
   g) Property Owner Agreements
      (1) Maintain vehicular access

i) Utility Discussion –
   i) Multiple utilities in the area. Use extreme caution when excavating.
      (1) Contractor shall comply with the Missouri Overhead Powerline Safety Act; this statute makes it illegal for an unauthorized person or entity to work or bring equipment within 10 feet of a high voltage line that has not been covered or de-energized. The purpose of the Missouri Overhead Powerline Safety Act is to ensure the safety of the public when working around overhead power lines.
      (2) If Contractor needs line cover when working near City Utilities overhead facilities, they shall contact City Utilities Developer Services (@ 417-831-8888) **10 days** ahead of the date that line cover is required. City Utilities installation of line cover for municipally-driven projects (by City of Springfield, MoDOT, Greene County Highway Department projects, and etc) is ***free-of-charge***.
   ii) Contractor must coordinate with all utilities.
   iii) Please refer to JSPs for more information.

j) Maintain project site – in a neat, clean, and organized manner. Premises shall be cleaned on a daily basis. This will include sweeping, removing mud, and keeping work zone items clean. Workmen shall be courteous and polite at all times. Obscene language, gestures, etc. will not be tolerated. The City reserves the right to issue a stop work order if the work zone is not maintained in a clean, safe, and professional manner.

It was noted that there is work currently being performed on site to relocate the CU large water lines, install some storm inlets and lines and cut the profile of Eastgate north of Division. CMT explained that the quantities reflect this work being done by others.
Also noted that this work does not include work on Division Street.

6) <u>Items that will be added on Addendum #1</u>

A) Prebid Agenda and Minutes will be sent out in the Addendum #1
B) Revised Bid Form
C) Prebid sign in sheet will be sent out in the Addendum #1
D) Revised JSP #5 – "Required Contract Milestones" will be sent out in the Addendum #1
E) Revised JSP #31 – "Removal of Trail Paving from project" will be sent out in the Addendum #1
F) Revised JSP #32 – "CU Electric Street lighting" will be sent out in the Addendum #1
G) Geotechnical Engineering Report- Palmerton and Parrish
H) SWPPP forms
I) Removal of retaining wall from the project. Replaced by grading.
J) A Question was asked if "Blasting is allowed on the Eastgate project?" The answer is YES blasting will be allowed on the Eastgate project, but the Springfield Underground will need to review and approve any and all blasting plans prior to commencement.
K) Revised Inlet 1B, on sheet 39
L) Remove light pole LUM-5, Sheet 59, Sta 117+57.53. Off 75.8' LT
M) Revised Division Street typical sections showed the old plans leaving a 6' wide strip of existing pavement between the median and the north side of Division Street (between Sta 110+48 and 118+63). Shown in Plans and Quantities.

Notes:_____

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F) Geotechnical Engineering Report- Palmerton and Parrish
G) SWPPP forms
H) Removal of

Notes:_____

SCHEDULE A- CITY OF SPRINGFIELD STANDARD PAY ITEMS

ITEM NO.		DESCRIPTION	QTY	UNIT TYPE	UNIT PRICE	EXTENDED PRICE
1	COS-3.2.5.5.1	Earth Embankment (Compacting)	2662	CY	$	$
2	COS-3.2.4.2	Excavation	15790	CY	$	$
3	COS-3.5.4.2	Miscellaneous Removals	1	LS	$	$
4	COS-3.6.4.1	Asphalt Pavement Removal	1669	SY	$	$
5	COS-3.6.4.2	Concrete Pavement Removal	2436	SY	$	$
6	COS-3.6.4.3	Curb Removal	16	LF	$	$
7	COS-3.6.4.5	Sidewalk Removal	18	SY	$	$
8	COS-5.1.5.1.15	Circular Storm Pipe (15")	1410	LF	$	$
9	COS-5.1.5.1.18	Circular Storm Pipe (18")	24	LF	$	$
10	COS-5.1.5.1.24	Circular Storm Pipe (24")	512	LF	$	$
11	COS-5.1.5.1.30	Circular Storm Pipe (30")	628	LF	$	$
12	COS-5.1.5.1.36	Circular Storm Pipe (36")	202	LF	$	$
13	COS-5.1.5.1.48	Circular Storm Pipe (48")	695	LF	$	$
14	COS-5.1.5.5.15	15" Concrete Flared End Section	3	EA	$	$
15	COS-5.1.5.5.24	24" Concrete Flared End Section	1	EA	$	$
16	COS-5.1.5.5.48	48" Concrete Flared End Section	1	EA	$	$
17	COS-5.2.5.1.72.72	SS-1 Junction Box (6'x6')	2	EA	$	$
18	COS-5.2.5.2.48	SS-2 Storm Sewer Manhole (4' Dia.)	1	EA	$	$
19		INTENTIONALLY LEFT BLANK			$	$
20	COS-5.2.5.5.60.60	SS-5 Area Inlet (5'x5')	4	EA	$	$
21	COS-5.2.5.6.84.36	SS-6 Curb Inlet (7'x3')	18	EA	$	$
22	COS-5.2.5.6.84.48	SS-6 Curb Inlet Modified (7'x4')	5	EA	$	$
23	COS-5.2.5.6.84.60	SS-6 Curb Inlet Modified (7'x5')	4	EA	$	$
24	COS-7.6.6	Construction Surveying	1	LS	$	$
25	COS-7.7.6	Temporary Traffic Control	1	LS	$	$
26	COS-8.1.5	Portland Cement Concrete Curb & Gutter (30" Wide)	6296	LF	$	$
27	COS-10.5.1.4	4" Concrete Sidewalk & Multi-Use Path	17377	SF	$	$
28	COS-10.5.2.6	Concrete ADA Ramp	1315	SF	$	$
29	COS-10.5.3.8	Concrete Driveway	2882	SF	$	$
30	COS-11.8.11.5.2.2	2" Asphalt Surface Course (BP-1 W/PG64-22)	14240	SY	$	$
31	COS-11.8.11.5.3.9	9" Asphalt Base Course (BP1 W/PG64-22)	14240	SY	$	$
32	COS-11.8.11.5.4.6	6" Type 5 Aggregate Base	14240	SY	$	$

ITEM NO.		DESCRIPTION	QTY	UNIT TYPE	UNIT PRICE	EXTENDED PRICE
33	COS-13.1.5	Seeding	3	AC	$	$
34	COS-16.8.2.1	Construction Exit	2	EA	$	$
35	COS-16.8.2.3	Compost Filter Sock	3570	LF	$	$
36	COS-16.8.2.4	Inlet Protection	45	EA	$	$
37	COS-16.8.2.5	Rock Check Dam	17	EA	$	$
38	MoDOT-2063000	Class 3 Excavation	21	CY	$	$
39	MoDOT-2063100	Class 3 Excavation in Rock	3	CY	$	$
40	MoDOT-3040504	Type 5 Aggregate for Base (4 in. Thick)	1931	SY	$	$
41	MoDOT-4019905	Misc. (12 Inches, Bituminous Pavement)	8084	SY	$	$
42	MoDOT-6081000	Concrete Median	434	SY	$	$
43	MoDOT-6091052	Curb and Gutter Type B	905	LF	$	$
44	MoDOT-6097000	Rock Lining	15	CY	$	$
45	MoDOT-6141120	Curved Vane Grate and Frame (2'x2')	3	EA	$	$
46	MoDOT-6200015	Preformed Thermoplastic Pavement Marking, 24 In. White	260	LF	$	$
47	MoDOT-6200018	Preformed Thermoplastic Pavement Marking, 24 In. Yellow	164	LF	$	$
48	MoDOT-6200021	Preformed Thermoplastic Pavement Marking, Left/Right Arrow	11	EA	$	$
49	MoDOT-6200036	Preformed Thermoplastic Pavement Marking, 30 In. White	42	EA	$	$
50	MoDOT-6200042	Preformed Thermoplastic Pavement Marking, 12 In. White, Yield Line Triangles	18	EA	$	$
51	MoDOT-6205901A	4 In. Yellow High Build Waterborne Pavement Marking Paint, Type L Beads	2934	LF	$	$
52	MoDOT-6205902A	6 In. White High Build Waterborne Pavement Marking Paint, Type L Beads	2413	LF	$	$
53	MoDOT-6205906A	12 In. White High Build Waterborne Pavement Marking Paint, Type L Beads	391	LF	$	$
54	MoDOT-620993	Misc. (4 In. White High Build Waterborne Pavement Marking Paint, Type L Beads)	616	LF	$	$

ITEM NO.		DESCRIPTION	QTY	UNIT TYPE	UNIT PRICE	EXTENDED PRICE
55	MoDOT-6209903(1)	Misc. (12 In. Yellow High Build Waterborne Pavement Marking Paint, Type L Beads)	1276	LF	$	$
56	MoDOT-7311022	Precast Concrete Drop Inlet (2'x2')	15	LF	$	$
57		INTENTIONALLY LEFT BLANK			$	$
58		INTENTIONALLY LEFT BLANK			$	$
59	MoDOT-9020113	Signal Head, Type 3T	1	EA	$	$
60	MoDOT-9020513	Signal Head, Type 3B	9	EA	$	$
61	MoDOT-9020514	Signal Head, Type 4B	3	EA	$	$
62	MoDOT-9020811	Signal Head, Type 1S, Pedestrian	4	EA	$	$
63	MoDOT-9020833	SH-Flat Sheet - Signal Sign	63	SF	$	$
64	MoDOT-9020834	Signal Sign, Mounting Hardware	7	EA	$	$
65	MoDOT-9022651	Luminaire LED-A, 120 Volt Compatible	4	EA	$	$
66	MoDOT-9022708	Post, Signal 8 FT.	2	EA	$	$
67	MoDOT-9022715	Post, Signal 15 FT.	1	EA	$	$
68	MoDOT-9023145	Post, Type CL, 45 FT. Arm or 13.7M Arm	1	EA	$	$
69	MoDOT-9023155	Post, Type CL, 55 FT. Arm	1	EA	$	$
70	MoDOT-9023450	Post, Type BL, Longest Arm 50 FT. or 15.2M	1	EA	$	$
71	MoDOT-9025200	Conduit, 2 IN., Trench with Tracer Wire	23	LF	$	$
72	MoDOT-9025300	Conduit, 3 IN., Trench with Tracer Wire	310	LF	$	$
73	MoDOT-9027300	Conduit, 3 IN., Pushed with Tracer Wire	202	LF	$	$
74	MoDOT-9028100	Cable, 10 AWG 1 Conductor, Pole and Bracket	190	LF	$	$
75	MoDOT-9028208	Cable, 8 AWG 1 Conductor, Power	100	LF	$	$
76	MoDOT-9028308	Cable, 16 AWG 2 Conductor	650	LF	$	$
77	MoDOT-9028310	Cable, 16 AWG 5 Conductor	650	LF	$	$
78	MoDOT-9028311	Cable, 16 AWG 7 Conductor	3000	LF	$	$
79	MoDOT-9028302	Cable, 12 AWG 2 Conductor	720	LF	$	$
80	MoDOT-9028621	Power Supply Assembly, Type 2 with 120V Lighting Control Cabinet	1	EA	$	$

ITEM NO.		DESCRIPTION	QTY	UNIT TYPE	UNIT PRICE	EXTENDED PRICE
81	MoDOT-9028810	Pull Box, Preformed Class 1	1	EA	$	$
82	MoDOT-9028811	Pull Box, Preformed Class 2	2	EA	$	$
83	MoDOT-9028812	Pull Box, Preformed Class 3	1	EA	$	$
84	MoDOT-9028821	Pull Box, Concrete, Double, Type A	1	EA	$	$
85	MoDOT-9029100	Base, Concrete	13.2	CY	$	$
86	MoDOT-9029902	Misc. (Signal Controller)	1	EA	$	$
87	MoDOT-9029902(1)	Misc. (Contractor Furnished, Contractor Installed Radar Detection System)	1	EA	$	$
88	MoDOT-9029902(3)	Misc. (Audible Pedestrian Pushbutton and Signing)	4	EA	$	$
89	MoDOT-9029902(4)	Misc. (Battery Backup System on Type II Power Supply)	1	EA	$	$
90	MoDOT-9029902(5)	Misc. (Wireless Connection)	2	EA	$	$
91	MoDOT-9029903	Misc. (Radar 6 Conductor)	900	LF	$	$
92	MoDOT-9031010	Concrete Footings, Embedded	0.2	CY	$	$
93	MoDOT-9031210	Structural Steel Posts	230	LB	$	$
94	MoDOT-9031241	Breakaway Assembly (Perforated Square Steel Tube)	5	EA	$	$
95	MoDOT-9031270A	2 In. PSST Post - 12 GA	113	LF	$	$
96	MoDOT-9031271A	Driven Post Anchor for 2 In. PSST - 12 GA	9	EA	$	$
97	MoDOT-9031280	2.5 In. PSST Post - 7 GA	63	LF	$	$
98	MoDOT-9031281A	Driven Post Anchor for 2.5 In. PSST - 7 GA	5	EA	$	$
99	MoDOT-9035004A	SH-Flat Sheet	90	SF	$	$
100	MoDOT-9103700	CCTV Camera Assembly, Installed	1	EA	$	$
101	MoDOT-9109903	Misc. (CAT6 Ethernet Cable)	360	LF	$	$
SCHEDULE A SUBTOTAL					$	

SCHEDULE B - Job Special Provisions

ITEM NO.		DESCRIPTION	QTY	UNIT TYPE	UNIT PRICE	EXTENDED PRICE
102	JSP-12	Mobilization	1	LS	$	$
103	JSP-13	Tied Concrete Block Mat	600	SF	$	$
104		INTENTIONALLY LEFT BLANK			$	$
105	JSP-25	Seed & Erosion Control Blanket	12467	SY	$	$
106	JSP-28	Type A Pipe Collar	1	EA	$	$
SCHEDULE B SUBTOTAL					**$**	

SCHEDULE C - CITY UTILITIES ELECTRIC

***SPECIAL NOTE:** CONDUIT ELBOW(S), CONDUIT COUPLINGS AND CONDUIT PLUGS ARE **NOT** INCLUDED IN THE ELECTRIC QUANTITIES BID ITEM ESTIMATE. THESE ITEMS SHALL BE CONSIDERED INCIDENTAL TO OTHER BID ITEMS. ADJUST CORRESPONDING BID PRICES FOR PEDESTAL(S), JUNCTION CABINET(S), CONDUIT OR ETC. AS NECESSARY TO COVER COST OF INCIDENTAL ITEMS.

ITEM NO.		DESCRIPTION	QTY	UNIT TYPE	UNIT PRICE	EXTENDED PRICE
107	CU-1	Install Concrete Streetlight Pole Foundation W/Rebar (CF24)	19	EA	$	$
108	CU-2	Furnish/Install Secondary Riser Start (SR-2CP)	2	EA	$	$
109	CU-3	Install Secondary Pedestal (SP-2C)	2	EA	$	$
110	CU-4	Install 2" PVC Conduit in Trench (PVC-2)	3658	FT	$	$
SCHEDULE C SUBTOTAL					$	

TOTAL BID	$

Job Special Provision-05 - Required Contract Milestones

Eastgate Avenue – Division to LeCompte Road
Project No. 2023PW0068

Required Contract Milestones

1.0 **Project Schedule**. This JSP modifies General Condition GC-2-2.05.A.1 and GC-2-6.04 Progress Schedule by requiring the following Milestones to be included in the Progress Schedule. The purpose of these milestones to keep the public informed of various phases of the project that may affect their business operations.

2.0 **Required Project Milestones.** The contractor shall develop and maintain a construction Progress Schedule that includes the following Milestones. The contractor is encouraged to include additional milestones as needed. Additional Milestones maybe required by the owner as construction progresses.

1

- Notice to Proceed for Construction
- Electric work start and finish
- Any street closure or overnight street closure
- Each phase of the Temporary Traffic Control and Phasing Plan
- Signal Operations including installation of temporary traffic signals
- Paving Operations
- Substantial Completion

Job Special Provision-31 – Removal of Trail Paving from project

Eastgate Improvements (Division– Le Compte)
Project No. 2023PW0068

1.0 Description.

A TAP grant from MoDOT to cover the cost of the paving the 10 foot wide shared use path associated with the Eastgate Avenue Extension project has been awarded to the City of Springfield.

The paving of the shared use path (aggregate and concrete placing) will be done with the TAP grant project in the future. This will be a separate project bid at a later date.
The grading of and compacting for the share use trail along Eastgate will be performed in the Eastgate Avenue Extension project number 2023PW0068.

The successful low bidder will be allowed to bid on the TAP project as well.

2.0 Construction Requirements.

3.0 Basis of Payment. This grading and compaction is considered incidental to the project.

Job Special Provision-32 CU Electric Street lighting

Eastgate Improvements (Division Street– Le Compte)
Project No. 2023PW0068

2.0 Description. This items covers the installation of 19 CU standard street light foundations. The City Utiltites Electric plans were not available at the time of Bidding of Eastgate Avenue Extension. The Quantities for the construction of the 19 street light bases and the associated 2” conduit, secondary risers, secondary pedestal are included in the Eastgate bid.

2.0 Construction Requirements.
2.1 The Plans for the construction of the CU streetlighting along Eastgate will be distributed by Addendum during the advertisement period for the bid.

3.0 Method of Measurement. Bid quantities as listed.

4.0 Basis of Payment. As listed in the quantities for this project.

GEOTECHNICAL ENGINEERING REPORT

ROAD RE-ALIGNMENT

SPRINGFIELD UNDERGROUND

EASTGATE & FR 116

SPRINGFIELD, MISSOURI

Prepared for:

Erlen Group
3253 E. Chestnut Expressway #1
Springfield, Missouri 65802

Prepared by:

• Geotechnical Services
• Environmental Services
• Material Testing Services

PALMERTON & PARRISH, INC.

Springfield, MO
4168 W. Kearney Springfield, MO 65803
Call 417.864.6000 Fax 417.864.6004
www.ppimo.com

PROJECT NUMBER: 23-0546

March 09, 2023

PALMERTON & PARRISH, INC.

GEOTECHNICAL & MATERIALS ENGINEERS
MATERIALS TESTING LABORATORIES
ENVIRONMENTAL SERVICES

4168 W. Kearney Street.
Springfield, MO 65803
Ph: (417) 864-6000
www.ppimo.com

March 09, 2023

Erlen Group
3253 E. Chestnut Expressway #1
Springfield, Missouri 65802

Attn: Mr. Terry Quick, PE
Email: tquick@erlengroup.com

RE: Geotechnical Engineering Report
Road Re-alignment
Eastgate & FR 116
Springfield, Missouri
PPI Project Number: 23-0546

Dear Mr. Quick:

Attached, please find the report summarizing the results of the geotechnical investigation conducted for the Road Re-alignment over the top of Springfield Underground in Springfield, Missouri. We appreciate this opportunity to be of service and if you have any questions, please don't hesitate to contact this office.

PALMERTON & PARRISH, INC.
By:

Claire Lakin, E.I.
Geotechnical Engineer

PALMERTON & PARRISH, INC.
By:

Brandon R. Parrish, P.E.
Vice-President

STATE OF MISSOURI
BRANDON ROSS PARRISH
NUMBER PE-2010000852
PROFESSIONAL ENGINEER
March 09, 2023

Submitted: One (1) Electronic .pdf Copy

10,000 Hwy 160
Walnut Shade, MO 65771
Ph: (417) 561-8395

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Joplin, MO 64801
Ph: (417) 624-2005

PALMERTON & PARRISH, INC.

TABLE OF CONTENTS

APPENDICES

EXECUTIVE SUMMARY

A Geotechnical Investigation was performed for the construction of the Road Re-alignment of Eastgate and FR 116 over the top of Springfield Underground in Springfield, Missouri. It is understood that the subsurface information will be used to design the roadway sub-base, as well as provide information on rock roof thickness above the underground. Cut and/or fill depths are anticipated to be minimal at the subject site to provide finished subgrade elevations.

Based upon the information obtained from the borings drilled and subsequent laboratory testing, the site is suitable for the proposed Road Realignment with regards to the near surface soils. Important geotechnical considerations for the project are summarized below. However, users of the information contained in the report must review the entire report for specific details pertinent to geotechnical design considerations.

- Topsoil or root impacted material was noted within all of the borings, except the sinkhole borings, and extended to 2 to 6 inches below the existing ground surface. This project site has been used for agricultural purposes in the past;
- Shallow lean clays with little to no gavel were noted within the borings below the topsoil extending to depths of 1.5 to 4 ft. and will be exposed during construction of the realignment. This material was oftentimes logged as soft. During drier conditions this material may exhibit a stiff consistency; however this material is anticipated become unstable when exposed to the addition of moisture or repeated construction traffic. **Accordingly, over excavation and replacement or stabilization of these shallow soils should be anticipated for roadway construction.** Reuse of this material as structural fill in shallow applications without amendment should not be anticipated;
- Fat (high plastic) clay with less than 30% gravel was encountered in a majority of all borings at the subject site, typically at least 1.5 ft. below existing grade. Encountering these fat clays with a reduced gravel content should be anticipated within the influence of the proposed road realignment, especially in deeper cut

EXECUTIVE SUMMARY - CONTINUED

areas, if required. If encountered, this material should be kept moist and not allowed to dry and desiccate prior to pavement construction;

- Limestone bedrock was encountered at the project site at depths ranging 2.7 to 32.7 feet below the existing ground surface. A highly pinnacled and irregular bedrock surface is present at this site. Refer to the table within Section 6.3 for bedrock depth in each boring drilled;
- A mapped sinkhole is located on the eastern side of the proposed FR 116 Alignment, per Greene County and City of Springfield GIS mapping. In our opinion, based upon the borings drilled within this location, as well as LiDAR topographic data, the mapped sinkhole is indeed a sinkhole and should be treated as such. Refer to Section 7.0 for additional details; and
- Palmerton & Parrish, Inc. should be retained for construction observation and construction materials testing. Close monitoring of subgrade preparation work is considered critical to achieve adequate pavement and subgrade performance.

GEOTECHNICAL ENGINEERING REPORT

ROAD RE-ALIGNMENT

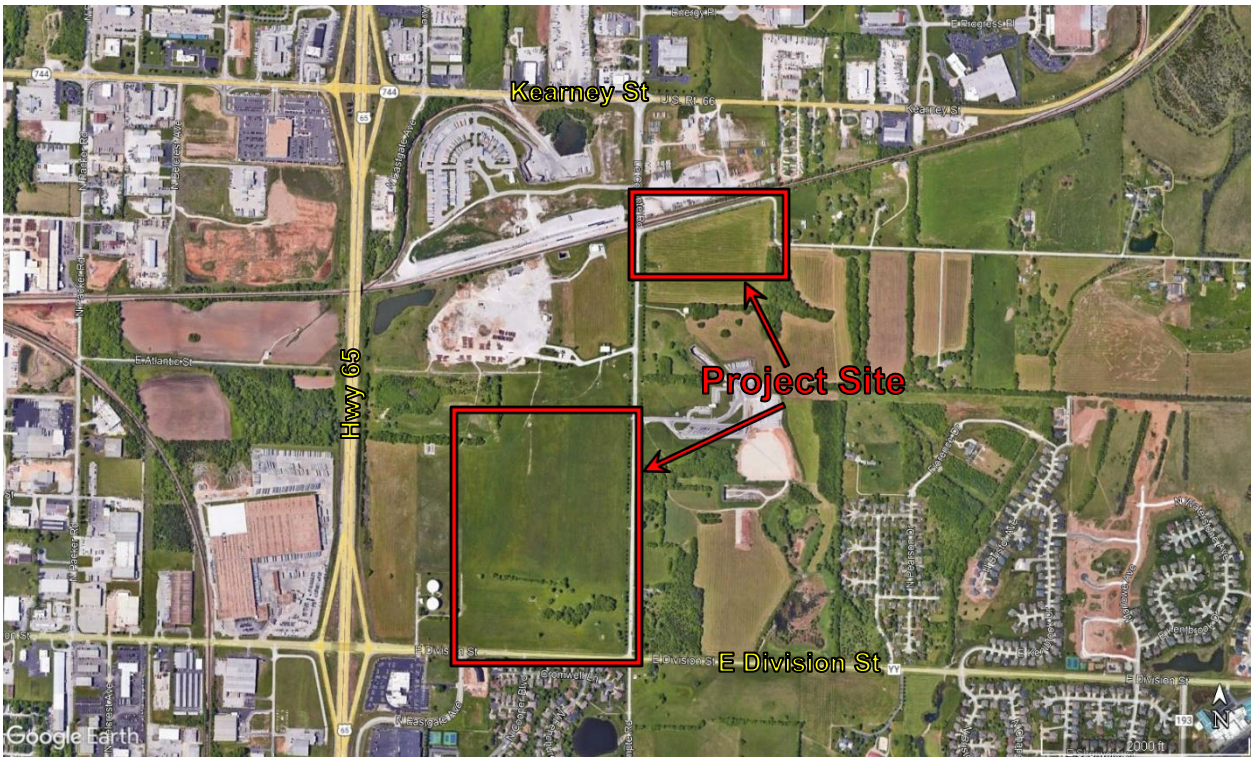
SPRINGFIELD UNDERGROUND

EASTGATE & FR 116

SPRINGFIELD, MISSOURI

1.0 INTRODUCTION

This is the report of the Geotechnical Investigation performed for the proposed constructions of the Road Re-alignment of Eastgate & FR 116 over the top of Springfield Underground in Springfield, Missouri. This investigation was authorized by a Professional Services Agreement dated January 27, 2023, and signed by Mr. Terry Quick, P.E. representing Erlen Group. The approximate site location is shown below:



The purpose of the Geotechnical Investigation was to provide information regarding the existing subsurface materials within the proposed roadway alignment, the rock roof thickness above the underground, and provide a preliminary evaluation of a sinkhole mapped by Greene County within the subject site. PPI's scope of services included field and laboratory investigation of the subsurface conditions, engineering analysis of the collected data, development of recommendations for subgrade preparation, and preparation of this engineering report.

2.0 PROJECT DESCRIPTION

Item	Description
Site Layout	See Figure 1, Eastgate Alignment Boring Location Plan; Figure 2, Eastgate Grid Boring Location Plan; Figure 3, FR 116 Alignment Boring Location Plan; Figure 4, FR 116 Grid Location Plan; and Figure 5, Sinkhole Boring Location Plan.
Project	Road Re-alignment of Eastgate and FR 116 over Springfield Underground.
Existing Structures	There are no existing structures along the alignment.
Anticipated Traffic Frequency & Wheel Loadings	Light to moderate.
Grading	Based on the existing site grading, the proposed road realignment is anticipated to have minimal cut and/or fill depths.

3.0 SITE DESCRIPTION

Item	Description
Physical Location	Eastgate & FR 116 in Springfield, Missouri
Latitude: Longitude: (± Center of Project Site)	Eastgate Alignment: 37.22860° -93.22051° FR 116 Alignment: 37.23401° -93.21322°
Available Historic Aerial Photography	Little to no site changes to the subject site are visible from readily available Google Earth Aerial Imagery dating back to 1990.
Current Ground Cover	The subject site is currently a grass-covered field with little to no vegetation and has been historically used for agricultural purposes.
Existing Topography	The site is sloped with increasing elevation to the northwest.
Drainage Characteristics	Poor to fair.

4.0 SUBSURFACE INVESTIGATION

Subsurface conditions were investigated through completion of ninety-eight (98) subsurface borings. Samples were collected within sixteen (16) of the borings, and subsequent laboratory testing was performed.

4.1 Subsurface Borings

Boring locations were selected and staked in the field by the Client. Approximate boring locations are shown on Figure 1, Eastgate Alignment Boring Location Plan; Figure 2, Eastgate Grid Boring Location Plan; Figure 3, FR 116 Alignment Boring Location Plan; Figure 4, FR 116 Grid Boring Location Plan; and Figure 5, Sinkhole Boring Location Plan. The Missouri One-Call System was notified prior to the investigation to assist in locating buried public utilities. Surface elevation for each boring location, except sinkhole borings, was provided by Erlen.

Logs of the borings, for sample borings only, showing descriptions of soil and rock units encountered, as well as results of field tests, laboratory tests, and a “Key to Symbols” are presented in Appendix II.

Soil sample borings and probe borings were drilled on February 8 through February 24, 2023, using 4.5-inch O.D. continuous flight augers powered by an ATV-mounted drill-rig. Within the soil sample borings, samples were collected at 2.5 to 5-foot centers during drilling using a split spoon sampler while performing the Standard Penetration Test (SPT) in general accordance with ASTM D1586. Within both the soil sample borings and the probe borings, the depth from the ground surface to the top of limestone bedrock was recorded and is summarized in Section 6.3. Please refer to Appendix III for general notes regarding boring logs and additional soil sampling information.

4.2 Laboratory Testing

Collected samples were sealed and transported to the laboratory for further evaluation and visual examination. Laboratory soil testing included the following:

- Moisture Content (ASTM D2216);

- Atterberg Limits (ASTM D4318);
- Grain Size Analysis (ASTM D6913); and
- Pocket Penetrometers.

Laboratory test results are shown on each boring log in Appendix II and are summarized in the following table. Results of the grain size analysis are presented in Appendix IV.

Boring	Depth (ft.)	Liquid Limit (LL)	Plastic Limit (PL)	Plasticity Index (PI)	Moisture Content (%)	% < No. 200 Sieve	USCS Symbol
200	8.5	95	28	67	47.3	-	CH
209	3.5	51	20	31	22.0	-	CH
220	6.0	-	-	-	20.0	24	GC
220	13.5	113	35	78	50.2	-	CH
225	6.0	72	25	47	42.2	-	CH
230	6.0	85	27	58	43.8	-	CH
501+50	0.0	34	18	16	20.9	-	CL
501+50	3.5	48	14	34	24.4	-	CL-CH
510+50	3.5	-	-	-	17.2	31	GC

4.3 Dynamic Cone Penetrometer

Dynamic Cone Penetrometer (DCP) testing was performed at the ground surface within the roadway sample borings. The DCP is used to assess the in-situ strength of the undisturbed soil. The operator drives the DCP tip into the soil by lifting the sliding hammer to the handle then releasing it. The total penetration for a given number of blows is measured and recorded. The data is then used to estimate the in-situ California Bearing Ratio (CBR) or shear strength from an appropriate correlation chart using equations recommended by the U.S. Army Corps of Engineers. Graphical results from DCP testing are presented in Appendix V and are summarized in the following table.

DCP Data		
Station / Location	**Depth (in)**	**Average Minimum CBR Value of the Subgrade**
11+00	0 - 6	2.0
	> 6	> 8.0
16+00	0 - 6	2.0
	> 6	> 6.0
20+00	0 - 6	> 10.0
	> 6	> 10.0
26+00	0 - 10	2.0
	> 10	> 6.0
31+00	0 - 12	2.0
	> 12	> 8.0
36+00	0 - 16	2.0
	> 16	> 10.0
41+00	0 - 15	1.0
	> 15	> 10.0
501+50	0 - 24	2.0
	> 24	> 10.0
505+50	0 - 12	2.0
	> 12	> 10.0
510+50	0 - 15	2.0
	> 15	> 10.0
B-14-1	0 - 8	5.0
	> 8	> 10.0

As presented in the table above, a surficial layer of soft material ranging from 6 to 24 inches was present at the time of testing and exhibited low average minimum CBR

values correlated from field DCP testing. CBR values of less than 3.0 typically do not pass a proof-roll.

5.0 SITE GEOLOGY

The general site area is underlain at depth by Osagean Series Bedrock. This unit characteristically consists of limestone with some amount of chert and dolomite. Trace shales are also noted within this series. Overburden soils are usually composed of red clay and chert and are residual having developed from physical and chemical weathering of the parent limestone. The chert fragments were interbedded with the limestone but are much more resistant to weathering and retain rock-like properties. The contact between comparatively unweathered bedrock and the residual soils is usually abrupt.

The general site area is located within the Ozarks Physiographic Region of Missouri, which is characterized by rugged to rolling hill terrain, meandering streams, and karst topography. Karst topography forms over areas of carbonate bedrock where groundwater has solutionally enlarged openings to form a subsurface drainage system. Springs, caves, losing streams, and sinkholes are common in karst areas. Sinkholes are defined as a depression in the landscape with an internal drainage system.

A sinkhole was mapped by Greene County and City of Springfield GIS within the project site, and a sinkhole evaluation was completed by PPI. Refer to Section 7.0 for information and recommendations regarding the mapped sinkhole. However, the Owner and contractor should be aware that it is possible for additional karst features to be encountered at the project site during construction. If a karst feature is identified during site grading, PPI should be contacted immediately for evaluation on a case-by-case basis.

6.0 GENERAL SITE SUBSURFACE CONDITIONS

Based upon subsurface conditions encountered within the borings drilled at the project site, generalized subsurface conditions are summarized below. Soil stratification lines on the boring logs indicate approximate boundary lines between different types of soil units based upon observations made during drilling.

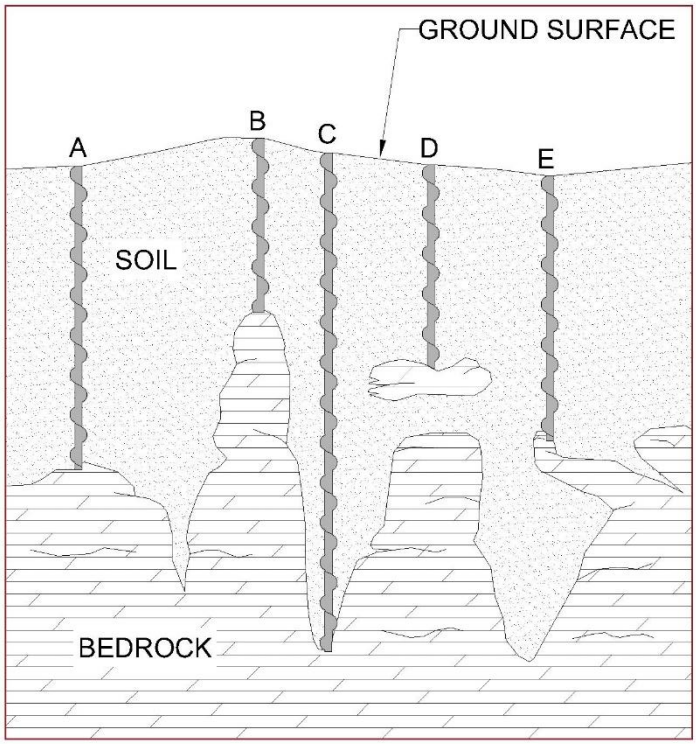
6.1 Soils

Soils at the project site consisted of a shallow layer of grass-covered topsoil to approximately 2 to 6 inches below the surface. Below the topsoil, a layer of brown lean clay with varying amounts of gravel was noted to a depth of 1.3 to 4.8 feet below the existing ground surface. Red fat clay with varying amounts of gravel was noted beneath the brown lean clay in all of the soil sample borings except Boring 205-B. This material generally extended to the auger refusal on bedrock.

6.2 Bedrock & Refusal

The depth to the top of bedrock ranged from 2.7 to 32.7 feet below the ground surface. PPI extended borings using augers to the depth where bedrock exhibited refusal. Based on the results of the subsurface exploration, the bedrock at the subject site is anticipated to be moderately to highly variable or pinnacled with refusal depths ranging from 2.7 to 32.9 feet below the ground surface. Refer to the table in Section 6.3 for bedrock and boring termination depths.

Auger refusal is defined as the depth below the ground surface at which a boring can no longer be advanced with the soil drilling technique being used. Auger refusal is subjective and is based upon the type of drilling equipment and types of augers being used, as well as the effort exerted by the driller. Several different auger refusal conditions are possible in the general site area. These conditions are represented graphically in the adjacent figure: (A) on the upper surface of continuous bedrock, (B) on rock “pinnacles”, (C) in widened joints that may extend well below the surrounding bedrock surface, (D) slabs of unweathered rock suspended in the residual soil matrix, or “floaters”, or (E) on the upper surface of discontinuous bedrock.



Note: The bedrock conditions illustrated above are for reference only and do not indicate conditions encountered at the project site.

Due to the possibility that some or all of these features exist at this project site, estimating the exact quantity of rock excavation is difficult. Linear interpolation of apparent bedrock elevations based upon the boring data is often used but can misrepresent actual rock removal quantities where such anomalies exist.

6.3 Bedrock Depth

The depth to bedrock and boring termination are summarized in the following table.

Alignment	Boring	Station	Surface Elevation	Depth to Limestone (ft.)	Top of Limestone Elevation	Boring Termination Depth (ft.)	Notes
Eastgate	200	11+00	1407.2	12.2	1395.0	12.7	Weathered
				12.7	1394.5	12.7	Competent
	201	12+00	1408.0	9.6	1398.4	13.3	Weathered
				12.5*	1395.5	13.3	Competent
	202	13+00	1408.6	4.3	1404.3	4.8	Weathered
				4.8	1403.8	4.8	Competent
	202-B			9.5*	1399.1	10.0	5.0’ North of Boring 202
	202-C			22.0	1386.6	22.0	10.0’ North of Boring 202
	202-D			3.5	1405.1	3.5	4.5’ South of Boring 202
	202-E			3.5	1405.1	3.5	10.0’ South of Boring 202
	203	14+00	1410.0	23.0	1387.0	23.0	-
	204	15+00	1411.1	3.0	1408.1	3.2	-
	204-B			5.0	1406.1	5.0	7.0’ North of Boring 204
	204-C			2.7	1408.4	2.7	5.0’ South of Boring 204
	204-D			3.4	1407.7	3.4	10.0’ South of Boring 204
	205	16+00	1411.9	3.0	1408.9	3.3	Weathered
				3.3	1408.6	3.3	Competent
	205-B			6.0	1405.9	6.2	5.0’ South of Boring 205
	206	17+00	1412.2	5.5*	1406.7	5.7	-
	207	18+00	1410.6	26.0	1384.6	26.3	Weathered
				26.3	1384.3	26.3	Competent
	208	19+00	1408.2	20.3	1387.9	20.3	-
	209	20+00	1407.4	29.5	1377.9	29.5	-
	211	22+00	1407.9	23.7	1384.2	23.9	Weathered
				23.9	1384.0	23.9	Competent
	212	23+00	1407.9	16.2*	1391.7	19.2	-
	213	24+00	1407.6	28.0	1379.6	28.5	Weathered, 5.0’ South of Boring 213
				28.5	1379.1	28.5	Competent, 5.0’ South of Boring 213
	214	25+00	1407.0	28.0	1379.0	28.0	-
	215	26+00	1406.4	26.0	1380.4	26.0	-
	216	27+00	1406.1	19.6	1386.5	19.6	-
	217	28+00	1405.9	18.2*	1387.7	22.3	Weathered
				22.2*	1383.7	22.3	Competent
	218	29+00	1404.5	28.1	1376.4	28.4	Weathered
				28.4	1376.1	28.4	Competent
	219	30+00	1401.9	25.0	1376.9	25.4	Weathered
				25.4	1376.5	25.4	Competent

Eastgate	220	31+00	1403.2	26.9	1376.3	27.0	Weathered
				27.0	1376.2	27.0	Competent
	221	32+00	1403.6	14.8	1388.8	15.2	Weathered
				15.2	1388.4	15.2	Competent
	222	33+00	1401.7	6.0*	1395.7	7.2	-
	223	34+00	1401.5	32.7	1368.8	32.9	Weathered
				32.9	1368.6	32.9	Competent
	224	35+00	1403.9	24.2	1379.7	24.2	-
	225	36+00	1405.5	20.9	1384.6	22.8	Weathered
				22.6	1382.9	22.8	Competent
	226	37+00	1405.1	20.8*	1384.3	21.8	Weathered
				21.8	1383.3	21.8	Competent
	227	38+00	1405.2	24.2	1381.0	24.4	Weathered
				24.4	1380.8	24.4	Competent
	228	39+00	1404.4	27.2*	1377.2	27.4	Weathered
				27.3*	1377.1	27.4	Competent
	229	40+00	1402.1	13.4	1388.7	13.6	-
	230	41+00	1399.3	14.0	1385.3	14.4	-
	231	42+00	1396.4	12.8*	1383.6	15.8	-
	232	43+00	1393.6	11.3	1382.3	11.8	Weathered
				11.7	1381.9	11.8	Competent
	233	44+00	1389.8	4.8	1385.0	5.2	Weathered
				5.1	1384.7	5.2	Competent
	B-14-1	-	1387.6	12.8	1374.8	13.3	Weathered
				13.2	1374.4	13.3	Competent
	B-14-2	-	1387.2	8.3	1378.9	8.8	Weathered
				8.7	1378.5	8.8	Competent
	B-14-3	-	1386.5	14.0*	1372.5	14.4	-
	B-14-4	-	1385.6	11.4	1374.2	11.7	Weathered
				11.7	1373.9	11.7	Competent
	B-14-5	-	1387.0	8.7	1378.3	8.9	Weathered
				8.8	1378.2	8.9	Competent
	B-14-6	-	1385.5	5.0	1380.5	5.3	Weathered
				5.3	1380.2	5.3	Competent
	B-14-7	-	1383.7	17.8*	1365.9	18.3	-
	B-14-8	-	1388.6	9.4	1379.2	9.6	Weathered
				9.6	1379.0	9.6	Competent
	B-14-9	-	1388.9	14.8*	1374.1	15.4	-
	B-14-10	-	1388.3	21.0	1367.3	21.1	-
	B-14-11	-	1387.3	14.6	1372.7	14.8	Weathered
				14.8	1372.5	14.8	Competent
	B-14-12	-	1388.3	13.8*	1374.5	15.8	Weathered

Eastgate	B-14-13	-	1386.9	10.3*	1376.6	11.4	-
	B-14-14	-	1385.5	7.0	1378.5	7.3	Weathered
				7.3	1378.2	7.3	Competent
FR 116	500+50		1401.3	7.0	1394.3	7.3	Weathered
				7.3	1394.0	7.3	Competent
	501+50		1400.6	7.9	1392.7	8.3	Weathered
				8.3	1392.3	8.3	Competent
	502+50		1397.6	16.7	1380.9	16.9	Weathered
				16.9	1380.7	16.9	Competent
	503+50		1394.4	5.3*	1389.1	7.3	-
				7.1	1387.3	7.3	Weathered
				7.3	1387.1	7.3	Competent
	504+50		1391.8	19.8	1372.0	20.1	Weathered
				20.1	1371.7	20.1	Competent
	505+50		1389.4	16.2	1373.2	16.4	Weathered
				16.4	1373.0	16.4	Competent
	506+50		1386.6	14.8	1371.8	15.1	Weathered
				15.1	1371.5	15.1	Competent
	507+50		1383.6	18.1	1365.5	18.3	Weathered
				18.3	1365.3	18.3	Competent
	508+50		1380.2	18.7	1361.5	18.9	Weathered
				18.9	1361.3	18.9	Competent
	509+50		1376.4	6.2*	1370.2	9.9	Weathered
	510+50		1372.0	14.2	1357.8	14.2	-
	511+50		1369.0	13.3	1355.7	13.5	Weathered
				13.5	1355.5	13.5	Competent
	512+50		1366.5	13.0*	1353.5	13.9	-
	G213	-	1381.8	16.5*	1365.3	18.7	-
	G214	-	1378.6	11.2	1367.4	11.3	Weathered
				11.3	1367.3	11.3	Competent
	G215	-	1378.0	18.3*	1359.7	20.1	-
	G216	-	1379.7	10.7	1369.0	10.8	Weathered
				10.8	1368.9	10.8	Competent
	G217	-	1380.1	21.7*	1358.4	22.4	Weathered
				22.3	1357.8	22.4	Weathered
				22.4	1357.7	22.4	Competent
	G218	-	1379.0	15.9*	1363.1	17.3	Weathered
				17.1	1361.9	17.3	Weathered
				17.3	1361.7	17.3	Competent
	G219	-	1377.8	19.4	1358.4	19.5	Weathered
				19.5	1358.3	19.5	Competent
	G220	-	1376.6	8.6*	1368.0	11.8	-

FR 116	G221	-	1374.6	16.3*	1358.3	16.3	-
	G222	-	1376.4	15.8	1360.6	15.9	Weathered
				15.9	1360.5	15.9	Competent
	G223	-	1377.6	15.6	1362.0	15.8	Weathered
				15.8	1361.8	15.8	Competent
	G224	-	1378.8	11.6*	1367.2	13.9	Weathered
	G225	-	1380.0	5.6*	1374.4	9.9	Weathered
	G226	-	1380.8	17.5	1363.3	17.8	Weathered
				17.8	1363.0	17.8	Competent
	G227	-	1381.6	25.4	1356.2	25.6	Weathered
				25.6	1356.0	25.6	Competent
	G228	-	1382.4	9.0	1373.4	9.3	Weathered, 6.5’ North of Boring G228
				9.3	1373.1	9.3	Competent, 6.5’ North of Boring G228
	G230	-	1380.6	19.3	1361.3	19.5	Weathered, 5.5’ South of Boring G230
				19.5	1361.1	19.5	Competent, 5.5’ South of Boring G230
	G231	-	1379.8	18.3	1361.5	18.5	Weathered
				18.5	1361.3	18.5	Competent
	G232	-	1377.4	15.8	1361.6	16.1	Weathered
				16.1	1361.3	16.1	Competent
	G233	-	1376.3	15.5	1360.8	15.8	Weathered
				15.8	1360.5	15.8	Competent
	G234	-	1374.9	9.8	1365.1	10.1	Weathered
				10.1	1364.8	10.1	Competent
	G235	-	1380.9	7.4	1373.5	7.7	Weathered
				7.7	1373.2	7.7	Competent
	G236	-	1381.5	20.1	1361.4	20.4	Weathered
				20.4	1361.1	20.4	Competent
	G237	-	1382.4	5.9*	1376.5	6.6	Weathered
				6.3	1376.1	6.6	Weathered
				6.6	1375.8	6.6	Competent
	G238	-	1380.8	12.2*	1368.6	14.1	Weathered
				13.9	1366.9	14.1	Weathered
				14.1	1366.7	14.1	Competent
Sinkhole	S-1	-	-	13.3	-	13.3	-
	S-2	-	-	6.7*	-	9.8	Weathered
				9.8	-	9.8	Competent
	S-3	-	-	19.5	-	20.0	Weathered
				20.0	-	20.0	Competent
	S-4	-	-	11.4	-	11.4	-

Sinkhole	S-5	-	-	9.5	-	9.5	Weathered
*Pinnacled, sloping side wall							

6.4 Groundwater

Shallow groundwater was observed within Borings 225 and 230 at depths of 20.9 and 12.5 feet below the existing ground surface, respectively, on the date drilled. Groundwater levels should be expected to fluctuate with changes in site grading, precipitation, and regional groundwater levels. Groundwater may be encountered at shallower depths during wetter periods. Development of perched groundwater at the soil-bedrock contact can occur in the general site area.

7.0 SINKHOLE EVALUATION

7.1 Preliminary Observations

Prior to drilling the sinkhole borings, PPI completed a preliminary sinkhole evaluation. LiDAR topographic data was overlain atop the project site, and closed contours revealed a depression within the area that was previously mapped by Greene County as a sinkhole. The LiDAR data is displayed in Figure 6, LiDAR Topographic Plan. The depression appeared to be a sinkhole but without conclusive data. Accordingly, a subsurface investigation was completed within the mapped sinkhole area to confirm whether or not the depression was considered a sinkhole. An initial site visit was performed by Mr. Brandon Parrish, P.E. and Ms. Claire Lakin, E.I. of PPI to observe the mapped sinkhole location. Minor ground disturbance from tree clearing had been performed; however, a depression within the center of the closed topographic contours indicated by LiDAR was observed. Borings around this area were staked accordingly.

7.2 Encountered Subsurface Conditions

On February 24, 2023, PPI engineer, Ms. Claire Lakin, E.I., with PPI visited the site to log soil samples collected during the drilling of the sinkhole borings. On that date, PPI performed three (3) soil borings within the previously mapped sinkhole area and two

(2) soil borings directly outside of the mapped sinkhole area. The locations of these soil borings were selected by PPI based on the information collected in the LiDAR overlay and are listed in the following table.

Sinkhole Boring Locations			
Boring	**Latitude**	**Longitude**	**Approximate Location**
S-1	37.23463°	-93.21104°	5 feet east of the eastern border of the mapped sinkhole area
S-2	37.23463°	-93.21114°	At the center of the mapped sinkhole area
S-3	37.23463°	-93.21125°	5 feet west of the western border of the mapped sinkhole area
S-4	37.23465°	-93.21109°	15 feet northeast of the sinkhole center, within the mapped area
S-5	37.23461°	-93.21119°	17 feet southwest of the sinkhole center, within the mapped area

Soils within the sinkhole borings generally consisted of shallow lean (low plasticity) clay with varying amounts of gravel, ranging in depth from 2.1 feet to 4.0 feet below the existing ground surface. Below the lean clay, fat (high plasticity) clay was noted within all of the borings and contained varying amounts of gravel. A chert band was encountered between the lean and fat clay layers in Boring S-4 and within the fat clay layer in Borings S-1 and S-3. Additionally, within Borings S-1 and S-4, a lean clay layer was encountered below the fat clay layer at depths of 7.0 feet and 6.0 feet, respectively, indicating possible soil movement. Limestone bedrock caused auger refusal within all of the sinkhole borings at depths ranging from 9.6 to 20.0 feet.

7.3 Conclusions

As stated above, lean clays were found below the fat clay layer within Borings S-1 and S-4. This usually occurs in sinkhole formations as lean clay transported by water is deposited in a depression caused by the removal of the subsurface materials through karst features. Therefore, PPI has concluded using the subsurface data as well as the topographic data and visual observations that the area previously mapped by Greene County should be confirmed as a sinkhole.

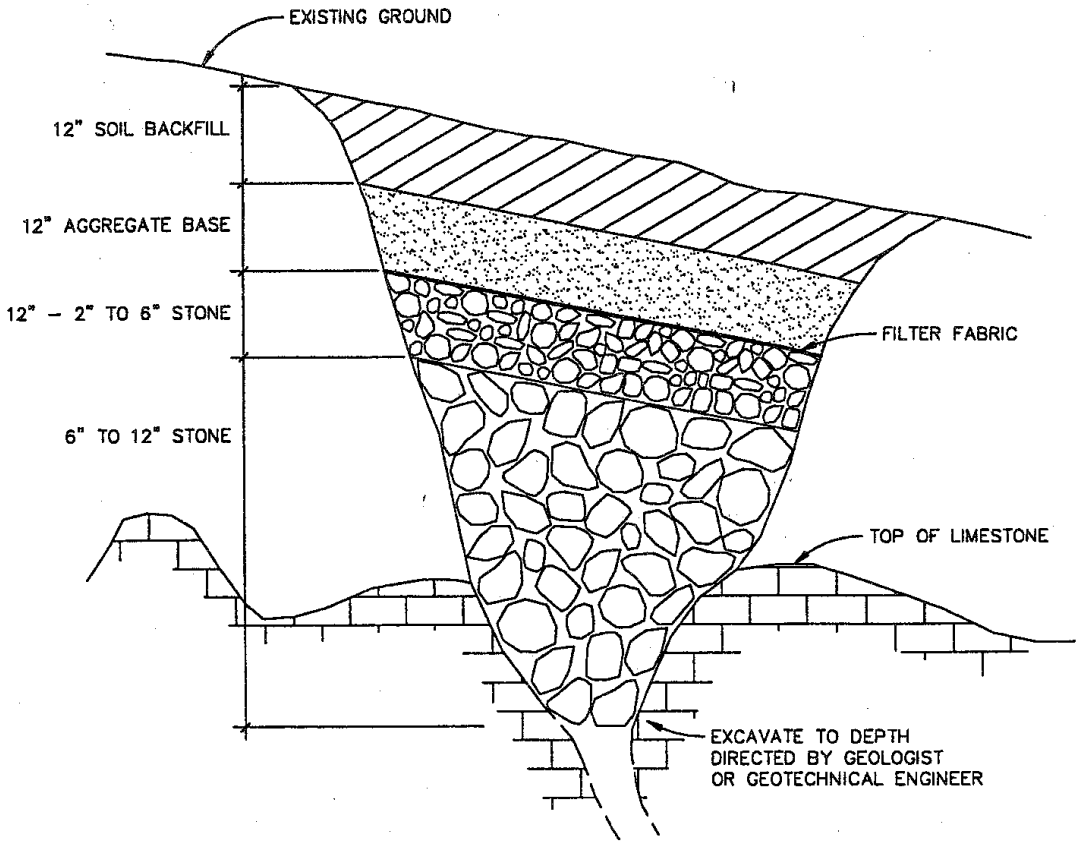
7.4 Sinkhole Remediation

Per City of Springfield sinkhole regulations, a sinkhole must first be avoided if possible. However, the alignment of this roadway lines up with the existing FR 116 and may not be able to be offset. If an offset cannot be performed, stabilization of the sinkhole is considered possible IF allowed by the City of Springfield.

Stabilizing the sinkhole will first require that it be excavated down to bedrock. If sufficient bedrock is exposed around the throat of the sinkhole, then a graded stone filter can be installed in the excavation to stabilize the sinkhole. Construction of a graded filter provides for structural stability and reduces the likelihood that the sinkhole will collapse in the future. Generally, construction of a graded filter consists of the following:

- Line the sides of the excavation with filter fabric;
- Place 6” to 12” stone in the bottom to approximately 8 feet below the surface;
- Place a 12” thick layer of 2” to 6” stone on top of the larger stone;
- Wrap the filter fabric over the 2” to 6” stone, placing additional filter fabric where needed to completely cover;
- Cover the filter fabric with a 12” thick layer of compacted aggregate base; and
- Filling the remainder of the hole as outlined in Section 8.5.

A general schematic showing the construction of a graded filter is shown on the following figure.



Please note that the actual construction of the graded filter may need to be modified based on the conditions encountered. The most common modification is using larger stone in and on top of the bedrock.

It should be recognized by the Owner that sinkholes are natural phenomena and, although the repair recommendations provided above have been utilized by our firm and others with success on many sinkholes in the area, formation of additional sinkholes or sinkhole drift is still a possibility. Directing surface water away from the area and constructing a sinkhole repair that is in contact with the limestone surrounding the sinkhole are both key to constructing a long-lasting repair.

8.0 EARTHWORK

8.1 Topsoil

Topsoil or root impacted material was noted within all of the borings and extended to 2 to 6 inches below the existing ground surface. Due to the influence of vegetation, this material should be stripped from construction areas and stockpiled for use in non-structural areas or removed from the site. Additionally, the material directly below the topsoil that is notes as lean clay (CL) should be treated as additional topsoil due to the history of agricultural use of the project site. It should be noted that the use of the term topsoil within this report is for site construction and does not imply that the material is suitable for sale as topsoil. Due to the increased gravel and sand contents and the plasticity of some of the topsoil, some of this material may not be suitable for re-use as a surficial landscaping material.

8.2 Site Preparation

The initial phase of site preparation will include topsoil stripping and removal of all organic matter. This material should be stockpiled outside of the primary grading area or hauled off-site and should be allocated for future use in surficial landscaping areas only.

8.3 Proof Rolling & Undercutting

All areas scheduled to receive controlled fill or roadway construction should be proof-rolled to assure a stable subgrade. Proof-rolling consists essentially of rolling the ground surface with a loaded tandem axle dump truck or similar heavy rubber-tired construction equipment and noting any areas which rut or deflect during rolling. Soft subgrade areas identified during proof-rolling should be remediated. **Some volume of remediation should be anticipated under any weather circumstance. In the event that earthwork is completed during periods of wet weather, additional remediation volume should be anticipated. Based upon the borings drilled and DCP testing performed, minimum undercuts ranging from 6 to 24 inches should be anticipated. During wet weather, even deeper undercut should be expected.**

8.3.1 Subgrade Remediation Alternates

Subgrade remediation alternates should be evaluated on a case-by-case basis. Variables that should be considered include overall construction schedule, weather forecast, depth to a firm bottom within the area being remediated, areal extents of the area being remediated, fill thickness remaining to be placed on top of the area in question, and other factors. Possible remediation alternates that could be considered depending on the specific conditions encountered are listed below.

- The area could be scarified, allowed to dry, recompacted, and then proof-rolled again;
- The area could be over-excavated to firm bottom, the bottom proof-rolled and approved, and then new controlled fill placed and compacted;
- The area could be over-excavated to firm bottom, the bottom proof-rolled and approved, a geogrid installed, and replaced with controlled fill; or
- If more than a few feet of fill is scheduled to be placed on the area in need of remediation, the alternates below may be considered:
    - Partial removal and replacement of the soft soils;
    - Placement of a geogrid on top of the failing proof-roll subgrade; or
    - Placement of a bridge lift of open-graded rock.

8.3.2 Chemical Stabilization

Chemical stabilization is an alternate to utilize the existing on-site lean and fat clays. It is recommended that chemically stabilized clays be placed in 6 to 9-inch lifts and compacted to specified densities or stabilized in place. Use of approximately 6 percent hydrated lime or 15 percent Type C Flyash, by weight, should be anticipated. With CH or CL clays chemically stabilized, it is considered applicable to place this material at all locations and elevations within the proposed pavement areas. Chemically stabilizing the shallow moisture sensitive CL soils

should reduce undercut volumes and reduce haul-off while providing a superior all-weather subgrade.

8.4 Scarification and Recompaction of Approved Subgrade

After evaluation by proof-rolling, remediation where required, and approval, the subgrade should be scarified to a depth of at least 8 inches, adjusted to within the specified ranges of optimum moisture content, and compacted to specified densities as outlined below. Placement of controlled fill may then proceed.

8.5 Fill Material Types

Table 8.4-1: Fill Material Types

Fill Type[1]	USCS Classification	Acceptable Location for Placement
Low Volume Change Engineered Fill[2]	CL[2, 3 & 6], GC, SC, or GW[6]	All locations and elevations
On-Site Natural Soils	CL[2, 3, 4 & 6], CL-CH[4], CH[4], GC, and SC	All locations and elevations. **See Notes 2, 3, and 4**
Off-Site Borrow	CL[2, 3, 4 & 6], GC, SC, or GW	All locations and elevations **See Notes 2, 3, and 4**
Off-Site Borrow	CL-CH[3, 4] or CH[4]	All locations and elevations. **See Notes 3 and 4**
Aggregate Base Rock	GW[5]	All locations and elevations

1. Controlled, compacted fill should consist of approved materials that are free of organic matter and debris and contain maximum rock size of 4 to 6 inches. Frozen material should not be used and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation prior to its use.
2. Low plasticity cohesive soil or granular soil with Liquid Limit <50 and having at least 15% low plasticity fines.
3. These soil types can be moisture-sensitive, and compaction may be difficult at higher moisture contents, and during periods of wet weather.
4. CH Clays with Liquid Limit equal to or above 50 are considered suitable for use as controlled fill only if the percentage of rock fragments exceeds 35% or if placed 2 ft. pavement areas.
5. Aggregate base rock, classifying at MoDOT Type 1 or Type 5, is suitable for use as controlled fill.
6. Lean clay (CL) soils containing less than 30% gravel particles are acceptable for use as LVC fill material as indicated above; however, on and off-site CL soils with little gravel content are not recommended for use as structural fill below pavements due to their moisture sensitivity.

8.6 Compaction Requirements

Table 8.5-1: Compaction Requirements – Controlled Fill	
Item	**Description**
Subgrade Scarification Depth	At least 8 inches
Fill Lift Thickness	8 inches (loose)
Compaction Requirements[1]	95% Standard Proctor Density (ASTM D698)
Moisture Content	• ± 2% optimum moisture for CL, GC and SC soil types; and • 0 to 4% above optimum for CL-CH and CH soil types.
Recommended Density Test Frequency	• Pavement Areas – Every 5,000 sq. ft.; and • Minimum of 3 tests per lift.
1. Engineered fill (including scarified compacted subgrade) should be tested for moisture content and compaction during placement. If test results indicate the specified moisture or compaction limits have not been met, the area represented by the test should be reworked and retested as required until the specified moisture and compaction requirements are achieved.	

8.7 Soft Surficial Soils

Areas of lean clay were noted near the surface in all of the borings. Again, these materials may be stable during dry weather; however, these materials are anticipated to be sensitive to the addition of moisture. **During wet seasons or rain events or when exposed to repeated traffic, the near surface lean clay soils may become unstable and require over excavation and replacement or stabilization.** The amount of over excavation will be dependent upon conditions encountered during construction.

8.8 Inclement Weather

If construction is initiated during wetter months, the requirement for undercutting soft surficial soils below normal site stripping should be anticipated and reflected in contract documents. Undercut depths on the order of 2 or more feet are considered possible within the development area. The shallow lean clay subgrade at the site is known to significantly lose strength when saturated and disturbed by construction

equipment. Further, material removed from undercuts may not be suitable for use as compacted fill due to high soil moisture if poor drying conditions (cool temperatures and/or frequent precipitation) occur during site grading. If the construction schedule will not permit delay for better drying conditions, the project budget should include an allowance for subgrade undercut and replacement soil material containing appreciable quantities of chert or sand and gravel from an off-site borrow area that meet the requirements above. As an alternate to select fill, rock fill subbase (4 to 6-inch top size stone) may be placed to improve subgrade stability.

8.9 Moderate Volume Change Material

Based on experience from the project site, soils with low swell potential were noted, but typically greater than 1.5 ft. in depth. Fat Clays, if exposed, should not be allowed to dry and desiccate prior to pavement construction to limit the potential for shrink/swell movement.

8.10 Groundwater Considerations

Groundwater was encountered during the subsurface exploration at depths between 12.5 and 20.9 feet below the ground surface. As previously mentioned, water levels at the subject site should be anticipated to fluctuate with seasonal changes in moisture. Contractors should be prepared to encounter areas of shallow groundwater at the subject site. Generally, the shallow groundwater is not anticipated to affect roadway construction.

8.11 CBR Value

Based upon laboratory DCP test results as well as past experience of this firm, the following table provides CBR values to be used in pavement design based upon the subgrade preparation alternate chosen.

Subgrade Preparation Alternate	Design CBR
Medium Stiff to Stiff or Medium Dense to Dense Natural Soils or Existing Fill Material Approved after Proof-rolling. (Undercutting is anticipated to expose this natural layer)	3.0
Select Earth Fill Material with at least 30 Percent Rock Fragments Retaining on No. 4 Sieve	6.0
Rock Fill (18" min. below pavement section)	12.0
Chemical Stabilization	8.0 or greater

9.0 CONSTRUCTION OBSERVATION & TESTING

The construction process is an integral design component with respect to the geotechnical aspects of a project. Since geotechnical engineering is influenced by variable depositional and weathering processes and because we sample only a small portion of the soils affecting the performance of the proposed pavement, unanticipated or changed conditions can be disclosed during grading. Proper geotechnical observation and testing during construction is imperative to allow the Geotechnical Engineer the opportunity to evaluate assumptions made during the design process. Therefore, we recommend that PPI be kept apprised of design modifications and construction schedule of the proposed project to observe compliance with the design concepts and geotechnical recommendations, and to allow design changes in the event that subsurface conditions or methods of construction differ from those assumed while completing this study. We recommend that during construction all earthwork be monitored by a representative of PPI, including site preparation, placement of all engineered fill and trench backfill, and all excavations as outlined below.

- An experienced Geotechnical Engineer or Engineering Technician of PPI should observe the subgrade throughout the proposed project site immediately following stripping to evaluate the native clay, identify areas requiring undercutting, and evaluate the suitability of the exposed surface for fill placement;
- An experienced Engineering Technician of PPI should monitor and test all fill placed within the pavement areas to determine whether the type of material, moisture content, and degree of compaction are within recommended limits;

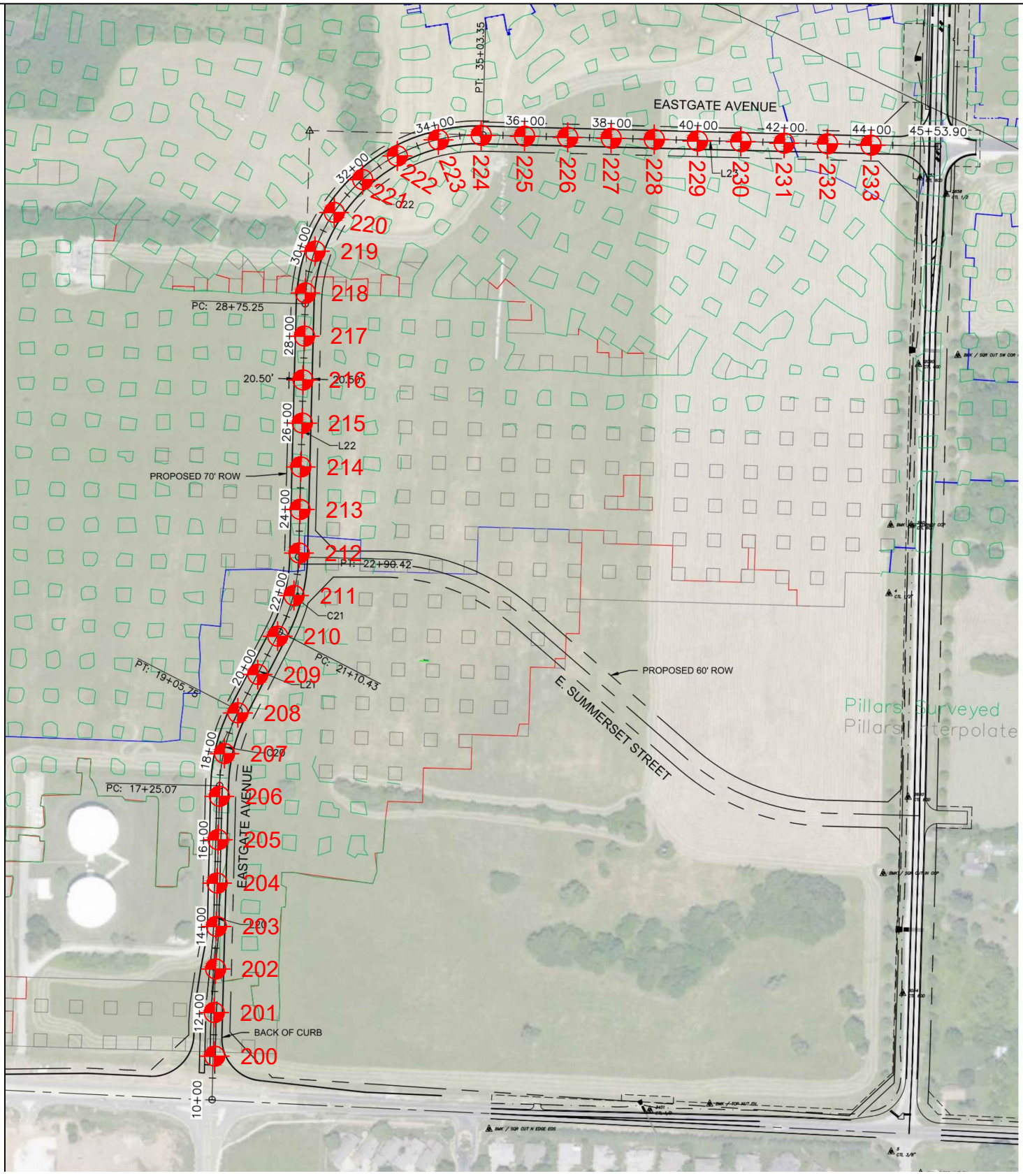
- An experienced Engineering Technician of PPI should monitor and test fill placed within pavement areas to determine whether the type of material, moisture content, and degree of compaction are within recommended limits; and
- The condition of the subgrade should be evaluated immediately prior to the placement of the aggregate base to determine whether the moisture content and relative density of the subgrade soils are as recommended.

10.0 REPORT LIMITATIONS

This report has been prepared in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same geographical area. Palmerton & Parrish, Inc. observed that degree of care and skill generally exercised by other consultants under similar circumstances and conditions. Palmerton & Parrish's findings and conclusions must be considered not as scientific certainties, but as opinions based on our professional judgment concerning the significance of the data gathered during the course of this investigation. Other than this, no warranty is implied or intended.

APPENDIX I - FIGURES

S:_MASTER PROJECT FILE\2023_MO\E\Erlen Group-23-0546-Eastgate FR116 Subsurface Investigation-SUB\Figures\Figure 1 - Eastgate Alignment Boring Location Plan.



LEGEND

Boring Location

SCALE
1" = 310'

Project: Eastgate & FR 116 Road Realignment
Client: Erlen Group

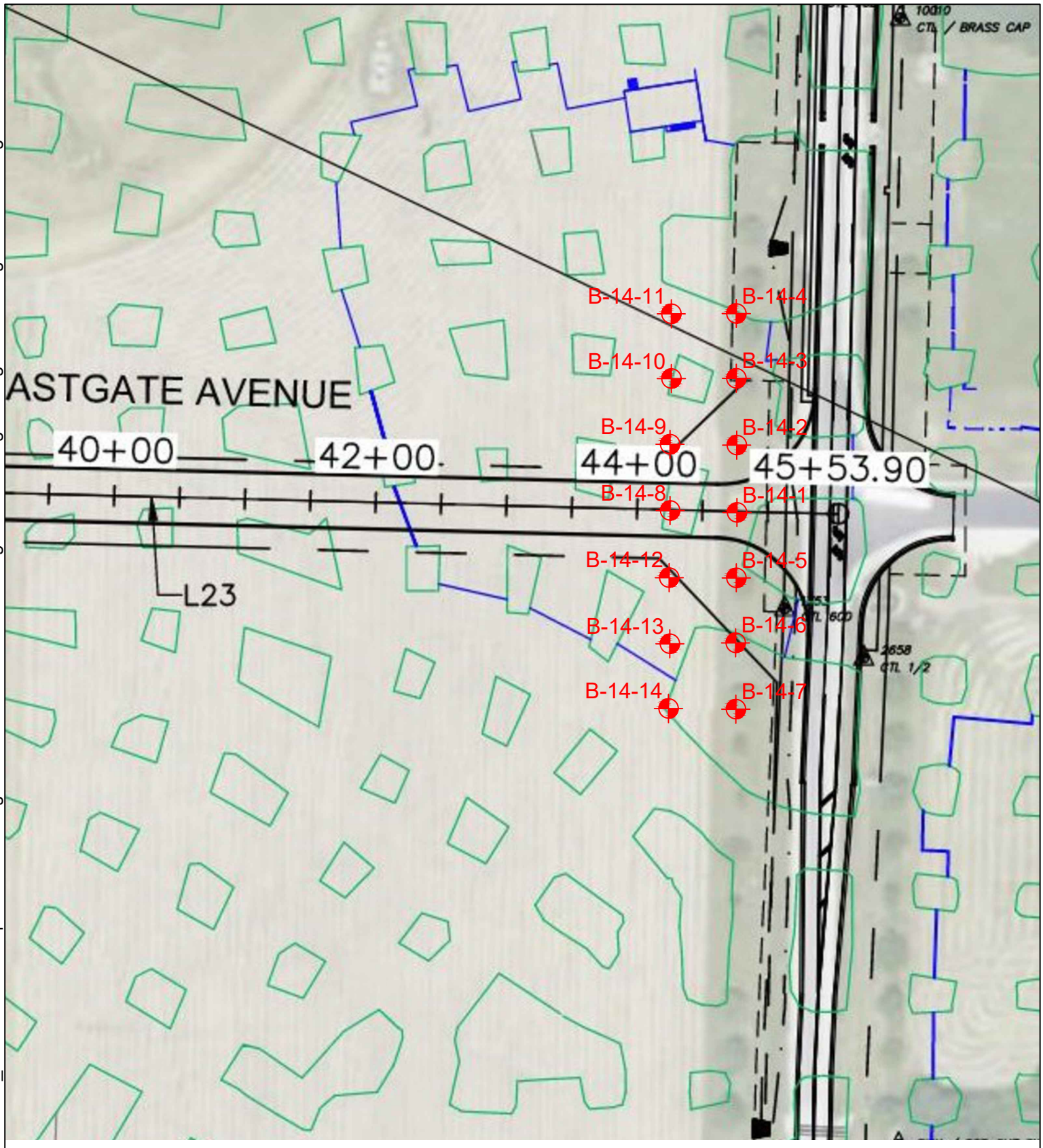
Eastgate Alignment Boring Location Plan

Date: March 7, 2023

Project Number: 23-0546

PALMERTON & PARRISH, INC.
GEOTECHNICAL AND MATERIALS ENGINEERS/MATERIALS TESTING LABORATORIES/ENVIRONMENTAL SERVICES

FIGURE 1



S:_MASTER PROJECT FILE\2023_MO\E\Erlen Group-23-0546-Eastgate FR116 Subsurface Investigation-SUB\Figures\Figure 2 - Eastgate Grid Boring Location Plan.dwg

LEGEND

Boring Location

SCALE
1" = 100'

Project: Eastgate & FR 116 Road Realignment
Client: Erlen Group

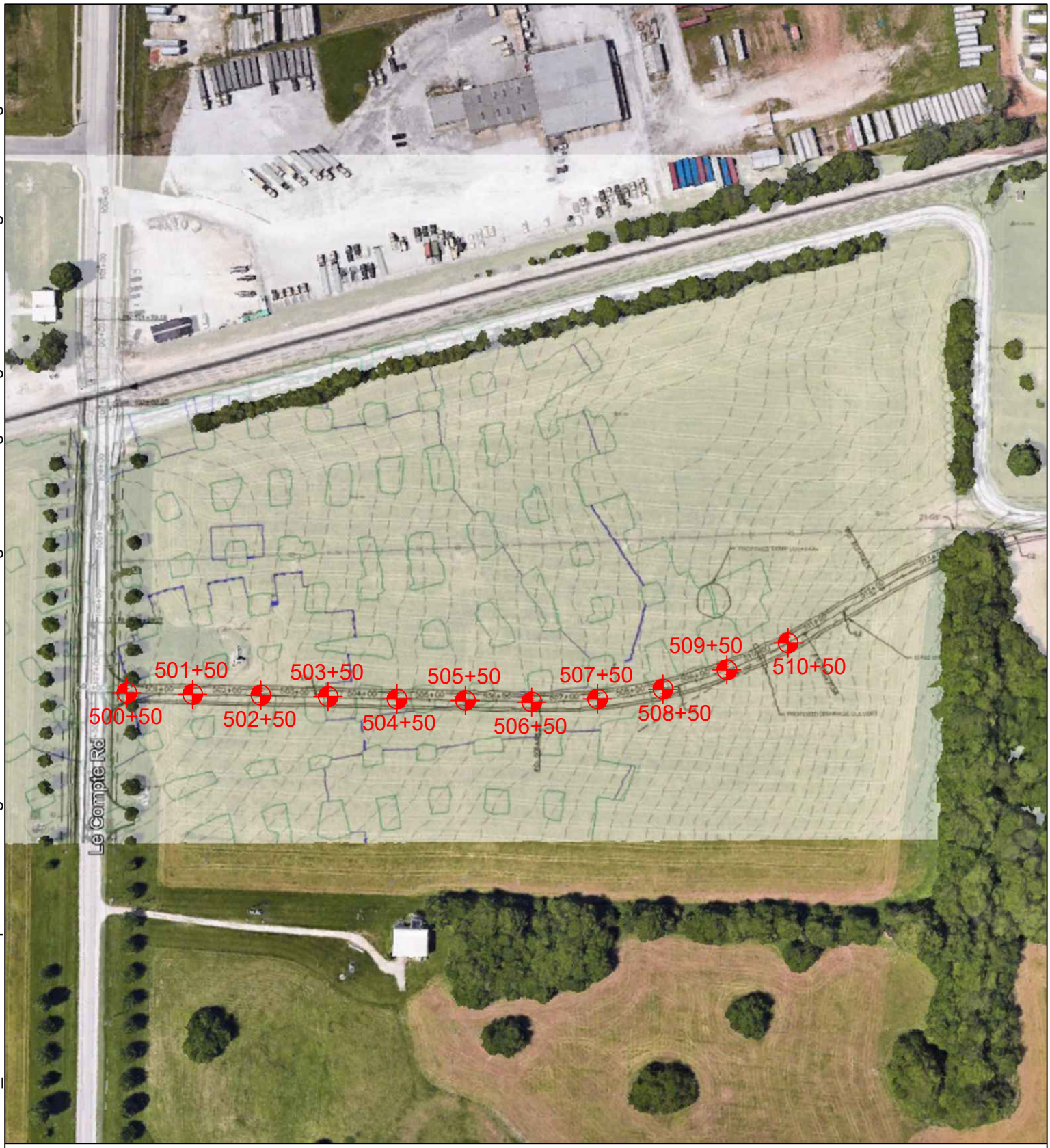
Eastgate Grid Boring Location Plan

Date: March 7, 2023

Project Number: 23-0546

PALMERTON & PARRISH, INC.
GEOTECHNICAL AND MATERIALS ENGINEERS/MATERIALS TESTING LABORATORIES/ENVIRONMENTAL SERVICES

FIGURE 2



LEGEND

Boring Location

SCALE
1" = 200'

Project: Eastgate & FR 116 Road Realignment
Client: Erlen Group

FR 116 Alignment Boring Layout Plan

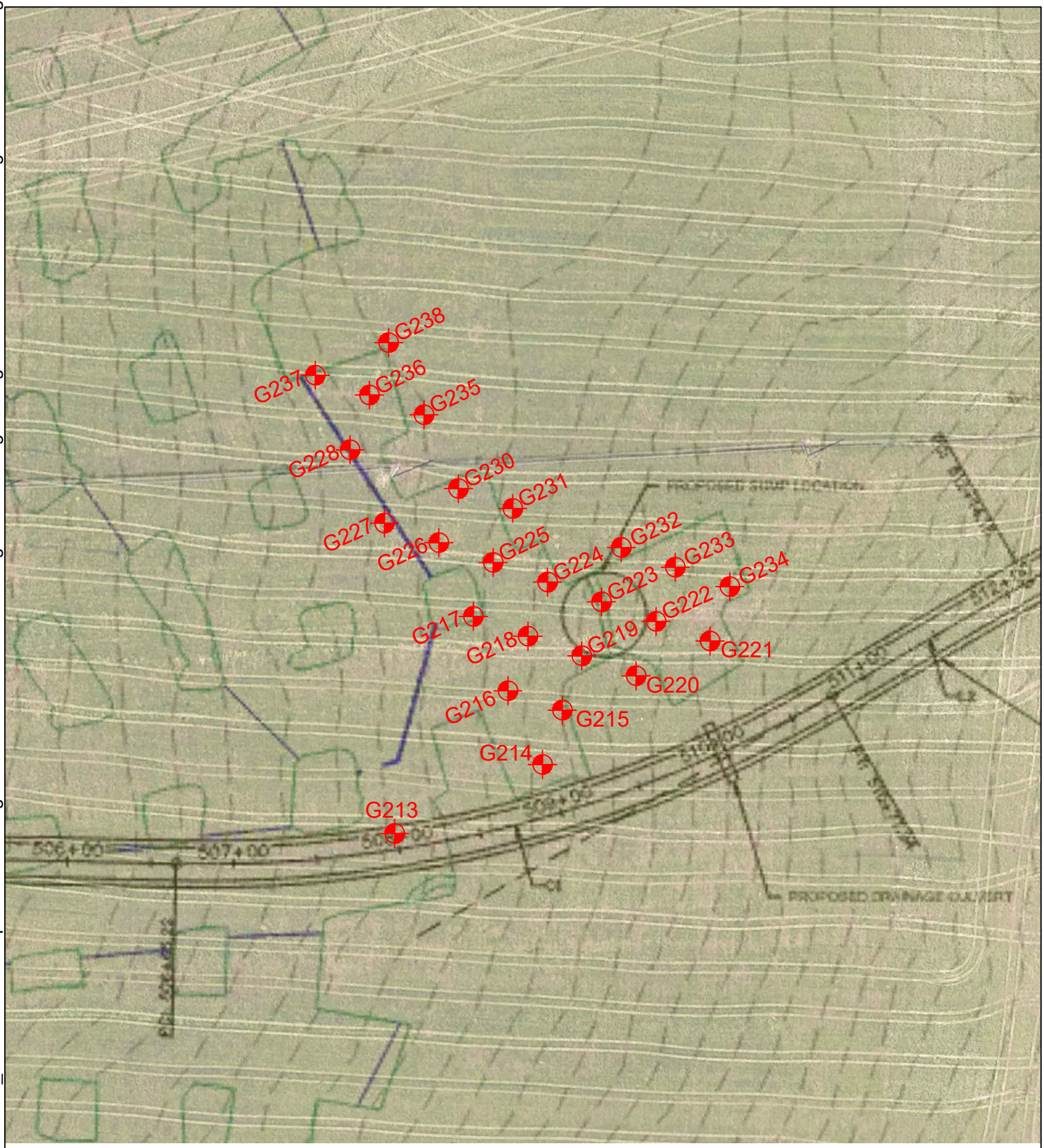
Date: March 7, 2023

Project Number: 23-0546

PALMERTON & PARRISH, INC.
GEOTECHNICAL AND MATERIALS ENGINEERS/MATERIALS TESTING LABORATORIES/ENVIRONMENTAL SERVICES

FIGURE 3

S:_MASTER PROJECT FILE\2023_MO\E\Erlen Group-23-0546-Eastgate FR116 Subsurface Investigation-SUB\Figures\Figure 3 - FR 116 Alignment Boring Location Plan.dwg



LEGEND

Boring Location

SCALE
1" = 80'

Project: Eastgate & FR 116 Road Realignment
Client: Erlen Group

FR 116 Grid Boring Location Plan

Date: March 7, 2023

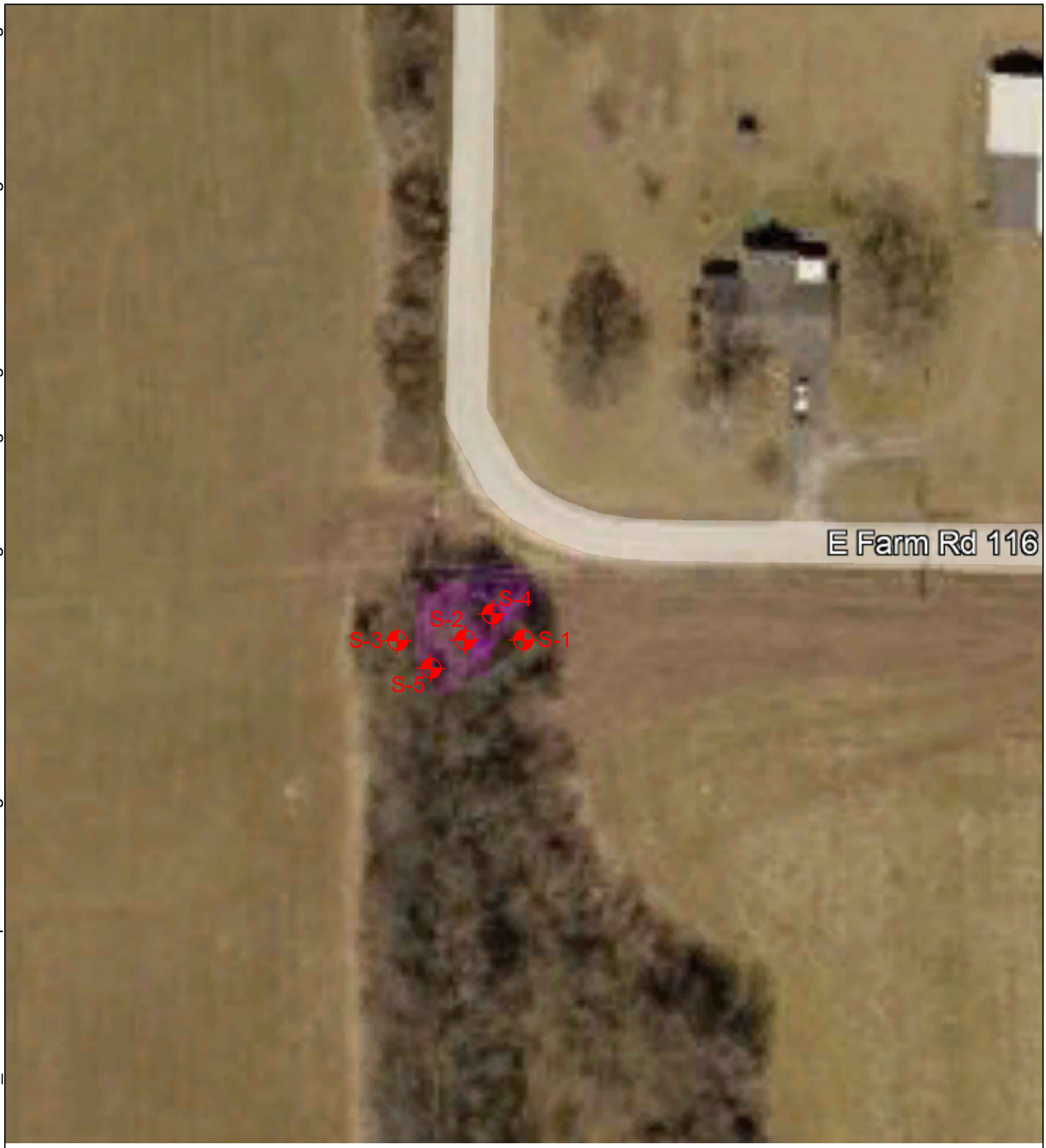
Project Number: 23-0546

PALMERTON & PARRISH, INC.
GEOTECHNICAL AND MATERIALS ENGINEERS/MATERIALS TESTING LABORATORIES/ENVIRONMENTAL SERVICES

FIGURE 4

S:_MASTER PROJECT FILE\2023_MO\E\Erlen Group-23-0546-Eastgate FR116 Subsurface Investigation-SUB\Figures\Figure 4 - FR 116 Grid Boring Location Plan.dwg

S:_MASTER PROJECT FILE\2023_MO\E\Erlen Group-23-0546-Eastgate FR116 Subsurface Investigation-SUB\Figures\Figure 5 - Sinkhole Boring Location Plan.dwg



LEGEND

Boring Location

SCALE
1" = 65'

Project: Eastgate & FR 116 Road Realignment
Client: Erlen Group

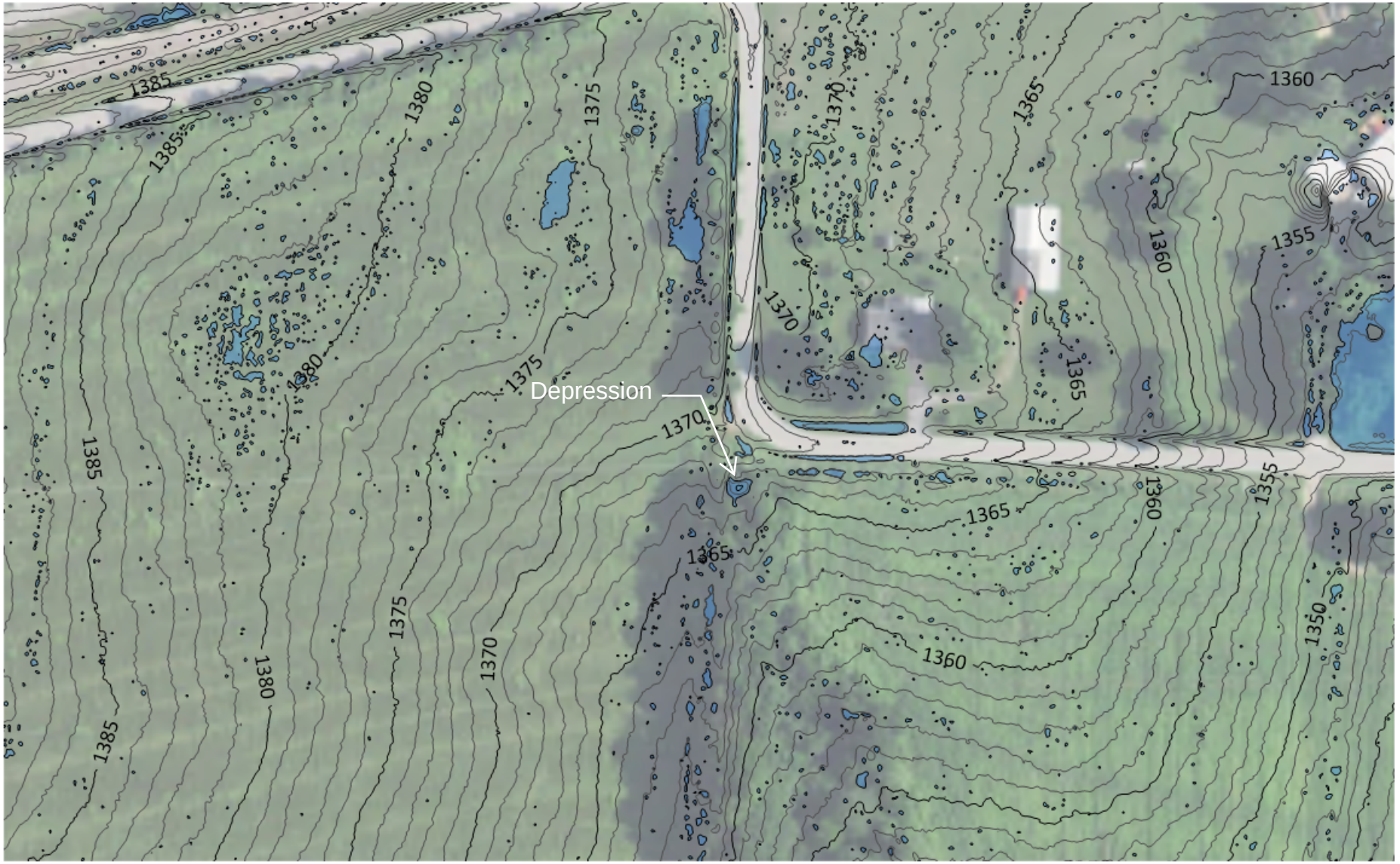
Sinkhole Boring Location Plan

Date: March 7, 2023

Project Number: 23-0546

PALMERTON & PARRISH, INC.
GEOTECHNICAL AND MATERIALS ENGINEERS/MATERIALS TESTING LABORATORIES/ENVIRONMENTAL SERVICES

FIGURE 5



AERIAL IMAGERY FROM AVAILABLE USGS AERIAL IMAGERY.
TOPOGRAPHIC INFORMATION FROM LiDAR IMAGERY AVAILABLE FROM MSDIS.

Project: Eastgate & FR 116 - Sinkhole
Client: Erlen Group

LiDAR Topographic Plan

DATE: February 22, 2023

Project Number: 23-0546

PALMERTON & PARRISH, INC.
GEOTECHNICAL AND MATERIALS ENGINEERS/MATERIALS TESTING LABORATORIES/ENVIRONMENTAL SERVICES

FIGURE 6

APPENDIX II - BORING LOGS & KEY TO SYMBOLS

4168 W. Kearney
Springfield, Missouri 65803
Telephone: (417) 864-6000
Fax: (417) 864-6004

GEOTECHNICAL BORING LOG

BORING NUMBER 200

CLIENT Erlen Group
PROJECT NAME Eastgate & FR 116
PROJECT NO. 23-0546
PROJECT LOCATION Springfield, MO
DATE STARTED 2/8/23 **COMPLETED** 2/8/23
SURFACE ELEVATION _____ **BENCHMARK EL.** _____
DRILLER EV **DRILL RIG** 2019 CME-55
GROUND WATER LEVELS
HAMMER TYPE Auto
AT TIME OF DRILLING None
LOGGED BY MH **CHECKED BY** CL
AT END OF DRILLING _____
NOTES _____

DEPTH (ft)	DRILLING METHOD	STRATA SYMBOL	MATERIAL DESCRIPTION (Unified Soil Classification System)	SAMPLE TYPE NUMBER	RECOVERY % (RQD %)	CORRECTED BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	ELEVATION (ft)
0.0	CFA - 4.5" O.D.		TOPSOIL (2") 0.2 ft LEAN CLAY (CL), Trace Gravel, Very Stiff, Moist, Brown	SPT 1		3-3-13 (16)	1	
2.5			2.5 ft GRAVELLY FAT CLAY (CH), Hard, Moist, Red	SPT 2		19-12-30 (42)	2	
5.0			6.0 ft FAT CLAY (CH), Scattered Mottling, Medium Stiff to Stiff, Moist, Red	SPT 3		3-3-4 (7)	2.5	
7.5				SPT 4		3-4-6 (10)	2	
10.0			12.2 ft WEATHERED LIMESTONE 12.7 ft					
12.5								

DRY UNIT WT (pcf) 20 40 60 80 100
N VALUE 20 40 60 80
PL MC LL 20 40 60 80
SHEAR STRENGTH (ksf) 1 2 3 4

Refusal at 12.7 feet.
Bottom of borehole at 12.7 feet.

4168 W. Kearney
Springfield, Missouri 65803
Telephone: (417) 864-6000
Fax: (417) 864-6004

GEOTECHNICAL BORING LOG

BORING NUMBER 209

CLIENT Erlen Group
PROJECT NAME Eastgate & FR 116
PROJECT NO. 23-0546
PROJECT LOCATION Springfield, MO
DATE STARTED 2/9/23 **COMPLETED** 2/9/23
SURFACE ELEVATION _____ **BENCHMARK EL.** _____
DRILLER DA **DRILL RIG** 2019 CME-55
GROUND WATER LEVELS
HAMMER TYPE Auto
AT TIME OF DRILLING None
LOGGED BY MH **CHECKED BY** CL
AT END OF DRILLING _____
NOTES _____

DEPTH (ft)	DRILLING METHOD	STRATA SYMBOL	MATERIAL DESCRIPTION (Unified Soil Classification System)	SAMPLE TYPE NUMBER	RECOVERY % (RQD %)	CORRECTED BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)
0	CFA - 4.5" O.D.		TOPSOIL (3") 0.3 ft				
			LEAN CLAY (CL), Scattered Sand, Trace Gravel, Very Stiff, Moist, Brown 3.0 ft	SPT 1		7-12-7 (19)	1.5
			FAT CLAY (CH), Trace Gravel, Medium Stiff to Stiff, Moist, Red	SPT 2		3-3-4 (7)	2.5
5				SPT 3		4-6-7 (13)	3
				SPT 4		2-6-7 (13)	1.5
10							
			- Trace Mottling Below 13.5 ft	SPT 5		4-6-9 (15)	3
15							
20							
25			29.5 ft				

DRY UNIT WT (pcf) 20 40 60 80 100
N VALUE 20 40 60 80
PL MC LL 20 40 60 80
SHEAR STRENGTH (ksf) 1 2 3 4

ELEVATION (ft)

Refusal at 29.5 feet.
Bottom of borehole at 29.5 feet.

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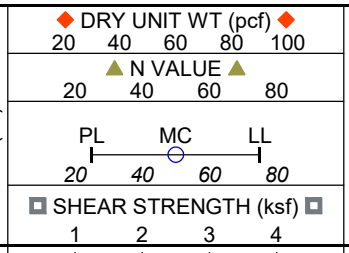
GEOTECHNICAL BORING LOG

BORING NUMBER **215**

CLIENT Erlen Group
PROJECT NAME Eastgate & FR 116
PROJECT NO. 23-0546
PROJECT LOCATION Springfield, MO
DATE STARTED 2/10/23 **COMPLETED** 2/10/23
SURFACE ELEVATION _____ **BENCHMARK EL.** _____
DRILLER DA **DRILL RIG** 2019 CME-55
GROUND WATER LEVELS
HAMMER TYPE Auto
AT TIME OF DRILLING None
LOGGED BY MH **CHECKED BY** CL
AT END OF DRILLING _____
NOTES _____

DEPTH (ft)	DRILLING METHOD	STRATA SYMBOL	MATERIAL DESCRIPTION (Unified Soil Classification System)	SAMPLE TYPE NUMBER	RECOVERY % (RQD %)	CORRECTED BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)
0	CFA - 4.5" O.D.		TOPSOIL (3") 0.3 ft LEAN CLAY (CL), Medium Stiff, Moist, Brown 2.5 ft	SPT 1		3-2-6 (8)	1
			FAT CLAY (CH), Scattered Gravel, Very Stiff, Moist, Red	SPT 2		7-9-11 (20)	3
5			- With Gravel Below 6.0 ft	SPT 3		9-10-15 (25)	1.5
				SPT 4		7-9-16 (25)	3.5
10			13.3 ft CHERT 15.0 ft	SPT 5		22-21-16 (37)	5
15			FAT CLAY (CH), With Gravel, Very Stiff, Moist, Red				
20			- Wet Below 24.0 ft				
25			26.0 ft				



ELEVATION (ft)

Refusal at 26.0 feet.
Bottom of borehole at 26.0 feet.

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GEOTECHNICAL BORING LOG

BORING NUMBER 220

CLIENT Erlen Group
PROJECT NAME Eastgate & FR 116
PROJECT NO. 23-0546
PROJECT LOCATION Springfield, MO
DATE STARTED 2/13/23 **COMPLETED** 2/13/23
SURFACE ELEVATION _____ **BENCHMARK EL.** _____
DRILLER EV **DRILL RIG** 2019 CME-55
GROUND WATER LEVELS
HAMMER TYPE Auto
AT TIME OF DRILLING None
LOGGED BY BC **CHECKED BY** CL
AT END OF DRILLING _____
NOTES _____

DEPTH (ft)	DRILLING METHOD	STRATA SYMBOL	MATERIAL DESCRIPTION (Unified Soil Classification System)	SAMPLE TYPE NUMBER	RECOVERY % (RQD %)	CORRECTED BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT (pcf) 20 40 60 80 100 / N VALUE 20 40 60 80 / PL MC LL 20 40 60 80 / SHEAR STRENGTH (ksf) 1 2 3 4	ELEVATION (ft)
0	CFA - 4.5" O.D.		TOPSOIL (2")						
			0.2 ft LEAN CLAY (CL), Medium Stiff, Moist, Brown	SPT 1		2-2-4 (6)	1		
			1.3 ft FAT CLAY (CH), Stiff, Moist, Red						
			- Scattered Gravel Below 3.5 ft	SPT 2		3-3-11 (14)	1.5		
5			6.5 ft	SPT 3		19-39-43 (82)			
			CLAYEY GRAVEL (GC), With Sand, Dense to Very Dense, Moist, Red to Gray	SPT 4		20-18-12 (30)	1		
10			12.0 ft FAT CLAY (CH), Medium Stiff, Moist, Red						
				SPT 5		3-4-4 (8)	2		113
15									
20									
25			26.9 ft 27.0 ft WEATHERED LIMESTONE						

Refusal at 27.0 feet.
Bottom of borehole at 27.0 feet.

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GEOTECHNICAL BORING LOG

BORING NUMBER 225

CLIENT Erlen Group
PROJECT NAME Eastgate & FR 116
PROJECT NO. 23-0546
PROJECT LOCATION Springfield, MO
DATE STARTED 2/15/23 **COMPLETED** 2/15/23
SURFACE ELEVATION _____ **BENCHMARK EL.** _____
DRILLER JS **DRILL RIG** 2019 CME-55
GROUND WATER LEVELS
HAMMER TYPE Auto
AT TIME OF DRILLING 20.92 ft
LOGGED BY BC **CHECKED BY** CL
AT END OF DRILLING _____
NOTES _____

DEPTH (ft)	DRILLING METHOD	STRATA SYMBOL	MATERIAL DESCRIPTION (Unified Soil Classification System)	SAMPLE TYPE NUMBER	RECOVERY % (RQD %)	CORRECTED BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT (pcf) 20 40 60 80 100 / N VALUE 20 40 60 80 / PL MC LL 20 40 60 80 / SHEAR STRENGTH (ksf) 1 2 3 4	ELEVATION (ft)
0	CFA - 4.5" O.D.		TOPSOIL (2") 0.2 ft GRAVELLY LEAN CLAY (CL), Medium Stiff, Moist, Brown 3.0 ft	SPT 1		2-2-6 (8)	1		
			GRAVELLY FAT CLAY (CH), Very Stiff, Moist, Red 5.5 ft	SPT 2		16-8-9 (17)	1.5		
5			FAT CLAY (CH), Very Hard, Moist, Red 7.1 ft	SPT 3		4-56/4"	4.5		
			GRAVELLY FAT CLAY (CH), Very Stiff, Moist, Red	SPT 4		11-11-11 (22)	4.5		
10			11.0 ft FAT CLAY (CH), Trace Gravel, Stiff, Moist, Red						
				SPT 5		3-6-7 (13)	4		
15									
20			22.6 ft 22.8 ft WEATHERED LIMESTONE						

Refusal at 22.8 feet.
Bottom of borehole at 22.8 feet.

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GEOTECHNICAL BORING LOG

BORING NUMBER 230

CLIENT Erlen Group
PROJECT NAME Eastgate & FR 116
PROJECT NO. 23-0546
PROJECT LOCATION Springfield, MO
DATE STARTED 2/16/23 **COMPLETED** 2/16/23
SURFACE ELEVATION _____ **BENCHMARK EL.** _____
DRILLER JS **DRILL RIG** 2019 CME-55
GROUND WATER LEVELS
HAMMER TYPE Auto
AT TIME OF DRILLING 12.5 ft
LOGGED BY BC **CHECKED BY** CL
AT END OF DRILLING _____
NOTES _____

DEPTH (ft)	DRILLING METHOD	STRATA SYMBOL	MATERIAL DESCRIPTION (Unified Soil Classification System)	SAMPLE TYPE NUMBER	RECOVERY % (RQD %)	CORRECTED BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	ELEVATION (ft)
0.0	CFA - 4.5" O.D.		TOPSOIL (2")					
			0.2 ft LEAN CLAY (CL), Medium Stiff, Moist, Brown	SPT 1		2-4-3 (7)	0.5	
			2.5 ft GRAVELLY FAT CLAY (CH), Very Stiff, Moist, Red	SPT 2		11-17-9 (26)	1	
5.0			5.3 ft FAT CLAY (CH), Trace Mottling, Stiff, Moist, Red	SPT 3		4-6-6 (12)	3	
7.5			8.0 ft GRAVELLY FAT CLAY (CH), Soft, Moist, Red	SPT 4		4-2-2 (4)	2	
10.0			9.0 ft FAT CLAY (CH), With Sand, Soft, Wet, Red					
12.5			▽					
			14.0 ft	SPT 5		2-56/5"	0	
			WEATHERED LIMESTONE 14.4 ft					

DRY UNIT WT (pcf) ◆ 20 40 60 80 100
▲ N VALUE ▲ 20 40 60 80
PL MC LL 20 40 60 80
SHEAR STRENGTH (ksf) ▢ 1 2 3 4

Refusal at 14.4 feet.
Bottom of borehole at 14.4 feet.

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GEOTECHNICAL BORING LOG

BORING NUMBER 205-B

CLIENT Erlen Group
PROJECT NAME Eastgate & FR 116
PROJECT NO. 23-0546
PROJECT LOCATION Springfield, MO
DATE STARTED 2/9/23 **COMPLETED** 2/9/23
SURFACE ELEVATION _____ **BENCHMARK EL.** _____
DRILLER DA **DRILL RIG** 2019 CME-55
GROUND WATER LEVELS
HAMMER TYPE Auto
AT TIME OF DRILLING None
LOGGED BY MH **CHECKED BY** CL
AT END OF DRILLING _____
NOTES Offset 5' South of Boring 205

DEPTH (ft)	DRILLING METHOD	STRATA SYMBOL	MATERIAL DESCRIPTION (Unified Soil Classification System)	SAMPLE TYPE NUMBER	RECOVERY % (RQD %)	CORRECTED BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	ELEVATION (ft)
0.0	CFA - 4.5" O.D.		TOPSOIL (3")					
			0.3 ft GRAVELLY LEAN CLAY (CL), Very Stiff, Moist, Brown	SPT 1		7-9-11 (20)	1	
2.5				SPT 2		17-12-15 (27)	2	
			4.8 ft CHERT					
5.0			5.5 ft GRAVELLY LEAN TO FAT CLAY (CL-CH), Stiff, Moist, Red to Brown					
			6.0 ft WEATHERED LIMESTONE	SPT 3		56/2"		
			6.2 ft					

DRY UNIT WT (pcf) 20 40 60 80 100
N VALUE 20 40 60 80
PL MC LL 20 40 60 80
SHEAR STRENGTH (ksf) 1 2 3 4

Refusal at 6.2 feet.
Bottom of borehole at 6.2 feet.

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GEOTECHNICAL BORING LOG

BORING NUMBER 501+50

CLIENT Erlen Group
PROJECT NAME Eastgate & FR 116
PROJECT NO. 23-0546
PROJECT LOCATION Springfield, MO
DATE STARTED 2/20/23 **COMPLETED** 2/20/23
SURFACE ELEVATION _____ **BENCHMARK EL.** _____
DRILLER EV **DRILL RIG** 2019 CME-55
GROUND WATER LEVELS
HAMMER TYPE Auto
AT TIME OF DRILLING None
LOGGED BY MH **CHECKED BY** CL
AT END OF DRILLING _____
NOTES _____

DEPTH (ft)	DRILLING METHOD	STRATA SYMBOL	MATERIAL DESCRIPTION (Unified Soil Classification System)	SAMPLE TYPE NUMBER	RECOVERY % (RQD %)	CORRECTED BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	ELEVATION (ft)
0.0	CFA - 4.5" O.D.		TOPSOIL (3") 0.3 ft LEAN CLAY (CL), Medium Stiff, Moist, Brown	SPT 1		3-3-3 (6)	1.5	
2.5			2.5 ft LEAN TO FAT CLAY (CL-CH), Scattered Gravel, Very Stiff, Moist, Red	SPT 2		3-6-20 (26)	1	
5.0			5.5 ft GRAVELLY FAT CLAY (CH), Very Hard, Moist, Red	SPT 3		4-17-56/2"	2	
7.5			7.9 ft WEATHERED LIMESTONE 8.3 ft					

DRY UNIT WT (pcf) 20 40 60 80 100
N VALUE 20 40 60 80
PL MC LL 20 40 60 80
SHEAR STRENGTH (ksf) 1 2 3 4

Refusal at 8.3 feet.
Bottom of borehole at 8.3 feet.

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GEOTECHNICAL BORING LOG

BORING NUMBER 505+50

CLIENT Erlen Group
PROJECT NAME Eastgate & FR 116
PROJECT NO. 23-0546
PROJECT LOCATION Springfield, MO
DATE STARTED 2/20/23 **COMPLETED** 2/20/23
SURFACE ELEVATION _____ **BENCHMARK EL.** _____
DRILLER EV **DRILL RIG** 2019 CME-55
GROUND WATER LEVELS
HAMMER TYPE Auto
AT TIME OF DRILLING None
LOGGED BY MH **CHECKED BY** CL
AT END OF DRILLING _____
NOTES _____

DEPTH (ft)	DRILLING METHOD	STRATA SYMBOL	MATERIAL DESCRIPTION (Unified Soil Classification System)	SAMPLE TYPE NUMBER	RECOVERY % (RQD %)	CORRECTED BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT (pcf) 20 40 60 80 100 / N VALUE 20 40 60 80 / PL MC LL 20 40 60 80 / SHEAR STRENGTH (ksf) 1 2 3 4	ELEVATION (ft)
0	CFA - 4.5" O.D.		TOPSOIL (3") — 0.3 ft LEAN CLAY (CL), Medium Stiff, Moist, Brown - With Gravel Below 1 ft	SPT 1		3-2-6 (8)	0.5		
			2.5 ft GRAVELLY FAT CLAY (CH), Scattered Sand, Very Hard, Moist, Red	SPT 2		16-56/5"	2.5		
5			5.3 ft FAT CLAY (CH), With Gravel, Medium Stiff to Very Stiff, Moist, Red	SPT 3		6-9-7 (16)	3		
			- No Gravel, Scattered Mottling Below 8.5 ft	SPT 4		3-4-7 (11)	3		
10				SPT 5		2-3-4 (7)	2.5		
15			16.2 ft 16.4 ft WEATHERED LIMESTONE						

Refusal at 16.4 feet.
Bottom of borehole at 16.4 feet.

PPI
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GEOTECHNICAL BORING LOG

BORING NUMBER 510+50

CLIENT Erlen Group
PROJECT NAME Eastgate & FR 116
PROJECT NO. 23-0546
PROJECT LOCATION Springfield, MO
DATE STARTED 2/21/23 **COMPLETED** 2/21/23
SURFACE ELEVATION _____ **BENCHMARK EL.** _____
DRILLER EV **DRILL RIG** 2019 CME-55
GROUND WATER LEVELS
HAMMER TYPE Auto
AT TIME OF DRILLING None
LOGGED BY MH **CHECKED BY** CL
AT END OF DRILLING _____
NOTES _____

DEPTH (ft)	DRILLING METHOD	STRATA SYMBOL	MATERIAL DESCRIPTION Unified Soil Classification System	SAMPLE TYPE NUMBER	RECOVERY % (RQD %)	CORRECTED BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT (pcf) 20 40 60 80 100 N VALUE 20 40 60 80 PL MC LL 20 40 60 80 SHEAR STRENGTH (ksf) 1 2 3 4	ELEVATION (ft)
0.0	CFA - 4.5" O.D.		TOPSOIL (3") 0.3 ft LEAN CLAY (CL), Trace Gravel, Soft, Moist, Brown	SPT 1		3-2-2 (4)	0.5		
2.5			2.8 ft CLAYEY GRAVEL (GC), With Sand, Dense, Moist, Red	SPT 2		7-9-16 (25)			
5.0			5.7 ft FAT CLAY (CH), With Gravel, Stiff, Moist, Red	SPT 3		3-7-6 (13)	1		
7.5			- Trace Gravel, Trace Mottling Below 8.5 ft	SPT 4		3-6-8 (14)	2		
10.0									
12.5			13.5 ft FAT CLAY (CH), With Sand, Very Hard, Moist, Red 14.2 ft	SPT 5		0-56/2"	0		

Refusal at 14.2 feet.
Bottom of borehole at 14.2 feet.

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GEOTECHNICAL BORING LOG

BORING NUMBER B-14-1

CLIENT Erlen Group
PROJECT NAME Eastgate & FR 116
PROJECT NO. 23-0546
PROJECT LOCATION Springfield, MO
DATE STARTED 2/16/23 **COMPLETED** 2/16/23
SURFACE ELEVATION _____ **BENCHMARK EL.** _____
DRILLER JS **DRILL RIG** 2019 CME-55
GROUND WATER LEVELS
HAMMER TYPE Auto
AT TIME OF DRILLING None
LOGGED BY BC **CHECKED BY** CL
AT END OF DRILLING _____
NOTES _____

DEPTH (ft)	DRILLING METHOD	STRATA SYMBOL	MATERIAL DESCRIPTION Unified Soil Classification System	SAMPLE TYPE NUMBER	RECOVERY % (RQD %)	CORRECTED BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	ELEVATION (ft)
0.0	CFA - 4.5" O.D.		TOPSOIL (2") 0.2 ft GRAVELLY LEAN CLAY (CL), Very Stiff, Moist, Brown	SPT 1		9-7-18 (25)		
2.5			3.0 ft GRAVELLY FAT CLAY (CH), Hard, Moist, Red	SPT 2		29-20-21 (41)	1.5	
5.0			5.0 ft FAT CLAY (CH), With Gravel, Stiff to Very Stiff, Moist, Red	SPT 3		4-10-8 (18)	2	
7.5			- No Gravel, Trace Mottling Below 8.5 ft	SPT 4		4-4-6 (10)	2.5	
10.0								
12.5			12.8 ft WEATHERED LIMESTONE 13.3 ft					

DRY UNIT WT (pcf) 20 40 60 80 100
N VALUE 20 40 60 80
PL MC LL 20 40 60 80
SHEAR STRENGTH (ksf) 1 2 3 4

Refusal at 13.3 feet.
Bottom of borehole at 13.3 feet.

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GEOTECHNICAL BORING LOG

BORING NUMBER **S-1**

CLIENT Erlen Group
PROJECT NAME Eastgate & FR 116
PROJECT NO. 23-0546
PROJECT LOCATION Springfield, MO
DATE STARTED 2/24/23 **COMPLETED** 2/24/23
SURFACE ELEVATION _____ **BENCHMARK EL.** _____
DRILLER JS **DRILL RIG** 2008 CME-55 LC
GROUND WATER LEVELS
HAMMER TYPE Auto
AT TIME OF DRILLING None
LOGGED BY CL **CHECKED BY** BP
AT END OF DRILLING _____
NOTES _____

DEPTH (ft)	DRILLING METHOD	STRATA SYMBOL	MATERIAL DESCRIPTION (Unified Soil Classification System)	SAMPLE TYPE NUMBER	RECOVERY % (RQD %)	CORRECTED BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT (pcf) 20 40 60 80 100 / N VALUE 20 40 60 80 / PL MC LL 20 40 60 80 / SHEAR STRENGTH (ksf) 1 2 3 4	ELEVATION (ft)
0.0	CFA - 4.5" O.D.		LEAN CLAY (CL), Very Stiff, Moist, Brown	SPT 1		2-3-15 (18)	1		
			1.3 ft						
			GRAVELLY LEAN CLAY (CL), Very Stiff, Moist, Brown						
			2.5 ft						
2.5			FAT CLAY (CH), Trace Gravel, Trace Mottling, Medium Stiff, Moist, Red	SPT 2		2-3-5 (8)	2		
			5.3 ft						
5.0			CHERT						
			6.0 ft						
			LEAN CLAY (CL), Very Stiff, Moist, Brown, Possible Sinkhole In-Wash	SPT 3		3-15-9 (24)	3		
			6.5 ft						
			FAT CLAY (CH), Scattered Gravel, Very Stiff, Moist, Red						
			7.0 ft						
7.5			LEAN CLAY (CL), Trace Sand, Stiff, Moist, Brown						
			9.5 ft	SPT 4		5-3-6 (9)	1		
			GRAVELLY FAT CLAY (CH), Stiff, Moist, Red						
10.0									
12.5									
			13.3 ft						
			Refusal at 13.3 feet. Bottom of borehole at 13.3 feet.	SPT 5		57/0"			

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GEOTECHNICAL BORING LOG

BORING NUMBER S-2

CLIENT Erlen Group
PROJECT NAME Eastgate & FR 116
PROJECT NO. 23-0546
PROJECT LOCATION Springfield, MO
DATE STARTED 2/24/23 **COMPLETED** 2/24/23
SURFACE ELEVATION _____ **BENCHMARK EL.** _____
DRILLER JS **DRILL RIG** 2008 CME-55 LC
GROUND WATER LEVELS
HAMMER TYPE Auto
AT TIME OF DRILLING None
LOGGED BY CL **CHECKED BY** BP
AT END OF DRILLING _____
NOTES _____

DEPTH (ft)	DRILLING METHOD	STRATA SYMBOL	MATERIAL DESCRIPTION Unified Soil Classification System	SAMPLE TYPE NUMBER	RECOVERY % (RQD %)	CORRECTED BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT (pcf) 20 40 60 80 100 N VALUE 20 40 60 80 PL MC LL 20 40 60 80 SHEAR STRENGTH (ksf) 1 2 3 4	ELEVATION (ft)
0.0	CFA - 4.5" O.D.		LEAN CLAY (CL), Trace Gravel, Soft, Moist, Brown	SPT 1		1-2-2 (4)	1		
2.5			2.5 ft FAT CLAY (CH), Scattered Gravel, Medium Stiff, Moist, Red						
			- No Gravel Below 3.8 ft	SPT 2		6-3-5 (8)	3		
5.0			- Scattered Mottling Below 6.0 ft	SPT 3		3-57/5"	2		
			6.7 ft 6.9 ft CHERT WEATHERED LIMESTONE PINNACLE						
7.5				SPT 4		34-40-44 (84)			
			9.8 ft						

Refusal at 9.8 feet.
Bottom of borehole at 9.8 feet.

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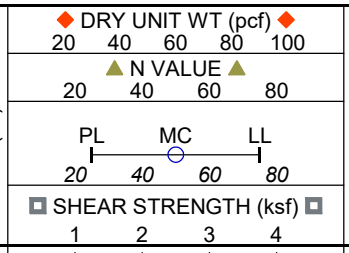
GEOTECHNICAL BORING LOG

BORING NUMBER S-3

CLIENT Erlen Group
PROJECT NAME Eastgate & FR 116
PROJECT NO. 23-0546
PROJECT LOCATION Springfield, MO
DATE STARTED 2/24/23 **COMPLETED** 2/24/23
SURFACE ELEVATION _____ **BENCHMARK EL.** _____
DRILLER JS **DRILL RIG** 2008 CME-55 LC
GROUND WATER LEVELS
HAMMER TYPE Auto
AT TIME OF DRILLING None
LOGGED BY CL **CHECKED BY** BP
AT END OF DRILLING _____
NOTES _____

DEPTH (ft)	DRILLING METHOD	STRATA SYMBOL	MATERIAL DESCRIPTION Unified Soil Classification System	SAMPLE TYPE NUMBER	RECOVERY % (RQD %)	CORRECTED BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)
0	CFA - 4.5" O.D.		LEAN CLAY (CL), Trace Sand, Medium Stiff, Moist, Brown	SPT 1		2-3-3 (6)	1
			2.1 ft GRAVELLY FAT CLAY (CH), Very Hard, Moist, Red				
			4.0 ft CLAYEY GRAVEL (GC), With Sand, Very Dense, Moist, White to Red	SPT 2		11-27-54 (81)	
5			5.5 ft FAT CLAY (CH), With Sand, Scattered Gravel, Very Stiff to Hard, Moist, Red	SPT 3		6-27-12 (39)	2
			- Trace Sand, Trace Gravel Below 8.5 ft	SPT 4		5-9-9 (18)	4.5
			9.4 ft 9.7 ft CHERT				
10			FAT CLAY (CH), Trace Gravel, Trace Mottling, Medium Stiff, Moist, Red	SPT 5		3-3-5 (8)	4
15			- No Gravel Below 18.5 ft	SPT 6		1-2-57/3"	2
			19.5 ft WEATHERED LIMESTONE 20.0 ft				
20			Refusal at 20.0 feet. Bottom of borehole at 20.0 feet.				



ELEVATION (ft)

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GEOTECHNICAL BORING LOG

BORING NUMBER **S-4**

CLIENT Erlen Group
PROJECT NAME Eastgate & FR 116
PROJECT NO. 23-0546
PROJECT LOCATION Springfield, MO
DATE STARTED 2/24/23 **COMPLETED** 2/24/23
SURFACE ELEVATION _____ **BENCHMARK EL.** _____
DRILLER JS **DRILL RIG** 2008 CME-55 LC
GROUND WATER LEVELS
HAMMER TYPE Auto
AT TIME OF DRILLING None
LOGGED BY CL **CHECKED BY** BP
AT END OF DRILLING _____
NOTES _____

DEPTH (ft)	DRILLING METHOD	STRATA SYMBOL	MATERIAL DESCRIPTION Unified Soil Classification System	SAMPLE TYPE NUMBER	RECOVERY % (RQD %)	CORRECTED BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)
0.0	CFA - 4.5" O.D.		LEAN CLAY (CL), Trace Sand, Stiff, Moist, Brown	SPT 1		2-5-5 (10)	1
			- Buried Tree Root from 1.2 ft to 1.3 ft				
			2.1 ft GRAVELLY LEAN CLAY (CL), Stiff, Moist, Brown				
2.5			2.8 ft CHERT				
			3.4 ft FAT CLAY (CH), With Gravel, Scattered Sand, Stiff, Moist, Red	SPT 2		3-6-3 (9)	2
5.0			6.0 ft 6.2 ft LEAN CLAY (CL), Stiff, Moist, Brown, Possible Sinkhole In-Wash	SPT 3		6-6-6 (12)	4.5
			GRAVELLY FAT CLAY (CH), Stiff, Moist, Red FAT CLAY (CH), Trace Mottling, Stiff, Moist, Red				
7.5			8.0 ft GRAVELLY FAT CLAY (CH), Very Stiff, Moist, Red				
			9.5 ft FAT CLAY (CH), Very Stiff, Moist, Red	SPT 4		3-7-10 (17)	4.5
10.0			10.6 ft POSSIBLE CHERT BOULDER				
			11.3 ft 11.4 ft GRAVELLY FAT CLAY (CH), Very Stiff, Moist, Red				
			PROBABLE LIMESTONE Refusal at 11.4 feet. Bottom of borehole at 11.4 feet.	SPT 5		57/0"	3

DRY UNIT WT (pcf) 20 40 60 80 100
N VALUE 20 40 60 80
PL MC LL 20 40 60 80
SHEAR STRENGTH (ksf) 1 2 3 4

ELEVATION (ft)

4168 W. Kearney
Springfield, Missouri 65803
Telephone: (417) 864-6000
Fax: (417) 864-6004

GEOTECHNICAL BORING LOG

BORING NUMBER **S-5**

CLIENT Erlen Group
PROJECT NAME Eastgate & FR 116
PROJECT NO. 23-0546
PROJECT LOCATION Springfield, MO
DATE STARTED 2/24/23 **COMPLETED** 2/24/23
SURFACE ELEVATION _____ **BENCHMARK EL.** _____
DRILLER JS **DRILL RIG** 2008 CME-55 LC
GROUND WATER LEVELS
HAMMER TYPE Auto
AT TIME OF DRILLING None
LOGGED BY CL **CHECKED BY** BP
AT END OF DRILLING _____
NOTES _____

DEPTH (ft)	DRILLING METHOD	STRATA SYMBOL	MATERIAL DESCRIPTION Unified Soil Classification System	SAMPLE TYPE NUMBER	RECOVERY % (RQD %)	CORRECTED BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)
0.0	CFA - 4.5" O.D.		LEAN CLAY (CL), Trace Gravel, Soft, Moist, Brown	SPT 1		2-1-2 (3)	1
2.5							
			4.0 ft FAT CLAY (CH), With Sand, Scattered Gravel, Stiff, Moist, Red	SPT 2		3-6-8 (14)	2
5.0			- Buried Tree Root from 5.4 ft to 5.9 ft - No Sand, Scattered Mottling Below 6.0 ft	SPT 3		5-6-7 (13)	4.5
7.5			- No Gravel Below 7.2 ft 8.0 ft GRAVELLY FAT CLAY (CH), Very Stiff, Moist, Red				
			9.0 ft CHERT	SPT 4		17-57/3"	4.5
			9.5 ft				

Refusal at 9.5 feet.
Bottom of borehole at 9.5 feet.

DRY UNIT WT (pcf) 20 40 60 80 100
N VALUE 20 40 60 80
PL MC LL 20 40 60 80
SHEAR STRENGTH (ksf) 1 2 3 4

ELEVATION (ft)

4168 W. Kearney
Springfield, Missouri 65803
Telephone: (417) 864-6000
Fax: (417) 864-6004

KEY TO SYMBOLS

CLIENT Erlen Group **PROJECT NAME** Eastgate & FR 116

PROJECT NO. 23-0546 **PROJECT LOCATION** Springfield, MO

LITHOLOGIC SYMBOLS
(Unified Soil Classification System)


CH: USCS High Plasticity Clay


CHERT: Chert


CHG: USCS High Plasticity Gravelly Clay


CL: USCS Low Plasticity Clay


CL-CH: USCS Low to High Plasticity Clay


CLG: USCS Low Plasticity Gravelly Clay


CLG-CHG: USCS Gravelly Low to High Plasticity Clay


GC: USCS Clayey Gravel


TOPSOIL: Topsoil


WEATHERED LIMESTONE: Weathered Limestone

SAMPLER SYMBOLS


Standard Penetration Test

WELL CONSTRUCTION SYMBOLS

ABBREVIATIONS

LL - LIQUID LIMIT (%)
PI - PLASTIC INDEX (%)
W - MOISTURE CONTENT (%)
DD - DRY DENSITY (PCF)
NP - NON PLASTIC
-200 - PERCENT PASSING NO. 200 SIEVE
PP - POCKET PENETROMETER (TSF)

TV - TORVANE
PID - PHOTOIONIZATION DETECTOR
UC - UNCONFINED COMPRESSION
ppm - PARTS PER MILLION


Water Level at Time Drilling, or as Shown


Water Level at End of Drilling, or as Shown


Water Level After 24 Hours, or as Shown

APPENDIX III - GENERAL NOTES

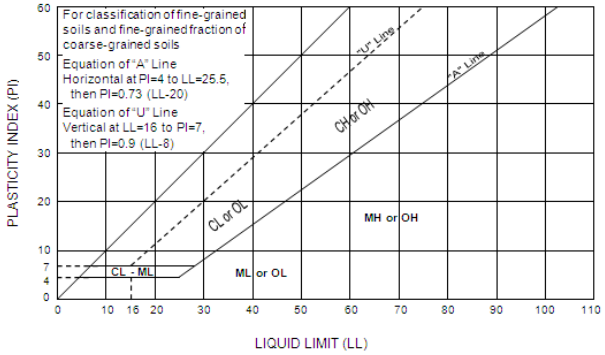
PALMERTON & PARRISH, INC.

GENERAL NOTES

SOIL PROPERTIES & DESCRIPTIONS

COHESIVE SOILS

Consistency	Unconfined Compressive Strength (Qu)	Pocket Penetrometer Strength	N-Value
	(psf)	(tsf)	(blows/ft)
Very Soft	<500	<0.25	0-1
Soft	500-1000	0.25-0.50	2-4
Medium Stiff	1001-2000	0.50-1.00	5-8
Stiff	2001-4000	1.00-2.00	9-15
Very Stiff	4001-8000	2.00-4.00	16-30
Hard	>8000	>4.00	31-60
Very Hard			>60



Group Symbol	Group Name
CL –	Lean Clay
ML –	Silt
OL –	Organic Clay or Silt
CH –	Fat Clay
MH –	Elastic Silt
OH –	Organic Clay or Silt
PT –	Peat
CL-CH –	Lean to Fat Clay

Plasticity		Moisture	
Description	Liquid Limit (LL)	Descriptive Term	Guide
Lean	<45%	Dry	No indication of water
Lean to Fat	45-49%	Moist	Indication of water
Fat	≥50%	Wet	Visible water

Fine Grained Soil Sub Classification	Percent (by weight) of Total Sample
Terms: SILT, LEAN CLAY, FAT CLAY, ELASTIC SILT	PRIMARY CONSTITUENT
Sandy, gravelly, abundant cobbles, abundant boulders	>30-50]
with sand, with gravel, with cobbles, with boulders	>15-30] – secondary coarse grained constituents
scattered sand, scattered gravel, scattered cobbles, scattered boulders	5-15]
a trace sand, a trace gravel, a few cobbles, a few boulders	<5]
The relationship of clay and silt constituents is based on plasticity and normally determined by performing index tests. Refined classifications are based on Atterberg Limits tests and the Plasticity Chart.	

NON-COHESIVE (GRANULAR) SOILS

RELATIVE DENSITY	N-VALUE
Very Loose	0-4
Loose	5-10
Medium Dense	11-24
Dense	25-50
Very Dense	≥51

MOISTURE CONDITION	
Descriptive Term	Guide
Dry	No indication of water
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table.

**GRAIN SIZE IDENTIFICATION		
Name	Size Limits	Familiar Example
Boulder	12 in. or more	Larger than basketball
Cobbles	3 in. to 12 in.	Grapefruit
Coarse Gravel	¾-in. to 3 in.	Orange or lemon
Fine Gravel	No. 4 sieve to ¾-in.	Grape or pea
Coarse Sand	No. 10 sieve to No. 4 sieve	Rock salt
Medium Sand	No. 40 sieve to No. 10 sieve	Sugar, table salt
Fine Sand*	No. 200 sieve to No. 40 sieve	Powdered sugar
Fines	Less than No. 200 sieve	
*Particles finer than fine sand cannot be discerned with the naked eye at a distance of 8 inches.		

Coarse Grained Soil Sub Classification	Percent (by weight) of Total Sample
Terms: GRAVEL, SAND, COBBLES, BOULDERS	PRIMARY CONSTITUENT
Sandy, gravelly, abundant cobbles, abundant boulders	>30-50]
with gravel, with sand, with cobbles, with boulders	>15-30] – secondary coarse grained constituents
scattered gravel, scattered sand, scattered cobbles, scattered boulders	5-15]
a trace gravel, a trace sand, a few cobbles, a few boulders	<5]
Silty (MH & ML)*, clayey (CL & CH)*	<15]
(with silt, with clay)*	5-15] – secondary fine grained constituents
(trace silt, trace clay)*	<5]
*Index tests and/or plasticity tests are performed to determine whether the term "silt" or "clay" is used.	

*Modified after Ref. ASTM D2487-93 & D2488-93
**Modified after Ref. Oregon DOT 1987 & FHWA 1997
***Modified after Ref. AASHTO 1988, DM 7.1 1982, and Oregon DOT 1987

GENERAL NOTES

BEDROCK PROPERTIES & DESCRIPTIONS

ROCK QUALITY DESIGNATION (RQD)	
Description of Rock Quality	*RQD (%)
Very Poor	< 25
Poor	25-50
Fair	50-75
Good	75-90
Excellent	90-100

*RQD is defined as the total length of sound core pieces 4 in. or greater in length, expressed as a percentage of the total length cored. RQD provides an indication of the integrity of the rock mass and relative extent of seams and bedding planes.

SCALE OF RELATIVE ROCK HARDNESS		
Term	Field Identification	Approx. Unconfined Compressive Strength (tsf)
Extremely Soft	Can be indented by thumbnail	2.6-10
Very Soft	Can be peeled by pocket knife	10-50
Soft	Can be peeled with difficulty by pocket knife	50-260
Medium Hard	Can be grooved 2 mm deep by firm pressure of knife	260-520
Moderately Hard	Requires one hammer blow to fracture	520-1040
Hard	Can be scratched with knife or pick only with difficulty	1040-2610
Very Hard	Cannot be scratched by knife or sharp pick	>2610

DEGREE OF WEATHERING	
Slightly Weathered	Rock generally fresh, joints stained and discoloration extends into rock up to 25mm (1 in), open joints may contain clay, core rings under hammer impact.
Weathered	Rock mass is decomposed 50% or less, significant portions of rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.
Highly Weathered	Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

GRAIN SIZE (TYPICALLY FOR SEDIMENTARY ROCKS)		
Description	Diameter (mm)	Field Identification
Very Coarse Grained	>4.76	
Coarse Grained	2.0-4.76	Individual grains can easily be distinguished by eye.
Medium Grained	0.42-2.0	Individual grains can be distinguished by eye.
Fine Grained	0.074-0.42	Individual grains can be distinguished by eye with difficulty.
Very Fine Grained	<0.074	Individual grains cannot be distinguished by unaided eye.

VOIDS	
Pit	Voids barely seen with the naked eye to 6mm *1/4-inch)
Vug	Voids 6 to 50mm (1/4 to 2 inches) in diameter
Cavity	50 to 6000mm (2 to 24 inches) in diameter
Cave	> 600mm

BEDDING THCKNESS	
Very Thick Bedded	> 3' Thick
Thick Bedded	1' to 3' Thick
Medium Bedded	4" to 1' Thick
Thin Bedded	1-1/4" to 4" Thick
Very Thin Bedded	½" to 1-1/4" Thick
Thickly Laminated	1/8" to ½" Thick
Thinly Laminated	1/8" or less (paper thin)

DRILLING NOTES

Drilling & Sampling Symbols		
NQ – Rock Core (2-inch diameter)	CFA- Continuous Flight (Solid Stem) Auger	WB – Wash Bore or Mud Rotary
HQ – Rock Core (3-inch diameter)	SS – Split Spoon Sampler	TP – Test Pit
HSA – Hollow Stem Auger	ST – Shelby Tube	HA – Hand Auger

Soil Sample Types

Shelby Tube Samples: Relatively undisturbed soil samples were obtained from the borings using thin wall (Shelby) tube samplers pushed hydraulically into the soil in advance of drilling. This sampling, which is considered to be undisturbed, was performed in accordance with the requirements of ASTM D 1587. This type of sample is considered best for the testing of "in-situ" soil properties such as natural density and strength characteristics. The use of this sampling method is basically restricted to soil containing little to no chert fragments and to softer shale deposits.

Split Spoon Samples: The Standard Penetration Test is conducted in conjunction with the split-barrel sampling procedure. The "N" value corresponds to the number of blows required to drive the last 1 foot of an 18-inch long, 2-inch O.D. split-barrel sampler with a 140 lb. hammer falling a distance of 30 inches. The Standard Penetration Test is carried out according to ASTM D-1586.

Water Level Measurements

Water levels indicated on the boring logs are levels measured in the borings at the times indicated. In permeable materials, the indicated levels may reflect the location of groundwater. In low permeability soils, shallow groundwater may indicate a perched condition. Caution is merited when interpreting short-term water level readings from open bore holes. Accurate water levels are best determined from piezometers.

Automatic Hammer

Palmerton and Parrish, Inc.'s CME's are equipped with automatic hammers. The conventional method used to obtain disturbed soil samples used a safety hammer operated by company personnel with a cat head and rope. However, use of an automatic hammer allows a greater mechanical efficiency to be achieved in the field while performing a Standard Penetration resistance test based upon automatic hammer efficiencies calibrated using dynamic testing techniques.

*Modified after Ref. ASTM D2487-93 & D2488-93
**Modified after Ref. Oregon DOT 1987 & FHWA 1997
***Modified after Ref. AASHTO 1988, DM 7.1 1982, and Oregon DOT 1987

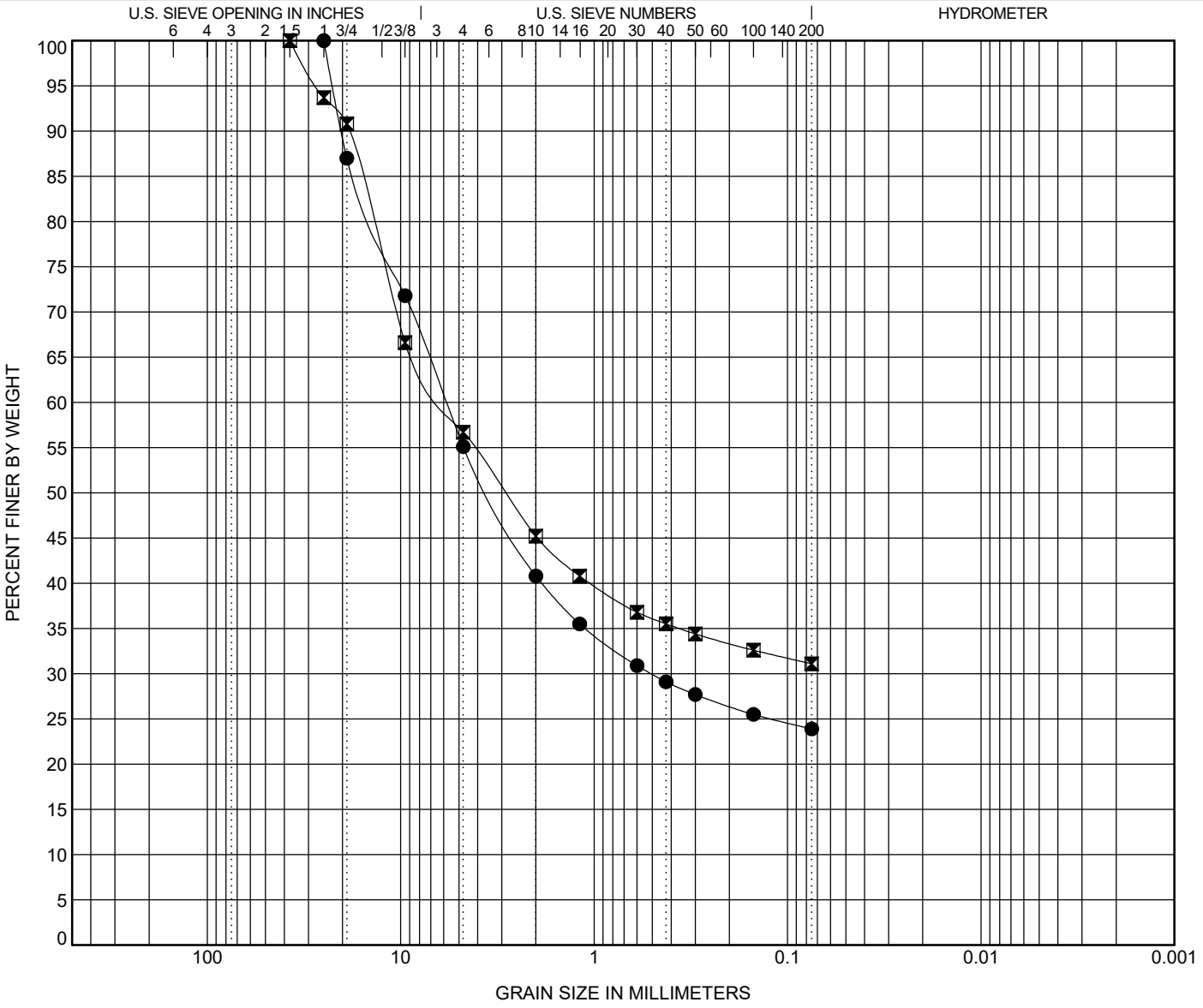
APPENDIX IV - GRAIN SIZE ANALYSIS

GRAIN SIZE DISTRIBUTION

4168 W Kearney St.
Springfield, MO 65803
Telephone: 417-864-6000

CLIENT Erlen Group **PROJECT NAME** Eastgate & FR 116

PROJECT NO. 23-0546 **PROJECT LOCATION** Springfield, MO



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	220	6.0	CLAYEY GRAVEL with SAND(GC)					
⊠	510+50	3.5	CLAYEY GRAVEL with SAND(GC)					

	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	220	6.0	25	5.821	0.505		44.9	31.2	23.9	
⊠	510+50	3.5	37.5	5.985			43.3	25.6	31.1	

APPENDIX V - DCP GRAPHICAL RESULTS

DCP TEST DATA

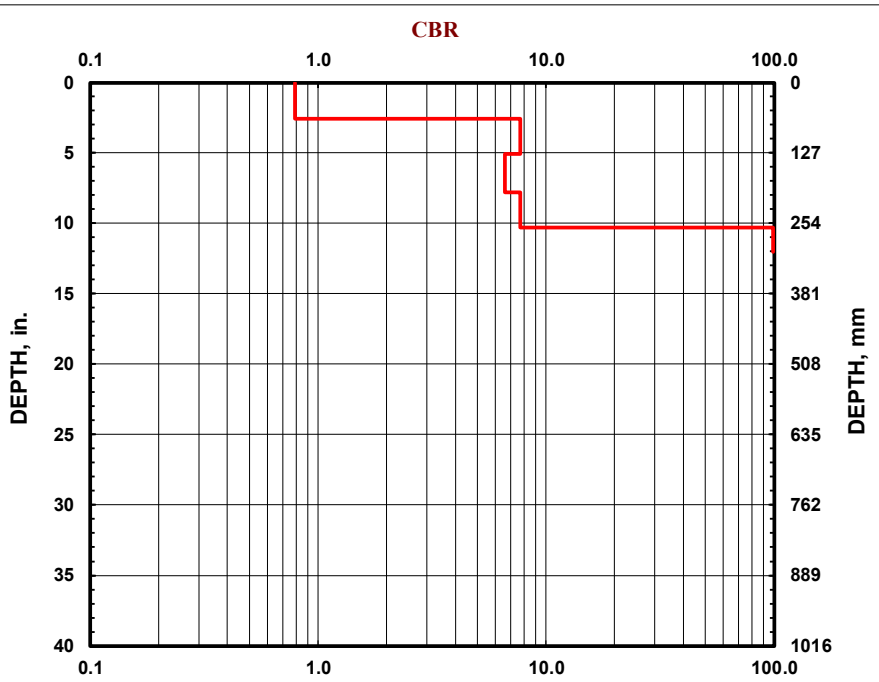
Client: Erlen Group

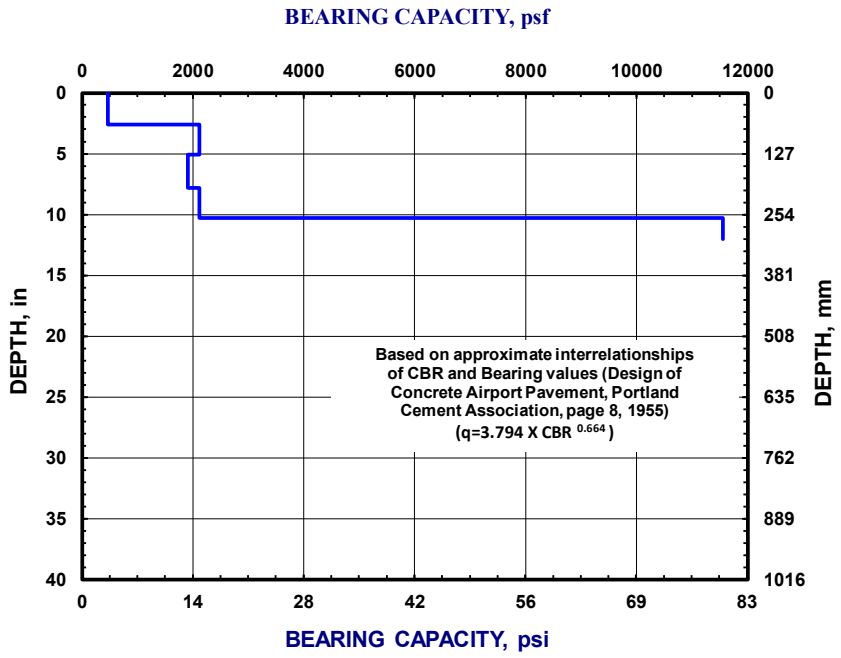
Project: *23-0546*
Location: 11+00
Date: 23-Feb-23
Soil Type(s): Low plasticity Clay with CBR<10

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ◉ CL
- ○ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
1	66	1
3	130	1
3	198	1
3	262	1
10	305	1





DCP TEST DATA

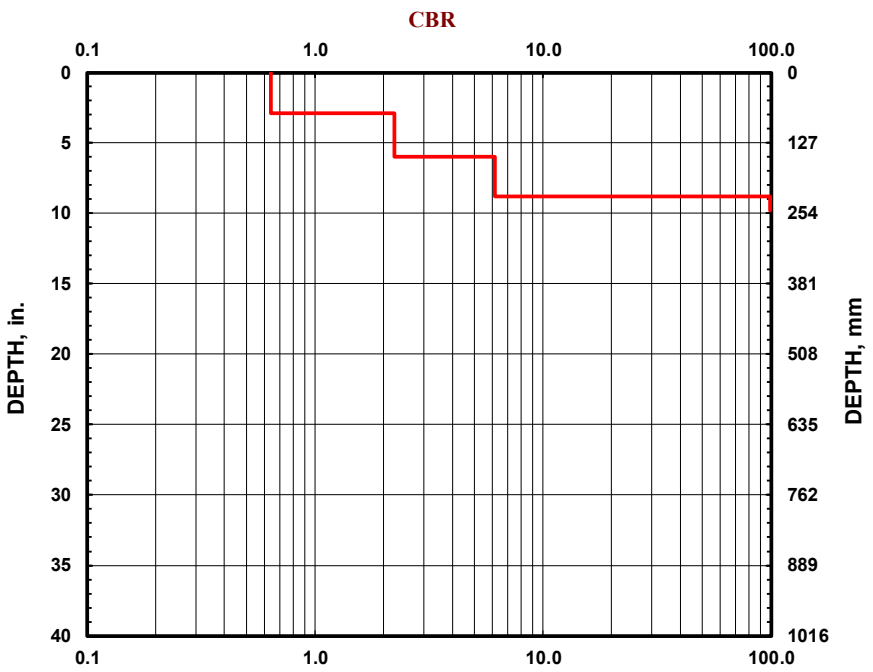
Client: Erlen Group

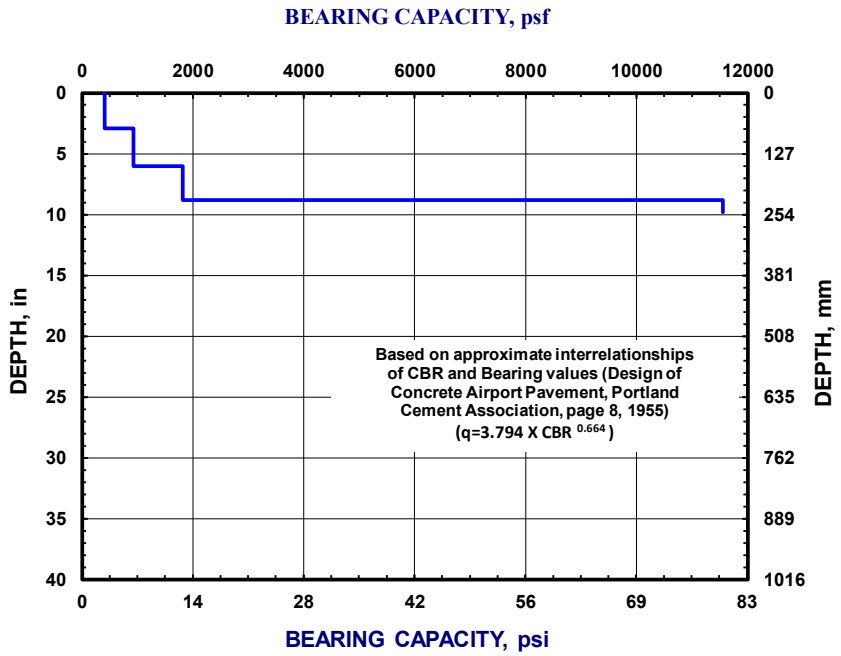
Project: *23-0546*
Location: 16+00
Date: 23-Feb-23
Soil Type(s): Low plasticity Clay with CBR<10

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ◉ CL
- ○ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
1	74	1
2	152	1
3	224	1
10	249	1





DCP TEST DATA

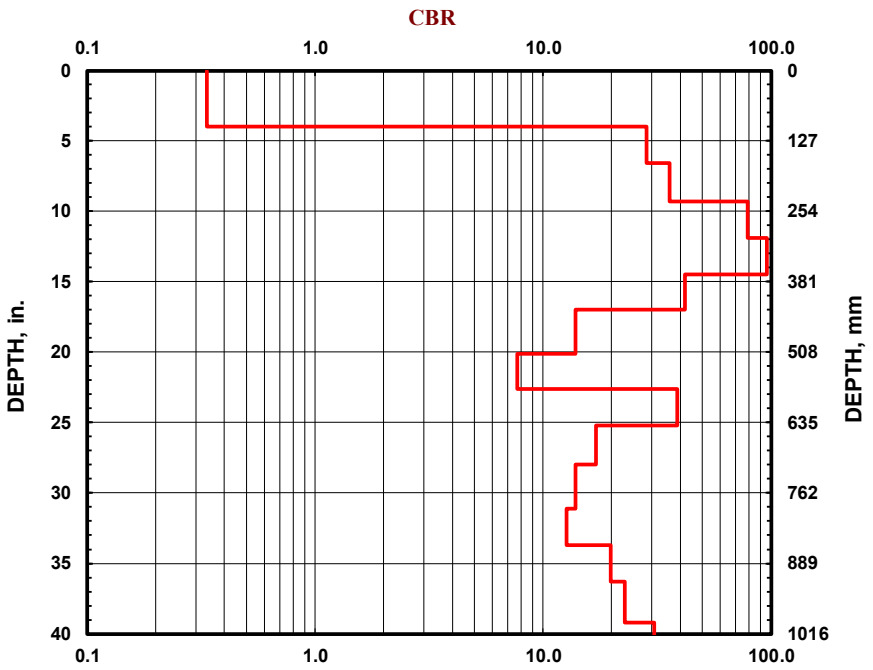
Client: Erlen Group

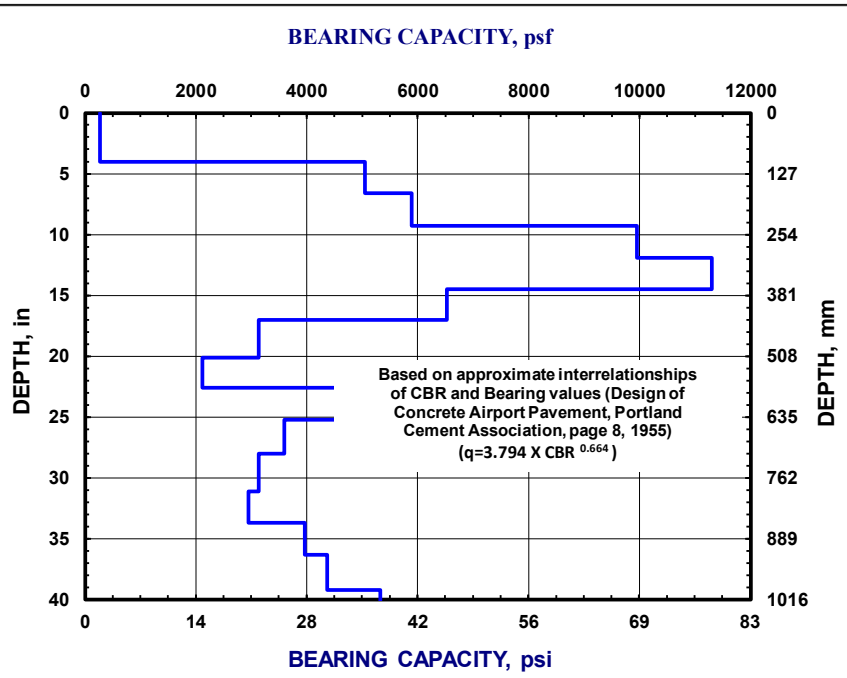
Project: *23-0546*
Location: 20+00
Date: 23-Feb-23
Soil Type(s): Low plasticity Clay with CBR<10

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ◉ CL
- ○ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
1	102	1
6	168	1
7	236	1
10	302	1
11	368	1
7	432	1
5	511	1
3	574	1
7	640	1
5	711	1
5	790	1
4	856	1
5	922	1
6	996	1
6	1059	1





DCP TEST DATA

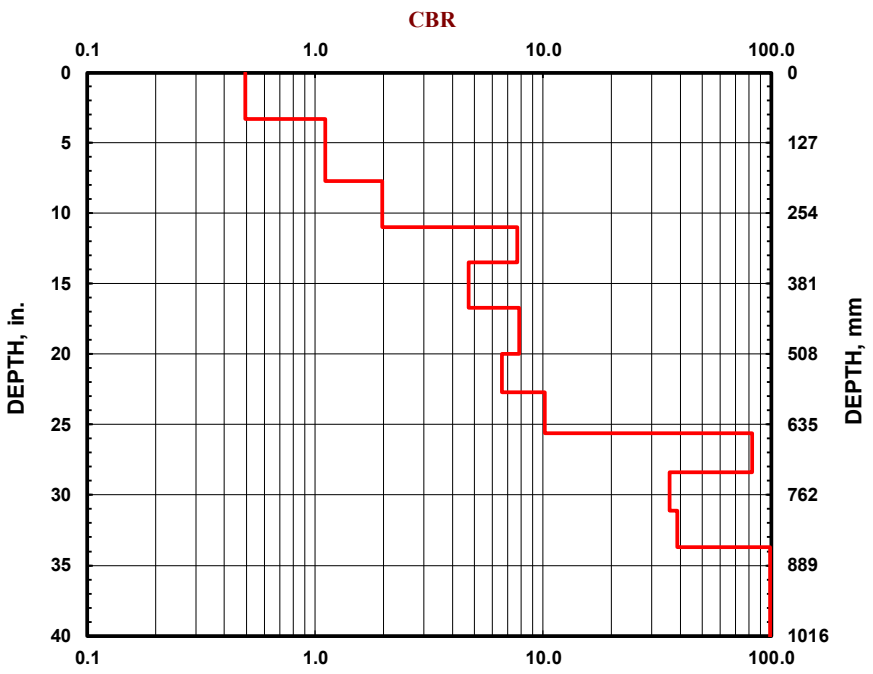
Client: Erlen Group

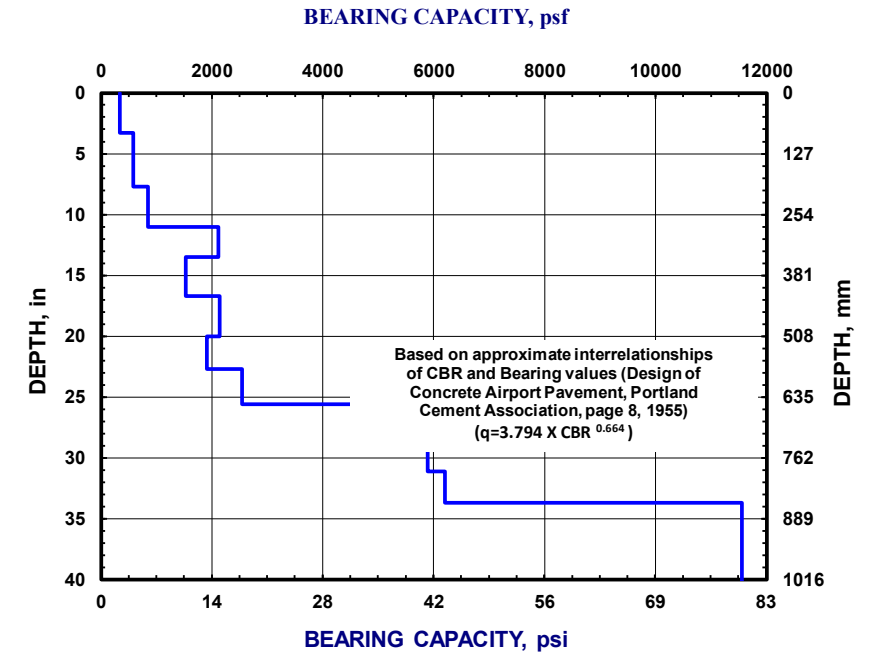
Project: *23-0546*
Location: 26+00
Date: 23-Feb-23
Soil Type(s): Low plasticity Clay with CBR<10

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ◉ CL
- ○ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
1	84	1
2	196	1
2	279	1
3	343	1
3	424	1
4	508	1
3	577	1
4	650	1
11	721	1
7	790	1
7	856	1
22	922	1
12	991	1
16	1057	1





DCP TEST DATA

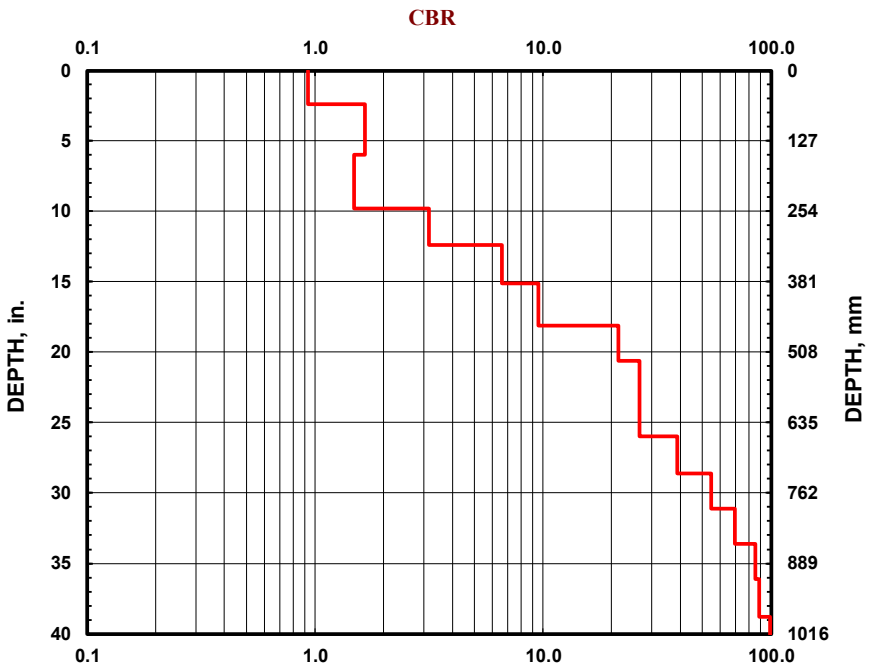
Client: Erlen Group

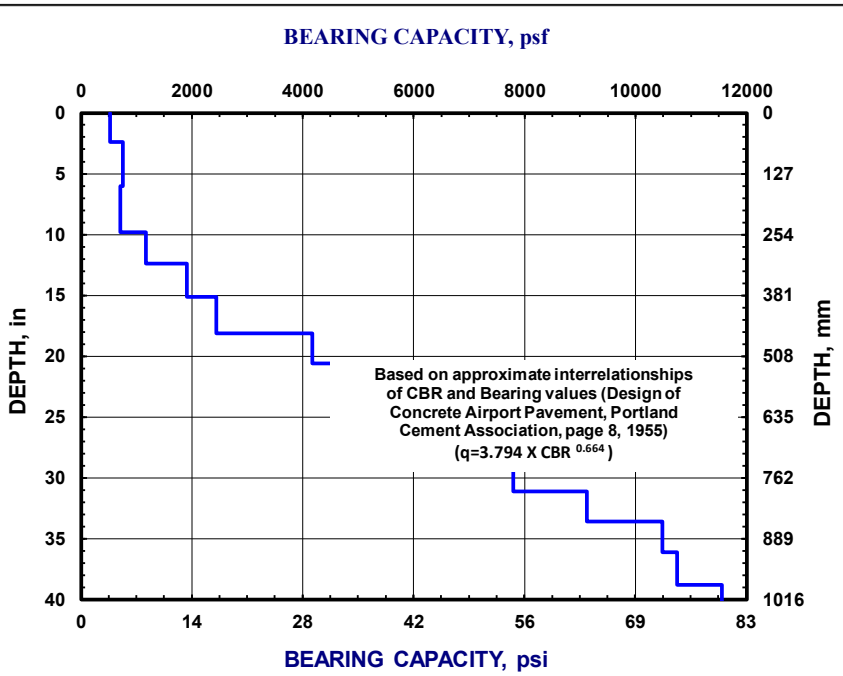
Project: *23-0546*
Location: 31+00
Date: 23-Feb-23
Soil Type(s): Low plasticity Clay with CBR<10

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ◉ CL
- ○ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
1	61	1
2	152	1
2	249	1
2	315	1
3	384	1
4	460	1
5	523	1
6	592	1
6	660	1
7	726	1
8	790	1
9	853	1
10	917	1
11	986	1
11	1049	1





DCP TEST DATA

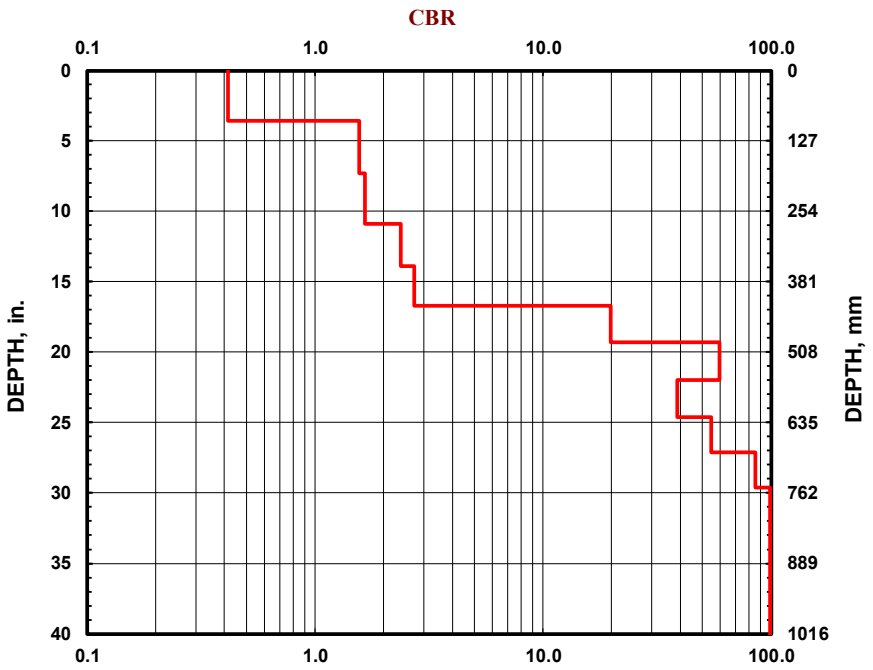
Client: Erlen Group

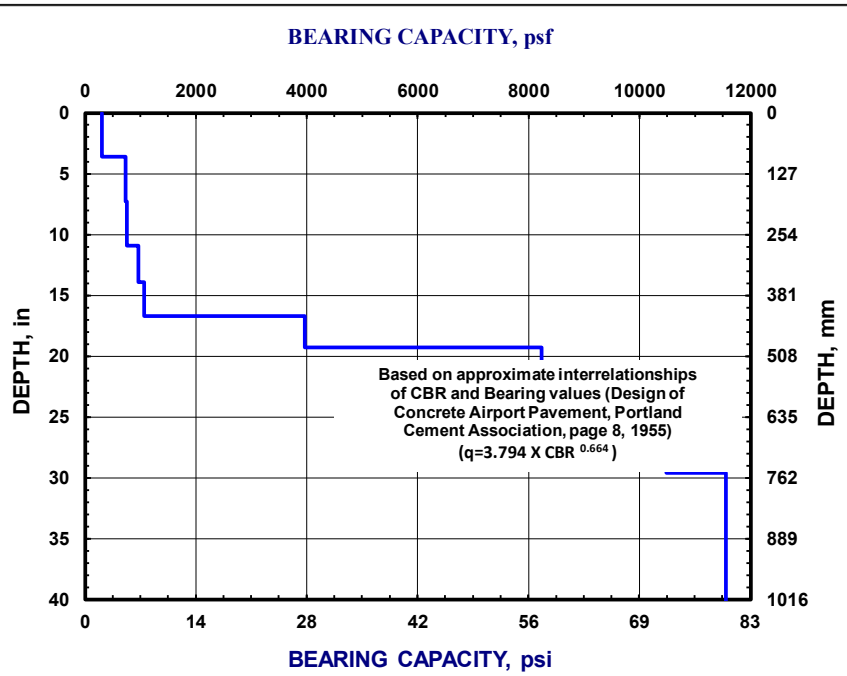
Project: *23-0546*
Location: 36+00
Date: 23-Feb-23
Soil Type(s): Low plasticity Clay with CBR<10

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ◉ CL
- ○ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
1	91	1
2	185	1
2	277	1
2	353	1
2	424	1
5	490	1
9	559	1
7	625	1
8	688	1
10	752	1
16	815	1
42	879	1
25	942	1
17	1006	1
11	1069	1





DCP TEST DATA

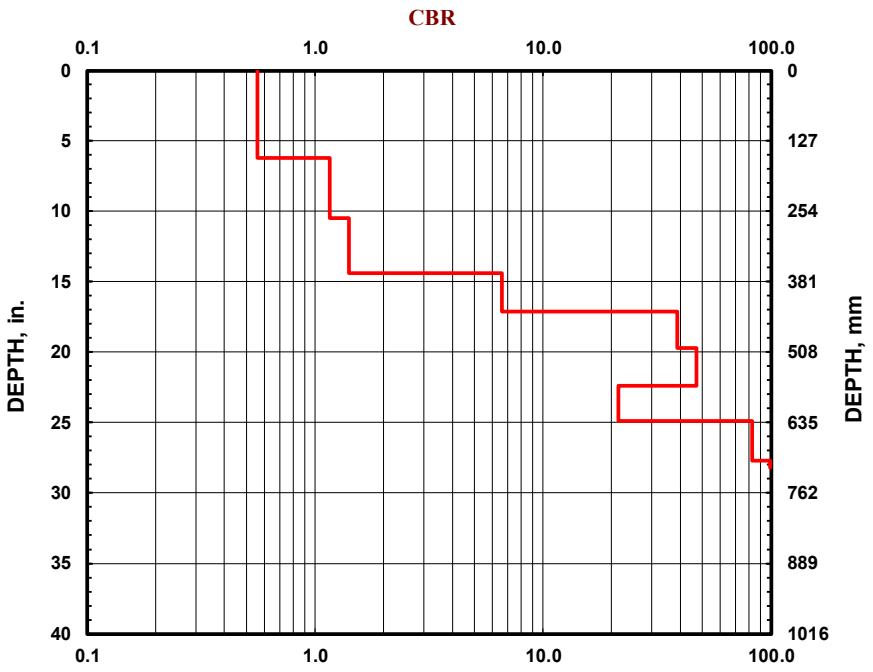
Client: Erlen Group

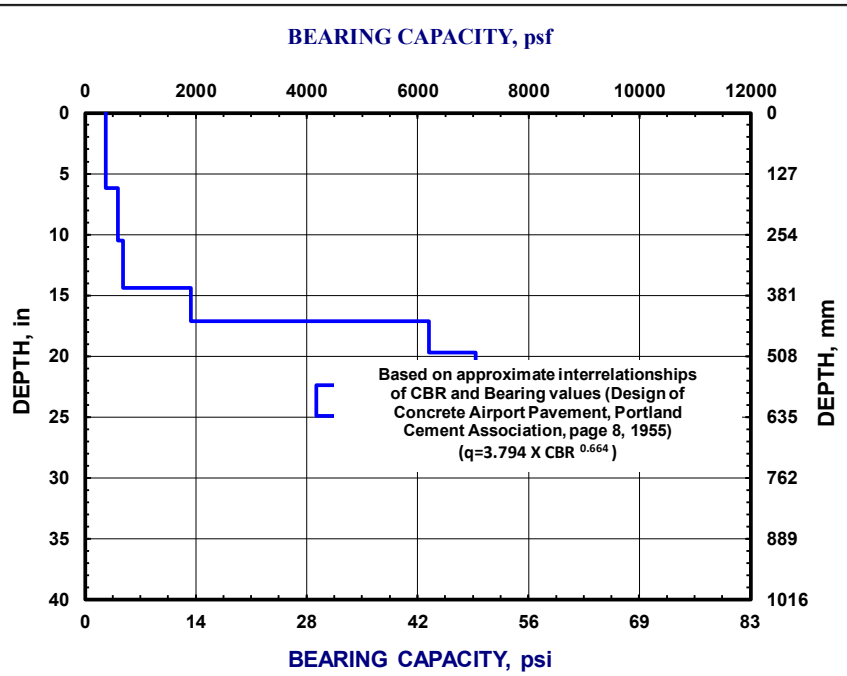
Project: *23-0546*
Location: 41+00
Date: 23-Feb-23
Soil Type(s): Low plasticity Clay with CBR<10

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ◉ CL
- ○ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
1	79	1
1	157	1
2	267	1
2	366	1
3	434	1
7	500	1
8	569	1
5	632	1
11	704	1
9	716	1





DCP TEST DATA

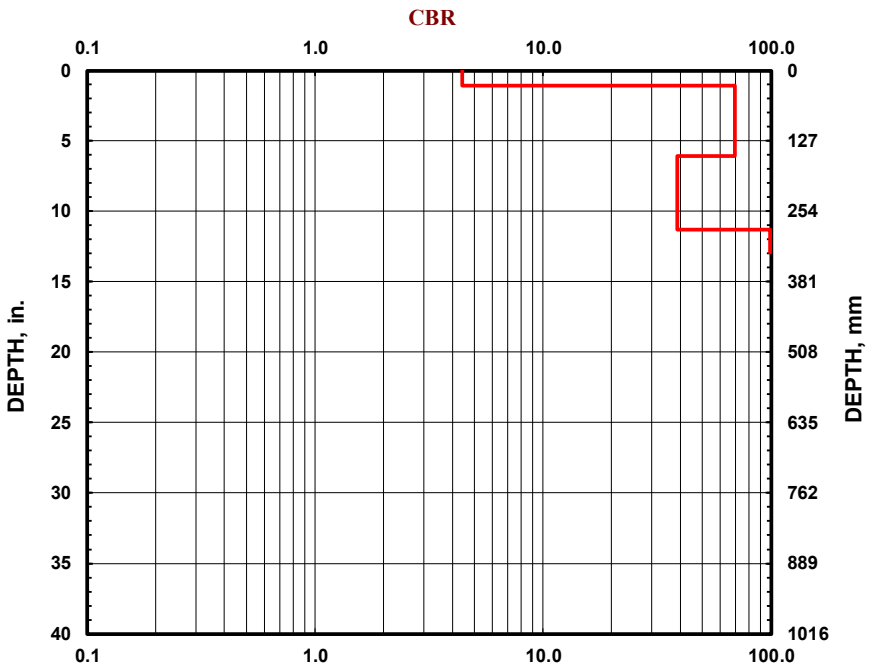
Client: Erlen Group

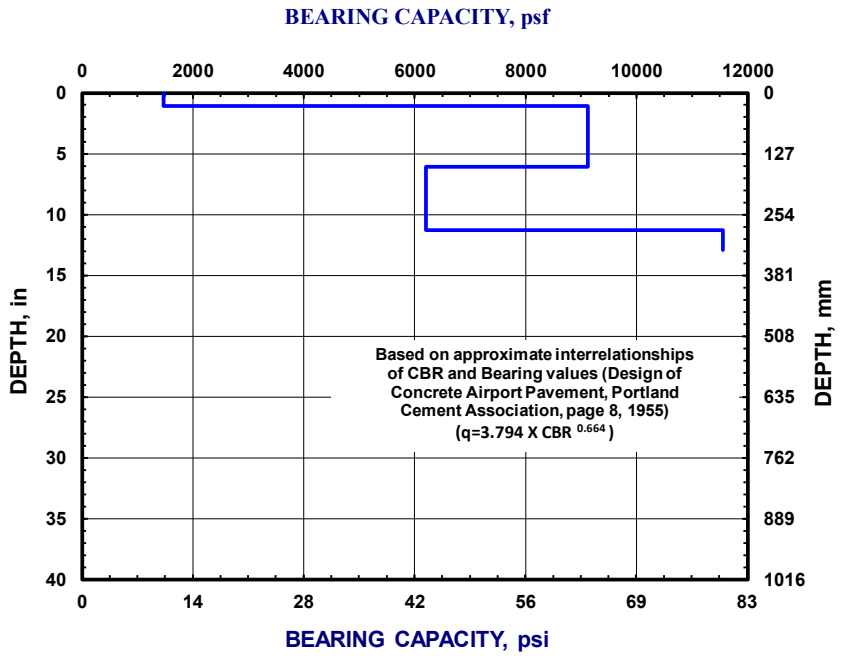
Project: *23-0546*
Location: B-14-1
Date: 23-Feb-23
Soil Type(s): Low plasticity Clay with CBR<10

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ◉ CL
- ○ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
1	28	1
9	91	1
9	155	1
7	221	1
7	287	1
10	328	1





DCP TEST DATA

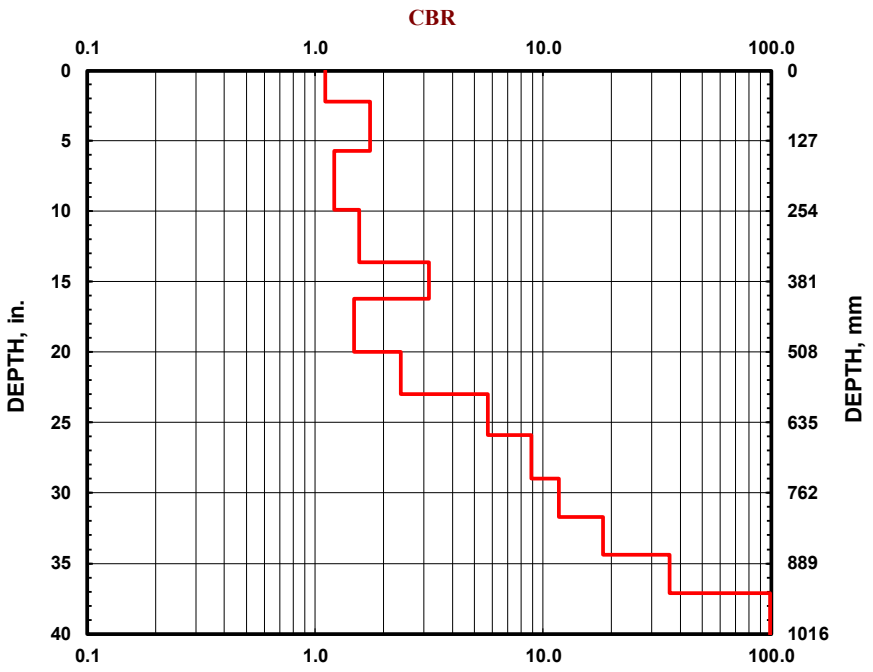
Client: Erlen Group

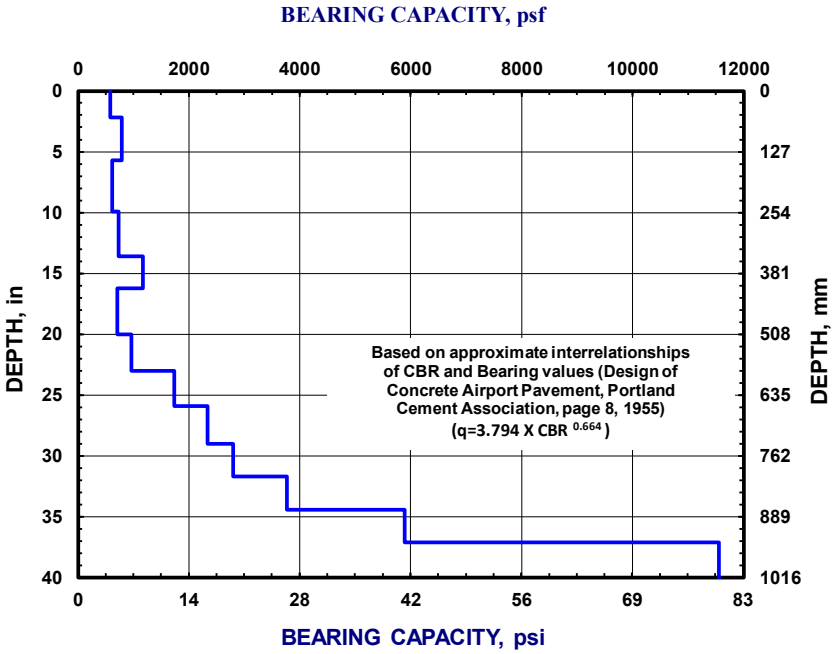
Project: *23-0546*
Location: 501+50
Date: 23-Feb-23
Soil Type(s): Low plasticity Clay with CBR<10

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ◉ CL
- ○ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
1	56	1
2	145	1
2	251	1
2	345	1
2	411	1
2	508	1
2	584	1
3	658	1
4	737	1
4	805	1
5	874	1
7	942	1
12	1008	1
16	1072	1





DCP TEST DATA

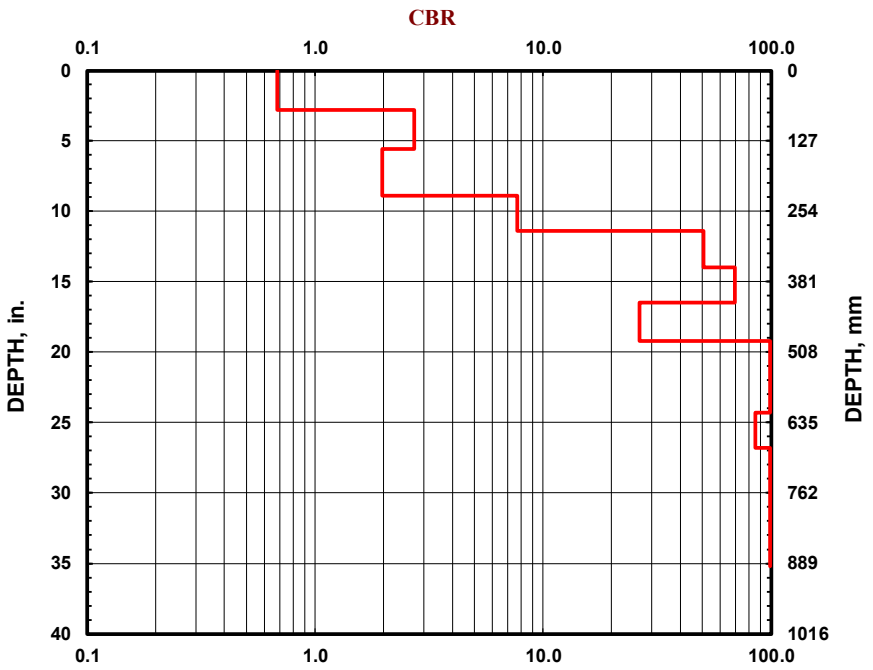
Client: Erlen Group

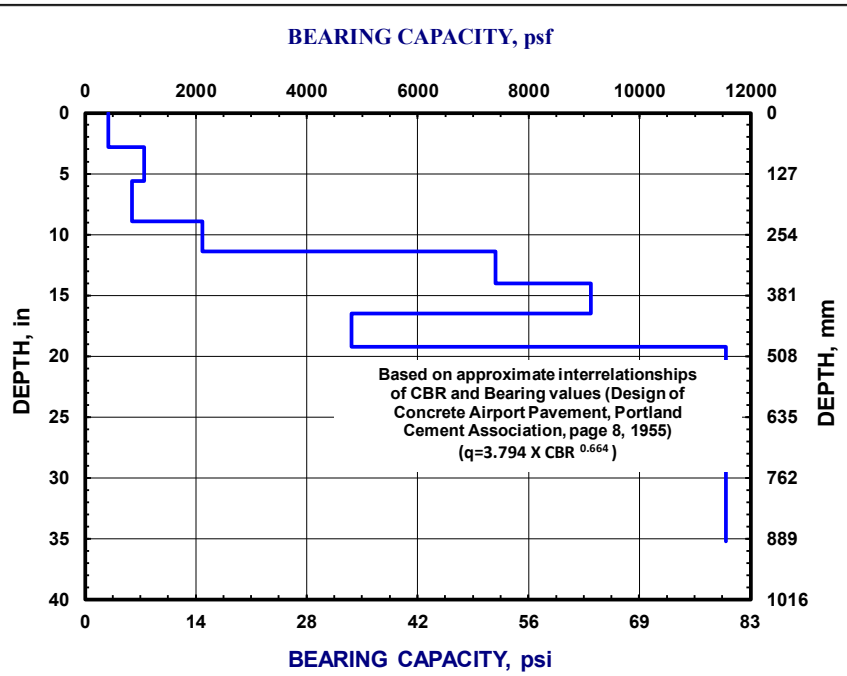
Project: *23-0546*
Location: 505+50
Date: 23-Feb-23
Soil Type(s): Low plasticity Clay with CBR<10

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ◉ CL
- ○ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
1	71	1
2	142	1
2	226	1
3	290	1
8	356	1
9	419	1
6	488	1
17	554	1
11	617	1
10	681	1
14	744	1
26	808	1
20	871	1
12	894	1





DCP TEST DATA

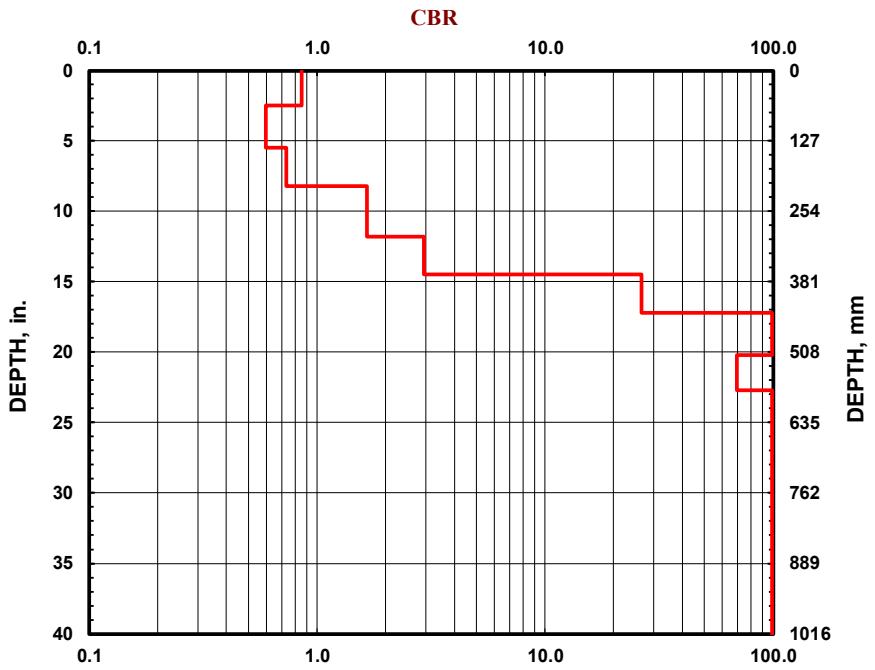
Client: Erlen Group

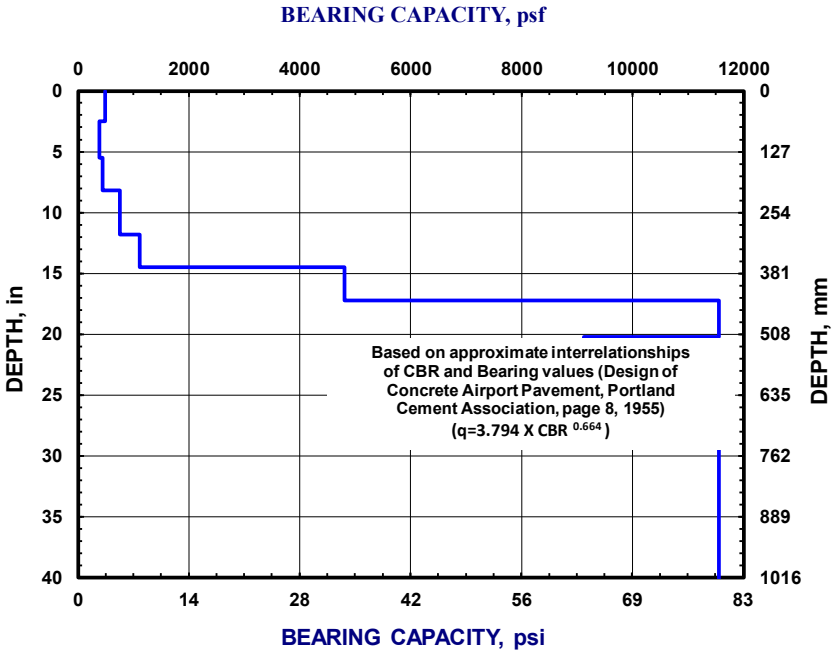
Project: *23-0546*
Location: 510+50
Date: 23-Feb-23
Soil Type(s): Low plasticity Clay with CBR<10

Hammer
- ○ 10.1 lbs.
- ◉ 17.6 lbs.
- ○ Both hammers used

Soil Type
- ○ CH
- ◉ CL
- ○ All other soils

No. of Blows	Accumulative Penetration (mm)	Type of Hammer
0	0	1
1	64	1
1	140	1
1	208	1
2	300	1
2	368	1
6	437	1
13	513	1
9	577	1
18	645	1
11	709	1
35	772	1
15	841	1
14	907	1
16	970	1
14	1034	1





APPENDIX VI - IMPORTANT INFORMATION REGARDING YOUR GEOTECHNICAL REPORT

Important Information about This

Geotechnical-Engineering Report

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

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

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

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled.* No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

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

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

Stormwater Pollution Prevention Plan (SWPPP)

Springfield City Code Chapter 96, Article 3 requires that the Responsible Party, defined as the property owner or person authorized to act on the property owner's behalf, obtain a permit prior to commencing land disturbance activity.

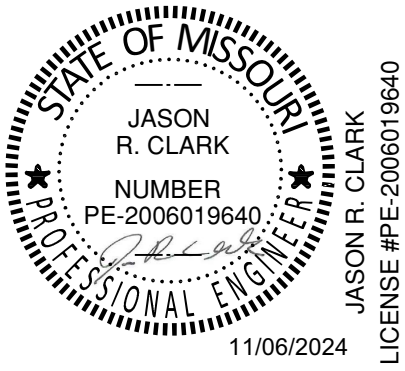
EASTGATE AVENUE IMPROVMENTS
2023PW0068
DIVISION ST. TO LE COMPTE RD.
SPRINGFIELD, MO 65802

SWPPP Prepared For:

CITY OF SPRINGFIELD, MO
KING COLTRIN
840 BOONVILLE AVENUE
SPRINGFIELD, MO 65802
(417) 864-1917
KING.COLTRIN@SPRINGFIELDMO.GOV

SWPPP Prepared By:

CRAWFORD, MURPHY & TILLY, INC.
JASON CLARK, P.E.
1631 West Elfindale
Springfield, MO 65807
(417) 799-6255
jclark@cmtengr.com



Estimated Project Duration: 1 YEAR
SWPPP Preparation Date: 11/06/2024
Estimated Project Start Date: 12/01/2024
Estimated Project Completion Date: 12/01/2025

Contents

SECTION 1: NATURE OF CONSTRUCTION ACTIVITY

Instructions:

- Describe the function of the project and estimate the total area expected to be disturbed by tree removal, excavation, grading, or other construction support activities, including, but not limited to, off-site borrow and fill areas.
- Provide a general description of the nature of the construction activities at your project.
- What is the size of the property (in acres), the total area expected to be disturbed by the construction activities (in acres), and the maximum area expected to be disturbed at any one time? Include the area needed for material production such as batch plants and storage of materials or piles.
- A general map (e.g., United States Geological Survey quadrangle map, a portion of a city of county map, or other map) with enough detail to identify the location of the construction site and waters of the state within one mile of the site.

General Description of Project
Excavation, grading, and paving operations to support development of a new roadway.

Size of Construction Project
TOTAL ACREAGE OF PROPERTY: 132.6 AC
TOTAL ACREAGE TO BE DISTURBED BY ACTIVITY: 12.4 AC

TOTAL ACREAGE TO BE DISTURBED AT ONE TIME DURING EACH PHASE OF THE SITE (refer to phasing and stabilization section for more information): TOTAL ACREAGE DISTURBED AT ONE TIME DURING EACH PHASE (repeat for each phase)

Public Improvement Project: 2023PW0068
☐ The site is associated with a Public Improvement Project.
☒ The Public Improvement is inside the area of disturbance.
☐ The Public Improvement is connected and continues outside of the area of disturbance.

Land Disturbance Permit Type:
☒ General (for full plan submittal of architectural and civil site improvements)
☐ Stand-alone (for land disturbance only)
☐ Phased submittal of Civil Site Improvements

1.1 Discharge Information

Instructions:

- Describe water resources found on or near the site.
- Describe the locations and methods (e.g. channel or sheet flow) of water leaving the site through all site outfalls.
- List the name of the first surface water that receives discharges from your site. If your site has discharges to multiple surface waters, indicate the names of all such waters.
- You may utilize the City of Springfield's GIS Viewer program found on the website. Under "Table of Contents," select the "Streams" layer.

General Description of Water Resources found on Site (e.g. streams and sinkholes) and Stormwater Outfalls (where the water leaves the site).
The project site has four total stormwater outfalls. Outfall 1 is a 24" RCP under Division St that leads to Pierson Creek. Outfalls 2 & 3 discharge into culverts underneath Le Compte Ave east of the project site to Pierson Creek. Outfall 4 is in the northwest corner of the site and outfalls to the existing 5'x3' RCBC under U.S. 65 towards the Jordan Creek North Branch.

List Receiving Waters
Pierson Creek, Jordan Creek North Branch

Are the Receiving Waters within the watershed of Outstanding National or State Resource Water or in the watershed of a water impaired for sediment? (Note: The 303(d) list published in 2022 does not include impairments for sediment within any watershed regulated by the City of Springfield MS4.)

☐ Yes
☒ No

1.2 Construction Support Activities

Instructions:

- Will there be any construction support activities for the project (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas)?
- Describe how the support activities will be contained and stormwater runoff prevented.

Description of construction support activity and BMPs used to prevent runoff.

INSERT TEXT HERE AS PER INSTRUCTIONS

Support activity subcontractor:

COMPANY OR ORGANIZATION NAME_____

NAME_____

ADDRESS_____

ADDRESS_____

CELL PHONE NUMBER_____

OFFICE PHONE NUMBER_____

EMAIL_____

Location of construction support activity

INSERT ADDRESS HERE

[Repeat as necessary.]

SECTION 2: SWPPP TEAM CONTACT INFORMATION/RESPONSIBLE PARTIES

2.1 Property Owner: Notification, Certification & Delegation of Authority to Contractor

Instructions:

- The following certification statement must be signed and dated by the owner or legally authorized representative.
  - For a corporation, this could be a president, secretary, treasurer, or vice president, or any other person who performs similar policy or decision-making functions for the corporation.
  - For a partnership or sole proprietorship, this could be a general partner or the proprietor.
  - For a municipality, state, federal or other public agency, this could be a principal executive officer or ranking elected official.
- This certification must be re-signed in the event of a SWPPP Modification.

Property Owner/Permittee:
City Of Springfield, Mo
King Coltrin
840 Boonville Avenue
Springfield, Mo 65802
(417) 864-1917
king.coltrin@springfieldmo.gov

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Submittal of the SWPPP and/or permit fee does not imply that the permit has been or will be authorized or issued. The permit fee will be adjusted according to the fee schedule if it's determined during the review process of the SWPPP that the area to be disturbed is more or less than that represented on the application.

I hereby certify that I am the legal owner of the property for which this permit is requested or his/her legally authorized agent.

OWNER: Please ***Use Ink*** to Print Name, Sign and Date

2.2 CONTRACTOR GIVEN AUTHORITY: NOTIFICATION & CERTIFICATION

Instructions:

- The designee is authorized if:
  - The authorization is made in writing by the individual making the designation.
  - The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as an operator, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company.
  - The signed and dated written authorization is included in the SWPPP.

Delegation of Authority

I, _____ (OWNER/PERMITTEE), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Missouri State Operating Permit, at Eastgate Ave Improvements .

The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit. This person will conduct inspections in accordance with the inspection schedule in Section 3.2

General Contractor:

Site Superintendent and/or designated Inspector #1 (makes decisions for corrective actions)

Name of person_____

Company_____

Cell Phone_____

Email_____

[Repeat as needed for Contractor team.]

Delegation of Authority Continued

By signing this authorization, I confirm that I meet the requirements to make such a designation, and that the designee above meets the definition of a "duly authorized representative."

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____

OWNER: Please ***Use Ink*** to Print Name, Sign and Date

CONTRACTOR NOTIFICATION OF
STORMWATER POLLUTION PREVENTION PLAN

While working at a permitted job-site, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP). Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract (if under a contractual agreement). You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is on-site and shall be made available upon request.

Each contractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the practices described in the SWPPP.

_____

Site Superintendent and/or designated Inspector #1
CONTRACTOR: Please ***Use Ink*** to Print Name, Sign and Date
[Repeat as needed for Contractor team.]

2.3 Additional Contractors: Notification & Certification

Instructions:

- List the additional contractors expected to work on-site. Notify contractors of stormwater requirements applicable to their work.
- "Subcontractor" refers to any person or company performing work on-site for completion of the project, not just entities under contractual agreement.
- Only contractors performing activities which could impact stormwater quality (working in the dirt) need to be listed.

ALL ADDITIONAL CONTRACTORS MUST SIGN THE CONTRACTOR AGREEMENT FOUND IN THE APPENDIX.

Additional Contractors: Demolition, Excavation, Dirt Work, ESC Contractor, Plumbing & Utilities must sign the Contractor Agreement found in the appendix.

COMPANY OR ORGANIZATION NAME_____

NAME_____

ADDRESS_____

ADDRESS_____

CELL PHONE NUMBER_____

OFFICE PHONE NUMBER_____

EMAIL_____

COMPANY OR ORGANIZATION NAME_____

NAME_____

ADDRESS_____

ADDRESS_____

CELL PHONE NUMBER_____

OFFICE PHONE NUMBER_____

EMAIL_____

COMPANY OR ORGANIZATION NAME_____

NAME_____

ADDRESS_____

ADDRESS_____

CELL PHONE NUMBER_____

OFFICE PHONE NUMBER_____

EMAIL_____

Contractor Agreement

CONTRACTOR NOTIFICATION OF STORMWATER POLLUTION PREVENTION PLAN

While working at a permitted jobsite, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP). Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract (if under a contractual agreement). You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is on-site and shall be made available upon request.

Each contractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the practices described in the SWPPP.

CONTRACTOR: Please ***Use Ink*** to Print Name, Sign and Date

CONTRACTOR: Please ***Use Ink*** to Print Name, Sign and Date

CONTRACTOR: Please ***Use Ink*** to Print Name, Sign and Date

CONTRACTOR: Please ***Use Ink*** to Print Name, Sign and Date

CONTRACTOR: Please ***Use Ink*** to Print Name, Sign and Date

CONTRACTOR: Please ***Use Ink*** to Print Name, Sign and Date

SECTION 3: TRAINING, INSPECTION AND CORRECTIVE ACTION

3.1 Training

Instructions:

- The Responsible Party (Permittee or Designee) is required to complete regularly scheduled erosion and sediment control inspections. The State Operating Permit issued through the Missouri Department of Natural Resources (MDNR) requires that these inspections shall be conducted by a qualified person, one who is responsible for environmental matters on the site, or a person trained by and directly supervised by the person designated as the Environmental Lead at the site. The following website provides sources for educational webinars, conferences, professional networking, and formal certifications: https://www.springfieldmo.gov/5875/Training-Outreach-Materials.

3.2 Inspection Personnel and Procedures

Instructions:

- Describe the procedures you will follow for conducting inspections.
- Describe the procedures you will follow for corrective action.
- The person/people conducting inspections and corrective actions must be delegated as the people/person of authority.
- Site Superintendent and/or designated Inspector are responsible for conducting inspections and corrective actions.

Inspection Schedule:

☒**Choice A**

- **SELF INSPECTION FORM TO BE USED FOR THIS SITE IS IN THE APPENDIX.**
- Inspection will be done at least once per 7 calendar days. Inspections must also occur within 48 hours after any rain event equal to or greater than 3.74 inches (2-year, 24-hour storm) and has ceased during a normal work day and within 72 hours if the rain event ceases during a non-work day such as a weekend or holiday.

☐**Choice B**

- **SELF INSPECTION FORM TO BE USED FOR THIS SITE IS IN THE APPENDIX.**

  Inspections shall be conducted once per 14 calendar days and within 24 hours of the occurrence of a storm event of 0.25 inches of precipitation or greater, or the occurrence of runoff from snowmelt. Additionally, an inspection shall be conducted within 24 hours of the event end, or within 72 hours if the rain event ceases during a non-workday (weekend or holiday). To determine inches of precipitation, the permittee shall keep a properly maintained rain gauge on site or obtain the storm event information from a nearby weather station, such as http://www.123mc.com/ (Username: rain@springfieldmo.gov; Password: rainfall1).
  - Inspections are only required during project normal working hours. Areas on-site that have been finally stabilized must be inspected at least once per month.

Corrective Action Schedule to be used for choice A and B

Any structural or maintenance problems shall be noted in an inspection report and corrected within seven calendar days of the inspection. If weather conditions prevent correction of BMPs within 7 calendar days, the reasons for the delay must be documented (including pictures) and there must be a narrative explaining why the work cannot be accomplished within the 7-day time period. The documentation must be filed with the regular inspection reports, and the problem shall be corrected as soon as weather conditions allow. The responsible person must be notified by phone, text or email when stormwater runoff occurs.

☐ **Frozen Conditions**

- If construction activities are suspended due to frozen conditions, the permittee may temporarily reduce site inspections to monthly until thawing conditions begin if all the following are met:
  - Land Disturbance has been suspended;
  - All disturbed areas have been stabilized with temporary BMPs; and
  - The inspection frequency change is noted within the SWPPP

SECTION 4: Best Management Practices (BMPs) for Pollution Control

General Instructions:

- Describe the erosion and sediment controls that will be installed and maintained at your site.
- BMPs shall be maintained and remain in effective operating condition during the entire duration of the project.
- **COMBINE ALL BMP DESIGNS WITH PHASING TABLES TOGETHER ON ONE LARGE DETAIL PLAN SHEET AND INCLUDE THEM ON THE EROSION CONTROL SITE PLANS.**
- Ensure the design, installation and maintenance of effective erosion, sediment and chemical controls to minimize the discharge of pollutants. At a minimum, such controls shall be designed, installed and maintained to:
  - Control storm water volume, velocity, and peak flow rates within the site to minimize soil erosion;
  - Control storm water discharges, including both peak flow rates and total storm water volume, to minimize erosion at outlets and to minimize downstream channel and streambank erosion and scour;
  - Minimize the amount of soil exposed during construction activity;
  - Minimize the disturbance of steep slopes;
  - Minimize sediment discharges from the site. Address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting storm water runoff, expected flow from impervious surfaces, slopes, and drainage features, and soil characteristics, including the range of soil particle sizes expected to be present on the site;
  - Provide and maintain natural buffers around surface waters of the state as detailed in Section 4.2, direct storm water to vegetated areas to increase sediment removal and maximize storm water infiltration and filtering, unless infeasible;
  - Minimize soil compaction and preserve topsoil where practicable; and
  - Capture or treat a 2-year, 24-hour storm event.

BMP Details and Design Narratives:

BMP DESIGN DETAIL, DESCRIPTION AND NARATIVE NOTES ARE PROVIDED ON EROSION SEDIMENT CONTROL DETAIL SHEET AND LISTED ON PHASING PLAN. ALL BMPS ARE SHOWN ON EROSION CONTROL PLAN.

BMP Notes shall address the following:

- BMP Type
- Physical Description
- Site Conditions that must be met for effective use of the BMP
- BMP Installation and Construction Procedures, including typical drawings
- Operation and Maintenance Procedures
- Whether the BMP is Temporary or Permanent
- Site Conditions that must be met before removal of the BMP if it is not a permanent BMP.

THE CITY OF SPRINGFIELD'S BMP DETAILS ARE DESIGNED TO PROVIDE ALL NECESSARY NARRATIVE INFORMATION IN THE BMP NOTES. THESE DETAILS ARE AVAILABLE ONLINE HERE:
https://www.springfieldmo.gov/5874/Best-Management-Practices.

4.1 Phasing of Construction Activities

Instructions:

- Describe the intended sequence and timing of activities that disturb soils at the site. For each phase of construction, include the following information:
  - Installation of structural or non-structural Best Management Practices (BMPs);
  - Beginning and duration of earth-disturbing activities, including clearing and grubbing, demolition, mass grading, site preparation (i.e., excavating, cutting and filling), final grading, and creation of soil and vegetation stockpiles requiring stabilization;
  - Cessation, temporarily or permanently, of construction activities on the site, or in designated portions of the site;
  - Final or temporary stabilization of areas of exposed soil. The dates for stabilization must reflect applicable deadlines;
  - Make sure that the phases for installation of each BMP are consistent with installation sequencing;
  - The number of phases should be determined by the SWPPP Preparer as appropriate for the site; and
  - **COMBINE ALL TYPICAL BMP DESIGN DETAILS WITH PHASING TABLE ON ESC DETAIL PLAN SHEET.**

Phase	Instructions, Tips & Tricks	Start Date	Construction Sequence	BMPs- Check the BMPs that will be installed and maintained.	End Date
Pre-Construction	**Initial BMPs are to be installed prior to any other activity on-site. Call City at 864-2087 for an initial BMP inspection as soon as this has been done.** The following is needed to pass this inspection: 1. Installation of Pre-con BMPs. 2. SWPPP on-site. 3. Site sign posted. Upon successful completion of installation, a City Land Disturbance Permit will be issued. The hold on the building permit will also be released at this time. If a temporary sedimentation basin is required, the permit will be issued upon completion and inspection of the basin.	__/__/__	a. Initial BMP & SWPPP Installations	☒ LDP Site Sign is displayed and SWPPP is stored where sign designates ☐ Equipment/Material yard established ☒ Construction exit ☒ Perimeter control (sock, fence, or other) ☐ Ditch checks ☒ Tree protection fencing ☒ Inlet protection for existing inlets	__/__/__

Phase	Instructions, Tips & Tricks	Start Date	Construction Sequence	BMPs- Check the BMPs that will be installed and maintained.	End Date
Phase 1: Demolition and Grading	Demolition and tree removal is the first phase of construction. When removing vegetation, it is a good practice to chip some of the material on-site and apply as a mulch ground cover. The mulch protects the soil from the erosive impact of rainfall. It also protects the roots of remaining trees from soil compaction. Utilize fencing and/or signage to indicate preservation of vegetation.	__/__/__	a. Demolition / Clearing	☐ Contain and cover building materials containing PCBs ☐ Preservation of existing vegetation ☒ Dust control ☒ Street sweeping	__/__/__
	If a sedimentation basin is called for, it should be installed with temporary outfall pipe and emergency spillway prior to any other grading activity. The State requires installation of a sedimentation basin for each drainage area with ten or more acres disturbed at one time. The basin shall be sized to contain a volume of at least 3,600 cubic feet per each disturbed acre draining thereto. **After the sedimentation basin has been installed, contact the City at 864-2087 for an inspection. At this time, the hold on the building permit will be released.**	__/__/__	b. Sedimentation Basins/traps	☐ Sedimentation basin ☐ Sediment trap	__/__/__
	It is always best to try to limit the area of disturbance at any given time. Rather than mass grading, leave areas of vegetation. A vegetated strip between limits of grading and the perimeter BMP both enhances the effectiveness of the perimeter control and increases its lifespan, as it is less likely to be damaged by equipment. Once a parking area has been graded, lay base-rock if possible. This will greatly cut down on track-out. Seed and stabilize stockpiles. Remember, vegetation is always the best BMP.	__/__/__	c. Grading	☐ Soil binders ☒ Retain topsoil ☒ Stockpile protection ☐ Slope drains ☐ Stream crossing ☐ Water diversion ☐ Dewatering ☒ Dust Control	__/__/__

Phase	Instructions, Tips & Tricks	Start Date	Construction Sequence	BMPs- Highlight/Circle BMPs that will be installed/maintained during the associated phase	End Date
Phase 2: Construction	As stormwater system becomes active, protect new inlets. Add ditch checks, check dams, and erosion control blanket as specified in the plan.	__/__/__	a. Drainage System Installation	☐ Ditch checks ☒ Check dams ☒ Inlet protection for new inlets ☒ FES protection	__/__/__
	Make sure that communication is happening between you and your utility contractor. If they will need to access within a tree preservation zone, discuss alternatives to trenching, such as boring. If utilities must be trenched contact Sarah Davis at 380-2817 so root cuts can be documented.	__/__/__	b. Utilities Installation	☒ Sign subcontractor agreement	__/__/__
	All wash-out pits should be lined in plastic.	__/__/__	c. Paving	☒ Concrete wash-out pit	__/__/__
	Windblown trash and debris is considered a pollutant.	__/__/__	d. Building Construction	☐ Plastic lined masonry area ☐ Trash Dumpster	__/__/__
	These BMPs include bioretention, infiltration trenches, pervious pavement, and pavers, etc. If these features become clogged with sediment and/or compacted by equipment, they will not function properly.	__/__/__	e. Permanent BMP Installations	☒ Prevent soil compaction ☒ Protect permanent structures ☐ Remediate soils	__/__/__

Phase	Instructions, Tips & Tricks	Start Date	Construction Sequence	BMPs- Check the BMPs that will be installed and maintained.	End Date
Phase 3: Stabilization	Stabilization must be initiated immediately and completed within seven (7) calendar days where soil disturbing activities have temporarily ceased on any portion of the site and will not resume for a period exceeding fourteen (14) calendar days. Interim stabilization shall consist of well established and maintained BMPs.* *Temporary stabilization is met with functioning perimeter control BMPs.	__/__/__	a. Temporary Stabilization	☐ Hydroseed, ☒ Seed/straw ☐ Sod ☒ Perimeter control BMPs ☒ Seed mix used: ☐ Turf reinforcement mat ☒ Erosion control blanket	__/__/__
	Final stabilization of disturbed areas must be initiated immediately and completed within seven (7) calendar days whenever any clearing, grading, excavating, or other earth disturbing activities have permanently ceased on any portion of the site. To prevent the loss of topsoil, seed and straw, utilize temporary BMPs such as: erosion control blanket, turf reinforcement mat, ditch checks, and perimeter control.	__/__/__	b. Permanent Stabilization	☐ Hydroseed ☒ Seed/straw ☐ Sod ☒ Seed mix used: ☐ Turf reinforcement mat ☒ Erosion control blanket ☒ Stone and Rip-Rap ☐ Other method controlling the movement of top soil (please describe)	__/__/__

4.2 Natural Buffers for Surface Waters

Instructions:

- (For surface waters of the state, defined in Section 644.016.1(27) RSMo, located on or adjacent to the site, the permittee must maintain a riparian buffer or structural equivalent in accordance with at least one of the following options. The selection and location must be described in the SWPPP.
  - a) Provide and maintain a 50-foot undisturbed natural buffer; or
  - b) Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or
  - c) If infeasible to provide and maintain an undisturbed natural buffer of any size, implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.
  - d) The permittee is not required to comply with (a), (b), or (c) above if one or more of the following exceptions apply and documentation is provided in the SWPPP:
    - 1) If there is no discharge of stormwater to waters of the state through the area between the disturbed portions of the site and waters of the state located within 50 feet of the site. This includes situations where the permittee has implemented permanent control measures that will prevent such discharges, such as a berm or other barrier.
    - 2) Where no natural buffer exists due to preexisting development disturbances that occurred prior to the initiation of planning for the current development of the site.
      - Where some natural buffer exists but portions of the area within 50 feet of the waters of the state are occupied by preexisting development disturbances the permittee is required to comply with (a), (b), or (c) above.
    - 3) For linear projects where site constraints make it infeasible to implement a buffer or equivalent provided the permittee limit disturbances within 50 feet of any waters of the state and/or the permittee provides supplemental erosion and sediment controls to treat stormwater discharges from earth disturbances within 50 feet of the water of the state. The permittee must also document in the SWPPP the rationale for why it is infeasible for the permittee to implement (a), (b), or (c) and describe any buffer width retained and supplemental BMPs installed.
  - e) Where the permittee is retaining a buffer of any size, the buffer should be measured perpendicularly from any of the following points, whichever is further landward from the water:
    - 1) The ordinary high-water mark of the water body, defined as the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris; or
    - 2) The edge of the stream or riverbank, bluff, or cliff, whichever is applicable.
- If Buffer disturbances are authorized as part of in-stream work under a US Army Corps Engineers (USACE) Clean Water Act (WCA) Section 404 permit, no further documentation is required for Section 4.1 of the Template. Attach CWA Section 404 Permit. This exception only applies to the limits of disturbance authorized under the Section 404 permit, and does not apply to any upland portion of the construction project.
- Indicate the boundaries of the preserved buffer on site map.

Are there any surface waters within 50 feet of your project's earth disturbances?

☒**No** (If no, no further documentation is required for the SWPPP Template.)

☐**Yes,** I will provide and maintain a 50-foot undisturbed natural buffer as per ESC plan.

☐**Yes, buffer will be less than 50-foot supplemented by erosion and sediment controls that achieve the sediment load reduction equivalent to 50-foot undisturbed natural buffer.**

☐**Yes,** however I will NOT provide and maintain an undisturbed natural buffer of any size.

- INSERT RATIONALE FOR CONCLUDING THAT IT IS INFEASIBLE TO PROVIDE AND MAINTAIN A NATURAL BUFFER OF ANY SIZE

☐**Yes,** however buffer disturbances are authorized as part of in-stream work under an Army Corps Section 404 permit found in Appendix.

- INSERT DESCRIPTION OF ANY EARTH DISTURBANCES THAT WILL OCCUR WITHIN THE BUFFER AREA

☐**Yes** and buffer disturbances will occur for the construction of a water-dependent structure or water access area (e.g., pier, boat ramp, and trail).

- INSERT DESCRIPTION OF ANY EARTH DISTURBANCES THAT WILL OCCUR WITHIN THE BUFFER AREA

4.3 Tree and Vegetation Preservation

Instructions:

- The SWPPP shall require existing vegetation and trees to be preserved where practical.
- Indicate all trees and vegetated areas that will be preserved on your site map or on a separate tree preservation plan

Will any areas of existing vegetation other than for surface water buffers be preserved during construction?
☐YES, this project will practice preservation of existing vegetation as a non-structural BMP.
☒NO, existing vegetation will not be preserved.

Existing vegetation is to be removed to create a buffer area from the proposed right of way.

☐ ***Check box if section is NOT applicable.***
INSERT RATIONALE FOR CONCLUDING THAT IT IS IMPRACTICAL TO PRESERVE TREES.

☐ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*
BMP DESIGN DETAIL, DESCRIPTION AND NARATIVE NOTES ARE PROVIDED ON EROSION SEDIMENT CONTROL DETAIL SHEET AND LISTED ON PHASING PLAN. ALL BMPS ARE SHOWN ON EROSION CONTROL PLAN.

4.4 Perimeter Controls

Instructions:

- Describe sediment controls used along any perimeter areas of the site that are downgradient from any exposed soil or other disturbed areas.

☐ ***Check box if section is NOT applicable.***

☒ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*
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4.5 Sediment Track-Out

Instructions:

- Restrict vehicle traffic to designated exit points
- Use additional controls to remove sediment from vehicle and equipment tires prior to exit from facility where necessary.
- Any sediment or debris that is tracked out past the exit pad or is deposited on a roadway after a precipitation event shall be removed the shorter of either daily or before a rain event.
- Describe how track-out will be removed (sweeping, shoveling, vacuuming, or other similarly effective means).
- Explain how removed track-out will be disposed of (note: shall not be disposed of into any stormwater conveyance, storm drain inlet, or water of the state).
- Stormwater inlets susceptible to receiving track-out or other pollutants shall have curb inlet protection. This may include inlets off the active area where track-out could impact the stormwater runoff to those inlets.

☐ ***Check box if section is NOT applicable.***

☒ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*
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4.6 Soil, Materials and Borrow/Fill sites

Instructions:

- Piles shall be located outside of any designated natural buffer zone and away from any stormwater conveyance, drain inlets, and areas where stormwater flow is concentrated.
- Stormwater runoff shall be prevented from eroding stockpiles, and a sediment barrier shall be installed at the downgradient of any stockpile.
- Stockpiles left unused for 14 days or more shall be protected with an appropriate temporary stabilization method.
- Describe how topsoil will be preserved where practicable and identify these areas and control measures on your site map(s).
- Indicate if a borrow/fill site will be used for the project and provide information of permitted or non-permitted site.

☐ ***Check box if section is NOT applicable.***

Borrow/fill sites (excavated material disposal areas, borrow areas)

Excess soil will be disposed of:

☐ On-site

☐ Off-site area is covered under this project's permit numbers and will be stabilized following construction per the stabilization plan.

☐ Off-site area will not be stabilized following construction, a separate permit is needed.

Additional fill soil will be obtained from:

☐ Off-site

☐ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*

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Borrow/Fill site

City LDP#_____

State Permit #_____

COMPANY OR ORGANIZATION NAME_____

ADDRESS_____

CELL PHONE NUMBER_____

EMAIL_____

Disposal site

City LDP#_____

State Permit #_____

COMPANY OR ORGANIZATION NAME_____

ADDRESS_____

CELL PHONE NUMBER_____

EMAIL_____

4.7 Minimization of Dust

Instructions:

- Describe controls and procedures you will use at your project/site to minimize the generation of dust.

☐***Check box if section is NOT applicable.***

☒ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*
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4.8 Minimization of Disturbance of Steep Slopes

Instructions:

- Describe how you will minimize the disturbance of steep slopes.
- Describe controls (e.g., erosion control blankets, tackifiers), including design, installation and maintenance specifications, that will be implemented to minimize sediment discharges from slope disturbances.

☐***Check box if section is NOT applicable.***

☒ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*
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4.9 Stormwater Control Measures

Instructions:

- Describe BMPs to protect detention/water quality stormwater control measures (pervious pavement, bioretention, underground detention) from sediment impacts during construction.

☒***Check box if section is NOT applicable.***

☐ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*
BMP DESIGN DETAIL, DESCRIPTION AND NARATIVE NOTES ARE PROVIDED ON EROSION SEDIMENT CONTROL DETAIL SHEET AND LISTED ON PHASING PLAN. ALL BMPS ARE SHOWN ON EROSION CONTROL PLAN.

4.10 Storm Drain Inlets

Instructions:

- Describe controls that will be implemented to protect all inlets that will receive stormwater from your construction activities and that you have authority to access.

☐***Check box if section is NOT applicable.***

☒ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*
BMP DESIGN DETAIL, DESCRIPTION AND NARATIVE NOTES ARE PROVIDED ON EROSION SEDIMENT CONTROL DETAIL SHEET AND LISTED ON PHASING PLAN. ALL BMPS ARE SHOWN ON EROSION CONTROL PLAN.

4.11 Constructed Stormwater Conveyance Channels

Instructions:

- If you will be installing a stormwater conveyance channel, describe control practices (e.g. velocity dissipation devices) that will be implemented at the construction site.

☐ ***Check box if section is NOT applicable***

☒ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*

BMP DESIGN DETAIL, DESCRIPTION AND NARATIVE NOTES ARE PROVIDED ON EROSION SEDIMENT CONTROL DETAIL SHEET AND LISTED ON PHASING PLAN. ALL BMPS ARE SHOWN ON EROSION CONTROL PLAN.

4.12 Sediment Basins and Sediment Traps

Instructions:

- A sedimentation basin will be provided for each drainage area with 10 or more acres disturbed at one time. The basin shall be sized to treat a local 2-year, 24-hour storm. Include design specifications for each basin including volume, dimensions and outlet structure.
- Sediment basins must also utilize outlet structures that withdraw water from the surface unless infeasible.
- Temporary and permanent sedimentation basins must have a stabilized spillway to minimize the potential for erosion of the spillway or basin embankment.
    - Discharges from the basin shall not cause scouring of the banks or bottom of the receiving stream.
- Accumulated sediment shall be removed from the basin when the basin is 25% full. The basin shall be maintained until final stabilization of the disturbed area served by the basin.
- If use of a sediment basin is impractical, similarly effective BMPs must be chosen and employed to control erosion and sediment delivery. These similarly effective BMPs must provide equivalent water quality protection.
- Sediment traps are smaller and do not require a temporary outfall structure. However, a dewatering plan may be required to empty traps, such as a pump with filtering BMP.
- Prevent discharges to the receiving stream which could cause sediment plumes or cloudiness.
- Any basin dewatering shall be inspected daily when discharge is occurring; and if the receiving stream is being impacted dewatering shall cease immediately. These inspections shall be noted on a log or within the inspection report. A dewatering log template can be found in Section 4.15.

☒ ***Check box if section is NOT applicable***

☐ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*

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4.13 Treatment Chemicals and Flocculants

Instructions:

- Provide details below if you are using treatment chemicals (polymers, flocculants, etc.) at your site.

☒***Check box if section is NOT applicable.***

Treatment Chemicals

- List all treatment chemicals that will be used at the site
- Describe the dosage of all treatment chemicals you will use at the site or the methodology you will use to determine dosage
- Provide information from any applicable Material Safety Data Sheets (MSDS)
- Describe how each of the chemicals will stored

Schematic Drawings of Stormwater Controls/Chemical Treatment Systems

- Provide schematic drawings of any chemically enhanced stormwater controls or chemical treatment systems to be used for application of treatment chemicals: INSERT TEXT HERE

Training

- Describe the training that personnel who handle and apply chemicals have received prior to permit coverage, or will receive prior to the use of treatment chemicals: INSERT TEXT HERE

☐ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*

BMP DESIGN DETAIL, DESCRIPTION AND NARATIVE NOTES ARE PROVIDED ON EROSION SEDIMENT CONTROL DETAIL SHEET AND LISTED ON PHASING PLAN. ALL BMPS ARE SHOWN ON EROSION CONTROL PLAN.

4.14 Allowable Non-Stormwater Discharges

Instructions:

- Identify all allowable sources of non-stormwater discharges including:
  - Water only (i.e., without detergents or additives) rinsing of streets and buildings; and
  - Site watering to establish vegetation.

☐***Check box if section is NOT applicable.***

☐Fire hydrant flushing
☒Landscape irrigation
☐Potable water including uncontaminated water line flushing
☐Routine external building wash off waters
☒Pavement wash off waters through a BMP

4.15 Dewatering Practices and Water Diversions

Instructions:

- If you will be discharging water that is removed from excavations, trenches, foundations, vaults, or other similar points of accumulation, include design specifications and details of all dewatering practices.
- List specific BMPs designed to treat water pumped from trenches and excavations and in NO CASE shall this water be pumped off-site without being treated by the specific BMP.
- When working within a waterway, it may be necessary to divert water around the job site using a berm, pipe, or pump structure. This is an ideal BMP as it keeps the work area dry and water is not exposed to sediment.
- Any basin dewatering shall be inspected daily when discharge is occurring. The discharge shall be observed and dewatering activities shall be ceased immediately if the receiving stream is being impacted. These inspections shall be noted on a log or on the inspection report.

☒***Check box if section is NOT applicable.***

☐ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*
BMP DESIGN DETAIL, DESCRIPTION AND NARATIVE NOTES ARE PROVIDED ON EROSION SEDIMENT CONTROL DETAIL SHEET AND LISTED ON PHASING PLAN. ALL BMPS ARE SHOWN ON EROSION CONTROL PLAN.

4.16 Wash Water (Paving, Concrete, Stucco, Paint and Equipment/Vehicle)

Instructions:

- Describe how you will minimize the discharge of pollutants from wash waters and process water associated with paint, concrete and mortar activities.
- Describe equipment/vehicle rinsing practices that will be used to minimize the discharge of pollutants from equipment and vehicle rinsing. No detergents, additives, or soaps of any kind shall be used. Rinse waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge.
- Locate concrete washout facilities a minimum of 50 feet from waters of the state, stormwater inlets and/or stormwater conveyances. Wash water shall be directed into a leak-proof washout and disposed of once 75% capacity is reached.

☐***Check box if section is NOT applicable.***

☒ Paving Operations- Sediment, Oils & Grease, Trash, Debris, Solids
☒ Concrete Wash-Out and Cement Waste- Heavy Metals, pH (acids and bases), Trash, Debris, Solids
☐ Structure Construction, Stucco, Painting and Cleaning- Heavy Metals, pH (acids and bases), Trash, Debris, Solids, Toxic Chemicals
☒ Equipment/Vehicle Rinsing- Sediment, Heavy Metals, pH (acids and bases), Oils & Grease, Trash, Debris, Solids, Toxic Chemicals

☒ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*
BMP DESIGN DETAIL, DESCRIPTION AND NARATIVE NOTES ARE PROVIDED ON EROSION SEDIMENT CONTROL DETAIL SHEET AND LISTED ON PHASING PLAN. ALL BMPS ARE SHOWN ON EROSION CONTROL PLAN.

4.17 Fuel, Oil, and Petroleum Products (Equipment and Vehicles)

Instructions:

- All fueling will adhere to applicable federal and state regulations concerning underground storage, above ground storage and dispensing.
- Describe how you will minimize the discharge of pollutants from fuel, oil, and petroleum products associated with equipment and vehicles.
- Describe fueling, storage and mechanic practices that will be used to minimize the discharge of pollutants (e.g. locating activities away from surface waters and stormwater inlets or conveyances, containing activities with plastic liners, using filtration devices such as filter bags or sand filters, or using other similarly effective controls).
- Implement chemical spill and leak prevention and response procedures. These procedures include but are not limited to maintenance of spill kits, installation of containment berms, and use of drip pans at petroleum product and liquid storage tanks and containers.

☐ ***Check box if section is not applicable.***

☒ Fueling- pH (acids and bases), Oils & Grease, Toxic Chemicals
☒ Equipment Maintenance- Sediment, Nutrients, Heavy Metals, pH (acids and bases), Pesticides/Herbicides, Oils & Grease, Trash, Debris, Solids, Toxic Chemicals
☐ Other Toxic Chemicals- DESCRIBE HERE

☒ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*
BMP DESIGN DETAIL, DESCRIPTION AND NARATIVE NOTES ARE PROVIDED ON EROSION SEDIMENT CONTROL DETAIL SHEET AND LISTED ON PHASING PLAN. ALL BMPS ARE SHOWN ON EROSION CONTROL PLAN.

- Fuel, oil, and other petroleum products will not be stored below the ordinary high water mark at any time or in the adjacent floodway beyond normal working hours. All fueling facilities present on the site shall adhere to applicable federal and state regulations concerning underground storage, above ground storage, and dispensers. All fuel, oil, and other fluids exposed to precipitation shall be stored in watertight, structurally sound, closed containers.
- Minimize the discharge of fluids from spills and leaks by implementing chemical spill and leak prevention and response procedures, including, but not limited to, installation of containment berms and use of drip pans.
- Machinery will be kept out of the waterway as much as possible.
- No fueling, servicing, maintenance or repair of equipment or machinery should be done within 100 feet of a stream, or within 150 feet of a classified stream, losing stream, or sinkhole.
- Tarps or drop cloths and drip pads should be used when servicing, repairing, or performing maintenance on construction equipment in the field.
- When work is complete, the contaminated materials should be disposed of appropriately.

4.18 Chemical Storage, Handling and Spill Response

Instructions:

- All chemicals will adhere to applicable federal and state regulations concerning storage and dispensing.
- Describe how you will minimize the discharge of pollutants from chemicals associated with construction activities.
- Describe storage and dispensing practices that will be used to minimize the discharge of pollutants (e.g. locating activities away from surface waters and stormwater inlets or conveyances, containing activities with plastic liners, using filtration devices such as filter bags or sand filters, or using other similarly effective controls).
- Describe the spill response plan for minor and major spills over 25 gallons.
- Implement chemical spill and leak prevention and response procedures. These procedures include but are not limited to maintenance of spill kits, installation of containment berms, and use of drip pans and liquid storage tanks and containers.

☐ ***Check box if section is not applicable.***

☒ Material/Chemical Delivery and Storage- Sediment, Nutrients, Heavy Metals, pH (acids and bases), Oils & Grease, Trash, Debris, Solids, Toxic Chemicals
☐ Material/Chemical Use During Building Process- Nutrients, Heavy Metals, pH (acids and bases), Oils & Grease, Trash, Debris, Solids, Toxic Chemicals
☐ Other Polluting Material/Chemical Used During Construction Process- DESCRIBE HERE

☒ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*
BMP DESIGN DETAIL, DESCRIPTION AND NARATIVE NOTES ARE PROVIDED ON EROSION SEDIMENT CONTROL DETAIL SHEET AND LISTED ON PHASING PLAN. ALL BMPS ARE SHOWN ON EROSION CONTROL PLAN.

- Location and contents of spill kit will be printed on Site Sign. Spill kit on-site will be kept with equipment necessary for spill clean-up. Equipment and materials include, but are not limited to: brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sawdust, and trash containers.
- Missouri, state law will be followed. It requires the responsible party to report releases greater than 50 gallons to the Missouri Department of Natural Resources at the earliest practical moment after discovery. If the release is from an underground storage tank, or UST, or piping, the reportable quantity is 25 gallons or more. Reports are also required for above ground storage tanks, or AST, that have released 50 gallons or greater. Further, federal law requires the responsible party to report any release of oil if the oil reaches or threatens any waterway. Any such spills or petroleum or other chemicals are to be reported as soon as possible to the Missouri Department of Natural Resources. Call the Southwest Regional Office at (417) 891-4300 or the Department's 24-hour Environmental Emergency Response number at (573) 634-2436
- Hazardous wastes shall comply with Missouri Hazardous Waste Laws and Regulations. For guidance, contact 1-800-361-4827
- Post guidelines for proper handling, storage and disposal of materials, and emergency spill cleanup on site.
- An accurate, up-to-date inventory of materials delivered and stored on-site will be kept.
- Retain original labels and material safety data sheets.
- All paint, solvents, petroleum products, petroleum waste products and storage containers such as drums, cans, or cartons shall be stored using best management practices.
    - The materials exposed to precipitation shall be stored in watertight, structually sound, closed containers.
    - All containers shall be inspected for leaks or spillage during the inspection of BMPs.
- Materials exposed to precipitation shall be stored in watertight, structurally sound, closed containers with proper labels.
- Store bagged and boxed materials on pallets.
- Cover bagged and boxed materials during non-working days and prior to rain events.
- Incompatible materials, such as ammonia and chlorine, must not be stored in the same temporary containment facility.
- Containers for proper disposal of waste paints, solvents, and cleaning compounds shall be provided.

4.19 Pesticides, Herbicides, Insecticides, Fertilizers, and Landscape Materials

Instructions:

- Exposure of these chemicals to precipitation and stormwater on-site should be minimized.
- Implement chemical spill and leak prevention and response procedures. These procedures include but are not limited to maintenance of spill kits, installation of containment berms, and use of drip pans at petroleum product and liquid storage tanks and containers.

☒***Check box if section is not applicable.***

☐ Chemical Use During Landscaping Operations- Sediment , Nutrients, Pesticides, Herbicides, Insecticides, Fertilizers, Trash, Debris, Solids, Toxic Chemicals
☐ Material/Chemical Delivery and Storage- Sediment, Nutrients, Heavy Metals, pH (acids and bases), Oils & Grease, Trash, Debris, Solids, Toxic Chemicals
☐ Other Polluting Chemicals Used During Landscaping Process- DESCRIBE HERE

☐ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*
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- Hazardous wastes shall comply with Missouri Hazardous Waste Laws and Regulations. For guidance, contact 1-800-361-4827
- An accurate, up-to-date inventory of materials delivered and stored on-site will be kept.
- Retain original labels and material safety data sheets.
- Products and storage containers such as drums, cans, or cartons shall be stored using best management practices.
- Materials exposed to precipitation shall be stored in watertight, structurally sound, closed containers with proper labels.
- Store bagged and boxed materials on pallets.
- Cover bagged and boxed materials during non-working days and prior to rain events.
- Incompatible materials, such as ammonia and chlorine, must not be stored in the same temporary containment facility.
- Containers for proper disposal of waste shall be provided.

4.20 Waste Management (Trash and Recycling Dumpster, Portable Toilet)

Instructions:

- Describe how you will control the pollutants from solid waste and sanitary waste.
    1. Examples include packaging materials, scrap construction materials, masonry products, timber, pipe, and electrical cuttings, plastics, Styrofoam, concrete, and other trash or building materials.
    2. Avoid locating sanitary facilities on impervious surfaces.

☐ ***Check box if section is NOT applicable.***

☒ Solid Waste Disposal- Trash, Debris, Solids, Toxic Chemicals
☒ Portable Toilet - Nutrients, pH (acids and bases), Bacteria & Viruses

☒ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*
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SECTION 5: SITE STABILIZATION

5.1 Temporary Stabilization

Instructions:

- Describe the specific vegetative and/or non-vegetative practices that will be used to stabilize exposed soils where construction activities have ceased.
- For soil disturbing activates that have been temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days:
    1. The permittee shall construct BMPs to establish interim stabilization; and
    2. Stabilization must be initiated immediately and completed within 14 calendar days.
- Until stabilization is complete, interim sediment control shall consist of well-established and maintained BMPs that are reasonably certain to protect waters of the state from sediment pollution over an extended period of time. This may require adding more BMPs to an area than is normally used during daily operations. The types of BMPs used must be suited to the area disturbed, taking into account the number of acres exposed and the steepness of the slopes. If the slope of the area is greater than 3:1 (three feet horizontal to one foot vertical) or if the slope is greater than 3% and greater than 150 feet in length, then the permittee shall establish interim stabilization within 7 days of ceasing operations on that part of the site. The following activities would constitute the immediate initiation of stabilization:
    1. Prepping the soil for vegetative or non-vegetative stabilization as long as seeding, planting, and/or installation of non-vegetative stabilization products takes place as soon as practicable;
    2. Applying mulch or other non-vegetative product to the exposed area;
    3. Seeding or planting the exposed area; and
    4. Finalizing arrangements to have stabilization product fully installed in compliance with the deadlines for completing stabilization.
- Allowances to the 14-day completion period for temporary and final stabilization may be made due to weather and equipment malfunctions. Use of allowances shall be documented in the SWPPP.

Stabilization practices selected (select all that apply):
☒BMPs
☒Seed and Straw
☐Hydroseed
☐Tackifier/Soil Binder
☒Other: Erosion Control Blanket

☒ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*
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5.2 Final Permanent Stabilization

Instructions:

- For spoil disturbing activities that have been permanently ceased on any portion of the site, final stabilization of the disturbed areas must be initiated immediately and completed within 14 calendar days.
- Allowances to the 14-day completion period for temporary and final stabilization may be made due to weather and equipment malfunctions. Use of allowances shall be documented in the SWPPP.
- Describe the vegetative and/or non-vegetative practices that will be used to stabilize exposed soils where construction activities have permanently ceased.
- Vegetative stabilization efforts are considered "installed" when all activities necessary to seed or plant the area are completed. Vegetative stabilization is not considered "operational" until the vegetation is established

Stabilization practices (select all that apply):

☒Concrete/Asphalt
☐Mulch
☒Seed and Straw
☐Hydroseed
☐Sod
☒Other: Erosion Control Blanket, Stone & Rip-Rap

☒ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*
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5.3 Explanation for Delayed Completion of Stabilization

Instructions:

- Only use this page if uncontrollable circumstances have delayed the initiation or completion of stabilization.
- Insert a description of circumstances that prevent you from stabilizing site with mulch, grass, rock, etc., as well as the schedule you will follow for initiating and completing stabilization.

☒***Check box if section is NOT applicable.***

Justification
WRITE EXPLANATION HERE

Stabilization practice selected:

☐Tackifier/Soil Binder
☐Sod
☐Concrete/Asphalt
☐Other: DESCRIBE HERE
☐Mulch
☐Seed and Straw
☐Hydroseed

☐ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*
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SECTION 6: PERMIT TERMINATION OR RENEWAL

6.1 Directions for Permit Termination

Instructions:

- Per Springfield City Code Sec. 96-49, the responsible party shall meet termination standards within 30 days of demobilization and shall request permit termination from the City.
    - Demobilization can include removal of all contractor and subcontractor personnel, supplies, materials, rubbish, temporary facilities, and construction equipment.
- Stand-alone permits or permits issued for phased submittal of civil site improvements shall be terminated 180 calendar days after issuance.
    - These permits can be renewed for an additional 180 calendar days if active land disturbance is ongoing or additional plans are submitted by the expiration date.
    - If additional plans are not approved within 180 calendar days of submittal, the permit shall terminate.
- The permit can be terminated once the following are completed:
    - The project site is stabilized with perennial vegetation, pavement, buildings or structures using permanent materials over all areas that have been disturbed. With respect to the areas that have been vegetated, vegetation coverage is at least 70% over 100% of the site. Temporary erosion and sediment control BMPs have been removed from the site and any pollutants associated with construction, such as sediment in storm water boxes, mud on public streets, solid waste issues, etc. have been removed; or
    - The permitted site was sold to an entity who has obtained a new land disturbance permit. The SWPPP has been amended to show the area is no longer under the original permit's jurisdiction.
- When ready to terminate the permit, email Teri Arceneaux at teri.arceneaux@springfieldmo.gov certifying that one of the preceding activities is completed, and include your Land Disturbance Number, Project Name, and Property Location

SECTION 7: DOCUMENTATION OF COMPLIANCE WITH OTHER FEDERAL REQUIREMENTS

7.1 US Army Corps of Engineers (USACE) Clean Water Act (WCA) Section 404 permit Cover Page

Instructions:

- Section 404 of the Clean Water Act (CWA) establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands.
- Obtain USACE permits at their regulatory program website http://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/Obtain-a-Permit/
- Provide the cover page of the permit. Do not include the entire permit in the SWPPP.

☒***Check box if section is NOT applicable.***
INSERT COVER PAGE OF YOUR PERMIT AS ISSUED BY THE US ARMY CORPS OF ENGINEERS INTO APPENDIX A.

7.2 Missouri State Operating Permit MORA00000

Instructions:

- Obtain a new land disturbance permit from the Missouri Department of Natural Resources ePermitting website (http://dnr.mo.gov/env/wpp/epermit/help.htm)
- Provide the cover page of the Missouri State Operating Permit. Do not include the entire permit in the SWPPP.

INSERT COVER PAGE OF YOUR STATE OPERATING PERMIT AS ISSUED BY THE MISSOURI DEPARTMENT OF NATURAL RESOURCES INTO APPENDIX B.

7.3 Endangered Species Protection

Instructions:

- This SWPPP does not supersede compliance with the Endangered Species Act.
- Results from both requested reports need to be included in this section. Projects must be reviewed on U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Conservation (IPaC) website (http://ecos.fws.gov/ipac/) AND Missouri Department of Conservation's (MDC) Natural Heritage Review website (https://naturalheritagereview.mdc.mo.gov).
- For suitable habitat definitions refer to USFW IPaC report.
- If disturbances May affect, describe BMPs used to minimize impact.
- The applicant assumes all risk of violating section 9 of the ESA. Take is prohibited and cannot mitigated without an Incidental Take Permit (ITP). To get an ITP, a Habitat Conservation Plan (HCP) is required. The only option to proceed without risk of violating section 9 is to avoid take or apply for an HCP.
- For further directions regarding the IPaC Report (may affect determination and when a project does not involve a federal authority) contact: karen_herrington@fws.gov, (573) 234-2132 ext: 166
- For further directions regarding the Natural Heritage Review (Level Two and Three) contact: NaturalHeritageReview@mdc.mo.gov, 573-522-4115 ext: 3182

USFWS's Official Species List determination:

☐ **Project is reviewed under the US Army Corps 404 Permit process.**

☐ **May affect**:

- Will impact suitable bat habitat (live trees and standing snags which possess exfoliating bark and/or cavities, cracks and crevices).
- Will remove any suitable bat habitat during the active season between the periods of April 1st - October 31st.
- Impact subterranean features such as caves/mine shafts/springs.

☒ **No effect** (April 1st - October 31st, AND no suitable habitat)

INSERT IPaC REPORT AND COPIES OF LETTERS, EMAILS, OR OTHER COMMUNICATION BETWEEN YOU AND FEDERAL OR STATE AGENCIES INTO APPENDIX C.

Missouri Natural Heritage Review Response:

☐ **Level One** response:

There are no known records of Species and Natural Communities of Conservation Concern within the project area. No further coordination with the Missouri Department of Conservation is necessary.

☒ **Level Two** response:

Records of state-listed Species and Natural Communities of Conservation Concern occur within or near the project area. Please contact the Missouri Department of Conservation for further coordination and information.

☐ **Level Three** response:

Records of federal, and possibly also state-listed Species and Natural Communities of Conservation Concern occur within or near the project area. Please contact the Missouri Department of Conservation for further coordination and information. In addition, further coordination and consultation with the U.S. Fish and Wildlife Service for USFWS trust resources including Endangered Species Act species, is necessary. Please visit the U.S. Fish and Wildlife Website – Information for Planning and Conservation at https://ecos.fws.gov/ipac/ for additional information or contact the USFWS.

INSERT MISSOURI NATURAL HERITAGE REVIEW AND COPIES OF LETTERS, EMAILS, OR OTHER COMMUNICATION BETWEEN YOU AND FEDERAL OR STATE AGENCIES INTO APPENDIX C.

☒ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*

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7.4 Historic Preservation

Instructions:

- Under Section 106 of the National Historic Preservation Act, federal agencies must consider the effect of their actions on historic properties and provide the federal Advisory Council on Historic Preservation (ACHP) the opportunity to comment on proposed actions.
    - To successfully complete Section 106 review via website (https://dnr.mo.gov/shpo/sectionrev.htm), Federal agencies must:
    - gather information to decide which properties in the project area **are listed in or** *eligible for* **listing in the National Register of Historic Places**;
    - if so, determine how these historic properties might be affected;
    - explore alternatives to avoid or reduce harm to historic properties; and
    - reach agreement with the State Historic Preservation Office (SHPO) and the ACHP in some cases, on measures to deal with any adverse effects or obtain advisory comments from the ACHP, which are sent to the head of the agency.

☒***Check box if section is not applicable.***
☐**Project is reviewed under the US Army Corps 404 Permit process.**

☐Historic properties were located; however, they do NOT meet the eligibility standards for listing in the National Register of Historic Places
☐Historic properties were located which meet the eligibility standards for listing in the National Register of Historic Places
☐Historic properties may meet requirements for National Register Listing; Phase II testing is recommended

INSERT 106 REVIEW AND COPIES OF LETTERS, EMAILS, OR OTHER COMMUNICATION BETWEEN YOU AND FEDERAL OR STATE AGENCIES INTO APPENDIX D.

☐ *Best Management Practice Applicable: https://www.springfieldmo.gov/5874/Best-Management-Practices*
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APPENDIX

A. US Army Corps Engineers (USACE) Clean Water Act (WCA) Section 404 permit Cover Page

B. Missouri State Operating Permit MORA00000 Cover Page

C. Endangered Species Protection IPaC and Natural Heritage Review Documents,

D. State Historic Preservation 106 Review Documents

E. Self-Inspection Form

F. Site Maps, Plans and Details Sheet

G. Site Sign

Appendix A: US Army Corps Engineers (USACE) Clean Water Act (CWA) Section 404 permit Cover Page,

NOT APPLICABLE FOR THIS PROJECT

Appendix B: Missouri State Operating Permit MORA00000 Cover Page

NOT APPLICABLE FOR THIS PROJECT

Appendix C: Endangered Species Protection IPaC and Natural Heritage Review Documents

Insert Here

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Missouri Ecological Services Field Office
101 Park Deville Drive
Suite A
Columbia, MO 65203-0057
Phone: (573) 234-2132 Fax: (573) 234-2181

In Reply Refer To: 08/13/2024 18:14:23 UTC
Project Code: 2024-0129838
Project Name: Eastgate Ave Improvements

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Threatened and Endangered Species

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and may be affected by your proposed project. The species list fulfills the requirement for obtaining a Technical Assistance Letter from the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).
New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. **Note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days.** The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

Consultation Technical Assistance

Refer to the Midwest Region S7 Technical Assistance website for step-by-step instructions for making species determinations and for specific guidance on the following types of projects:

projects in developed areas, HUD, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

Federally Listed Bat Species

Indiana bats, gray bats, and northern long-eared bats occur throughout Missouri and the information below may help in determining if your project may affect these species.

Gray bats - Gray bats roost in caves or mines year-round and use water features and forested riparian corridors for foraging and travel. If your project will impact caves, mines, associated riparian areas, or will involve tree removal around these features – particularly within stream corridors, riparian areas, or associated upland woodlots –gray bats could be affected.
Indiana and northern long-eared bats - These species hibernate in caves or mines only during the winter. In Missouri the hibernation season is considered to be November 1 to March 31. During the active season in Missouri (April 1 to October 31) they roost in forest and woodland habitats. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥5 inches diameter at breast height (dbh) for Indiana bat, and ≥3 inches dbh for northern long-eared bat, that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Tree species often include, but are not limited to, shellbark or shagbark hickory, white oak, cottonwood, and maple. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat and evaluated for use by bats. If your project will impact caves or mines or will involve clearing forest or woodland habitat containing suitable roosting habitat, Indiana bats or northern long-eared bats could be affected.
Examples of unsuitable habitat include:

- Individual trees that are greater than 1,000 feet from forested or wooded areas;
- Trees found in highly-developed urban areas (e.g., street trees, downtown areas);
- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees; and
- A stand of eastern red cedar shrubby vegetation with no potential roost trees.

Using the IPaC Official Species List to Make No Effect and May Affect Determinations for Listed Species

1. If IPaC returns a result of “There are no listed species found within the vicinity of the project,” then project proponents can conclude the proposed activities will have **no effect** on any federally listed species under Service jurisdiction. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records. An example "No Effect" document also can be found on the S7 Technical Assistance website.

2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project – other than bats (see #3 below) – then project proponents can conclude the proposed activities **may affect** those species. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain Life History Information for Listed and Candidate Species through the Species website.
3. If IPac returns a result that one or more federally listed bat species (Indiana bat, northern long-eared bat, or gray bat) are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** these bat species **IF** one or more of the following activities are proposed:
    a. Clearing or disturbing suitable roosting habitat, as defined above, at any time of year;
    b. Any activity in or near the entrance to a cave or mine;
    c. Mining, deep excavation, or underground work within 0.25 miles of a cave or mine;
    d. Construction of one or more wind turbines; or
    e. Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

If none of the above activities are proposed, project proponents can conclude the proposed activities will have **no effect** on listed bat species. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records. An example "No Effect" document also can be found on the S7 Technical Assistance website.
If any of the above activities are proposed in areas where one or more bat species may be present, project proponents can conclude the proposed activities **may affect** one or more bat species. We recommend coordinating with the Service as early as possible during project planning. If your project will involve removal of over 5 acres of suitable forest or woodland habitat, we recommend you complete a Summer Habitat Assessment prior to contacting our office to expedite the consultation process. The Summer Habitat Assessment Form is available in Appendix A of the most recent version of the Range-wide Indiana Bat Summer Survey Guidelines.

Other Trust Resources and Activities

Bald and Golden Eagles - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. Should bald or golden eagles occur within or near the project area please contact our office for further coordination. For communication and wind energy projects, please refer to additional guidelines below.

Migratory Birds - The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA

to proactively prevent the mortality of migratory birds whenever possible and we encourage implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Communication Towers - Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed voluntary guidelines for minimizing impacts.

Transmission Lines - Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines. In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. To minimize these risks, please refer to guidelines developed by the Avian Power Line Interaction Committee and the Service. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas that support large numbers of raptors and migratory birds.

Wind Energy - To minimize impacts to migratory birds and bats, wind energy projects should follow the Service's Wind Energy Guidelines. In addition, please refer to the Service's Eagle Conservation Plan Guidance, which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

Next Steps

Should you determine that project activities **may affect** any federally listed species or trust resources described herein, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

If you have not already done so, please contact the Missouri Department of Conservation (Policy Coordination, P. O. Box 180, Jefferson City, MO 65102) for information concerning Missouri Natural Communities and Species of Conservation Concern.
We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

John Weber

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Missouri Ecological Services Field Office
101 Park Deville Drive
Suite A
Columbia, MO 65203-0057
(573) 234-2132

PROJECT SUMMARY

Project Code: 2024-0129838
Project Name: Eastgate Ave Improvements
Project Type: Road/Hwy - New Construction
Project Description: Excavation, grading, and paving operations to support development of a new roadway in Section 10 of T29N R21W in Greene County with discharges to Jordan Valley Creek & Pierson Creek.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.22730755,-93.22073822686824,14z

Counties: Greene County, Missouri

ENDANGERED SPECIES ACT SPECIES

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Gray Bat *Myotis grisescens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6329	Endangered
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949 General project design guidelines: https://ipac.ecosphere.fws.gov/project/MFC5VAFAQRDJ3I5FBIKRC4XMYQ/documents/generated/7280.pdf	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

FISHES

NAME	STATUS
Ozark Cavefish *Amblyopsis rosae* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6490	Threatened

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

Missouri Department of Conservation

Missouri Department of Conservation's Mission is to
protect and manage the forest, fish, and
wildlife resources of the state and to
facilitate and provide opportunities for all citizens to
use, enjoy and learn about these resources.

Natural Heritage Review Level Two Report: State Listed Endangered Species and/or Missouri Species/Natural Communities of Conservation Concern

There are records of state-listed Endangered Species, or Missouri Species or Natural Communities of Conservation Concern within or near the defined Project Area. Please contact Missouri Department of Conservation for further coordination.

Foreword: Thank you for accessing the Missouri Natural Heritage Review Website developed by the Missouri Department of Conservation with assistance from the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, Missouri Department of Transportation and NatureServe. The purpose of this report is to provide information to federal, state and local agencies, organizations, municipalities, corporations, and consultants regarding sensitive fish, wildlife, plants, natural communities, and habitats to assist in planning, designing, and permitting stages of projects.

PROJECT INFORMATION

Project Name and ID Number: Eastgate Ave. Improvements #15016
User Project Number: 2023PW0068
Project Description: Excavation, grading, and paving operations to support development of a new roadway in Section 10 of T29N R21W in Greene County with discharges to Jordan Valley Creek & Pierson Creek.
Project Type: Transportation, Roads
Contact Person: Blake Bettes
Contact Information: bbettes@cmtengr.com or 4177996273

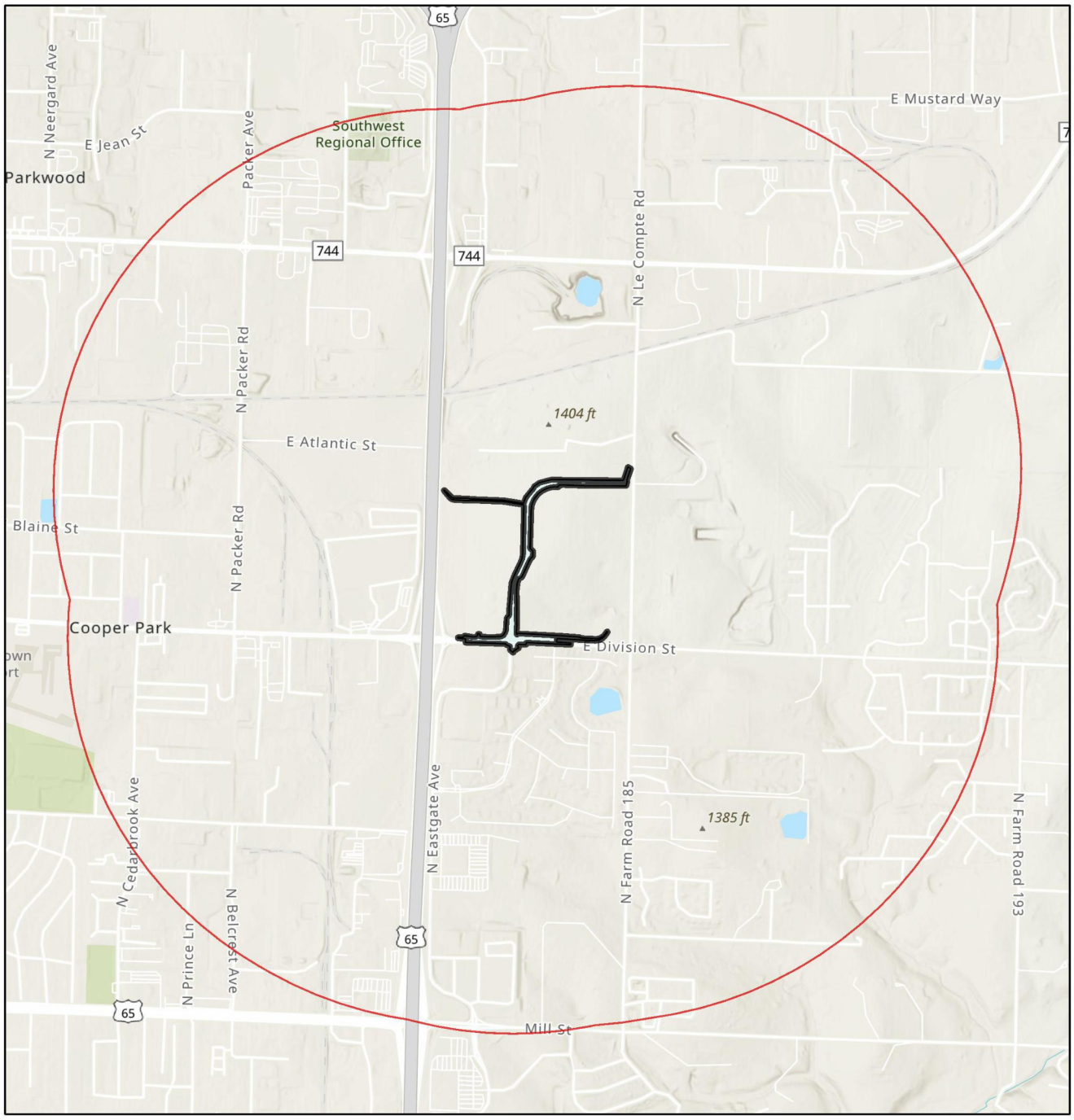
Disclaimer: This NATURAL HERITAGE REVIEW REPORT identifies if a species or natural community tracked by the Natural Heritage Program is known to occur within or near the project area submitted, and shares recommendations to avoid or minimize project impacts to sensitive species or natural habitats. Incorporating information from the Natural Heritage Program into project plans is an important step in reducing impacts to Missouri's sensitive natural resources. If an occurrence record is present, or the proposed project might affect federally listed species, the user must contact the Department of Conservation or U.S. Fish and Wildlife Service for more information.

This Natural Heritage Review Report is not a site clearance letter for the project. Rather, it identifies public lands and records of sensitive resources located close to and/or potentially affected by the proposed project. If project plans or location change, this report may no longer be valid. Because land use conditions change and animals move, the existence of an occurrence record does not mean the species/habitat is still present. Therefore, reports include information about records near but not necessarily on the project site. Lack of an occurrence record does not mean that a sensitive species or natural community is not present on or near the project area. On-site verification is the responsibility of the project. However, the Natural Heritage Program is only one reference that should be used to evaluate potential adverse project impacts and additional information (e.g. wetland or soils maps, on-site inspections or surveys) should be considered. Reviewing current landscape and habitat information, and species' biological characteristics would additionally ensure that Missouri Species of Conservation Concern are appropriately identified and addressed in planning efforts.

U.S. Fish and Wildlife Service – Endangered Species Act (ESA) Coordination: Lack of a Natural Heritage Program occurrence record for federally listed species in your project area does not mean the species is not present, as the area may never have been surveyed. Presence of a Natural Heritage Program occurrence record does not mean the project will result in negative impacts. This report does not fulfill Endangered Species Act consultation with the U.S. Fish and Wildlife Service (USFWS) for listed species. Direct contact with the USFWS may be necessary to complete consultation and it is required for actions with a federal connection, such as federal funding or a federal permit; direct contact is also required if ESA concurrence is necessary. Visit IPaC: Home (fws.gov) to initiate USFWS Information for Planning and Conservation (IPaC) consultation. Contact the Columbia Missouri Ecological Field Services Office (573-234-2132, or by mail at 101 Park Deville Drive, Suite A, Columbia, MO 65203) for more information.

Transportation Projects: If the project involves the use of Federal Highway Administration transportation funds, these recommendations may not fulfill all contract requirements. Please contact the Missouri Department of Transportation at 573-526-4778 or visit Home Page | Missouri Department of Transportation (modot.org) for additional information on recommendations.

Eastgate Ave. Improvements



August 13, 2024

1:23,047

0 0.2 0.4 0.8 mi

0 0.3 0.6 1.2 km

Buffered Project Boundary

Project Boundary

Missouri Dept. of Conservation, Missouri DNR, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, Esri, NASA, NGA, USGS, FEMA

Species or Communities of Conservation Concern within the Area:

There are records of state-listed Endangered Species, or Missouri Species or Natural Communities of Conservation Concern within or near the defined Project Area. Please contact the Missouri Department of Conservation for further coordination.

Email (preferred): NaturalHeritageReview@mdc.mo.gov
MDC Natural Heritage Review
Science Branch
P.O. Box 180
Jefferson City, MO
65102-0180
Phone: 573-522-4115 ext. 3182

Other Special Search Results:

The project occurs on or near public land, Southwest Regional Office, please contact MDC.

Project Type Recommendations:
Transportation - Roads: New and Maintenance projects typically change the plants and animals that live on the right-of-way or in the vicinity. Minimize erosion and sedimentation/runoff to nearby streams and lakes by carefully adhering to any Clean Water Act permit conditions; and include design elements to manage stormwater so that present water discharge rates from the site to streams during heavy rain events are not increased. Revegetation of disturbed areas is recommended to minimize erosion, as is restoration with native plant species compatible with the local landscape and wildlife needs. Annuals like ryegrass may be combined with native perennials for quicker green-up. Avoid aggressive exotic perennials such as crown vetch and sericea lespedeza.
Maintenance of ground cover in utility corridors can have significant implications for sensitive resources. Native plant species typically require low maintenance over the long term, and provide more benefits to native wildlife. Use silt fences and/or vegetative filter strips to buffer streams and drainages, and monitor those after rain events and until a well-rooted ground cover is reestablished. Please see Best Management Practices for Construction and Development Projects Affecting Missouri Rivers and Streams (mo.gov).

Project Location and/or Species Recommendations:

Endangered Species Act Coordination - If this project has the potential to alter habitat (e.g. tree removal, projects in karst habitat) or cause direct mortality of bats, please coordinate directly with U.S. Fish and Wildlife Service (Ecological Services, 101 Park Deville Drive, Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132 Ext. 100 for Ecological Services) for further coordination under the Endangered Species Act. Indiana bats *(Myotis sodalis*, federal- and state-listed endangered) and **Northern long-eared bats** (*Myotis septentrionalis,* federal-listed threatened) may occur near the project area. Both of these species of bats hibernate during winter months in caves and mines. During the summer months, they roost and raise young under the bark of trees in wooded areas, often riparian forests and upland forests near perennial streams. During project activities, avoid degrading stream quality and where possible leave snags standing and preserve mature forest canopy. Do not enter caves known to harbor Indiana bats or Northern long-eared bats, especially from September to April.

Gray Bat: The submitted project location is within the range of the Gray Myotis (i.e., Gray Bat) in Missouri. Depending on habitat conditions of your project's location, Gray Myotis (*Myotis grisescens*, federal and state-listed endangered) could occur within the project area, as they forage over streams, rivers, lakes, and reservoirs. Avoid entry or disturbance of any cave inhabited by Gray Myotis and when possible retain forest vegetation along the stream and from the cave opening to the stream. Please see Best Management Practices for Construction and Development Projects Gray bat (mo.gov).

Karst: This county has known karst geologic features (e.g., caves, springs, and sinkholes, all characterized by subterranean water movement). Few karst features are recorded in Natural Heritage records, and ones not noted here may be encountered at the project site or affected by the project. Cave fauna (many of which are Species of Conservation Concern) are influenced by changes to water quality; please check your project site for any karst features and make every effort to protect groundwater in the project area. Additional information and specific recommendations are available at Management Recommendations for Construction and Development Projects Affecting Missouri Karst Habitat (mo.gov).

Ozark Cavefish: The project is within the recharge area for an Ozark Cavefish (Troglichthys rosae, federal listed threatened, state-listed endangered) site. All activities that might adversely impact groundwater quality should be avoided. Please see Best Management Practices for Construction and Development Projects Ozark Cavefish (mo.gov) and Management Recommendations for Construction and Development Projects Affecting Missouri Karst Habitat (mo.gov). Additional coordination with the U.S. Fish and Wildlife Service may be required for the project under the federal Endangered Species Act (U.S. Fish and Wildlife Service, Ecological Services, 101 Park DeVille Drive, Suite A, Columbia, Missouri 65203-0007; phone 573-234-2132).

Invasive exotic species are a significant issue for fish, wildlife and agriculture in Missouri. Seeds, eggs, and larvae may be moved to new sites on boats or construction equipment. Please inspect and clean equipment thoroughly before moving between project sites. See Managing Invasive Species in Your Community | Missouri Department of Conservation (mo.gov) for more information.

- Remove any mud, soil, trash, plants or animals from equipment before leaving any water body or work area.
- Drain water from boats and machinery that have operated in water, checking motor cavities, live-well, bilge and transom wells, tracks, buckets, and any other water reservoirs.
- When possible, wash and rinse equipment thoroughly with hard spray or HOT water (>140° F, typically available at do-it-yourself car wash sites), and dry in the hot sun before using again.

Streams and Wetlands – Clean Water Act Permits: Streams and wetlands in the project area should be protected from activities that degrade habitat conditions. For example, soil erosion, water pollution, placement of fill, dredging, in-stream activities, and riparian corridor removal, can modify or diminish aquatic habitats. Streams and wetlands may be protected under the Clean Water Act and require a permit for any activities that result in fill or other modifications to the site. Conditions provided within the U.S. Army Corps of Engineers (USACE) Clean Water Act Section 404 permit (Kansas City District Regulatory Branch (army.mil)) and the Missouri Department of Natural Resources (DNR) issued Clean Water Act Section 401 Water Quality Certification (Section 401 Water Quality Certification | Missouri Department of Natural Resources (mo.gov)), if required, should help minimize impacts to the aquatic organisms and aquatic habitat within the area. Depending on your project type, additional permits may be required by the Missouri Department of Natural Resources, such as permits for stormwater, wastewater treatment facilities, and confined animal feeding operations. Visit Wastewater Permits | Missouri Department of Natural Resources (mo.gov) for more information on DNR permits. Visit both the USACE and DNR for more information on Clean Water Act permitting.

For further coordination with the Missouri Department of Conservation and the U.S. Fish and Wildlife Services, please see the contact information below:

Email (preferred): NaturalHeritageReview@mdc.mo.gov
MDC Natural Heritage Review
Science Branch
P.O. Box 180
Jefferson City, MO
65102-0180
Phone: 573-522-4115 ext. 3182

U.S. Fish and Wildlife Service
Ecological Service
101 Park Deville Drive
Suite A
Columbia, MO
65203-0007
Phone: 573-234-2132

Miscellaneous Information

FEDERAL Concerns are species/habitats protected under the Federal Endangered Species Act and that have been known near enough to the project site to warrant consideration. For these, project managers must contact the U.S. Fish and Wildlife Service Ecological Services (101 Park Deville Drive Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132; Fax 573-234-2181) for consultation.

STATE Concerns are species/habitats known to exist near enough to the project site to warrant concern and that are protected under the Wildlife Code of Missouri (RSMo 3 CSR 1 0). "State Endangered Status" is determined by the Missouri Conservation Commission under constitutional authority, with requirements expressed in the Missouri Wildlife Code, rule 3CSR 1 0-4.111. Species tracked by the Natural Heritage Program have a "State Rank" which is a numeric rank of relative rarity. Species tracked by this program and all native Missouri wildlife are protected under rule 3CSR 10-4.110 General Provisions of the Wildlife Code.

See Missouri Species and Communities of Conservation Concern Checklist (mo.gov) for a complete list of species and communities of conservation concern. Detailed information about the animals and some plants mentioned may be accessed at Mofwis Search Results. Please contact the Missouri Department of Conservation to request printed copies of any materials linked in this document.

Appendix D: State Historic Preservation 106 Review Documents

NOT APPLICABLE FOR THIS PROJECT

Appendix E: Self-Inspection Form

BMP Self-Inspection: Land Disturbance Permit

City of Springfield, Department of Environmental Services: **290 E Central St Springfield, MO 65802 (417) 864-2087**

Date & Time:	**Project Name:**	**Permit #: LDP**
Environmental Lead in SWPPP (Name & Company):		
☐**Weekly** ☐**Biweekly** ☐**Post Rain Event** **Rainfall Total:**		☐**Other:**

Inspection Checklist	Satisfactory?	Corrective Action Needed and Notes
SWPPP -Is SWPPP on site and updated with records attached? Is sign posted on construction site? Is ESC Plan updated?	☐**YES** ☐**NO**	Date Completed:
Construction Exit -Is sediment trackout controlled at the construction exit? Are streets substantially free of sediment?	☐**YES** ☐**NO** ☐**NA**	Date Completed:
Stockpiles -Are stockpiles stabilized or controlled by a BMP? Are borrow/fill areas identified on the SWPPP?	☐**YES** ☐**NO** ☐**NA**	Date Completed:
Dewatering operations -Are dewatering operations filtering sediment/pollutants?	☐**YES** ☐**NO** ☐**NA**	Date Completed:
Housekeeping -Are litter, construction debris, and construction chemicals controlled?	☐**YES** ☐**NO** ☐**NA**	Date Completed:
BMP Maintenance -Have all BMPs been repaired/ sediment accumulation removed? Should any BMPs be added and/or removed?	☐**YES** ☐**NO** ☐**NA**	Date Completed:
Tree Protection -Is fencing installed properly? Are root zones and tree canopy protected from equipment, vehicles and construction material?	☐**YES** ☐**NO** ☐**NA**	Date Completed:
Stabilization -Has temporary or final stabilization been achieved on areas inactive for more than 14 days?	☐**YES** ☐**NO** ☐**NA**	Date Completed:
Stormwater Outfall and Receiving Streams -Is the outfall free from sediment accumulation? Are receiving waters free of visible pollutants?	☐**YES** ☐**NO** ☐**NA**	Date Completed:
Additional Comments –		

SWPPP Amendment Log – Create a log here of changes and updates to the SWPPP. Modifications are required when: (a) location, design, operation, or maintenance of BMPs is changed; (b) design of the construction project is changed that could significantly affect the quality of the stormwater discharges; (c) permittee's inspections indicate deficiencies in the SWPPP or any BMP; (d) City of Springfield or Department of Natural Resources notify you in writing of deficiencies in the SWPPP; (e) SWPPP is determined to be ineffective in minimizing or controlling erosion and sedimentation; (f) City of Springfield or Department of Natural Resources determine violations of water quality standards may occur or have occurred.	☐New amendment detail added to SWPPP	**Date:** **Explanation of amendment found on ESC plan:**

Grading and Stabilization Log – Create a log here of grading and stabilization. Interim stabilization must be initiated immediately and completed within 14 calendar days where soil disturbing activities have temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. Final stabilization of disturbed areas must be initiated immediately and completed within 14 calendar days whenever soil disturbing activities have permanently ceased on any portion of the site. Slopes greater than 3:1 or greater than 3% and 150 feet in length shall establish interim stabilization within 7 days. Until stabilization is complete, interim sediment control shall consist of well-established and maintained BMPs. Stabilization refers to vegetation and/or non-vegetative protective cover to prevent erosion and sediment loss.	☐Construction temporarily ceased ☐Temporary BMPs are in place ☐Construction permanently ceased ☐Stabilization has begun ☐Stabilization is complete	**Date:** **Location:** **Temporary BMPs:** **Permanently Stabilized by:** ☐Mulch ☐Rock ☐Concrete/Asphalt ☐Hydroseed ☐Sod ☐Seed and Straw ☐Other:

Unless otherwise noted, all corrective actions must be completed by:

Training: The person designated as the Environmental Lead, and the person designated to conduct self-inspections (if different) are required to have knowledge in erosion, sediment, and stormwater control principles, knowledge of the permit, and the site's SWPPP.
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. **Name: _____Title: _____ Signature: _____**

Appendix F: Site Maps, Plans and Details Sheet

Instructions:

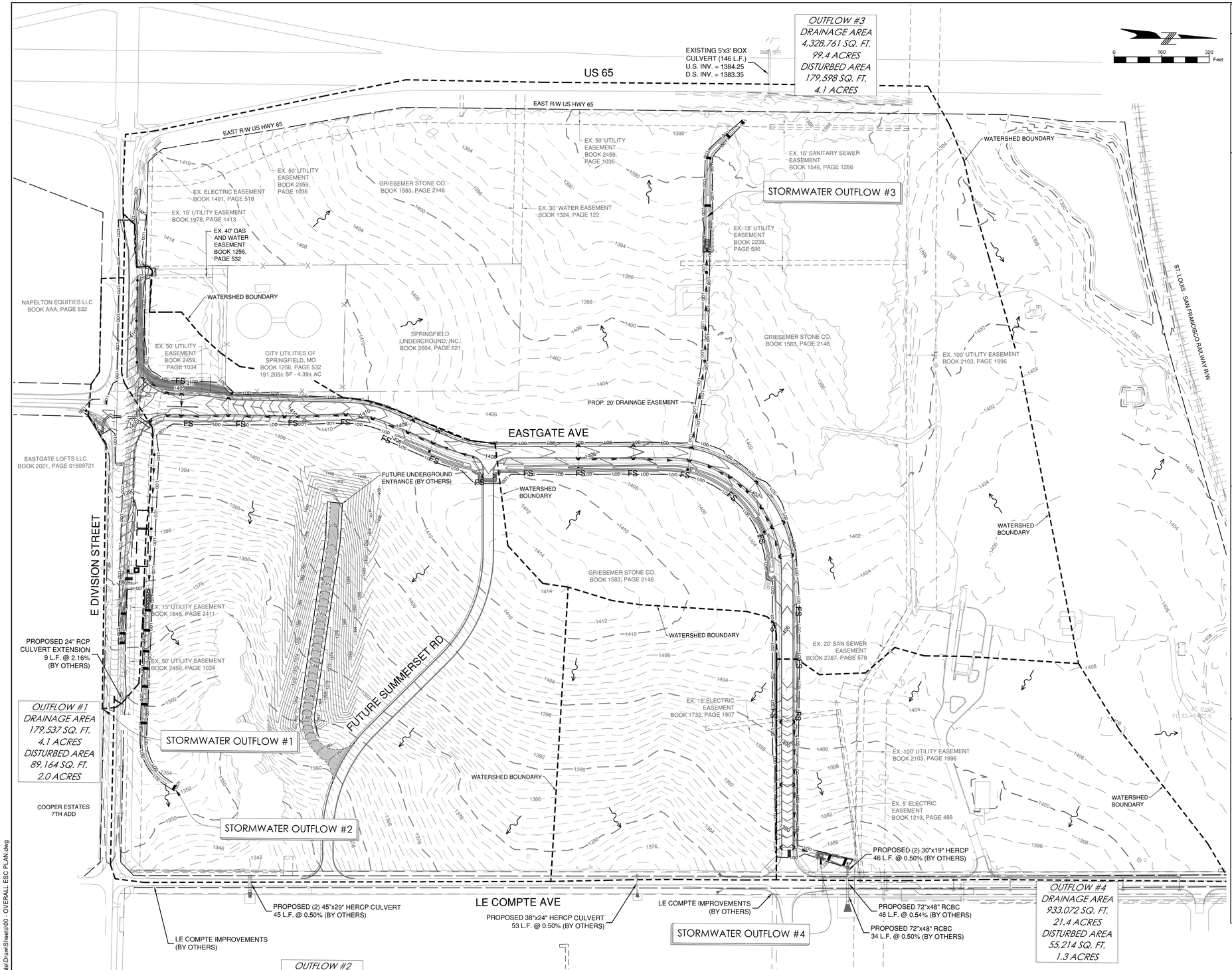
- Attach a general location map. You may utilize the City of Springfield's GIS Viewer program to create a general location map: https://maps.springfieldmo.gov/GISviewer/
- Attach an Erosion and Sediment Control (ESC) Plan including features listed below.
- Attach an Erosion and Sediment Control (ESC) Plan for associated Public Improvement Plans including features listed below.
- Attach BMP Details sheet **with Phasing of Construction Activities Table** in the ESC Plan sheet.
- Attach the stormwater infrastructure site plan.
- Attach the landscape plan including tree preservation and new plantings.
- Attach a tree preservation plan if applicable.

BMP DESIGN DETAIL, DESCRIPTION AND NARATIVE NOTES ARE PROVIDED ON EROSION SEDIMENT CONTROL DETAIL SHEET AND LISTED ON PHASING PLAN. ALL BMPS ARE SHOWN ON EROSION CONTROL PLAN.

The erosion and sediment control site map(s) must include the following features:

- Limits of disturbance
- Property lines
- Labeled outfall(s)
- Geologic features (springs, sinkholes and caves)
- Locations where stormwater discharges to surface water and all waters of the State (including wetlands)
- Drainage patterns and slopes anticipated before and after major grading activities are completed
- Areas of soil disturbance and areas that will not be disturbed (perimeter control options: are there any areas where perimeter control could be substituted with a vegetated buffer?)
- Existing and planned streets, buildings and parking lots
- Location of stormwater inlets and conveyances including ditches, pipes, man-made conduits, and swales.
- Location and phase of permanent Stormwater Control Measures (SCMs), including permanent erosion control
- Location and phase of installation of temporary structural and non-structural Best Management Practices (BMPs)
- Temporary sanitary facility and trash receptacles
- Material storage areas, vehicle/equipment fueling, batch plants, maintenance areas, concrete wash-outs and spill kits
- Locations of stockpiles and off-site borrow/fill areas
- Areas of stabilization and description of stabilization method: hydroseed, seed/straw, sod, mulch, rock, paved, etc
- Protected features: trees, natural vegetation, buffer strips, steep slopes, surface waters, sinkholes, etc
- Specify where existing vegetation and trees will be preserved where practical
- Areas where final stabilization has been accomplished and no further construction-phase permit requirements apply
- A legend which includes all symbols
- Locations where stabilization practices are expected to occur
- Locations of all waters of the state (including wetlands) within the site and half a mile downstream of the site's outfall

****ATTACH ALL MAPS, PLANS AND DETAIL SHEETS HERE**



PHASE	INSTRUCTIONS, TIPS AND TRICKS	START DATE	CONSTRUCTION SEQUENCE	BMPs- CHECK THE BMPS THAT WILL BE INSTALLED AND MAINTAINED	END DATE
PRE-CONSTRUCTION	INITIAL BMPs ARE TO BE INSTALLED PRIOR TO ANY OTHER ACTIVITY ON-SITE. CALL CITY AT 864-2087 FOR AN INITIAL BMP INSPECTION AS SOON AS THIS HAS BEEN DONE. THE FOLLOWING IS NEEDED TO PASS THIS INSPECTION: 1. INSTALLATION OF PRE-CON BMPs. 2. SWPPP ON-SITE. 3. SITE SIGN POSTED. UPON SUCCESSFUL COMPLETION OF INSTALLATION, A CITY LAND DISTURBANCE PERMIT WILL BE ISSUED.	__/__/__	a. INITIAL BMP AND SWPPP INSTALLATIONS	X LDP SITE SIGN IS DISPLAYED AND SWPPP IS STORED WHERE SIGN DESIGNATES ☐ EQUIPMENT/MATERIAL YARD ESTABLISHED X CONSTRUCTION EXIT X PERIMETER CONTROL (SILT SOCK) ☐ DITCH CHECKS X TREE PROTECTION FENCING X INLET PROTECTION FOR EXISTING INLETS	__/__/__
PHASE 1: DEMOLITION, GRADING AND STABILIZATION	DEMOLITION AND TREE REMOVAL IS THE FIRST PHASE OF CONSTRUCTION. WHEN REMOVING VEGETATION, IT IS A GOOD PRACTICE TO CHIP SOME OF THE MATERIAL ON-SITE AND APPLY AS A MULCH GROUND COVER. THE MULCH PROTECTS THE SOIL FROM THE EROSIVE IMPACT OF RAINFALL. IT ALSO PROTECTS THE ROOTS OF REMAINING TREES FROM SOIL COMPACTION. UTILIZE FENCING AND/OR SIGNAGE TO INDICATE PRESERVATION OF VEGETATION.	__/__/__	a. DEMOLITION / CLEARING	☐ CONTAIN AND COVER BUILDING MATERIALS CONTAINING PCBs ☐ PRESERVATION OF EXISTING VEGETATION X DUST CONTROL X STREET SWEEPING	__/__/__
	IF A SEDIMENT BASIN IS CALLED FOR, IT SHOULD BE INSTALLED WITH TEMPORARY OUTFALL PIPE AND EMERGENCY SPILLWAY PRIOR TO ANY OTHER GRADING ACTIVITY. THE STATE REQUIRES INSTALLATION OF A SEDIMENTATION BASIN FOR EACH DRAINAGE AREA WITH TEN OR MORE ACRES DISTURBED AT ONE TIME. THE BASIN SHALL BE SIZED TO CONTAIN A VOLUME OF AT LEAST 3,600 CUBIC FEET PER EACH DISTURBED ACRE DRAINING THERETO. AFTER THE SEDIMENTATION BASIN HAS BEEN INSTALLED, CONTACT THE CITY AT 864-2087 FOR AN INSPECTION. AT THIS TIME, THE HOLD ON THE BUILDING PERMIT WILL BE RELEASED.	__/__/__	b. SEDIMENTATION BASINS/TRAPS	☐ SEDIMENTATION BASIN ☐ SEDIMENT TRAP	__/__/__
	IT IS ALWAYS BEST TO TRY TO LIMIT THE AREA OF DISTURBANCE AT ANY GIVEN TIME, RATHER THAN MASS GRADING. LEAVE AREAS OF VEGETATION. A VEGETATED STRIP BETWEEN LIMITS OF GRADING AND THE PERIMETER BMP BOTH ENHANCES THE EFFECTIVENESS OF THE PERIMETER CONTROL AND INCREASES ITS LIFESPAN, AS IT IS LESS LIKELY TO BE DAMAGED BY EQUIPMENT. ONCE A PARKING AREA HAS BEEN GRADED, LAY BASE-ROCK IF POSSIBLE. THIS WILL GREATLY CUT DOWN ON TRACK-OUT. SEED AND STABILIZE STOCKPILES. REMEMBER, VEGETATION IS ALWAYS THE BEST BMP.	__/__/__	c. GRADING	☐ SOIL BINDERS X RETAIN TOPSOIL X STOCKPILE PROTECTION ☐ SLOPE DRAINS ☐ STREAM CROSSING ☐ WATER DIVERSION ☐ DEWATERING X DUST CONTROL	__/__/__
	AS STORMWATER SYSTEM BECOMES ACTIVE, PROTECT NEW INLETS. ADD DITCH CHECKS, CHECK DAMS, AND EROSION CONTROL BLANKET AS SPECIFIED IN THE PLAN.	__/__/__	a. DRAINAGE SYSTEM INSTALLATION	☐ DITCH CHECKS X CHECK DAMS X INLET PROTECTION FOR NEW INLETS X FES PROTECTION	__/__/__
PHASE 2: CONSTRUCTION	MAKE SURE THAT COMMUNICATION IS HAPPENING BETWEEN YOU AND YOUR UTILITY CONTRACTOR. IF THEY WILL NEED TO ACCESS WITHIN A TREE PRESERVATION ZONE, DISCUSS ALTERNATIVES TO TRENCHING, SUCH AS BORING. IF UTILITIES MUST BE TRENCHED CONTACT SARAH DAVIS AT 380-2817 SO ROOT CUTS CAN BE DOCUMENTED.	__/__/__	b. UTILITIES INSTALLATION	X SIGN SUBCONTRACTOR AGREEMENT	__/__/__
	ALL WASH-OUT PITS SHOULD BE LINED IN PLASTIC.	__/__/__	c. PAVING	X CONCRETE WASH-OUT PIT	__/__/__
	WINDBLOWN TRASH AND DEBRIS IS CONSIDERED A POLLUTANT.	__/__/__	d. BUILDING CONSTRUCTION	☐ PLASTIC LINED MASONRY AREA ☐ TRASH DUMPSTER	__/__/__
	THESE BMPs INCLUDE BIORETENTION, INFILTRATION TRENCHES, PERVIOUS PAVEMENT, AND PAVERS, ETC. IF THESE FEATURES BECOME CLOGGED WITH SEDIMENT AND/OR COMPACTED BY EQUIPMENT, THEY WILL NOT FUNCTION PROPERLY.	__/__/__	e. PERMANENT BMP INSTALLATION	X PREVENT SOIL COMPACTION X PROTECT PERMANENT STRUCTURES ☐ REMEDIATE SOILS	__/__/__
PHASE 3: STABILIZATION	STABILIZATION MUST BE INITIATED IMMEDIATELY AND COMPLETED WITHIN SEVEN (7) CALENDAR DAYS WHERE SOIL DISTURBING ACTIVITIES HAVE TEMPORARILY CEASED ON ANY PORTION OF THE SITE AND WILL NOT RESUME FOR A PERIOD EXCEEDING FOURTEEN (14) CALENDAR DAYS. INTERIM STABILIZATION SHALL CONSIST OF WELL ESTABLISHED AND MAINTAINED BMPS.* *TEMPORARY STABILIZATION IS MET WITH FUNCTIONING PERIMETER CONTROL BMPS.	__/__/__	a. TEMPORARY STABILIZATION	☐ HYDROSEED X SEED/STRAW ☐ SOD X PERIMETER CONTROL BMPs X SEED MIX USED: ☐ TURF REINFORCEMENT MAT X EROSION CONTROL BLANKET	__/__/__
	FINAL STABILIZATION OF DISTURBED AREAS MUST BE INITIATED IMMEDIATELY AND COMPLETED WITHIN SEVEN (7) CALENDAR DAYS WHENEVER ANY CLEARING, GRADING, EXCAVATING, OR OTHER EARTH DISTURBING ACTIVITIES HAVE PERMANENTLY CEASED ON ANY PORTION OF THE SITE. TO PREVENT THE LOSS OF TOPSOIL, SEED AND STRAW, UTILIZE TEMPORARY BMPS SUCH AS: EROSION CONTROL BLANKET, TURF REINFORCEMENT MAT, DITCH CHECKS, AND PERIMETER CONTROL.	__/__/__	b. PERMANENT STABILIZATION	☐ HYDROSEED X SEED/STRAW ☐ SOD X SEED MIX USED: ☐ TURF REINFORCEMENT MAT X EROSION CONTROL BLANKET X STONE AND RIP-RAP ☐ OTHER METHOD OF CONTROLLING THE MOVEMENT OF TOPSOIL (DESCRIBE)	__/__/__

PLAN LEGEND

- 992 — EXISTING CONTOUR (2' INTERVALS)
- 992 — PROPOSED CONTOUR (2' INTERVALS)
- PROPOSED ROW
- PROPOSED TCE
- LOD LOD LOD — PROPOSED LIMITS OF DISTURBANCE

ACREAGE SUMMARY

TOTAL DISTURBED AREA	= 12.4 AC
PERVIOUS AREA	= 5.0 AC
IMPERVIOUS AREA	= 7.4 AC

MISSOURI ONE CALL SYSTEM, INC. 1-800-344-7483 STOP-CALL BEFORE YOU DIG

STATE OF MISSOURI
JASON R. CLARK
NUMBER PE-2006019640
PROFESSIONAL ENGINEER
10/25/2024

REVISIONS			
NUMBER	BY	DATE	REMARKS

CMT
Crawford, Murphy & Tilly
Engineers and Consultants
1631 W Elfindale, Springfield, Missouri 65807
tel 417-869-6009 fax 417-869-8129

CMT JOB# 23005703-00

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI

NORTH EASTGATE AVE -
EAST DIVISION ST TO LE COMPTE RD

OVERALL EROSION CONTROL PLAN

SURVEYED BY: CMT	DESIGN: CMT	SCALES	SHEET 52
FIELD BK.: CMT	DRAWN: CMT	HOR. 1"=160'	OF 87 SHEETS
LEVEL BK.: CMT	CHECKED: RTS	VERT. N/A	FILE NO.: 2023PW0068

Path: M:\ERLENGroup\23005703-00_Eastgate\Draw\Sheets\00 - OVERALL ESC PLAN.dwg

NOTES

1. PRIOR TO THE INSTALLATION OF ANY RECP ON SITE, THE CONTRACTOR MUST ARRANGE AN ON-SITE MEETING WITH THE CITY OF SPRINGFIELD WATER QUALITY INSPECTOR. TO SCHEDULE THIS MEETING, PLEASE CONTACT 417-864-1169.
2. CONTRACTOR SHALL MARK LIMITS OF DISTURBANCE IN THE FIELD.
3. ALL CHANGES TO ESC PLAN AND PHASES NEED TO BE APPROVED BY THE CITY'S WATER QUALITY INSPECTOR.
4. BEFORE ISSUANCE OF A CITY LAND DISTURBANCE PERMIT, A PRE-PERMIT MEETING SHALL BE HELD TO DISCUSS THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND ESC PLAN. CALL THE WATER QUALITY INSPECTOR AT (417) 864-1169 TO SCHEDULE. CONSTRUCTION SHALL NOT BEGIN UNTIL THE CONTRACTOR NOTIFIES THE WATER QUALITY INSPECTOR AT (417) 864-1169 TO SCHEDULE THE INITIAL BMP INSPECTION. ONCE THE INSPECTION IS APPROVED AND A PERMIT HAS BEEN ISSUED, CONSTRUCTION ACTIVITIES CAN BEGIN.
5. THIS PLAN SHOWS THE LOCATION AND DETAILS OF BMPS TO BE INSTALLED. THE CONTRACTOR IS RESPONSIBLE FOR CONTROLLING EROSION AND DISCHARGE OF SEDIMENT AND OTHER POLLUTANTS FROM THE SITE AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE NECESSARY BMPS DURING ALL PHASES OF CONSTRUCTION REGARDLESS OF WHETHER THEY ARE SPECIFICALLY NOTED ON THIS PLAN, INCLUDING BMP ADDITIONS OR CHANGES APPROVED BY THE PROJECT MANAGER, AND SHALL MAINTAIN AND REPLACE CONTROLS AS NECESSARY DURING CONSTRUCTION TO CONTROL EROSION AND MINIMIZE THE DISCHARGE OF SEDIMENT AND OTHER POLLUTANTS FROM THE SITE.
6. THE LIMITS OF CLEARING, GRADING AND DISTURBANCE AS SHOWN ON THE PLAN(S) SHALL BE KEPT TO A MINIMUM WITHIN THE APPROVED AREA OF DISTURBANCE. ALL AREAS OUTSIDE THE LIMITS OF DISTURBANCE SHALL REMAIN TOTALLY UNDISTURBED. PHASING SHALL BE USED TO MINIMIZE THE AMOUNT OF DISTURBED AREA AT ANY GIVEN TIME.
7. ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS SHALL BE CLEANED AND SWEPT AT THE END OF EACH WORKDAY AT A MINIMUM, MORE FREQUENTLY IF SEDIMENT TRACK OUT IS HEAVY. WASHING OF SEDIMENT INTO THE STORM DRAIN OR WATERWAY IS PROHIBITED.
8. SEDIMENT REMOVED FROM BMPS AND FACILITIES SHALL NOT BE PLACED ON STEEP SLOPES, WETLANDS, FLOODPLAINS OR DRAINAGE SWALES AND SHALL BE IMMEDIATELY STABILIZED, OR PLACED IN TOPSOIL STOCKPILES.
9. THE CONTRACTOR IS RESPONSIBLE FOR THE TEMPORARY PROTECTION AND STABILIZATION OF ALL SOIL STOCKPILES ON SITE AS WELL AS OFF-SITE BORROW AND FILL AREAS.
10. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT DEPOSITION, THE CONTRACTOR SHALL IMPLEMENT APPROPRIATE BMPS TO ELIMINATE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT DEPOSITION.
11. TEMPORARY AND FINAL STABILIZATION SHALL BE INITIATED AND COMPLETED IN ACCORDANCE WITH TIME PERIODS IN CHAPTER 16 OF THE GENERAL CONDITIONS AND TECHNICAL SPECIFICATIONS.
12. AFTER FINAL STABILIZATION HAS BEEN ACHIEVED WITH 70% PLANT DENSITY OVER 100% OF THE SITE OR OTHER PERMANENT MATERIALS PER CHAPTER 16, TEMPORARY EROSION AND SEDIMENTATION CONTROLS SHALL BE REMOVED. AREAS DISTURBED DURING REMOVAL OF THE CONTROLS SHALL BE STABILIZED IMMEDIATELY, THE CONTRACTOR OR THEIR REPRESENTATIVE MUST NOTIFY THE WATER QUALITY INSPECTOR TO SCHEDULE A MEETING AT THE SITE TO REVIEW FINAL STABILIZATION MEASURES AND REMOVAL OF THE SEDIMENT AND EROSION CONTROLS.
13. THE CONTRACTOR SHALL MAINTAIN BMPS THROUGH CONSTRUCTION IN ACCORDANCE WITH THE CONDITIONS OF THE LAND DISTURBANCE PERMIT. THE LAND DISTURBANCE PERMIT AND STORM WATER POLLUTION PREVENTION PLAN WILL BE KEPT DIGITALLY BY THE WATER QUALITY INSPECTOR. COPIES OF THE LAND DISTURBANCE PERMIT AND STORM WATER POLLUTION PREVENTION PLAN CAN BE OBTAINED BY REQUEST OF THE WATER QUALITY INSPECTOR.
14. THE CONTRACTOR SHALL INSTALL FES PROTECTION MEASURES IN CONJUNCTION WITH THE RESPECTIVE FLARED END SECTIONS.

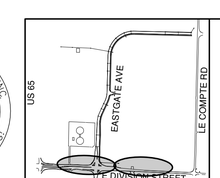
ACREAGE SUMMARY

TOTAL DISTURBED AREA	= 12.4 AC
PERVIOUS AREA	= 5.0 AC
IMPERVIOUS AREA	= 7.4 AC

LEGEND

- LIMITS OF DISTURBANCE
- 1280 EXISTING CONTOUR
- 1280 PROPOSED CONTOURS
- FS FS PROPOSED FILTER SOCK
- FLOW ARROW
- AREA INLET PROTECTION
- CURB INLET PROTECTION
- AREA TO RECEIVE SEEDING / FERTILIZING PER SPECIFICATIONS AND NORTH AMERICAN GREEN BioNet C150BN EROSION CONTROL BLANKET (11,931 SY)
- AREA TO BE SEEDED (2.8 AC)
- RIP-RAP AT END SECTION
- ROCK CHECK DAM

MISSOURI ONE CALL SYSTEM INC. 1-800-DIG-RITE (1-800-344-7483) STOP! CALL BEFORE YOU DIG!



KEYMAP

STATE OF MISSOURI
JASON R. CLARK
NUMBER PE-2006019640
PROFESSIONAL ENGINEER
10/25/2024

REVISIONS			
NUMBER	BY	DATE	REMARKS

CMT
Crawford, Murphy & Tilly
Engineers and Consultants
1631 W Elfindale, Springfield, Missouri 65807
tel 417-869-6009 fax 417-869-8129

CMT JOB# 23005703-00

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI

NORTH EASTGATE AVE -
EAST DIVISION ST TO LE COMPTE RD

EROSION CONTROL PLAN

SURVEYED BY: CMT	DESIGN: CMT	SCALES	SHEET 53
FIELD BK.: CMT	DRAWN: CMT	HOR. 1"=30'	OF 87 SHEETS
LEVEL BK.: CMT	CHECKED: RTS	VERT N/A	FILE NO.: 2023PW0068

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GRIESEMER STONE CO. BOOK 1583, PAGE 2146

STA. 11+44.74 O/S 77.48' LT

PROP. 285 LF COMPOST SOCK

STA. 12+79.57 O/S 74.55' LT

EXIST PROPERTY LINE

SPRINGFIELD UNDERGROUND, INC. BOOK 2005, PAGE 06785905

STA. 13+25.18 O/S 66.03' LT

CITY UTILITIES OF SPRINGFIELD, MO BOOK 1256, PAGE 532 191,205± SF - 4.39± AC

SPRINGFIELD UNDERGROUND, INC. BOOK 2604, PAGE 621

PROP. GRATE INLET FILTER

EXIST PROPERTY LINE

GRIESEMER STONE CO. BOOK 1583, PAGE 2146

PROP. ROW

MATCHLINE STA 11+26

PROP. INLET PROTECTION (TYP)

℄ N EASTGATE AVENUE

STA. 11+57.26 O/S 66.39' RT

STA. 13+67.41 O/S 64.74' RT

PROP. 2371 LF COMPOST SOCK

PROP. ROW

STA. 17+11.31 O/S 49.81' RT

STA. 17+85.49 O/S 49.24' RT

STA. 18+63.86 O/S 49.28' RT

STA. 18+97.39 O/S 49.01' RT

STA. 18+97.85 O/S 73.57' RT

GRIESEMER STONE CO. BOOK 1583, PAGE 2146

PROP. TCE

AREA INLET PROTECTION

MATCHLINE STA 21+19

10+97.40 108.86' RT

GRIESEMER STONE CO. BOOK 1583, PAGE 2146

SEE SHEET 56

GRIESEMER STONE CO. BOOK 1583, PAGE 2146

GRIESEMER STONE CO. BOOK 1583, PAGE 2146

PROP. ROW

MATCHLINE STA 21+19

PROP. INLET PROTECTION (TYP)

℄ N EASTGATE AVENUE

STA. 21+76.02 O/S 73.69' RT

STA. 22+16.65 O/S 106.82' RT

STA. 23+24.00 O/S 72.56' RT

PROP. T.C.E.

STA. 22+91.62 O/S 102.08' RT

PROP. 2371 LF COMPOST SOCK

GRIESEMER STONE CO. BOOK 1583, PAGE 2146

STA. 28+39.55 O/S 72.81' RT

AREA INLET PROTECTION

STA. 29+44.68 O/S 73.11' RT

GRIESEMER STONE CO. BOOK 1583, PAGE 2146

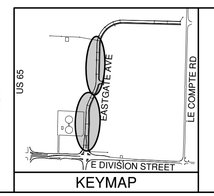
STA. 30+54.32 O/S 72.61' RT

MATCHLINE STA 30+76

LEGEND

- LIMITS OF DISTURBANCE
- EXISTING CONTOUR (1280)
- PROPOSED CONTOURS (1280)
- PROPOSED FILTER SOCK (FS)
- FLOW ARROW
- AREA INLET PROTECTION
- CURB INLET PROTECTION
- AREA TO RECEIVE SEEDING / FERTILIZING PER SPECIFICATIONS AND NORTH AMERICAN GREEN BioNet C150BN EROSION CONTROL BLANKET (11,931 SY)
- AREA TO BE SEEDED (2.8 AC)
- RIP-RAP AT END SECTION
- ROCK CHECK DAM

MISSOURI ONE CALL SYSTEM, INC. 1-800-344-7483 STOP! CALL BEFORE YOU DIG!



KEYMAP

STATE OF MISSOURI JASON R. CLARK NUMBER PE-2006019640 PROFESSIONAL ENGINEER

10/25/2024

REVISIONS			
NUMBER	BY	DATE	REMARKS

CMT Crawford, Murphy & Tilly
Engineers and Consultants
1631 W Elfindale, Springfield, Missouri 65807
tel 417-869-6009 fax 417-869-8129

CMT JOB# 23005703-00

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI

NORTH EASTGATE AVE -
EAST DIVISION ST TO LE COMPTE RD

EROSION CONTROL PLAN

SURVEYED BY: CMT	DESIGN: CMT	SCALES	SHEET 54
FIELD BK.: CMT	DRAWN: CMT	HOR. 1"=30'	OF 87 SHEETS
LEVEL BK.: CMT	CHECKED: RTS	VERT. NA	FILE NO.: 2023PW0068

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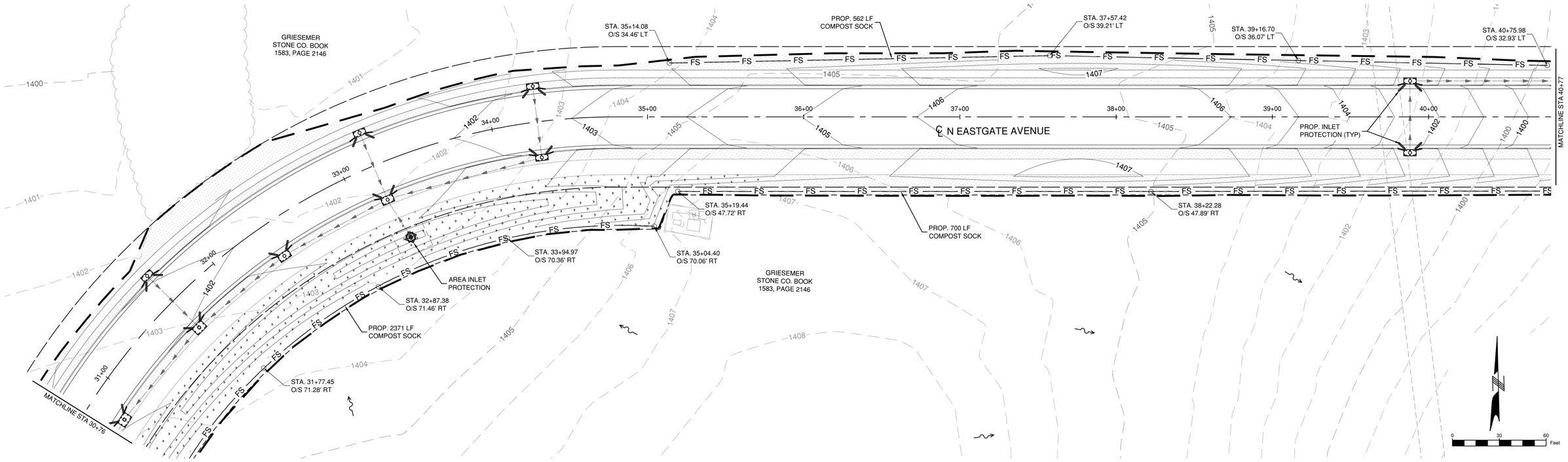

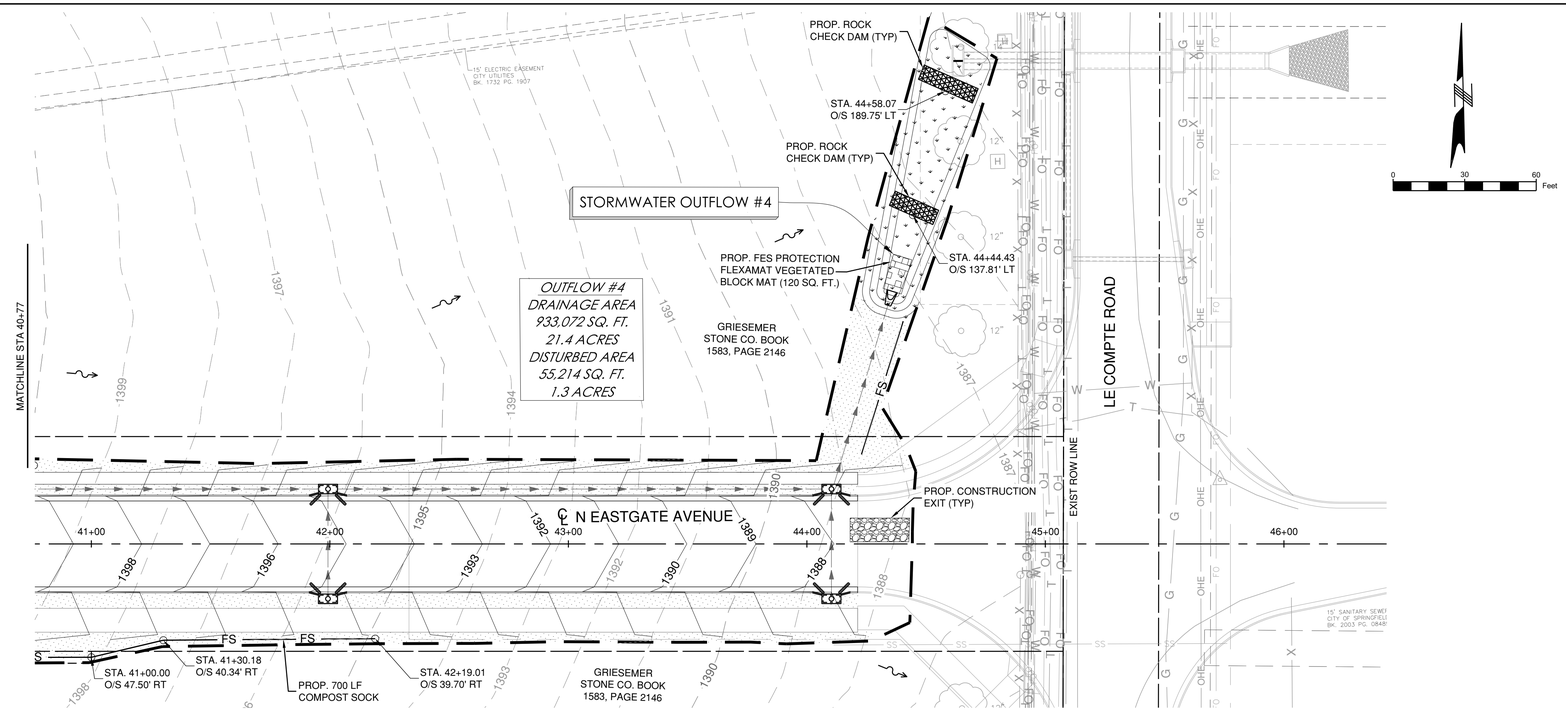

LEGEND

- LIMITS OF DISTURBANCE
- EXISTING CONTOUR
- PROPOSED CONTOURS
- PROPOSED FILTER SOCK
- FLOW ARROW
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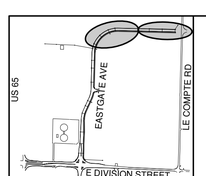

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SPRINGFIELD, MISSOURI

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EAST DIVISION ST TO LE COMPTE RD

EROSION CONTROL PLAN

SURVEYED BY: CMT	DESIGN: CMT	SCALES	SHEET 55
FIELD BK.: CMT	DRAWN: CMT	HOR. 1"=30'	OF 87 SHEETS
LEVEL BK.: CMT	CHECKED: RTS	VERT. N/A	FILE NO.: 2023PW0068

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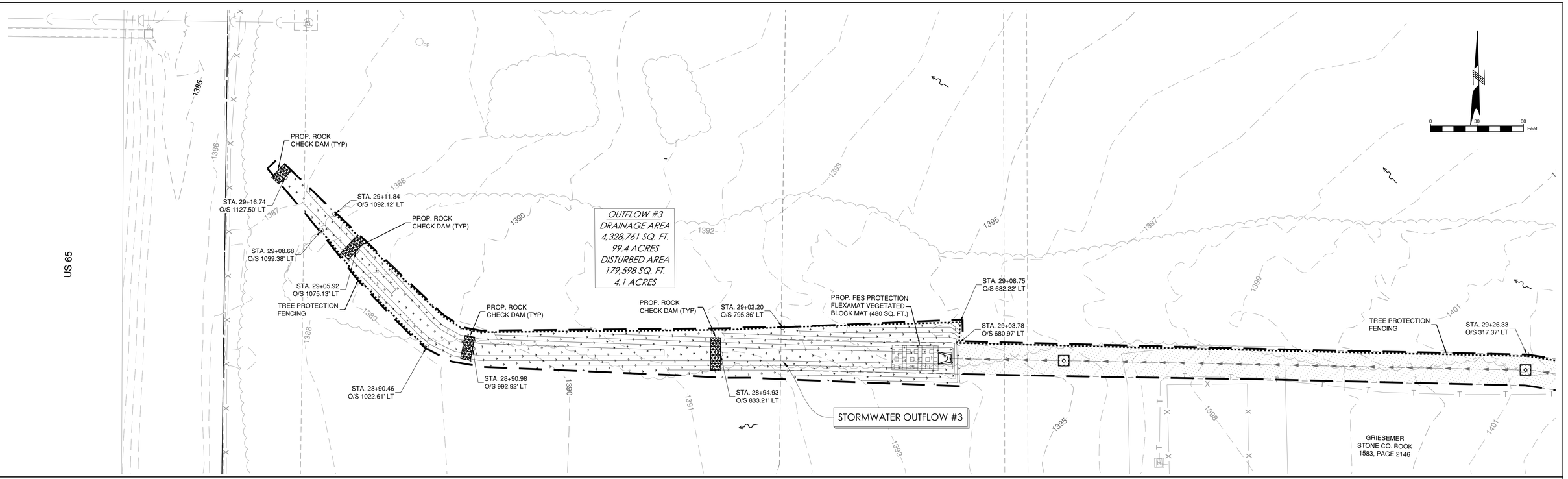
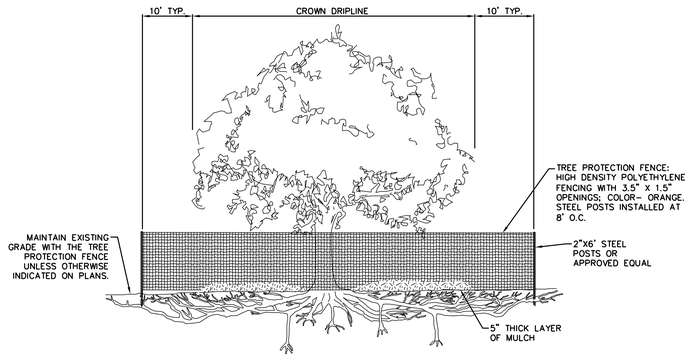
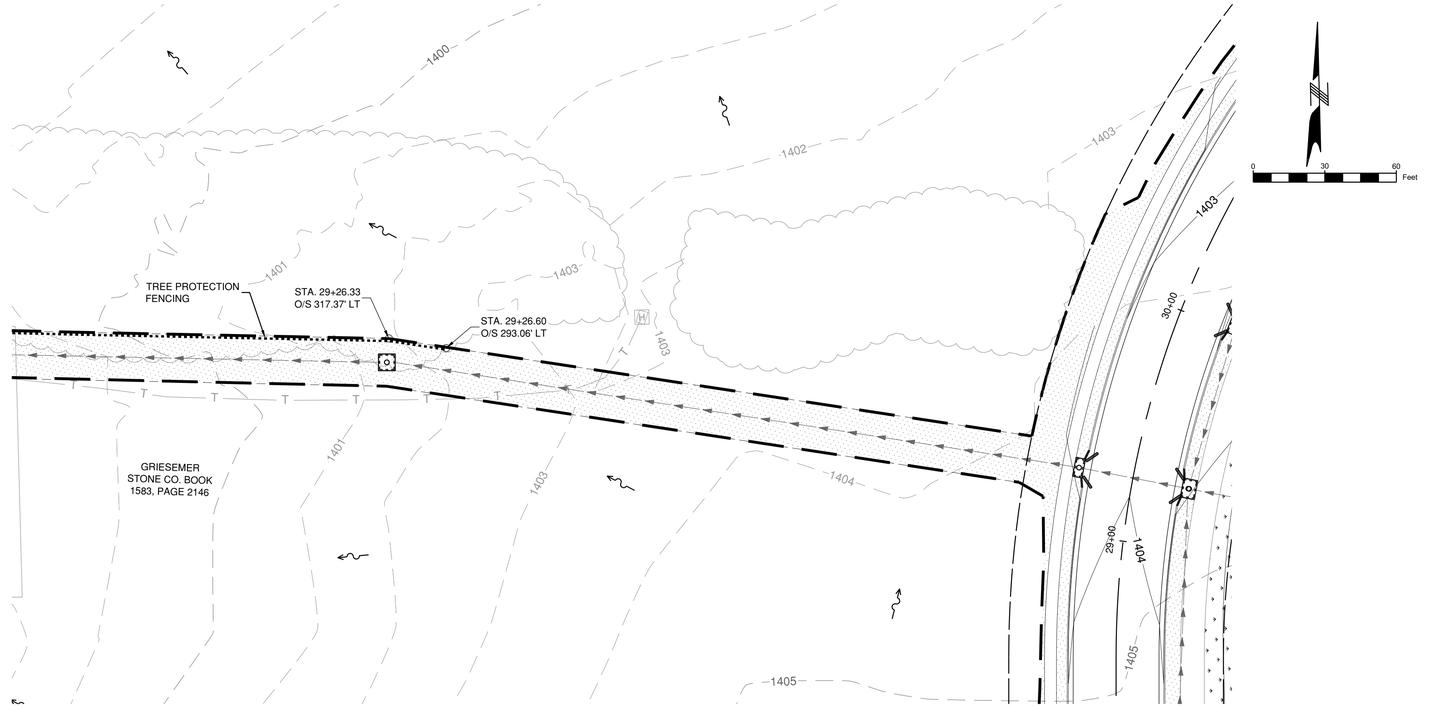




TREE PROTECTION FENCE DETAIL

NOT TO SCALE



LEGEND

- LIMITS OF DISTURBANCE
- EXISTING CONTOUR (1280)
- PROPOSED CONTOURS (1280)
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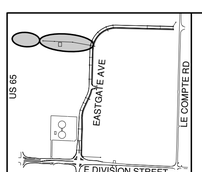

KEYMAP

STATE OF MISSOURI
JASON R. CLARK
NUMBER PE-2006019640
PROFESSIONAL ENGINEER
10/25/2024

REVISIONS			
NUMBER	BY	DATE	REMARKS

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DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI

NORTH EASTGATE AVE -
EAST DIVISION ST TO LE COMPTE RD

EROSION CONTROL PLAN

SURVEYED BY: CMT	DESIGN: CMT	SCALES	SHEET 56
FIELD BK.: CMT	DRAWN: CMT	HOR. 1"=30'	OF 87 SHEETS
LEVEL BK.: CMT	CHECKED: RTS	VERT N/A	FILE NO.: 2023PW0068

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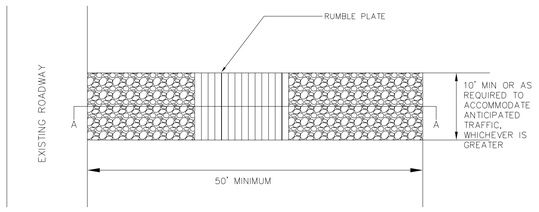
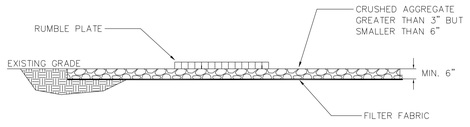
NOTES:
1. RUMBLE STRIPS ARE RECOMMENDED FOR LARGER SITES.
2. RUMBLE STRIPS SHALL BE A MINIMUM LENGTH OF 20' OR AS NEEDED TO REMOVE SEDIMENT FROM TIRES.
3. AVOID PLACING EXITS IN AN OUTFALL AREA OR OTHER LOW AREAS WHERE WATER PONDS OR FLOWS.
4. A CULVERT SHALL BE INSTALLED IF EXIT CROSSES A DITCH.
5. ROCK APRON INSTALLATION SHALL BE WIDE ENOUGH TO ACCOMODATE TURNING VEHICLES.
6. ADD NEW ROCK OR RAKE EXISTING ROCK WHEN VOIDS FILL WITH SEDIMENT.
7. ANY MUD, ROCK OR DEBRIS TRACKED ONTO PAVED SURFACES AND ACCUMULATED IN CURBS SHALL BE REMOVED IMMEDIATELY USING A SWEEPER, SHOVEL, ETC.
8. REMOVE EXIT WHEN VEHICLES AND EQUIPMENT WILL NO LONGER ACCESS UNPAVED AREAS.



PLAN VIEW



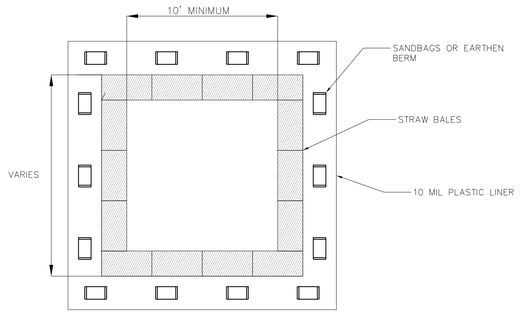
SECTION A–A

ENVIRONMENTAL SERVICES DEPT. SPRINGFIELD, MO.	CONSTRUCTION EXIT	UPDATED: AUG. 2018 BMP MANUAL

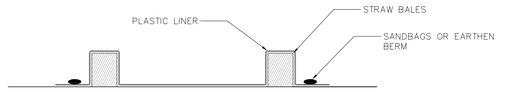
C1

NOTES:
1. WASHOUT CONTAINMENT SHALL BE INSTALLED FOR DURATION OF CONCRETE WORK AND RETAIN CONCRETE AND OTHER WASHOUT LIQUIDS UNTIL EVAPORATION OR REMOVAL BY PUMP.
2. CONTAINMENT SHALL BE SIZED FOR EXPECTED WASHOUT VOLUMES.
3. AVOID PLACING NEAR STORM DRAINS, STREAMS, SINKHOLES, OUTFALLS OR OTHER LOW AREAS WHERE WATER PONDS OR FLOWS.
4. OTHER APPROVED LEAK–PROOF CONTAINMENT IS ACCEPTABLE.
5. TRAPS SHALL BE ROUTINELY. MAINTAINED AT 75% CAPACITY AND REPLACED AS NECESSARY TO PERFORM.
6. THE WASHOUT PIT SHALL BE COVERED BEFORE PREDICTED RAIN EVENTS TO PREVENT OVERFLOW.
7. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30FT OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

SIGNAGE



PLAN VIEW

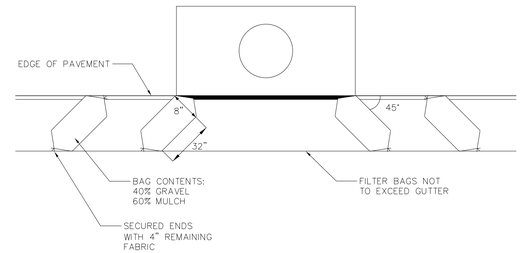


SECTION VIEW

ENVIRONMENTAL SERVICES DEPT. SPRINGFIELD, MO.	CONCRETE WASHOUT	UPDATED: AUG. 2018 BMP MANUAL

C2

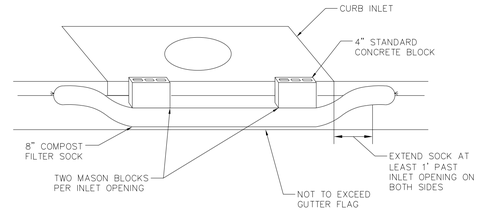
NOTES:
1. FILTER BAGS SHALL BE INSTALLED PRIOR TO DISTURBANCE AND AS INLETS ARE INSTALLED.
2. FILTER BAG INLET PROTECTION SHALL BE INSTALLED IN CONJUNCTION WITH GRATE INLET FILTER BMP WHEN A GRATE IS CONNECTED TO A CURB INLET.
3. SEDIMENT ACCUMULATION SHALL BE REMOVED AFTER RAIN EVENTS AND SHALL NOT EXCEED 50%.
4. FILTER BAGS SHALL BE REPLACED WHEN PERFORMANCE IS NO LONGER SATISFACTORY.
5. FILTER BAGS SHALL ONLY BE REMOVED WHEN UPSTREAM AREAS ARE PERMANENTLY STABILIZED.



ENVIRONMENTAL SERVICES DEPT. SPRINGFIELD, MO.	CURB INLET FILTER BAG	UPDATED: DEC. 2018 BMP MANUAL

C3

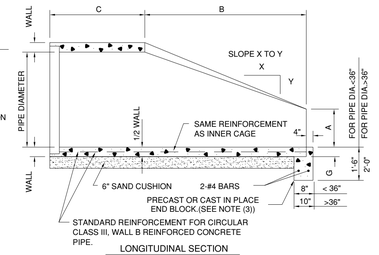
NOTES:
1. COMPOST SOCK SHALL BE INSTALLED PRIOR TO DISTURBANCE AND AS INLETS ARE INSTALLED.
2. COMPOST SOCK SHALL BE INSTALLED IN CONJUNCTION WITH GRATE INLET FILTER WHEN A GRATE IS CONNECTED TO A CURB INLET.
3. SEDIMENT ACCUMULATION SHALL BE REMOVED WHEN ACCUMULATION REACHES HALF THE HEIGHT OF THE SOCK
4. COMPOST SOCK SHALL BE REPLACED OR REINSTALLED WHEN DAMAGED AND PERFORMANCE IS NO LONGER SATISFACTORY.
5. UPSTREAM AREAS MUST BE STABILIZED BEFORE REMOVAL OF COMPOST SOCK.



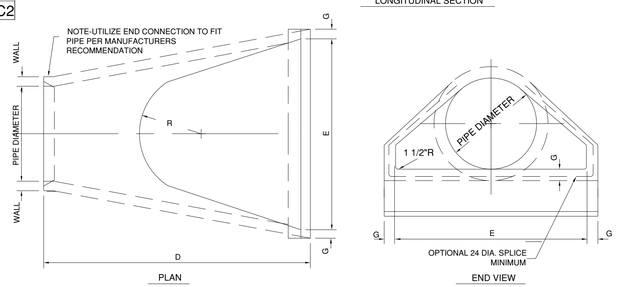
ENVIRONMENTAL SERVICES DEPT. SPRINGFIELD, MO.	SUMPED CURB INLET FILTER	UPDATED: JAN 2019 BMP MANUAL

C4

NOTES
1. PRECAST CONCRETE FLARED END SECTIONS SHALL CONFORM TO THE APPLICABLE REQUIRE-MENTS OF AASHTO M-170 CLASS III, WALL B REINFORCED CONCRETE PIPE.
2. PRECAST CONCRETE FLARED END SECTION FOR PIPE DIAMETER REQUIRED SHALL BE AS INDICATED ON DETAIL PLAN FOR EACH INDIVIDUAL INSTALLATION.
3. THE END BLOCK SHALL BE PLACED PRIOR TO THE INSTALLATION OF THE FLARED END SECTION.



LONGITUDINAL SECTION



PLAN

END VIEW

PIPE DIA.	APPROX WT.(lbs.)	WALL	A	B	C	D	E	G	R	SLOPE
12"	530	2"	4"	2'-0"	4'-0 7/8"	6'-0 7/8"	2'-0"	2"	9"	3:1
15"	740	2 1/4"	6"	2'-3"	3'-10"	6'-1"	2'-6"	2 1/4"	11"	3:1
18"	990	2 1/2"	9"	2'-3"	3'-10"	6'-1"	3'-0"	2 1/2"	12"	3:1
21"	1280	2 3/4"	9"	2'-11"	3'-2"	6'-1"	3'-6"	2 3/4"	13"	3:1
24"	1520	3"	9 1/2"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	3"	14"	3:1
27"	1930	3 1/4"	10 1/2"	4'-0"	2'-1 1/2"	6'-1 1/2"	4'-6"	3 1/4"	14 1/2"	3:1
30"	2190	3 1/2"	1'-0"	4'-6"	1'-7 3/4"	6'-1 3/4"	5'-0"	3 1/2"	15"	3:1
33"	3200	3 3/4"	1-1 1/2"	4'-10 1/2"	3'-3 1/4"	8'-1 3/4"	5'-6"	3 3/4"	17 1/2"	3:1
36"	4100	4"	1'-3"	5'-3"	2'-10 3/4"	8'-1 3/4"	6'-0"	4"	20"	3:1
42"	5380	4 1/2"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	4 1/2"	22"	3:1
48"	6550	5"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	5"	22"	3:1
54"	8240	5 1/2"	2'-3"	5'-5"	2'-11"	8'-4"	7'-6"	5 1/2"	24"	2.4:1
60"	8730	6"	2'-11"	5'-0"	3'-3"	8'-3"	8'-0"	5"	*	2:1
66"	10710	6 1/2"	2'-6"	6'-0"	2'-3"	8'-3"	8'-6"	5 1/2"	*	2:1
72"	12520	7"	3'-0"	6'-6"	1'-9"	8'-3"	9'-0"	6"	*	1.86:1
78"	14770	7 1/2"	3'-0"	7'-6"	1'-9"	9'-3"	9'-6"	6 1/2"	*	1.82:1
84"	18160	8"	3'-0"	7'-6 1/2"	1'-9"	9'-3 1/2"	10'-0"	6 1/2"	*	1.5:1

* RADIUS AS FURNISHED BY MANUFACTURER.

PRECAST REINFORCED CONCRETE FLARED END SECTION

N.T.S.

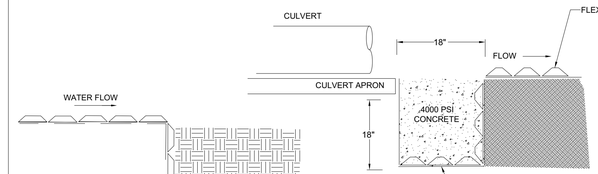
C7

GUIDANCE TABLE FOR STORMWATER OUTFALL PROTECTION			
PIPE DIAMETER	*DISCHARGE (CFS)	FLEXAMAT PROTECTION WIDTH	FLEXAMAT PROTECTION LENGTH (*MIN)
12"	8 CFS	5.5'	8'
18"	20 CFS	8'	8'
24"	30 CFS	8'	10'
36"	75 CFS	12'	16'
48"	100 CFS	16'	20'
60"	150 CFS	20'	25'

*LENGTH OF PROTECTION WILL VARY ON THE LENGTH OF THE SLOPE, DEGREE OF SLOPE, OR IF IT IS DISCHARGING ONTO A FLAT AREA. OUTFALLS DISCHARGING ONTO SLOPES, IT IS RECOMMENDED TO EXTEND FLEXAMAT THE LENGTH OF THE SLOPE AND 3' PAST THE TOE.

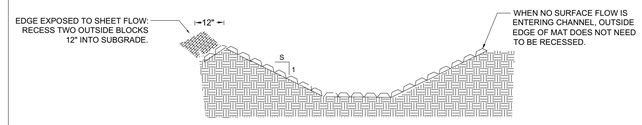
*CONSULT MANUFACTURER FOR GUIDANCE IF DESIGN DISCHARGE VARIES SIGNIFICANTLY FROM VALUES LISTED IN TABLE.

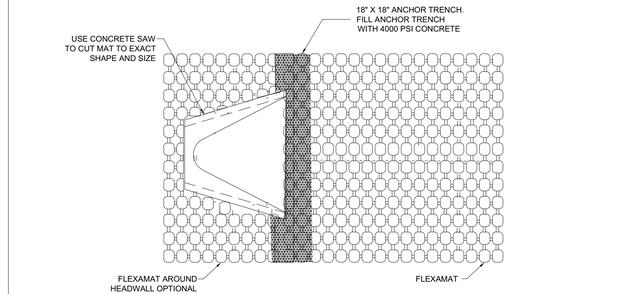
CONSTRUCTION NOTES:
1. GRADE CHANNEL SO THAT WATER WILL FLOW DOWN THE CENTER OF THE CHANNEL AND BE CONTAINED TO THE CHANNEL. ALL SUBGRADE SURFACES PREPARED FOR PLACEMENT OF MATS SHALL BE SMOOTH AND FREE OF ALL ROCKS, STICKS, ROOTS, OTHER PROTRUSIONS, OR DEBRIS OF ANY KIND. THE PREPARED SURFACE SHALL PROVIDE A FIRM UNYIELDING FOUNDATION FOR THE MATS.
2. WHEN VEGETATION IS DESIRED, APPLY SEED DIRECTLY TO THE PREPARED SOIL PRIOR TO FLEXAMAT INSTALLATION. USE SEED PER PROJECT SPECIFICATIONS.
3. INSTALL FLEXAMAT ROLLS. AVAILABLE WIDTHS ARE 4', 5.5', 8', 10', 12', & 16' AVAILABLE IN CUSTOM LENGTHS.
4. AT THE BEGINNING OF CHANNEL, THE INITIAL LEADING EDGE OF FLEXAMAT EXPOSED TO CONCENTRATED FLOWS SHALL BE EMBEDDED 18" VERTICALLY INTO ANCHOR TRENCH. THE TRENCH SHALL BE FILLED WITH 4000 PSI CONCRETE.
5. AT THE END OF THE ARMORED CHANNEL, EMBED THE MAT 18" IN A TERMINATION TRENCH. FILL AND COMPACT TERMINATION TRENCH WITH COHESIVE FILL.



18" TERMINATION TRENCH AT END OF ARMOR

CONCRETE ABUTMENT ANCHOR TRENCH



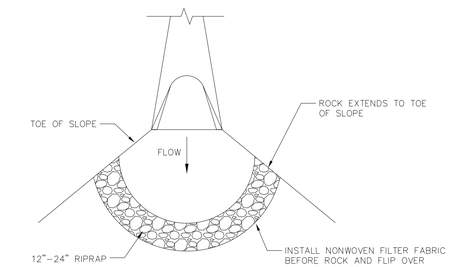


FLEXAMAT OUTLET DETAIL

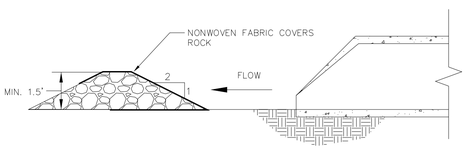
N.T.S.

C8

NOTES:
1. TEMPORARY ROCK CHECK FILTER SHALL BE INSTALLED AFTER FLARED END SECTION IS INSTALLED AND SHALL TRAP SEDIMENT DURING STORM PIPE INSTALLATION.
2. ROCK SIZE AND QUANTITY SHALL BE SIZED TO FILTER STORMWATER RUNOFF VOLUME.
3. NONWOVEN FILTER FABRIC SHALL BE INSTALLED FIRST. ONCE ROCK IS INSTALLED WRAP FILTER FABRIC OVER ROCK TO COVER.
4. ALL FLOW SHALL PASS THROUGH ROCK CHECK FILTER.
5. SEDIMENT ACCUMULATION SHALL BE REMOVED AFTER RAIN EVENTS AND SHALL NOT EXCEED 50%.
6. ROCK CHECK FILTER SHALL BE REMOVED ONCE AREA UPSTREAM OF PIPE IS PERMANENTLY STABILIZED.



PLAN VIEW

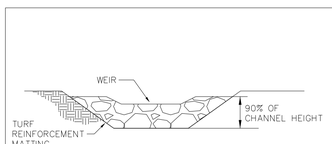


PROFILE VIEW

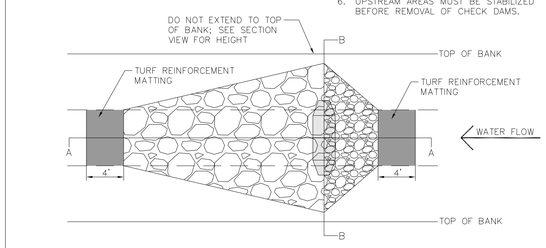
ENVIRONMENTAL SERVICES DEPT. SPRINGFIELD, MO.	FLARED END ROCK CHECK FILTER	UPDATED: JUN 2019 BMP MANUAL

C5

NOTES:
1. ROCK CHECK DAMS SHALL BE INSTALLED IN DITCHES, CHANNELS AND OUTFALLS PRIOR TO UPSTREAM DISTURBANCE AND DOWNSTREAM OF CONCENTRATED STORMWATER FLOW. ROCK CHECK DAMS SHALL NOT BE PLACED IN FLOWING STREAMS.
2. REINFORCEMENT MATTING SHALL BE INSTALLED AS PER MANUFACTURER SPECS UNDER THE ROCK AND SHALL EXTEND 4' UPSTREAM AND DOWNSTREAM.
3. THE CENTER OF THE CHECK DAM SHALL FORM A WEIR TO RELEASE WATER.
4. SEDIMENT ACCUMULATION SHALL BE REMOVED WHEN IT REACHES HALF THE HEIGHT OF THE CHECK DAM.
5. ROCK SHALL BE REINSTALLED WHEN PERFORMANCE IS NO LONGER SATISFACTORY.
6. UPSTREAM AREAS MUST BE STABILIZED BEFORE REMOVAL OF CHECK DAMS.



SECTION B–B



PLAN VIEW

SECTION A–A

SLOPE SPACING

ENVIRONMENTAL SERVICES DEPT. SPRINGFIELD, MO.	ROCK CHECK DAM	UPDATED: JAN 2020 BMP MANUAL

C6

STATE OF MISSOURI
JASON R. CLARK
NUMBER PE-2006019640
PROFESSIONAL ENGINEER
10/25/2024

REVISIONS			
NUMBER	BY	DATE	REMARKS

CMT
Crawford, Murphy & Tilly
Engineers and Consultants
1631 W Elfindale, Springfield, Missouri 65807
tel 417-869-6009 fax 417-869-8129

CMT JOB# 23005703-00

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI

NORTH EASTGATE AVE -
EAST DIVISION ST TO LE COMPTE RD

STANDARD DRAWINGS AND DETAILS

SURVEYED BY: CMT	DESIGN: CMT	SCALES	SHEET 86
FIELD BK.: CMT	DRAWN: CMT	HOR. N/A	OF 87 SHEETS
LEVEL BK.: CMT	CHECKED: RTS	VERT N/A	FILE NO.: 2023PW0068

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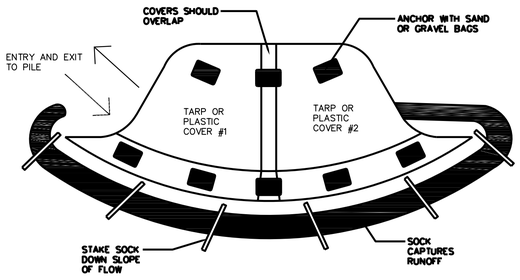
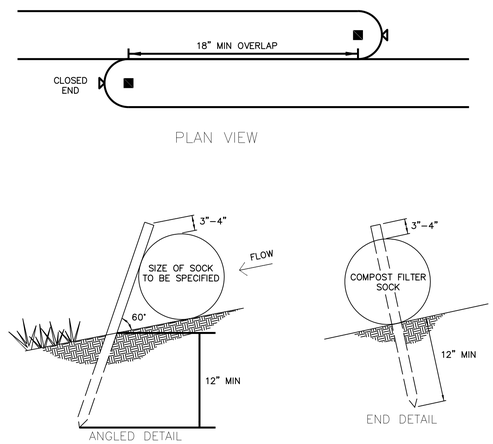
NOTES:
1. PLASTIC COVERS SHALL BE INSTALLED OVER STOCKPILES AS THEY ARE GENERATED THROUGHOUT THE PROJECT. COVERS SHALL PREVENT EROSION AND SEDIMENT TRANSFER PRIOR TO RAIN EVENTS.
2. SEAMS SHALL BE TAPED OR WEIGHTED DOWN THEIR ENTIRE LENGTH.
3. COMPOST FILTER SOCK SHALL BE INSTALLED TO RETAIN SEDIMENT RUNOFF.
4. STOCKPILE SLOPES SHALL NOT EXCEED 2:1.
5. OFF-SITE BORROW/FILL AREAS SHALL ALSO BE PROTECTED BY ADEQUATE SEDIMENT AND EROSION CONTROL BMPS. IF PART OF A JOB DISTURBING 1 ACRE OR GREATER THEIR LOCATION SHALL BE NOTED WITHIN THE SWPPP.
6. ADHERE TO COMPOST FILTER SOCK STANDARDS FOR MAINTENANCE.
7. STOCKPILE BMPS MAY BE REMOVED AFTER AREA IS STABILIZED



ENVIRONMENTAL SERVICES DEPT. SPRINGFIELD, MO.	**STOCKPILE CONTROL**	UPDATED: DEC. 2020
		BMP MANUAL

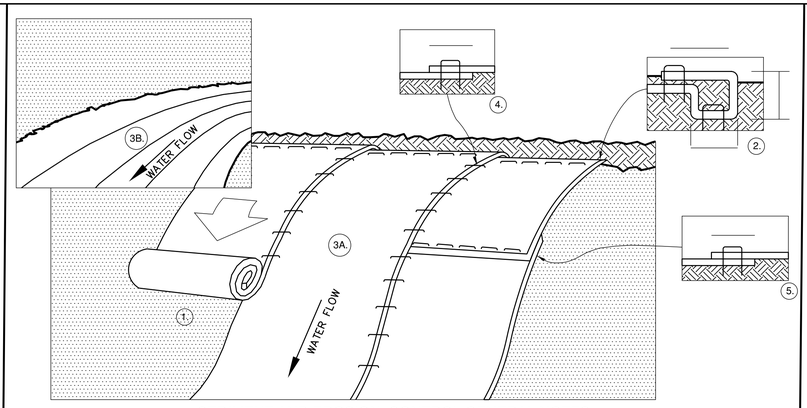
D1

NOTES:
1. COMPOST SOCK SHALL BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE ACTIVITIES.
2. COMPOST SOCKS ARE GENERALLY PLACED ALONG THE PERIMETER OF A SITE, AT INTERVALS ALONG A SLOPE, AT AREA INLETS, OR AS DITCH CHECKS TO SLOW DOWN RUNOFF AND RETAIN SEDIMENT.
3. MANUFACTURER'S SPECIFICATIONS SHALL BE FOLLOWED FOR SELECTING SOCK DIAMETER.
4. VEHICLES AND MACHINERY SHALL BE PREVENTED FROM DAMAGING THE SOCK.
5. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/2 THE HEIGHT OF THE SOCK.
6. BROKEN STAKES AND TORN SECTIONS SHALL BE REPLACED AND REPAIRED.
7. SOCK SHALL BE REMOVED AFTER PERMANENT VEGETATION IS ESTABLISHED.



ENVIRONMENTAL SERVICES DEPT. SPRINGFIELD, MO.	**COMPOST SOCK**	UPDATED: NOV. 2020
		BMP MANUAL

D2



SEDIMENT AND EROSION CONTROL GENERAL NOTES:

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.

2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES / STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES / STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.

3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES / STAKES IN APPROPRIATE LOCATIONS PER MANUFACTURER'S RECOMMENDATION.

4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH MINIMUM 6" OVERLAP. TO ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET.

5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATELY 6" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH.

6. PLACE STAPLES / STAKES PER MANUFACTURER'S RECOMMENDATION FOR THE APPROPRIATE SLOPE BEING APPLIED.

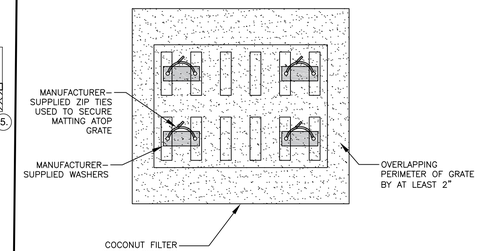
NOTES:
1. IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE / STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

2. FOLLOW EROSION CONTROL TECHNOLOGY COUNCIL SPECIFICATIONS FOR PRODUCT SELECTION.

EROSION CONTROL BLANKET

N.T.S.

D3

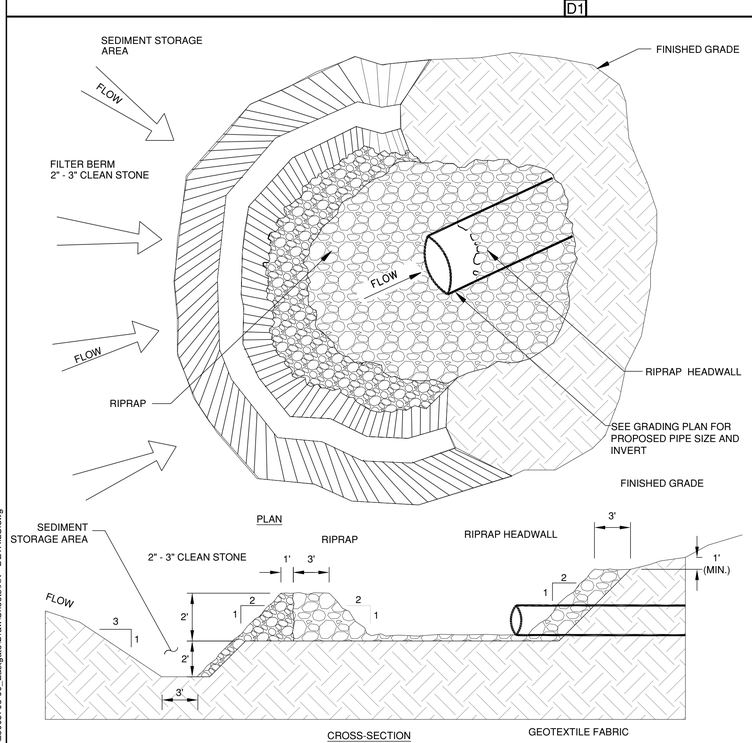


NOTES:
1. GRATE INLET FILTERS SHALL BE PLACED PRIOR TO DISTURBANCE AND AFTER GRATES ARE INSTALLED.
2. A CURB INLET BMP SHALL BE INSTALLED IN CONJUNCTION WITH THE GRATE INLET FILTER WHEN A GRATE IS CONNECTED TO A CURB INLET.
3. SEDIMENT AND DEBRIS COLLECTED ON TOP AND SIDES OF INLET FILTERS SHALL BE REMOVED AFTER EACH RAIN EVENT WITH A BROOM.
4. INLET FILTERS SHALL BE REPLACED WHEN PERFORMANCE IS NO LONGER SATISFACTORY.
5. INLET FILTERS SHALL ONLY BE REMOVED WHEN UPSTREAM AREAS ARE PERMANENTLY STABILIZED.

GRATE INLET FILTER

N.T.S.

D5



ROCK CHECK DAM INLET PROTECTION

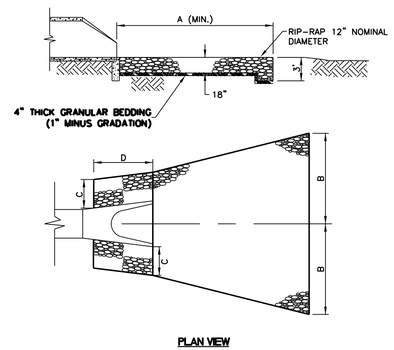
N.T.S.

D4

INSIDE DIAMETER STORM SEWER (IN.)	MIN. DIMENSION (FT)			
	A	B	C	D
12" thru 24"	15	4	1.5	4
27" thru 30"	18	5	2.0	6
36" thru 48"	22	6	2.5	8
54" thru 60"	25	7	3.0	10

NOTES:
1. INSPECT RIP RAP AFTER STORM EVENTS FOR STONE DISPLACEMENT AND FOR EROSION AT THE SIDES AND ENDS OF THE APRON.

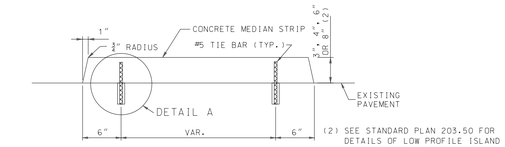
2. MAKE NEEDED REPAIRS IMMEDIATELY; USE APPROPRIATE SIZE STONE, AND DO NOT PLACE THEM ABOVE FINISHED GRADE.



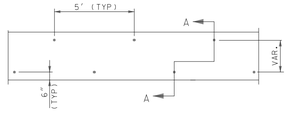
RIPRAP AT END SECTIONS

N.T.S.

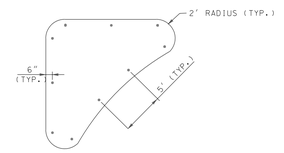
D6



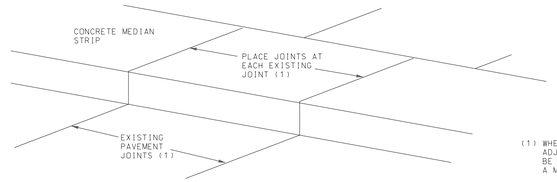
SECTION A-A
CONCRETE MEDIAN STRIP



TIE BAR LOCATIONS FOR CONCRETE MEDIAN STRIP

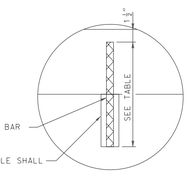


TIE BAR LOCATIONS FOR CONCRETE MEDIAN STRIP (ISLAND)



(1) WHEN THERE ARE NO VISIBLE JOINTS IN THE ADJACENT PAVEMENT, THE JOINT SPACING WILL BE EQUAL TO THE MEDIAN STRIP WIDTH, WITH A MINIMUM SPACING OF 10'.

CONCRETE MEDIAN STRIP JOINT LOCATION



DETAIL A

MEDIAN HEIGTH	BAR LENGTH
3"	8"
4"	9"
6"	11"
8"	13"

GENERAL NOTES:

TIE BARS SHALL BE EPOXY COATED, DEFORMED REINFORCING BARS MEETING THE REQUIREMENTS OF SECTION 710 AND 1057.

BONDING FOR TIE BARS SHALL BE EPOXY OR POLYESTER BONDING AGENTS AS SPECIFIED IN SECTION 1039.

THE FACE OF THE MEDIAN MAY BE CONSTRUCTED WITHOUT BATTER WHEN CONSTRUCTED ON A RADIUS OF 6' OR LESS.

WHEN CONCRETE MEDIANS ARE CONSTRUCTED DIRECTLY BENEATH GUARDRAIL, THE MEDIAN HEIGHT WILL BE 4".

MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION
105 WEST CAPITOL
JEFFERSON CITY, MO 65102
1-888-ASK-MODOT (1-888-275-6636)

CONCRETE MEDIAN STRIP

DATE EFFECTIVE: 10/01/2018	608.30A	SHEET NO.
DATE PREPARED: 10/17/2018		1 OF 1

STATE OF MISSOURI
JASON R. CLARK
NUMBER PE-2006019640
PROFESSIONAL ENGINEER
10/25/2024

REVISIONS			
NUMBER	BY	DATE	REMARKS

CMT
Crawford, Murphy & Tilly
Engineers and Consultants
1631 W Elfindale, Springfield, Missouri 65807
tel 417-869-6009 fax 417-869-8129

CMT JOB# 23005703-00

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI

NORTH EASTGATE AVE -
EAST DIVISION ST TO LE COMPTE RD

STANDARD DRAWINGS AND DETAILS

SURVEYED BY: CMT	DESIGN: CMT	SCALES	SHEET 87
FIELD BK.: CMT	DRAWN: CMT	HOR. N/A	OF 87 SHEETS
LEVEL BK.: CMT	CHECKED: RTS	VERT. N/A	FILE NO.: 2023PW0068

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Appendix G: Site Sign

LAND DISTURBANCE PERMIT
STORMWATER POLLUTION PREVENTION PLAN
PERMITTED BY:

MISSOURI STATE OPERATING PERMIT NUMBER:

MORA_____

CITY LAND DISTURBANCE PERMIT NUMBER:

LDP20____-000____

ANYONE WITH QUESTIONS OR CONCERNS ABOUT THE WATER QUALITY OR POTENTIAL POLLUTION LEAVING THIS SITE, PLEASE CONTACT THE CITY OF SPRINGFIELD'S ENVIRONMENTAL SERVICES DIVISION AT 417-864-1169.

Contact Name	
Contact Cell Phone	
Project Name	
SWPPP Location	
Spill Kit Location	

Stormwater Quality
Environmental Resource Center • 290 E. Central St.
Springfield, Missouri 65802 • 417-864-1996 • springfieldmo.gov

CITY OF Springfield ENVIRONMENTAL SERVICES

GENERAL NOTES

1) ALL IMPROVEMENTS IN THE CITY OF SPRINGFIELD'S RIGHT-OF-WAY SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE "STANDARD GENERAL CONDITIONS AND TECHNICAL SPECIFICATIONS AND STANDARD DRAWINGS & DETAILS FOR PUBLIC WORKS CONSTRUCTION" ADOPTED OCTOBER 1, 2021, ISSUED BY THE CITY OF SPRINGFIELD, MISSOURI. AND WITH THE DETAILS IN THESE PLANS AND THE SPECIAL PROVISIONS IN THE CONTRACT DOCUMENTS.

2) IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REMOVE AND DISPOSE OF ALL MATERIAL AND DEBRIS, RESULTING FROM CONSTRUCTION OPERATIONS. THE COST FOR THE REMOVAL AND DISPOSAL OF ALL CONSTRUCTION RELATED DEBRIS SHALL BE INCLUDED IN THE CONTRACT AND NO ADDITIONAL COST WILL BE INCURRED BY THE OWNER.

3) THE CONTRACTOR IS RESPONSIBLE FOR RETURNING ALL EXISTING AREAS (TO REMAIN) AFFECTED BY CONSTRUCTION ACTIVITIES, EQUIPMENT, OR LABORERS TO THE ORIGINAL UNDISTURBED CONDITIONS. THE CONTRACTOR IS ALSO RESPONSIBLE FOR PROTECTING ALL NEW WORK UNTIL THE COMPLETION OF THE CONTRACT. ANY ADDITIONAL COST FOR REPLACEMENT OF COMPLETED WORK PRIOR TO FINAL INSPECTION AND ACCURACY WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

4) REMOVAL OF PAVEMENT, SIDEWALK, CURB AND GUTTER, ETC. SHALL BE DISPOSED OF OFFSITE AT LOCATIONS PROVIDED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

5) ALL DRAINAGE STRUCTURES AND FLOW LINES SHALL BE FREE FROM DIRT AND DEBRIS. THIS WORK SHALL BE INCLUDED IN THE CONTRACT, AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTORS' FAILURE TO PROVIDE THE ABOVE WILL PRECLUDE ANY POSSIBLE ADDED COMPENSATION REQUESTED DUE TO DELAYS, OR REMOVAL OF UNSUITABLE MATERIALS CREATED AS A RESULT THEREOF.

6) THE CONTRACTOR SHALL PLAN THEIR WORK BASED ON THEIR OWN SOIL BORINGS, EXPLORATIONS, AND OBSERVATIONS TO DETERMINE SOIL CONDITIONS AT THE LOCATION OF THE PROPOSED WORK. HOWEVER, BORE LOGS HAVE BEEN INCLUDED AS PART OF THE PLAN SET.

7) THE CONTRACTOR SHALL OBTAIN CITY APPROVAL BEFORE PERFORMING ANY UNDERGRADING OR STABILIZATION

8) EXCESS MATERIALS, IF NOT UTILIZED AS FILL, SHALL BE COMPLETELY REMOVED FROM THE CONSTRUCTION SITE AND DISPOSED OF OFF-SITE BY THE CONTRACTOR. ADDITIONAL COSTS ASSOCIATED WITH THE EXCAVATION, STOCKPILING, TRANSPORTATION, AND DISPOSAL OF THESE EXCESS MATERIALS SHALL BE INCLUDED IN THE CONTRACT UNIT COST FOR EXCAVATION.

9) IN ADDITION TO FIELD SURVEYS AND AERIAL SURVEYS, PLAN DIMENSIONS AND DETAILS RELATIVE TO EXISTING FACILITIES HAVE BEEN TAKEN FROM EXISTING PLANS AND ARE SUBJECT TO CONSTRUCTION VARIATIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY SUCH DIMENSIONS AND DETAILS IN THE FIELD. SUCH VARIATIONS SHALL NOT BE CAUSE FOR ADDITIONAL COMPENSATION DUE TO A CHANGE IN THE SCOPE OF WORK. HOWEVER, THE CONTRACTOR WILL BE PAID FOR THE QUANTITY ACTUALLY FURNISHED AT THE AGREED UNIT PRICE BID FOR THE WORK. GRADING SHALL BE DONE BY HAND AROUND BUILDINGS, LIGHT POLES, UTILITY POLES, SIGN POSTS, SHRUBS, TREES OR OTHER NATURAL OR MAN-MADE OBJECTS WHERE SHALLOW FILLS OR CUTS ARE ADJACENT TO THE ITEMS. THE DECISION AS TO ITEMS TO REMAIN IN PLACE SHALL BE DIRECTED BY THE ENGINEER. THIS WORK WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE CONSIDERED INCLUDED IN THE CONTRACT UNIT PRICE OF EXCAVATION AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

10) SEEDING SHALL BE DONE ON ALL VEGETATED AREAS THAT ARE DISTURBED BY CONSTRUCTION OPERATIONS AS DIRECTED BY THE ENGINEER. ALL AREAS DISTURBED BY THE CONTRACTOR OUTSIDE THE PROPOSED CONSTRUCTION LIMITS SHALL BE SEEDED, AS DIRECTED BY THE ENGINEER, AT THE CONTRACTOR'S EXPENSE.

11) WHERE PROPOSED CONSTRUCTION ABUTS EXISTING APPURTENANCES, A SAW CUT SHALL BE MADE TO ACHIEVE A NEAT BUTT JOINT. ALL OTHER SAWED JOINTS FOR REMOVALS, PATCHING, BUTT JOINTS, AND CONSTRUCTION STAGING SHALL NOT BE PAID FOR SEPARATELY, AND SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION AND NO FURTHER COMPENSATION WILL BE ALLOWED.

12) THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO BEGINNING CONSTRUCTION.

13) ALL CONSTRUCTION TRAFFIC CONTROL DEVICES MUST BE UTILIZED AND MAINTAINED IN COMPLIANCE WITH PART V OF THE 2009 EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND ANY REVISIONS THERE TO.

14) THE INSTALLATION OF AGGREGATE UNDER THE PROPOSED CURB AND GUTTER SHALL BE INCLUDED IN THE UNIT COST OF CONCRETE CURB AND GUTTER.

15) THE APPLICATION OF PRIME COAT MATERIAL FOR BITUMINOUS PAVEMENT SHALL BE INCLUDED IN THE UNIT COST FOR ITEMS ASSOCIATED WITH BITUMINOUS PAVEMENT.

16) THE INSTALLATION OF BITUMINOUS MATERIAL NECESSARY TO TRANSITION TRAFFIC FROM EXISTING TO PROPOSED PAVEMENT ELEVATION DURING CONSTRUCTION SHALL BE INCLUDED IN THE COST FOR TEMPORARY TRAFFIC CONTROL.

17) IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT HORIZONTAL AND VERTICAL LOCATION OF EXISTING UNDERGROUND FACILITIES PRIOR TO BEGINNING INSTALLATION OF NEW FACILITIES. CONTACT THE ENGINEER FOR INSTRUCTIONS WHEREVER ANY CONFLICTS ARE DISCOVERED.

18) IT IS THE CONTRACTOR'S RESPONSIBILITY TO CORRECT ANY DAMAGE TO UNDERGROUND UTILITIES OR OTHER OBSTRUCTIONS WHICH IS DUE TO HIS OPERATIONS.

19) CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES BEFORE EXCAVATION. UTILIZE "MISSOURI ONE-CALL" BY CALLING 1-800-DIG-RITE.

20) ALL DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED. ALL RETAINING WALLS ARE TO FACE OF WALL.

21) ALL CONSTRUCTION ACTIVITIES, INCLUDING PLACEMENT AND STORAGE OF MATERIALS AND STAGING AREAS SHALL BE CONFINED TO THE LIMITS OF THE RIGHTS-OF-WAY, STAGING AREAS AND EASEMENTS SHOWN ON THESE PLANS.

22) IF APPLICABLE, CONTRACTOR IS REQUIRED TO OBTAIN THE NECESSARY PERMITS FROM MODOT TO PERFORM WORK ON STATE RIGHT-OF-WAY.

23) IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH ADJACENT PROPERTY OWNER IMPACTED BY CONSTRUCTION OPERATIONS.

24) ALL AREAS DISTURBED BY CONSTRUCTION. EXCLUDING THOSE TO RECEIVE CRUSHED STONE, ASPHALT OR CONCRETE PAVING, SHALL BE FERTILIZED, AND HYDROSEEDED AS DESCRIBED IN THE SPECIFICATIONS.

25) ALL DRIVEWAYS SHALL REMAIN ACCESSIBLE TO RESIDENTIAL AND EMERGENCY VEHICLES DURING PROJECT DURATION UNLESS OTHERWISE SPECIFIED IN THE JOB SPECIAL PROVISIONS.

26) CONTRACTOR SHALL REMOVE, PRESERVE AND REPLACE ALL SIGNS, MAILBOXES, FENCES AND MISC. ITEMS WITHIN THE LIMITS OF THE PROPOSED IMPROVEMENTS, UNLESS OTHERWISE NOTED.

UTILITY NOTES

1) WHEN THE PLANS OR SPECIAL PROVISIONS INCLUDE INFORMATION PERTAINING TO THE LOCATION OF EXISTING UTILITY FACILITIES, SUCH INFORMATION ONLY REPRESENTS THE OPINION OF THE ENGINEER AS TO THE LOCATION OF SUCH FACILITIES AND IS ONLY INCLUDED FOR THE CONTRACTOR'S CONVENIENCE. THE ENGINEER AND THE OWNER ASSUME NO RESPONSIBILITY FOR THE SUFFICIENCY OR ACCURACY OF THE INFORMATION SHOWN IN THE PLAN RELATING TO THE LOCATION OF EXISTING FACILITIES OR THE MANNER IN WHICH THEY ARE TO BE REMOVED OR ADJUSTED.

2) IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM OR ESTABLISH THE EXISTENCE OF ALL UTILITY FACILITIES RELEVANT TO THEIR EXACT LOCATIONS, AND TO SCHEDULE ALL NECESSARY UTILITY RELOCATIONS WITH THE APPROPRIATE UTILITY COMPANY.

3) THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE NATURE OF AND STATUS OF ALL UTILITY RELOCATION WORK PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO ENSURE THAT CONSTRUCTION ACTIVITIES DO NOT INTERFERE WITH UTILITY FACILITIES AND RELOCATION WORK. THE CONTRACTOR'S SCHEDULE SHOULD REFLECT CONSTRUCTION SEQUENCING WHICH COORDINATES WITH ALL UTILITY RELOCATION WORK. THE CONTRACTOR SHALL BE REQUIRED TO ADJUST THE SEQUENCE SCHEDULE OF WORK TO COORDINATE WITH THE RELOCATION SCHEDULE OF CONFLICTING UTILITY COMPANIES.

4) CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES BEFORE EXCAVATION. UTILIZE "MISSOURI ONE CALL" BY CALLING 1-800-DIG-RITE.

5) IT IS THE CONTRACTORS RESPONSIBILITY TO COMPENSATE THE IMPACTED UTILITY COMPANY OR CUSTOMER FOR ANY MATERIAL, LABOR, LOSS OF USE, AND ASSOCIATED COSTS DUE TO ANY DAMAGE TO UNDERGROUND OR OVERHEAD FACILITIES DUE TO THE CONTRACTOR'S OPERATION.

6) ALL EXISTING UTILITIES INDICATED ON THE DRAWINGS REPRESENT THE BEST INFORMATION AVAILABLE TO THE ENGINEER; HOWEVER, ALL EXISTING UTILITIES MAY NOT BE SHOWN. UTILITIES DAMAGED THROUGH NEGLIGENCE OF THE CONTRACTOR TO OBTAIN THE LOCATION SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT HIS EXPENSE.

7) RELOCATION OF ANY WATER LINE, SEWER LINE, OR SERVICE LINE THEREOF REQUIRED FOR THE CONSTRUCTION OF THIS PROJECT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE AT HIS EXPENSE.

8) THE CONTRACTOR SHALL PROVIDE 1-WEEK ADVANCED NOTICE TO UTILITY COMPANY REPRESENTATIVES PRIOR TO WORKING WITHIN THE VICINITY OF EXISTING UTILITIES.

9) ANY CONFLICTS BETWEEN THE INSTALLATION OF THE PROPOSED IMPROVEMENTS AND KNOWN OR UNKNOWN EXISTING UTILITIES SHALL BE IDENTIFIED BY THE CONTRACTOR AND IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE A PROPOSED SOLUTION TO AVOID THE CONFLICT.

10) GRADING AND STORM SEWER CONSTRUCTION ACTIVITY IS TO BE PERFORMED IN CLOSE PROXIMITY TO A CU GAS MAIN AND WATER MAIN. CONTRACTOR IS TO EXERCISE EXTREME CAUTION WHEN PERFORMING ANY WORK NEAR THE GAS AND WATER MAIN.

DRAINAGE NOTES

1) DURING CONSTRUCTION OPERATIONS THE CONTRACTOR SHALL ENSURE POSITIVE SITE DRAINAGE AT THE CONCLUSION OF EACH DAY. SITE DRAINAGE MAY BE ACHIEVED BY DITCHING, PUMPING, OR ANY OTHER METHOD ACCEPTABLE TO THE ENGINEER.

2) THE CONTRACTOR SHALL RECONNECT ALL EXISTING DRAINAGE TILES OR ACTIVE PIPES FOUND DURING EXCAVATION TO THE NEW STORM SEWER LINES IN ACCORDANCE WITH THE DETAILS SHOWN IN THE PLANS. THE COST OF INSTALLING THIS CONNECTION IS INCLUDED IN THE ASSOCIATED DRAINAGE ITEMS.

3) FRAME ELEVATIONS GIVEN ON THE PLANS ARE ONLY TO ASSIST THE CONTRACTOR IN DETERMINING THE APPROXIMATE OVERALL HEIGHT OF THE STRUCTURE. FRAMES ON ALL NEW STRUCTURES WILL BE ADJUSTED TO THE FINAL ELEVATION OF THE AREA IN WHICH THEY ARE LOCATED AS PART OF THE DRAINAGE STRUCTURE COST.

4) ALL OPENINGS IN PRECAST STRUCTURES SHALL BE FABRICATED TO THE PROPER SIZE. COSTS FOR THESE OPENINGS AND THE ASSOCIATED CONNECTIONS SHALL BE INCLUDED IN THE PAY ITEMS FOR THE STRUCTURES INVOLVED. ALL DRAINAGE STRUCTURES SHALL BE DELIVERED TO THE CITY WITHOUT SILT, DEBRIS OR OTHER SUCH OBSTRUCTIONS AT THE TIME OF FINAL INSPECTION. THE NEED FOR ADDITIONAL CLEANING OF THE STRUCTURES SHALL BE AT THE DIRECTION OF THE ENGINEER AND WILL NOT BE PAID FOR AS AN ADDITIONAL COST TO THE CONTRACT. THE COST OF MAKING STORM SEWER CONNECTIONS TO EXISTING DRAINAGE STRUCTURES SHALL BE INCLUDED IN THE VARIOUS CONTRACT UNIT PRICES FOR STORM SEWER.

5) ANY MATERIALS PLACED THAT REQUIRE NUCLEAR DENSITY TESTING SHALL BE TESTED A MINIMUM OF EVERY OTHER LIFT BY A QUALIFIED TESTING TECHNICIAN. EACH TEST SHALL BE APPROVED BY THE CITY BEFORE THE NEXT LIFT IS PLACED. ALL TESTING LABORATORY EXPENSES SHALL BE PAID FOR BY THE CONTRACTOR.

SUMMARY OF QUANTITIES - BASE PROJECT

	ITEM NO.	DESCRIPTION	QTY	UNIT
1 REVISED 02/10/2025	COS-3.2.5.5.1	Earth Embankment (Compacting)	2662	CY
	COS-3.2.4.2	Excavation	15790	CY
	COS-3.5.4.2	Miscellaneous Removals	1	LS
	COS-3.6.4.1	Asphalt Pavement Removal	1669	SY
	COS-3.6.4.2	Concrete Pavement Removal	2436	SY
	COS-3.6.4.3	Curb Removal	16	LF
1 REVISED 02/10/2025	COS-3.6.4.5	Sidewalk Removal	18	SY
	COS-5.1.5.1.15	Circular Storm Pipe (15")	1410	LF
	COS-5.1.5.1.18	Circular Storm Pipe (18")	24	LF
	COS-5.1.5.1.24	Circular Storm Pipe (24")	512	LF
	COS-5.1.5.1.30	Circular Storm Pipe (30")	628	LF
	COS-5.1.5.1.36	Circular Storm Pipe (36")	202	LF
	COS-5.1.5.1.48	Circular Storm Pipe (48")	695	LF
	COS-5.1.5.5.15	15" Concrete Flared End Section	3	EA
	COS-5.1.5.5.24	24" Concrete Flared End Section	1	EA
	COS-5.1.5.5.48	48" Concrete Flared End Section	1	EA
	COS-5.2.5.1.72.72	SS-1 Junction Box (6'x6')	2	EA
1 REMOVED 02/10/2025	COS-5.2.5.2.48	SS-2 Storm Sewer Manhole (4' Dia.)	1	EA
	~~COS-5.2.5.5.36.36~~	~~SS-5 Inlet (3'x3')~~	~~1~~	~~EA~~
	COS-5.2.5.5.60.60	SS-5 Area Inlet (5'x5')	4	EA
	COS-5.2.5.6.84.36	SS-6 Curb Inlet (7'x3')	18	EA
	COS-5.2.5.6.84.48	SS-6 Curb Inlet Modified (7'x4')	5	EA
	COS-5.2.5.6.84.60	SS-6 Curb Inlet Modified (7'x5')	4	EA
	COS-7.6.6	Construction Surveying (1%)	1	LS
	COS-7.7.6	Temporary Traffic Control	1	LS
1 REVISED 02/10/2025	COS-8.1.5	Portland Cement Concrete Curb & Gutter (30" Wide)	6296	LF
	COS-10.5.1.4	4" Concrete Sidewalk	17377	SF
	COS-10.5.2.6	Concrete ADA Ramp	1315	SF
	COS-10.5.3.8	Concrete Driveway	2882	SF
	COS-11.8.11.5.2.2	2" Asphalt Surface Course (BP-1 W/PG64-22)	14240	SY
	COS-11.8.11.5.3.9	9" Asphalt Base Course (BP1 W/PG64-22)	14240	SY
	COS-11.8.11.5.4.6	6" Type 5 Aggregate Base	14240	SY
	COS-13.1.5	Seeding	3	AC
	COS-16.8.2.1	Construction Exit	2	EA
	COS-16.8.2.3	Compost Filter Sock	3570	LF
	COS-16.8.2.4	Inlet Protection	45	EA
	COS-16.8.2.5	Rock Check Dam	17	EA
	MoDOT-2063000	Class 3 Excavation	21	CY
1 REVISED 02/10/2025	MoDOT-2063100	Class 3 Excavation in Rock	3	CY
	MoDOT-3040504	Type 5 Aggregate for Base (4 in. Thick)	1931	SY
	MoDOT-4019905	Misc. (12 Inches, Bituminous Pavement)	8084	SY
	MoDOT-6081000	Concrete Median	434	SY
	MoDOT-6091052	Curb and Gutter Type B	905	LF
	MoDOT-6097000	Rock Lining	15	CUYD
	MoDOT-6141120	Curved Vane Grate and Frame (2'x2')	3	EA
	MoDOT-6200015	Preformed Thermoplastic Pavement Marking, 24 In. White	260	LF
	MoDOT-6200018	Preformed Thermoplastic Pavement Marking, 24 In. Yellow	164	LF
	MoDOT-6200021	Preformed Thermoplastic Pavement Marking, Left/Right Arrow	11	EA
	MoDOT-6200036	Preformed Thermoplastic Pavement Marking, 30 In. White	42	EA
	MoDOT-6200042	Preformed Thermoplastic Pavement Marking, 12 In. White, Yield Line Triangles	18	EA
	MoDOT-6205901A	4 In. Yellow High Build Waterborne Pavement Marking Paint, Type L Beads	2934	LF
	MoDOT-6205902A	6 In. White High Build Waterborne Pavement Marking Paint, Type L Beads	2413	LF
	MoDOT-6205906A	12 In. White High Build Waterborne Pavement Marking Paint, Type L Beads	391	LF
	MoDOT-620993	Misc. (4 In. White High Build Waterborne Pavement Marking Paint, Type L Beads)	616	LF
	MoDOT-6209903(1)	Misc. (12 In. Yellow High Build Waterborne Pavement Marking Paint, Type L Beads	1276	LF
	MoDOT-7311022	Precast Concrete Drop Inlet (2'x2')	15	LF
1 REMOVED 02/10/2025	~~MoDOT-9011030~~	~~Lighting Pole, 30 FT. or 9.0M, Type AT~~	~~1~~	~~EA~~
	~~MoDOT-9017407~~	~~Cable Conduit, 1 IN., 2 Conductors And 1 Bare Neutral, 8 AWG~~	~~40~~	~~LF~~
	MoDOT-9020113	Signal Head, Type 3T	1	EA
	MoDOT-9020513	Signal Head, Type 3B	9	EA
	MoDOT-9020514	Signal Head, Type 4B	3	EA
	MoDOT-9020811	Signal Head, Type 15, Pedestrian	4	EA
	MoDOT-9020833	SH-Flat Sheet - Signal Sign	63	SF
1 REVISED 02/10/2025	MoDOT-9020834	Signal Sign, Mounting Hardware	7	EA
	MoDOT-9022651	Luminaire LED-A, 120 Volt Compatible	4	EA
	MoDOT-9022708	Post, Signal 8 FT.	2	EA
	MoDOT-9022715	Post, Signal 15 FT.	1	EA
	MoDOT-9023145	Post, Type CL, 45 FT. Arm or 13.7M Arm	1	EA
	MoDOT-9023155	Post, Type CL, 55 FT. Arm	1	EA
	MoDOT-9023450	Post, Type BL, Longest Arm 50 FT. or 15.2M	1	EA
	MoDOT-9025200	Conduit, 2 IN., Trench with Tracer Wire	23	LF
	MoDOT-9025300	Conduit, 3 IN., Trench with Tracer Wire	310	LF
1 REVISED 02/10/2025	MoDOT-9027300	Conduit, 3 IN., Pushed with Tracer Wire	202	LF
	MoDOT-9028100	Cable, 10 AWG 1 Conductor, Pole and Bracket	190	LF
	MoDOT-9028208	Cable, 8 AWG 1 Conductor, Power	100	LF
	MoDOT-9028308	Cable, 16 AWG 2 Conductor	650	LF
	MoDOT-9028310	Cable, 16 AWG 5 Conductor	650	LF
1 REVISED 02/10/2025	MoDOT-9028311	Cable, 16 AWG 7 Conductor	3000	LF
	MoDOT-9028302	Cable, 12 AWG 2 Conductor	720	LF
	MoDOT-9028621	Power Supply Assembly, Type 2 with 120V Lighting Control Cabinet	1	EA
	MoDOT-9028810	Pull Box, Preformed Class 1	1	EA
	MoDOT-9028811	Pull Box, Preformed Class 2	2	EA
	MoDOT-9028812	Pull Box, Preformed Class 3	1	EA
	MoDOT-9028821	Pull Box, Concrete, Double, Type A	1	EA
	MoDOT-9029100	Base, Concrete	13.2	EA
	MoDOT-9029902	Misc. (Signal Controller)	1	EA
	MoDOT-9029902(1)	Misc. (Contractor Furnished, Contractor Installed Radar Detection System)	1	EA

SUMMARY OF QUANTITIES - BASE PROJECT (CONT.)

ITEM NO.	DESCRIPTION	QTY	UNIT
MoDOT-9029902(3)	Misc. (Audible Pedestrian Pushbutton and Signing)	4	EA
MoDOT-9029902(4)	Misc. (Battery Backup System on Type II Power Supply)	1	EA
MoDOT-9029902(5)	Misc. (Wireless Connection)	2	EA
MoDOT-9029903	Misc. (Radar 6 Conductor)	900	LF
MoDOT-9031010	Concrete Footings, Embedded	0.2	CY
MoDOT-9031210	Structural Steel Posts	230	LB
MoDOT-9031241	Breakaway Assembly (Perforated Square Steel Tube)	5	EA
MoDOT-9031270A	2 In. PSST Post - 12 GA	113	LF
MoDOT-9031271A	Driven Post Anchor for 2 In. PSST - 12 GA	9	EA
MoDOT-9031280	2.5 In. PSST Post - 7 GA	63	LF
MoDOT-9031281A	Driven Post Anchor for 2.5 In. PSST - 7 GA	5	EA
MoDOT-9035004A	SH-Flat Sheet	90	SF
MoDOT-9103700	CCTV Camera Assembly, Installed	1	EA
MoDOT-9109903	Misc. (CAT6 Ethernet Cable)	360	LF
JSP	Flexamat Vegetated Block Mat	600	SF
~~JSP~~	~~Gravity Block Retaining Wall~~	~~1500~~	~~SF~~
JSP	Type A Pipe Collar	1	EA
JSP	Seed & Erosion Control Blanket	12467	SY
JSP	Mobilization (7%)	1	LS

1 REMOVED 02/10/2025

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

STATE OF MISSOURI
JASON R. CLARK
NUMBER PE-2006019640
PROFESSIONAL ENGINEER
12/03/2024

REVISIONS			
NUMBER	BY	DATE	REMARKS
1	CMT	02/10/2025	REVISION #1

CMT
Crawford, Murphy & Tilly
Engineers and Consultants
1631 W Elfindale, Springfield, Missouri 65807
tel 417-869-6009 fax 417-869-8129

CMT JOB# 23005703-00

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI

NORTH EASTGATE AVE -
EAST DIVISION ST TO LE COMPTE RD

GENERAL NOTES & SUMMARY OF QUANTITIES

SURVEYED BY: CMT	DESIGN: CMT	SCALES	SHEET 2
FIELD BK.: CMT	DRAWN: CMT	HOR. N/A	OF 86 SHEETS
LEVEL BK.: CMT	CHECKED: RTS	VERT. N/A	FILE NO.: 2023PW0068

APPROVED BY
DIRECTOR OF PUBLIC WORKS
FILED
IN THE OFFICE OF THE
DIRECTOR OF PUBLIC WORKS
FILE NO. 2023PW0068
DATE 2/11/2025

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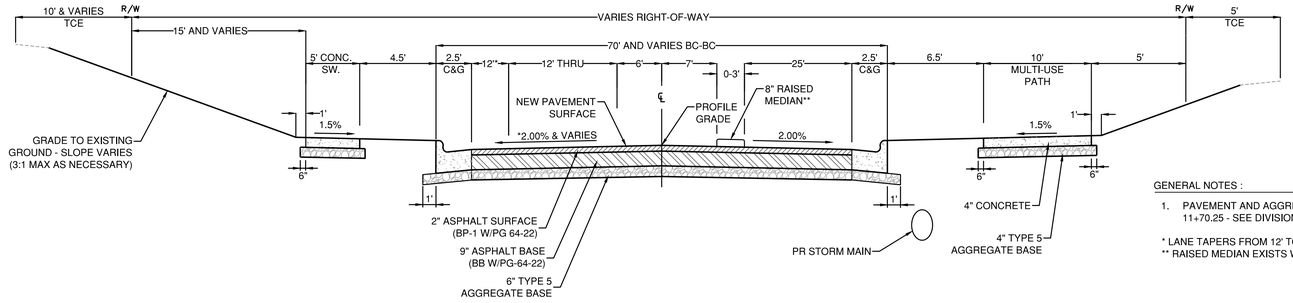


N EASTGATE AVE. TYPICAL SECTION
STATION 11+67.25 TO 13+59.46

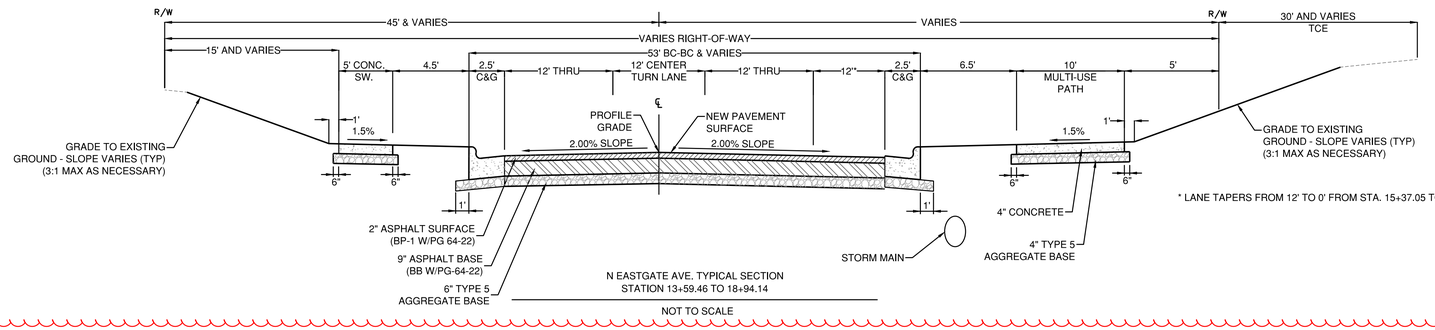
NOT TO SCALE

GENERAL NOTES :

1. PAVEMENT AND AGGREGATE BASE TYPE AND DEPTH TO MATCH DIVISION STREET FROM STA. 10+00.00 - STA 11+70.25 - SEE DIVISION STREET TYPICAL AND PAVEMENT PLANS FOR DETAILS

* LANE TAPERS FROM 12' TO 0' FROM STA. 12+59.46 TO STA. 13+59.46
** RAISED MEDIAN EXISTS WITHIN THIS TYPICAL FROM STA. 11+67.25 TO STA. 12+42.00

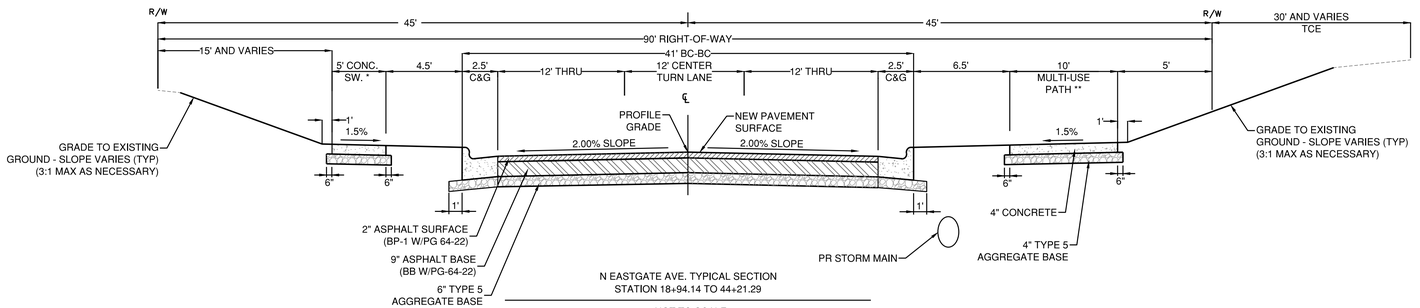
1
REVISED
02/10/2025



N EASTGATE AVE. TYPICAL SECTION
STATION 13+59.46 TO 18+94.14

NOT TO SCALE

* LANE TAPERS FROM 12' TO 0' FROM STA. 15+37.05 TO STA. 18+94.14



N EASTGATE AVE. TYPICAL SECTION
STATION 18+94.14 TO 44+21.29

NOT TO SCALE
(SUMMERSET ST. INTERSECTION OMISSION STA. 21+91.85 TO 23+11.55 RT.)
*10' MULTI-USE PATH BEGINS AT STA. 43+80.00
**10' MULTI-USE PATH ENDS AT STA. 43+80.00

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

STATE OF MISSOURI
JASON R. CLARK
NUMBER PE-2006019640
PROFESSIONAL ENGINEER
12/03/2024

REVISIONS			
NUMBER	BY	DATE	REMARKS
1	CMT	02/10/2025	REVISION #1

CMT
Crawford, Murphy & Tilly
Engineers and Consultants
1631 W Elfindale, Springfield, Missouri 65807
tel 417-869-6009 fax 417-869-8129

CMT JOB# 23005703-00

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI

NORTH EASTGATE AVE -
EAST DIVISION ST TO LE COMPTE RD

TYPICAL SECTIONS

SURVEYED BY: CMT	DESIGN: CMT	SCALES	SHEET 4
FIELD BK.: CMT	DRAWN: CMT	HOR. N/A	OF 86 SHEETS
LEVEL BK.: CMT	CHECKED: RTS	VERT. N/A	FILE NO.: 2023PW0068

APPROVED BY Dan Smith
DIRECTOR OF PUBLIC WORKS
FILED
IN THE OFFICE OF THE
DIRECTOR OF PUBLIC WORKS
FILE NO. 2023PW0068
DATE 2/11/2025

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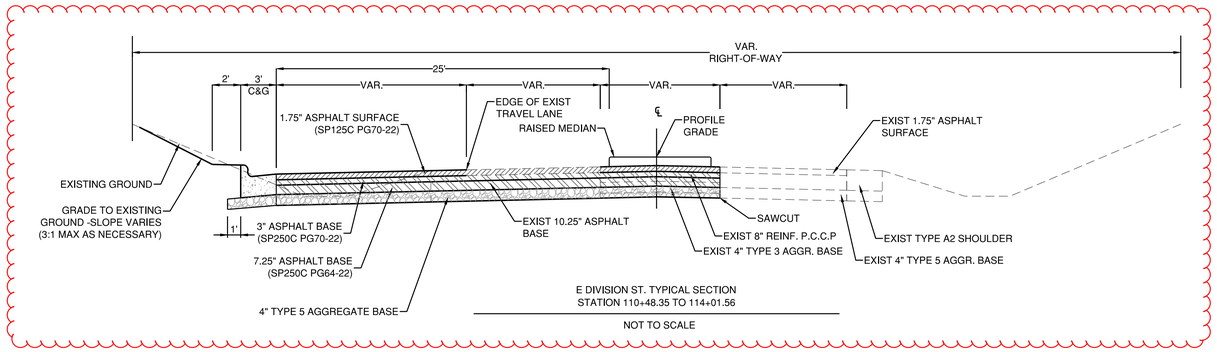
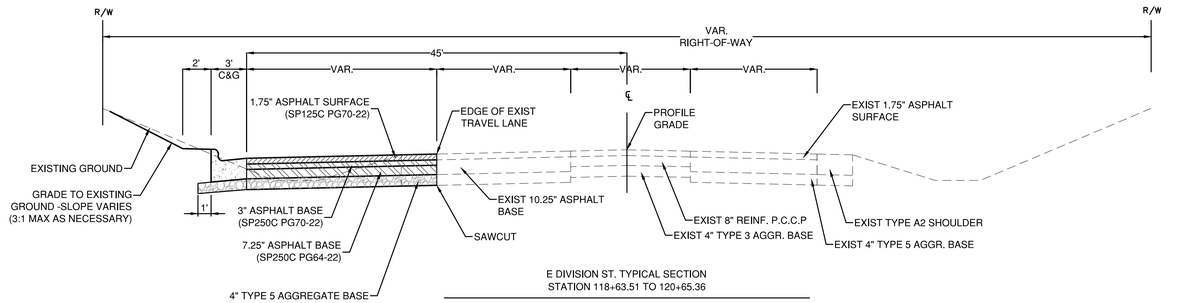


E DIVISION ST. TYPICAL SECTION
STATION 110+48.35 TO 114+01.56

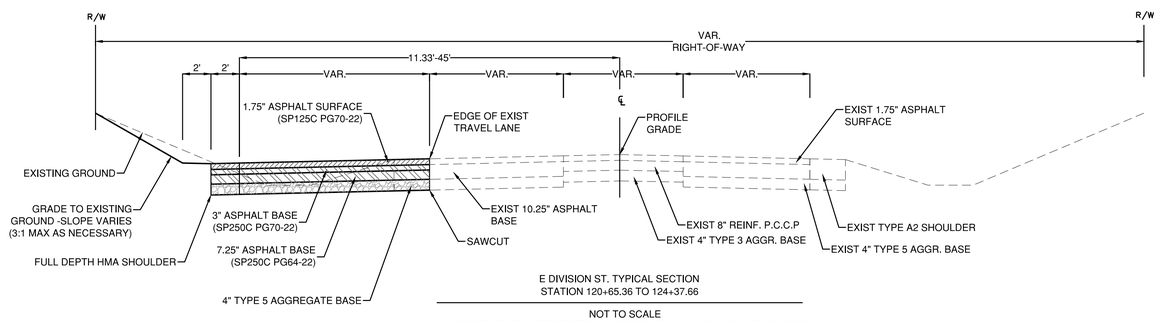
NOT TO SCALE

1
REVISED
02/10/2025



E DIVISION ST. TYPICAL SECTION
STATION 118+63.51 TO 120+65.36

NOT TO SCALE
(N COOPER BLVD. INTERSECTION OMISSION STA. 122+06.86 TO 123+03.15 RT.)



E DIVISION ST. TYPICAL SECTION
STATION 120+65.36 TO 124+37.66

NOT TO SCALE
(N COOPER BLVD. INTERSECTION OMISSION STA. 122+06.86 TO 123+03.15 RT.)

Know what's below.
Call before you dig.

STATE OF MISSOURI
JASON R. CLARK
NUMBER PE-2006019640
PROFESSIONAL ENGINEER
12/03/2024

REVISIONS			
NUMBER	BY	DATE	REMARKS
1	CMT	02/10/2025	REVISION #1

CMT
Crawford, Murphy & Tilly
Engineers and Consultants
1631 W Elfindale, Springfield, Missouri 65807
tel 417-869-6009 fax 417-869-8129

CMT JOB# 23005703-00

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI

NORTH EASTGATE AVE -
EAST DIVISION ST TO LE COMPTE RD

TYPICAL SECTIONS (DIVISION STREET)

SURVEYED BY: CMT	DESIGN: CMT	SCALES	SHEET 5
FIELD BK.: CMT	DRAWN: CMT	HOR. N/A	OF 86 SHEETS
LEVEL BK.: CMT	CHECKED: RTS	VERT. N/A	FILE NO.: 2023PW0068

APPROVED BY Dan Smith
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DATE 2/11/2025

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GENERAL NOTES

1. ALL RADIUS CALLOUTS ARE TO BACK OF CURB UNLESS NOTED OTHERWISE.
2. REFER TO SH. 31 - 33 FOR GEOMETRIC LAYOUT.

PLAN AND PROFILE KEYNOTES

1. 2" ASPHALT SURFACE COURSE (BP-1 W/PG 64-22), 9" ASPHALT BASE (BB W/PG-64-22) & 6" TYPE 5 AGG. BASE
2. 1.75" ASPHALT SURFACE (SP125C PG70-22), 3" ASPHALT BASE (SP250C PG70-22), 7.25" ASPHALT BASE (SP250C PG64-22) & 4" TYPE 5 AGG. BASE
3. MULTI-USE PATH- 4" THICK CONCRETE W/ 4" TYPE 5 AGG. BASE
4. SIDEWALK - 4" THICK CONCRETE W/ 4" TYPE 5 AGG. BASE
5. CONCRETE COMMERCIAL DRIVEWAY & APPROACH PAVEMENT - 8" THICK NON-REINFORCED CONCRETE, 4" TYPE 5 AGGREGATE
6. CITY OF SPRINGFIELD C&G (2.5' WIDE)
7. MODOT TYPE B CURB & GUTTER (3.0' WIDE)
8. ADA CURB RAMP
9. DETECTABLE WARNINGS
10. 8" PINNED ON CONCRETE MEDIAN (SEE DETAIL SHEET 86)
11. PROPOSED CU WATER MAIN - BY OTHERS
12. PROPOSED CU GAS MAIN - BY OTHERS

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

KEYMAP

US 65 · EASTGATE AVE · LE COMPTE RD · E DIVISION STREET

STATE OF MISSOURI
JASON R. CLARK
NUMBER PE-2006019640
PROFESSIONAL ENGINEER
12/03/2024

REVISIONS

NUMBER	BY	DATE	REMARKS
1	CMT	02/10/2025	REVISION #1

CMT
Crawford, Murphy & Tilly
Engineers and Consultants
1631 W Elfindale, Springfield, Missouri 65807
tel 417-869-6009 fax 417-869-8129

CMT JOB# 23005703-00

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI

NORTH EASTGATE AVE -
EAST DIVISION ST TO LE COMPTE RD

ROADWAY PLAN & PROFILE

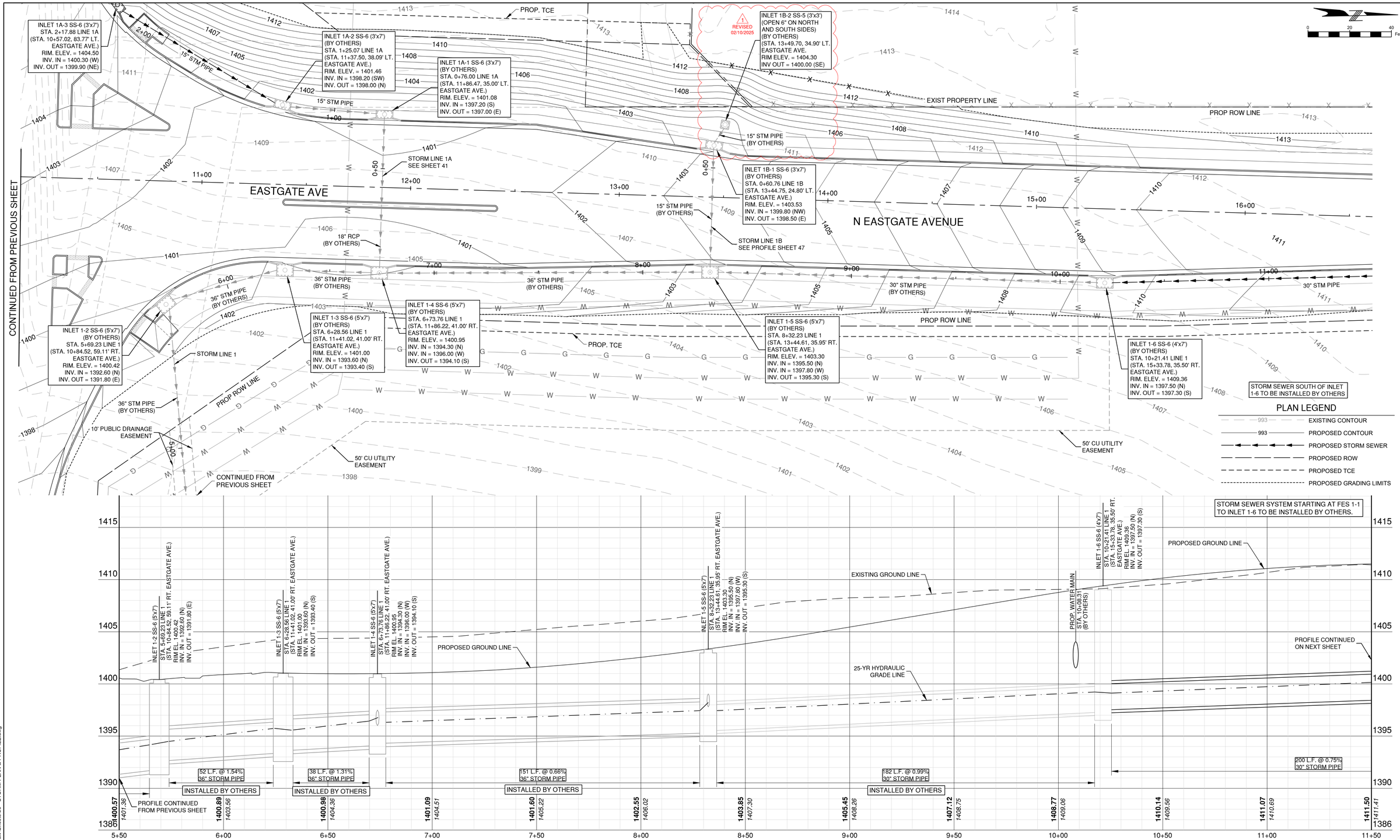
SURVEYED BY: CMT
FIELD BK.: CMT
LEVEL BK.: CMT

DESIGN: CMT
DRAWN: CMT
CHECKED: RTS

SCALES
HOR. 1"=20'
VERT. 1"=4'

SHEET 22
OF 86 SHEETS
FILE NO.: 2023PW0068

APPROVED BY [illegible]
DIRECTOR OF PUBLIC WORKS
FILED
IN THE OFFICE OF THE
DIRECTOR OF PUBLIC WORKS
FILE NO. 2023PW0068
DATE 2/11/2025

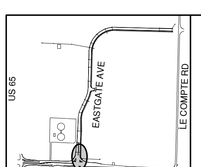


STORM SEWER LINE 1

NOTES:

1. ALL FILL MATERIAL IS TO BE IN PLACE, AND COMPACTED BEFORE INSTALLATION OF PROPOSED UTILITIES.
2. DRAWINGS DO NOT PURPORT TO SHOW ALL EXISTING UTILITIES.
3. EXISTING UTILITIES SHALL BE VERIFIED IN FIELD PRIOR TO INSTALLATION OF ANY NEW LINES.
6. MINIMUM TRENCH WIDTH SHALL BE 2 FEET.
7. ALL STORM LINES SHALL BE EITHER RCP OR POLYPROPYLENE PIPE IN ACCORDANCE WITH SECTION 5.1.2 OF THE CITY SPECIFICATIONS FOR PUBLIC IMPROVEMENTS.
8. CONTRACTOR SHALL INCLUDE GRANULAR BACKFILL UNDER ALL PAVEMENT AREAS PER SECTION 5.1.3.7 OF THE CITY SPECIFICATIONS.
9. ALL UTILITIES SHOULD BE KEPT TEN (10') APART (PARALLEL) OR WHEN CROSSING 18" APART (OUTSIDE EDGE OF PIPE TO OUTSIDE EDGE OF PIPE).
10. LINES UNDERGROUND SHALL BE INSTALLED, INSPECTED AND APPROVED BEFORE BACKFILLING.

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



KEYMAP

STATE OF MISSOURI
JASON R. CLARK
NUMBER PE-2006019640
PROFESSIONAL ENGINEER
12/03/2024

REVISIONS			
NUMBER	BY	DATE	REMARKS
1	CMT	02/10/2025	REVISION #1

CMT
Crawford, Murphy & Tilly
Engineers and Consultants
1631 W Ellindale, Springfield, Missouri 65807
tel 417-869-6009 fax 417-869-8129

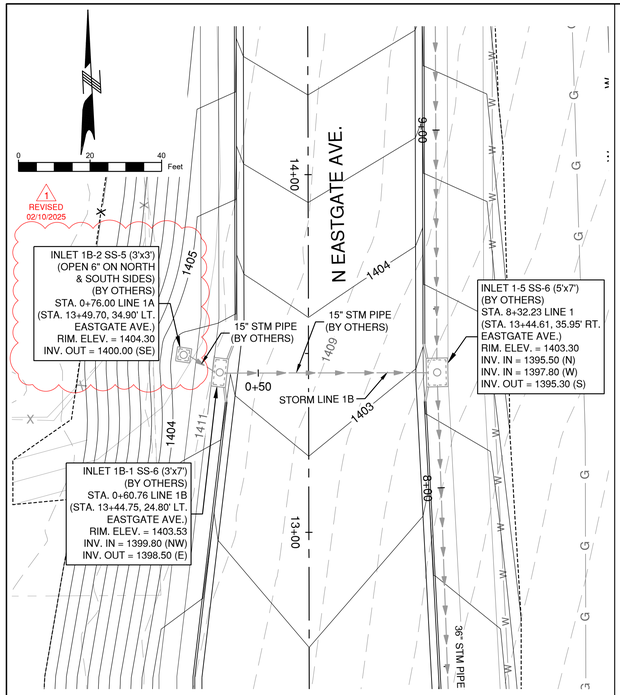
CMT JOB# 23005703-00

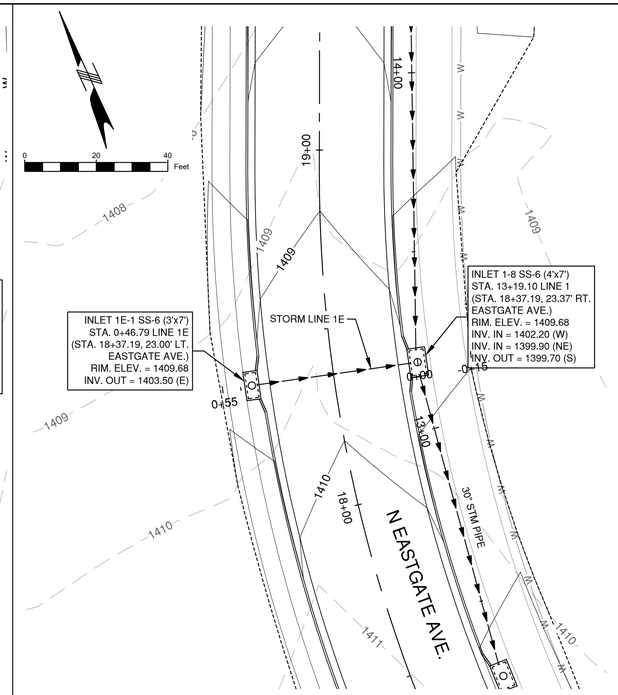
DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI
NORTH EASTGATE AVE - EAST DIVISION ST TO LE COMPTE RD
STORM PLAN & PROFILE

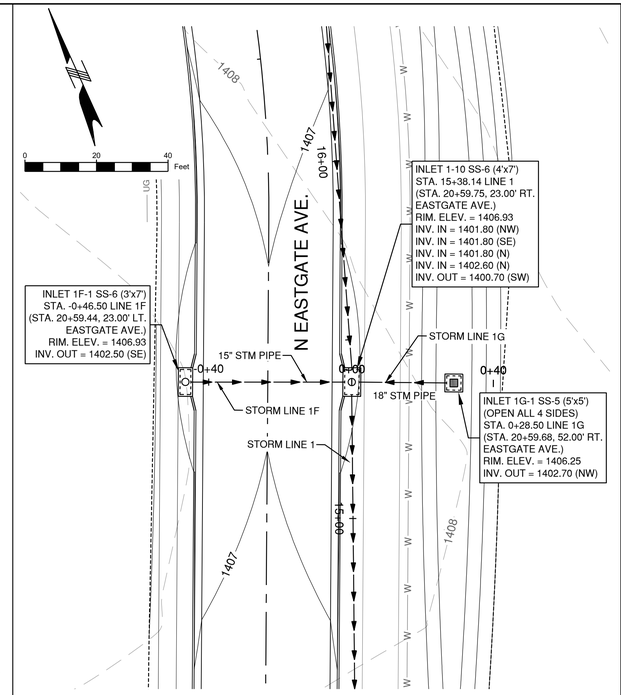
SURVEYED BY: CMT	DESIGN: CMT	SCALES	SHEET 39
FIELD BK.: CMT	DRAWN: CMT	HOR. 1"=20'	OF 86 SHEETS
LEVEL BK.: CMT	CHECKED: RTS	VERT. 1"=4'	FILE NO.: 2023PW0068

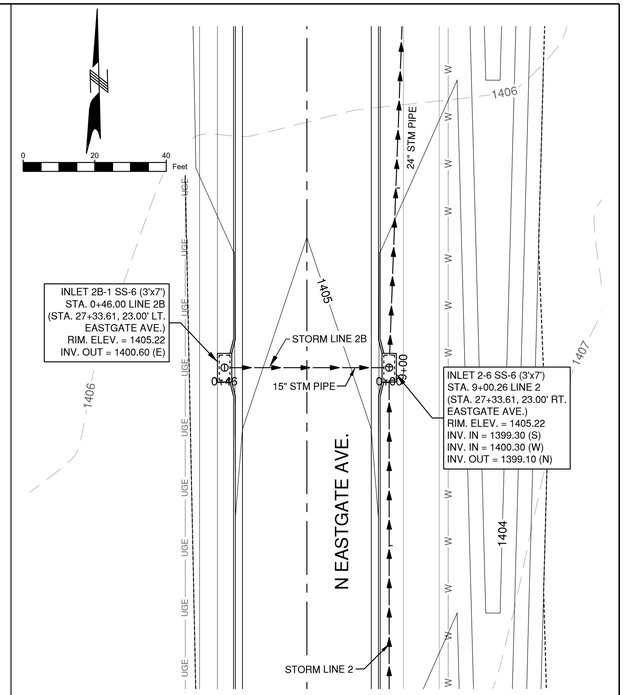
APPROVED BY Dan Smith
DIRECTOR OF PUBLIC WORKS
FILED
IN THE OFFICE OF THE
DIRECTOR OF PUBLIC WORKS
FILE NO. 2023PW0068
DATE 2/11/2025

Path: M:\ERLEN\Group\23005703-00_Eastgate\Draw\Sheets\03 - STORM PLAN & PROFILE.dwg

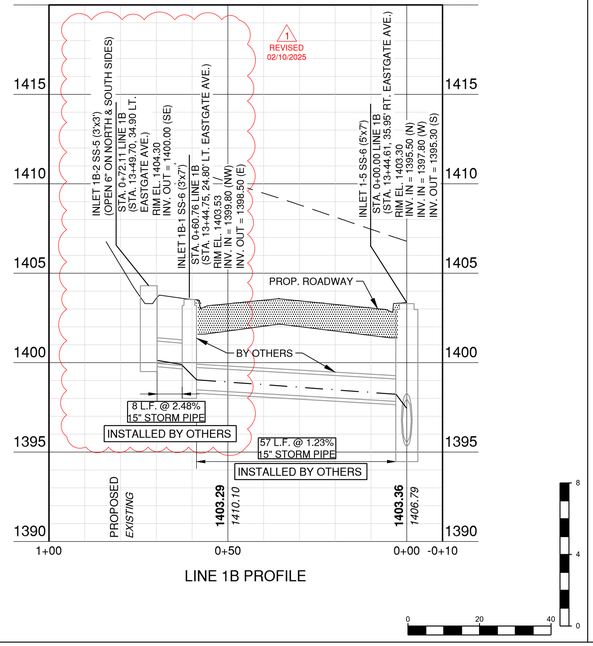


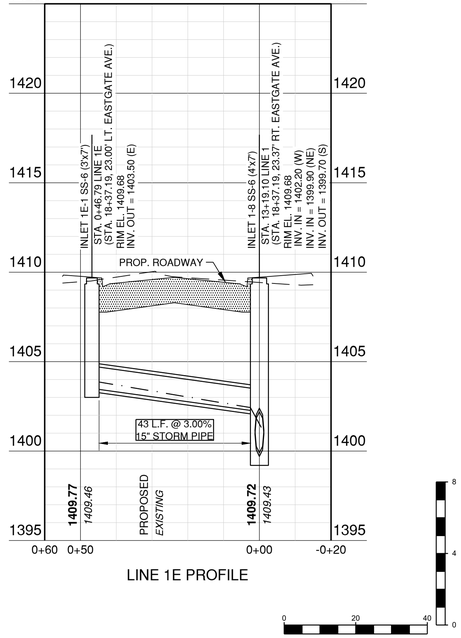


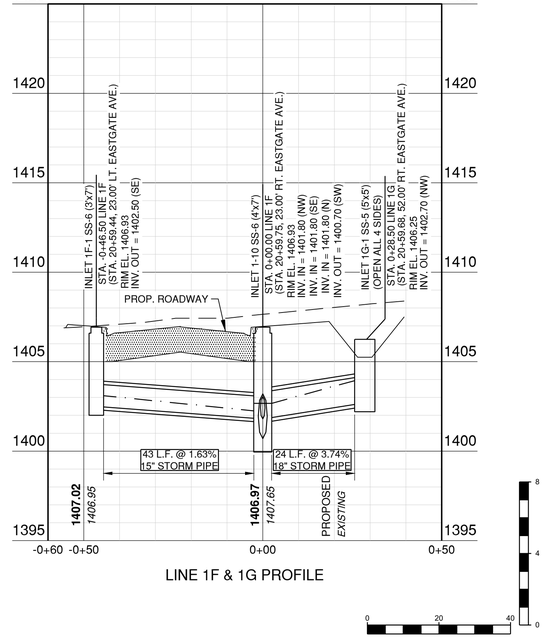


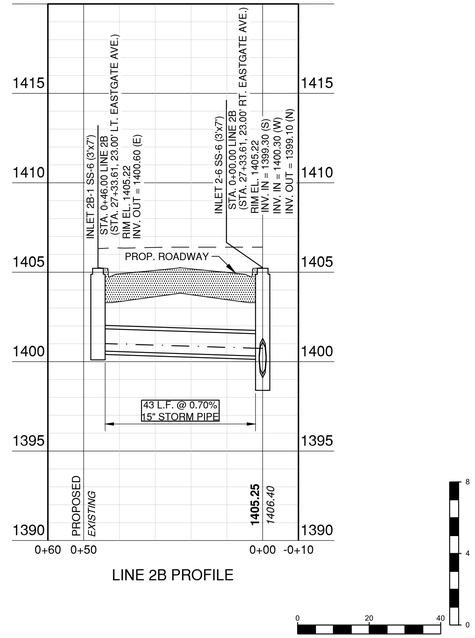


STORM SEWER SYSTEM STARTING AT INLET 1-5 TO INLET 1B-2 TO BE INSTALLED BY OTHERS.









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PLAN LEGEND

- 993 EXISTING CONTOUR
- 993 PROPOSED CONTOUR
- PROPOSED STORM SEWER
- PROPOSED ROW
- PROPOSED TCE
- PROPOSED GRADING LIMITS

PROFILE LEGEND

- EXISTING GROUND PROFILE
- PROPOSED GROUND PROFILE
- 25-YEAR HYDRAULIC GRADE LINE

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

STATE OF MISSOURI
JASON R. CLARK
NUMBER PE-2006019640
PROFESSIONAL ENGINEER
12/03/2024

REVISIONS			
NUMBER	BY	DATE	REMARKS
1	CMT	02/10/2025	REVISION #1

CMT

Crawford, Murphy & Tilly
Engineers and Consultants
1631 W Elfindale, Springfield, Missouri 65807
tel 417-869-6009 fax 417-869-8129

CMT JOB# 23005703-00

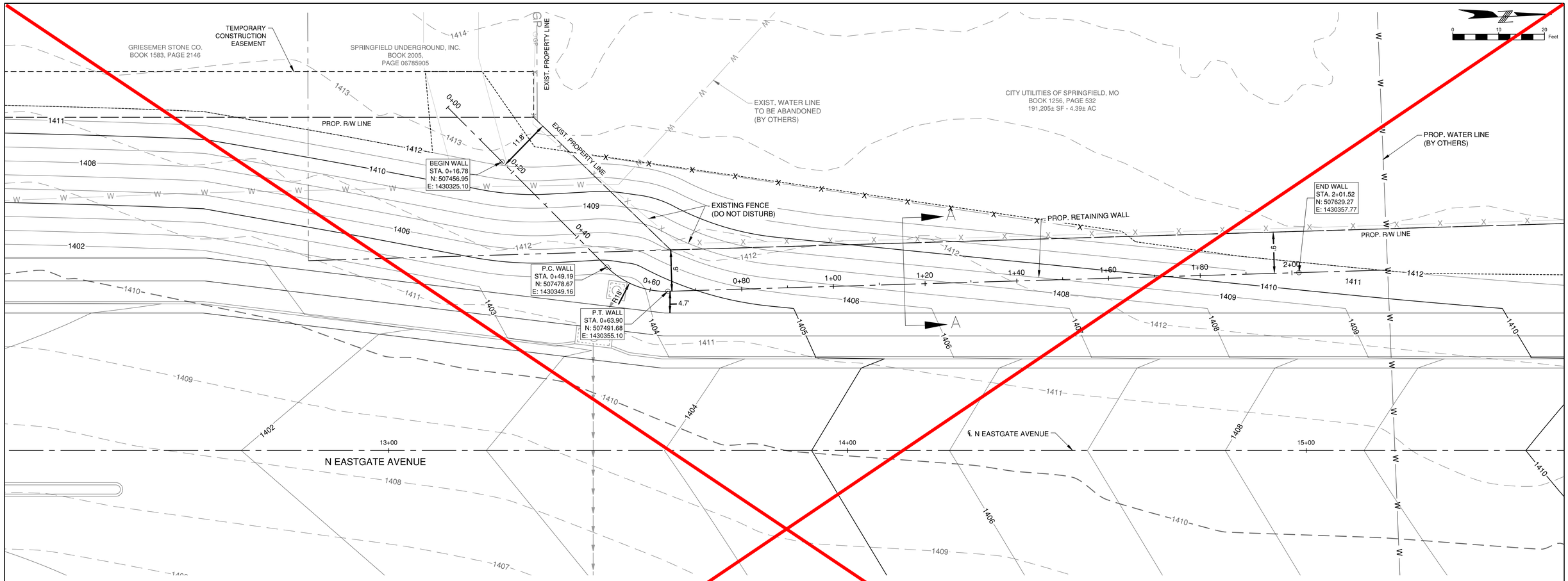
DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI

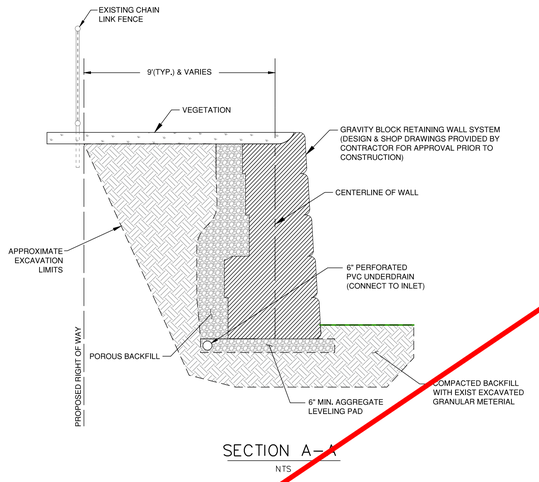
NORTH EASTGATE AVE -
EAST DIVISION ST TO LE COMPTE RD

STORM PLAN & PROFILE

SURVEYED BY: CMT	DESIGN: CMT	SCALES	SHEET 47
FIELD BK.: CMT	DRAWN: CMT	HOR. 1"=20'	OF 86 SHEETS
LEVEL BK.: CMT	CHECKED: RTS	VERT. 1"=4'	FILE NO.: 2023PW0068

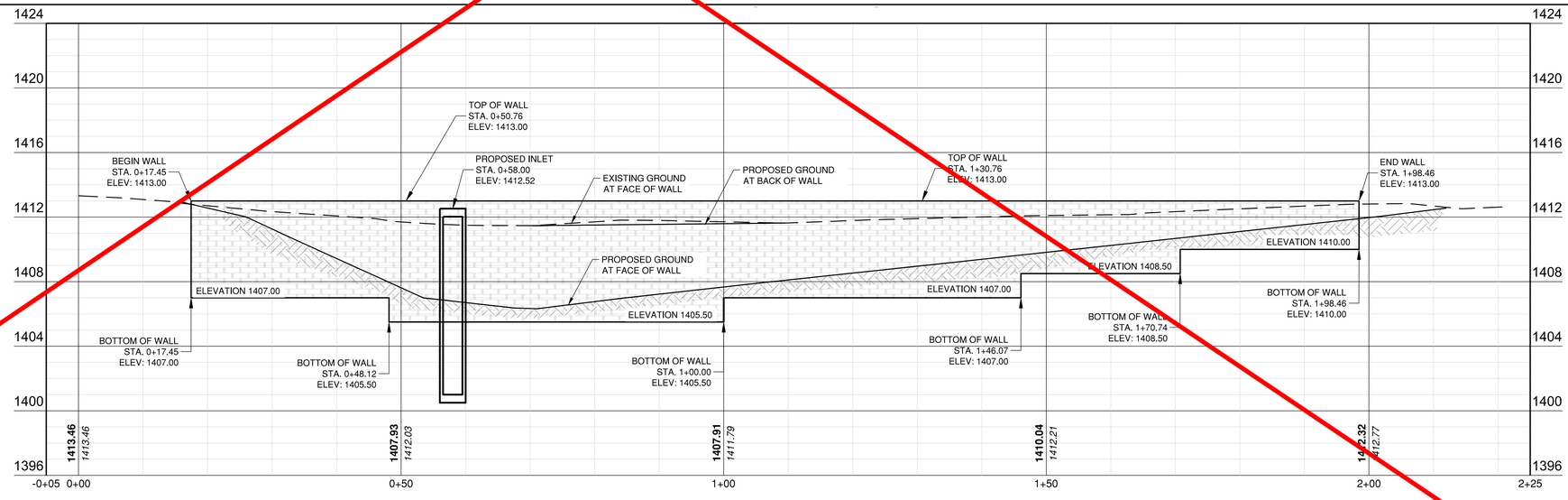
APPROVED BY
DIRECTOR OF PUBLIC WORKS
FILED
IN THE OFFICE OF THE
DIRECTOR OF PUBLIC WORKS
FILE NO. 2023PW0068
DATE 2/11/2025





SECTION A–A

NTS



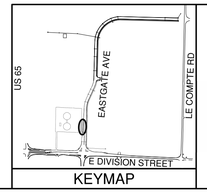
NOTES:
1) PROPOSED GROUND LINES AT FACE OF WALL ARE SHOWN FOR PURPOSES OF PROVIDING QUANTITIES AND FILL HEIGHTS FOR BIDDING. FINAL DESIGN SHALL BE PROVIDED BY THE CONTRACTOR.

2) COMPACT SUBBASE TO 98% STANDARD PROCTOR DENSITY (PER ASTM D-698).

3) LEVELING PAD SHALL BE 6" COMPACTED AGGREGATE MATERIAL TO 98% STANDARD PROCTOR DENSITY (PER ASTM D-698).

4) PRICE FOR MODULAR BLOCK RETAINING WALL SYSTEM SHALL INCLUDE THE FOLLOWING: EXCAVATION, BACKFILL, LEVELING PAD, UNDERDRAIN, AND ALL COSTS ASSOCIATED WITH THE FINAL DESIGN OF THE MODULAR BLOCK RETAINING WALL SYSTEM.

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



KEYMAP

STATE OF MISSOURI
JASON R. CLARK
NUMBER PE-2006019640
PROFESSIONAL ENGINEER
12/03/2024

REVISIONS			
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1	CMT	02/10/2025	REVISION #1

CMT
Crawford, Murphy & Tilly
Engineers and Consultants
1631 W Elfindale, Springfield, Missouri 65807
tel 417-869-6009 fax 417-869-8129

CMT JOB# 23005703-00

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI

NORTH EASTGATE AVE -
EAST DIVISION ST TO LE COMPTE RD

RETAINING WALL PLAN & PROFILE

SURVEYED BY: CMT	DESIGN: CMT	SCALES	SHEET 50
FIELD BK.: CMT	DRAWN: CMT	HOR. 1"=10'	OF 86 SHEETS
LEVEL BK.: CMT	CHECKED: RTS	VERT. 1"=4'	FILE NO.: 2023PW0068

APPROVED BY
DIRECTOR OF PUBLIC WORKS
FILED
IN THE OFFICE OF THE
DIRECTOR OF PUBLIC WORKS
FILE NO. 2023PW0068
DATE 2/11/2025

1 REMOVED 02/10/2025

Path: M:\ER\ENGroup-23005703-00_EastgateDrawSheets\03 - RETAINING WALL PLAN & PROFILE.dwg

GRIESEMER STONE CO. BOOK 1583, PAGE 2146

STA. 11+44.74 O/S 77.48' LT

PROP. 285 LF COMPOST SOCK

STA. 12+79.57 O/S 74.55' LT

EXIST PROPERTY LINE

SPRINGFIELD UNDERGROUND, INC. BOOK 2005, PAGE 06785905

STA. 13+34.51 O/S 64.94' LT

1 REVISED 02/10/2025

CITY UTILITIES OF SPRINGFIELD, MO BOOK 1256, PAGE 532 191,205± SF - 4.39± AC

SPRINGFIELD UNDERGROUND, INC. BOOK 2604, PAGE 621

EXIST PROPERTY LINE

GRIESEMER STONE CO. BOOK 1583, PAGE 2146

PROP. ROW

MATCHLINE STA 11+26

PROP. INLET PROTECTION (TYP) (BY OTHERS)

PROP. INLET PROTECTION (TYP) (BY OTHERS)

PROP. INLET PROTECTION (TYP) (BY OTHERS)

AREA INLET PROTECTION (BY OTHERS)

PROP. INLET PROTECTION (TYP) (BY OTHERS)

℄ N EASTGATE AVENUE

PROP. INLET PROTECTION (TYP)

STA. 11+57.26 O/S 66.39' RT

PROP. INLET PROTECTION (TYP) (BY OTHERS)

STA. 13+67.41 O/S 64.74' RT

PROP. 2371 LF COMPOST SOCK

PROP. ROW

STA. 17+11.31 O/S 49.81' RT

STA. 17+85.49 O/S 49.24' RT

STA. 18+63.86 O/S 49.28' RT

STA. 18+97.39 O/S 49.01' RT

STA. 18+97.85 O/S 73.57' RT

GRIESEMER STONE CO. BOOK 1583, PAGE 2146

PROP. TCE

AREA INLET PROTECTION

MATCHLINE STA 21+19

PROP. INLET PROTECTION (TYP) (BY OTHERS)

℄ 10+97.40 108.86' RT

GRIESEMER STONE CO. BOOK 1583, PAGE 2146

SEE SHEET 55

GRIESEMER STONE CO. BOOK 1583, PAGE 2146

GRIESEMER STONE CO. BOOK 1583, PAGE 2146

PROP. ROW

MATCHLINE STA 21+19

PROP. INLET PROTECTION (TYP)

℄ N EASTGATE AVENUE

PROP. INLET PROTECTION (TYP)

STA. 21+76.02 O/S 73.69' RT

STA. 23+24.00 O/S 72.56' RT

PROP. T.C.E.

AREA INLET PROTECTION

PROP. 2371 LF COMPOST SOCK

STA. 28+39.55 O/S 72.81' RT

AREA INLET PROTECTION

STA. 29+44.68 O/S 73.11' RT

GRIESEMER STONE CO. BOOK 1583, PAGE 2146

MATCHLINE STA 30+76

STA. 22+16.65 O/S 106.82' RT

STA. 22+91.62 O/S 102.08' RT

GRIESEMER STONE CO. BOOK 1583, PAGE 2146

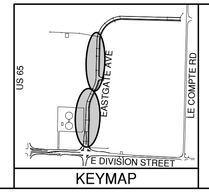
STA. 30+54.32 O/S 72.61' RT

0 30 60 Feet

LEGEND

- LIMITS OF DISTURBANCE
- EXISTING CONTOUR (1280)
- PROPOSED CONTOURS (1280)
- PROPOSED FILTER SOCK (FS)
- FLOW ARROW
- AREA INLET PROTECTION
- CURB INLET PROTECTION
- AREA TO RECEIVE SEEDING / FERTILIZING PER SPECIFICATIONS AND NORTH AMERICAN GREEN BioNet C150BN EROSION CONTROL BLANKET (12,467 SY)
- AREA TO BE SEEDED (3.0 AC)
- RIP-RAP AT END SECTION
- ROCK CHECK DAM

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



KEYMAP

STATE OF MISSOURI JASON R. CLARK NUMBER PE-2006019640 PROFESSIONAL ENGINEER

12/03/2024

REVISIONS			
NUMBER	BY	DATE	REMARKS
1	CMT	02/10/2025	REVISION #1

CMT
Crawford, Murphy & Tilly
Engineers and Consultants
1631 W Elfindale, Springfield, Missouri 65807
tel 417-869-6009 fax 417-869-8129

CMT JOB# 23005703-00

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI

NORTH EASTGATE AVE -
EAST DIVISION ST TO LE COMPTE RD

EROSION CONTROL PLAN

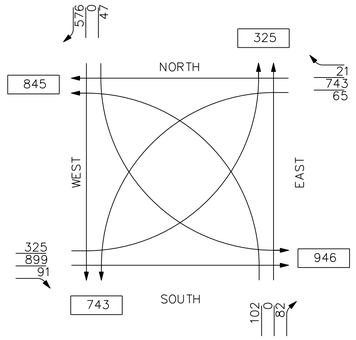
SURVEYED BY: CMT	DESIGN: CMT	SCALES	SHEET 53
FIELD BK.: CMT	DRAWN: CMT	HOR. 1"=30'	OF 86 SHEETS
LEVEL BK.: CMT	CHECKED: RTS	VERT. NA	FILE NO.: 2023PW0068

APPROVED BY
DIRECTOR OF PUBLIC WORKS

FILED
IN THE OFFICE OF THE
DIRECTOR OF PUBLIC WORKS

FILE NO. 2023PW0068
DATE 2/11/2025

Path: M:\ERLEN\Group\23005703-00_Eastgate\Draw\Sheets\ESC Plan.dwg

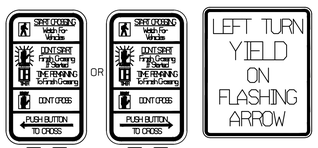


TRAFFIC FLOW DIAGRAM
ESTIMATED – 2045
TRAFFIC VOLUME

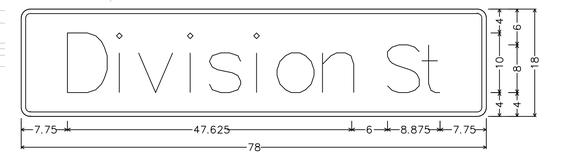
DISCLAIMER
THE PROFESSIONAL WHOSE SIGNATURE AND PERSONAL SEAL APPEAR HEREON ASSUMES RESPONSIBILITY ONLY FOR WHAT APPEARS ON THIS PAGE, AND DISCLAIMS (PURSUANT TO SECTION 327.411 RSMO) SPECIFICATION, ESTIMATES, REPORTS, OR OTHER DOCUMENTS OR INSTRUMENTS NOT SEALED BY THE UNDERSIGNED PROFESSIONAL RELATING TO OR INTENDED TO BE USED FOR ANY PART OR PARTS OF THE PROJECT TO WHICH THIS PAGE REFERS.

NOTES:
1. ALL PEDESTRIAN HEADS SHALL BY COUNTDOWN TYPE HEADS.
2. ALL PUSHBUTTONS SHALL BE APS PUSHBUTTONS.
3. COORDINATE CURB RAMP AND LANDING CONSTRUCTION WITH SIGNAL PLANS. SEE PLAN SHEETS.
4. ALL PUSHBUTTONS REQUIRE SIGN R10-3E (9"X15") TO BE INSTALLED ABOVE THEM.
5. SEE SIGN DETAIL SHEETS FOR STREET SIGN DETAILS.
6. CCTV RADIO TRANSMITTER TO BE INSTALLED ON POST 6 AND THE CCTV POST NEAR THE NE QUADRANT OF THE US65 SB SIGNAL FOR CCTV COMMUNICATIONS. CAT-6 CABLE SHALL BE INSTALLED FROM FIBER CABINET TO RADIO TRANSMITTER ON WEST SIDE OF US65. CONTRACTOR TO COORDINATE WITH MoDOT ITS DEPARTMENT FOR FONAL CONNECTIONS TO FIBER CABINET.

PROP TCE
PROP ROW LINE
EXIST ROW LINE
PLANNED COMMERCIAL
COMMERCIAL
12' LANE
11' LANE
13' LANE
NEXT SIGNAL N/A 1.0% SPEED LIMIT = 45 MPH
NEXT SIGNAL 900' US 65 NB RAMPS 3.6% SPEED LIMIT = 45 MPH
NEXT SIGNAL 6,400' E MILL ST 1.3% SPEED LIMIT = 40 MPH
NEXT SIGNAL N/A 3.6% SPEED LIMIT = 45 MPH
PROP SIGNAL CONTROLLER
PROP TYPE 2 POWER SUPPLY W/ BBS & LIGHTING CONTROLER
LIGHT W/ 12' ARM ON EXIST. POLE (BY C.U.)
1 REVISED 02/10/2025
CCTV-17
RADIO-10
8' POST
15' POST
45' MAST ARM
50' MAST ARM
55' MAST ARM
R80
R35
R10-27a
R10-27c
R10-27A
90'
100'
114+00
115+00
116+00
117+00
118+00
119+00
120+00
E DIVISION ST
E EASTGATE AVE
STA. 116+61.42 E DIVISION ST=
STA. 9+82.67 EASTGATE AVE
0 20 40 Feet

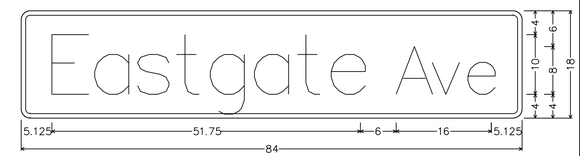


SIGN R10-3EL INSTALLED ABOVE PUSH BUTTONS (INCLUDED IN COST FOR AUDIBLE PEDESTRIAN PUSH BUTTON)
24 44
SIGN R10-3ER
23 43
SIGN R10-27A 30"X 36"



D3-1 SH-FLAT SHEET;
1.500" Radius, 0.750" Border, White on, Green;
"Division", C; "St", C;
Table of letter and object lefts

D	i	v	i	s	i	o	n	S	t
7.750	16.000	19.750	27.875	31.625	39.000	42.875	50.500	61.375	67.125



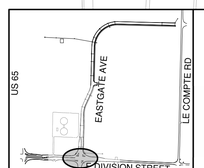
D3-1 SH-FLAT SHEET;
1.500" Radius, 0.750" Border, White on, Green;
"Eastgate", C; "Ave", C;
Table of letter and object lefts

E	a	s	t	g	a	t	e	A	v	e
5.125	12.375	19.500	26.000	31.750	39.125	46.375	52.000	62.875	68.875	74.875

TRAFFIC SIGNALS LEGEND

CONTROLLER	RADAR DETECTOR		CONDUIT MEDIAN
CONTROLLER (EXISTING)	PUSH BUTTON DETECTOR		CONDUIT PUSHED
JUNCTION BOX	PREFORMED PULL BOX TYPE 1		CONDUIT BRIDGE
POWER SUPPLY	PREFORMED PULL BOX TYPE 2		CONDUIT EXISTING
WOOD POST	CONCRETE PULL BOX TYPE 1		CONDUIT TRENCHED
SIGNAL HEAD (OPT LIM CONV)	CONCRETE PULL BOX TYPE 2		SPAN WIRE
SIGNAL HEAD (OPT LIM)	ITS PULL BOX TYPE 2		MAST ARM - TYPE A BASE
SIGNAL HEAD (PEDESTRIAN)	ITS PULL BOX TYPE 5		MAST ARM - TYPE C BASE
SIGNAL HEAD (STANDARD)	6 X 6 LOOP DETECTOR		MAST ARM - TYPE F BASE
	6 X 15 LOOP DETECTOR		
	30 X 6 LOOP DETECTOR		

Know what's below. Call before you dig.



KEYMAP

STATE OF MISSOURI
JASON R. CLARK
NUMBER PE-2006019640
PROFESSIONAL ENGINEER
12/03/2024

REVISIONS			
NUMBER	BY	DATE	REMARKS
1	CMT	02/10/2025	REVISION #1

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Engineers and Consultants
1631 W Elfindale, Springfield, Missouri 65807
tel 417-869-6009 fax 417-869-9129

CMT JOB# 23005703-00

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI

NORTH EASTGATE AVE -
EAST DIVISION ST TO LE COMPTE RD

DIVISION & EASTGATE SIGNAL PLAN

SURVEYED BY: CMT	DESIGN: CMT	SCALES	SHEET 59
FIELD BK.: CMT	DRAWN: CMT	HOR. 1"=20'	OF 86 SHEETS
LEVEL BK.: CMT	CHECKED: RTS	VERT. N/A	FILE NO.: 2023PW0068

APPROVED BY Dan Smith
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DATE 2/11/2025

Path: M:\ERLEN\Group\23005703-00_Eastgate\Draw\Sheets\ES - SIGNAL SHEET.dwg

POST / PULL BOX TABLE

LOCATION / BASE

POST NUMBER	PULL BOX NUMBER	APPROACH	STATION	OFFSET	BASE A 9	A 9.5	A 10	A 10.5	A 11	A 12	F 9	F 9.5	F 10	F 10.5	F 11	F 12	C	CONCRETE** (CU. YARDS)
		CONTROLLER (AS REQ'D)																1.31
1		DIVISION	117+02.47	65.5' LT													1	0.44
2		DIVISION	117+06.03	51.8' LT				1										3.27
3		DIVISION	117+03.54	24.6' RT													1	0.44
4		DIVISION	116+97.40	43.7' RT						1								3.67
5		DIVISION	116+20.03	25.7' RT													1	0.44
6		DIVISION	116+34.53	52.1' LT				1										3.27
	1	DIVISION	117+48.25	85.1' LT														
	2	DIVISION	117+24.40	56.2' LT														
	3	DIVISION	116+97.40	43.7' RT														
	4	DIVISION	116+08.64	25.6' RT														
	5	DIVISION	116+32.54	73.2' LT														
																	SUBTOTAL	12.84
																	TOTAL	13.2

PULL BOX / DRAIN / TOP MOUNT POST

POST NUMBER	PULL BOX NUMBER	PREFORMED CLASS 1	CLASS 2	CLASS 3	CLASS 5	CONCRETE STANDARD	DOUBLE, TYPE A	DOUBLE, TYPE B	DRAIN TYPE* I	II A	II B	II C	TOP MOUNT POST 8 FT.	15 FT.
1													1	
2														
3													1	
4														
5														1
6														
	1						1					1		
	2			1					1					
	3		1						1					
	4	1							1					
	5		1						1					
SUBTOTAL		1	2	1			1		4			1	2	1
TOTAL		1	2	1			1		4			1	2	1

POST – TYPE C & CL

POST NUMBER	ARM LENGTH A	A	A	A	SIGNAL SPACING B	C	D	D'	SIGN SPACING B	C	D	D'
2	45'				20'	11'	11'		8'	30'		
6		55'			13.5'	12'	18.5'		6'	42'		
SUBTOTAL	1	1										
TOTAL	1	1										

POST – TYPE B & BL (ARM LENGTH / LEFT ARM E)

POST NUMBER	ARM LENGTH E	K	E	K	E	K	LEFT ARM E SIGNAL SPACING F	G	H	H'	SIGN SPACING F	G	H	H'
4	50'	45'					30.5'	12.5'			5'			
SUBTOTAL	1													
TOTAL	1													

POST – TYPE B & BL (RIGHT ARM K) / LIGHTING POLE / LUMINAIRE BRACKET ARM

POST NUMBER	RIGHT ARM K SIGNAL SPACING L	M	N	N'	SIGN SPACING L	M	N	N'	INCLUDED ANGLE	LIGHTING POLE 30 FT., AT	45 FT., AT	LUMINAIRE BRACKET ARM 8 FT.	10 FT.	12 FT.	15 FT.
2															1*
4	13.7'	12'	12'	11'	8'	25'			90°						2*
6															1*
SUBTOTAL															4
TOTAL															4

NOTE: SIGNAL & SIGN SPACING SHOWN IS APPROXIMATE. CONTRACTOR SHALL ADJUST AS NECESSARY

CCTV MOUNTED ON POST 6 CL

1 REVISED 02/10/2025

SIGNAL HEADS

INDICATIONS*

SPAN NUMBER	POST NUMBER	FACE NUMBER	LUMINAIRE LED A	12" LENS CONVENTIONAL R	RL	Y	YL	Yrt	FYL	FYR	G	S	L		12" LENS OPTICAL LIMITING R	Y	YL	Yrt	FYL	FYR	G	S	L	Rt
	1	44												1										
	2	51	1		1		1		1				1											
	2	21		1		1					1													
	2	22		1		1					1													
	2	23												1										
	3	24												1										
	4	31	2		1		1						1											
	4	32			1		1						1											
	4	81		1		1					1													
	4	82		1		1					1													
	4	61		1		1					1													
	4	11			1		1		1				1											
	5	62		1		1					1													
	6	71	1		1		1		1				1											
	6	41		1		1					1													
	6	42		1		1					1													
	6	43												1										
	LUM-5		1																					
SUBTOTAL			5																					
TOTAL			5																					

NOTE: ALL PED SIGNAL INDICATIONS SHALL BE COUNTDOWN

VISORS* / LOUVERS* / BACKPLATE* / RETROREFLECTIVE BACKPLATE* / BRACKET*

POST NUMBER	FACE NUMBER	VISORS 12" LENS	PED	LOUVERS A	B	C	D	E	F	BACKPLATE LENSES 1	2	3	4	5	RETROREFLECTIVE BACKPLATE LENSES 1	2	3	4	5	BRACKET TYPE I	II	III
1	44		1							1										1		
2	51	4											1							1		
2	21	3										1								1		
2	22	3										1								1		
2	23		1							1										1		
3	24		1							1										1		
4	31	3										1								1		
4	32	3										1								1		
4	81	3										1								1		
4	82	3										1								1		
4	61	3										1								1		
4	11	4											1							1		
5	62	3										1								1		
6	71	4											1							1		
6	41	3										1								1		
6	42	3										1								1		
6	43		1							1										1		

ONE FACE SECTION / TWO FACE SECTIONS

POST NUMBER	FACE NUMBER	1- T	1- S	1- C	1- B	2- T	2- S	2- C	2- B	3- T	3- S	3- C	3- B	4- T	4- S	4- C	4- B	11- T	11- S	11- B	33- T	33- S	33- C	33- B	34- S	34- B	44- S	44- B	45- S	45- B
1	44		1																											
2	51																1													
2	21												1																	
2	22												1																	
2	23		1																											
3	24		1																											
4	31												1																	
4	32												1																	
4	81												1																	
4	82												1																	
4	61												1																	
4	11																1													
5	62									1																				
6	71																1													
6	41												1																	
6	42												1																	
6	43		1																											
SUBTOTAL OPTICALLY LIMITED																														
SUBTOTAL CONVENTIONAL			4							1			9				3													
SUBTOTAL COMBINATION OL & CONV																														
TOTAL OPTICALLY LIMITED																														
TOTAL CONVENTIONAL			4							1			9				3													
TOTAL COMBINATION OL & CONV																														

REMARKS

ALL LENGTHS AND SPACINGS ARE IN FEET UNLESS OTHERWISE INDICATED.

* ITEMS FOR WHICH SEPARATE PAYMENT WILL NOT BE MADE.

** SEE STANDARD PLANS 902.10 AND 902.30 FOR CONCRETE REQUIREMENTS ON BASES.

*** USE D3-16 FOR ONE LINE. USE D3-18 FOR TWO LINE.

SIGNAL STRUCTURES WHICH WILL EXCEED THE DIMENSION LIMITS SHOWN ON STANDARD PLAN SHEETS IN SECTION 902 AND ANY OTHER INSTALLATION WHERE THE DETAILS OF CONSTRUCTION ARE NOT FURNISHED IN THE CONTRACT PLANS, SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER IN ACCORDANCE WITH THE 2001 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, 4TH EDITION, AND LATEST INTERIMS. THE STRUCTURE SHALL BE DESIGNED AS IMPORTANCE CATEGORY I FOR FATIGUE WITH A 50-YEAR DESIGN LIFE. THE CONTRACTOR SHALL SUBMIT A SET OF SHOP DETAIL DRAWINGS INCLUDING WELD PROCEDURE SPECIFICATIONS AND DESIGN COMPUTATIONS FOR MODOT RECORDS AND REFERENCE. THE SUBMITTED DRAWINGS AND CALCULATIONS SHALL BE SIGNED AND SEALED IN ACCORDANCE WITH THE LAWS RELATING TO ARCHITECTS AND PROFESSIONAL ENGINEERS (CHAPTER 327, RSMO.), AND SHALL INCLUDE A TITLE BLOCK OR SUMMARY SHEET WHICH LISTS AND CERTIFIES THAT THE PRODUCT MEETS ALL OF THE SPECIFIED DESIGN CRITERIA.

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

D-37A

LEGEND

T – TOP MOUNT
S – SIDE MOUNT
C – SPANWIRE MOUNT
B – MAST ARM MOUNT

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DIVISION STREET AND EASTGATE AVENUE INTERSECTION

STATE OF MISSOURI — JASON R. CLARK — NUMBER PE-2006019640 — PROFESSIONAL ENGINEER — 12/03/2024

REVISIONS			
NUMBER	BY	DATE	REMARKS
1	CMT	02/10/2025	REVISION #1

CMT Crawford, Murphy & Tilly
Engineers and Consultants
1631 W Elfindale, Springfield, Missouri 65807
tel 417-869-6009 fax 417-869-8129

CMT JOB# 23005703-00

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI

NORTH EASTGATE AVE -
EAST DIVISION ST TO LE COMPTE RD

DIVISION & EASTGATE SIGNAL PLAN

SURVEYED BY: CMT
FIELD BK.: CMT
LEVEL BK.: CMT
DESIGN: CMT
DRAWN: CMT
CHECKED: RTS
SCALES HOR. 1"=20' VERT. N/A
SHEET 60 OF 86 SHEETS
FILE NO.: 2023PW0068

APPROVED BY [signature]
DIRECTOR OF PUBLIC WORKS
FILED IN THE OFFICE OF THE DIRECTOR OF PUBLIC WORKS
FILE NO. 2023PW0068
DATE 2/11/2025

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CONDUIT (WITH #14 TRACER WIRE)

FROM	TO	CENTER TO CENTER DISTANCE	LOOP DET. 1"	TRENCH 2"	TRENCH 3"	TRENCH 4"	TRENCH 2" RIGID STEEL *	PUSHED 2"	PUSHED 3"	PUSHED 4"	MEDIAN 2"	MEDIAN 3"	MEDIAN 4"	ON STRUCTURE 2"	ON STRUCTURE 3"	ON STRUCTURE	REMARKS
P/S	∅	-					-										SOURCE TO SUPPLY
∅	⊠	15'		23'													
∅	[1]	18'			21'												
⊠	[1]	10'			26'												2-3" CONDUITS
[1]	[2]	37'			70'												2-3" CONDUITS
[2]	(1)	24'			25'												
[2]	(2)	19'			22'												
[2]	[3]	103'							101'								
[2]	[5]	93'			91'												
[3]	(3)	20'			19'												
[3]	(4)	8'			11'												
[3]	[4]	91'							89'								
[4]	(5)	11'							12'								
[5]	(6)	22'			25'												
SUBTOTALS				23'	310'				202'								
TOTALS				23'	310'				202'								

CABLE

FROM	TO	CENTER TO CENTER DISTANCE	POWER 1c #8	POWER 1c #2 *	CONTROL 2c #16	CONTROL 5c #16	CONTROL 7c #16	CONTROL 3c #16	CABLED CONDUIT 2c#8	LUMINAIRE CONTROL 2c #12	LUMINAIRE POLE & BRACKET 1c #10	DETECTOR 1c #14 IN DUCT	DETECTOR 2c #14 LEAD-IN CABLE	DETECTOR RADAR 6 CONDUCTOR	CAT6	REMARKS
P/S	∅	-		-												SOURCE TO SUPPLY
∅	⊠	15'	93'												31'*	3-1C#8 CABLES / BBS
∅	(2)	71'	75'													SUPPLY TO POLE 2
∅	(4)	146'	166'													SUPPLY TO POLE 4
∅	(6)	143'	170'													SUPPLY TO POLE 6
⊠	(1)	71'				101'										PEDESTRIAN HEAD 44
⊠	(1)	71'			100'											PUSH BUTTON 43
⊠	(2)	67'					152'									SIGNAL HEAD 51
⊠	(2)	67'					140'									SIGNAL HEAD 21
⊠	(2)	67'					100'									SIGNAL HEAD 22
⊠	(2)	67'				97'										PEDESTRIAN HEAD 23
⊠	(2)	67'			96'											PUSH BUTTON 24
⊠	(2)	67'												117'		Ø1 Ø6
⊠	(3)	172'				208'										PEDESTRIAN HEAD 24
⊠	(3)	172'			207'											PUSH BUTTON 23
⊠	(4)	159'					255'									SIGNAL HEAD 31
⊠	(4)	159'					244'									SIGNAL HEAD 32
⊠	(4)	159'					232'									SIGNAL HEAD 81
⊠	(4)	159'					198'									SIGNAL HEAD 82
⊠	(4)	159'					236'									SIGNAL HEAD 11
⊠	(4)	159'					249'									SIGNAL HEAD 61
⊠	(4)	159'												215'		Ø4 Ø7
⊠	(4)	159'												215'		Ø2 Ø5
⊠	(5)	252'					297'									SIGNAL HEAD 62
⊠	(6)	162'					262'									SIGNAL HEAD 71
⊠	(6)	162'					234'									SIGNAL HEAD 41
⊠	(6)	162'					222'									SIGNAL HEAD 42
⊠	(6)	162'				198'										PEDESTRIAN HEAD 43
⊠	(6)	162'			197'											PUSH BUTTON 44
⊠	(6)	162'												218'		Ø3 Ø8
⊠	(6)	162'													218'	CCTV CAMERA
∅	(2)	74'								98'	45'					LUM 1
∅	(4)	166'								391'	90'					LUM 2 & LUM 3
∅	(6)	170'								194'	45'					LUM 4
F.O.C	RADIO	55'													120'	CCTV RADIO TRANSMITTER US65 SB RAMP SIGNAL POST X TO F.O.C.
SUBTOTALS			93'		597'	601'	2821'			683'	180'			765'	338'	
5% FOR SNAKING			98'		627'	631'	2962'			717'	189'			803'	355'	
TOTALS			100'		650'	650'	3000'			720'	190'			900'	360'	

*QUANTITY SHOWN FOR INFORMATION PURPOSES. NO DIRECT PAY.

1 REVISED 02/10/2025

DIVISION STREET AND EASTGATE AVENUE
INTERSECTION

D-37B

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STATE OF MISSOURI — JASON R. CLARK — NUMBER PE-2006019640 — PROFESSIONAL ENGINEER
12/03/2024

REVISIONS

NUMBER	BY	DATE	REMARKS
1	CMT	02/10/2025	REVISION #1

CMT Crawford, Murphy & Tilly
Engineers and Consultants
1631 W Elfindale, Springfield, Missouri 65807
tel 417-869-6009 fax 417-869-8129

CMT JOB# 23005703-00

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI

NORTH EASTGATE AVE -
EAST DIVISION ST TO LE COMPTE RD

DIVISION & EASTGATE SIGNAL PLAN

SURVEYED BY: CMT
FIELD BK.: CMT
LEVEL BK.: CMT
DESIGN: CMT
DRAWN: CMT
CHECKED: RTS
SCALES HOR. 1"=20' VERT. N/A
SHEET 61 OF 86 SHEETS
FILE NO.: 2023PW0068

APPROVED BY [signature]
DIRECTOR OF PUBLIC WORKS
FILED
IN THE OFFICE OF THE
DIRECTOR OF PUBLIC WORKS
FILE NO. 2023PW0068
DATE 2/11/2025

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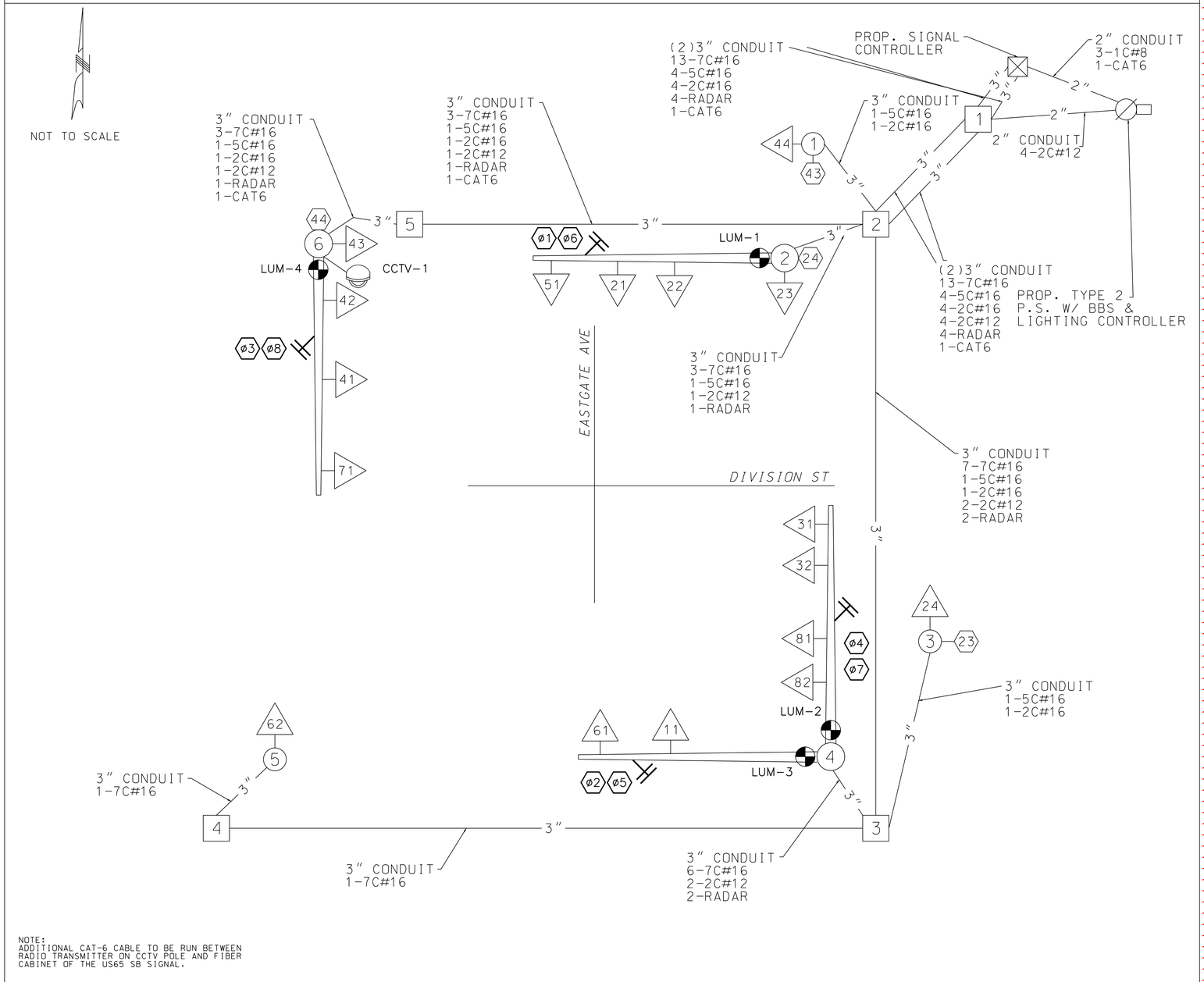
WIRING DIAGRAM



NOTE:
ADDITIONAL CAT-6 CABLE TO BE RUN BETWEEN RADIO TRANSMITTER ON CCTV POLE AND FIBER CABINET OF THE US65 SB SIGNAL.

1
REVISED
02/10/2025

LEGEND

3"	CONDUIT CONTAINING CABLE WITH SIZE
	CABLE
	EXISTING CONDUIT
X-Xc	MULTI-CONDUCTOR CABLE #16 AWG (UNLESS OTHERWISE INDICATED)
LIC	#14 AWG DETECTOR LEAD-IN CABLE (2C TWISTED SHIELDED)
X	PULL BOX WITH NUMBER
X	POST WITH NUMBER
X	POST WITH MAST ARM
X	POST WITH MAST ARM AND LUMINAIRE
X	DETECTOR WITH NUMBER
X	SIGNAL HEAD WITH NUMBER
	SIGNAL CONTROLLER
	POWER SUPPLY
	LIGHTING CONTROLLER
	RADAR DETECTOR
	CCTV CAMERA

DIVISION STREET AND EASTGATE AVENUE

INTERSECTION

D-37D

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JASON R. CLARK
NUMBER PE-2006019640
PROFESSIONAL ENGINEER
12/03/2024

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1	CMT	02/10/2025	REVISION #1

CMT
Crawford, Murphy & Tilly
Engineers and Consultants
1631 W Elfindale, Springfield, Missouri 65807
tel 417-869-6009 fax 417-869-8129

CMT JOB# 23005703-00

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI

NORTH EASTGATE AVE -
EAST DIVISION ST TO LE COMPTE RD

DIVISION & EASTGATE SIGNAL PLAN

SURVEYED BY: CMT	DESIGN: CMT	SCALES	SHEET 63
FIELD BK.: CMT	DRAWN: CMT	HOR. 1"=20'	OF 86 SHEETS
LEVEL BK.: CMT	CHECKED: RTS	VERT. N/A	FILE NO.: 2023PW0068

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DIRECTOR OF PUBLIC WORKS
FILE NO. 2023PW0068
DATE 2/11/2025

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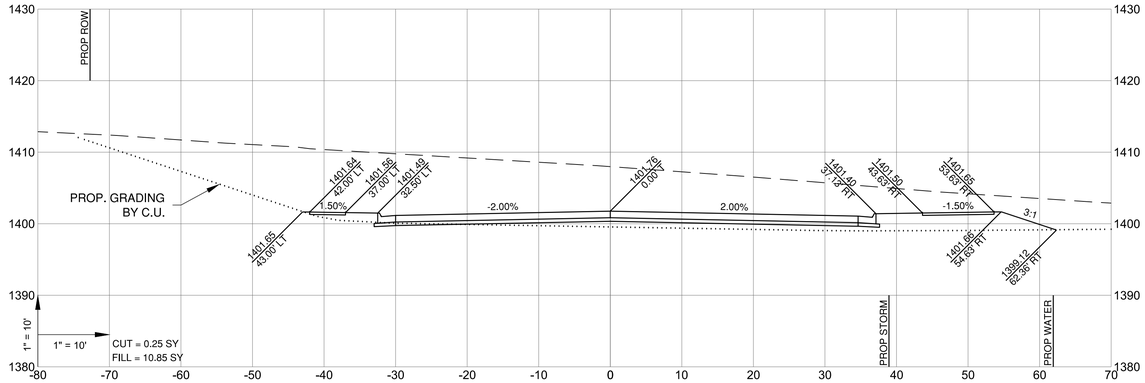
NOTE: EARTHWORK QUANTITY CALCULATIONS BASED ON PROPOSED C.U. GRADING TO BE COMPLETED PRIOR TO ROADWAY CONSTRUCTION

1
REVISED
02/10/2025

12+50



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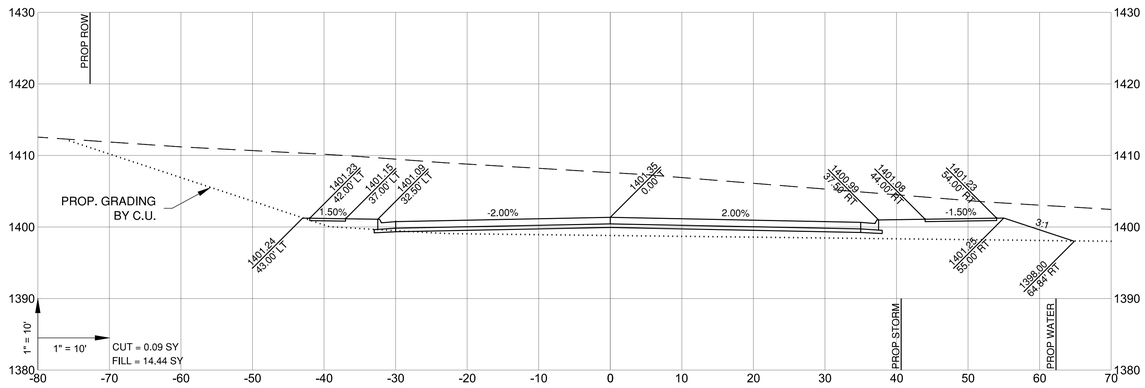

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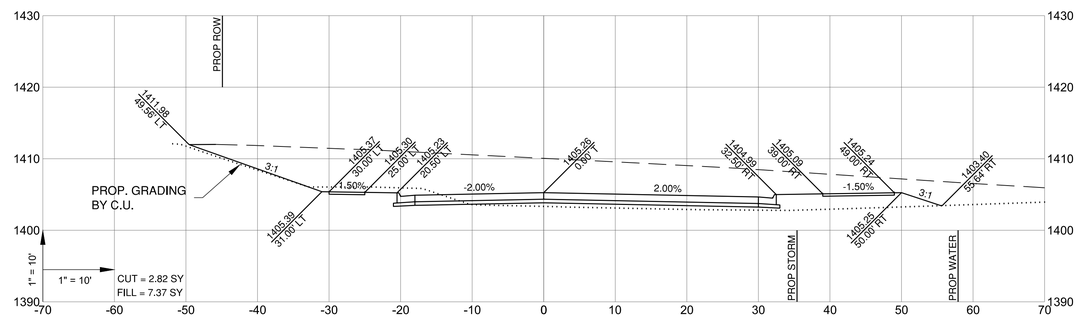

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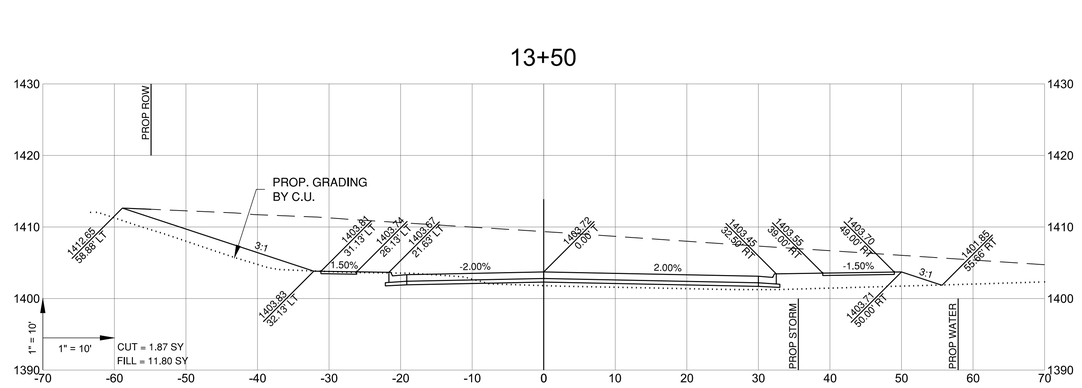

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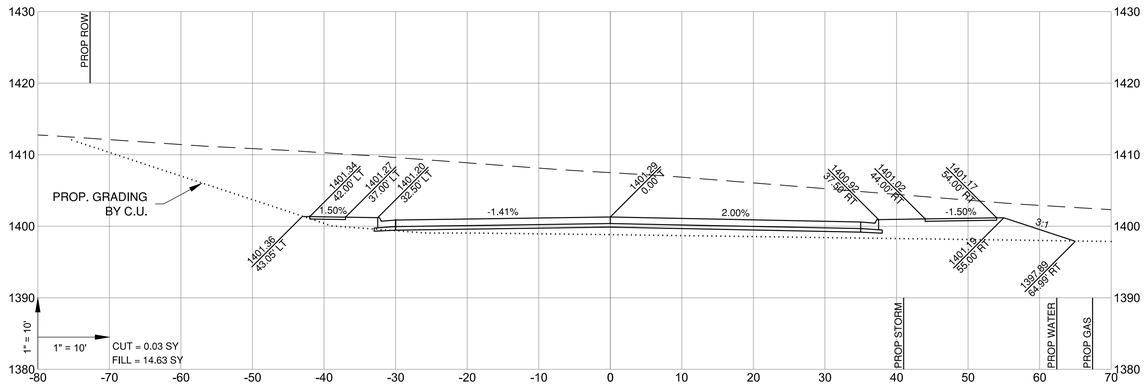

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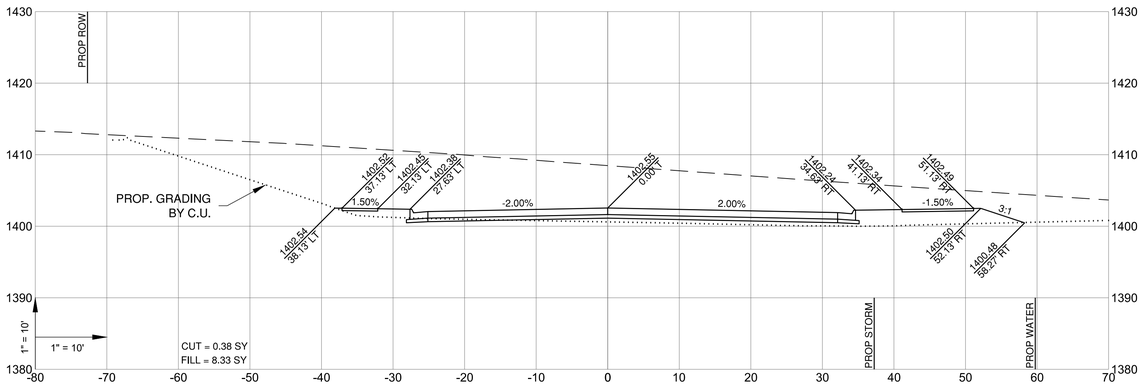

EASTGATE AVENUE

Know what's below. Call before you dig.

STATE OF MISSOURI
JASON R. CLARK
NUMBER PE-2006019640
PROFESSIONAL ENGINEER
12/03/2024

REVISIONS			
NUMBER	BY	DATE	REMARKS
1	CMT	02/10/2025	REVISION #1

CMT
Crawford, Murphy & Tilly
Engineers and Consultants
1631 W Elfindale, Springfield, Missouri 65807
tel 417-869-6009 fax 417-869-8129

CMT JOB# 23005703-00

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI

NORTH EASTGATE AVE -
EAST DIVISION ST TO LE COMPTE RD

EASTGATE CROSS SECTIONS

SURVEYED BY: CMT	DESIGN: CMT	SCALES	SHEET 75
FIELD BK.: CMT	DRAWN: CMT	HOR. 1"=10'	OF 86 SHEETS
LEVEL BK.: CMT	CHECKED: RTS	VERT. 1"=10'	FILE NO.: 2023PW0068

APPROVED BY Dan Smith
DIRECTOR OF PUBLIC WORKS
FILED
IN THE OFFICE OF THE
DIRECTOR OF PUBLIC WORKS
FILE NO. 2023PW0068
DATE 2/11/2025

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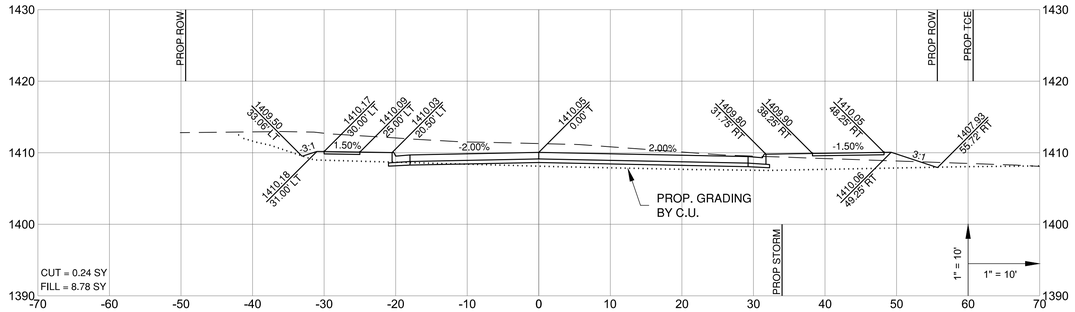
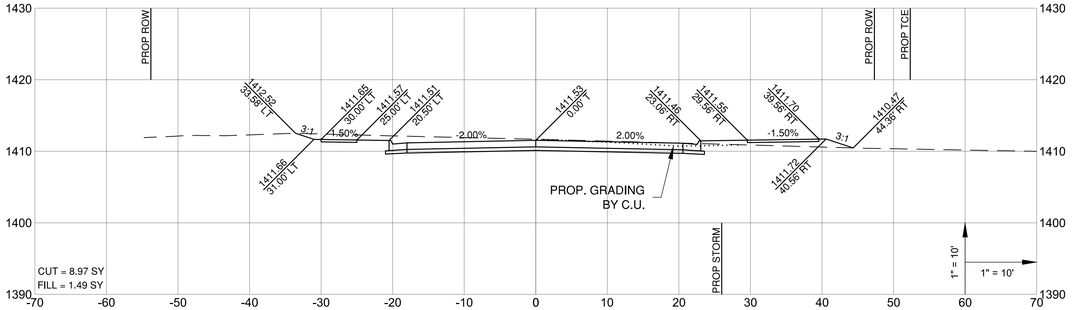
NOTE: EARTHWORK QUANTITY CALCULATIONS BASED ON PROPOSED C.U. GRADING TO BE COMPLETED PRIOR TO ROADWAY CONSTRUCTION

15+50



17+00



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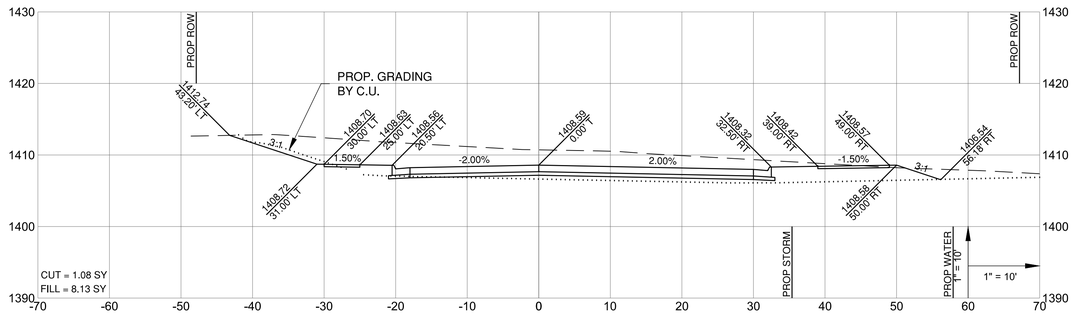

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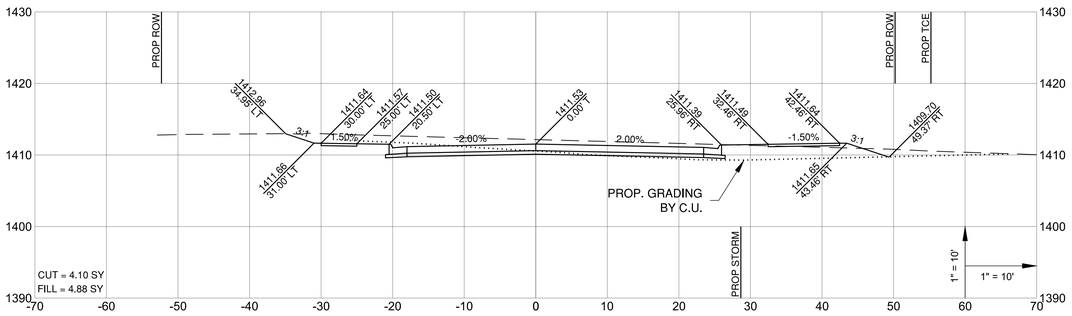

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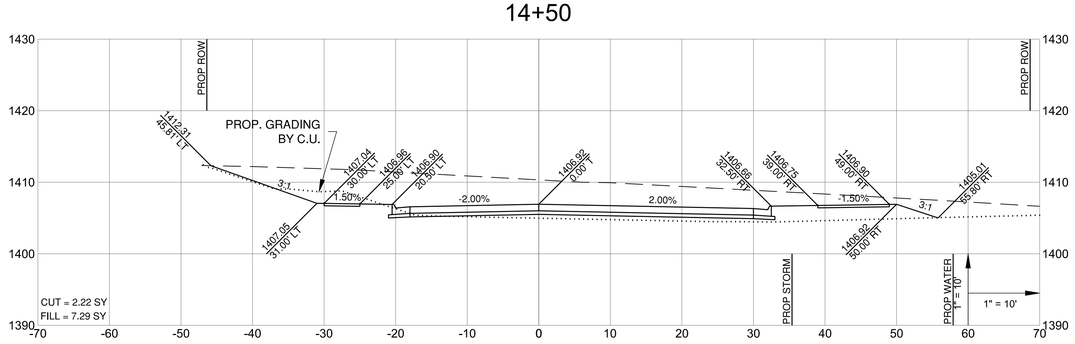

1
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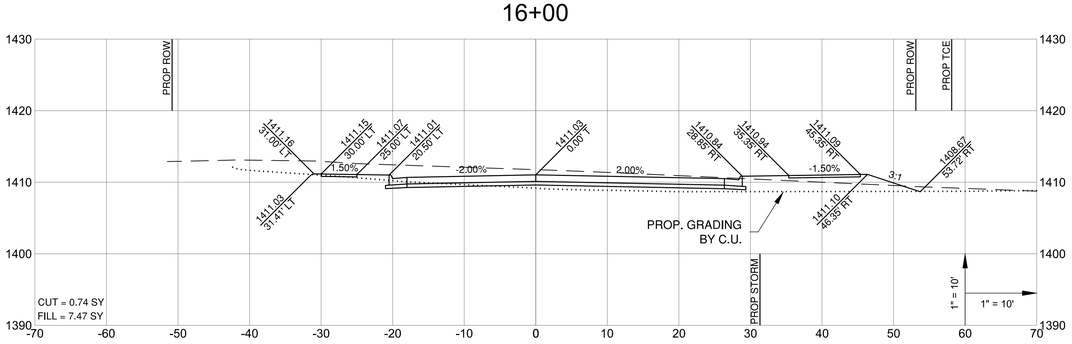
02/10/2025

16+00



EASTGATE AVENUE

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

STATE OF MISSOURI
JASON R. CLARK
NUMBER PE-2006019640
PROFESSIONAL ENGINEER
12/03/2024

REVISIONS			
NUMBER	BY	DATE	REMARKS
1	CMT	02/10/2025	REVISION #1

CMT
Crawford, Murphy & Tilly
Engineers and Consultants
1631 W Elfindale, Springfield, Missouri 65807
tel 417-869-6009 fax 417-869-8129

CMT JOB# 23005703-00

DEPARTMENT OF PUBLIC WORKS
SPRINGFIELD, MISSOURI

NORTH EASTGATE AVE -
EAST DIVISION ST TO LE COMPTE RD

EASTGATE CROSS SECTIONS

SURVEYED BY: CMT	DESIGN: CMT	SCALES	SHEET 76
FIELD BK.: CMT	DRAWN: CMT	HOR. 1"=10'	OF 86 SHEETS
LEVEL BK.: CMT	CHECKED: RTS	VERT. 1"=10'	FILE NO.: 2023PW0068

APPROVED BY Dan Smith
DIRECTOR OF PUBLIC WORKS
FILED
IN THE OFFICE OF THE
DIRECTOR OF PUBLIC WORKS
FILE NO. 2023PW0068
DATE 2/11/2025

Path: M:\ERLEN\Group\23005703-00_Eastgate\Draw\Sheets\XX.CROSS SECTIONS.dwg